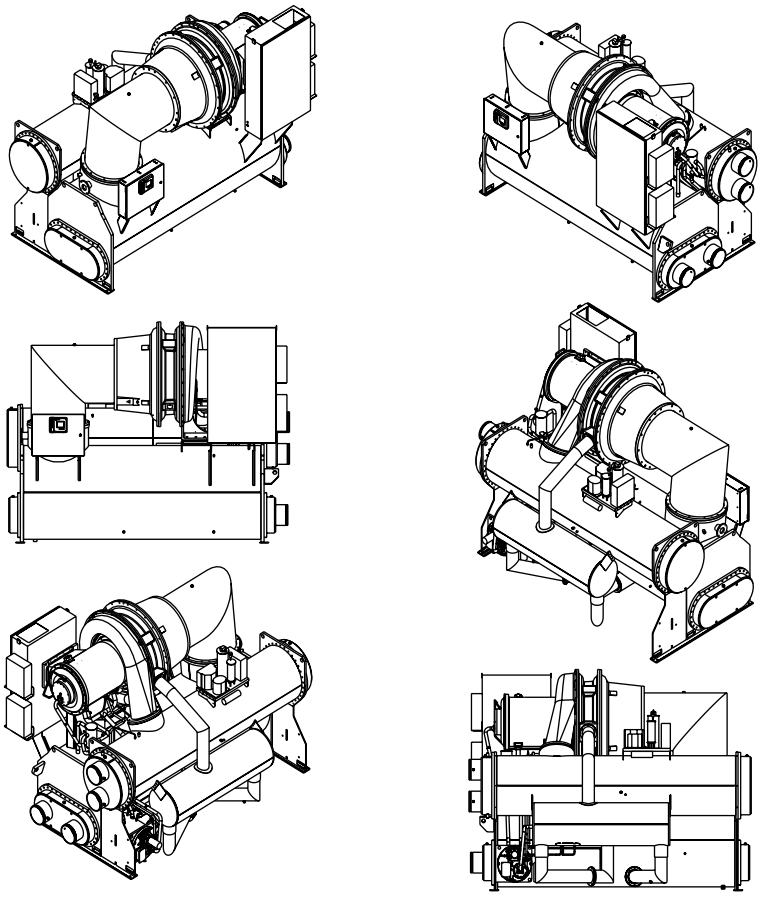
Installation – Electrical Information

Water-Cooled CenTraVac™ With CH530



Required Installation Information:
CVHE-SVN01A-EN – General Information
CVHE-SVN02B-EN – Piping Information
CVHE-SVN03C-EN – Electrical Information

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CVHE-SVN03C-EN

Warnings and Cautions

Warnings and Cautions

Notice that warnings and cautions appear at appropriate intervals throughout this manual. Warnings are provided to alert installing contractors to potential hazards that could result in personal injury or death, while cautions are designed to alert personnel to conditions that could result in equipment damage.

Your personal safety and the proper operation of this machine depend upon the strict observance of these precautions.

NOTICE: Warnings and Cautions appear at appropriate sections throughout this manual. Read these carefully.

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

⚠ **CAUTION** – Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.

CAUTION – Indicates a situation that may result in equipment or property-damage-only accidents.

Contents

Electrical Information

General

Note: Unit-mounted starters are available as an option on most CVHE, CVHF, and CVHG units with wye delta, and solid-state starters, with nominal voltages of up to 600 volts and unit mounted medium voltage across-the-line starters..

While this option eliminates most field-installed wiring requirements, the electrical contractor must still complete the electrical connection for: (1) Power supply wiring to the starter, (2) Other unit control options present, and (3) Any field-supplied control devices.

General Requirements

⚠ WARNING!

Hazardous Voltage!

Use extreme caution when measurements, adjustments, or other service-related work is performed with power on. Failure to disconnect power before servicing could result in death or serious injury.

⚠ WARNING

Rotating Parts!

During installation, testing, servicing and troubleshooting of this product it may be necessary to measure the speed of rotating components. Have a qualified or licensed service individual who has been properly trained in handling exposed rotating components perform these tasks. Failure to follow all safety precautions when exposed to rotating components could result in death or serious injury.

As you review this manual, along with the wiring instructions presented in this section, keep in mind that:

Typical field connection requirements for remote-mounted starters are shown at the end of the manual, and summarized in Table 1.

All field-installed wiring must conform to National Electric Code (NEC) guidelines, as well as to any applicable state and local codes. Be sure to satisfy proper equipment grounding requirements per NEC.

All field-installed wiring must be checked for proper terminations, and for possible shorts or grounds.

Note: The typical customer connection diagrams shown in this manual are representative of standard CVHE, CVHF and CVHG units, and are provided only for general reference. Always refer to the actual wiring diagrams that shipped with the chiller for specific as built electrical schematic and connection information.

Do not modify or cut enclosure to provide electrical access. Removable panels have been provided for this purpose. Modify these panels only; away from enclosure. Refer to installation information shipped with the starter or submittal drawings.

CAUTION

TO AVOID DAMAGE TO STARTER COMPONENTS, remove debris inside the starter panel. Failure to do so may cause an electrical short that seriously damages the starter components.

Electrical Information

Trane Supplied Remote Starter

Table 1. CVHE, CVHF, and CVHG standard remote starter field wiring requirements

Power Supply wiring (to Starter Panel)	**Starter Panel Terminals**		
3-Phase Line Voltage: Terminal Block (2TB3 or 2X3)	2X3-L1, L2, L3, and GROUND		All wiring to be in accordance with National Electrical Code and any local codes.
3-Phase Line Voltage: Circuit Breaker	2Q1-L1,L2,L3, and GROUND		
Remote Starter to Chiller Motor Junction Box	T1 through T6		
Starter to UCP 120VAC control wiring	**Starter Panel Terminals**	**Unit Control Panel Terminations**	
120VAC Power Supply (from starter to UCP)	2X1-1-1, 2X1-2 2X1-20(Ground)	1X1-1, 1X1-12 1X1-18 (Ground)	#8 gauge minimum 40 amps circuit
High Pressure Cutout to Starter	2X1-4,	1X1-4	14 ga.
1Q1 Circuit Breaker to Starter	2X1-6	1X1-3	14 ga.
Oil Pump Interlock	2X1-7, 2X1-8	1A7-J2-4, 1A7-J2-2	14 ga.
Low Voltage Circuits (less than 30VAC)	**Starter Panel Terminals**	**Unit Control Panel Terminations**	
Standard Circuits			
Inter Processor Communications (IPC) Remote Mounted	2A1- J3-3 to 4, or 2X1-12 to 13 if present (do not ground shield at starter)	1A1-J5-3 to 4 Shield ground at 1X1- 22(GND) only.	2 wire w/ ground Comm link.

Standard Field Power wiring:
Note: All wiring to be in accordance with National Electrical Code and any local codes.

Reference Field connection diagram 2309-4935 in this manual

Table 2. CVHE, CVHF, and CVHG standard customer supplied remote field wiring requirements

Power Supply wiring (to Starter Panel)	**Starter Panel Terminals**		
Starter by others Power wiring: 3-Phase Power Supply Starter and Motor Junction Box Interconnection (Remote starter only)	**See "Starter by** others" schematic		All wiring to be in accordance with National Electrical Code and any local codes.
Starter provided by others:			
Starter to UCP 120VAC control wiring	**Starter Panel Terminals**	**Unit Control Panel Terminations**	
120VAC Power Supply	See "Starter by others" schematic 5X1-1, 5X1-2 5X1-20 (Ground)	 1X1-1, 1X1-12 1X1-18	#8 gauge minimum 40 amps circuit
Power from UCP 1Q1	5X1-3	1X1-3, 1A23-J6-3	14 ga.
Interlock Relay signal	5X1-4	1A23-J10-1	14 ga.
Start contactor signal	5X1-5	1A23-J8-1	14 ga.
Oil Pump Interlock	5X1-7, 5X1-8	1A7-J2-4, 1A7-J2-2	14 ga.
Run Contactor signal	5X1-10	1A23-J6-12	14 ga.
Transition Complete	5X1-14	1A23-J12-2	14 ga.
Low Voltage Circuits (less than 30VAC)	**Starter Panel Terminals**	**Unit Control Panel Terminations**	
Standard Circuits			
Current Transformers* (see table next page)	5CT4- wht, blk 5CT5- wht, blk 5CT6- wht, blk	1A23-J7-1,2 1A23-J7-3,4, 1A23-J7-5,6,	Note: Phasing must be maintained
Potential Transformers	5T17-236,237 5T18-238,239 5T19-240,241	1A23 –J5-1,2, 1A23 –J5-3,4, 1A23 –J5-5,6	Note: Phasing must be maintained

Starter Supplied by Others -Standard Field Power wiring:
Note: All wiring to be in accordance with National Electrical Code and any local codes.

Reference Field Connection Customer Supplied Starter diagram 2309-4936 in this manual

Reference "Starter by Others" Specification available from your local Trane sales office.

Table 3. Current transformer and potential transformer wire sizing tables for customer supplied starter to chiller unit control panel starter module 1A23

The maximum recommended wire length for secondary CT leads in a dual CT system are:

Wire	Maximum Wire Length Secondary CT Leads	
AWG (mm^2)	Feet	Meters
8 (10)	1362.8	415.5
10 (6)	856.9	261.2
12 (4)	538.9	164.3
14 (2.5)	338.9	103.3
16 (1.5)	213.1	65.0
17 (1)	169.1	51.5
18 (0.75)	134.1	40.9
20 (0.5)	84.3	25.7

Note:
1. Wire lengths are for copper conductors only.
2. Wire lengths are total "one way" distance that the CT can be from the Starter module.

The maximum recommended total wire length for PT's in a single PT system:

Wire Gauge	Max lead length (ft)	Max lead length (m)
8	5339	1627
10	3357	1023
12	2112	643
14	1328	404
16	835	254
17	662	201
18	525	160
20	330	100
21	262	79
22	207	63

The maximum recommended total wire length (to and from) for PT leads in a dual PT system are:

Wire Gauge	Max Wire Length Primary (ft)	Max Wire Length Primary (m)	Max Wire Length Secondary (ft)	Max Wire Length Secondary (m)
8	3061	933	711	217
10	1924	586	447	136
12	1211	369	281	85
14	761	232	177	53
16	478	145	111	33
17	379	115	88	26
18	301	91	70	21
20	189	57	44	13
21	150	45	34	10
22	119	36	27	8

Note: These wire lengths are for copper conductors only
Note: The above lengths are maximum round trip wire lengths. The maximum distance the PT can be located from the Starter module is 1/2 of the listed value.

Electrical Information

Power Supply

Power Supply Wiring

To assure that power supply wiring to the starter panel is properly installed and connected, review and follow the guidelines outlined below.

3-Phase Power Source

1. Verify that the starter nameplate ratings are compatible with the power supply characteristics and with the electrical data on the unit nameplate.
2. If the starter enclosure must be cut to provide electrical access, exercise care to prevent debris from falling inside the enclosure. If the starter cabinet has a removable panel, be sure to remove the panel from the unit before drilling holes.

CAUTION

TO AVOID DAMAGE TO STARTER COMPONENTS, remove debris inside the starter panel. Failure to do so may cause an electrical short that seriously damages the starter components.

3. Use copper conductors to connect the 3-phase power supply to the remote or unit-mounted starter panel.

CAUTION

USE ONLY COPPER CONDUCTORS FOR TERMINAL CONNECTIONS. Failure to do so may cause corrosion or overheating, and starter damage.

4. Size the power supply wiring in accordance with the Minimum Circuit Ampacity (MCA) shown on the unit nameplate. (MCA = (RLA x 1.25) + Control Power Load)
5. Make sure that the incoming power wiring is properly phased; each power supply conduit run to the starter must carry the correct number of conductors to ensure equal phase representation. See Figure 1.
6. As you install the power supply conduit, make sure that this position does not interfere with the serviceability of any of the unit components, nor with structural members and equipment.

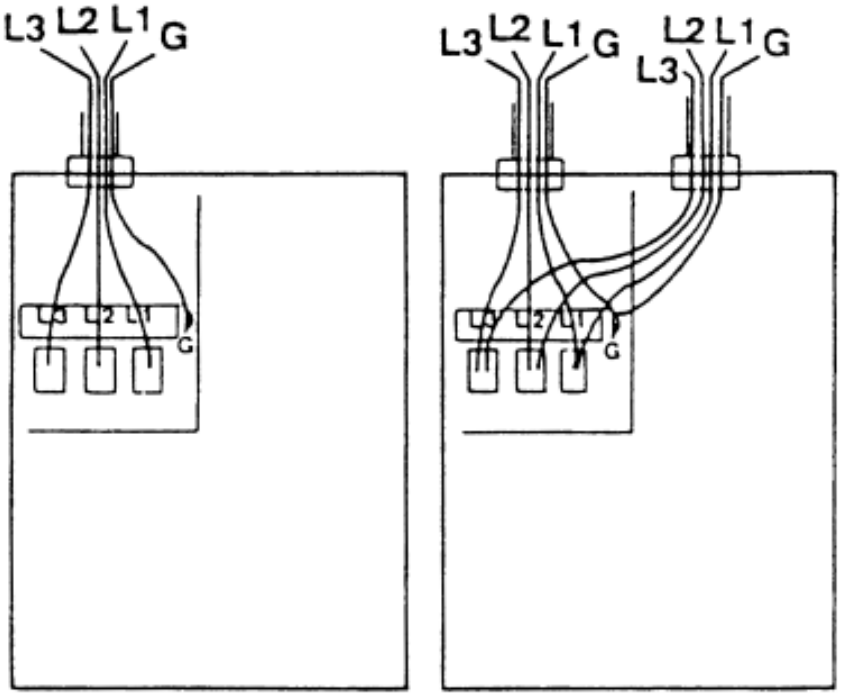
Also, assure that the conduit is long enough to simplify any servicing that may be necessary in the future (e.g., starter removal).

Note: Use flexible conduit to enhance serviceability and minimize vibration transmission.

Circuit Breakers and Fusible Disconnects

Size the circuit breaker or fuse disconnect in compliance with NEC or local guidelines.

Figure 1. Proper phasing for starter power supply wiring and conduit loading



Electrical Information PFCC

Optional PFCCs

Power factor correction capacitors (PFCCs) are designed to provide power factor correction for the compressor motor. They are available as an option.

Note: Remember that the PFCC nameplate voltage rating must be greater than or equal to the compressor voltage rating stamped on the unit nameplate. See Table 2 to determine what PFCC is appropriate for each compressor voltage application.

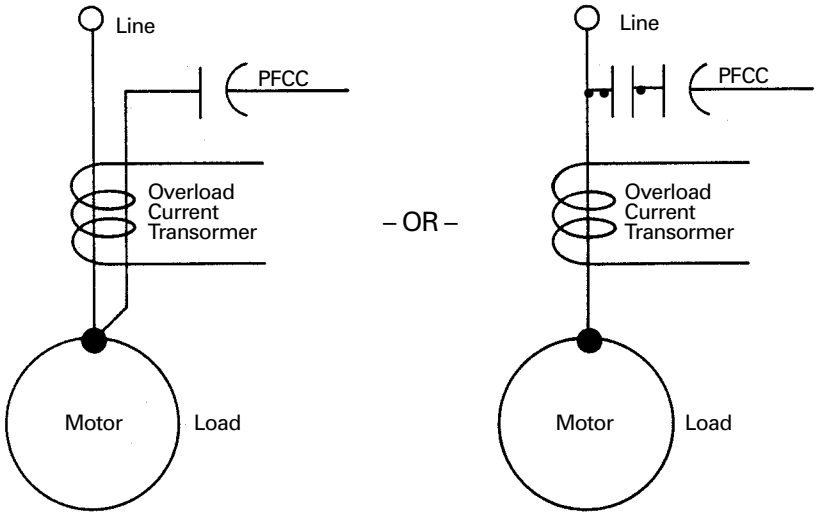
CAUTION

PFCCS MUST BE WIRED INTO THE STARTER CORRECTLY! Failure to do so may cause misapplication of these capacitors and result in a loss of motor overload protection and subsequently cause motor damage.

Table 3. PFCC design voltage sizing per compressor voltage application

PFCC Design Voltage	Compressor Motor Rating (See Unit Nameplate)
240/60 Hz	208V/60 Hz
480V/60 Hz	380V/60 Hz 440V/60 Hz 460V/60 Hz 480V/60 Hz
600V/60 Hz	575V/60 Hz 600V/60 Hz
2400V/60 Hz	2300V/60 Hz
	2400V/60 Hz
PFCC Rating	Compressor Motor Rating (See Unit Nameplate)
480V/50 Hz	346V/50 HZ 380V/50 HZ 400V/50 Hz 415V/50 Hz
4160V/60 Hz	3300V/60 Hz 4160V/60 Hz

Figure 2. PFCC leads routed through overload current transformer



Note: See the attached wiring diagram for more detail.

Electrical Information

Unit Mounted Starter

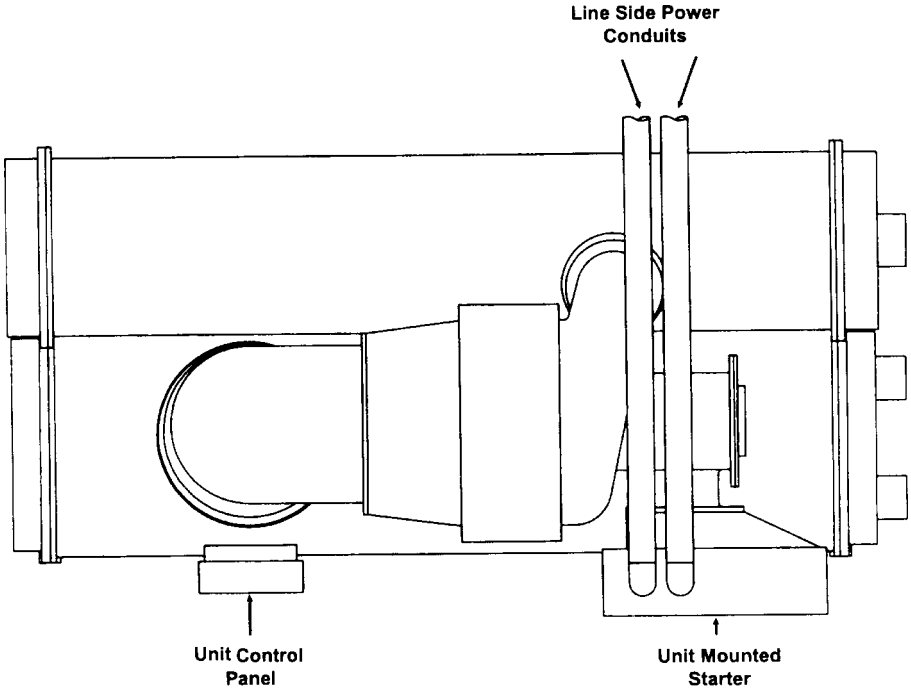
Interconnecting Wiring

Typical equipment room conduit layouts with and without unit-mounted starters are shown in Figures 3 and 4, respectively.

