



Installation, Operation, and Maintenance

Trane Rental Services

RTAC



Model Numbers: RTAC, CSCA

⚠ 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.

September 2023

RTAC-SVX005B-EN

TRANE
TECHNOLOGIES™



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:



Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.



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.



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 Labelling 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.

⚠ 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 Service Procedures!**

Failure to follow all precautions in this manual and on the tags, stickers, and labels 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 following instructions: Unless specified otherwise, disconnect all electrical power including remote disconnect and discharge all energy storing devices such as capacitors before servicing. Follow proper lockout/tagout procedures to ensure the power can not be inadvertently energized. When necessary to work with live electrical components, have a qualified licensed electrician or other individual who has been trained in handling live electrical components perform these tasks.

NOTICE**Use Copper Conductors Only!**

Failure to use copper conductors could result in equipment damage as the equipment was not designed or qualified to accept other types of conductors.

How to use this manual

The purpose of this manual is to supplement RTAC-SVX01*-EN, it is not intended to replace the information within the Installation, Operation, and Maintenance manual. Always use the most up-to-date version of the manual for the most accurate information.

Reference the latest version of the Electrical Safety Service Alert, RTAC-SVA03*-EN for more electrical information and safety precautions.

For more information about the standard RTAC unit installation or sound performance, see RLC-PRB006*-EN.

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Revision History

Added note under Single point power enclosure figure in Installation - Electrical chapter.



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General Data

Unit Description

The 155 to 500 ton (60 Hz) model RTAC units are helical-rotary type, aircooled liquid chillers, designed for outdoor installation. The compressor circuits are completely assembled, hermetic packages, that are factory-piped, wired, leak-tested, dehydrated, and tested for proper control operation before shipment.

Note: *Packaged units are factory charged with refrigerant and oil.*

Trane Rental Services rental equipment also includes a chilled water pump, shore power, leveling system, and piping and electrical connection points.

Receiving Checklist

To protect against loss due to damage incurred in transit, complete the following checklist upon receipt of the unit:

- Inspect individual pieces of the shipment before accepting the unit. Check for obvious damage to the unit or packing material.
- Confirm all (4) leveling jacks are with unit. Trailer mounted units may have jacks placed in one of the

boxes underneath the trailer. F2-F4 RTAC's have jacks that are stored in a different position for shipping vs. installation. These must be relocated on the chiller uprights or rear trailer mounting location in order to allow for proper travel of the jack.

- Check the unit for concealed damage before it is stored and as soon as possible after delivery. Concealed damage must be reported within 15 days.
- If concealed damage is discovered, stop unpacking the shipment. Do not remove damaged material from the receiving location. Take photos of the damage, if possible. The owner must provide reasonable evidence that the damage did not occur after delivery.
- Notify the carrier's terminal of damage immediately by phone and by mail. Request an immediate joint inspection of the damage by the carrier and the consignee.
- Notify the Trane sales representative and arrange for repair. Do not repair the unit, however, until damage is inspected by the carrier's representative.



Model Number Description

Digit 1, 2 — Unit Model

CS = Rental Services

Digit 3, 4 — Unit Type

CA = Air-Cooled Chiller

Digit 5, 6, 7, 8 — Unit Capacity

- 0155 = 155 Nominal Tons
- 0170 = 170 Nominal Tons
- 0200 = 200 Nominal Tons
- 0250 = 250 Nominal Tons
- 0300 = 300 Nominal Tons
- 0400 = 400 Nominal Tons
- 0500 = 500 Nominal Tons

Digit 9, 10 — Design Sequence

Note: See the table below.

Digit 11, 12 — Incremental Designator

AA

	Connection Type	Pump Bypass	Over-head Frame ^(a)	Power Connection Type Single or Dual Point ^(b)	Dual Point Only	Sound Attenuation	Wye-Delta Starters	Flow Meters	Arktite Plugs ^(c)
F0	Lugs or Series 16 Cam-Type Connections	No	Yes	300, 400 Ton	500 Tons	No	No	No	No
F2	Cam-Type Connections	Yes	Yes	N/A	300, 400 and 500 Tons	No	No	Yes	Yes
F3	Cam-Type Connections	Yes	No	N/A	300, 400 and 500 Tons	No	No	Yes	No
F4	Cam-Type Connections	Yes	No	N/A	500 Tons	500T	500T	Yes	No

^(a) Only applies to chillers smaller than 300 Tons.

^(b) This alludes only to 300 and 400 ton chillers ability to be setup at the site by a single or dual electrical point. All other chillers under 300 tons are setup as a single point unit only.

^(c) These plugs help seamlessly wire a TRS VFD to a rental chiller pump motor.



Pre-installation Installation Checklist

Drainage

Locate the unit so that the entire assembly can be allowed to drain during unit shutdown and repair.

Air Vents

Air vent(s) are located at high points in the Rental RTAC integral piping and/or evaporator to purge air from the system. Additional vents must be installed at high points in the piping system to facilitate air purging during the filling process.

Water pressure gauges

A water pressure gauge is installed near the inlet side of the chiller barrel with appropriate piping to measure the supply, return, and evaporator differential solution pressure.

NOTICE

Evaporator Damage!

Do not exceed 150 psig evaporator pressure as it could result in damage to the evaporator.

Pipe unions and connectors

Pipe unions and Victaulic connectors are used to simplify disassembly for system service.

Thermometers

Temperature gauges are used in the lines to monitor the evaporator entering and leaving water temperatures.

Differential Pressure

Differential pressure across the evaporator should be measured using pressure gauges located at strategic places in the chiller. This is used to determine approximate flow through the evaporator. Reference [Figure 35, p. 38](#) and [Figure 36, p. 38](#) in order to determine flow in the machine you have on site.

Balancing valves

A balancing butterfly valve is installed in the leaving water line. It will be used to establish a balanced flow.

Note: *Entering and leaving water lines have shutoff valves installed to isolate the evaporator for service.*

Flow Meter

F2-F4 style machines are equipped with mechanical flow meters placed in-line with the chiller piping to determine flow. Flow readings may become inaccurate at flow rates in excess of 1000 GPM. To confirm evaporator water flow rate, refer to procedures for measuring evaporator differential pressure from "[Differential Pressure Check,](#)" p. 37.

Strainer

A pipe strainer is installed in the water return line (inlet piping to chiller) to protect components from entrapped debris.

Chiller Drain

Chiller drains are piped to the outside of the chiller casing with a ball shutoff valve to facilitate evaporator draining during service or shutdown procedures.

Evaporator Water Piping

Trane Rental Services RTAC chillers utilize 6-inch victaulic connections.

NOTICE

Evaporator Damage!

Do not exceed 150 psig evaporator pressure as it could result in damage to the evaporator.

To prevent unit or pump damage, do NOT reverse system water piping connections to the unit or pump; evaporator inlet is pre-piped to the discharge of the pump.



Dimensions and Weights

Unit Assembly Dimensions and Weights

RTAC assembly weights are provided in [Table 1, p. 8](#).

Handling

Units 300 tons and larger are shipped on a flat bed trailer and will permanently remain on the trailer for rental.

Units 250 tons and smaller can be left on the trailer or removed for rental. Wide forklift trucks should use the forklift pockets to remove units. Reference unit weights to determine capacity. Units can also be lifted by an overhead-lifting frame and spreader bars.

Table 1. Unit weights

Unit Size (Tons)	Chiller Max Dry Weight (lbs)	Operational Weight (lbs)	Trailer Weight (lbs)
155	18,000	18,300	—
170	18,350	18,700	—
200	20,400	20,800	—
250	24,000	24,650	—

Table 1. Unit weights (continued)

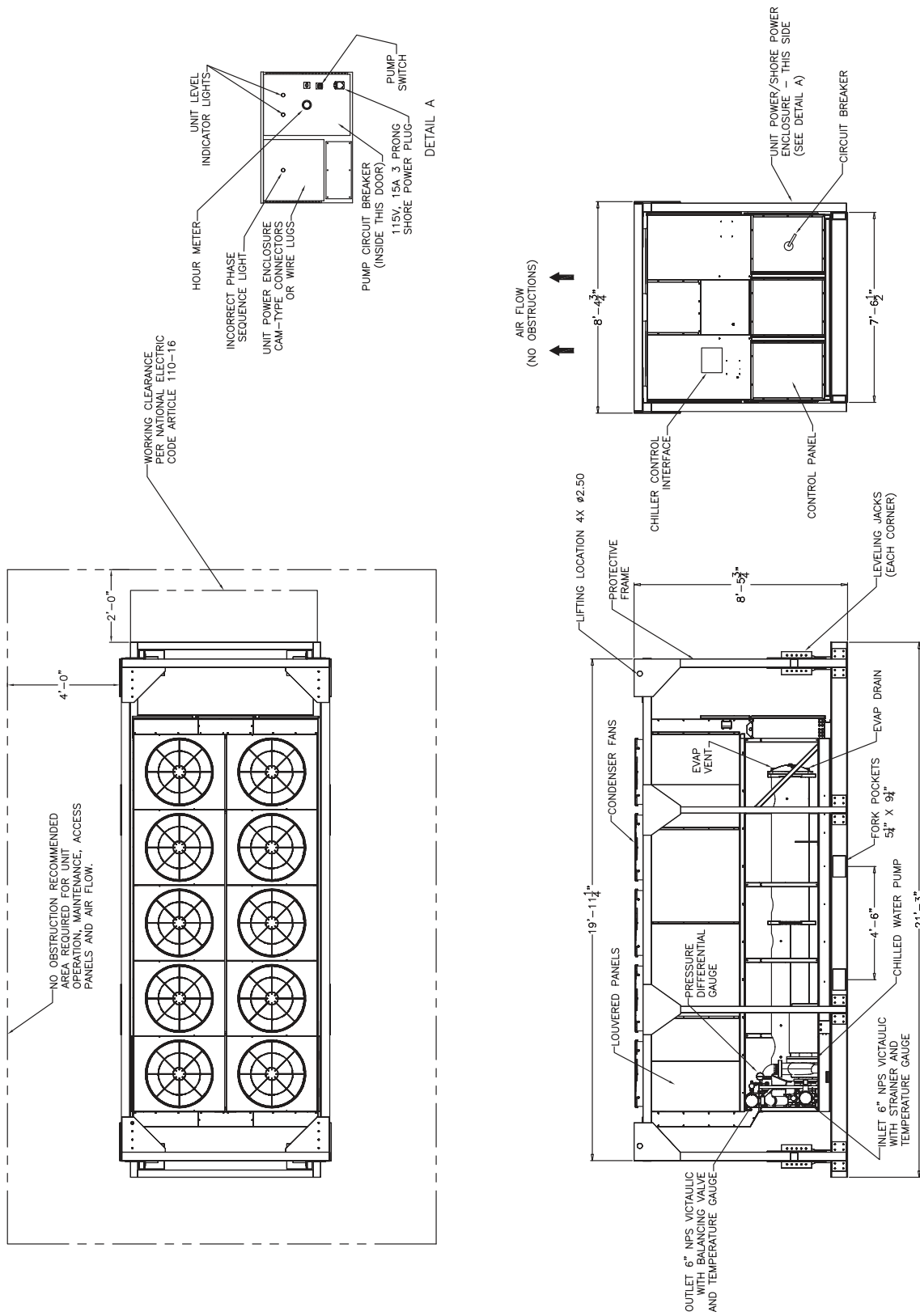
Unit Size (Tons)	Chiller Max Dry Weight (lbs)	Operational Weight (lbs)	Trailer Weight (lbs)
300	28,000	28,900	14,760
400	35,800	36,900	14,760
500	36,000	37,200	14,760

⚠ WARNING

Heavy Object!

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.

Figure 1. 155 tons RTAC (CSCA0155F0)





Dimensions and Weights

Figure 2. 155 tons RTAC (CSCA0155F2)

