

RKR

R.K. REDDING CONSTRUCTION, INC.

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SUBMITTAL APPROVAL SHEET

DESCRIPTION: Revised Chiller Equipment Product Data
SECTION: 15650

Honda Precision Parts Quality Control and Die Cast Expansion

CONTRACTOR

- A. Approved As Noted for
Architect's & Engineers Review**
 B. Revise and Resubmit
 C. Rejected

This review is for general compliance with plans and specifications only. Any deviations from the plans and specifications not clearly noted by the trade contractor have not been reviewed. Review shall not constitute complete check of detail dimensions or serve to relieve trade contractor of their responsibility for any errors or deviations from contract requirements.

R.K. Redding Construction, Inc.

By: *Adam Varney*

Date: **December 11, 2013**

Submittal Number: **15650-001REV1**

ARCHITECT/ENGINEER

Project No. _____

Submittal No. _____

SHOP DRAWING REVIEW

A-E REMARKS

- No Exceptions Note Markings
 Comments Attached Rejected

REQUIRED OF CONTRACTOR

- Process Resubmit

A-E review is for general conformance with the design concept and contract documents. Markings or comments shall not be construed as relieving the Contractor from compliance with the project plans and specifications, nor departures therefrom. The Contractor remains responsible for details and accuracy, for confirming and correlating all quantities and dimensions, for verification of field conditions, for selecting fabrication processes, for techniques of assembly and for performing his work in a safe manner.

BY: *Paul E. O'Neil*

DATE: **12-13-2013**

SSOE



Revised Submittal

Prepared For:
SSOE
320 Seven Springs Way, Suite 350
Brentwood, TN 37027

Date: December 11th, 2013

Customer P.O. Number:
Customer Project Number:

Sold To:
R.K. Redding
412 Sangamore Rd
Bremen, GA 30110

Job Number:
Job Name:
Honda PPG 89ki Expansion Project

Trane U.S. Inc. is pleased to provide the enclosed submittal for your review and approval.

Product Summary

Qty	Product
1	Centrifugal Chiller Duplex

Coordination Notes

- The following specified items have been removed per the owners request:
 - Power factor correction capacitors
 - Factory performance test with witness (standard air and run test now applies)
 - 2nd-5th year labor warranty on motor/compressor assemblies (parts warranty for that duration still applies)
- Warranty provided is for 12 months, parts, labor, and refrigerant from date of start-up or 18 months from shipment, whoever comes first. Extended parts warranty is for an additional 48 months starting at the end of the first year warranty, and lasting for 48 months or until 66 months from shipment, whichever occurs first.
- Scheduled condenser water pressure drop is 4.52' H2O. Submitted at 4.8' H2O due to slight re-rating of tubes for water flow.
- Iso-rib pads are included for isolation. Other forms of vibration isolation are not included
- Unit is provided with ModBus Gateway. Integration services are by controls contractor.
- Flow switches are of thermal dispersion type and are intended to be mounted by contractor in the piping, wired back to the chiller by contractor. Flow switches are pump interlocks are necessary for proper operation.

12-11-2013 Revision Notes

- Submittal data updated to include language for head pressure control option included with chiller. Revisions are in **BOLD** on pages 3,10, and 7 of this submittal.

Blaine Terry

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The attached information describes the equipment we propose to furnish for this project, and is submitted for your approval.

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Tag Data - Centrifugal Chiller Duplex (Qty: 1)

Item	Tag(s)	Qty	Description	Model Number
A1	Chiller - 5	1	Centrifugal Chiller Duplex (CDH)	CDHF2000

Product Data - Centrifugal Chiller Duplex**Item: A1 Qty: 1 Tag(s): Chiller - 5**

Duplex centrifugal liquid chiller with dual, 2 stage compressors, R-123 refrigerant

Compressor size: Two 910 nominal tons

Incoming line voltage: 480 volt, 3 phae

Compressor motor voltage: 480 volt 3 phase 60 Hz

Startup Included - Trane Service must start equipment for warranty to be honored

L.H. Compressor motor power: 512 kW

L.H. Compressor impeller cutback: 276

R.H. Compressor motor power: 588 kW

R.H. Compressor impeller cutback: 271

Economizer: Single stage standard

Evaporator:

Evaporator shell size: 2100 duplex

Evaporator bundle size: 2100 nominal tons

Evaporator tubes: 1 inch (25.4 mm) micro internally enhanced copper

Evaporator tube wall: .028 inch (0.7 mm) thick

Evaporator fluid type: Water

Evaporator water box type: Non-marine style, one pass

Evaporator water box construction: Standard

Evaporator water box pressure: 150 psig (1034 kPa)

Evaporator water box connection: Victaulic

Evaporator water box arrangement: in RH end - out LH end

Thermal dispersion flow switch (IFM) - Field Installed (FId)

Condenser:

Condenser shell size: 2100 duplex

Condenser bundle size: 1900 nominal tons

Condenser tube: 0.75 inch (19.1 mm) internally enhanced copper

Condenser tube wall: .028 inch (0.7 mm) thick

Condenser fluid type: Water

Condenser water box type: One pass, non-marine style

Condenser water box construction: Standard

Condenser water box pressure: 150 psig (1034 kPa)

Condenser water box connection: Victaulic

Condenser water box arrangement: in LH end - out RH end

Thermal dispersion flow switch (IFM) - Field Installed (FId)

Orifice size: 1265 (LH) nominal ton circuit

Orifice size: 1265 (RH) nominal ton circuit

Agency listing: U.L. listed unit (United States requirement)

Factory performance test: Standard air run and vibration test

Factory tolerance test: Standard air run and vibration test

Adaptiview controls

Brass logo with customer specified engraving

Unit option: Factory applied Insulation on all cold parts

Complies with ASHRAE 90.1 – 1999, 90.1 – 2007, 90.1 - 2007 Addendum M, 90.1 - 2010

Complies with ASHRAE 90.1 - 2010

***Operating Status option included**

*MODBUS communication protocol included

*** Condenser refrigerant pressure option included for integral head pressure control signal**

o **Head pressure control valve or VSD for pump not included**

Enhanced protection option included

Low voltage Wye-Delta starters (both starters)

Starter type: Unit Mounted Wye-Delta

Starter maximum RLA: 935 Amps

Starter power connection: Circuit Breaker

Starter power connection maximum RLA: 935 Amps

First year parts, labor, and refrigerant warranty included

Years 2nd-5th Parts Warranty Compressor Only

Performance Data - Centrifugal Chiller Duplex

Tags	Chiller - 5
Primary cooling capacity (tons)	1800.00
Primary kW (kW)	952.10
Primary RLA LH (Incoming line) (A)	662.90
Primary RLA RH (Incoming line) (A)	709.70
Minimum circuit ampacity LH compressor (A)	837.46
Minimum circuit ampacity RH compressor (A)	895.99
Max over current protection LH compr (A)	1200.00
Max over current protection RH compr (A)	1200.00
Compressor motor RLA left-hand (A)	661.70
Compressor motor RLA right-hand (A)	708.50
Motor locked rotor amps LH compressor (A)	3463.00
Motor locked rotor amps RH compressor (A)	4589.00
Primary kW left hand compressor (kW)	459.00
Primary kW right hand compressor (kW)	493.20
Primary kW/t (kW/ton)	0.529
NPLV (kW/ton)	0.426
Evaporator entering fluid temp (F)	57.93
Evaporator leaving fluid temp (F)	42.00
Evaporator fluid flow rate (gpm)	2700.00
Evaporator pressure drop (ft H2O)	3.22
Evaporator fouling factor (hr-sq ft-deg F/Btu)	0.00010
Evaporator fluid concentration (%)	0.00
Condenser entering fluid temp (F)	85.00
Condenser leaving fluid temp (F)	98.96
Condenser fluid flow rate (gpm)	3600.00
Condenser pressure drop (ft H2O)	4.80
Condenser fouling factor (hr-sq ft-deg F/Btu)	0.00025
Condenser fluid concentration (%)	0.00
HCFC 123 refrigerant charge left hand (lb)	1550.0
HCFC 123 refrigerant charge right hand (lb)	1550.0
Shipping weight (lb)	64572.0
Operating weight (lb)	75162.0
Unit center of gravity X (in)	48.000
Unit center of gravity Y (in)	64.000
Unit center of gravity Z (in)	120.000
Left Front isolator load (lb)	13494.0
Left Rear isolator load (lb)	9479.0
Right Front isolator load (lb)	15746.0
Right Rear isolator load (lb)	11405.0
Center Front isolator load (lb)	14608.0
Center Rear isolator load (lb)	10430.0
Chiller heat rejected to ambient (MBh)	16.25
Evaporator maximum fluid flow rate (gpm)	11441.30
Evaporator pressure drop maximum flow (ft H2O)	51.60
Evaporator minimum fluid flow rate (gpm)	1560.20
Evaporator pressure drop minimum flow (ft H2O)	1.07
Condenser maximum fluid flow rate (gpm)	11540.60
Condenser pressure drop maximum flow (ft H2O)	39.99
Condenser minimum fluid flow rate (gpm)	3147.40
Condenser pressure drop minimum flow (ft H2O)	3.74
LH Compressor Weight (lb)	6038.0
RH Compressor Weight (lb)	6038.0
LH Motor Weight (lb)	3412.0

Tags	Chiller - 5
RH Motor Weight (lb)	3412.0
LH Starter Weight (lb)	557.0
RH Starter Weight (lb)	557.0
LH Suction Elbow Weight (lb)	683.0
RH Suction Elbow Weight (lb)	683.0
LH Economizer Weight (lb)	878.0
RH Economizer Weight (lb)	878.0
Evaporator weight (lb)	19736.0
Evaporator Waterboxes Weight (lb)	944.0
Condenser Weight (lb)	17227.0
Condenser Waterboxes Weight (lb)	862.0
Miscellaneous Weight (lb)	2667.0

Mechanical Specifications - Centrifugal Chiller Duplex**Item: A1 Qty: 1 Tag(s): Chiller - 5****Compressor-Motor**

Direct drive multiple-stage compressor, multi-stage capacity control guide vanes. Shrouded aluminum alloy impellers dynamically balanced. Motor-compressor assembly balanced to .15 in./sec (.0038m/sec) maximum vibration measured on motor housing. Refrigerant cooled, hermetically sealed, two-pole, squirrel cage induction motor. Two pressure lubricated bearings support the rotating assembly. A direct drive submerged oil pump with 3/4 horsepower (.560 kW) 115V/50/60/1 motor provides filtered and temperature controlled oil to compressor bearings.

Evaporator-Condenser

The direction of flow shown on the "Unit Dimensions" drawing must be maintained for proper operation. Shells are carbon steel plate. Evaporator includes rupture disk per BSR/ASHRAE 15 Safety Code. Carbon steel tube sheets are drilled, reamed and grooved to accommodate tubes. Tubes are individually replaceable externally finned seamless copper with lands at all tube sheets and supports. Tubes are mechanically expanded into tube sheets. Evaporator tubes are also expanded into the intermediate tube supports. Eliminators are installed over entire length of the evaporator tube bundle. A welded or optional flanged multiple orifice control system maintains proper refrigerant flow. Condenser baffle prevents direct impingement of compressor discharge gas upon the tubes. Refrigerant side of the assembled unit is tested at both pressure and vacuum. Water side is hydrostatically tested at one and one-half times design working pressure, but not less than 225 psig (15.8 kg/cm²).

Trane reserves the right to implement chiller technology enhancements that will reduce the chiller's refrigerant charge, with no impact on chiller performance. Changes may be reflected in the chiller's nameplate refrigerant charge and the quantity of refrigerant charge shipped to the jobsite, depending upon the final date of equipment manufacture.

Water Boxes

Connections - Water boxes have removable end plates with horizontal connections for evaporator and horizontal or vertical connections for the cooling condenser.