IMPORTANT

Keep in mind that the interconnecting wiring between the starter panel, compressor and UCP control panel is factory-installed with unit-mounted starters but must be field-installed when a remote-mounted starter is used.

Figure 3. Typical equipment room layout with unit-mounted, Wye-Delta

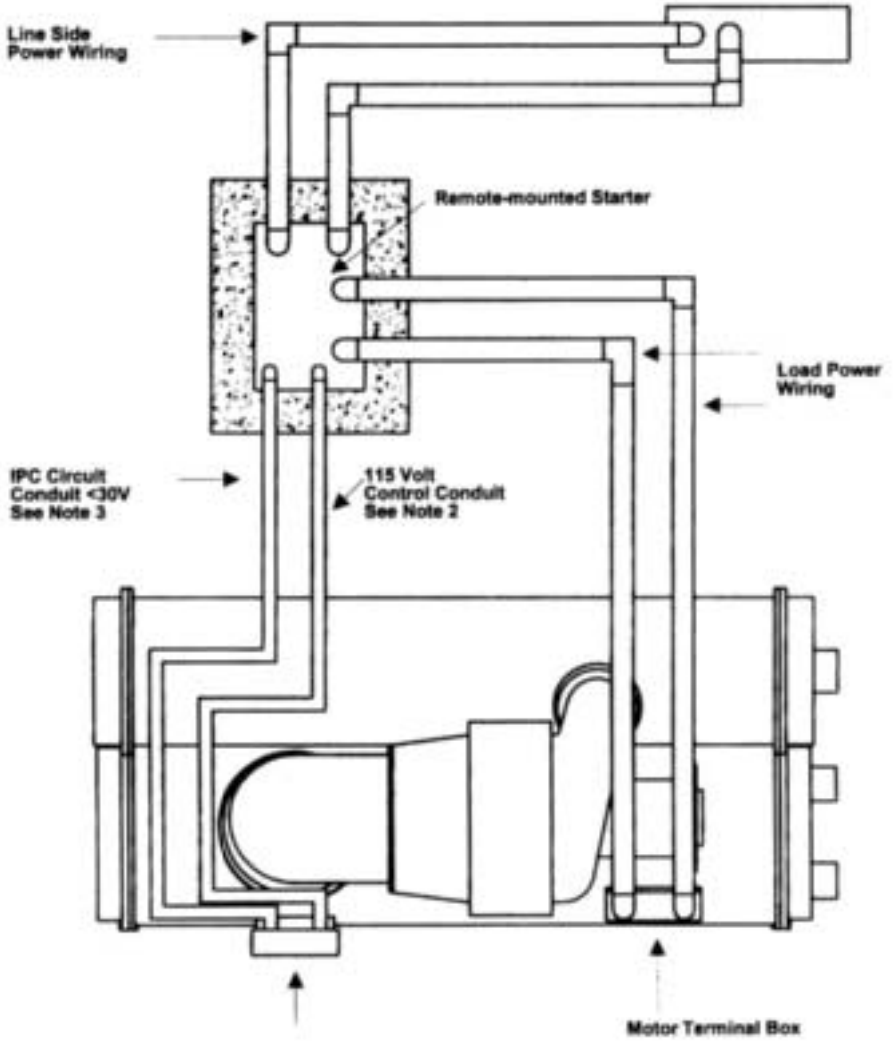


Note:
See Starter submittal drawing for location of incoming wiring to the starter.

Electrical Information

Remote Starter

Figure 4. Typical equipment room layout with remote-mounted Wye-Delta starter



Notes:
1. Refer to the unit field connection diagram for approximate UCP knockout locations.
2. 115-volt conduit must enter the higher than 30 Vdc Class I portion of the unit control panel.
3. IPC circuit conduit must enter the Low Voltage Class II portion of the UCP.
4. See starter submittal drawing for location of incoming wiring to the starter.

Starter to Motor (Remote-Mounted Starters Only)

Ground Wire Terminal Lugs
Ground wire lugs are provided in the motor terminal box and in the starter panel.

Terminal Clamps
Terminal clamps are supplied with the motor terminals to accommodate either bus bars or standard motor terminal wire lugs. Terminal clamps provide additional surface area to minimize the possibility of improper electrical connections.

Wire Terminal Lugs
Wire terminal lugs must be field-supplied.

1. Use field-provided crimp-type wire terminal lugs properly sized for the application.

   Note: Wire size ranges for the starter line and load-side lugs are listed on the starter submittal drawings supplied by the starter manufacturer or Trane. Carefully review the submitted wire lug sizes for compatibility with the conductor sizes specified by the electrical engineer or contractor.

2. A terminal clamp with a 3/8" bolt is provided on each motor terminal stud; use the factor-supplied Belleville washers on the wire lug connections.

   Figure 5 illustrates the juncture between a motor terminal stud and terminal clamp.

3. Tighten each bolt to 24 foot-pounds.
4. Install but do not connect the power leads between the starter and compressor motor. (These connections will be completed under supervision of a qualified Trane service engineer after the prestart inspection).

CAUTION

ENSURE THE POWER SUPPLY WIRING AND OUTPUT TO MOTOR WIRING ARE CONNECTED TO THE PROPER TERMINALS. Failure to do so will cause catastrophic failure of the starter and, or motor

Bus Bars
Install the bus bars between the motor terminals when a low-voltage "across-the-line", "primary reactor/ resistor," "auto transformer" or customer-supplied solid-state, or customer-supplied AFD.

Be sure to bus motor terminal T1 to T6, T2 to T4, and T3 to T5.

Note: Bus bars are not needed in high-voltage applications since only 3 terminals are used in the motor and starter.

Starter to UCP (Remote-Mounted Starters Only)

Electrical connections required between the remote-mounted starter and the unit control panel are shown in an example of a point-to-point starter-to-UCP connection diagram as shown at the end of the manual.

Note: Install control voltage conduit into control voltage section of chiller control panel and starter panel. Do not route with low voltage (30 volts) conduit wires.

When sizing and installing the electrical conductors for these circuits, follow the guidelines listed.

Unless otherwise specified use 14 ga. wire for 120 V control circuits.

Electrical Information

Remote Starter

CAUTION

Starter Component Damage.

Remove debris inside the starter panel. Failure to do so may cause an electrical short that seriously damages the starter components.

1. If the starter enclosure must be cut to provide electrical access, exercise care to prevent debris from falling inside the enclosure. Do not cut AFD enclosure.
2. Use only shielded twisted pair for the interprocessor communication (IPC) circuit between the starter and the UCP on remote mounted starters. Recommended wire is Beldon Type 8760, 18 AWG for runs up to 1000 feet.

   Note: The polarity of the IPC wire pair is critical for proper operation.
3. Separate low-voltage (less than 30V) wiring from the 115V wiring by running each in its own conduit.
4. As you route the IPC circuit out of the starter enclosure, make sure that it is at least 6" from all wires carrying a higher voltage.
5. For UCP IPC shielded twisted pair wiring, the shield should be grounded on one end only at UCP at 1X1-G. The other end should be unterminated and taped back on the cable sheath to prevent any contact between shield and ground.
6. Oil Pump Interlock - All starters must provide an interlock (N.O.) contact with the chiller oil pump connected to the UCP at Terminals 1A7-2-4 and 1A7-J2-2 (14 ga.)

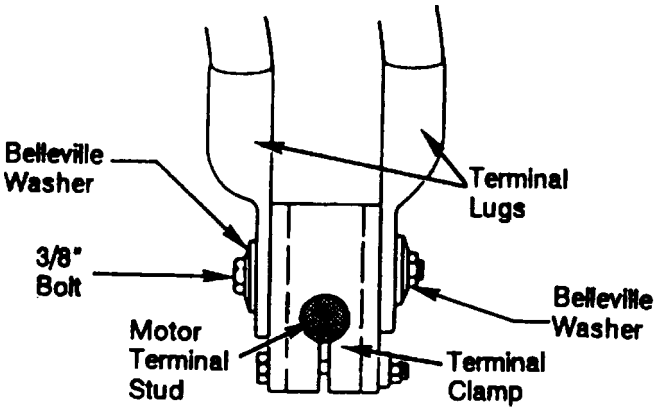
   The purpose of this interlock is to power the oil pump on the chiller in the event that a starter failure, such as welded contacts, keeps the chiller motor running after the controller interrupts the run signal.

CAUTION

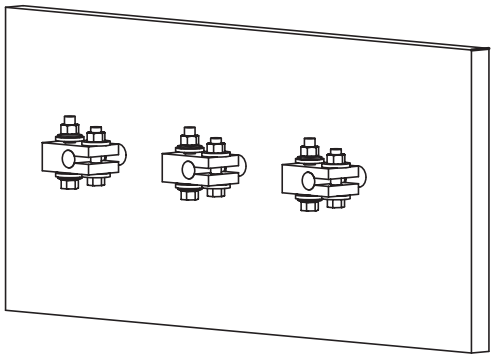
Electrical Noise.

Maintain at least 6 inches between low-voltage (<30V) and high voltage circuits. Failure to do so could result in electrical noise that may distort the signals carried by the low-voltage wiring, including the IPC.

Figure 5. Terminal stud, clamp and lug assembly



Front View



MID VOLTAGE
RXL RATR RPIR CXL CATR CPIR

Table 4

Standard Control Circuits: UCP Control Wiring (120 VAC)	**Unit Control Terminations**	**Included in Factory Package**	**Input or Output Type**	All wiring to be in accordance with National Electrical Code and any local codes. Contacts
Chilled Water Flow Proving Input	1X1-5 to 1A6-J3-2	Std.	Binary Input	Normally Open, closure with flow
Condenser Water Flow Proving Input	1X1-6 to 1A6-J2-2	Std.	Binary Input	Normally Open, closure with flow
Chilled Water Pump Relay Output	1A5-J2- 4 to 6	Std.	Binary Output	Normally Open
Condenser Water Pump Relay Output	1A5-J2-1 to 3	Std.	Binary Output	Normally Open
Optional Control Circuits (120 VAC)				
Alarm Relay MAR (Non-Latching) Output	1A8-J2-1 to 3	OPST	Binary Output	Normally Open
Limit Warning Relay Output	1A8-J2-4 to 6	OPST	Binary Output	Normally Open
Alarm Relay MMR (Latching) Output	1A8-J2-7 to 9	OPST	Binary Output	Normally Open
Compressor Running Relay Output	1A8-J2-10 to 12	OPST	Binary Output	Normally Open
Maximum Capacity Relay Output	1A9-J2-1 to 3	OPST	Binary Output	Normally Open
Head Relief Request Relay Output	1A9-J2-4 to 6	OPST	Binary Output	Normally Open
Purge Alarm Relay Output	1A9-J2-7 to 9	OPST	Binary Output	Normally Open
Ice Making Relay Output	1A5-J2-10 to 12	EXOP	Binary Output	Normally Open
Free Cooling Relay Output	1A11-J2-4 to 6	FRCL	Binary Output	Normally Open
Standard Low Voltage Circuits Low Voltage Circuits (less than 30VAC)	**Unit Control Panel Terminations**		**Input or Output Type**	
External Auto Stop Input	1A13-J2-1 to 2	Std.	Binary Input	Closure required for normal operation
Emergency Stop Input	1A13-J2-3 to 4	Std.	Binary Input	Closure required for normal operation
Optional Low Voltage Circuits				
External Base Loading Enable Input	1A18-J2-1 to 2	EXOP	Binary Input	Normally Open
External Hot Water Control Enable Input	1A18-J2-3 to 4	EXOP	Binary Input	Normally Open
External Ice Machine Control Enable Input	1A19-J2-1 to 2	EXOP	Binary Input	Normally Open
External Free Cooling Input Enable Input	1A20-J2-1 to 2	FRCL	Binary Input	Normally Open
RLA Compressor Output	1A15-J2-1 to 3	GBAS or CDRP	Analog Output	2-10 vdc
External Condenser Pressure Output	1A15-J2-4 to 6	GBAS or CDRP	Analog Output	2-10 vdc
External Current Limit Setpoint Input	1A16-J2-2 to 3	GBAS	Analog Input	2-10 vdc, or 4-20 mA
External Chilled Water Setpoint Input	1A16-J2-5 to 6	GBAS	Analog Input	2-10 vdc, or 4-20 mA
External Base Load Setpoint Signal Input	1A17-J2-2 to 3	EXOP	Analog Input	2-10 vdc, or 4-20 mA
Generic Refrigerant Monitor input	1A17-J2-5 to 6	EXOP	Analog Input	2-10 vdc, or 4-20 mA
Outdoor Air Temperature sensor	IPC bus Connection and sensor	CWR	Communication and sensor.	
Tracer Comm Interface	1A14-J2-1(+) to 2(-) 1A14-J2-3(+) to 4(-)	TRMM or LCI-C	Communication to Tracer	

Electrical Information

UCP Electrical Specifications

Following is a requirements list for the UCP in the control panel:

Note that the control panel is designed to receive input from the secondary of a power transformer in the starter panel.

1. **Nominal Voltage**: 115/110 VAC, 60/50 Hz with operating range of 98 to 127 VAC, inclusive.
2. **Maximum VA**: 4K VA (40-amp fuse) for units with the refrigerant pump.
3. Power input wiring must be at least 6" (152 mm) from low-voltage, less than 30V wiring.
4. All signal inputs are low-voltage less than 30V.
5. UCP Storage Range: -40°F to 158°F (-40°C to 70°C) i.e., not applicable for chiller.

Water Pump Interlock Circuits and Flow Switch Input

Chilled Water Pump. Wire the evaporator water pump contactor (5K1) to a separate 120 volt single phase power supply with 14 AWG, 600 volt copper wire, then connect this circuit to 1A5-J2-6. Then use 1A5-J2-4 120 VAC output to allow the UCP to control the evaporator water pump, or wire the 5K1 contactor to operate remotely and independently of the UCP.

Chilled Water Proof of Flow
Wire the auxiliary contacts of the evaporator water pump contactor (5K1) in series with the flow switch (5S1) installed in the evaporator supply pipe. Use 14 AWG, 600-volt copper wire.

Connect this circuit to UCP terminals 1X1-5 to 1A6-J3-2.

When installed properly, the chilled water interlock circuit will only allow compressor operation if the evaporator pump is running and providing at least the minimum water flow required.

Condenser Water Pump. Wire the condenser water pump contactor (5K2) to a separate 120-volt, single-phase power supply with 14 AWG, 600-volt copper wire; then connect this circuit to UCP terminals 1A5-J2-3. Then use 1A5-J2-1 120 VAC output to allow UCP to control the condenser pump.

Condenser Water Proof of Flow
Next, use 14 AWG, 600-volt copper wire to connect the auxiliary contacts of the condenser water pump contactor (5K2) in series with the flow switch (5S2) installed in the condenser supply pipe.

Connect this circuit to UCP terminals 1X1-6 to 1A6-J2-2.

When installed properly, the condenser water lock circuit will only allow the compressor to operate if the condenser pump is running and providing at least the minimum water flow required.

Electrical Information

Temperature Sensor Circuits

All temperature sensors are factory-installed except the optional outdoor air temperature sensor. This sensor is required for the outdoor air temperature type of chilled water reset. Follow the guidelines below to locate and mount the outdoor air temperature sensor. Mount the sensor probe where needed, however, mount the sensor module in the UCP.

CWR - Outdoor Option

The outdoor temperature sensor similar to the unit mounted temperature sensors in that it consists of the sensor probe and the module. A four-wire IPC bus is connected to the module for 24 vdc power and the communications link.

We recommend mounting the sensor module within the UCP and the sensor two wire leads be extended and routed to the outdoor temperature sensor probe sensing location. This assures the four wire IPC bus protection and provides access to the module for configuration at start-up.

The sensor probe lead wire between the sensor probe and the module can be separated by cutting the two wire probe lead leaving equal lengths of wire on each device; the sensor probe and the sensor module. Note this sensor and module are matched and must remain together or inaccuracy may occur. These wires can then be spliced to with two 14-18 AWG 600V wires of sufficient length to reach the desired outdoor location, maximum length 1000 feet (305 meters). The module four-wire bus must be connected to the UCP four-wire bus using the Trane approved connectors provided.

The sensor will be configured (given its identity and become functional) at start-up when the serviceman performs the start-up configuration. It will not be operational until that time.

Note: If shielded cable is used to extend the sensor leads, be sure to tape off the shield wire at the junction box and ground it at the UCP. If the added length is run in conduit, do not run them in the same conduit with other circuits carrying 30 or more volts.

Note:

MAINTAIN AT LEAST 6 INCHES BETWEEN LOW-VOLTAGE (<30V) AND HIGH VOLTAGE CIRCUITS. Failure to do so could result in electrical noise that may distort the signals carried by the low-voltage wiring, including the IPC.

Optional Relay Circuits

Optional Control and Output Circuits

Install various optional wiring as required by the owner's specifications.

TRMM or LC1-C

Optional Tracer Communication Interface

This control options allows the UCP to exchange information such as chiller status and operating set points with a Tracer system.

Figure 7 illustrates how such a communication/control network might appear.

Note: The circuit must be run in separate conduit to prevent electrical noise interference.

Additional information about the Tracer Comm option is published in the installation manual and operator's guide that ships with the Tracer.

Unit Start-Up

All phases of initial unit start-up must be conducted under the supervision of a qualified local service engineer. This includes pressure testing, evacuation, electrical checks, refrigerant charging, actual start-up and operator instruction.

Advance notification is required to assure that initial start-up is scheduled as close to the requested date as possible.

Starter Module Configuration

The starter module configuration settings will be checked (and configured for Remote Starters) during start-up commissioning. To configurate starter module, and perform other starter checks, it is recommended that the line voltage three phase power be turned off and secured (locked out), and then a separate source control power (115 vac) be utilized to power up the control circuit. To do this, remove control coil circuit fuse, typically 2F4, and then connect separate source power cord to starter terminal block 2X1-1 (H), 2X1-2 (N), and Ground. Use the "as-built starter schematic" to assure correct fuse and terminals. Verify correct fuse is removed, control circuit connections are correct, then apply the 115 vac separate source power to service the controls.

Forms Information

Samples of start-up and operating forms along with other helpful forms are found in the Operation Maintenance manual which can be obtained from the nearest Trane office.

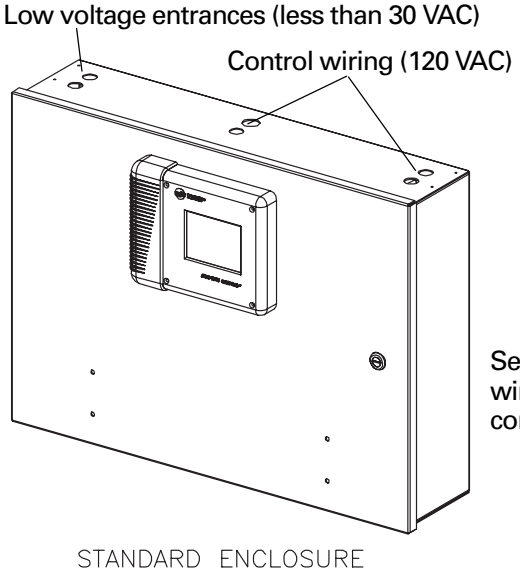
It is recommended that the serviceman contact the local Trane office to obtain the most recent printing date of the form. The forms in the operation and maintenance manual are only current at the time of printing of the manual.