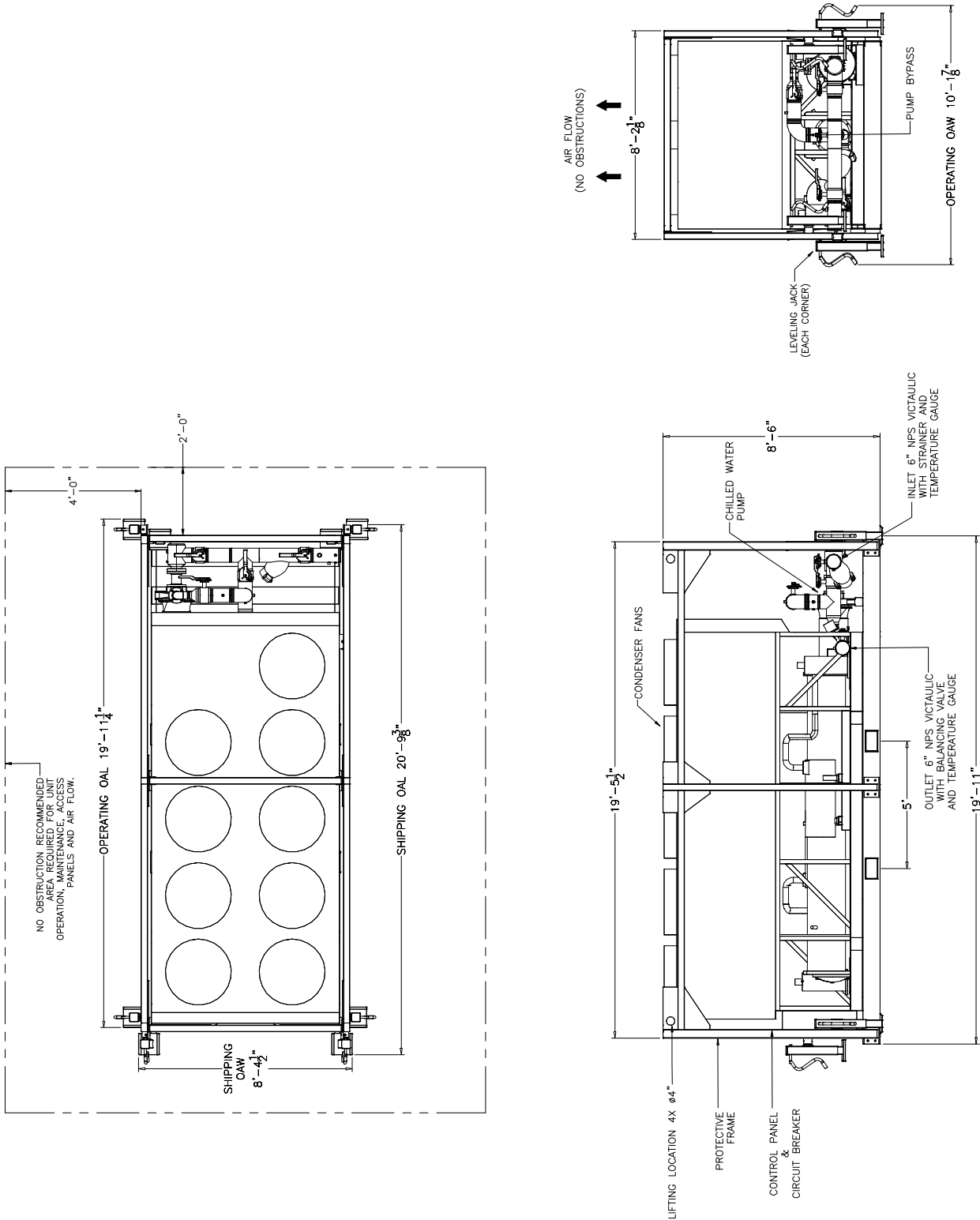
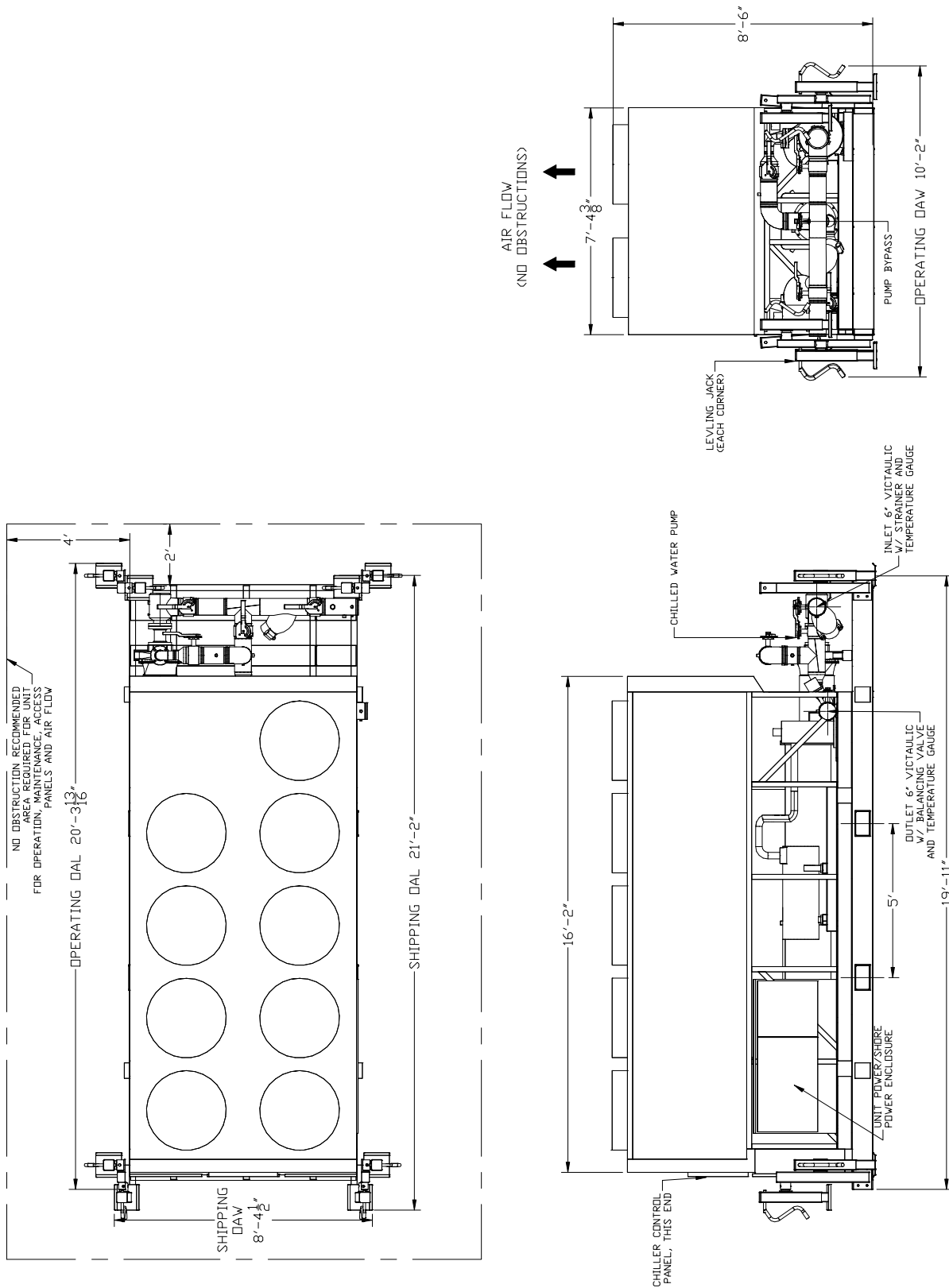


Figure 3. 155 tons RTAC (CSCA0155F3)



Dimensions and Weights

Figure 4. 170 tons RTAC (CSCA0170F0)

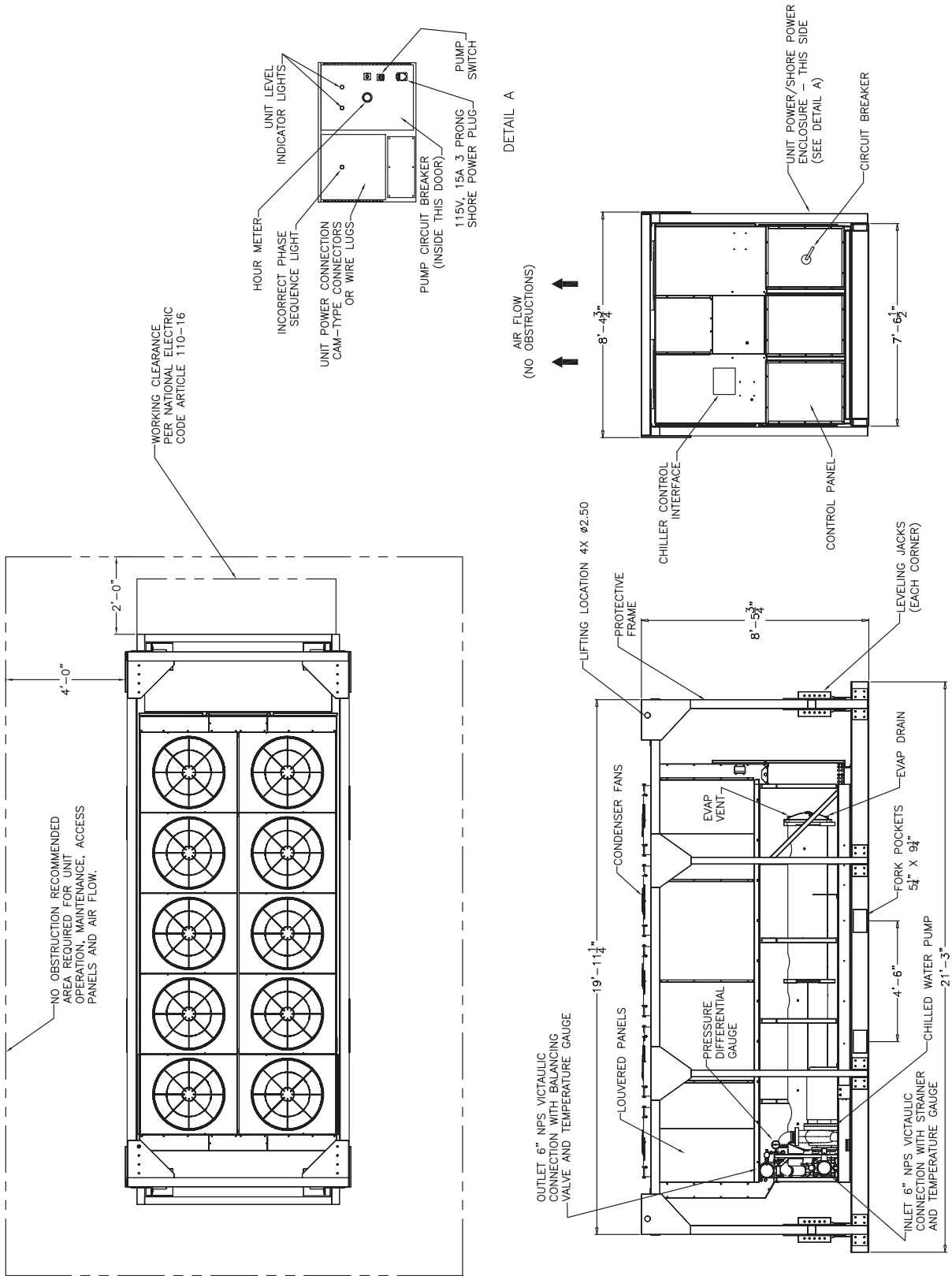
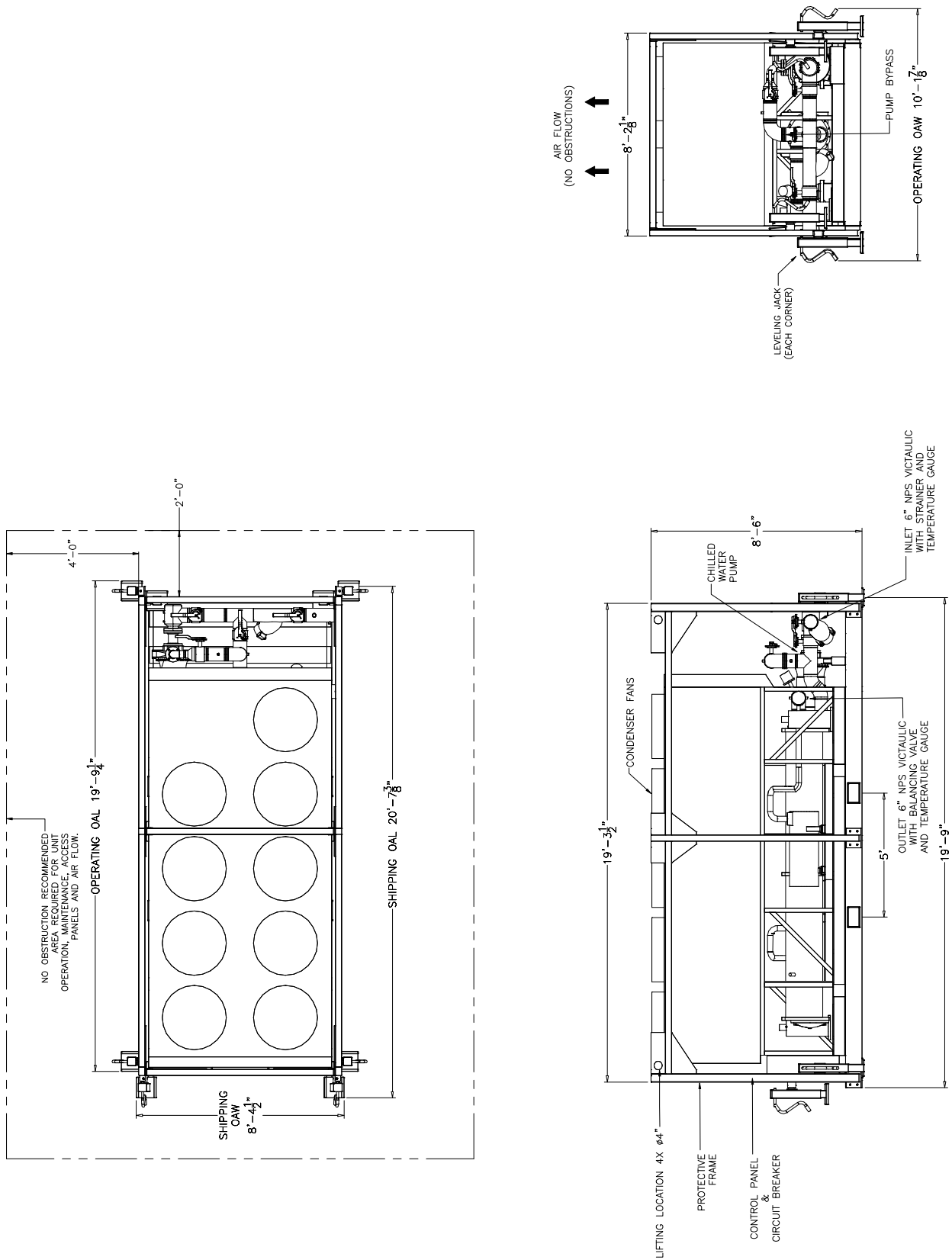


Figure 5. 170 tons RTAC (CSCA0170F2)



Dimensions and Weights

Figure 6. 200 tons RTAC (CSCA0200F0)