Drains and vents - All water boxes have 3/4-inch NPTI (19mm) vents and drain connections provided. Evaporators have 2 vents and 2 drains, condensers have 1 vent and 1 drain. If grooved connections are offered, the design is based on Style 77.

Economizers

Patented economizers with no moving parts provide power saving capability.

Purge System

The EarthWise(TM) purge includes a 1/4 hp 115V/60/1, 100V/50/1 air cooled condensing unit, purge tank, drier elements, a 1/20 hp (.037 kW) 115V/60/1, 110V/50/1 pump-out compressor, a carbon tank, and a heater. The purge is designed with an activated carbon filtration system that includes an auto regeneration feature which results in high-efficiency removal of noncondensibles from the chiller without manual carbon maintenance. The purge is rated in accordance with AHRI Standard 580.

AdaptiView Control Panel:

The Tracer(tm) AdaptiView is a microprocessor-based chiller control system that provides complete stand alone system control and monitoring for the water cooled CenTraVac (TM). It is a factory mounted package including a full complement of controls to safely and efficiently operate the CenTraVac chiller, including oil management, purge operation, interface to the starter, and comprehensive motor protection including three phase solid state motor overload. Inlet and outlet water (fluid) temperature sensors are located in the evaporator and condenser waterbox connections as standard.

The display is a touch sensitive 12 1/8" diagonal color liquid crystal display (LCD) that uses color graphics and animation to ensure ease of use. The touch sensitive interface allows the operator to view the chiller graphically and receive a status indication via subsystem animations. The operator can navigate easily between the primary chiller subsystems including: compressor, evaporator, condenser, and motor. For each subsystem, you can view status and detailed operating parameters. In addition, alarms, reports, trending, and settings can all be accessed quickly from the main screen. The display is mounted on a flexible "arm" that allows extensive height and viewing angle variations.

The panel supports an extensive list of Languages including the default English. The data can be set to be viewed in inch pounds IP or metric units SI. For remote starters - Class 1 control panel voltage (30-115 V) are clearly labeled in the control panel. Class 2 input voltage (30V max) is also labeled in the control panel.

Operating Data including:

- *operating hours
- *number of starts
- *chilled water setpoint
- *evaporator and condenser water flow status
- *evaporator entering and leaving water temperatures
- *evaporator saturated refrigerant temperatures
- *evaporator approach temperature
- *evaporator refrigerant pressure
- *condenser entering and leaving water temperatures
- *condenser saturated refrigerant temperatures
- *condenser approach temperature
- *condenser refrigerant pressure
- *oil differential pressure
- *oil tank temperature
- *purge mode
- *purge average daily pump-out time
- *% RLA per phase for motor
- *RLA per phase
- *volts per phase
- *power factor
- *kw
- *kwh
- *frequency

The AdaptiView also contains the following dedicated reports:

Evaporator, Condenser, Compressor, Motor, Purge, and ASHRAE. Each report is comprised of a detailed listing of operational data relative to that chiller subsystem.

Control functions including:

- *leaving chilled water temperature
- *percent demand limit
- *chiller water reset (based on return water temperature)
- *front panel control type
- *setpoint source
- *differential to start
- *differential to stop
- *modulating condenser head pressure control signal output integral to chiller – for use with field supplied Valve / VSD**

Status data including:

- *waiting to start
- *running
- *run limit
- *run inhibit (adaptive)
- *auto
- *free cooling (option)
- *preparing to shutdown
- *shutting down (post lube)
- *stopped

Safeties including:

Automatic safety shutdown for:

- *Low chilled water temperature,
- *low evaporator refrigerant temperature
- *high condenser refrigerant pressure
- *evaporator and condenser flow status
- *low evaporator/condenser differential refrigerant pressure
- *low oil pressure
- *oil pressure overdue
- *high or low oil temperature
- *high bearing oil temperature (requires enhanced protection option)

- *high motor current
- *high motor temperature
- *starter function faults
- *critical temperature and pressure sensor faults.

The devices are of a latching trip out type requiring manual reset. Non-latching safety trip outs for operating conditions external to the chiller automatically permits unit to resume normal operation when condition is corrected.

Advanced motor protection monitors 3-phase current to provide latching trip out protection from adverse effects of phase loss, phase unbalance, phase reversal, loss of phase reversal protection, and electrical distribution faults (momentary power loss) by instantaneous trip out of motor.

Surge protection - Detects surge and limits chiller loading through inlet vane modulation. Head relief through lowering cooling tower water temperature can be requested. If not corrected within 7 minutes, chiller is shut down.

Enhanced Adaptive Control(TM) - Built in intelligence to keep the chiller on line (safely making maximum tons) while simultaneously preventing chiller damage/failure. During any chiller limiting mode of operation, the control panel enunciates the condition via a relay output.

Trending:

The controller provides 10 standard graphs for trending multiple parameters. The operator can add an additional 6 custom graphs if desired. On any one custom graph, the operator can choose to trend up to 10 unique parameters from a more comprehensive list. Two Y axes are available for any graph to facilitate readability.

Diagnostics:

AdaptiView includes comprehensive diagnostic monitoring. All active diagnostics are available, and up to 20 historic diagnostics are communicated to the operator via the 12 1/8" LCD display with graphic navigation system. Each diagnostic is time and date stamped.

Service Tool:

A PC-based service tool, connected to the chiller via USB port, is available for additional cost and displays the last 100 diagnostics, indicating the time, date of occurrence, and system parameters at the time of the diagnostic. The service tool provides advanced troubleshooting and access to sophisticated configuration settings not needed during operation of the chiller.

Security:

The AdaptiView can be set to prevent unauthorized access to the chiller settings. The operator can choose to secure the operating settings with a password. Data and reports can still be accessed once the settings are locked out.

The memory for the AdaptiView is non-volatile type, so if power is lost, operating settings are retained. A life time battery is standard, which is used only to support the clock function for the chiller.

Chilled and Condenser water pump relays:

Chilled water and condenser water pump relays are provided and it is recommended that they be used for pump control.

MODBUS Direct Points List:

The following points are available directly from the chiller. Recognize that some of these points require chiller options or configurations.

Inputs Including

- Chiller Auto/Stop
- Chiller Emergency Stop
- Chiller Mode (e.g. cool)
- External Base Loading Enable/Disable (requires Extended Operation option)
- External Base Loading Setpoint (requires Extended Operation option)
- Chilled Water Setpoint
- Current Limit Setpoint
- Heating Setpoint (requires Extended Operation option)
- Wall Mounted Refrigerant Specific Monitor (requires Extended Operation option)
- Clear Diagnostics

Outputs Including

- Evaporator Pump relay

Condenser Pump relay
 Chilled Water Flow Status
 Condenser Water Flow Status
 Evaporator Water Flow Rate (requires Flow Compensation option)
 Condenser Water Flow Rate (requires Flow Compensation option)
 Chiller capacity (requires Flow Compensation option)
 Leaving Chilled Water Temperature
 Entering Chilled Water Temperature
 Entering Condenser Water Temperature
 Leaving Condenser Water Temperature
 Second Condenser Entering Water Temperature (requires HR or Aux condenser bundle)
 Second Condenser Leaving Water Temperature (requires HR or Aux condenser bundle)
 Active Chilled/Hot Water Setpoint
 Active Current Limit Setpoint
 Active Base Loading Setpoint (requires Extended Operation option)
 Head Relief Request relay
 Compressor Running relay
 Chiller On/Off
 Limit Warning relay
 Maximum Capacity relay
 Alarms Description1
 Manual Reset Alarm relay
 Auto Reset Alarm relay
 Purge Alarm relay

 Alarm Reset
 Condenser Refrigerant Pressure
 Condenser Refrigerant Temperature
 Evaporator Refrigerant Pressure
 Evaporator Refrigerant Temperature
 Compressor Discharge Refrigerant Temperature (requires Enhanced Protection option)
 Differential refrigerant pressure (not for head pressure control)
 Operating Status (Alarm, Run Enabled, Local Control, Limited)
 Chiller Modes (i.e. Off, Starting, Running, Shutting Down)
 Base Loading Active (requires Extended Operation option)
 Hot Gas Bypass Active (requires Hot Gas Bypass option)
 Operating Mode (e.g. Cool)
 Percent RLA
 Current Per Line
 Voltage Per Phase
 Unit Power Consumption (kW)
 Motor winding temperature
 Motor power factor (uncorrected)
 Oil Temperature
 Oil Pressure Differential
 High Side Oil Pressure
 Low Side Oil Pressure
 Compressor Starts
 Compressor Run Time
 Inlet guide vane position
 Inboard bearing oil temperature (requires Enhanced Protection option)
 Outboard bearing oil temperature (requires Enhanced Protection option)
 Purge Status2
 Purge Pumpout Average (24 hour)
 Purge pump-out
 Purge regeneration
 Purge carbon tank temperature
 Purge liquid temperature
 Purge suction temperature
 Purge time to next purge run
 Purge pump-out chiller on-7 days
 Purge pump-out chiller off-7 days
 Purge pump-out life

Purge regeneration life
Refrigerant monitor
AFD Output frequency
AFD transistor temperature

Condenser Pressure Output:

A hardwire output signal of condenser pressure, or differential pressure between the evaporator and condenser is provided. **This signal can be used to directly control a modulating head pressure control valve or pump VSD, provided by others.**

Enhanced Protection Option provides:

Bearing temperatures sensors installed for both bearings, displayed on unit controller
Compressor discharge refrigerant from the compressor
Actual pressure transducer in the condenser for enhanced condenser limit control

Operating Status:

The following hardwire binary outputs are available:
Compressor running relay
Alarm relay - manual reset
Alarm relay - auto reset
Limit warning relay
Purge alarm relay
Head relief request relay
Maximum capacity relay

Evaporator Proof of Flow - Thermal Dispersion

A factory provided, field installed thermal dispersion type proof of flow switch is provided. The thermal dispersion controller is mounted in the chiller control panel, the piping probe and wiring is shipped loose for field installation. Follow the installation instructions in the chiller installation manual.

Condenser Proof of Flow - Thermal Dispersion

A factory provided, field installed thermal dispersion type proof of flow switch is provided. The thermal dispersion controller is mounted in the chiller control panel, the piping probe and wiring is shipped loose for field installation. Follow the installation instructions in the chiller installation manual.

Paint

All CenTraVac(TM) painted surfaces are coated with a primer and an air-dry beige primer-finisher prior to shipment.

Isolation

All units ship with neoprene isolator pads as standard. Enough pads are provided to cover the area under the chiller supports.

Shipment

All units are of hermetic design, leak tested, charged to 5 psig (.352 kg/cm²) with dry nitrogen and shipped as a single factory assembled package. Full oil charge shipped in oil sump. Refrigerant shipped to jobsite from refrigerant manufacturer. The entire chiller is shrink wrapped for protection.

Insulation

Factory applied insulation. All low temperature surfaces are covered with 3/4" (19mm) Armaflex II or equal (thermal conductivity=0.28 BTU/hr-ft sq.) (1.59 W/m²-K), including the evaporators, water boxes and suction elbows. The economizers are insulated with 3/8" (10mm) insulation. The chiller feet are not insulated.

Unit Mounted Starter

Wye Delta-Reduced Voltage, NEMA 1A (vented) enclosure with a gasket. Starter factory mounted and completely prewired to compressor motor and control panel. Factory run testing assures proper circuitry and operational reliability. The Wye Delta starter is a reduced voltage starter and therefore draws ~ 33% of locker rotor amps (LRA), and the motor acceleration time is 3-8 seconds typically.

The starter is designed and tested in accordance with UL 508.

Features include:

Reduced inrush of amperage during chiller start, approximately 33 % of LRA

There is a 115 volt control power transformer to power chiller unit controller, purge and oil system. Therefore, with line power, no other power is needed for auxiliary equipment on the chiller.

Top of starter includes access area for convenience in cutting wiring access area.