After obtaining the most recent form, complete all the information and forward it to your local Trane office.

Electrical Information

Field Control Panel Signal Wiring

Figure 6



Note: UCP control wiring (120 VAC) must not be routed with low voltage circuits (less than 30 VAC). Conduit access holes are furnished in the top of the unit control panel. Use the left holes for low voltage wiring, and use center and right hand holes for control (120 VAC) wiring.

***Note:** The wire is retained in the clamp by the force of the spring which pushes the wire against the connecting bar. Use care to ensure full insertion of screwdriver into terminal block wire release mechanism. Proper tool engagement is required to release the tension for wire insertion.

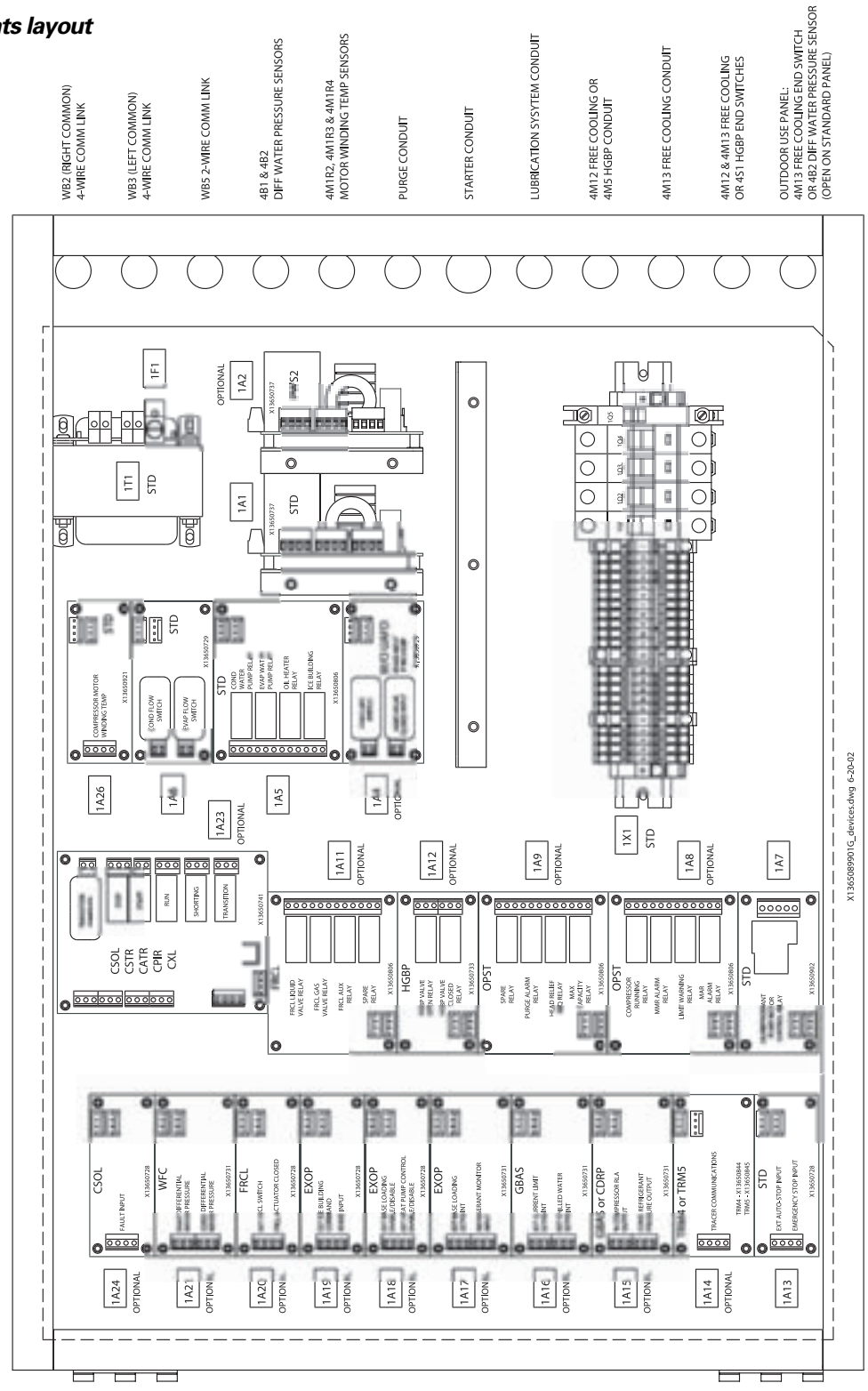
Control Panel Internally mounted devices

For visual identification Internal Control Panel mounted devices are identified by their respective schematic designation number. Control panel items are marked on the inner back panel in the control panel. Figure 7 illustrated below, identifies these devices. The Control Panel Devices table corresponds to the same device designators (see right hand column). Optional controls are present when a specific optional controls package is specified, as listed in the second column. Optional controls packages are; OPST Operating Status, GBAS Generic Building Systems, EXOP Extended operation, CDRP Condenser Pressure, TRMM Tracer communications, WPSR Water Flow Pressure sensing, FRCL Free Cooling, HGBP Hot Gas Bypass , and EPRO Enhanced Protection

Figure 20 illustrates the Control Panel Components Layout.

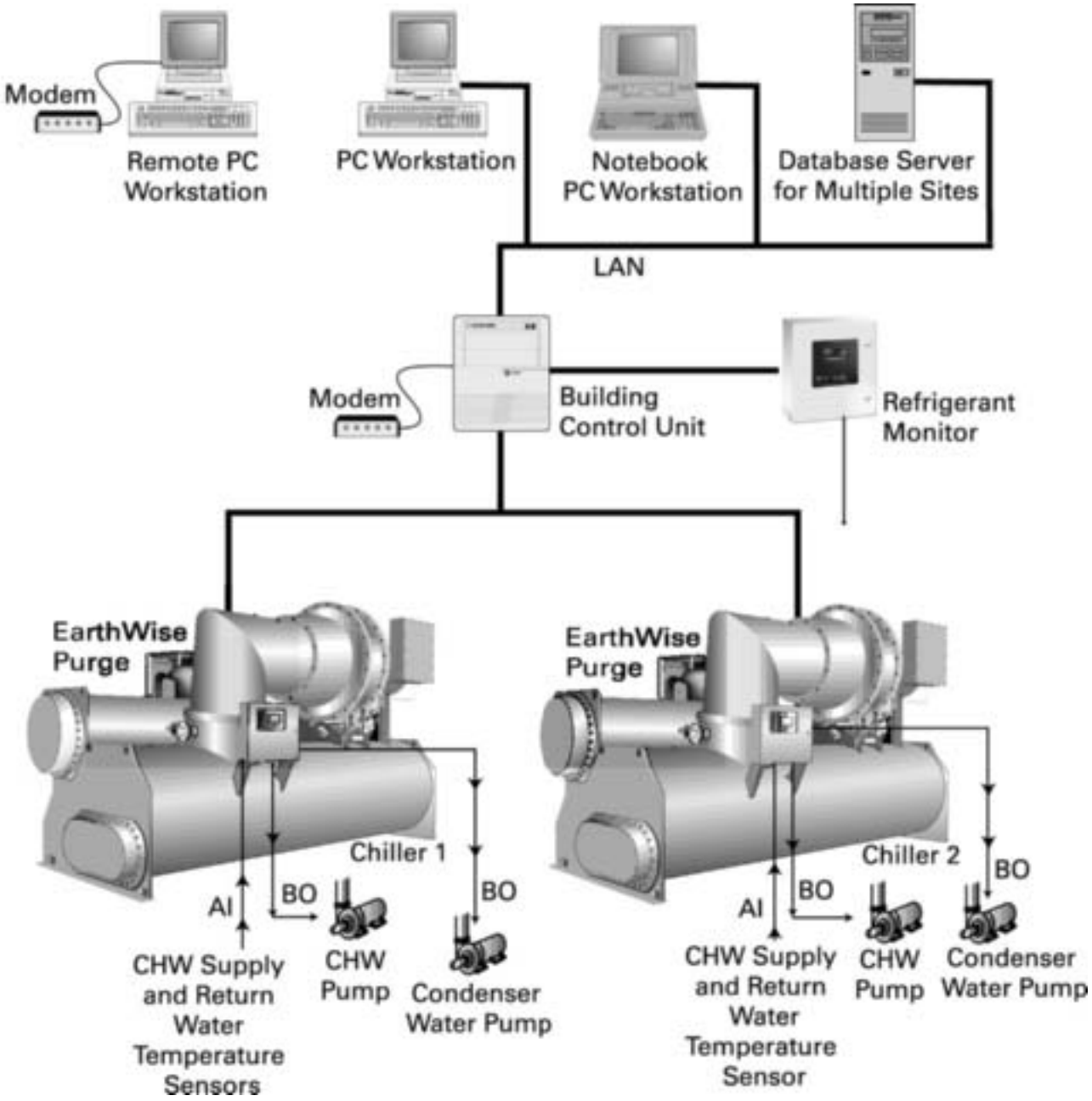
Modules 1A1, 1A3, 1A4, 1A5, 1A6, 1A7, and 1A13 are standard and present in all configurations. Other Modules vary depending on machine optional devices.

Figure 7. Control panel components layout



Electrical Information

Figure 8. Illustrates communication/control network to chiller units with CH530



Wiring Drawings

Schematic Wiring Drawings

The following pages consist of typical wiring drawings for an CVHE, CVHF or CVHG chiller. However, please refer to the submittals and drawings that actually shipped with the unit.

Refer to the chiller operation and maintenance manual for an example of a typical sequence of operation for a Unit Mounted Wye-Delta Starter.

In the starter drawings, shown in this manual, all starter variables are the same in the Sequence of Operation except the Maximum Acceleration Time.

Table 5 provides a listing of included schematics, connection diagrams and field wiring drawings to follow.

Table 5 also shows variables of the Maximum Acceleration Time for all starter drawings in this manual.

Table 5 . Wiring addendum

Type of Drawing	Drawing Number	Maximum Acceleration Time (seconds)	
Field Wiring Layout Drawings			Page #
Legend (Unit Mounted Wye-Delta Starter)	2309-4922-D	–	68-69
Unit Mounted Wye-Delta Starter	2309-4902-D	27	22-23
Unit Mounted Solid-State Starter	2309-4904-D	15	26-27
Unit Mounted Across-the-Line	2309-4906-D	6	30-31
Unit Mounted Adaptive Frequency Drive	2309-4912-E	30	38-39
Remote Wye-Delta Starter	2309-4903-D	27	24-25
Remote Mounted Solid-State Starter	2309-4905-D	15	28-29
Remote Across-the-Line Starter	2309-4909-E	6	32-33
Remote Primary Reactor Starter	2309-4910-E	11	34-35
Remote Auto Transformer Starter	2309-4911-E	11	36-37
Customer Supplied Wye-Delta Starter	2309-4913-F	27	40-41
Customer Supplied Primary Reactor and Auto Transformer Starter	2309-4914-F	11	42-43
Customer Supplied Across-the-Line Starter	2309-4915-F	6	44-45
Customer Supplied Solid-State Starter	2309-4916-F	20	46-47
Purge Schematic	2309-4917-D	–	48-49
Unit Controls Schematic	2309-4919-E	–	50-51
System Controls Schematic	2309-4920-E	–	52-53
Options Schematic	2309-4921-D	–	54-55
Connection Diagrams			
Standard Connection Diagram Panel with Options	2309-4923-E	–	56-57
Field Connection Trane Starter	2309-4935-E	–	58-59
Customer Supplied Starter	2309-4936-E	–	60-61
Unit Wiring – Standard	2309-4937-E	–	62-63
Unit Wiring – Optional	2309-4938-F	–	64-65
Purge Control Panel (Unit Mounted	2309-4939-D	–	66-67

Note: These are typical drawings only. Refer to specific as-built schematics for actual unit drawings which represent the unit wiring as shipped.

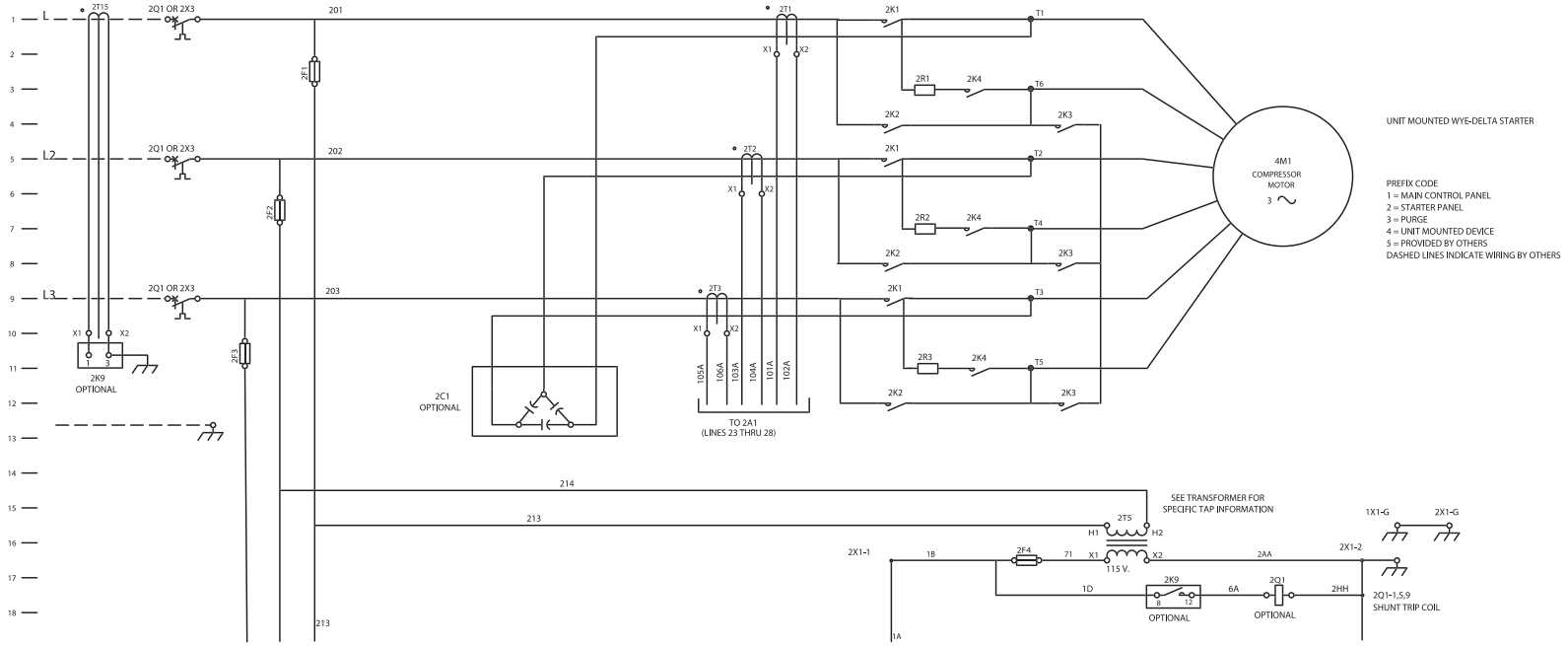
HERMETIC CENTRIFUGAL LIQUID CHILLER

CENTRAVAC®

CH530 SCHEMATIC WIRING CVHE, CVHF, CVHG, CDHF AND CDHG

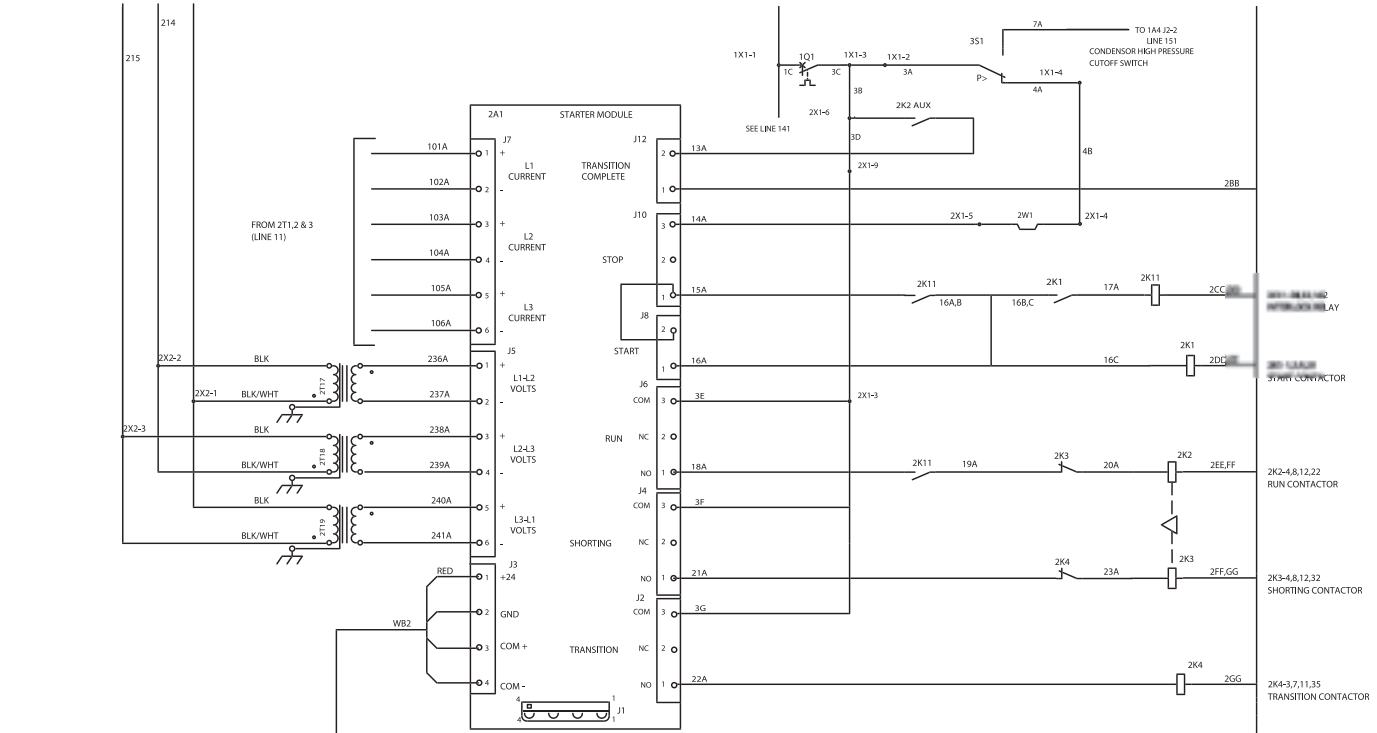
UNIT MOUNTED WYE-DELTA STARTER

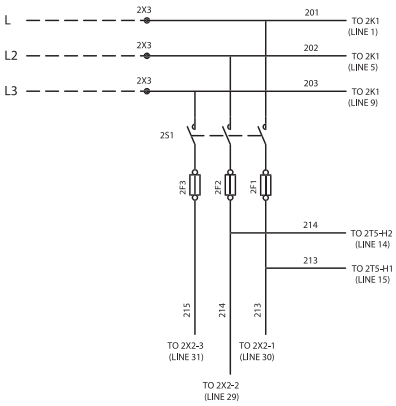
2309-4902 D



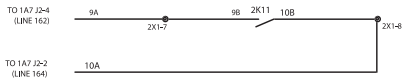
UNIT MOUNTED WYE-DELTA STARTER

PREFIX CODE
1 = MAIN CONTROL PANEL
2 = STARTER PANEL
3 = PURGE
4 = UNIT MOUNTED DEVICE
5 = PROVIDED BY OTHERS
DASHED LINES INDICATE WIRING BY OTHERS