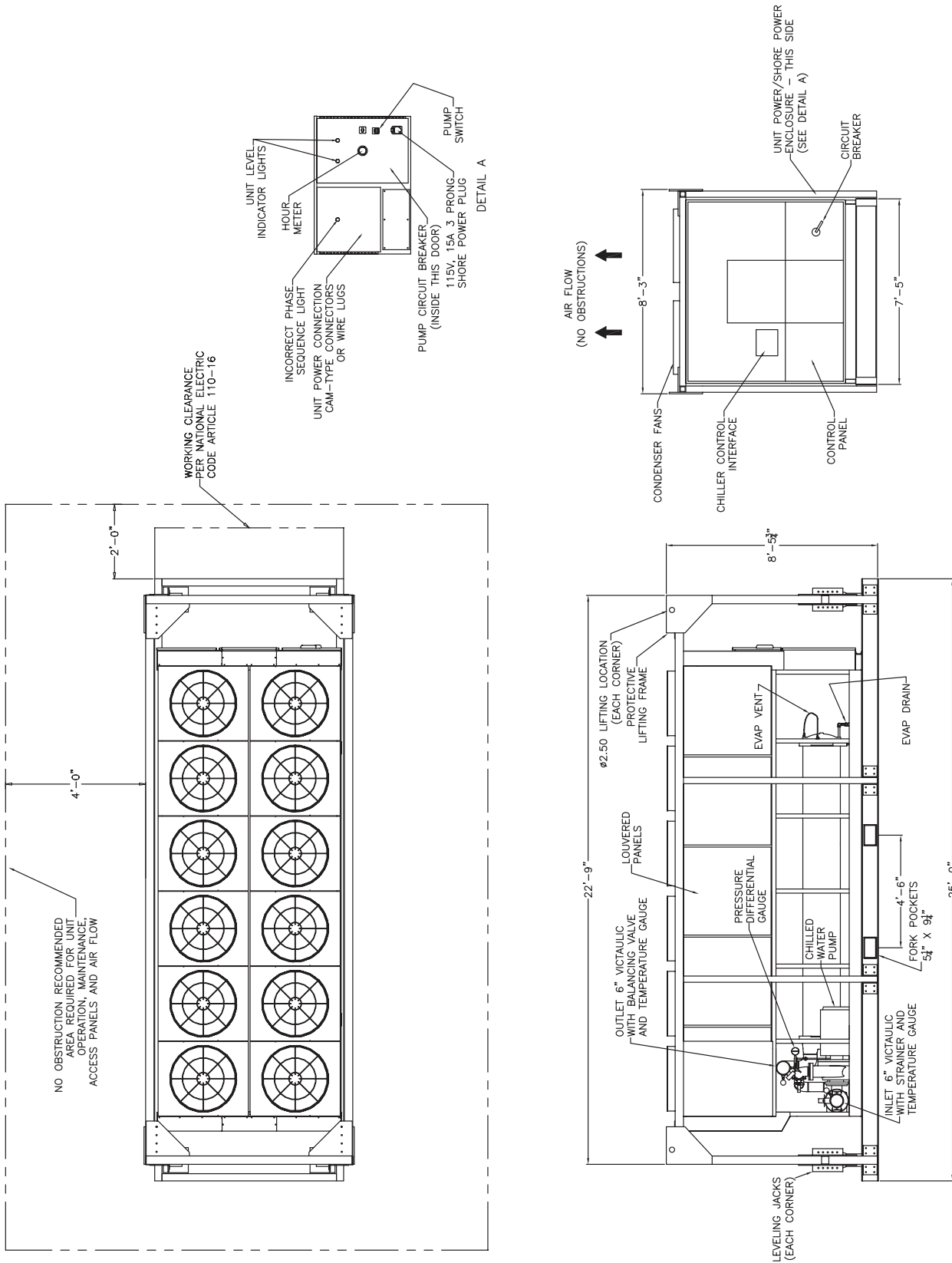
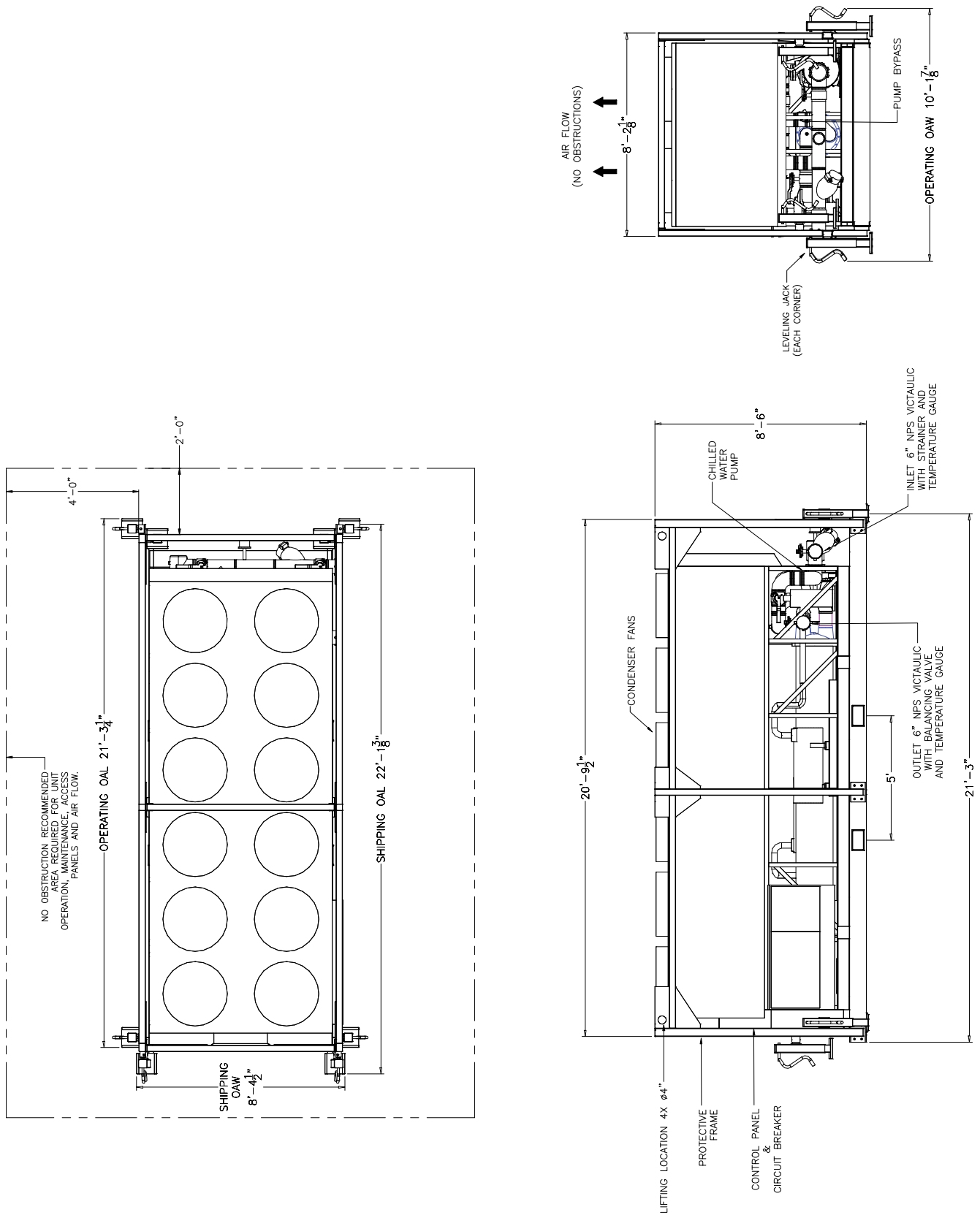


Figure 7. 200 tons RTAC (CSCA0200F2)





Dimensions and Weights

Figure 8. 200 tons RTAC (CSCA0200F3)

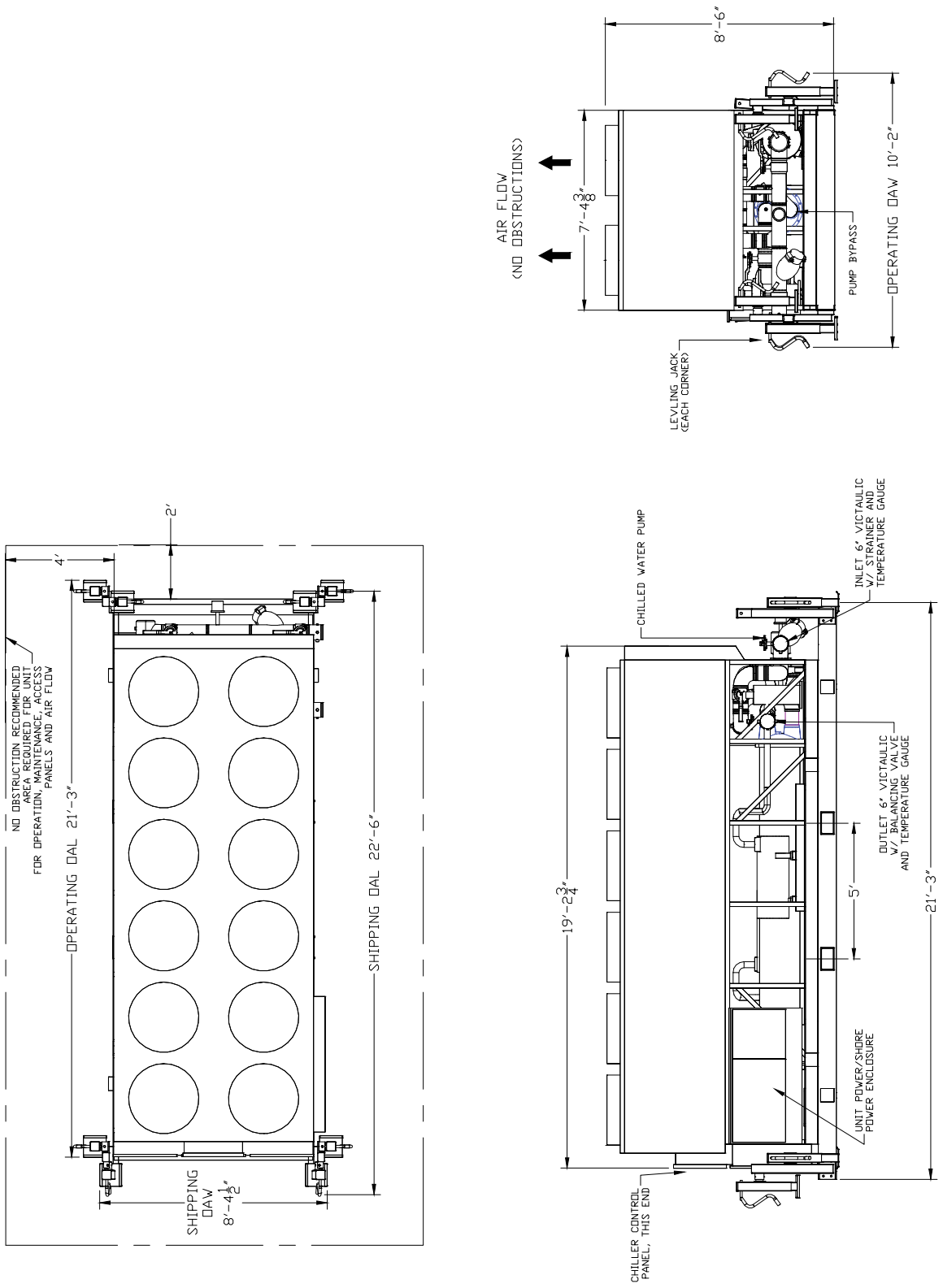
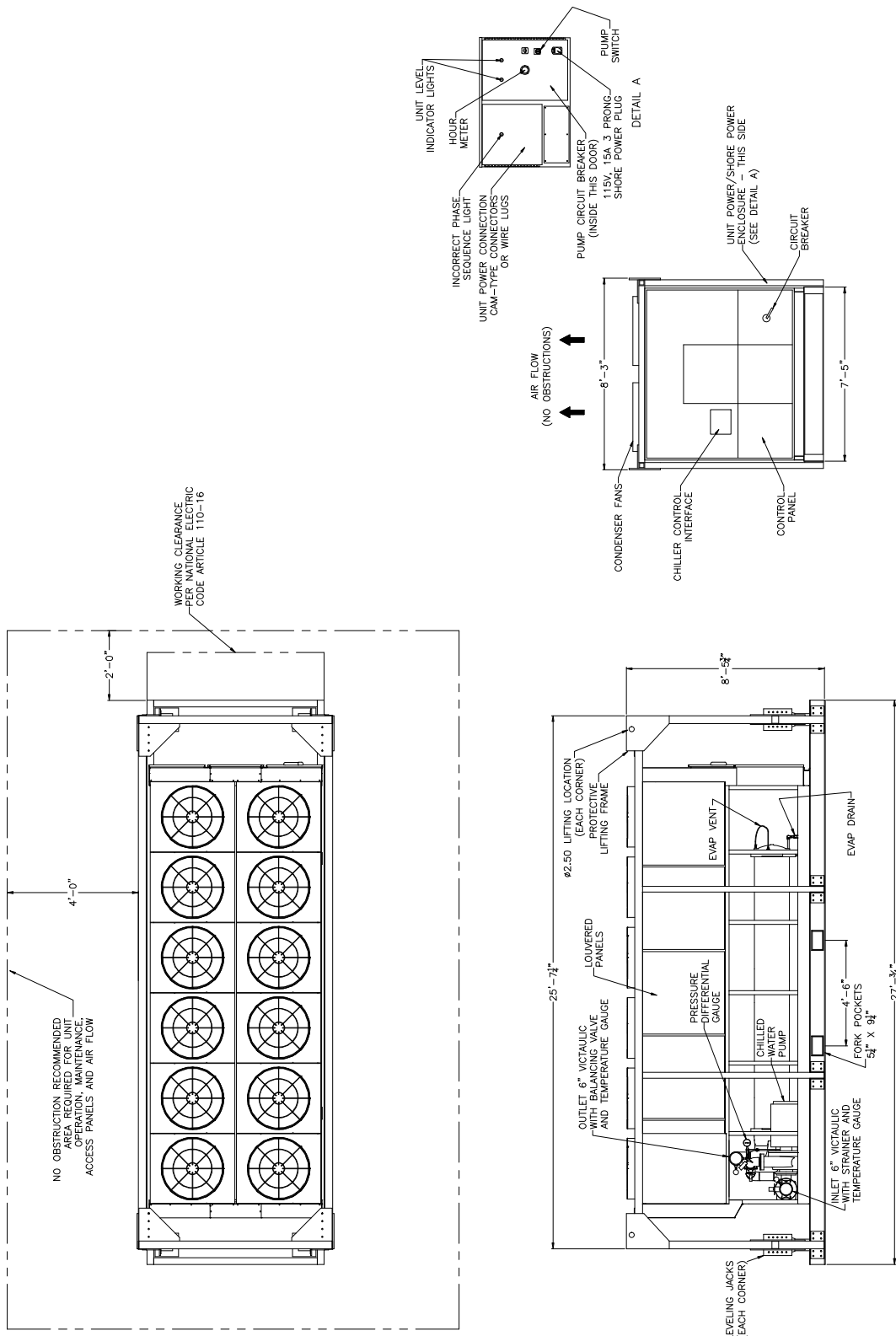


Figure 9. 250 tons RTAC (CSCA0250F0)





Dimensions and Weights

Figure 10. 250 tons RTAC (CSCA0250F2)