Terminal block connection is standard. Non-fused disconnects or circuit breakers may be included as an option. See the following submittal pages for disconnect ratings and lug information on these optional disconnects if offered.

Circuit breaker is mounted on starter. Starter door cannot be opened unless circuit breaker is off.

Circuit breaker current limiting is mounted on starter. Starter door cannot be opened unless circuit breaker is off.

Starter installer responsibilities

The following are considered functions normally required of the equipment installer for unit mounted starters.

Remove access area panel for line side wiring. The upper right quadrant of the starter provides recommended access to starter/disconnect lugs. The starter can accommodate top line power entry only.

Provide and install field wiring to line side lugs of starter.

Circuit breaker is mounted on starter. Starter door cannot be opened unless Circuit breaker is off.

Suggested Installer Responsibilities

The following are considered functions normally required of the equipment installer.

Install unit on a foundation with flat support surfaces level within 1/16" and of sufficient length to support concentrated loading. (Use spring type isolators for upper floor installation.)

Place isolation pads or optional spring type isolators provided by the chiller manufacturer under the unit.

Install unit per applicable Trane Installation Manual.

Complete all water and electrical connections.

Where specified, provide and install valves in water piping upstream and downstream of the evaporator and condenser water boxes as means of isolating shells for maintenance and to balance and trim system.

Furnish and install a flow switch with timer or equivalent device in both the chilled water and condenser water piping properly interlocked to insure that unit can operate only when water flow is established.

Furnish and install taps for thermometers and pressure gauges in water piping adjacent to inlet and outlet connections of both evaporator and condenser.

Furnish and install drain valves to each water box.

Install vent cocks on each water box.

Furnish and install strainers upstream of chiller evaporator and condenser bundles to protect tubes from potential damage caused by debris in the circulating water. Note: Failure to install strainers in all water piping entering the chiller could result in tube plugging conditions that could damage unit components. If the circulating pumps are immediately upstream of the chiller bundles, then the strainer can be installed immediately ahead of the pumps. If the circulating pumps are downstream of the chiller bundles, then the strainers should be installed immediately ahead of the chiller bundles.

Furnish sufficient refrigerant 25 lb.(11.34 kg) per machine and dry nitrogen 50 lb. (22.68 kg) per machine for pressure testing under manufacturer's supervision.

Start-up unit under supervision of a qualified Trane field engineer.

Where specified, insulate evaporator and any other portions of machine required to prevent sweating under normal operating conditions.

Water connection piping must not transfer forces to the chiller. Because of cumulative tolerances in manufacture and field installation, prepiping of water connections closer than 36" (914mm) is not recommended. Any problems associated with prepiping of water connections closer than 36" to the chiller are the responsibility of the installing contractor.

Furnish and install vent lines for rupture disk and purge venting to atmosphere per ASHRAE 15 and unit installation manual. If RuptureGuard-Relief Valve option is ordered, remove factory rupture disk and install RuptureGuard-Relief Valve per the IOM manual.

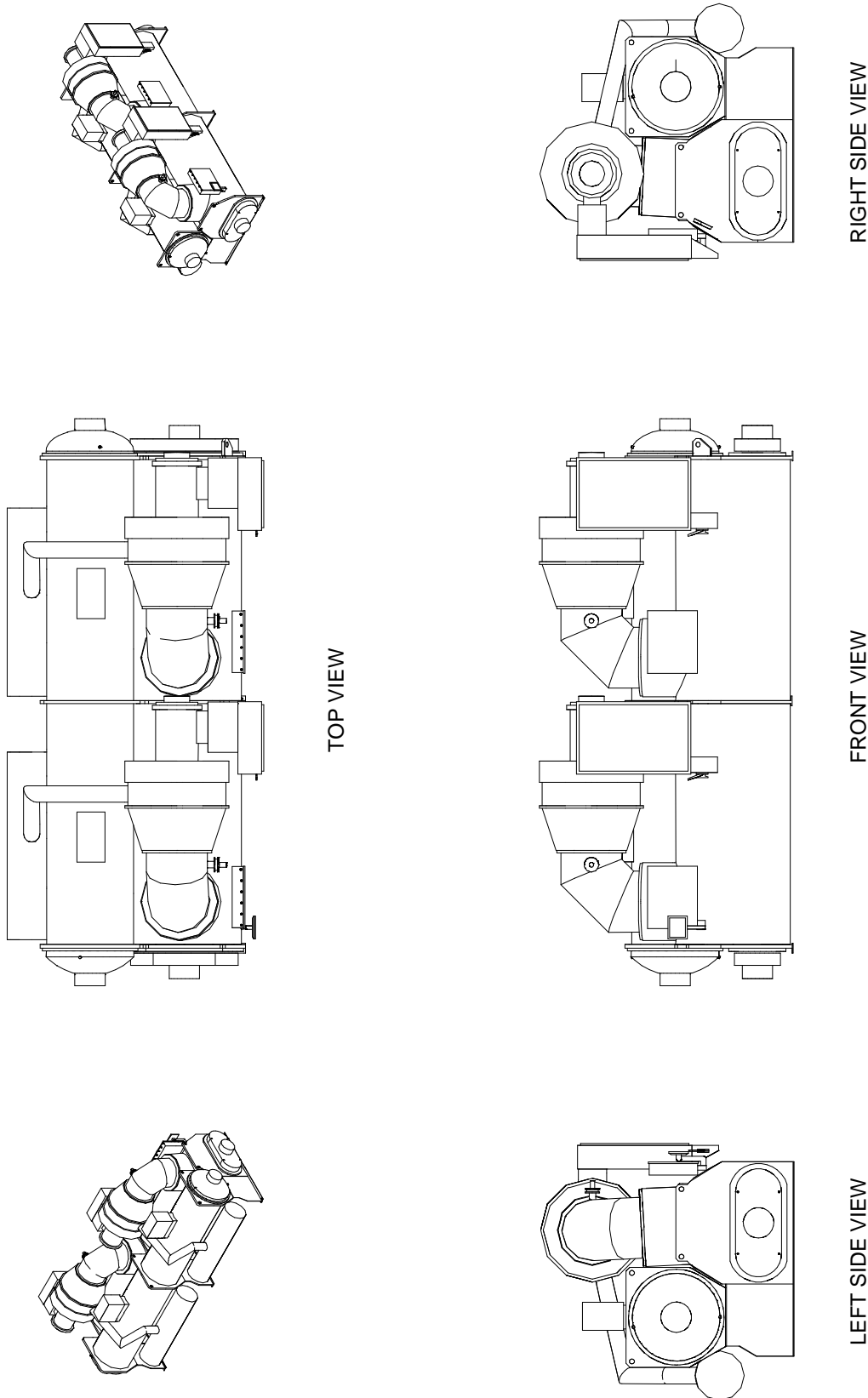
Leak-Tight Warranty

The CenTraVac chiller features a 5-year limited Leak-Tight Warranty which is valid for the lesser of 60 months from initial start-up or 66 months from date of shipment. The limited Leak-Tight Warranty covers models CVHE/F/L, CVHS and CDHF chillers installed in the United States or Canada. The Company's obligations and liabilities under this warranty are limited to furnishing replacement refrigerant; no other parts or labor are covered under this limited warranty. No liability whatever shall attach to the Company until appropriate actions have been taken (acceptable to Company) to eliminate the source of the leak, and then said liability shall be limited to furnishing the replacement refrigerant.

If the chiller is placed under a comprehensive Trane service and maintenance agreement (Trane Select Agreement or better) prior to the expiration of the standard Leak-Tight Warranty, the protection against refrigerant loss shall continue under the Trane Select Agreement for as long as an active Trane Select Agreement remains in effect without interruption.

If a 10-Year Parts, Labor and Refrigerant Warranty was purchased for the chiller and the chiller is placed under a Trane Select Agreement (or better) prior to the expiration of the 10-Year Parts, Labor and Refrigerant Warranty, the protection against refrigerant loss shall continue under the Trane Select Agreement for as long as an active Trane Select Agreement remains in effect without interruption.

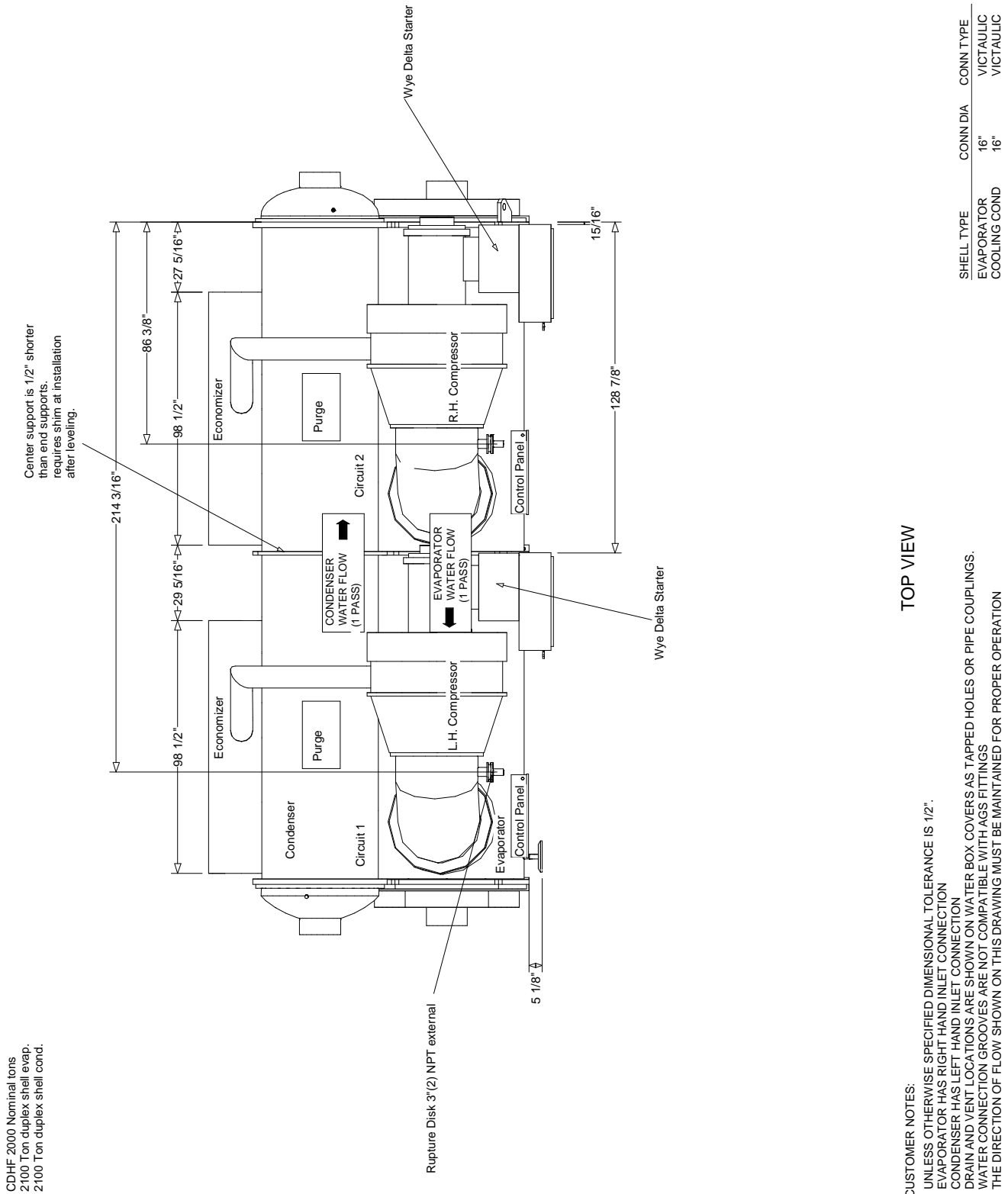
Unit Dimensions - Centrifugal Chiller Duplex
Item: A1 Qty: 1 Tag(s): Chiller - 5