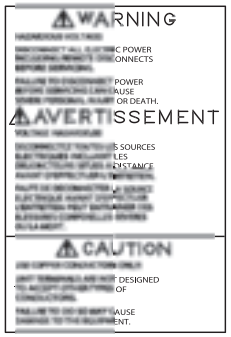




ALTERNATE WIRING FOR CALIFORNIA CODE



IPC BUS

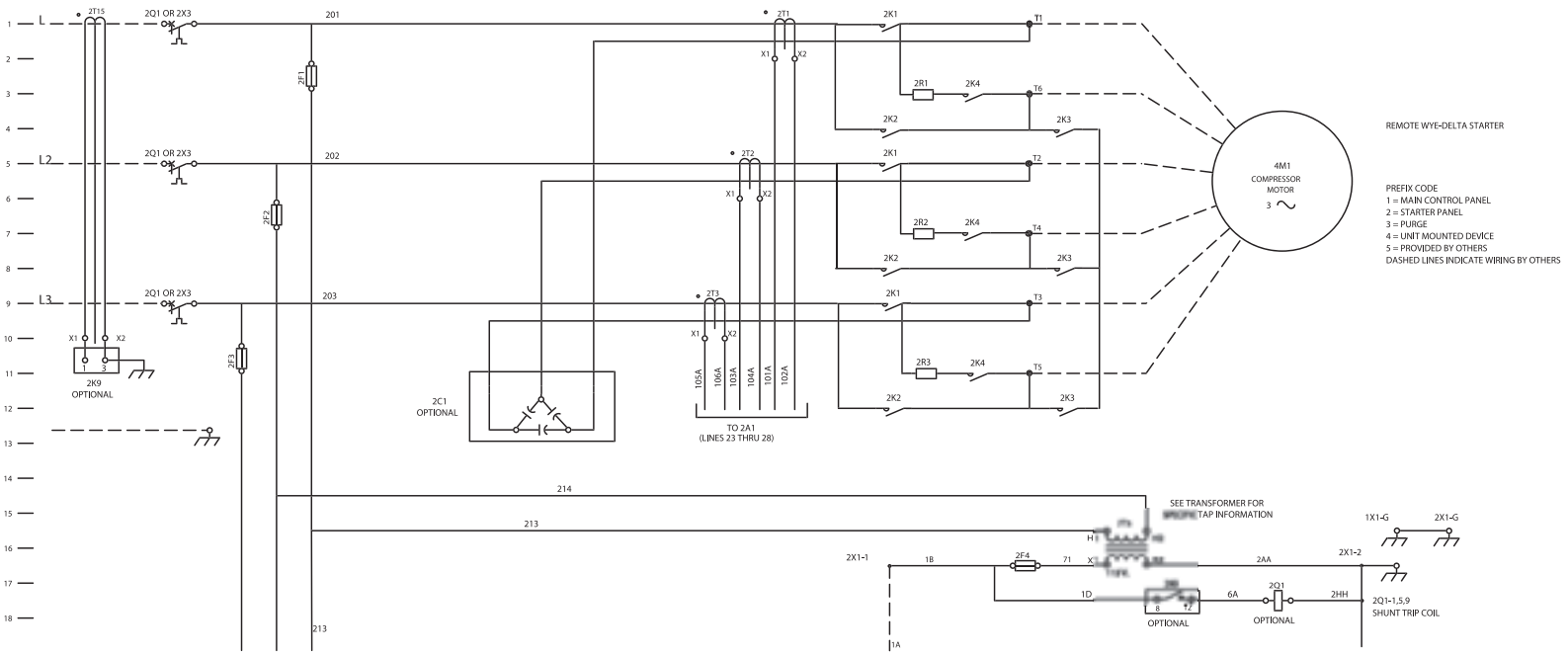


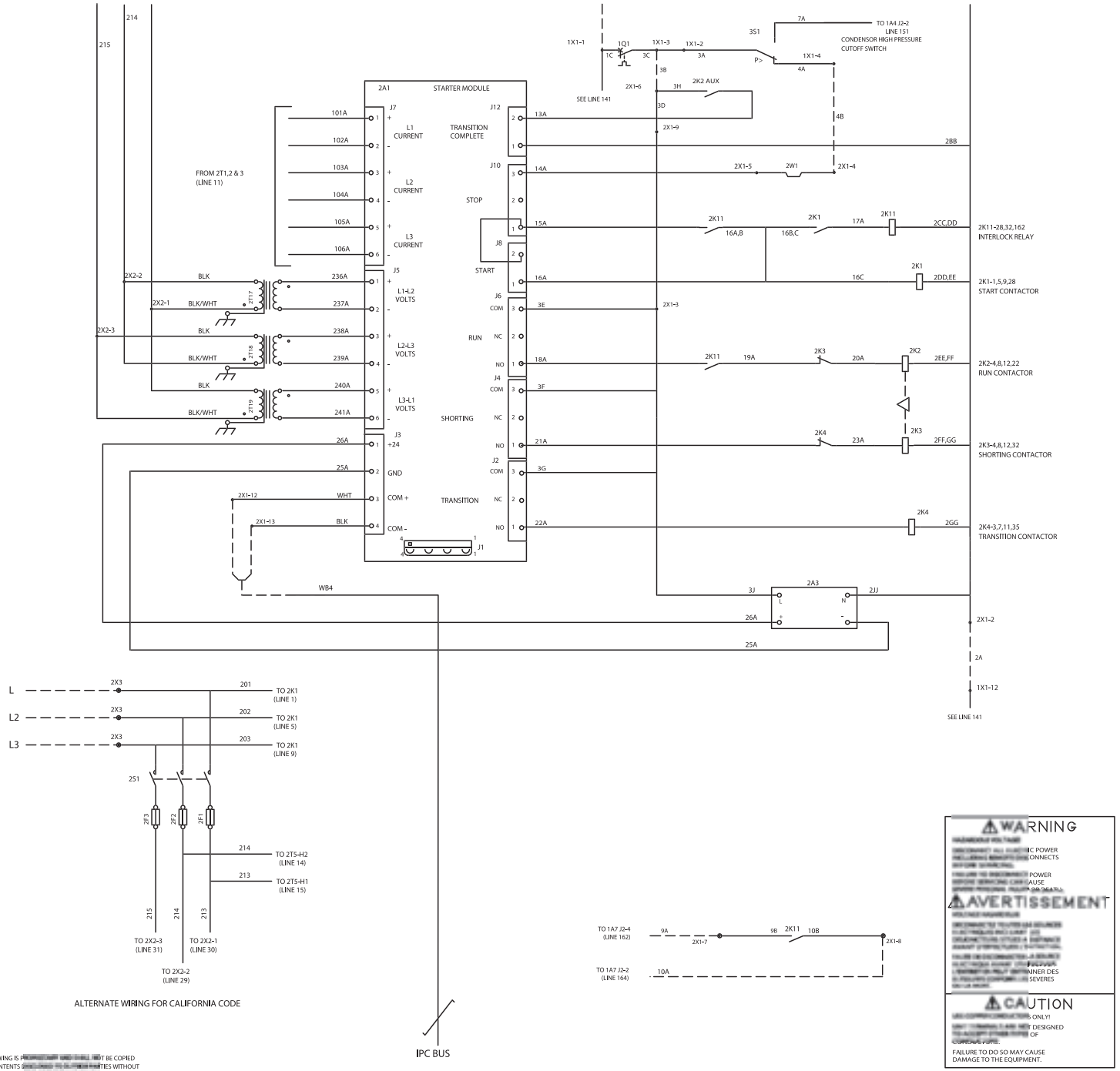
HERMETIC CENTRIFUGAL LIQUID CHILLER

CENTRAVAC©

CH530 SCHEMATIC WIRING CVHE, CVHF, CVHG, CDHF AND CDHG
REMOTE MOUNTED WYE-DELTA STARTER

2309-4903D





ALTERNATE WIRING FOR CALIFORNIA CODE

IPC BUS

⚠ WARNING

Hazardous Voltage!

Starter and motor components may be energized even if the motor is not running. Disconnect all electric power, including remote disconnects before servicing. Follow proper lockout/ tagout procedures to ensure the power cannot be inadvertently energized. Failure to disconnect power before servicing could result in death or serious injury.

CAUTION!

Equipment Damage!

Motor components may be energized even if the motor is not running. Do NOT apply a deep vacuum to the unit if the unit is energized. Disconnect all electric power before evacuating the chiller. Failure to do so may cause damage to the equipment. Applying a deep vacuum to an IT Solid State Starter equipped unit, while power is applied to the unit, can cause an electrical arc-over inside the motor housing. This can cause motor winding or motor terminal damage or failure.

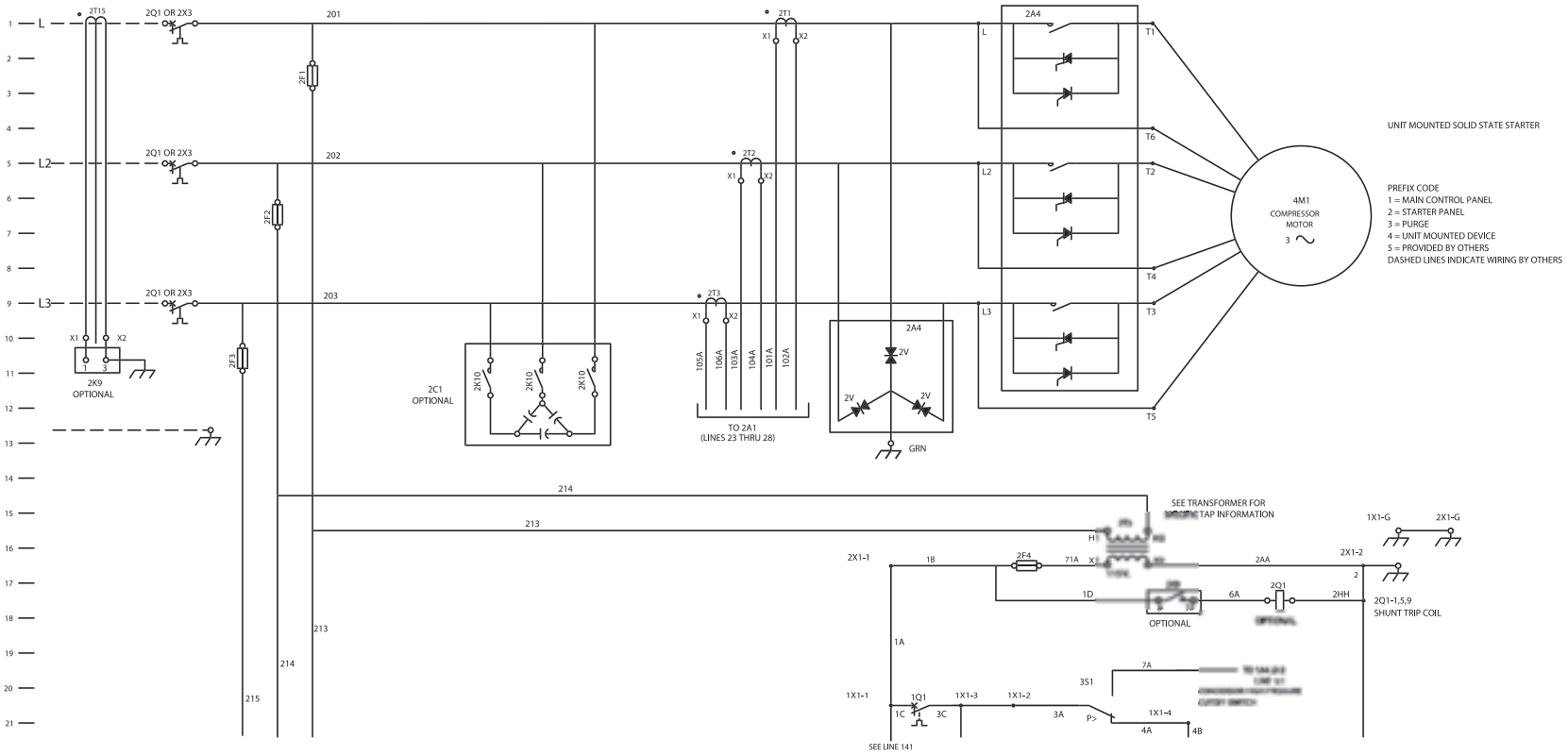
HERMETIC CENTRIFUGAL LIQUID CHILLER

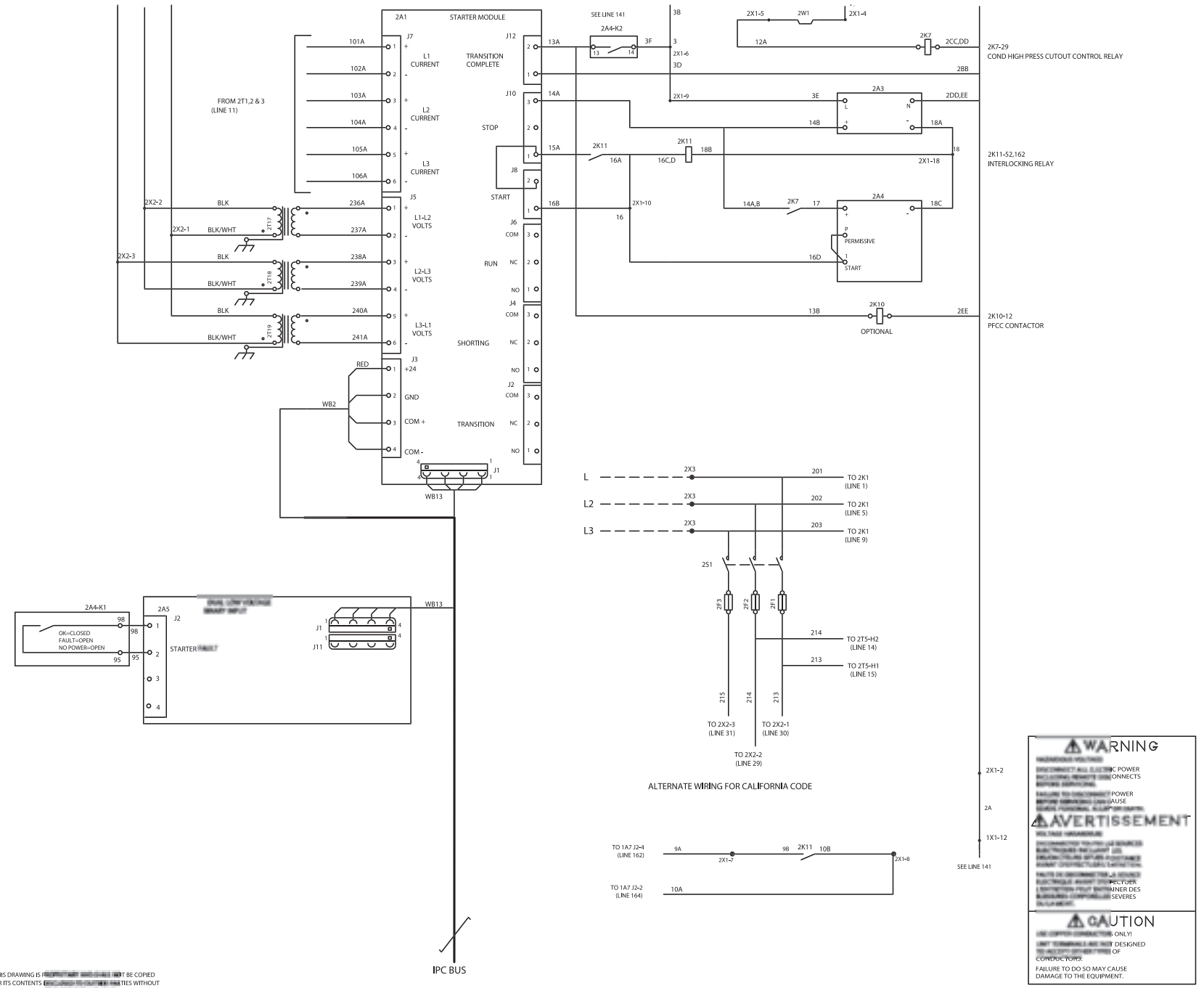
CENTRAVAC©

CH530 SCHEMATIC WIRING CVHE, CVHF, CVHG, CDHF AND CDHG

UNIT MOUNTED SOLID STATE STARTER

2309-4904 D





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Equipment Damage!