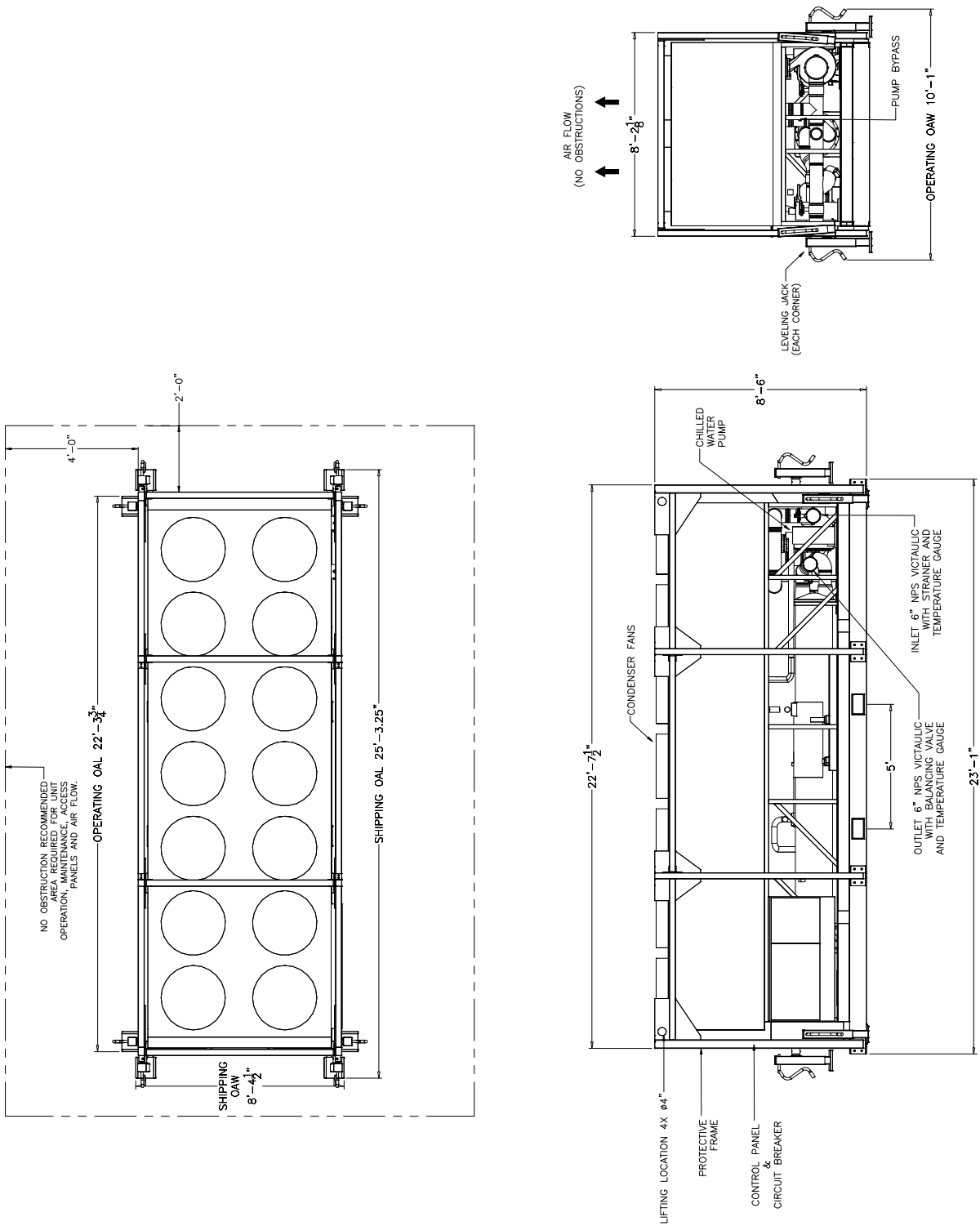
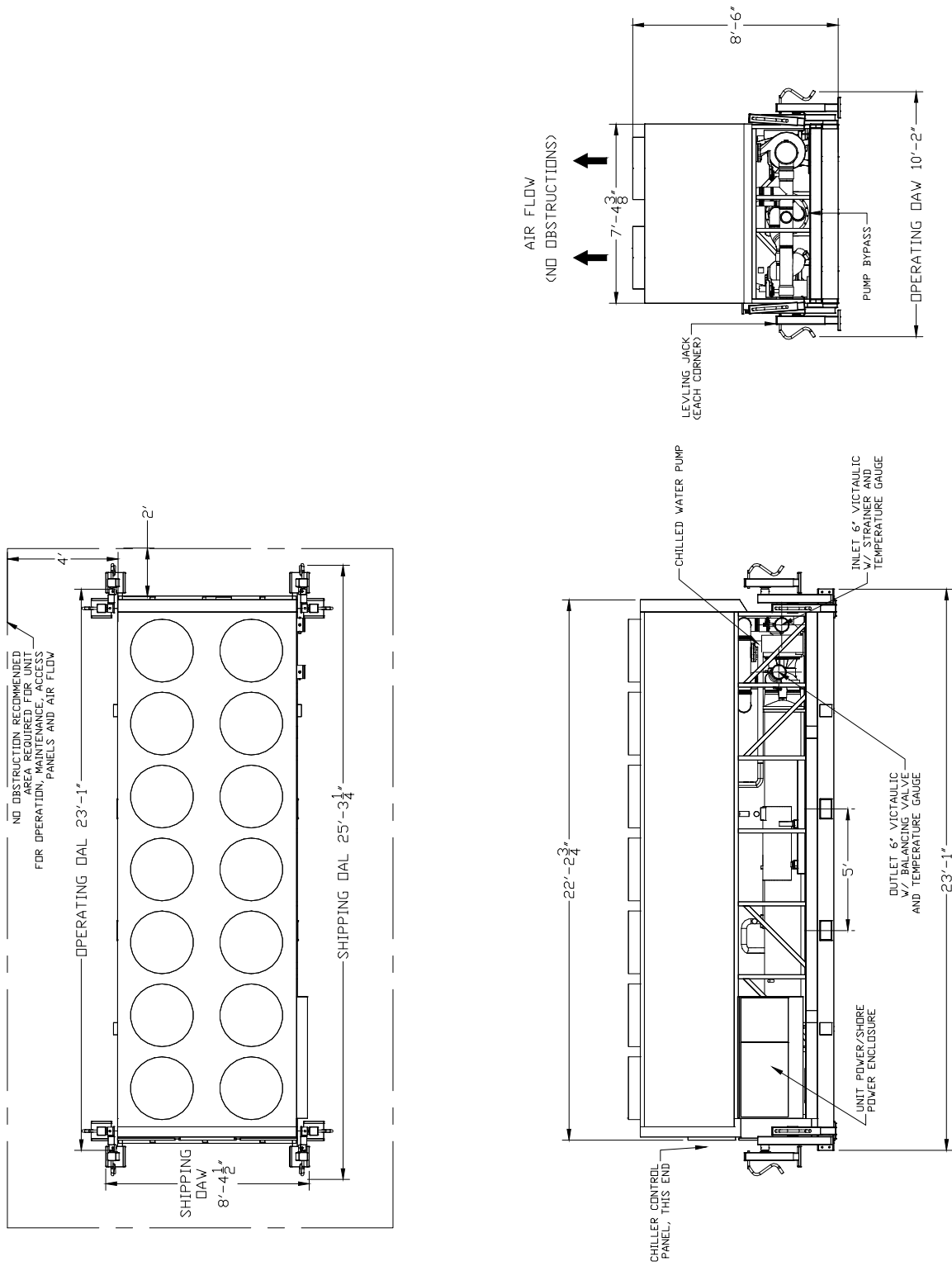


Figure 11. 250 tons RTAC (CSCA0250F3)





Dimensions and Weights

Figure 12. 300 tons RTAC (CSCA0300F0)

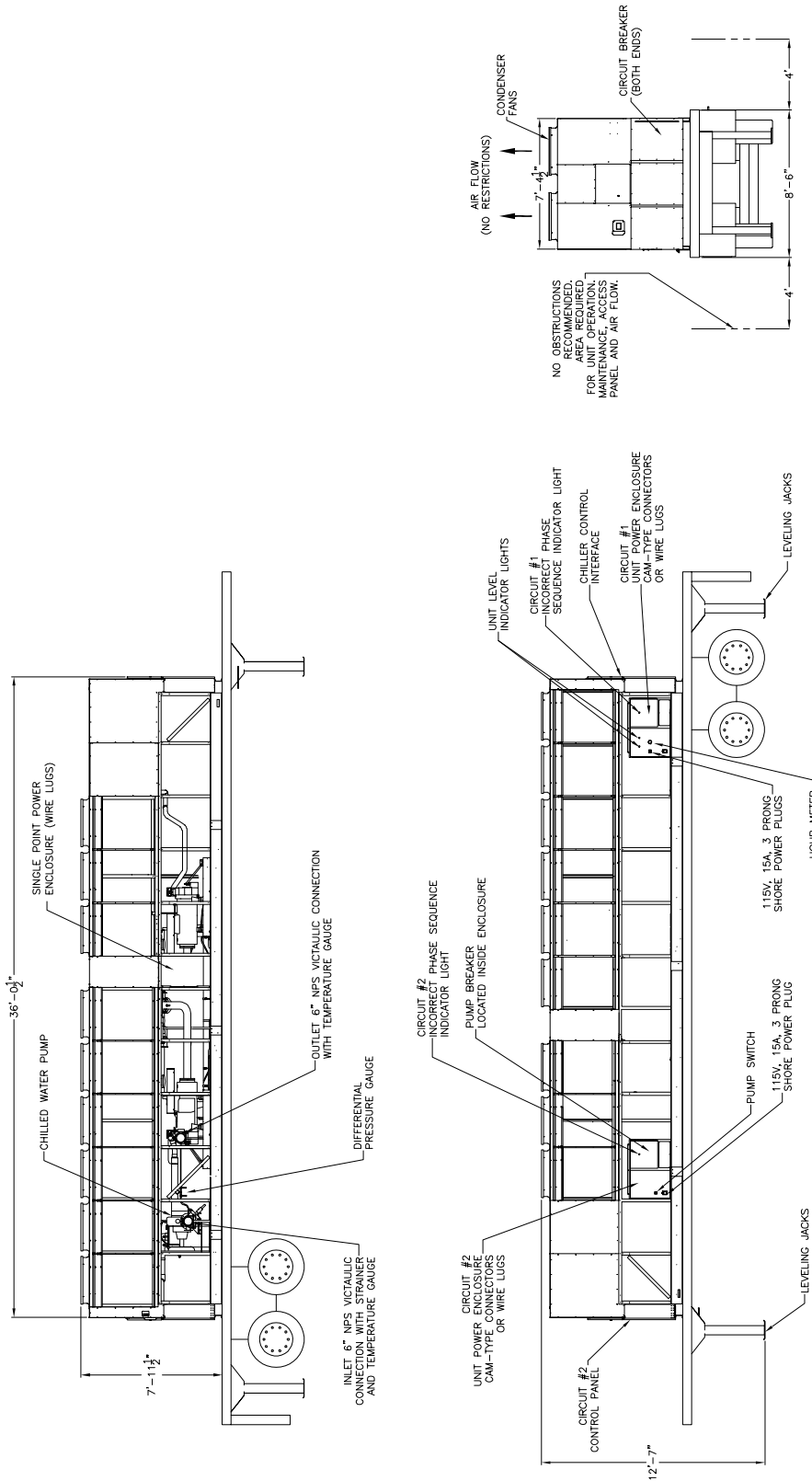
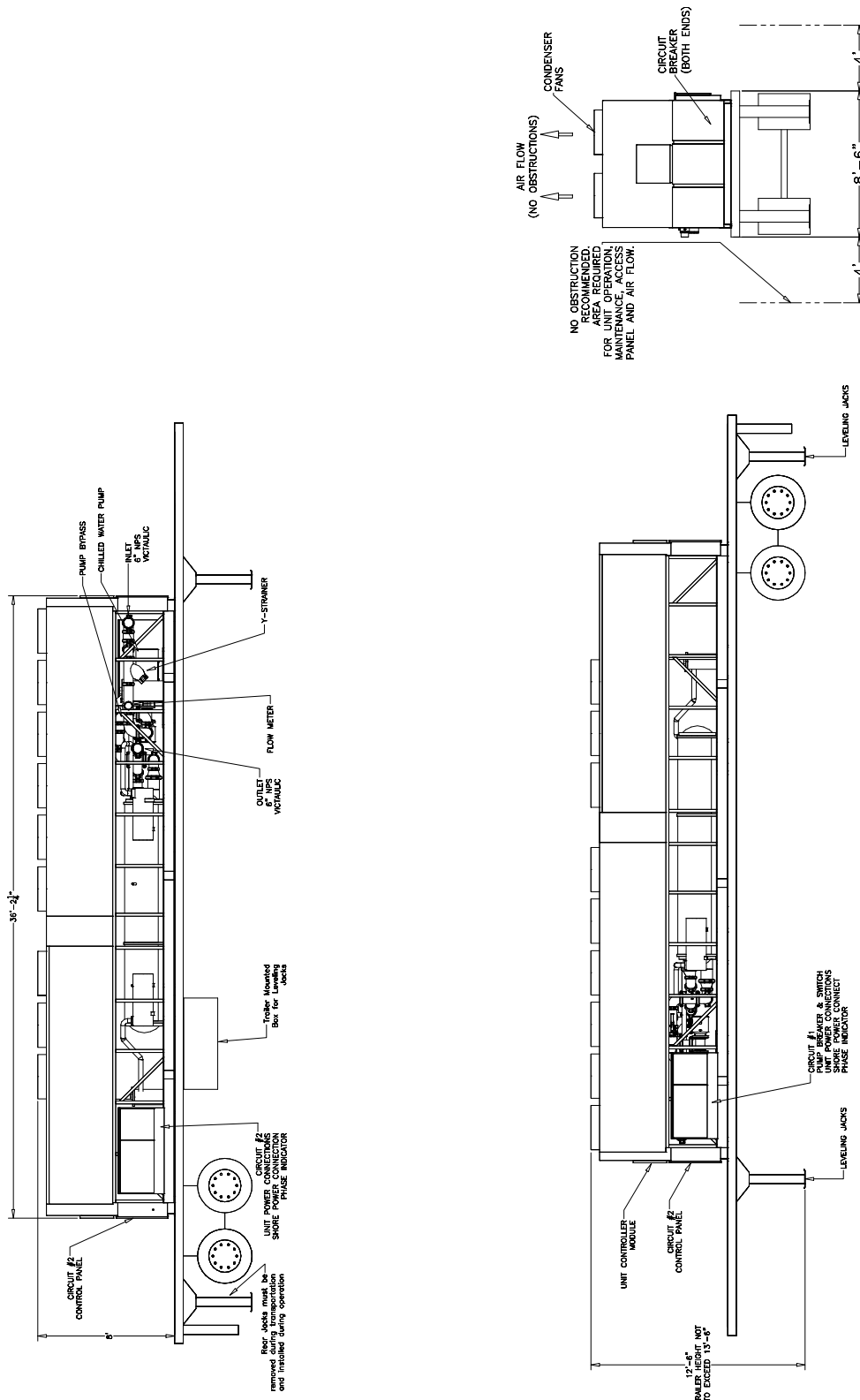


Figure 13. 300 tons RTAC (CSCA0300F2-F3)



Dimensions and Weights

Figure 14. 400 tons RTAC (CSCA0400F0)