SHELL TYPE	CONN DIA	CONN TYPE
EVAPORATOR	16"	VICTAULIC
COOLING COND	16"	VICTAULIC

CUSTOMER NOTES:
 UNLESS OTHERWISE SPECIFIED DIMENSIONAL TOLERANCE IS 1/2".
 EVAPORATOR HAS RIGHT HAND INLET CONNECTION
 CONDENSER HAS LEFT HAND INLET CONNECTION
 DRAIN AND VENT LOCATIONS ARE SHOWN ON WATER BOX COVERS AS TAPPED HOLES OR PIPE COUPLINGS.
 WATER CONNECTION GROOVES ARE NOT COMPATIBLE WITH AGS FITTINGS
 THE DIRECTION OF FLOW SHOWN ON THIS DRAWING MUST BE MAINTAINED FOR PROPER OPERATION

Unit Dimensions - Centrifugal Chiller Duplex
Item: A1 Qty: 1 Tag(s): Chiller - 5



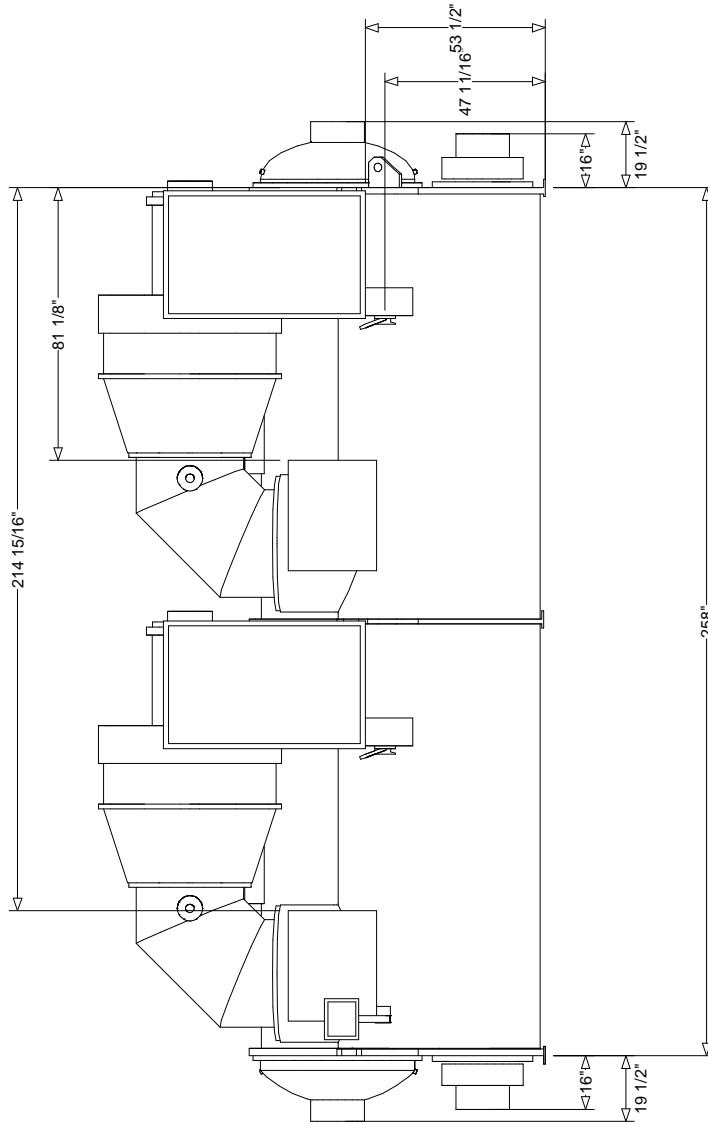
TOP VIEW

CUSTOMER NOTES:
 UNLESS OTHERWISE SPECIFIED DIMENSIONAL TOLERANCE IS 1/2".
 EVAPORATOR HAS RIGHT HAND INLET CONNECTION
 CONDENSER HAS LEFT HAND INLET CONNECTION
 DRAIN AND VENT LOCATIONS ARE SHOWN ON WATER BOX COVERS AS TAPPED HOLES OR PIPE COUPLINGS.
 WATER CONNECTION GROOVES ARE NOT COMPATIBLE WITH AGS FITTINGS
 THE DIRECTION OF FLOW SHOWN ON THIS DRAWING MUST BE MAINTAINED FOR PROPER OPERATION

SHELL TYPE	CONN DIA	CONN TYPE
EVAPORATOR	16"	VICTAULIC
COOLING COND	16"	VICTAULIC

CDHF 2000 Nominal tons
 2100 Ton duplex shell evap.
 2100 Ton duplex shell cond.

Unit Dimensions - Centrifugal Chiller Duplex
Item: A1 Qty: 1 Tag(s): Chiller - 5



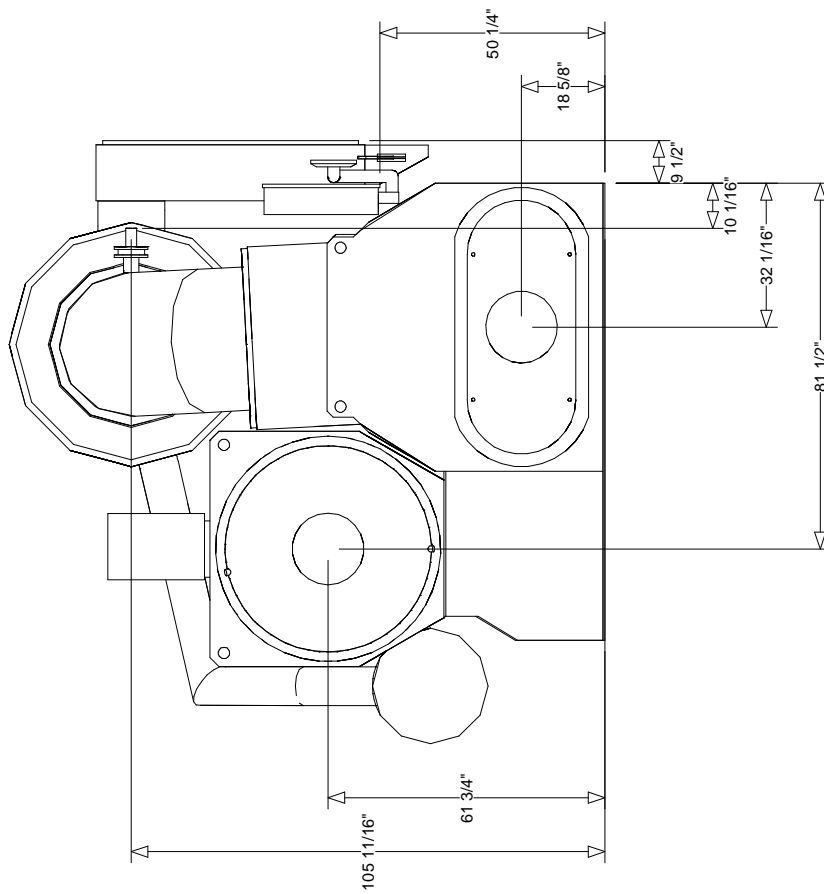
CDHF 2000 Nominal tons
 2100 Ton duplex shell evap.
 2100 Ton duplex shell cond.

SHELL TYPE	CONN DIA	CONN TYPE
EVAPORATOR	16"	VICTAULIC
COOLING COND	16"	VICTAULIC

FRONT VIEW

CUSTOMER NOTES:
 UNLESS OTHERWISE SPECIFIED DIMENSIONAL TOLERANCE IS 1/2".
 EVAPORATOR HAS RIGHT HAND INLET CONNECTION
 CONDENSER HAS LEFT HAND INLET CONNECTION
 DRAIN AND VENT LOCATIONS ARE SHOWN ON WATER BOX COVERS AS TAPPED HOLES OR PIPE COUPLINGS.
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Unit Dimensions - Centrifugal Chiller Duplex
Item: A1 Qty: 1 Tag(s): Chiller - 5



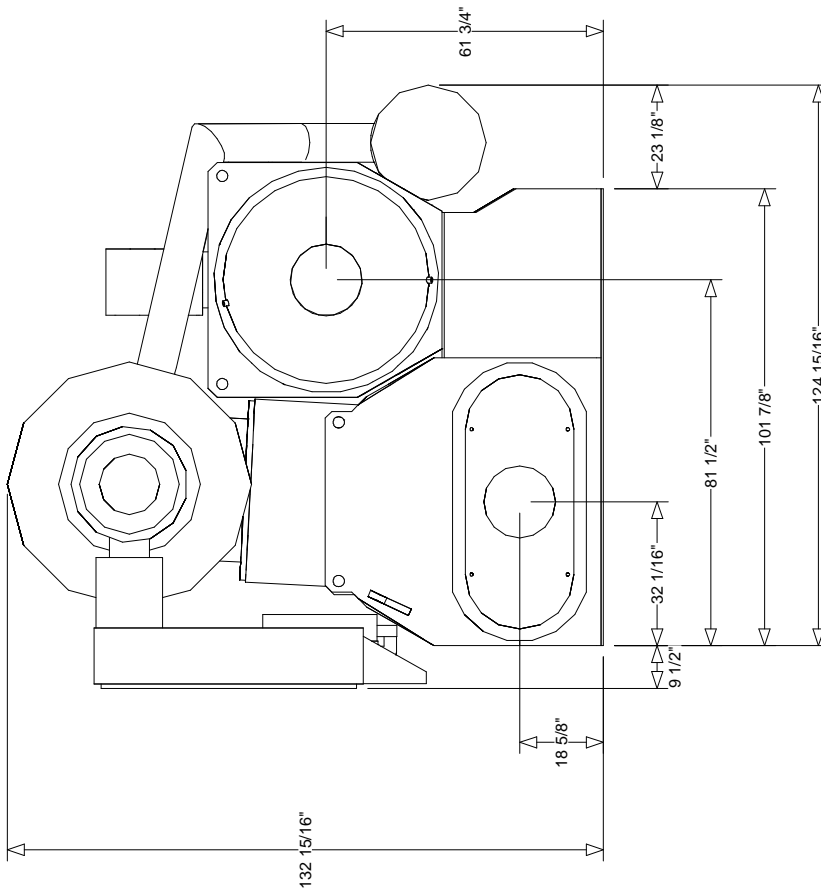
LEFT SIDE VIEW

CUSTOMER NOTES:
 UNLESS OTHERWISE SPECIFIED DIMENSIONAL TOLERANCE IS 1/2".
 EVAPORATOR HAS RIGHT HAND INLET CONNECTION
 CONDENSER HAS LEFT HAND INLET CONNECTION
 DRAIN AND VENT LOCATIONS ARE SHOWN ON WATER BOX COVERS AS TAPPED HOLES OR PIPE COUPLINGS.
 WATER CONNECTION GROOVES ARE NOT COMPATIBLE WITH AGS FITTINGS
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SHELL TYPE	CONN DIA	CONN TYPE
EVAPORATOR	16"	VICTAULIC
COOLING COND	16"	VICTAULIC

CDHF 2000 Nominal tons
 2100 Ton duplex shell evap.
 2100 Ton duplex shell cond.