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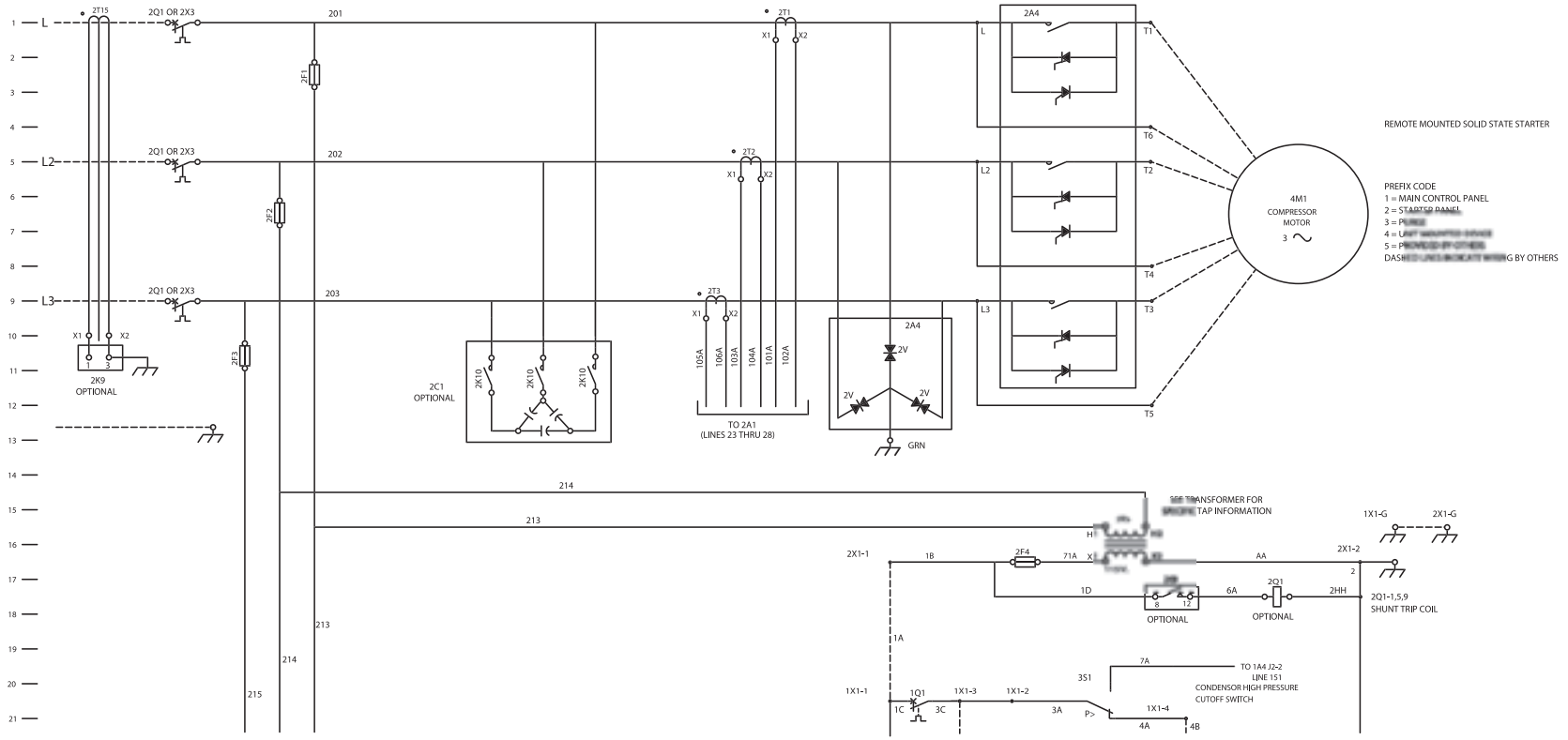
HERMETIC CENTRIFUGAL LIQUID CHILLER

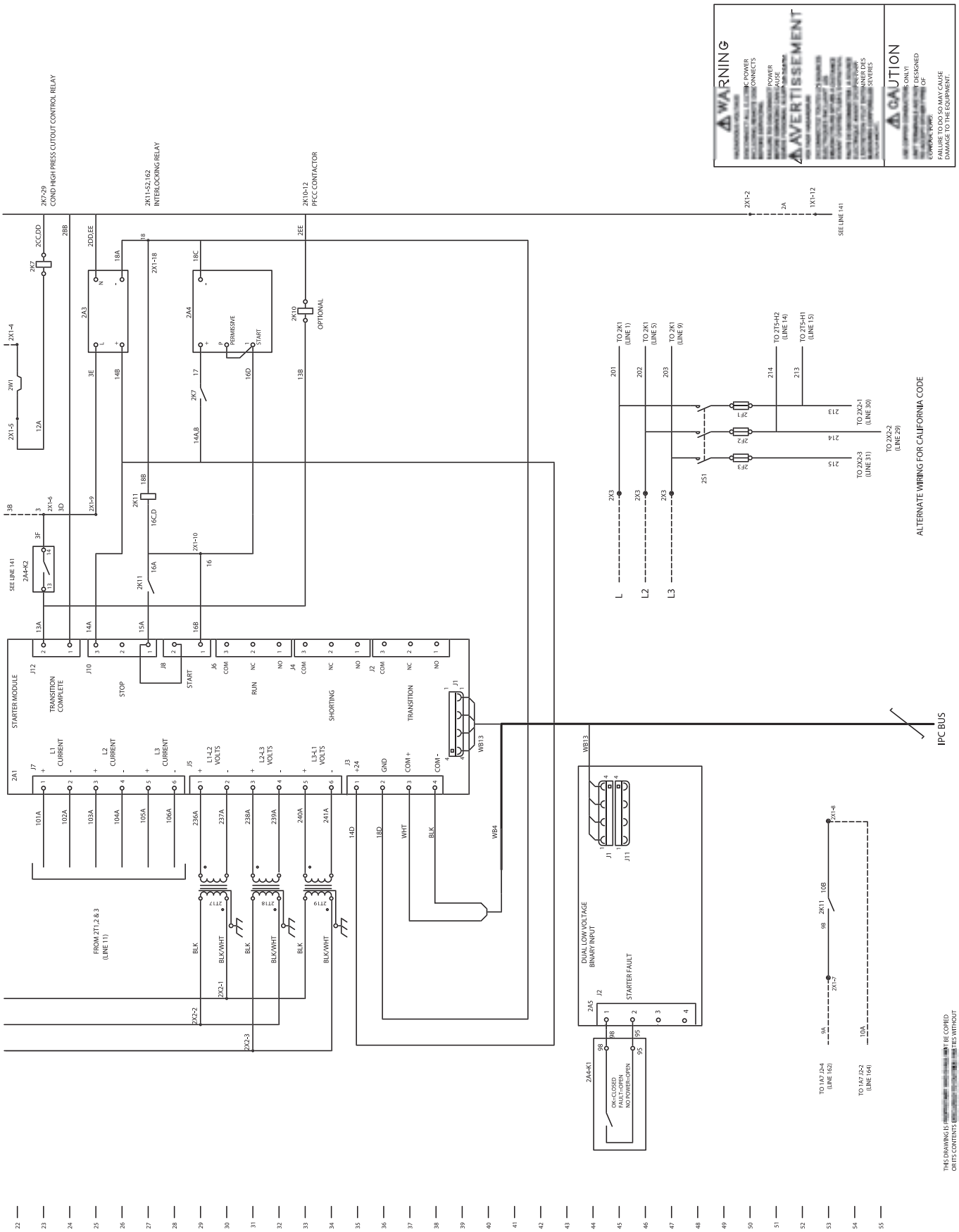
CENTRAVAC ®

CH530 SCHEMATIC WIRING CVHE, CVHF, CVHG, CDHF AND CDHG

REMOTE MOUNTED SOLID STATE STARTER

2309-4905 D




WARNING
AVERTISSEMENT
CAUTION
2K7-29
COND HIGH PRESS CUTOUT CONTROL RELAY
2K11-52,162
INTERLOCKING RELAY
2K10-12
PFCC CONTACTOR
OPTIONAL
STARTER MODULE
TRANSITION COMPLETE
STOP
START
RUN
SHORTING
TRANSITION
L1 CURRENT
L2 CURRENT
L3 CURRENT
L1-L2 VOLTS
L2-L3 VOLTS
L3-L1 VOLTS
+24
GND
COM+
COM-
PERMISSIVE
START
DUAL LOW VOLTAGE BINARY INPUT
STARTER FAULT
OK-CLOSED FAULT=OPEN NO POWER=OPEN
FROM 2T1,2 & 3 (LINE 11)
TO 2K1 (LINE 1)
TO 2K1 (LINE 5)
TO 2K1 (LINE 9)
TO 2T5-H2 (LINE 14)
TO 2T5-H1 (LINE 15)
TO 2X2-1 (LINE 30)
TO 2X2-2 (LINE 29)
TO 2X2-3 (LINE 31)
ALTERNATE WIRING FOR CALIFORNIA CODE
IPC BUS
SEE LINE 141
SEE LINE 141
TO 1A7 D-4 (LINE 162)
TO 1A7 D-2 (LINE 164)

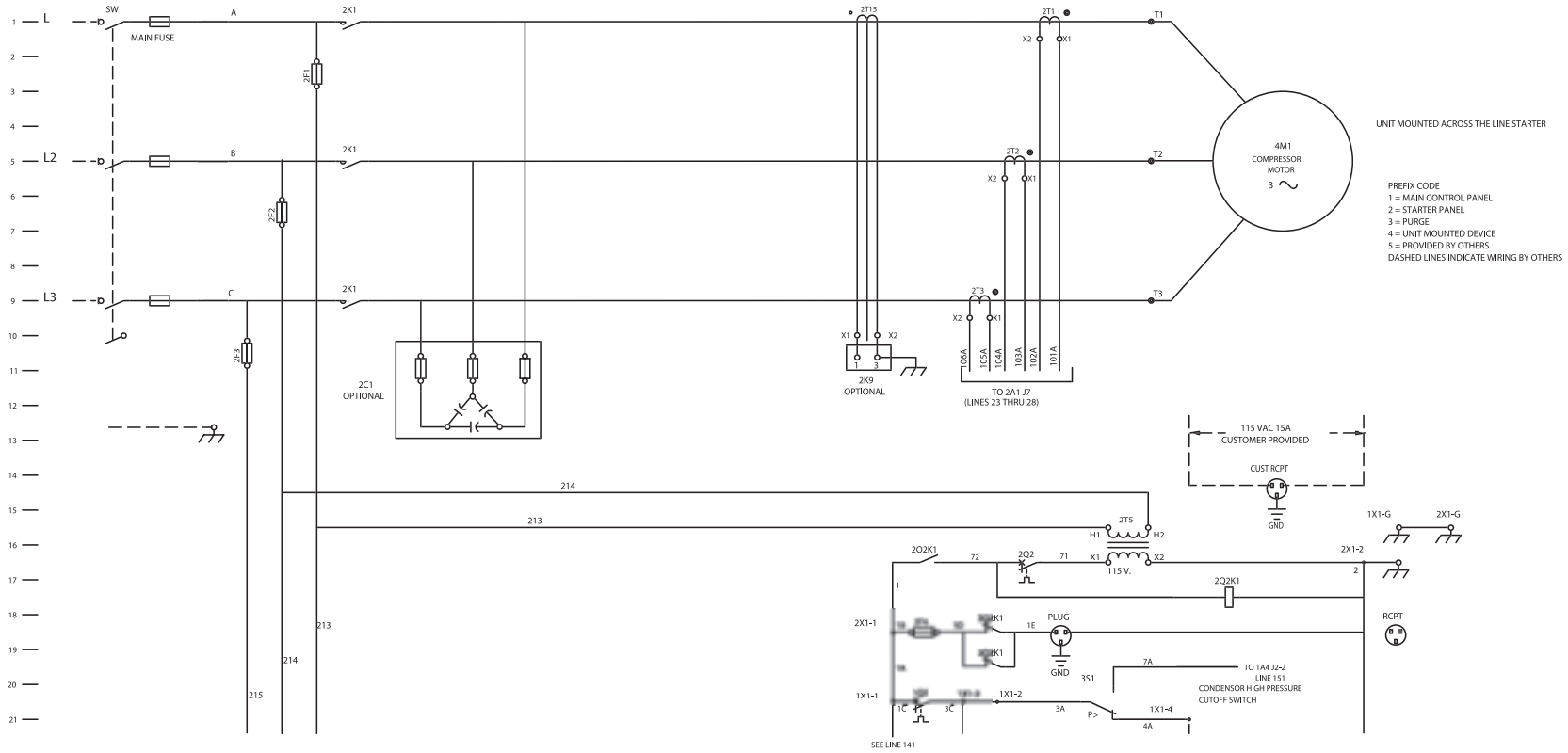
HERMETIC CENTRIFUGAL LIQUID CHILLER

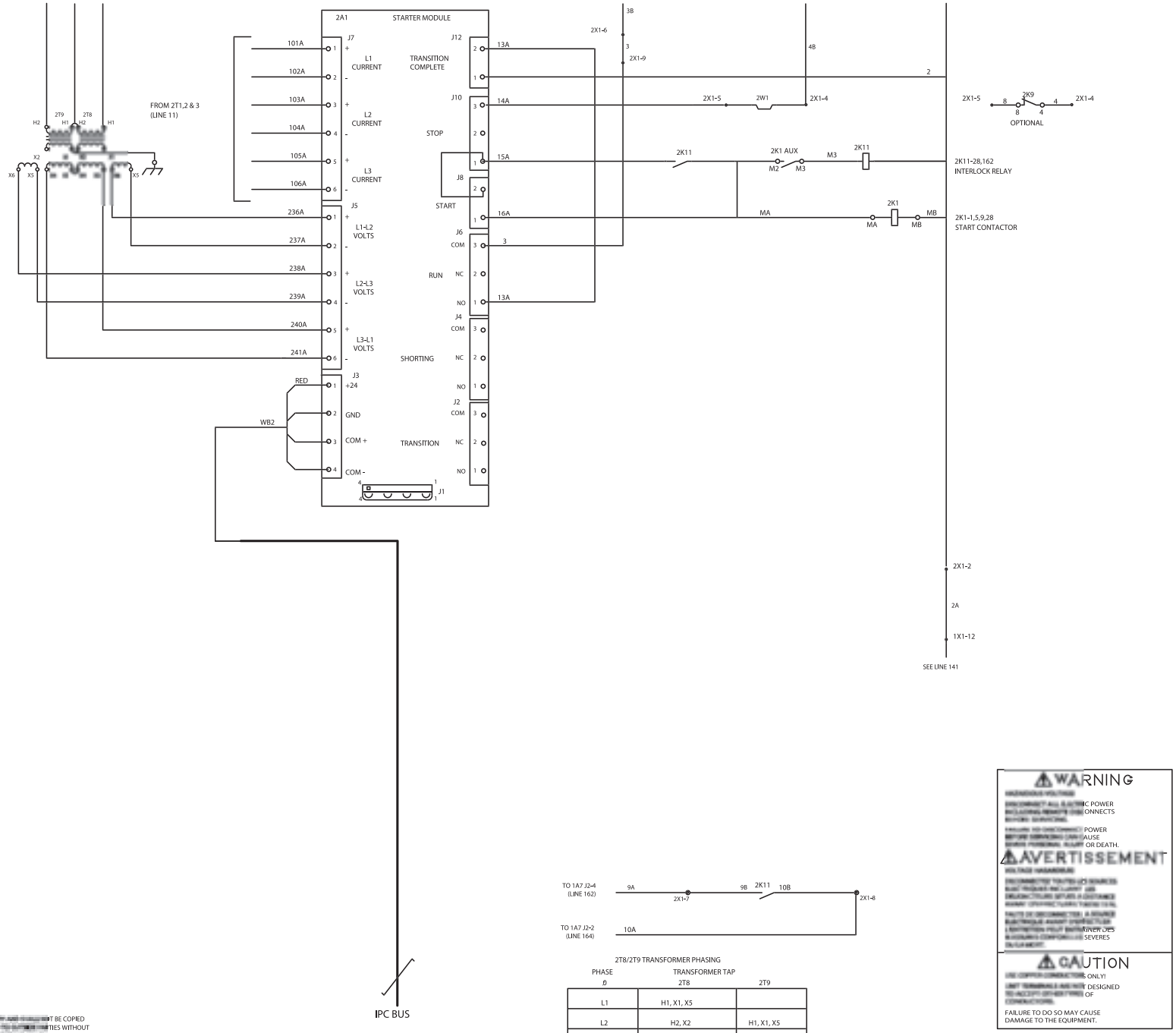
CENTRAVAC®

CH530 SCHEMATIC WIRING CVHE, CVHF, CVHG, CDHF AND CDHG

UNIT MOUNTED ACROSS THE LINE STARTER

2309-4906 D





2T8/2T9 TRANSFORMER PHASING

PHASE	TRANSFORMER TAP	
	2T8	2T9
L1	H1, X1, X5	
L2	H2, X2	H1, X1, X5
L3		H2, X2, X4

WARNING

[illegible] POWER [illegible] CONNECTS [illegible]

[illegible] POWER [illegible] AUSE [illegible] OR DEATH.

AVERTISSEMENT

[illegible] [illegible] SEVERES

CAUTION

[illegible] ONLY! [illegible] DESIGNED [illegible] OF [illegible]

FAILURE TO DO SO MAY CAUSE DAMAGE TO THE EQUIPMENT.