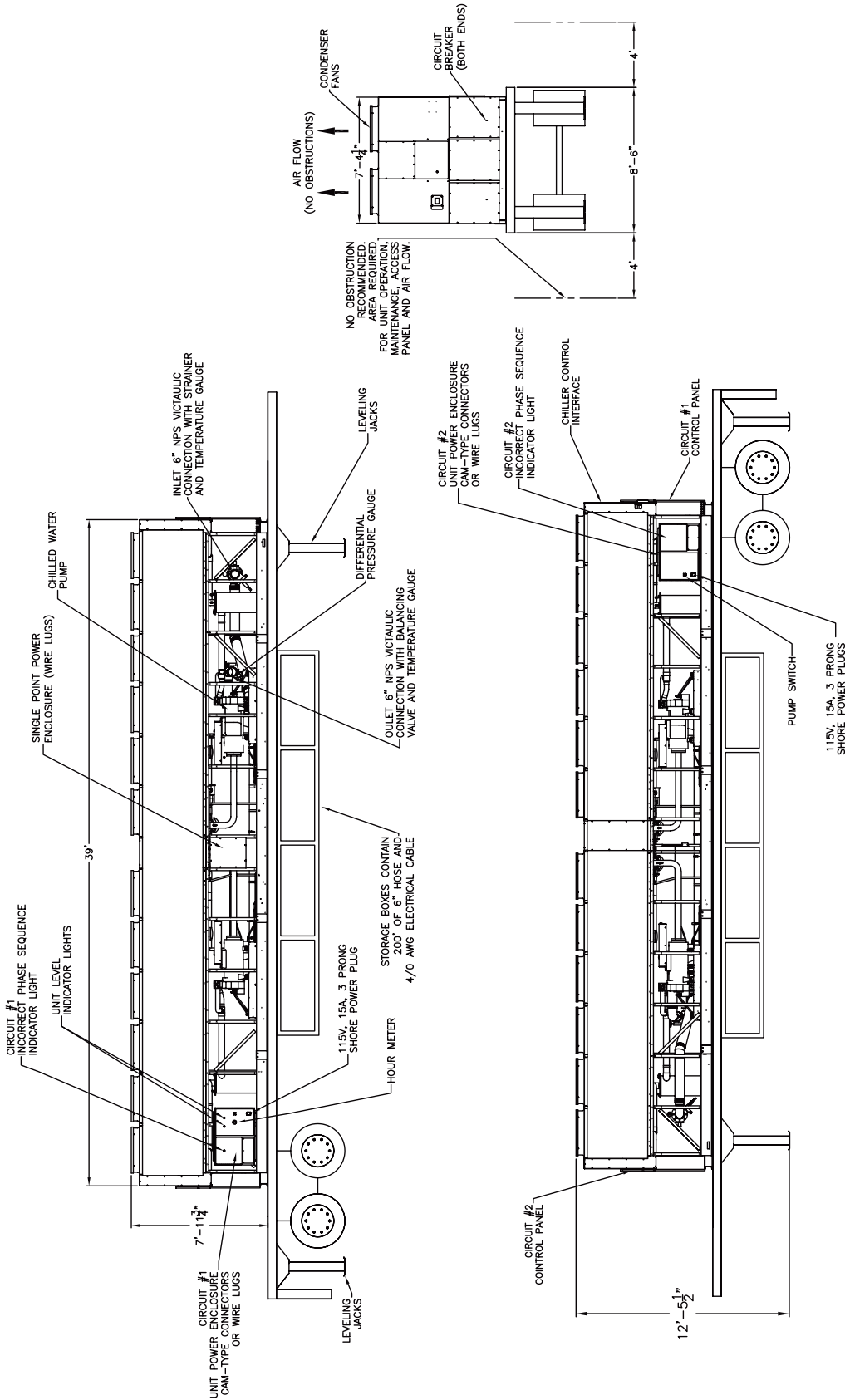
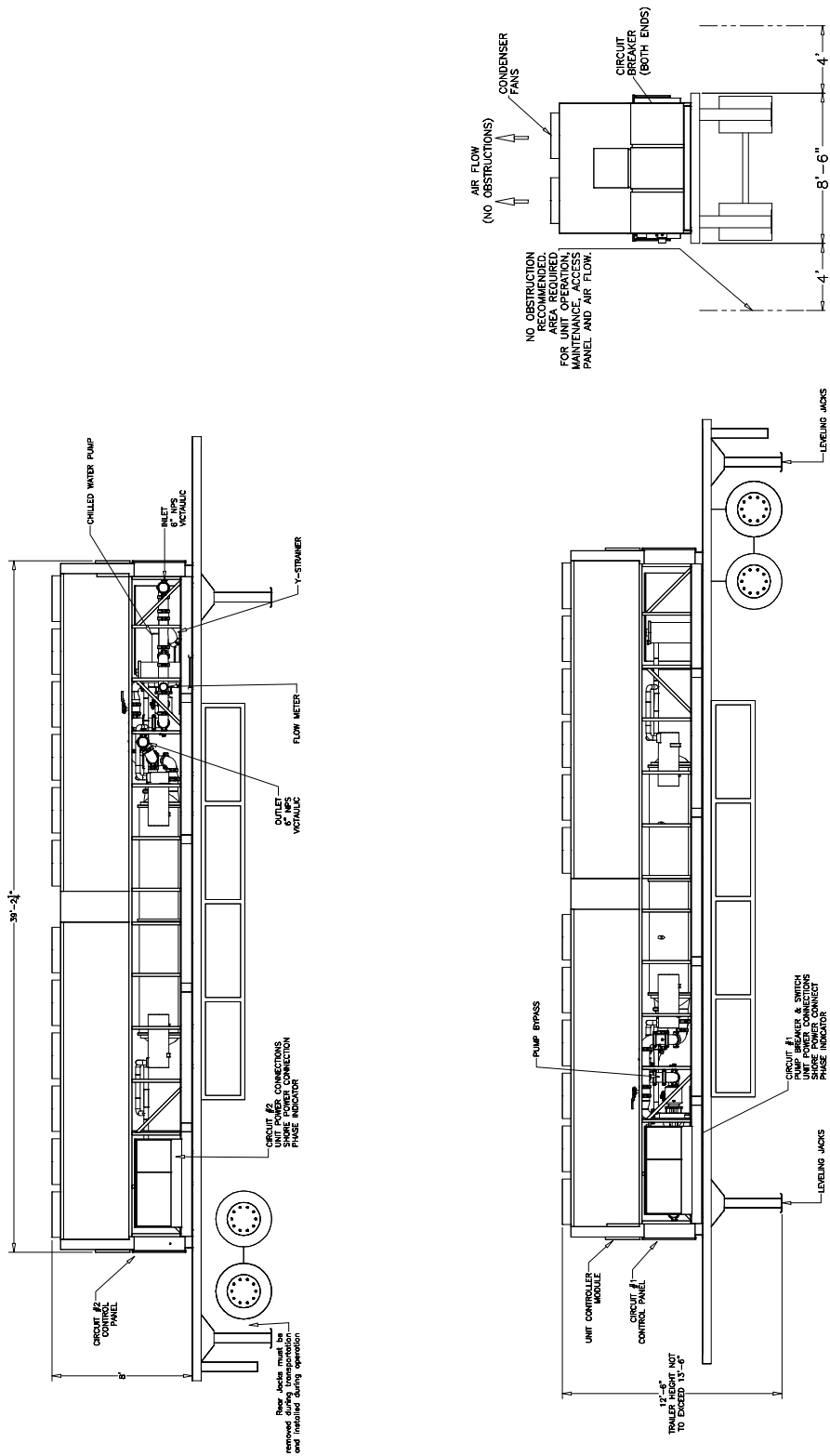


Figure 15. 400 tons RTAC (CSCA0400F2-F3)





Dimensions and Weights

Figure 16. 500 tons RTAC (CSCA0500F0)

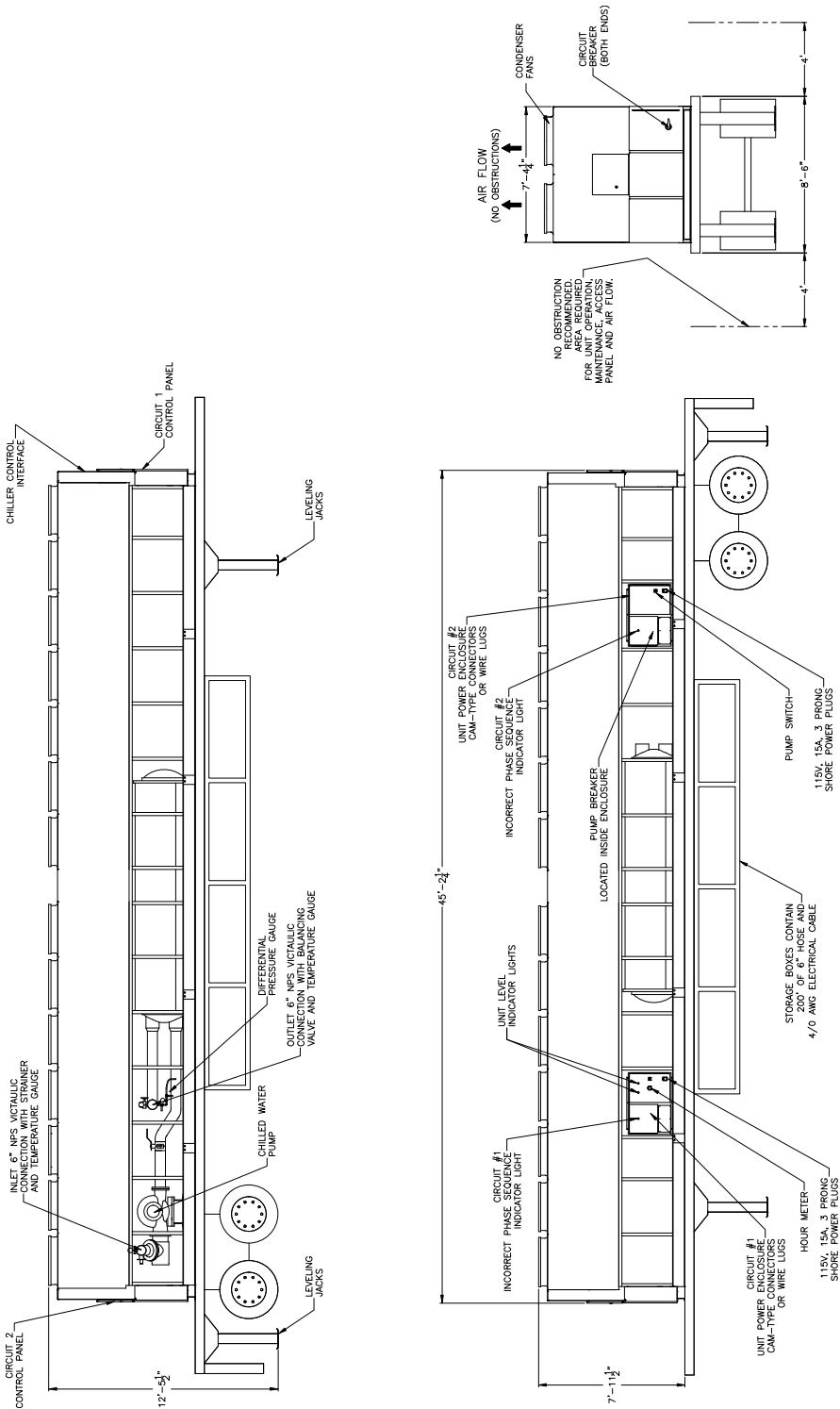
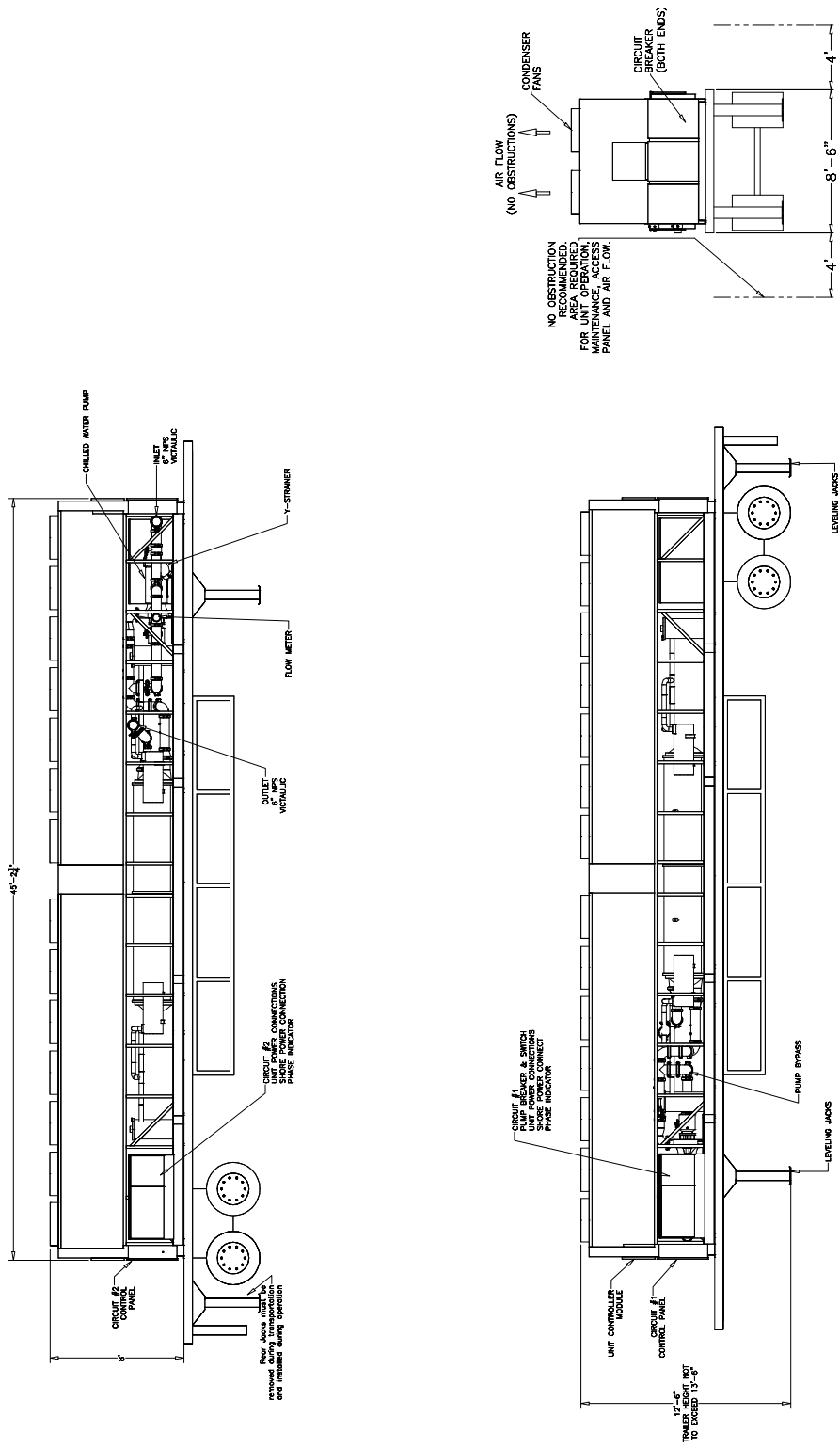


Figure 17. 500 tons RTAC (CSCA0500F2-F4)



Installation - Mechanical

Flexible Hose and Hard Pipe Installation

Use the following procedures to install/ minimize premature or catastrophic failure of temporary chilled water hose provided by Trane Rental Services. For more information please refer to CHS-SVX01*-EN.

⚠ CAUTION

Water Damage!
Flexible hose can burst. Flexible hose should never be used for an indoor installation. Failure to follow this recommendation could lead to equipment or property-only-damage.

⚠ CAUTION

Hose Damage!
Failure to follow instructions may lead to hose damage. Hose must never be pressurized over 150 psi. If higher pressures are required, "hard" suction pipe must be utilized.