Unit Dimensions - Centrifugal Chiller Duplex
Item: A1 Qty: 1 Tag(s): Chiller - 5



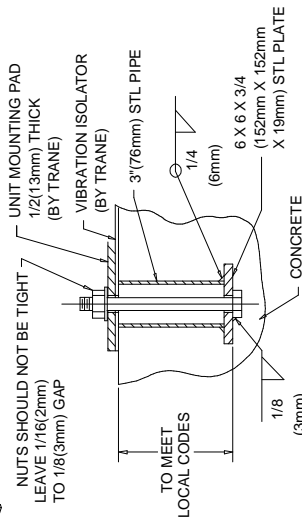
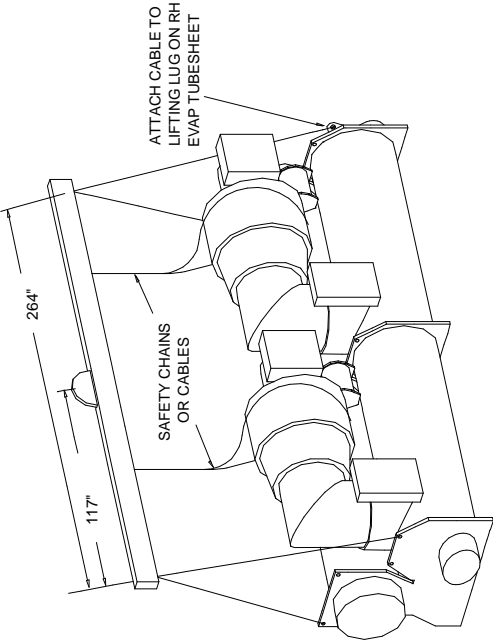
RIGHT SIDE VIEW

SHELL TYPE	CONN DIA	CONN TYPE
EVAPORATOR	16"	VICTAULIC
COOLING COND	16"	VICTAULIC

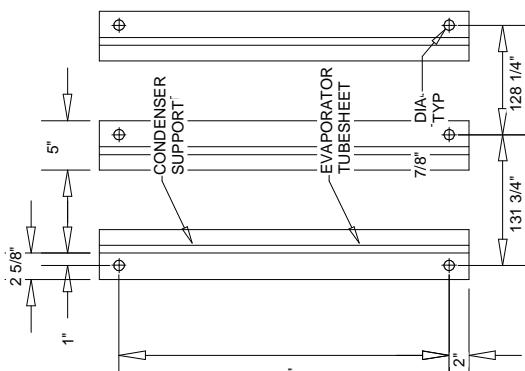
CUSTOMER NOTES:
 UNLESS OTHERWISE SPECIFIED DIMENSIONAL TOLERANCE IS 1/2".
 EVAPORATOR HAS RIGHT HAND INLET CONNECTION
 CONDENSER HAS LEFT HAND INLET CONNECTION
 DRAIN AND VENT LOCATIONS ARE SHOWN ON WATER BOX COVERS AS TAPPED HOLES OR PIPE COUPLINGS.
 WATER CONNECTION GROOVES ARE NOT COMPATIBLE WITH AGS FITTINGS
 THE DIRECTION OF FLOW SHOWN ON THIS DRAWING MUST BE MAINTAINED FOR PROPER OPERATION

CDHF 2000 Nominal tons
 2100 Ton duplex shell evap.
 2100 Ton duplex shell cond.

Weight, Clearance & Rigging Diagram - Centrifugal Chiller Duplex
Item: A1 Qty: 1 Tag(s): Chiller - 5



RECOMMENDED PROCEDURE TO ALLOW FOR THERMAL EXPANSION (UNLESS OTHERWISE SPECIFIED, PARTS ARE FURNISHED BY CUSTOMER). ANCHORING THE UNIT IS NOT A REQUIREMENT, IT MAY BE RECOMMENDED FOR SPECIFIC APPLICATIONS.

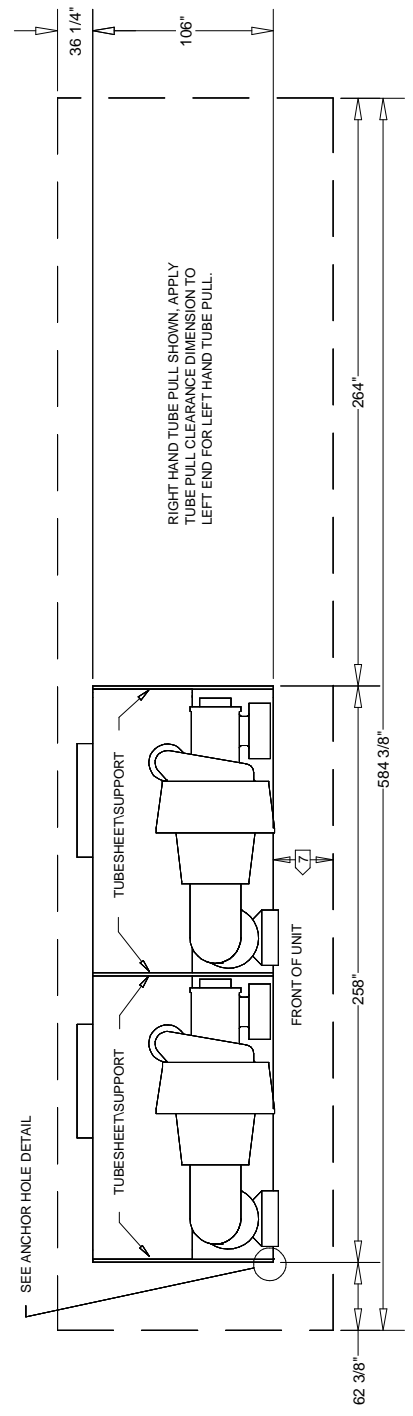


LEFT END MIDDLE RIGHT END
 ANCHOR HOLE DETAIL

WEIGHT	
SHIPPING	64572.0 lb
OPERATING	75162.0 lb

WARNING

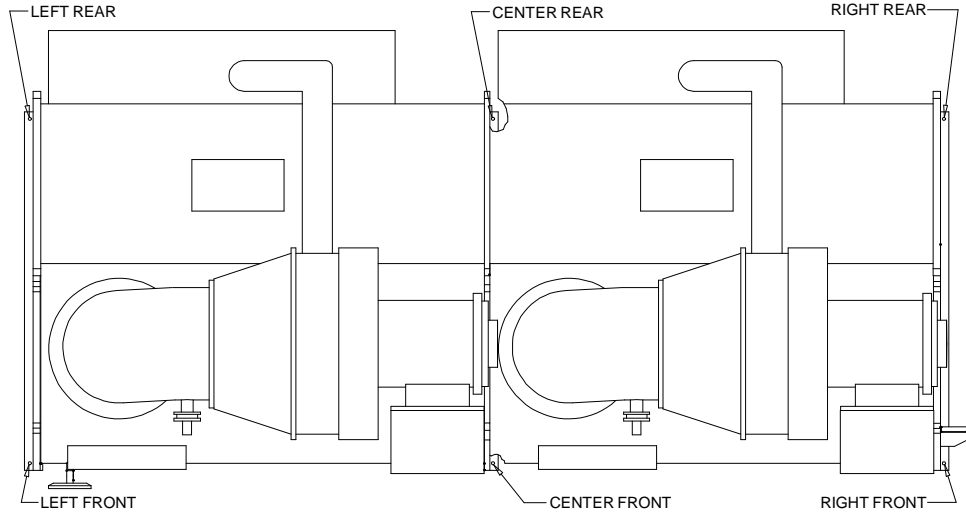
- HEAVY OBJECTS!
DO NOT USE CABLES (CHAINS OR SLINGS) EXCEPT AS SHOWN. EACH OF THE CABLES (CHAINS OR SLINGS) USED TO LIFT THE UNIT MUST BE CAPABLE OF SUPPORTING THE ENTIRE WEIGHT OF THE UNIT. LIFTING CABLES (CHAINS OR SLINGS) MAY NOT BE OF THE SAME LENGTH. ADJUST AS NECESSARY FOR EVEN UNIT LIFT. OTHER LIFTING ARRANGEMENTS MAY CAUSE EQUIPMENT OR PROPERTY-ONLY DAMAGE. FAILURE TO PROPERLY LIFT UNIT MAY RESULT IN DEATH OR SERIOUS INJURY. SEE DETAILS BELOW.
- IMPROPER UNIT LIFT!
TEST LIFT UNIT APPROXIMATELY 24 INCHES TO VERIFY PROPER CENTER OF GRAVITY LIFT POINT. TO AVOID DROPPING OF UNIT, REPOSITION LIFTING POINT IF UNIT IS NOT LEVEL. FAILURE TO PROPERLY LIFT UNIT COULD RESULT IN DEATH OR SERIOUS INJURY OR POSSIBLE EQUIPMENT OR PROPERTY-ONLY DAMAGE.
- ATTACH SAFETY CHAIN OR CABLE AS SHOWN WITHOUT TENSION, NOT AS A LIFTING CHAIN OR CABLE, BUT TO PREVENT THE UNIT FROM ROLLING.
- DO NOT FORKLIFT THE UNIT TO MOVE OR LIFT.
- LIFTING HOLES PROVIDED ON CHILLER TO ATTACH CABLES (CHAINS OR SLINGS).
- 36" (900 MM) RECOMMENDED CLEARANCE ABOVE HIGHEST POINT OF COMPRESSOR
- FOLLOW NEC SECTION 110 AND OTHER APPLICABLE LOCAL CODES FOR CLEARANCES IN FRONT OF ELECTRICAL ENCLOSURES.
- DETAILED LOAD POINT AND SPRING ISOLATOR APPLICATION WEIGHTS ARE AVAILABLE FROM "CENTRAVAC ISOLATOR SELECTION REPORT" AVAILABLE FROM THE REPORT GENERATOR OF THE TRANE TOPSS CHILLER SELECTION PROGRAM. CONTACT YOUR LOCAL TRANE SALES ENGINEER IF THIS DATA IS REQUIRED.



Weight, Clearance & Rigging Diagram - Centrifugal Chiller Duplex
Item: A1 Qty: 1 Tag(s): Chiller - 5

SPRING ISOLATOR INFORMATION

ISOLATOR LOCATION



ISOLATOR SELECTION

LOCATION	ISOLATOR LOAD*	VENDOR P/N	TRANE P/N	ISOLATOR COLOR
LEFT FRONT	13494.0 lb			
LEFT REAR	9479.0 lb			
RIGHT FRONT	15746.0 lb			
RIGHT REAR	11405.0 lb			
CENTER FRONT	14608.0 lb			
CENTER REAR	10430.0 lb			

COMPONENT	WEIGHT*
LH COMPRESSOR WEIGHT	6038.0 lb
RH COMPRESSOR WEIGHT	6038.0 lb
LH MOTOR WEIGHT	3412.0 lb
RH MOTOR WEIGHT	3412.0 lb
LH STARTER WEIGHT	557.0 lb
RH STARTER WEIGHT	557.0 lb
LH SUCTION ELBOW WEIGHT	683.0 lb
RH SUCTION ELBOW WEIGHT	683.0 lb
LH ECONOMIZER WEIGHT	878.0 lb
RH ECONOMIZER WEIGHT	878.0 lb
EVAPORATOR WEIGHT	19736.0 lb
EVAPORATOR WATERBOXES WEIGHT	944.0 lb
CONDENSER WEIGHT	17227.0 lb
CONDENSER WATERBOXES WEIGHT	862.0 lb
MISCELLANEOUS WEIGHT	2667.0 lb

UNIT CENTER OF GRAVITY	
CG Z (DIMENSION FROM RIGHT TO LEFT)	120.000 in
CG X (DIMENSION FROM FRONT TO REAR)	48.000 in
CG Y (HEIGHT DIMENSION FROM FLOOR)	64.000 in