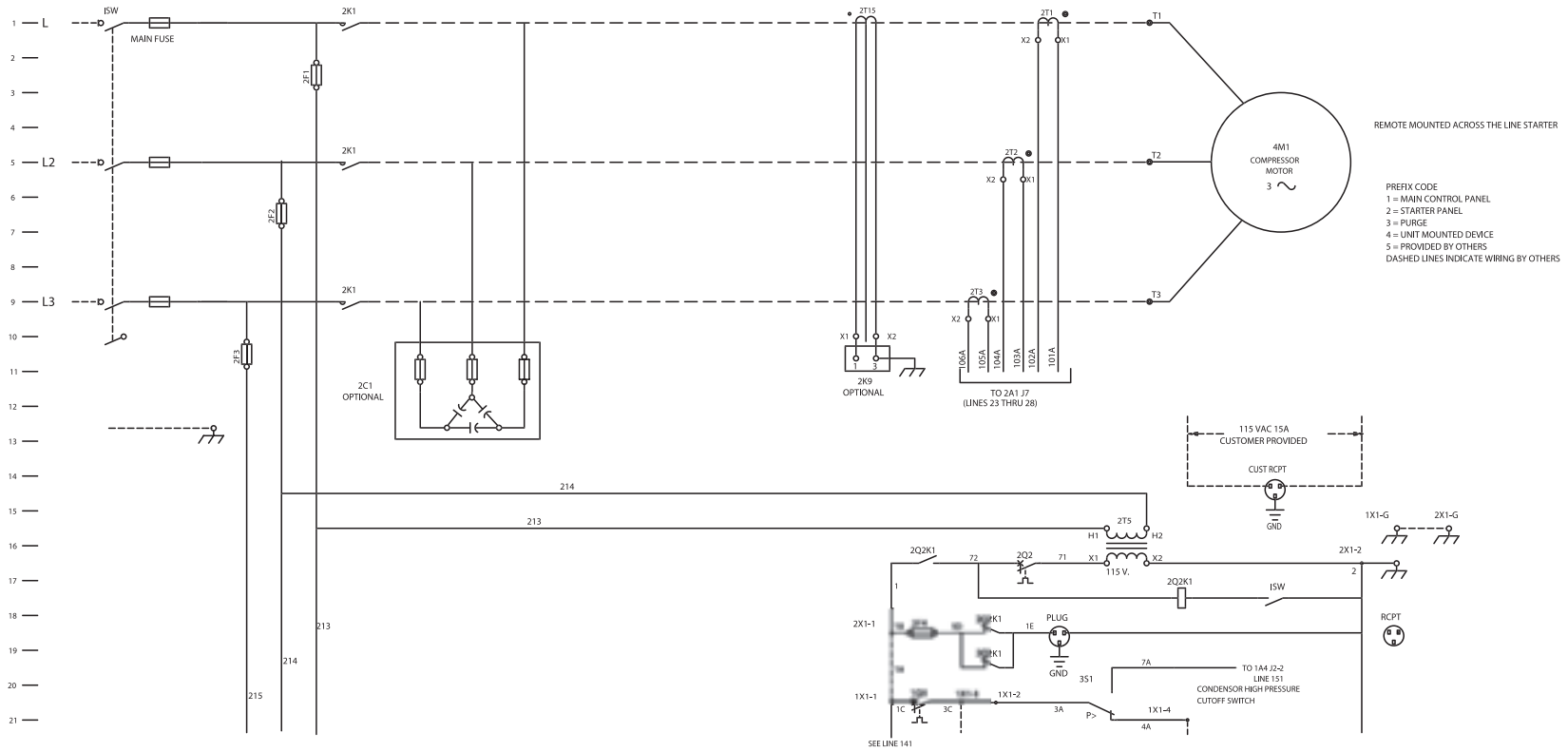
HERMETIC CENTRIFUGAL LIQUID CHILLER

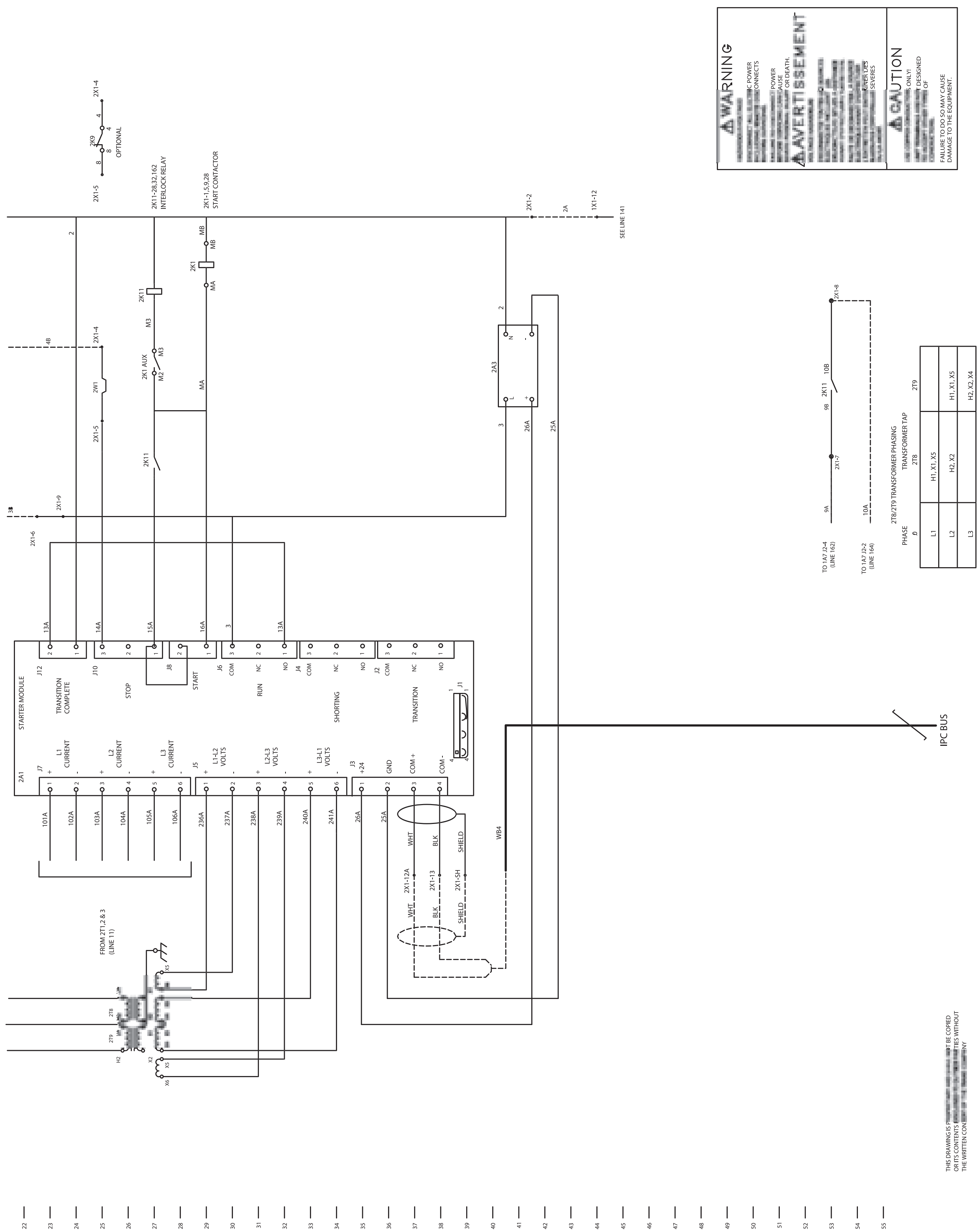
CENTRAVAC ⓘ

CH530 SCHEMATIC WIRING CVHE, CVHF, CVHG, CDHF AND CDHG

REMOTE MOUNTED ACROSS THE LINE STARTER

2309-4909 E




STARTER MODULE
2A1
TRANSITION COMPLETE
STOP
START
RUN
SHORTING
TRANSITION
L1 CURRENT
L2 CURRENT
L3 CURRENT
L1-L2 VOLTS
L2-L3 VOLTS
L3-L1 VOLTS
IPC BUS
2K11-28,32,162 INTERLOCK RELAY
2K1-1,5,9,28 START CONTACTOR
OPTIONAL
2K1 AUX
2A3
SEE LINE 141
FROM 2T1,2 & 3 (LINE 11)
TO 1A7 J2-4 (LINE 162)
TO 1A7 J2-2 (LINE 164)
2T8/2T9 TRANSFORMER PHASING
PHASE
TRANSFORMER TAP
2T8
2T9
L1
H1, X1, X5
H1, X1, X5
L2
H2, X2
H2, X2, X4
L3
WARNING
AVERTISSEMENT
CAUTION
FAILURE TO DO SO MAY CAUSE DAMAGE TO THE EQUIPMENT.

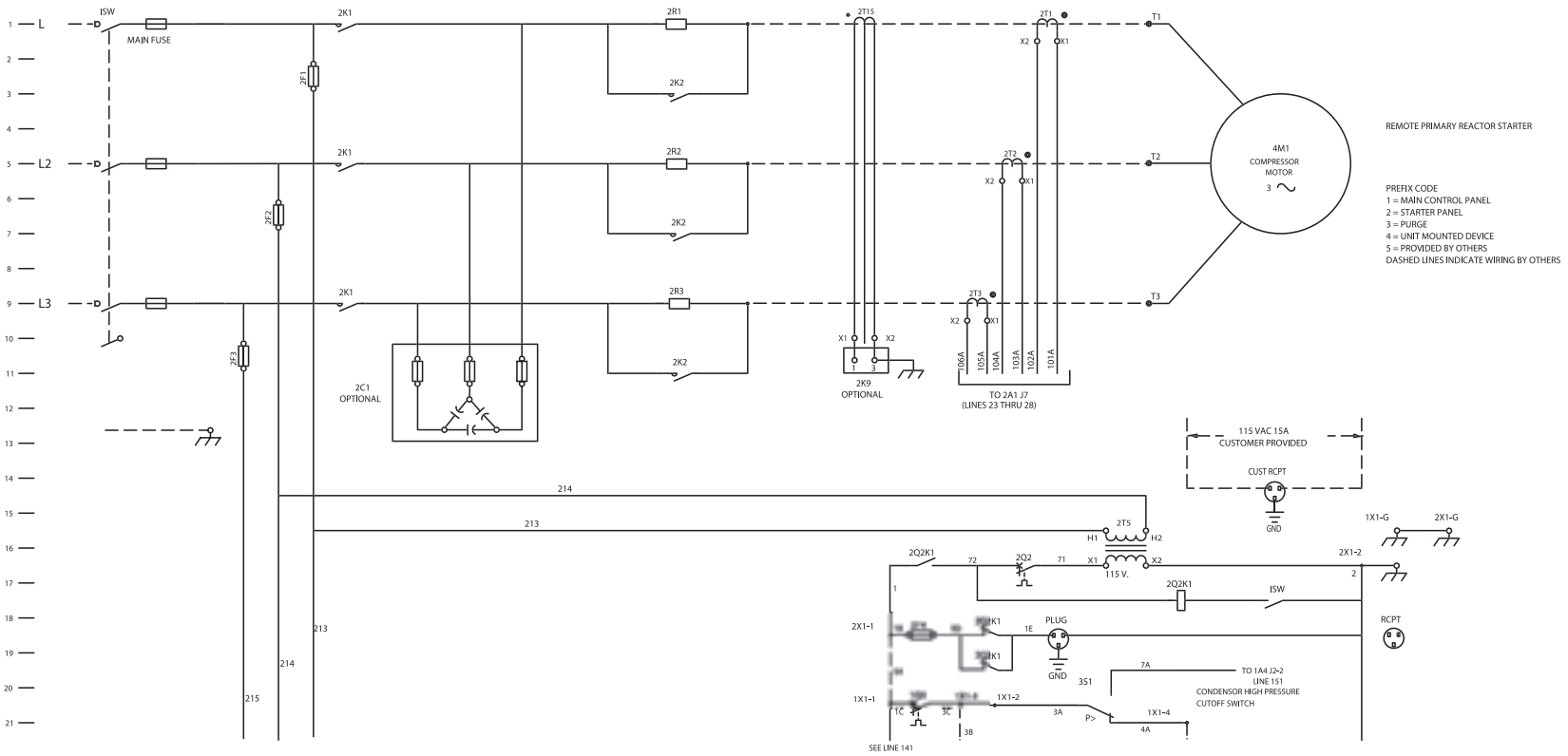
HERMETIC CENTRIFUGAL LIQUID CHILLER

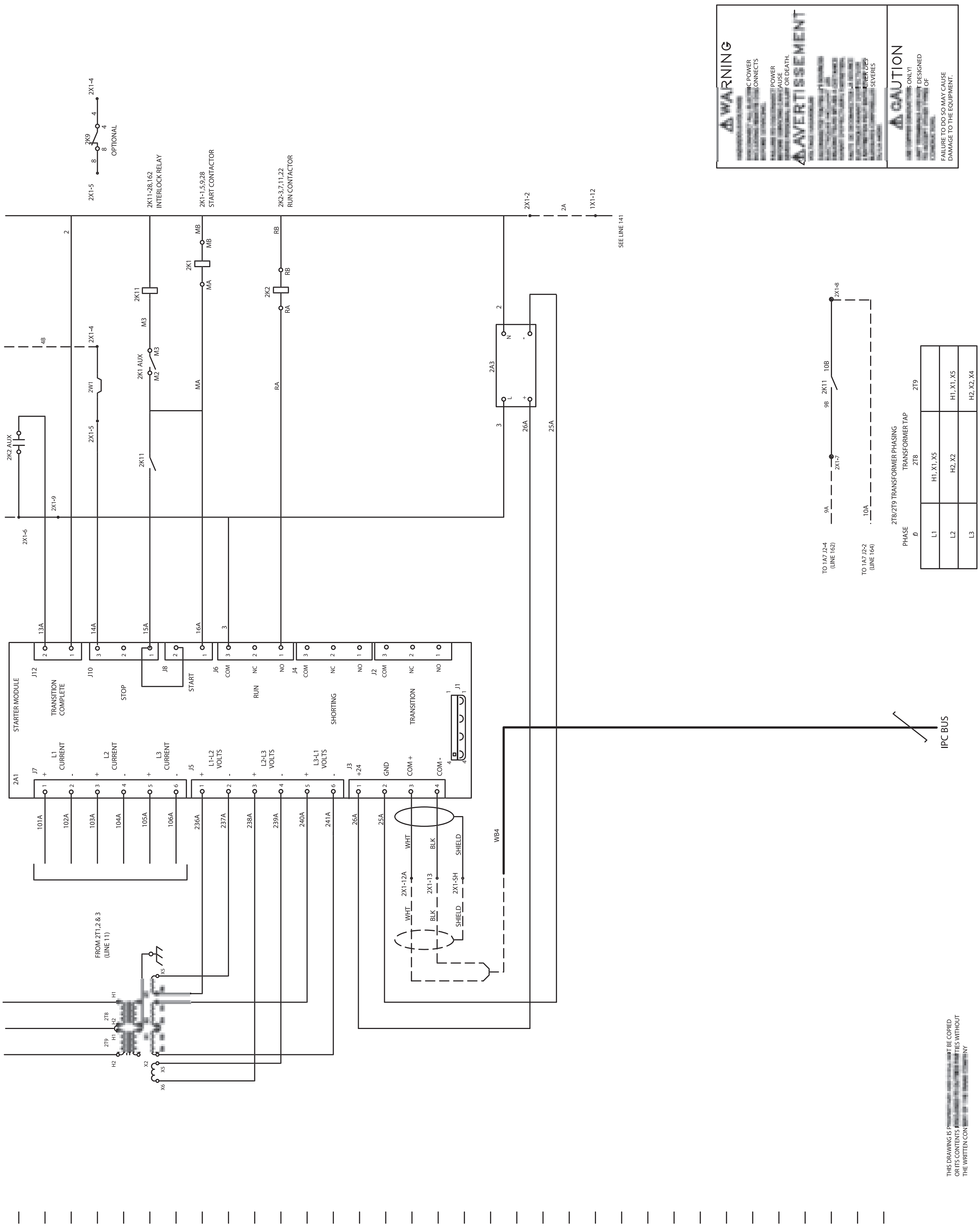
CENTRAVAC®

CH530 SCHEMATIC WIRING CVHE, CVHF, CVHG, CDHF AND CDHG

REMOTE MOUNTED PRIMARY REACTOR STARTER

2309-4910 E




STARTER MODULE
2A1
TRANSITION COMPLETE
STOP
START
RUN
SHORTING
TRANSITION
L1 CURRENT
L2 CURRENT
L3 CURRENT
L1-L2 VOLTS
L2-L3 VOLTS
L3-L1 VOLTS
+24
GND
COM +
COM -
IPC BUS
2K11-28,162 INTERLOCK RELAY
2K1-1,5,9,28 START CONTACTOR
2K2-3,7,11,22 RUN CONTACTOR
OPTIONAL
2K2 AUX
2K1 AUX
SEE LINE 141
FROM 2T1,2 & 3 (LINE 11)
WHT
BLK
SHIELD
TO 1A7 J2-4 (LINE 162)
TO 1A7 J2-2 (LINE 164)
2T8/2T9 TRANSFORMER PHASING
PHASE
TRANSFORMER TAP
2T8
2T9
L1
L2
L3
H1, X1, X5
H2, X2
H2, X2, X4
WARNING
AVERTISSEMENT
CAUTION
FAILURE TO DO SO MAY CAUSE DAMAGE TO THE EQUIPMENT.