NOTICE

Hose Damage!
Failure to follow instructions made lead to hose collapse and total system failure. Hose must always be used in pressurized application. If a negative pressure application is required, "hard" suction pipe must be used.

Flexible Hose Guidelines

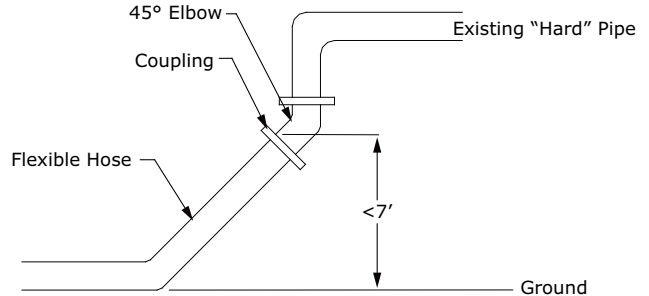
NOTICE

Hose Damage!
Failure to follow instructions below could result in death or serious injury, and equipment damage.

- Hard pipe is recommended for indoor applications.
- Do not support the hose ONLY by the couplings. Avoid clamp failure by supporting half of the hose length on the ground or other supporting surface.
- Do not run hose vertically more than 7 feet otherwise coupling clamps may fail.
- Do not cut hose to "custom" fit pieces-this will affect the integrity of the hose.
- Bleed air from the system prior to pressurizing hose to avoid couplings separating from the hose.
- Install elbows for a smooth hose transition on all vertical hose installations, see [Figure 18, p. 26](#).
- Never pressurize hose above 150 psig.

- For installations that required greater than 7 feet vertical rise, contact Trane Rental Services.

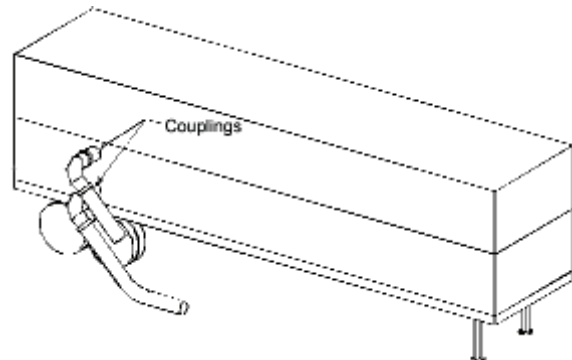
Figure 18. Elbow installation for a vertical hose



Horizontal Hose Installation

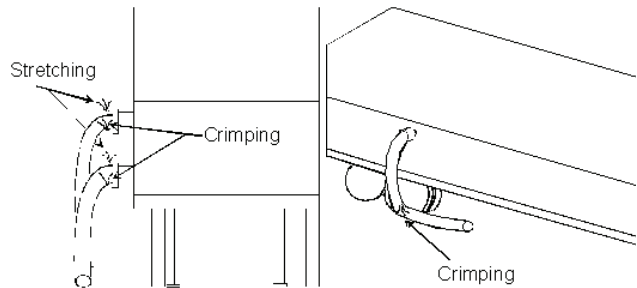
The figures below illustrate the correct and incorrect methods for installing hose in a horizontal hookup application.

Figure 19. Correct horizontal hose installation



In the configuration shown in [Figure 19, p. 26](#), either a 45° or 90° elbow can be installed. This elbow prevents stretching and crimping of the hose at the hose coupling connection. This elbow directs the hose to the ground at an appropriate angle to minimize the crimping of the hose at the ground or supporting surfaces.

Figure 20. Incorrect horizontal hose installation



In the configuration shown in [Figure 20, p. 26](#), elbows are not installed. This causes the top of the hose to be in

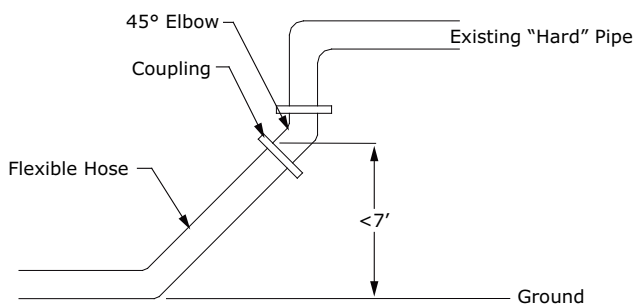
tension, which stretches the hose out of the coupling; and the bottom of the hose to be in compression, which causes it to crimp. It also causes the hose to crimp at the ground.

Vertical Hose Installation

The following figures illustrate the correct and incorrect methods for installing hose in a vertical hookup application.

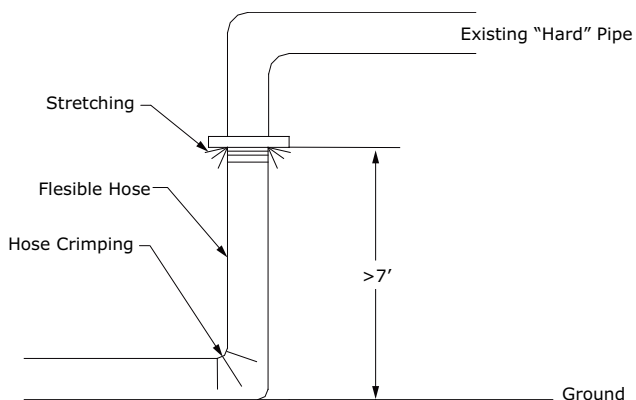
In the configuration shown in [Figure 21, p. 27](#), the hose is installed with an elevation less than 7 feet off the ground. A 45° elbow is installed to reduce the stress in the hose coupling connection. This elbow also directs the hose to the ground at an appropriate angle to minimize the crimping of the hose at the ground or supporting surface.

Figure 21. Correct vertical hose installation



In the configuration shown in [Figure 22, p. 27](#), the hose is installed without an elbow and with an elevation greater than 7 feet off the ground. This creates excessive stress at the hose coupling connection. The hose will stretch, separate from the coupling, and crimp at the ground.

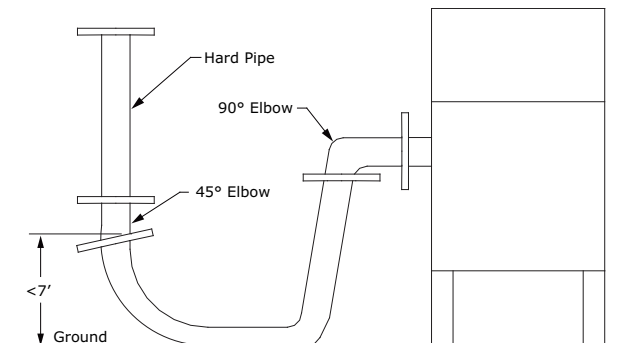
Figure 22. Incorrect vertical hose installation



Horizontal to Vertical Installation

The following figures illustrate the correct and incorrect methods for installing hose in a horizontal and vertical combination application.

Figure 23. Correct horizontal to vertical installation

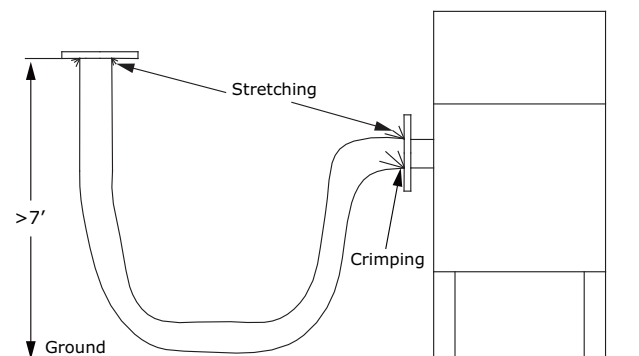


In this configuration, correct installation techniques followed are:

- The hose is installed with elbows at both connection ends.
- The vertical run of hose is less than 7 feet.
- The hose is adequately supported by more than half its total length on the ground.

These items minimize the stretching and separation at the hose-coupling interface and also the crimping of the hose at the ground.

Figure 24. Incorrect horizontal to vertical installation



In this configuration, a number of improper installation techniques can be noted:

- Elbows are not installed.
- The hose is completely supported by the couplings.
- The vertical run of hose is greater than 7 feet.
- The hose is not adequately supported by the ground.

These items cause excessive stress to be generated at the hose-coupling interface, causing the hose to stretch and separate from the coupling.

Figure 25. Correct unsupported horizontal installation

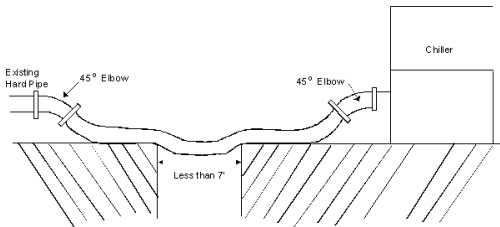


Figure above illustrates a correct horizontal hose installation where there is a section of unsupported hose. The length of unsupported hose should be less than 7 feet. The hose must be adequately supported by having more than half its total length on the ground.

Hard Pipe Guidelines

Certain installations may require the use of hard pipe (steel or PVC). Hard pipe is typically recommended for semi-permanent installations (three months or more), installations with space limitations and/or between connection and pump inlet.

When installing hard pipe:

- Construct and install the piping according to local and national codes.
- Isolate and support the piping as required to prevent stress on the unit and vibration to building piping.

If there are any questions regarding how to install water piping, contact Trane Rental Services.

Exceptions

Trane Rental Services Engineering must authorize any exceptions to the guidelines established in this bulletin in writing.

Material Disposition

In the event the hose fails or leaks, contact Trane Rental Services, tag the hose "BAD", and place it in the shipping box.

Leveling System

Each Trane Rental Services RTAC unit must be level to 1/4 inch over the length of the chiller. Level the chiller using four manual jacks with attachments points located on the corners of the lifting frame (155 to 250 ton) or trailer (300 to 500 ton).

F2-F4 style RTAC chillers ship with jacks that will need to be relocated from the shipping position to the installation position as shown in [Figure 26, p. 28](#). 300 to 500 ton chillers will require the two rear jacks to be removed from the trailer mounted box and installed prior to startup. If 155 to 250 ton chillers are commissioned on trailers, ensure the

trailer is level. Do not use the jacks mounted to the chiller. During decommissioning, return jacks to the shipping position.

Figure 26. F2-F3 RTAC jack positions

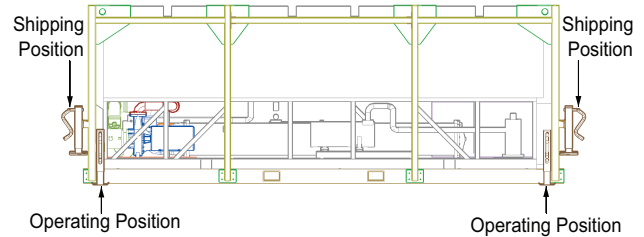
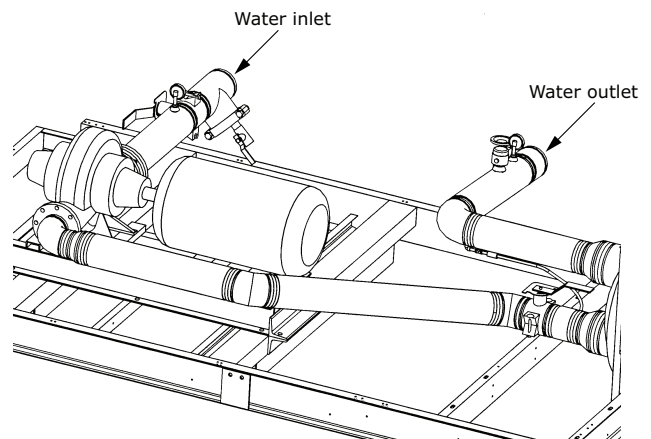


Figure 27. Water inlet/outlet connections



Notes:

- The water inlet and outlet connections are both 6 inch Victaulic.
- Water pipes should be routed away from the compressor access panels to allow for compressor servicing or replacement.

Freeze Protection

A glycol type anti-freeze may be required for freeze protection. For more information, reference RTAC Freeze Avoidance section in RF-PRB002*-EN.

Flow Sensor

An electronic flow sensor is installed on this RTAC unit near the outlet piping. This flow sensor is wired into the controls of this RTAC unit. The RTAC unit has a pump interlock control that requires flow to operate. If there is no flow through the evaporator of the RTAC unit, the chiller will not start or will shut down if the evaporator loses flow. Refer to the Chilled Water Flow (Pump) Interlock section of RTAC-SVX01*-EN for chilled water flow information.

Installation - Electrical

Electrical Connections

⚠ 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.

Depending on style, RTAC Rental chillers can accept main incoming power in the methods listed in [Table 2, p. 29](#). It is recommended that cable be laid out starting from the chiller working back to the electrical distribution panel. Confirm cam connection types mate with the chiller properly.

Table 2. Rental RTAC electrical connections

Chiller Sequence	Connection Style Available
F0	Series 16 Cam-type Connections
	Terminal Lug Connections (accepts up to 600 MCM Wire)
F2-F4	Series 16 Cam-type Connections Only

300 and 400 Ton Electrical Connections

The F0-style 300 and 400 ton RTAC Rental chillers are configurable for single or dual point power. Units will ship in the dual point power configuration. These chillers have separate nameplates detailing electrical requirements for each configuration.

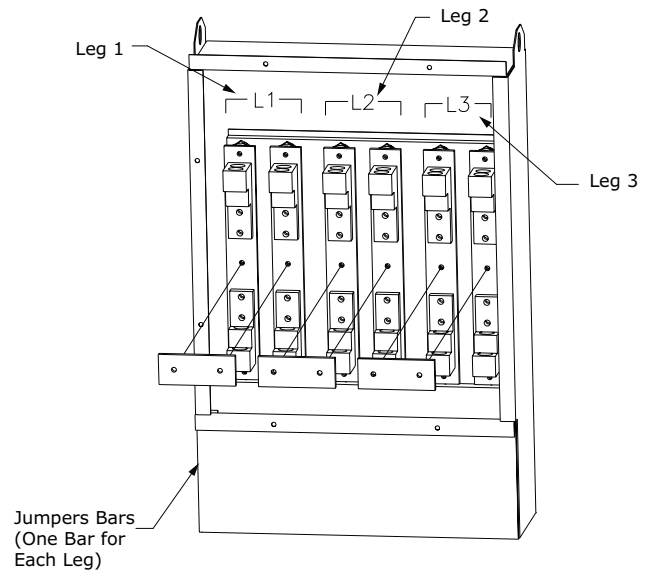
See the labeled instructions on the single point power enclosure for the detailed procedure explaining how to configure the unit for single or dual point power. If instructions are missing or unclear, contact Trane Rental Services.

Note: The jumper bars should always be checked for the proper configuration before power is supplied to the unit.