RIGHT FRONT ISOLATOR MOUNTING HOLE
 BOTTOM OF THIS HOLE IS 0,0,0 POINT
 FOR CENTER OF GRAVITY DIMENSIONS

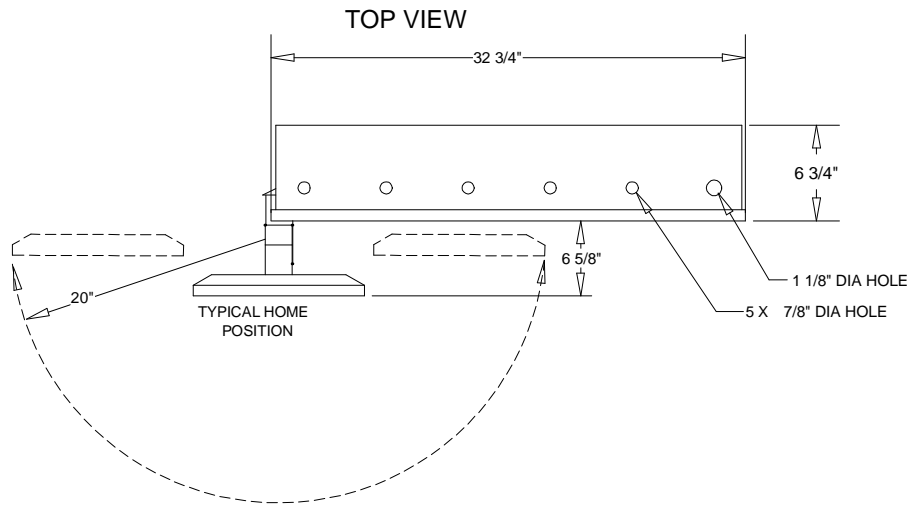
NAMEPLATE PRODUCT DESCRIPTION:

MODL CDHF	PTON 1800.00 tons	NTON 2000	CPM1 512
VOLT 480	CPM2 588	CPD2 271	CDTM TECU
CPD1 276	EVBS 2100	EVTM IMCU	ORC2 1265
EVSZ 210D	CDSZ 210D	CDBS 1900	
		ORC1 1265	

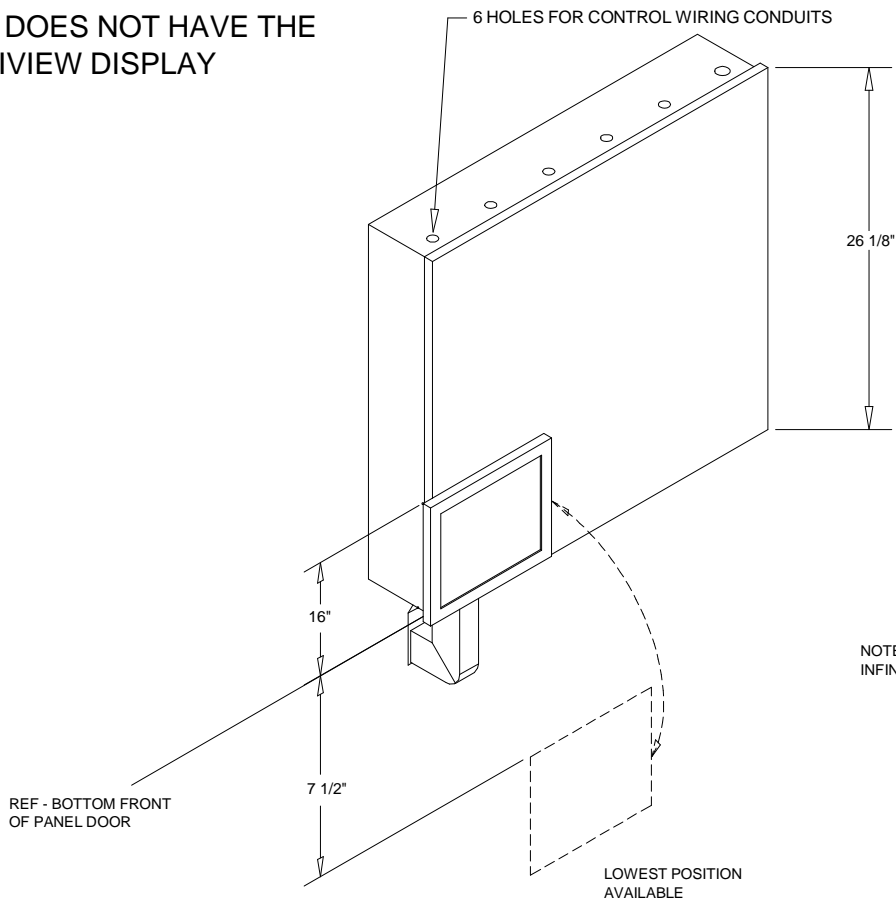
UNIT WEIGHTS	
SHIPPING	OPERATING
64572.0 lb	75162.0 lb

*ALL PUBLISHED WEIGHTS ACCURATE TO +/- 10 %

ADAPTIVIEW CONTROL PANEL



LEFT SIDE CONTROL PANEL
SHOWN. RIGHT SIDE CONTROL
PANEL DOES NOT HAVE THE
ADAPTIVIEW DISPLAY



Accessory - Centrifugal Chiller Duplex
Item: A1 Qty: 1 Tag(s): Chiller - 5

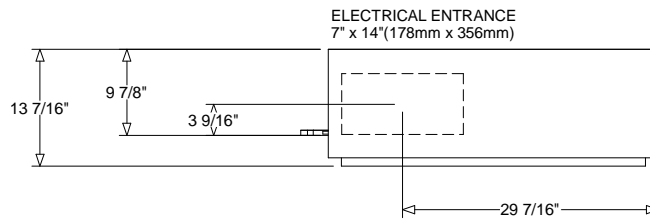
UNIT MOUNTED STARTER

Unit Mounted Wye-Delta Starter

STARTER	SIZE	MAX CONN RLA	BREAKER AIC AMPS	SHORT CIRCUIT WITHSTAND RATINGS (RMS SYMETRICAL AMPS)	LINE CONNECTION LUGS WYE-DELTA STARTERS	PANEL CONNECTION	INTERNAL WIRE LENGTH
LEFT	6	935	50000	42000	(4)4/0-500	CB	25"
RIGHT	6	935	50000	42000	(4)4/0-500	CB	25"

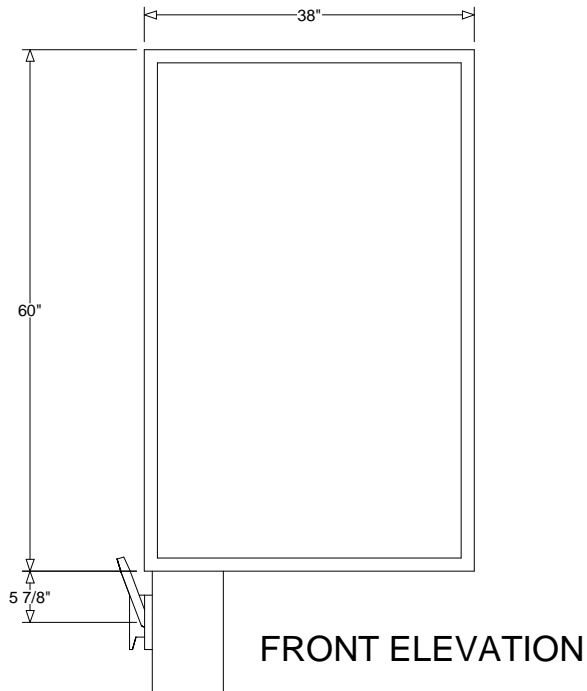
CB = CIRCUIT BREAKER

THE NON-FUSED DISCONNECT OR CIRCUIT BREAKER IS DESIGNED FOR USE AS A SERVICE DISCONNECT ONLY. THE DISCONNECT/CIRCUIT BREAKER HANDLE HEIGHT MAY EXCEED 6'7". A FLEXIBLE OPERATOR KIT CONSISTING OF A STARTER MOUNTED HANDLE THAT REDUCES THE HANDLE HEIGHT TO WITHIN THE 79" HEIGHT IS AVAILABLE.



ALLOW MIN. WORKING SPACE CLEARANCE PER NEC ARTICLE 110 - REQUIREMENT ELECTRICAL INSTAL **TOP VIEW**

RIGHT HAND STARTER DIMENSIONS ALSO APPLY TO LEFT HAND STARTER



FRONT ELEVATION

Field Wiring - Centrifugal Chiller Duplex
Item: A1 Qty: 1 Tag(s): Chiller - 5

<p>⚠ WARNING HAZARDOUS VOLTAGE! DISCONNECT ALL ELECTRIC POWER INCLUDING REMOTE DISCONNECTS AND FOLLOW LOCK OUT AND TAG PROCEDURES BEFORE SERVICING. INSURE THAT ALL MOTOR CAPACITORS HAVE DISCHARGED STORED VOLTAGE. UNITS WITH VARIABLE SPEED DRIVE, REFER TO DRIVE INSTRUCTIONS FOR CAPACITOR DISCHARGE. FAILURE TO DO THE ABOVE BEFORE SERVICING COULD RESULT IN DEATH OR SERIOUS INJURY.</p>	<p>⚠ AVERTISSEMENT TENSION DANGEREUSE! COUPER TOUTES LES TENSIONS ET OUVRIRE LES SECTIONNEURS A DISTANCE, PUIS SUIVRE LES PROCEDURES DE VERRIQUILLAGE ET DES ETIQUETTES AVANT TOUTE INTERVENTION. VERIFIER QUE TOUTS LES CONDENSATEURS DES MOTEURS SONT DECHARGES. DANS LE CAS D'UNITES COMPORTANT DES ENTRAINEMENTS A VITESSE VARIABLE, SE REPORTER AUX INSTRUCTIONS DE L'ENTRAINEMENT POUR DECHARGER LES CONDENSATEURS. NE PAS RESPECTER CES MESURES PEUT ENTRAINER DES BLESSURES GRAVES POUVANT ETRE MORTELLES.</p>	<p>⚠ ADVERTENCIA ¡VOLTAJE PELIGROSO! DESCONECTE TODA LA ENERGIA ELECTRICA, INCLUIDO LAS DESCONEXIONES REMITAS Y SIGA LOS PROCEDIMIENTOS DE CIERRE Y ETIQUETADO ANTES DE PROCEDER AL SERVICIO. ASEGURESE DE QUE TODOS LOS CAPACITORES DEL MOTOR HAYAN DESCARGADO EL VOLTAJE ALMACENADO PARA LAS UNIDADES CON EJE DE DIRECCION DE VELOCIDAD VARIABLE. CONSULTE LAS INSTRUCCIONES PARA LA DESCARGA DEL CONDENSADOR. EL NO REALIZAR LO ANTERIORMENTE INDICADO, PODRIA OCASIONAR LA MUERTE O SERIAS LESIONES PERSONALES.</p>
<p>CAUTION USE COPPER CONDUCTORS ONLY! UNIT TERMINALS ARE NOT DESIGNED TO ACCEPT OTHER TYPES OF CONDUCTORS. FAILURE TO DO SO MAY CAUSE DAMAGE TO THE EQUIPMENT.</p>	<p>ATTENTION N'UTILISER QUE DES CONDUCTEURS EN CUIVRE! LES BORNES DE L'UNITE NE SONT PAS CONÇUES POUR RECEVOIR D'AUTRES TYPES DE CONDUCTEURS. L'UTILISATION DE TOUT AUTRE CONDUCTEUR PEUT ENDOMMAGER L'EQUIPEMENT.</p>	<p>PRECAUCIÓN UTILICE ÚNICAMENTE CONDUCTORES DE COBRE! LAS TERMINALES DE LA UNIDAD NO ESTÁN DISEÑADAS PARA ACEPTAR OTROS TIPOS DE CONDUCTORES. SI NO LO HACE, PUEDE OCASIONAR DAÑO AL EQUIPO.</p>

* CONNECTION DIAGRAMS ARE AVAILABLE AT THE WEBPAGE SHOWN IN THE MECHANICAL SPECIFICATIONS SECTION OF THIS SUBMITTAL.

NOTES:

1. DASHED LINES INDICATE RECOMMENDED FIELD WIRING BY OTHERS. CHECK SALES ORDER TO DETERMINE IF WIRING IS REQUIRED FOR SPECIFIC OPTIONS.
2. CAUTION - DO NOT ENERGIZE UNIT UNTIL CHECK-OUT AND START-UP PROCEDURES HAVE BEEN COMPLETED.