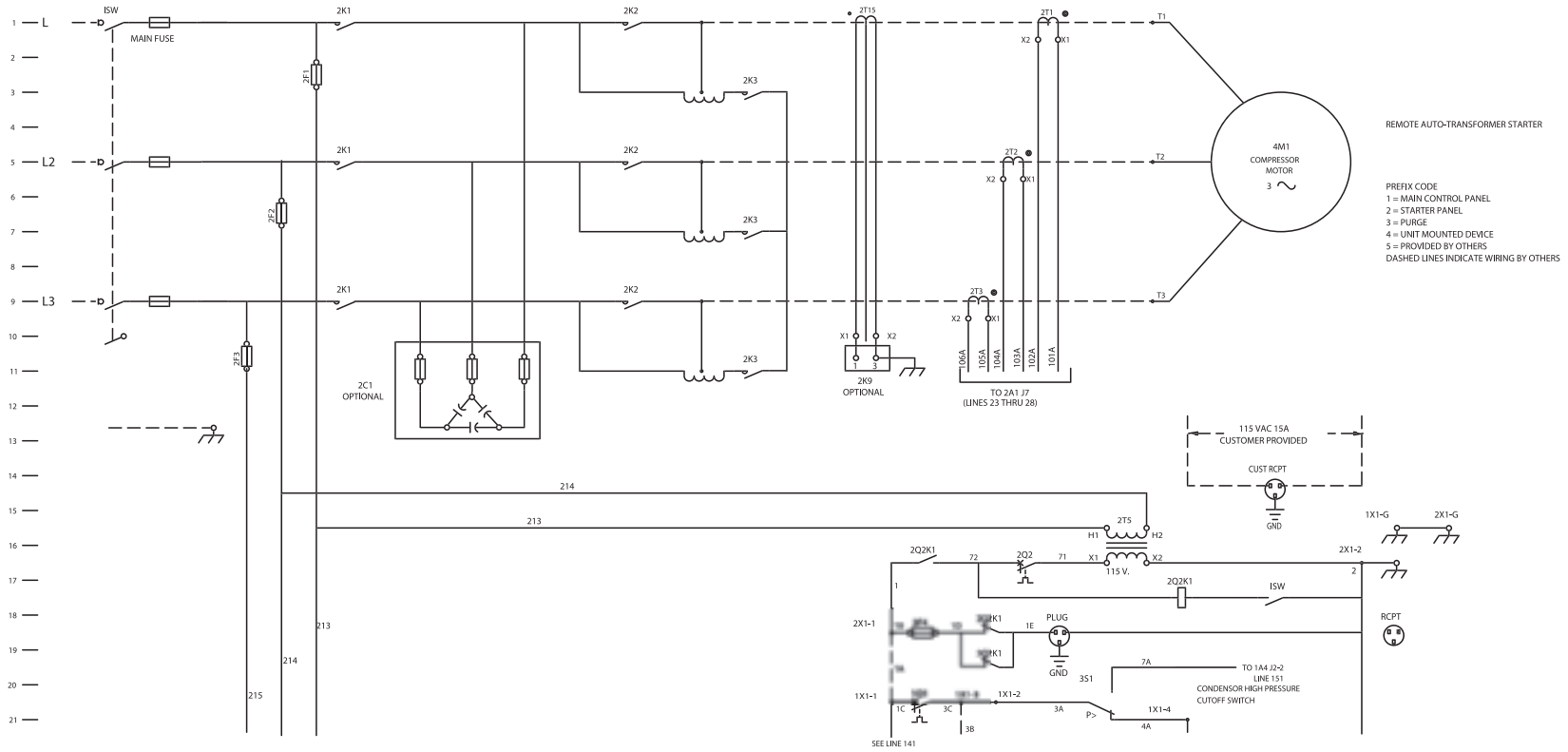
HERMETIC CENTRIFUGAL LIQUID CHILLER

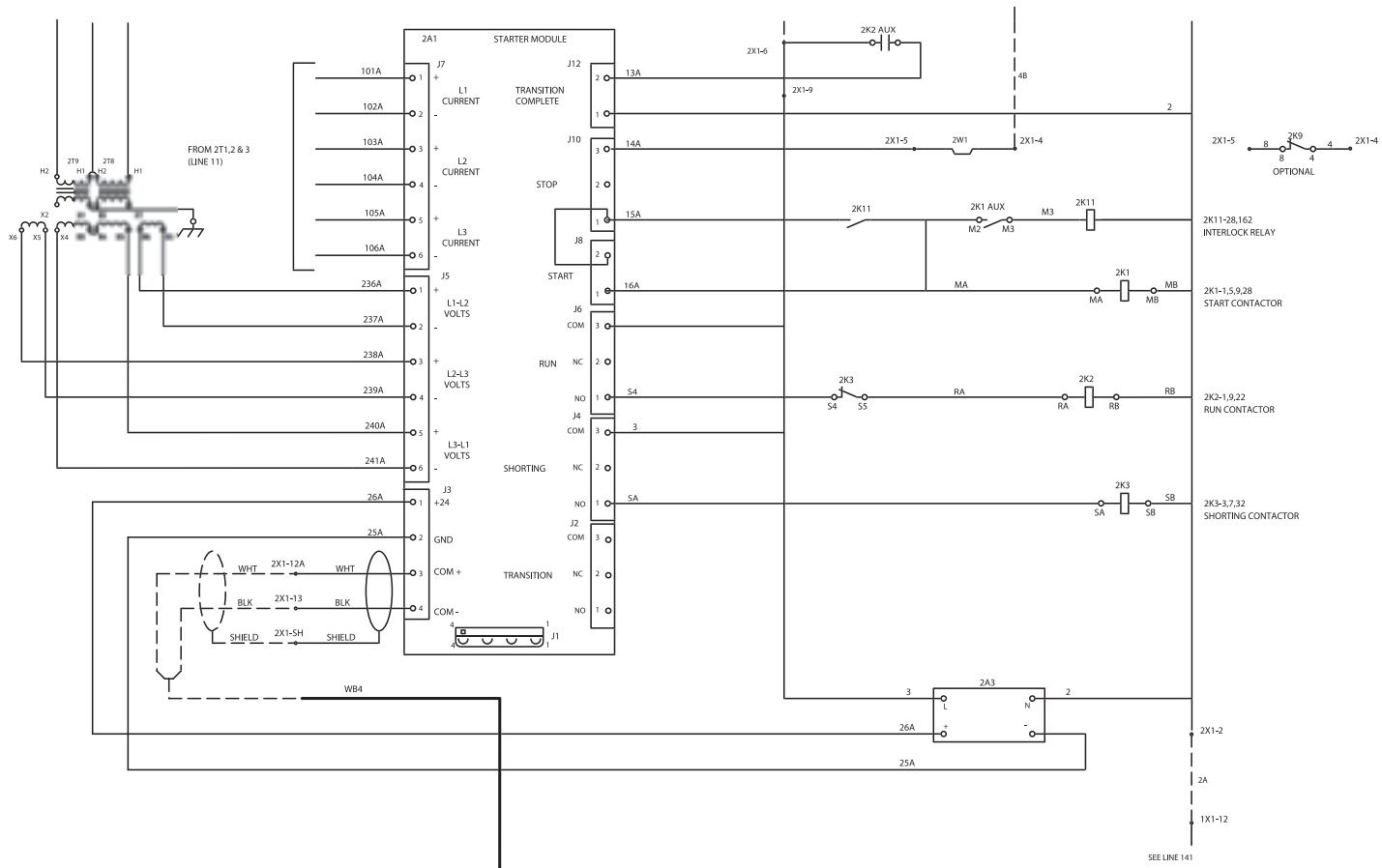
CENTRAVAC ®

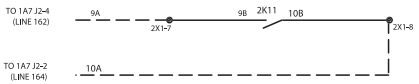
CH530 SCHEMATIC WIRING CVHE, CVHF, CVHG, CDHF AND CDHG

REMOTE MOUNTED AUTO-TRANSFORMER STARTER

2309-4911E







2T8/2T9 TRANSFORMER PHASING

PHASE	TRANSFORMER TAP	
	2T8	2T9
L1	H1, X1, X5	
L2	H2, X2	H1, X1, X5
L3		H2, X2, X4

WARNING

HAZARDOUS VOLTAGE

DISCONNECT ALL ELECTRIC POWER
INCLUDING REMOTE DISCONNECTS
BEFORE SERVICING.

FAILURE TO DISCONNECT POWER
BEFORE SERVICING COULD RESULT
IN SERIOUS PERSONAL INJURY OR DEATH.

AVERTISSEMENT

VOLTAGE DANGEREUX

DÉBRANCHEZ TOUTES LES SOURCES
ÉLECTRIQUES DE COURANT.
DÉBRANCHEZ TOUTE SOURCE À DISTANCE
AVANT D'EFFECTUER L'ENTRETIEN.
FAUTE DE DÉBRANCHER LA SOURCE
ÉLECTRIQUE AVANT D'EFFECTUER
L'ENTRETIEN PEUT ENTRAÎNER DES
BLESSURES CORPORELLES GRAVES
OU LA MORT.

CAUTION

USE COPPER CONDUCTORS ONLY!
UNSUITABLE FOR FIELD WIRING.
TERMINALS ARE NOT DESIGNED
TO ACCEPT OTHER TYPES OF
CONDUCTORS.

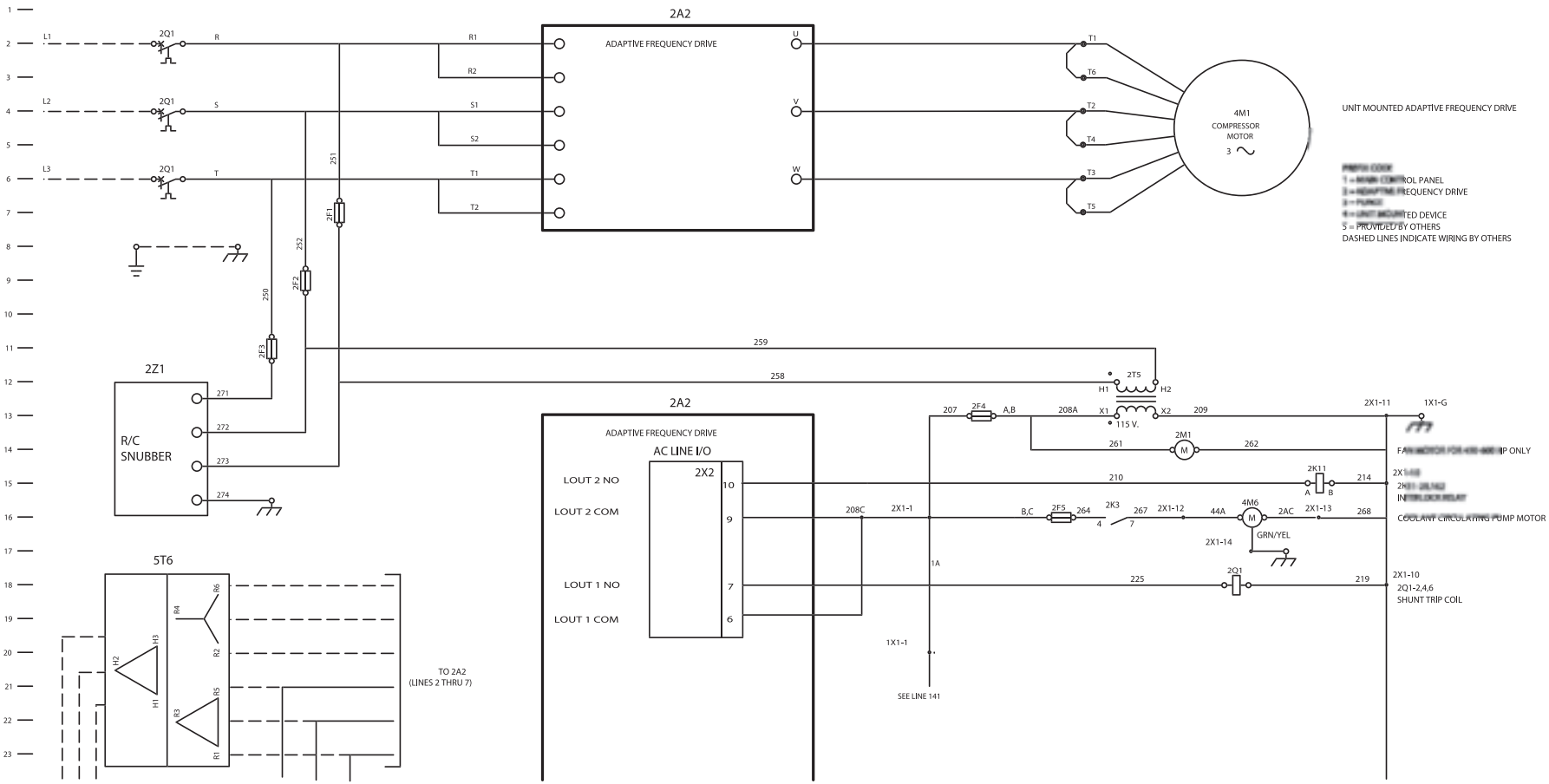
FAILURE TO DO SO MAY CAUSE
DAMAGE TO THE EQUIPMENT.

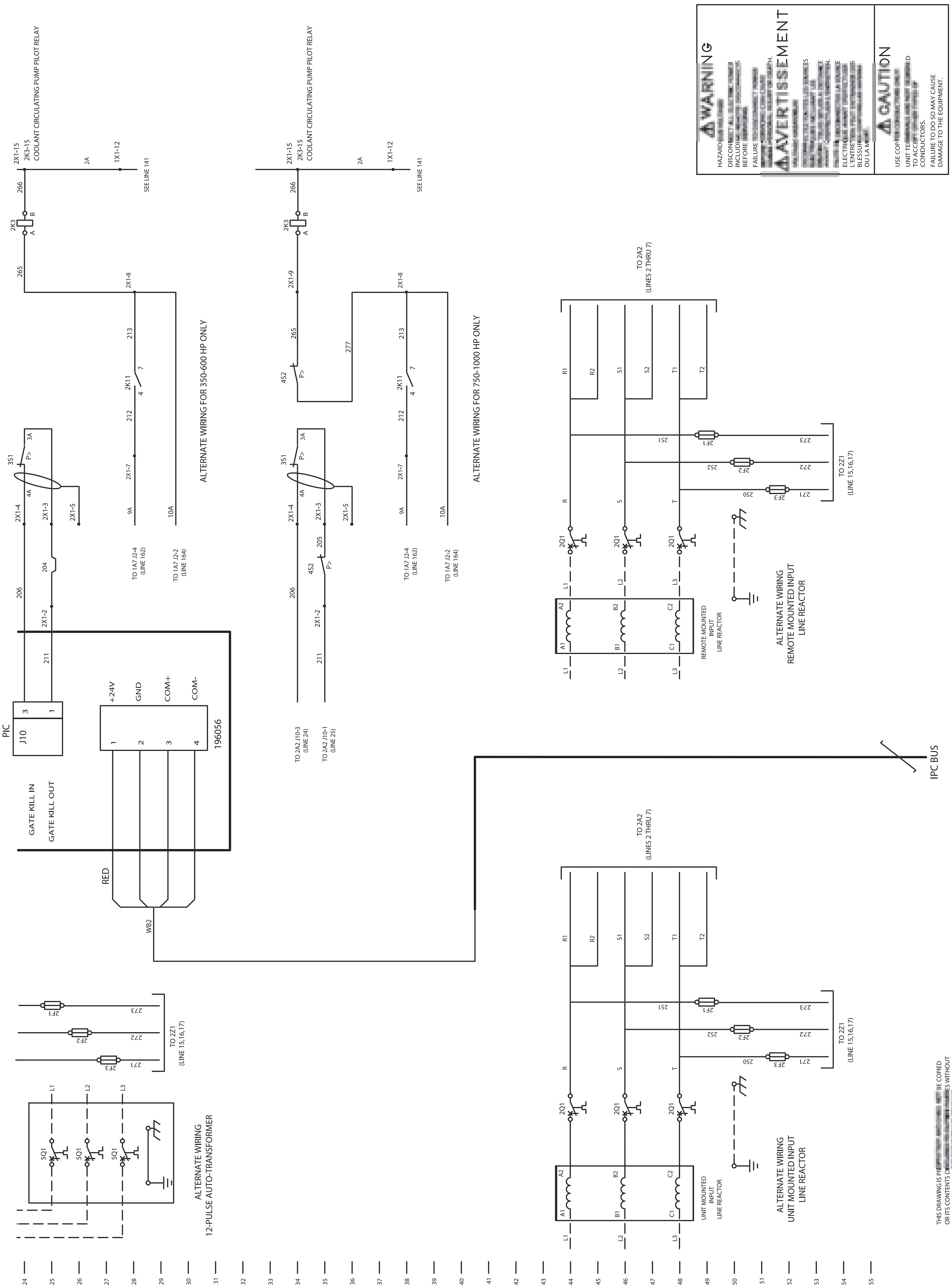
HERMETIC CENTRIFUGAL LIQUID CHILLER

CENTRAVAC®

CH530 SCHEMATIC WIRING CVHE, CVHF AND CVHG
UNIT MOUNTED ADAPTIVE FREQUENCE DRIVE

2309-4912 E




ALTERNATE WIRING FOR 350-600 HP ONLY
ALTERNATE WIRING FOR 750-1000 HP ONLY
COOLANT CIRCULATING PUMP PILOT RELAY
SEE LINE 141
GATE KILL IN
GATE KILL OUT
PIC
J10
+24V
GND
COM+
COM-
196056
RED
WB2
IPC BUS
TO 2A2 (LINES 2 THRU 7)
TO 2Z1 (LINE 15,16,17)
REMOTE MOUNTED INPUT LINE REACTOR
ALTERNATE WIRING REMOTE MOUNTED INPUT LINE REACTOR
UNIT MOUNTED INPUT LINE REACTOR
ALTERNATE WIRING UNIT MOUNTED INPUT LINE REACTOR
ALTERNATE WIRING 12-PULSE AUTO-TRANSFORMER
WARNING
AVERTISSEMENT
CAUTION
FAILURE TO DO SO MAY CAUSE DAMAGE TO THE EQUIPMENT.

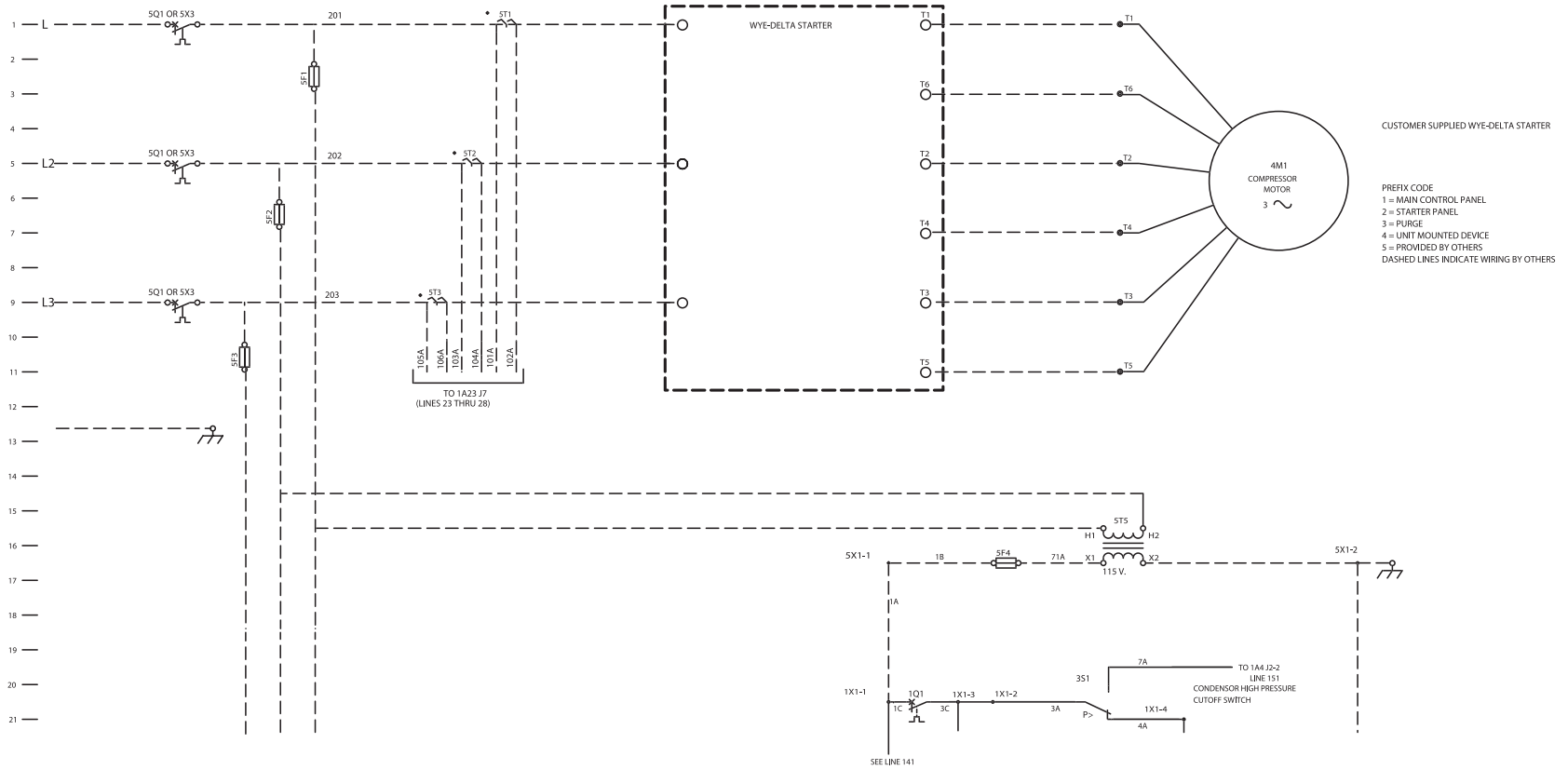
HERMETIC CENTRIFUGAL LIQUID CHILLER

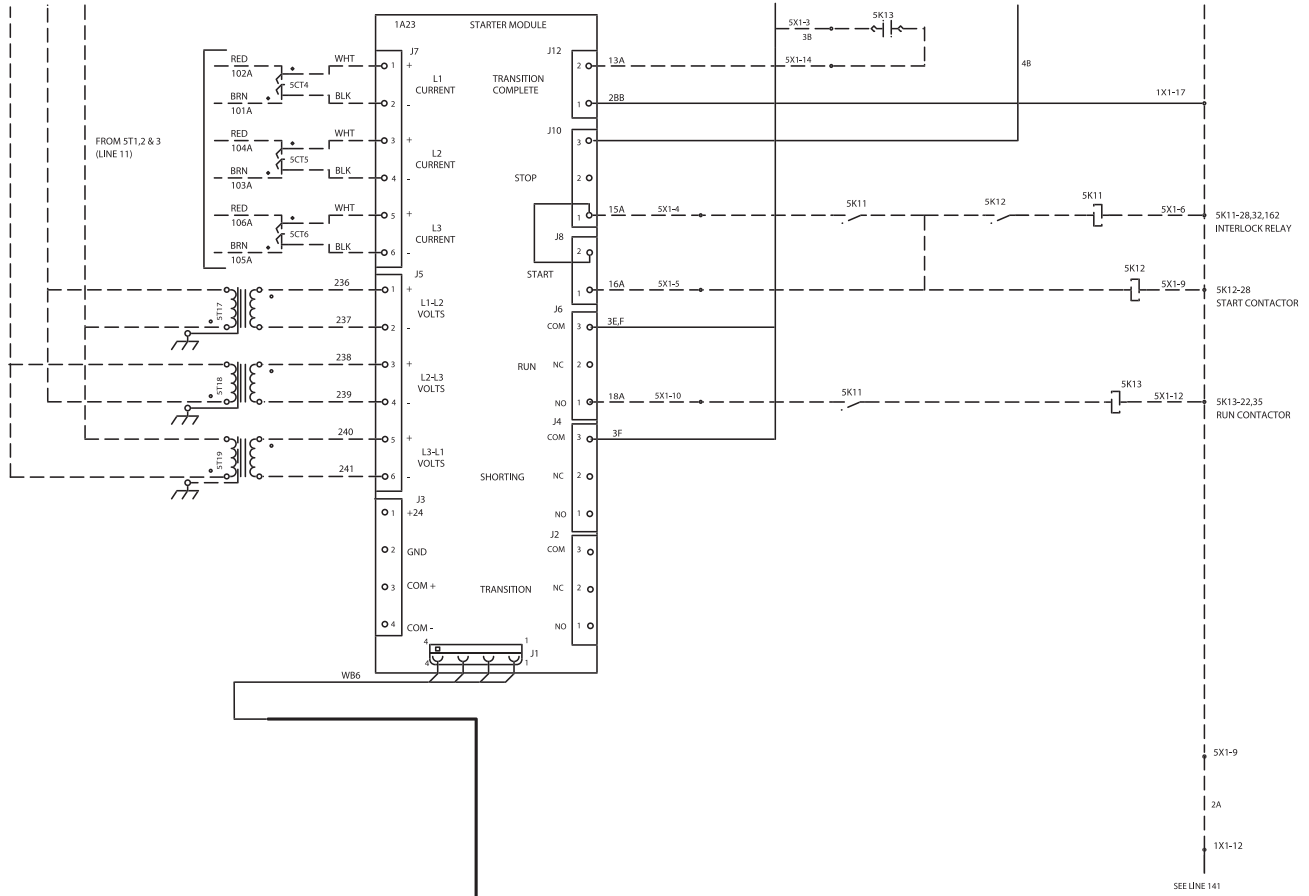
CENTRAVAC®

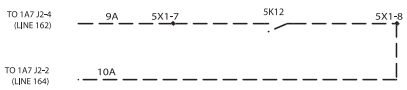
CH530 SCHEMATIC WIRING CVHE, CVHF, CVHG, CDHF AND CDHG