Installation of Jumper Bars for Single Point Power

The jumper bars are bolted tightly into position as shown in [Figure 28, p. 29](#), with the hardware supplied. When the jumper bars are connected for each phase, the unit is configured for single point power. When the jumper bars are not connected for each phase, the unit is configured for dual point power.

Figure 28. Single point power enclosure



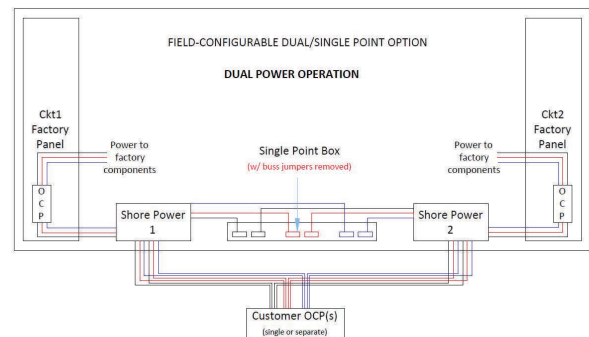
Notes:

- Always use rental nameplate data to size wire to this unit.
- Bus bar insulator maximum torque value is 45 inch-lbs.

Dual Point Power

Field wiring must be connected to the cam-type enclosures for either cam-type connections or for hard wiring. Jumper bars must not be connected.

Figure 29. Dual point configuration



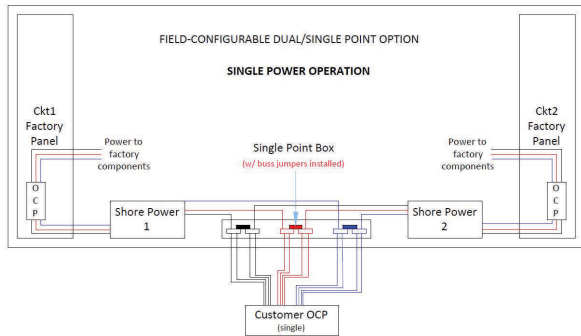
Single Point Power

Field wiring must be connected to the single point power enclosure only. Cam-type boxes must not be used for the single point power configuration. Cam-type connectors may not be used.

Remove the plate cover from the single point power enclosure and terminate the connections from the building

circuit breaker inside the cam-type enclosure. Jumper bars must be connected for each leg.

Figure 30. Single point configuration



and the RTAC controls interface. The shore power circuit is powered by a 115 Volt 60 Hz 15 Amp circuit. Power is supplied from the building to the shore power enclosure with an extension cord. RTAC 155 to 250 ton units have one shore power enclosure. RTAC 300 to 500 ton units have two shore power enclosures.

Note: The RTAC 300, 400, and 500 ton units have two circuits. Shore power enclosures must be supplied with 115 Volt, 60 Hz power. See "Unit Assembly Dimensions and Weights," p. 8 for 300 to 500 ton units.

Note: F2-F4 shore power enclosures include door switches for safety.

The shore power enclosure powers the following components:

- Shore power plug (115 Vac), circuit 1
 - Compressor heaters
 - Oil separator heater
 - CH530 interface
 - CH530 controls
- Shore power plug (115 Vac), circuit 2 (300-500 only)
 - Compressor heaters
 - Oil separator heater
 - CH530 controls

Note: Energizing circuit 1 shore power prior to circuit 2 shore power will result in a nuisance communication loss diagnostic on the control panel.

⚠ WARNING

Hazardous Voltage!
 Failure to disconnect power before servicing could result in death or serious injury.
 Disconnect all electric power, including remote disconnects before servicing. Follow proper lockout/tagout procedures to ensure the power can not be inadvertently energized. Verify that no power is present with a voltmeter.

NOTICE

Evaporator Damage!
 Failure to follow these instructions could result in catastrophic damage to the evaporator.
 At ambient temperatures below 40°F, unit must be winterized or 460V power applied. Shore power does not energize evaporator heat trace.

All wiring must comply with National Electric Code (NEC) and state and local requirements. Outside the United States, the national and/or local electrical requirements of other countries shall apply. The installer must provide properly sized system interconnecting and power supply wiring with appropriate fused disconnect switches. Type and locations of disconnects must comply with all applicable codes.

NOTICE

Use Copper Conductors Only!
 Failure to use copper conductors could result in equipment damage as the equipment was not designed or qualified to accept other types of conductors.

⚠ WARNING

Hazardous Service Procedures!
 Failure to follow all precautions in this manual and on the tags, stickers, and labels 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 following instructions: Unless specified otherwise, disconnect all electrical power including remote disconnect and discharge all energy storing devices such as capacitors before servicing. Follow proper lockout/tagout procedures to ensure the power can not be inadvertently energized. When necessary to work with live electrical components, have a qualified licensed electrician or other individual who has been trained in handling live electrical components perform these tasks.

Shore Point Power (115 Vac)

Each RTAC Trane Rental Services unit comes with a shore power enclosure. Shore power is provided for the purpose of energizing the oil heaters, oil separators, RTAC controls,

Refer to unit schematics to check the number of disconnects required to de-energize the unit. When electrically troubleshooting the compressor make sure electrical power is NOT applied. Inspect all wiring connections. Electrical connections should be clean and tight.

Unit Voltage and Amperage Checks

⚠ WARNING

Live Electrical Components!

Failure to follow all electrical safety precautions when exposed to live electrical components could result in death or serious injury.

When it is necessary to work with live electrical components, have a qualified licensed electrician or other individual who has been properly trained in handling live electrical components perform these tasks.

Electrical power to the unit must meet stringent requirements for the unit to operate properly. Total voltage supply and voltage imbalance between phases should be within the following tolerances.

Voltage Supply

Measure each leg of supply voltage at all line voltage on circuit breaker. Readings must fall within the voltage utilization range shown on the unit nameplate. If voltage on any leg does not fall within tolerance, notify the power company to correct this situation before operating the unit.

Inadequate voltage to the unit will cause control components to malfunction and shorten the life of electrical components and compressor motors.

Voltage Imbalance

Excessive voltage imbalance between phases in a three-phase system will cause motors to overheat and eventually fail. Maximum allowable imbalance is 2 percent. Voltage imbalance is defined as follows:

$$\% \text{ Voltage Imbalance} = \frac{100 \times V_A - V_D}{V_A}$$

$$\text{where } V_A = \frac{V_1 + V_2 + V_3 \text{ (Avg Voltage)}}{3}$$

- V_1, V_2, V_3 = Line Voltages
- V_D = Line Voltage that deviates the farthest from V_A .

Example: If the three voltages measured at the line voltage side of the circuit breaker are 453 volts, 470 volts, and 467 volts, the average (V_A) would be:

$$\frac{453 + 470 + 467}{3} = 463 \text{ volts}$$

The percentage of imbalance is then:

$$\frac{100 \times [463 - 453]}{463} = 2.2\%$$

The 2.2 percent imbalance that exists in the example above exceeds maximum allowable imbalance by 2.0 percent. This much imbalance between phases can equal as much as 20 percent current imbalance with a resulting increase in winding temperature that will decrease compressor motor life.

If the voltage imbalance is over 2 percent, notify the proper agencies to correct the voltage problem before operating this equipment.

Electrical Cable

Table 3. Technical cable data, size 2/0

Conductor size:	2/0 AWG
Ampacity:	265 Amps per conductor ^(a)
Construction:	Rope stranded copper conductor, colored-coded (blue, red, green and black) connectors on each end. Insulation is composed of water, acid, ozone and chemical resistant thermoplastic rubber compound.
Temperature rating (°F):	-49 to 194
Weight (Lbs./100 Ft.):	64
Conductor nominal OD (in.):	0.8200
Cable rating:	UL Rated at 2000 volts, C(UL) 600 volts for continuous use.

^(a) The values listed above are based upon ambient temperature @ 86°F, where the individual conductor is not installed in raceways or buried (Reference NEC Code, Table 400.5 (A)(2), 2014 Edition).

Table 4. Technical cable data, size 4/0

Conductor size:	4/0 AWG
Ampacity:	365 Amps per conductor ^(a)
Construction:	Rope stranded copper conductor, colored-coded (blue, red, green and black) connectors on each end. Insulation is composed of water, acid, ozone and chemical resistant thermoplastic rubber compound.
Temperature rating (°F):	-49 to 194
Weight (Lbs./100 Ft.):	90
Conductor nominal OD (in.):	0.965
Cable rating:	UL Rated at 2000 volts, C(UL) 600 volts for continuous use.

^(a) The values listed above are based upon ambient temperature @ 86°F, where the individual conductor is not installed in raceways or buried (Reference NEC Code, Table 400.5 (A)(2), 2014 Edition).

Use appropriate temperature correction factors when sizing supply cable.

Table 5. Temperature correction factors

Ambient temperature °F	Factor
70 - 77	1.05
78 - 86	1.00
87 - 95	0.94
96 - 104	0.88
105 - 113	0.82
114 - 122	0.75

Electrical Cable Box

The electrical cable is contained in a lightweight plastic box, approximately four feet long and four feet wide.

- Four (4) 100-foot or eight (8) 50-foot sections of 2/0 or 4/0 awg cables
- Eight (8) 7-foot pigtail connector cables

Figure 31. Electrical cable box


400 and 500 Ton Trailer Mounted Boxes

Cable is stored in trailer mounted boxes underneath the deck on 400 and 500 ton machines.

Contents include:

- F0 machines:
 - (16) 100-foot or (32) 50-foot sections of cable
 - (32) 7-foot pigtail cables
- F2-F4 machines:
 - (32) 50-foot pigtail cables
 - (16) 7-foot pigtail cables

Connectors

Cam-type

The cam-type connectors provide quick, easy one-twist connections. See [Figure 32, p. 32](#) for typical connection.

Note: For non cam-type connections pigtails are provided (see "Pigtail," p. 33).

Figure 32. Cam-type


Pigtail

Each cable box has pigtails for non cam-type connections. There is a cam-type on one end and a barrel lug on the other. The barrel lug end allows for connection into a power distribution panel or non cam-type equipment. The pigtail can be connected to the standard cam-type cable, see [Figure 33, p. 33](#).

Figure 33. Electrical connector overview

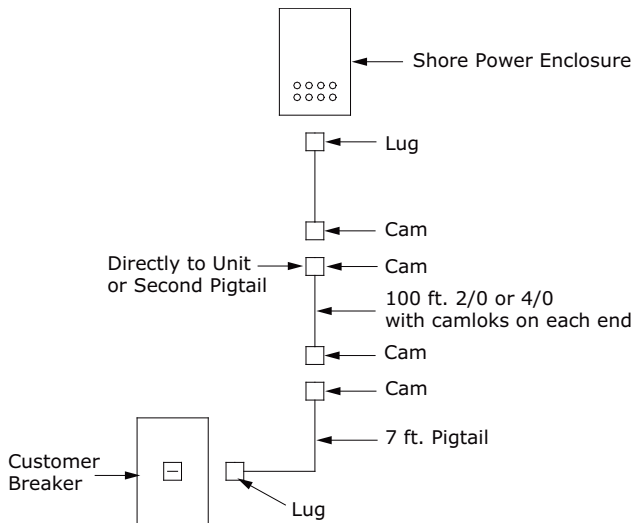


Figure 34. Pigtail



Field Installed Power Wiring

An overall dimensional layout for the field installed wiring entrance into the unit is illustrated in [Figure 1, p. 9](#) to [Figure 17, p. 25](#). To ensure that the unit's supply power wiring is properly sized and installed, follow the guidelines outlined below.

Note: All field installed wiring must conform to NEC guidelines as well as State and Local codes.

Verify power supply available is compatible with the unit nameplate. The available supply power must be within 10% of the rated voltage stamped on the nameplate. Use only copper conductors to connect the three-phase power supply to the unit.

NOTICE

Use Copper Conductors Only!

Failure to use copper conductors could result in equipment damage as the equipment was not designed or qualified to accept other types of conductors.

Circuit Breaker External Handle - Factory Mounted Option

Units have an external mounted circuit breaker handle. The operator can disconnect power from the unit without opening the control panel door. See the following table for locations and positions.

Position	Locations
ON	<ul style="list-style-type: none"> Circuit breaker is closed. Main power supply to be applied at the unit.
OFF	<ul style="list-style-type: none"> Circuit breaker is open. Main power supply to the unit is interrupted.
OPEN/COVER/RESET	<ul style="list-style-type: none"> Turn the handle to release the handle from the circuit breaker. The control panel door can now be opened.

⚠ WARNING

Hazardous Voltage!

Failure to disconnect power before servicing could result in death or serious injury.

Disconnect all electric power, including remote disconnects before servicing. Follow proper lockout/tagout procedures to ensure the power can not be inadvertently energized. Verify that no power is present with a voltmeter.

Once the door is open, it can be closed with the handle in any one of the three positions outlined above. Match the circuit breaker position.

For specific electrical schematic and connection information, refer to the ship-with wiring diagram.

Main Unit Power Wiring

The electrical service must be protected from over current and short circuit conditions in accordance with NEC requirements. Protection devices must be sized per the NEC according to the electrical data on the nameplate.



Installation - Electrical

- A field supplied disconnect switch must be installed at or near the unit in accordance with the National Electrical Code (NEC latest edition).
- Complete the unit's power wiring connections onto either the factory supplied cam-type receptacle, or the factory mounted lug-type connector inside the power supply box. Terminal lugs are provided for field supplied wire terminals. For specific termination points, refer to the ship-with, customer connection diagram.

Chilled Water Pump Performance and Operation

NOTICE

Proper Water Treatment Required!

The use of untreated or improperly treated water could result in scaling, erosion, corrosion, algae or slime.

Use the services of a qualified water treatment specialist to determine what water treatment, if any, is required. Trane assumes no responsibility for equipment failures which result from untreated or improperly treated water, or saline or brackish water.

Each RTAC unit comes with a 460 Volt, 3 phase, 60 hertz, centrifugal water pump permanently installed on the RTAC unit. The shore power panel provides power to the pump and has a control switch with an indication light that will be lit when the pump is running. The pump switch can be used to select between 3 operating modes: Off, Hand, and Auto.

When the pump is in the "Auto" mode of operation, the pump is controlled through the RTAC chiller controls. When the pump is in the "Hand" mode, the pump will run until the operating mode is changed. When the pump is in the "Off" mode, the pump will remain off until the operating mode is changed.

NOTICE

Evaporator Damage!

Failure to follow these instructions could result in damage to the evaporator.

If insufficient concentration or no freeze inhibitor is used, the evaporator water flow must be controlled by the unit controller AND heaters must be used to avoid catastrophic damage to the evaporator due to freezing. It is the responsibility of the installing contractor and/or the customer to ensure that a pump will start when called upon by the chiller controls. Even with water pump control, a power loss of as little as 15 minutes under freezing conditions can damage the evaporator. Only the proper addition of freeze inhibitor or complete drainage of the water circuit can ensure no evaporator damage in the event of a power failure.