REQUIRED

3. ALL CUSTOMER CONTROL CIRCUIT WIRING MUST HAVE A MINIMUM RATING OF 150 VOLTS.
4. ALL FIELD WIRING MUST BE IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE (NEC), STATE AND LOCAL REQUIREMENTS. OUTSIDE THE UNITED STATES, OTHER COUNTRIES APPLICABLE NATIONAL AND/OR LOCAL REQUIREMENTS SHALL APPLY.
5. EVAPORATOR AND CONDENSER FLOW SWITCHES ARE REQUIRED. THEY MUST BE INSTALLED AND WIRED TO THE TRANE PANEL BY THE INSTALLING CONTRACTOR. PURCHASE OF SWITCHES FROM TRANE IS OPTIONAL.

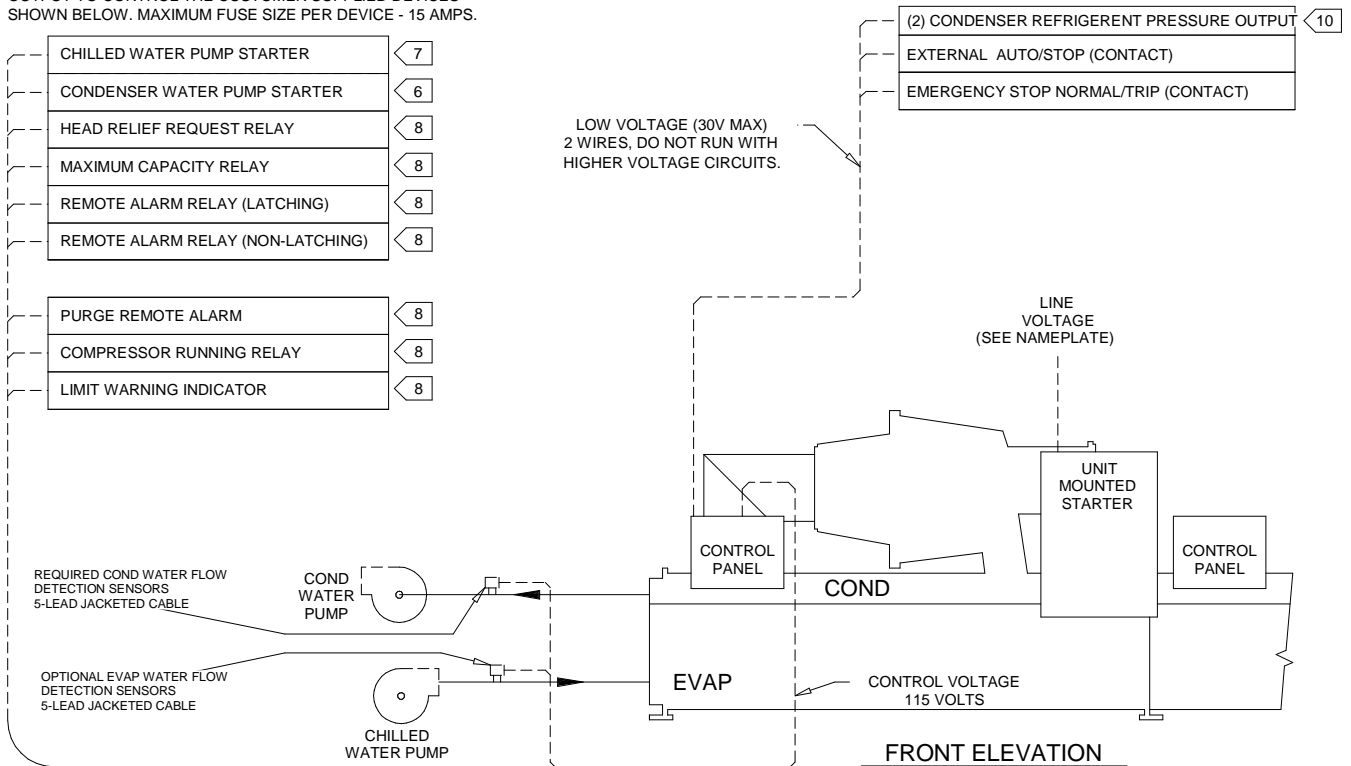
- 6 2 WIRES, 115 VAC CIRCUIT, SEPARATE POWER SUPPLY IS REQUIRED. MINIMUM CONTACT RATING AT 115 VAC - 2.88 INDUCTIVE 1/3 H.P. (.25 KW) AT 115 VAC OPTIONAL.
- 7 2 WIRES, 115 VAC CIRCUIT, SEPARATE POWER SUPPLY IS REQUIRED. CONTACTS ARE N.O. CONTACT RATING - 2.88 INDUCTIVE 1/3 H.P. (.25 KW) AT 115 VAC.
- 8 2 OR 3 WIRES(N.O. &/OR N.C.), 115 VAC CIRCUIT, SEPARATE 115 VAC POWER SUPPLY IS REQUIRED. CONTACTS ARE NO/NC RATINGS - 2.88 INDUCTIVE 1/3 H.P. (.25 KW) AT 115 VAC.

10 2-10V OUTPUT

FEATURES SHOWN BELOW ARE WIRED TO LEFT HAND CONTROL PANEL. FEATURES MARKED WITH "(2)" REPRESENT 2 DEVICES AND ARE WIRED TO EACH CONTROL PANEL.

FEATURES SHOWN BELOW ARE WIRED TO LEFT HAND CONTROL PANEL ONLY.
 THE UNIT CONTROL PANEL SUPPLIES A CONTACT OUTPUT TO CONTROL THE CUSTOMER SUPPLIED DEVICES SHOWN BELOW. MAXIMUM FUSE SIZE PER DEVICE - 15 AMPS.

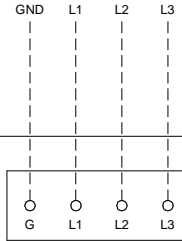
WIRING SHOWN BELOW APPLIES TO BOTH CONTROL PANELS



Field Wiring - Centrifugal Chiller Duplex
Item: A1 Qty: 1 Tag(s): Chiller - 5

LEFT HAND UNIT CONTROL PANEL - CIRCUIT 1

CUSTOMER SUPPLIED
 LINE VOLTAGE
 (SEE UNIT NAMEPLATE)



TRANE SUPPLIED
 UNIT MOUNTED
 LOW VOLTAGE
 WYE-DELTA
 STARTER PANEL

⚠ WARNING
 HAZARDOUS VOLTAGE!
 DISCONNECT ALL ELECTRIC POWER INCLUDING REMOTE DISCONNECTS AND FOLLOW LOCK OUT AND TAG PROCEDURES BEFORE SERVICING. INSURE THAT ALL MOTOR CAPACITORS HAVE DISCHARGED STORED VOLTAGE. UNITS WITH VARIABLE SPEED DRIVE, REFER TO DRIVE INSTRUCTIONS FOR CAPACITOR DISCHARGE. FAILURE TO DO THE ABOVE BEFORE SERVICING COULD RESULT IN DEATH OR SERIOUS INJURY.

⚠ AVERTISSEMENT
 TENSION DANGEREUSE!
 COUPER TOUTES LES TENSIONS ET OUVRIRE LES SECTIONNEURS A DISTANCE, PUIS SUIVRE LES PROCEDURES DE VERROUILLAGE ET DES ETIQUETTES AVANT TOUTE INTERVENTION. VERIFIER QUE TOUTS LES CONDENSATEURS DES MOTEURS SONT DECHARGES, DANS LE CAS D'UNITES COMPORTANT DES ENTRAINEMENTS A VITESSE VARIABLE, SE REPORTER AUX INSTRUCTIONS DE L'ENTRAINEMENT POUR DECHARGER LES CONDENSATEURS. NE PAS RESPECTER CES MESURES DE PRECAUTION PEUT ENTRAENER DES BLESSURES GRAVES POUVANT ETRE MORTELLES.

⚠ ADVERTENCIA
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 DESCONECTE TODA LA ENERGIA ELECTRICA, INCLUIDO LAS DESCONEXIONES REMOTAS Y SIGA LOS PROCEDIMIENTOS DE CIERRE Y ETIQUETADO ANTES DE PROCEDER AL SERVICIO. ASEGURESE DE QUE TODOS LOS CAPACITORES DEL MOTOR HAYAN DESCARGADO EL VOLTAJE ALMACENADO. PARA LAS UNIDADES CON EJE DE DIRECCION DE VELOCIDAD VARIABLE, CONSULTE LAS INSTRUCCIONES PARA LA DESCARGA DEL CONDENSADOR. EL NO REALIZAR LO ANTERIORMENTE INDICADO, PODRIA OCASIONAR LA MUERTE O SERIAS LESIONES PERSONALES.

CAUTION
 USE COPPER CONDUCTORS ONLY!
 UNIT TERMINALS ARE NOT DESIGNED TO ACCEPT OTHER TYPES OF CONDUCTORS.
 FAILURE TO DO SO MAY CAUSE DAMAGE TO THE EQUIPMENT.

ATTENTION
 N'UTILISER QUE DES CONDUCTEURS EN CUIVRE!
 LES BORNES DE L'UNITE NE SONT PAS CONÇUES POUR RECEVOIR D'AUTRES TYPES DE CONDUCTEURS.
 L'UTILISATION DE TOUT AUTRE CONDUCTEUR PEUT ENDOMMAGER L'EQUIPEMENT.

PRECAUCIÓN
 UTILICE UNICAMENTE CONDUCTORES DE COBRE!
 LAS TERMINALES DE LA UNIDAD NO ESTÁN DISEÑADAS PARA ACEPTAR OTROS TIPOS DE CONDUCTORES.
 SI NO LO HACE, PUEDE OCASIONAR DAÑO AL EQUIPO.

DEVICE PREFIX CODE

- 1 = MAIN UNIT CONTROL PANEL DEVICE
- 2 = REMOTE MOUNTED DEVICE
- 4 = UNIT MOUNTED DEVICE
- 5 = CUSTOMER PROVIDED DEVICE

WIRE NO OR DEVICE	FIELD WIRING CIRCUIT SELECTION INFORMATION
SUPPLY AND MOTOR LEADS	SEE NAMEPLATE; MINIMUM CIRCUIT AMPACITY
1A*	4000VA AT 115VAC, 8 AWG MAX WIRE SIZE
2A* AND GRN/YEL	4000VA AT 115VAC, 8 AWG MAX WIRE SIZE (WITHOUT OPTIONAL CPTR)
2A* AND GRN/YEL	CIRCUIT PROTECTED AT 20A, 115VAC 1PH, 10 AWG MAX WIRE SIZE (WITH OPTIONAL CPTR)
9A* AND 10A*	PUMP MOTOR; 1PH 3/4 HP, 11.7 FULL LOAD AMPS AT 115VAC. 14 AWG MAX WIRE SIZE.
WB4	TWISTED, SHIELDED PAIR, 30VDC, MAX LENGTH 1500 FT (BELDEN TYPE 8760 RECOMMENDED)
5S1*, 5S2*, 3B* AND 4B*	CIRCUIT PROTECTED AT 20A, 115VAC 1PH, 10 AWG MAX WIRE SIZE
5S3 THRU 5S7, 5S9 AND 5S10	24VDC, 12MA RESISTIVE LOAD, 14 AWG MAX WIRE SIZE
ALL REMAINING LLID TERMINALS	CONTACT RATING; 2.88A INDUCTIVE, 1/3 HP, 0.25KW AT 115VAC. 14 AWG MAX WIRE SIZE.

NOTES:

* TAPPED CONTROL CONDUCTORS

1. DASHED LINES INDICATE FIELD WIRING BY OTHERS. WIRE NUMBERS SHOWN ARE RECOMMENDED BY TRANE.
2. DO NOT ROUTE LOW VOLTAGE (30V) WITH CONTROL VOLTAGE (115V) AND DO NOT POWER UNIT UNTIL CHECK-OUT AND START-UP PROCEDURES HAVE BEEN COMPLETED.

Field Wiring - Centrifugal Chiller Duplex
Item: A1 Qty: 1 Tag(s): Chiller - 5

RIGHT HAND UNIT CONTROL PANEL - CIRCUIT 2

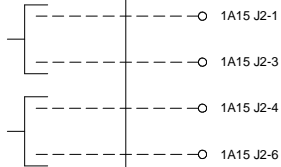
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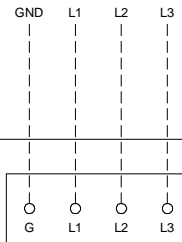
MAIN UNIT CONTROL PANEL
 TERMINAL CONNECTIONS

2-10VDC
 %%% RLA COMPRESSOR OUTPUT
 (GENERIC BAS)

2-10VDC
 CONDENSER REFRIGERANT PRESSURE
 OR EVAPORATOR/CONDENSER
 DIFFERENTIAL PRESSURE OUTPUT



CUSTOMER SUPPLIED
 LINE VOLTAGE
 (SEE UNIT NAMEPLATE)



TRANE SUPPLIED
 UNIT MOUNTED
 LOW VOLTAGE
 WYE-DELTA
 STARTER PANEL

WARNING
 HAZARDOUS VOLTAGE!
 DISCONNECT ALL ELECTRIC POWER INCLUDING REMOTE DISCONNECTS AND FOLLOW LOCK OUT AND TAG PROCEDURES BEFORE SERVICING. INSURE THAT ALL MOTOR CAPACITORS HAVE DISCHARGED STORED VOLTAGE. UNITS WITH VARIABLE SPEED DRIVE, REFER TO DRIVE INSTRUCTIONS FOR CAPACITOR DISCHARGE. FAILURE TO DO THE ABOVE BEFORE SERVICING COULD RESULT IN DEATH OR SERIOUS INJURY.

AVERTISSEMENT
 TENSION DANGEREUSE!
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 LAS TERMINALES DE LA UNIDAD NO ESTÁN DISEÑADAS PARA ACEPTAR OTROS TIPOS DE CONDUCTORES.
 SI NO LO HACE, PUEDE OCASIONAR DAÑO AL EQUIPO.

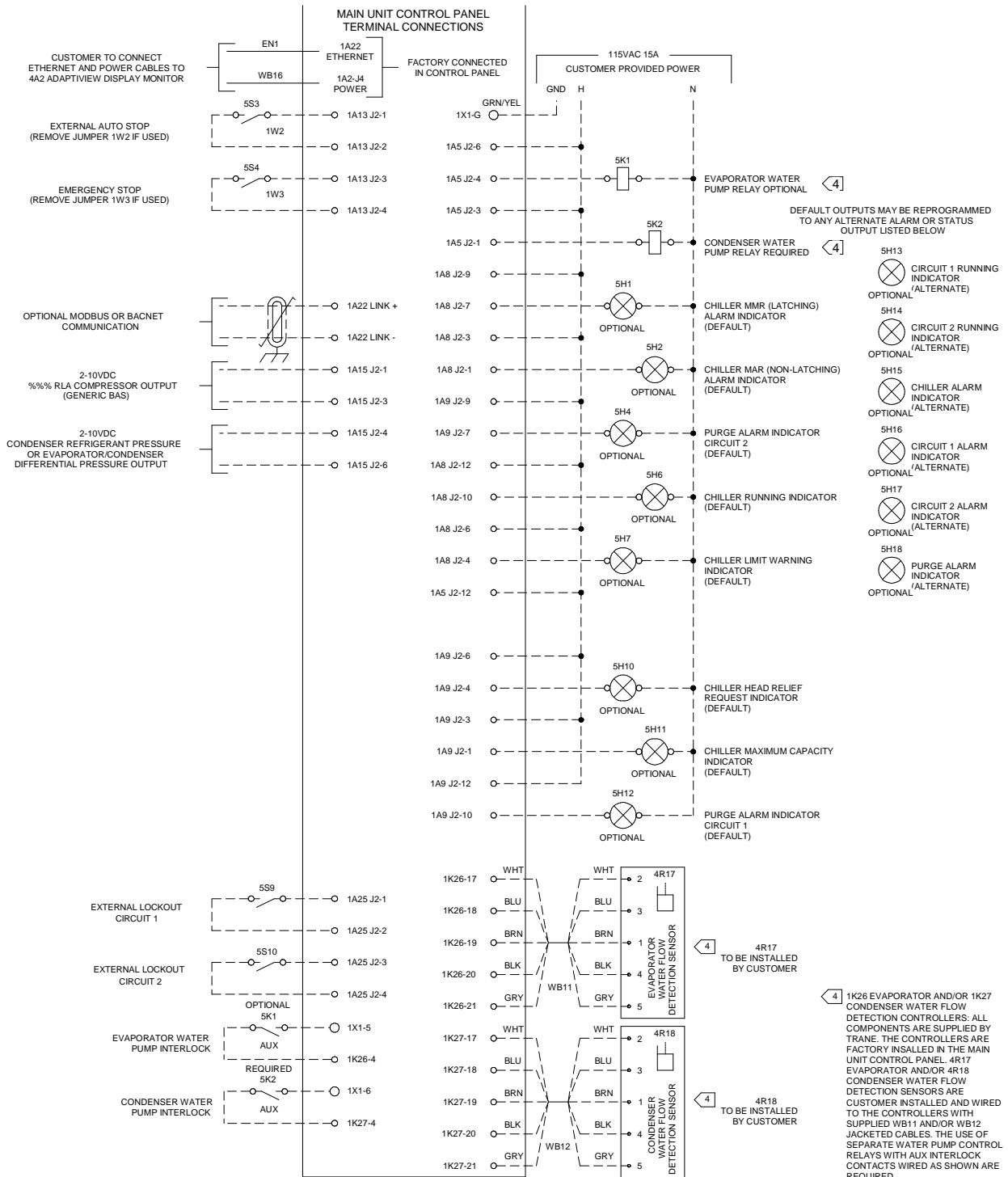
WIRE NO OR DEVICE	FIELD WIRING CIRCUIT SELECTION INFORMATION
SUPPLY AND MOTOR LEADS	SEE NAMEPLATE; MINIMUM CIRCUIT AMPACITY
1A*	4000VA AT 115VAC, 8 AWG MAX WIRE SIZE
2A* AND GRN/YEL	4000VA AT 115VAC, 8 AWG MAX WIRE SIZE (WITHOUT OPTIONAL CPTR)
2A* AND GRN/YEL	CIRCUIT PROTECTED AT 20A, 115VAC 1PH, 10 AWG MAX WIRE SIZE (WITH OPTIONAL CPTR)
9A* AND 10A*	PUMP MOTOR; 1PH 3/4 HP, 11.7 FULL LOAD AMPS AT 115VAC. 14 AWG MAX WIRE SIZE.
WB4	TWISTED, SHIELDED PAIR, 30VDC, MAX LENGTH 1500 FT (BELDEN TYPE 8760 RECOMMENDED)
3B* AND 4B*	CIRCUIT PROTECTED AT 20A, 115VAC 1PH, 10 AWG MAX WIRE SIZE
ALL REMAINING LLID TERMINALS	CONTACT RATING; 2.88A INDUCTIVE, 1/3 HP, 0.25KW AT 115VAC. 14 AWG MAX WIRE SIZE.

* TAPPED CONTROL CONDUCTORS

NOTES:

1. DASHED LINES INDICATE FIELD WIRING BY OTHERS. WIRE NUMBERS SHOWN ARE RECOMMENDED BY TRANE.
2. DO NOT ROUTE LOW VOLTAGE (30V) WITH CONTROL VOLTAGE (115V) AND DO NOT POWER UNIT UNTIL CHECK-OUT AND START-UP PROCEDURES HAVE BEEN COMPLETED.

Field Wiring - Centrifugal Chiller Duplex
Item: A1 Qty: 1 Tag(s): Chiller - 5



<p>⚠ WARNING HAZARDOUS VOLTAGE! DISCONNECT ALL ELECTRIC POWER INCLUDING REMOTE DISCONNECTS AND FOLLOW LOCK-OUT AND TAG PROCEDURES BEFORE SERVICING. INSURE THAT ALL MOTOR CAPACITORS HAVE DISCHARGED STORED VOLTAGE. UNITS WITH VARIABLE SPEED DRIVE REFER TO DRIVE INSTRUCTIONS FOR CAPACITOR DISCHARGE. FAILURE TO DO THE ABOVE BEFORE SERVICING COULD RESULT IN DEATH OR SERIOUS INJURY.</p>	<p>⚠ AVERTISSEMENT TENSION DANGEREUSE! COUPER TOUTES LES TENSIONS ET OUVRIRE LES SECTIONNEURS A DISTANCE. PUIS SUIVRE LES PROCEDURES DE VERRILLAGE ET DES ETIQUETTES AVANT TOUTE INTERVENTION. VERIFIER QUE TOUTS LES CONDENSATEURS DES MOTEURS SONT DECHARGES. DANS LE CAS D'UNITES COMPORTANT DES ENTRAINEMENTS A VITESSE VARIABLE, SE REPORTER AUX INSTRUCTIONS DE L'ENTRAINEMENT POUR DECHARGER LES CONDENSATEURS. NE PAS RESPECTER CES MESURES DE PRECAUTION PEUT ENTRAINER DES BLESSURES GRAVES POUVANT ETRE MORTELLES.</p>	<p>⚠ ADVERTENCIA ¡VOLTAJE PELIGROSO! DESCONECTE TODA LA ENERGIA ELECTRICA INCLUIDO LAS DESCONEXIONES REMOTAS Y SIGA LOS PROCEDIMIENTOS DE CIERRE Y ETIQUETADO ANTES DE PROCEDER AL SERVICIO. ASEGURESE DE QUE TODOS LOS CAPACITORES DEL MOTOR HAYAN DESCARGADO EL VOLTAJE ALMACENADO. PARA LAS UNIDADES CON E.L.E. DE DIRECCION DE VELOCIDAD VARIABLE, CONSULTE LAS INSTRUCCIONES PARA LA CARGA DEL CONDENSADOR. EL NO REALIZAR LO ANTERIORMENTE INDICADO, PODRIA DEASIONAR LA MUERTE O SERIAS LESIONES PERSONALES.</p>
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<p>CAUTION USE COPPER CONDUCTORS ONLY! UNIT TERMINALS ARE NOT DESIGNED TO ACCEPT OTHER TYPES OF CONDUCTORS. FAILURE TO DO SO MAY CAUSE DAMAGE TO THE EQUIPMENT.</p>	<p>ATTENTION UTILISER QUE DES CONDUCTEURS EN CUIVRE! LES BORNES DE L'UNITÉ NE SONT PAS CONÇUES POUR RECEVOIR D'AUTRES TYPES DE CONDUCTEURS. L'UTILISATION DE TOUT AUTRE CONDUCTEUR PEUT ENDOMMAGER L'EQUIPEMENT.</p>	<p>PRECAUCIÓN UTILICE ÚNICAMENTE CONDUCTORES DE COBRE! LAS TERMINALES DE LA UNIDAD NO ESTAN DISEÑADAS PARA ACEPTAR OTROS TIPOS DE CONDUCTORES. SI NO SE HACE, PUEDE OCASIONAR DAÑO AL EQUIPO.</p>
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Field Installed Options - Part/Order Number Summary

This is a report to help you locate field installed options that arrive at the jobsite. This report provides part or order numbers for each field installed option, and references it to a specific product tag. It is NOT intended as a bill of material for the job.

Product Family - Centrifugal Chiller Duplex

Item	Tag(s)	Qty	Description	Model Number
A1	Chiller - 5	1	Centrifugal Chiller Duplex (CDH)	CDHF2000

Field Installed Option Description	Part/Ordering Number
Thermal dispersion flow switch (IFM) - Field Installed	
Thermal dispersion flow switch (IFM) - Field Installed	