Note: F2-F4 style chillers include optional on-board pump bypass piping. It is recommended that chiller maintains control over pump (on-board or skid mounted) in order to avoid potential freezing condition.

Table 6. Evaporator flow and pump performance

Unit Size and Sequence (Tons)	Pump Motor Size (HP)	Evaporator			Pump Pressure		
		Minimum Flow (GPM)	Nominal Flow (GPM)	Maximum Flow (GPM)	Minimum Flow (ft)	Nominal Flow (ft)	Maximum Flow (ft)
155F0	25	193	372	709	129.7	126.7	104.1 @ 709 GPM
155F2-F3	25	193	372	709	143.2	129.4	98.9 @ 606 GPM
170F0	25	202	408	741	129.7	125.5	100.5 @ 741 GPM
170F2	25	202	408	741	143.2	125.8	98.9 @ 606 GPM
200F0	25	217	480	796	129.7	122.2	93.6 @ 796 GPM
200F2-F3	25	217	480	796	143.2	117.0	98.9 @ 606 GPM
250F0	40	217	600	796	117.0	114.2	108.8 @ 796 GPM
250F2-F3	30	217	600	796	123.1	111.5	93.7 @ 796 GPM
300F0	50	309	720	1134	161.0	153.8	123.8 @ 1134 GPM
300F2-F3	50	309	720	1134	142.2	137.3	119 @ 1134 GPM
400F0	50	381	960	1396	161.0	139.3	117 @ 1168 GPM
400F2-F3	50	381	960	1396	141.9	128.8	95.2 @ 1396 GPM
500F0	50	461	1200	1548	143.4	117.2	93 @ 1543 GPM
500F2-F4	50	422	1200	1548	145.9	119.2	86.8 @ 1522 GPM

Note: Table values are recommended maximum and minimum evaporator flow rates or maximum and minimum performance limits of the pump. Always keep the flow rates within the maximum and minimum flow rates of the above table.

Pre-start Checkout

Unit Location and Mounting

1. Inspect the location for installation and verify service access clearances.
2. Provide adequate blocking to level trailer.

Inspection

⚠ WARNING

Hazardous Voltage!

Failure to disconnect power before servicing could result in death or serious injury.

Disconnect all electric power, including remote disconnects before servicing. Follow proper lockout/tagout procedures to ensure the power can not be inadvertently energized. Verify that no power is present with a voltmeter.

1. Inspect all wiring connections. Connections should be clean and tight.
2. Energize crank case and oil separator heaters 24 hours prior to start up.

Note: Connecting shore power to the unit without main power energizes the crankcase and oil separator heaters. DynaView is powered at the same time.

3. Confirm all service and isolation valves are open.

Electric Wiring

⚠ WARNING

Hazardous Voltage!

Failure to disconnect power before servicing could result in death or serious injury.

Disconnect all electric power, including remote disconnects before servicing. Follow proper lockout/tagout procedures to ensure the power can not be inadvertently energized. Verify that no power is present with a voltmeter.

- Check for tight connections for the unit power supply wiring with the circuit breaker to the terminal block.
- Check interlock wiring, chilled water pump control, chilled water flow interlock and external auto stop (required). For further details refer to RTAC-SVX01*EN or unit wiring schematics.
- If remote alarm contacts, limit warning contact, emergency stop, external chilled water setpoint or external current limit setpoint are used, refer to RTAC-SVX01*EN and the unit wiring for further details.



NOTICE

Equipment Damage!

Failure to follow all instructions could result in equipment damage.

Follow instructions for the chilled water pump interlock and external auto/stop.

- Control power wiring isolated in control panel/starter enclosure.

Shore Power

NOTICE

Heater Damage!

Failure to follow instructions could result in heater damage.

Do not apply power to the evaporator heaters when no water is present.

Check to confirm evaporator heater switch is off until evaporator is full of solution. Switch is located on shore power/cam connection panel.

Unit Piping

NOTICE

Heat Exchanger Damage!

Failure to follow instructions below could result in heat exchanger damage.

If an acidic commercial flushing solution is used, bypass the EVP chiller to prevent damage .

NOTICE

Proper Water Treatment Required!

The use of untreated or improperly treated water could result in scaling, erosion, corrosion, algae or slime.

Use the services of a qualified water treatment specialist to determine what water treatment, if any, is required. Trane assumes no responsibility for equipment failures which result from untreated or improperly treated water, or saline or brackish water.

1. Flush all unit water piping before making final connections to unit.
2. Connect water piping to the evaporator.
3. Fill the chilled water system.
4. Vent the chilled water system at the high points of the system piping.
5. Vent the air out of the evaporator by opening the vents, located on the top of the chiller barrel or at the highest vent point in the piping.
6. Close the vent when the chiller barrel is full of water.
7. Once the system has been filled, inspect the entire chilled water piping system for leaks, and make any necessary repairs (if required) before proceeding.



Start-Up

Startup Procedure

⚠ WARNING

Hazardous Service Procedures!

Failure to follow all precautions in this manual and on the tags, stickers, and labels 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 following instructions: Unless specified otherwise, disconnect all electrical power including remote disconnect and discharge all energy storing devices such as capacitors before servicing. Follow proper lockout/tagout procedures to ensure the power can not be inadvertently energized. When necessary to work with live electrical components, have a qualified licensed electrician or other individual who has been trained in handling live electrical components perform these tasks.

NOTICE

Equipment Damage!

Failure to follow instructions could result in equipment damage.

Improper phasing can result in equipment damage due to reverse rotation.

1. Confirm phase sequencing "A-B-C".

Note: Unit is equipped with auxiliary phase monitors. If the Phase Indicator pilot light is on, the phasing is incorrect. Phase Indicator (red) pilot lights are located in the door of each shore power/cam connection panel.

2. Turn chilled water pump switch to "HAND", check for leaks and repair.
3. With water running, adjust water flow via butterfly valve, check pressure drop and compare with [Figure 35, p. 38](#) and [Figure 36, p. 38](#) to confirm desired flow rate.
4. If required, add appropriate amount of glycol to system.

5. Run pump to thoroughly mix solution.
6. Turn chiller water pump to automatic position.
7. Confirm evaporator heat switch located on shore power/cam connection panel, is turned on.

Contact Trane Rental Services with any questions.

Checking Operating Conditions

Once the unit has operated for at least 30 minutes and the system has stabilized, complete the following to ensure proper unit operation.

- Check evaporator water flow and pressure drop following procedure listed below. These readings should be stable at proper levels. Refer to [Figure 35, p. 38](#) and [Figure 36, p. 38](#) for pressure drop vs. flow charts.
- If pressure differential drops off, clean all evaporator water supply strainers, as well as check on all air vents in the chilled water loop.

Differential Pressure Check

F0 Style Chillers

1. Close both ball valves on pressure gauge tee.
2. Open left hand valve while keeping the right hand closed and record pressure reading provided on gauge.
3. Close left hand valve and open right hand valve, record pressure reading provided on gauge.
4. Subtract largest pressure reading from smallest to obtain differential pressure across chiller.
5. Close both ball valves on pressure gauge tee.

F2-F4 Style Chillers

1. Open both ball valves feeding differential pressure gauge.
2. Record differential pressure provided on gauge.
3. Close both ball valves feeding differential pressure gauge.

Figure 35. Evaporator water pressure drop, 2-pass evaporator, 155 to 250 tons

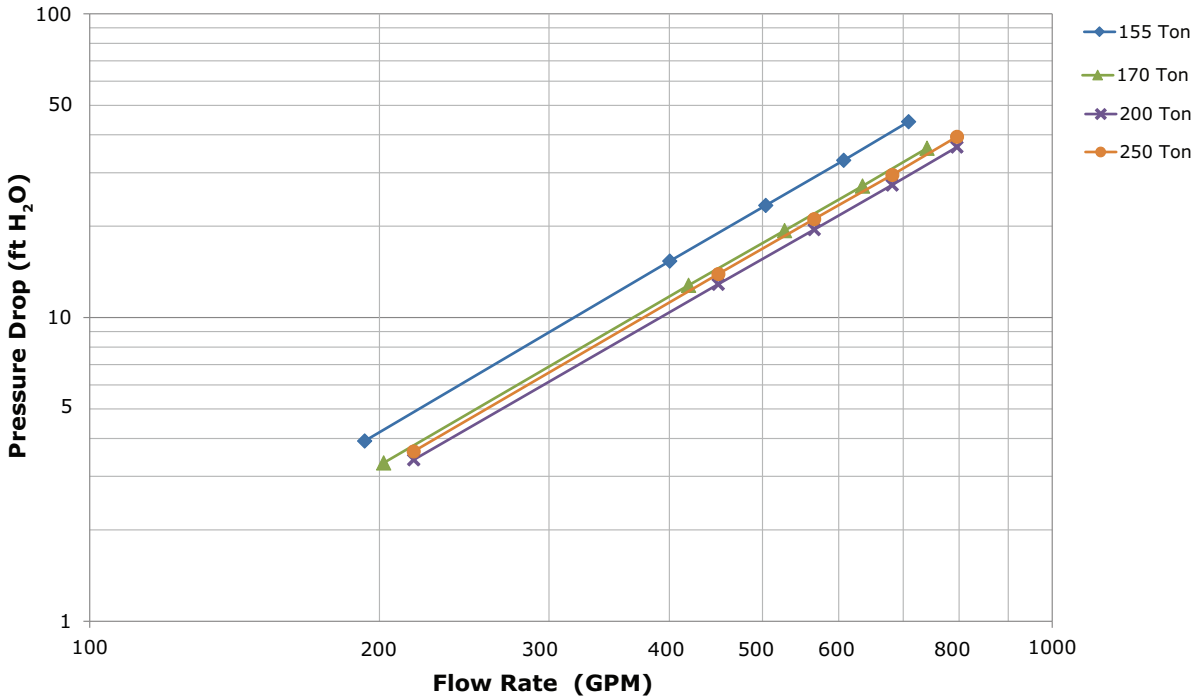
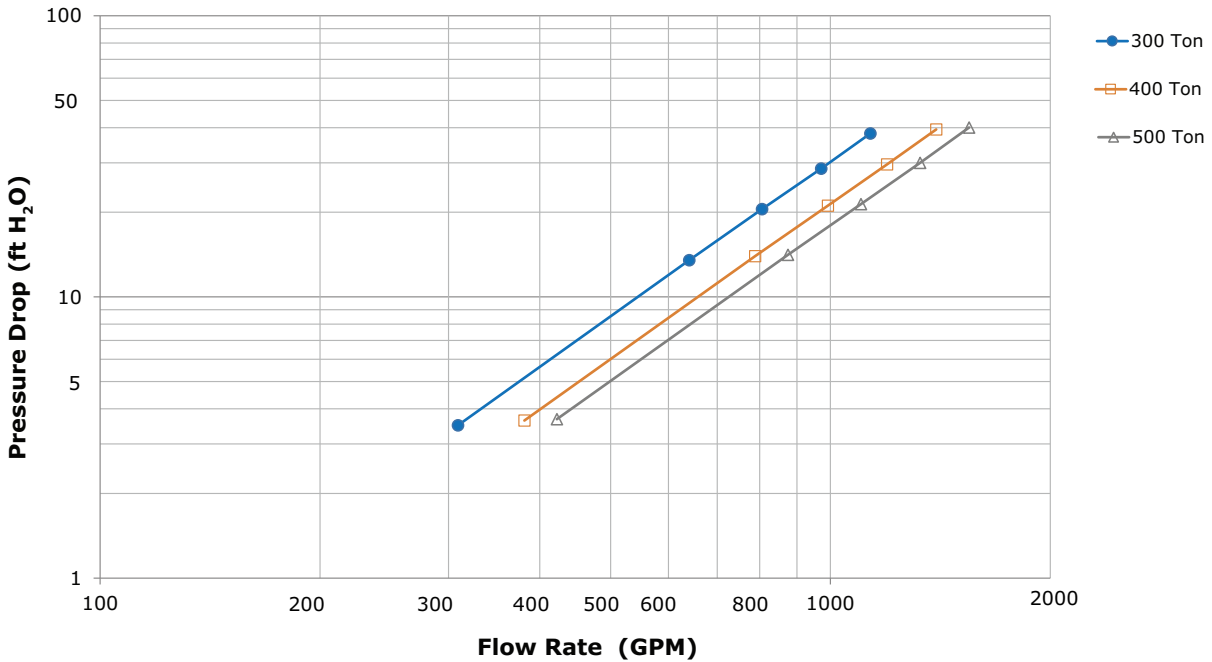


Figure 36. Evaporator water pressure drop, 2-pass evaporator, 300 to 500 tons



Final System Setup

After completing all of the steps previously outlined, perform these final checks before leaving the unit:

⚠ 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. Verify with a CAT III or IV voltmeter rated per NFPA 70E that all capacitors have discharged.

- Turn the solution pump control circuit breaker handle to the “Off” position. Inspect the unit for misplaced tools, hardware, and debris.
- Close the disconnect switch or circuit protector switch that provides the supply power to the unit’s circuit breaker.
- Turn the solution pump control circuit disconnect switch to the “Hand or Auto” position.
- Press the “AUTO” key at the Human Interface Module to begin system operation.
- The system will start automatically once a request for solution cooling has been initiated.
- Verify that all exterior panels including the control panel doors and condenser grilles are secured in place.



Maintenance

Maintenance Procedures

Weekly/Monthly Maintenance

While unit is running in stable conditions, inspect the entire system for unusual conditions and inspect the condenser coils for dirt and debris. If the coils are dirty, refer to coil cleaning in RTAC-SVX01*-EN.

Call Trane Rental Services Technical Support for any unusual conditions or repairs needed.

Decommissioning Procedure

1. Press STOP key on the CH530 DynaView control. Allow enough time for compressors to go through the unload sequence and shut down.
2. Turn the chilled water pump to the OFF position.
3. Turn evaporator heater switch, located on the shore power/cam connection panel, to OFF position.

Note: Local codes and regulations apply for disposal of glycol or anti-freeze solutions.

4. Drain solution from system. If the system has glycol or other anti-freeze solution, flush hoses and evaporator with water. Refer to Trane Rental Services Freeze Protection Procedure if decommissioning is taking place during a time that could see below freezing ambient temperatures.

⚠ 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. Verify with a CAT III or IV voltmeter rated per NFPA 70E that all capacitors have discharged.

5. Disconnect power supply.
6. Secure any loose panels. Replace any sheet metal screws or bolts to prevent panel from blowing off during transportation.
7. Return hose, fittings or cables (if furnished by Trane Rental Services) to appropriate containers for return shipment.
8. If applicable, return leveling jacks on F2-F4 style machines to shipping position.
9. Notify Trane Rental Services if unit needs repairs or has damage.



Notes

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

Trane has a policy of continuous product and product data improvements and reserves the right to change design and specifications without notice. We are committed to using environmentally conscious print practices.

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