CUSTOMER SUPPLIED WYE-DELTA STARTER

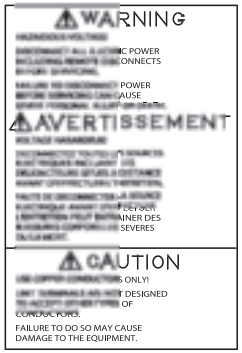
2309-4913 F







WIRE AND TERMINAL NO'S ARE REFERENCE ONLY



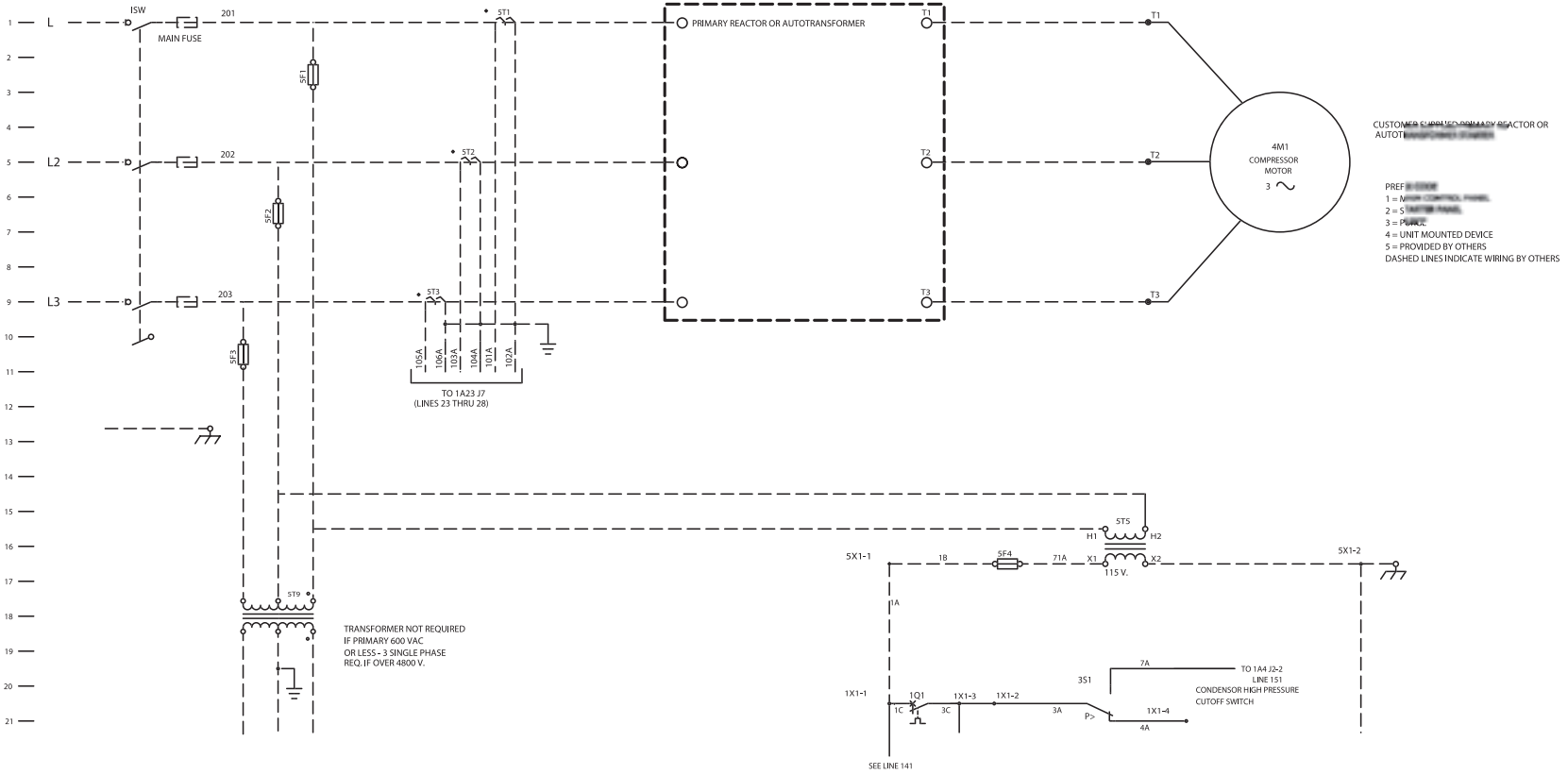
HERMETIC CENTRIFUGAL LIQUID CHILLER

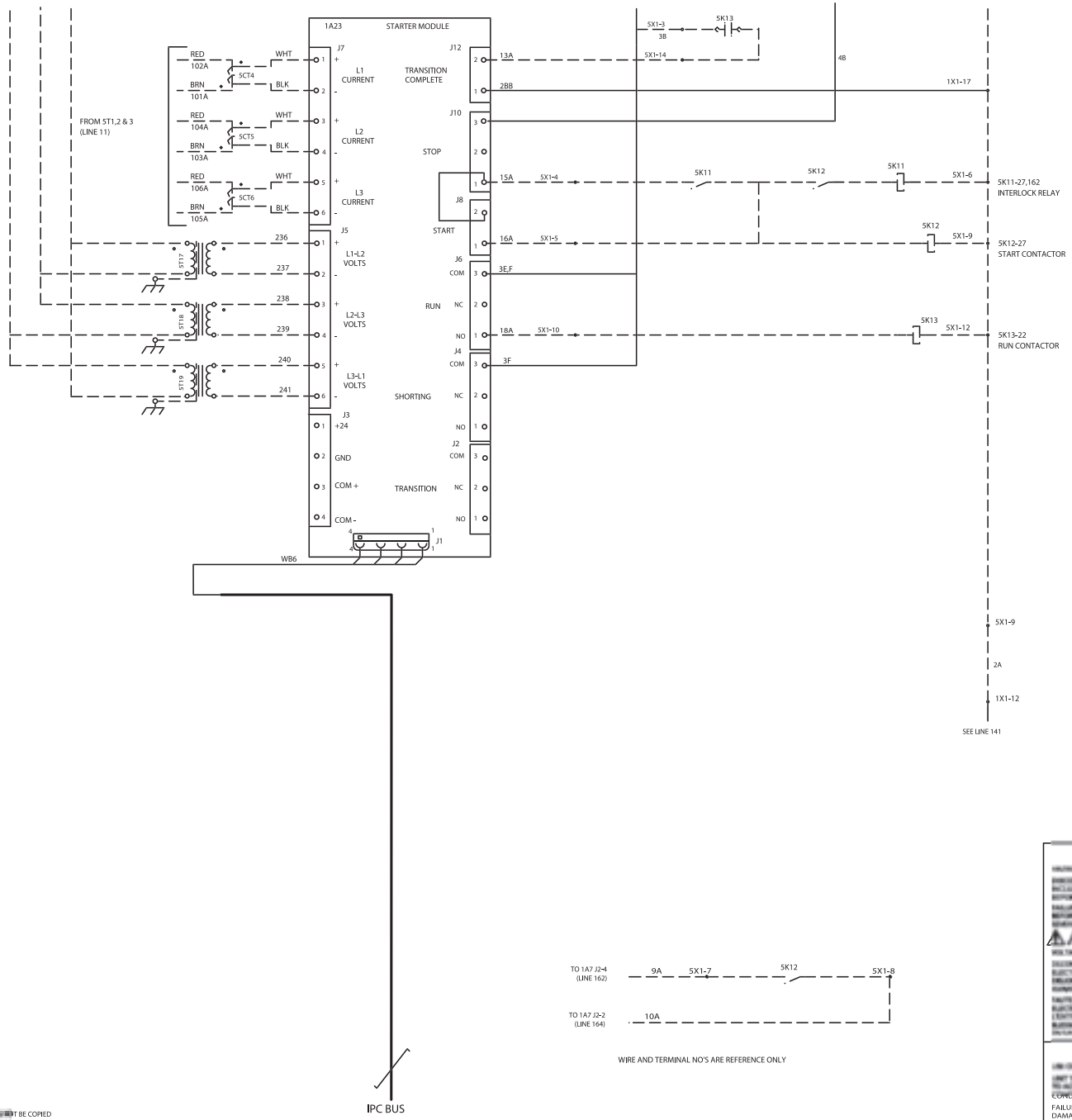
CENTRAVAC ©

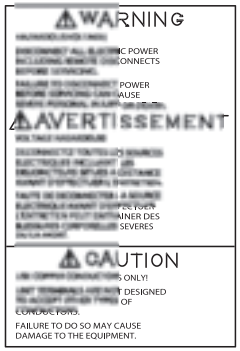
CH530 SCHEMATIC WIRING CVHE, CVHF, CVHG, CDHF AND CDHG

CUSTOMER SUPPLIED PRIMARY REACTOR OR AUTO-TRANSFORMER STARTER

2309-4914 F







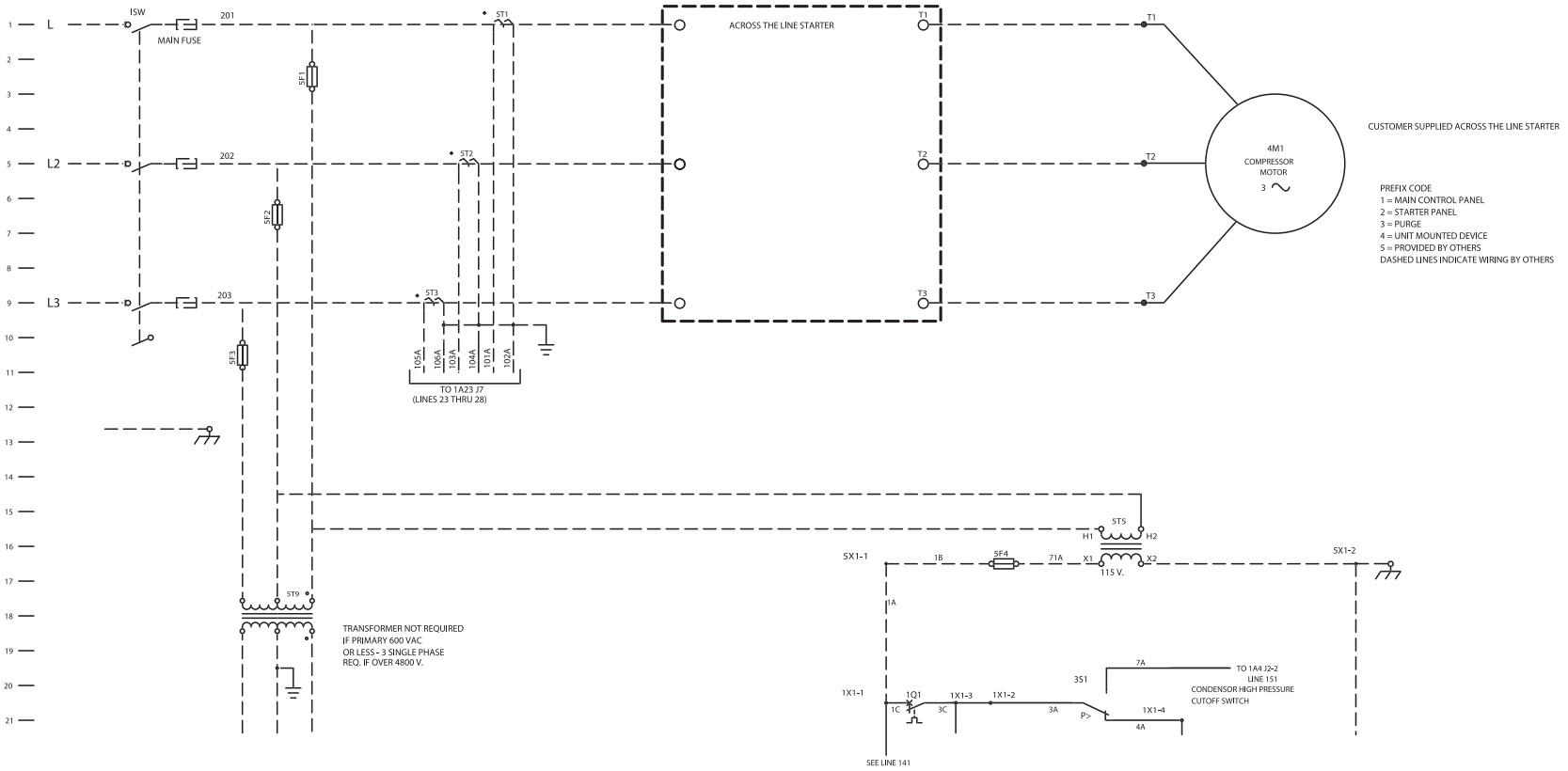
HERMETIC CENTRIFUGAL LIQUID CHILLER

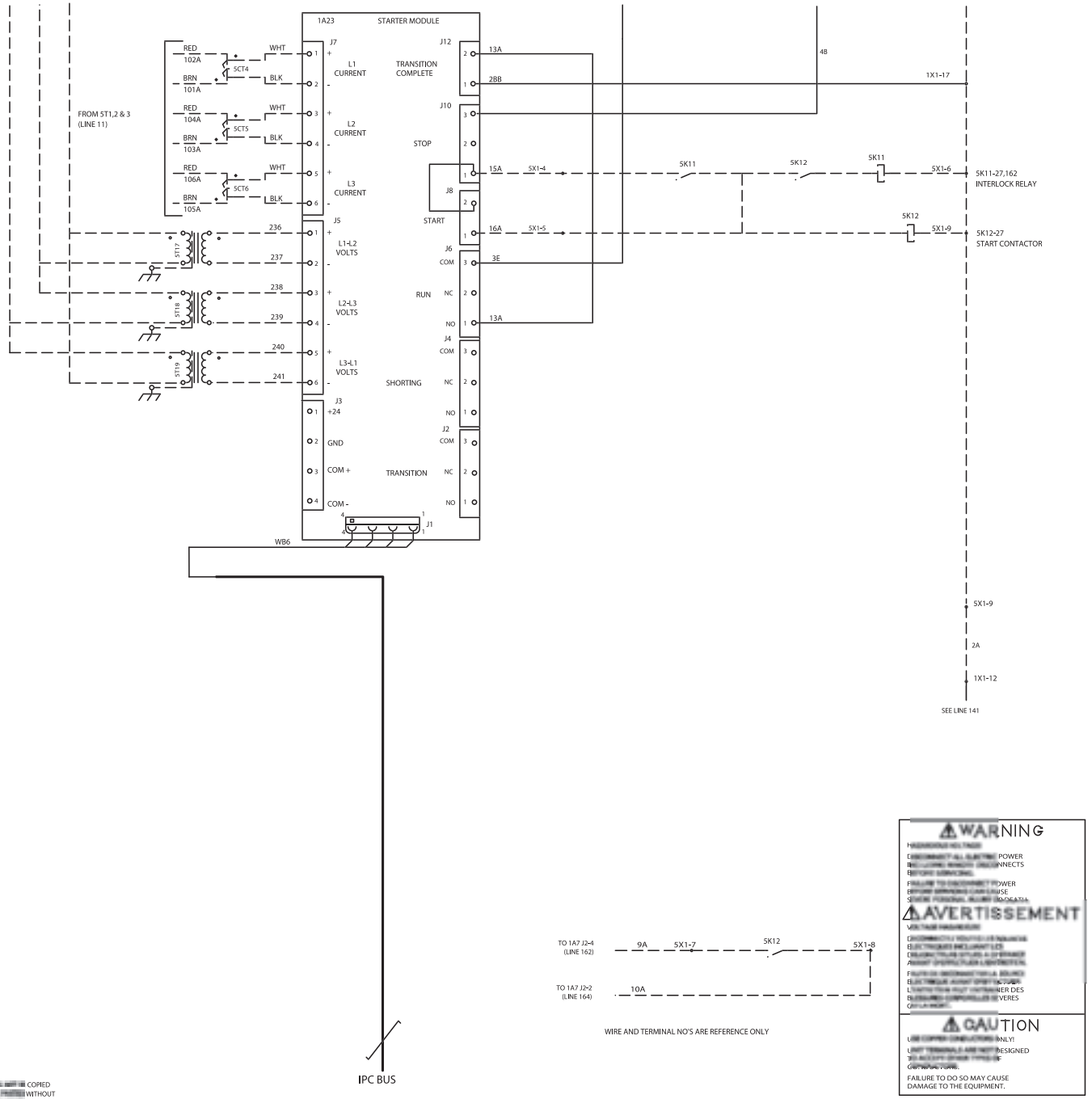
CENTRAVAC ®

CH530 SCHEMATIC WIRING CVHE, CVHF, CVHG, CDHF AND CDHG

CUSTOMER SUPPLIED ACROSS THE LINE STARTER

2309-4915 F





WARNING

AVERTISSEMENT

CAUTION

FAILURE TO DO SO MAY CAUSE
DAMAGE TO THE EQUIPMENT.

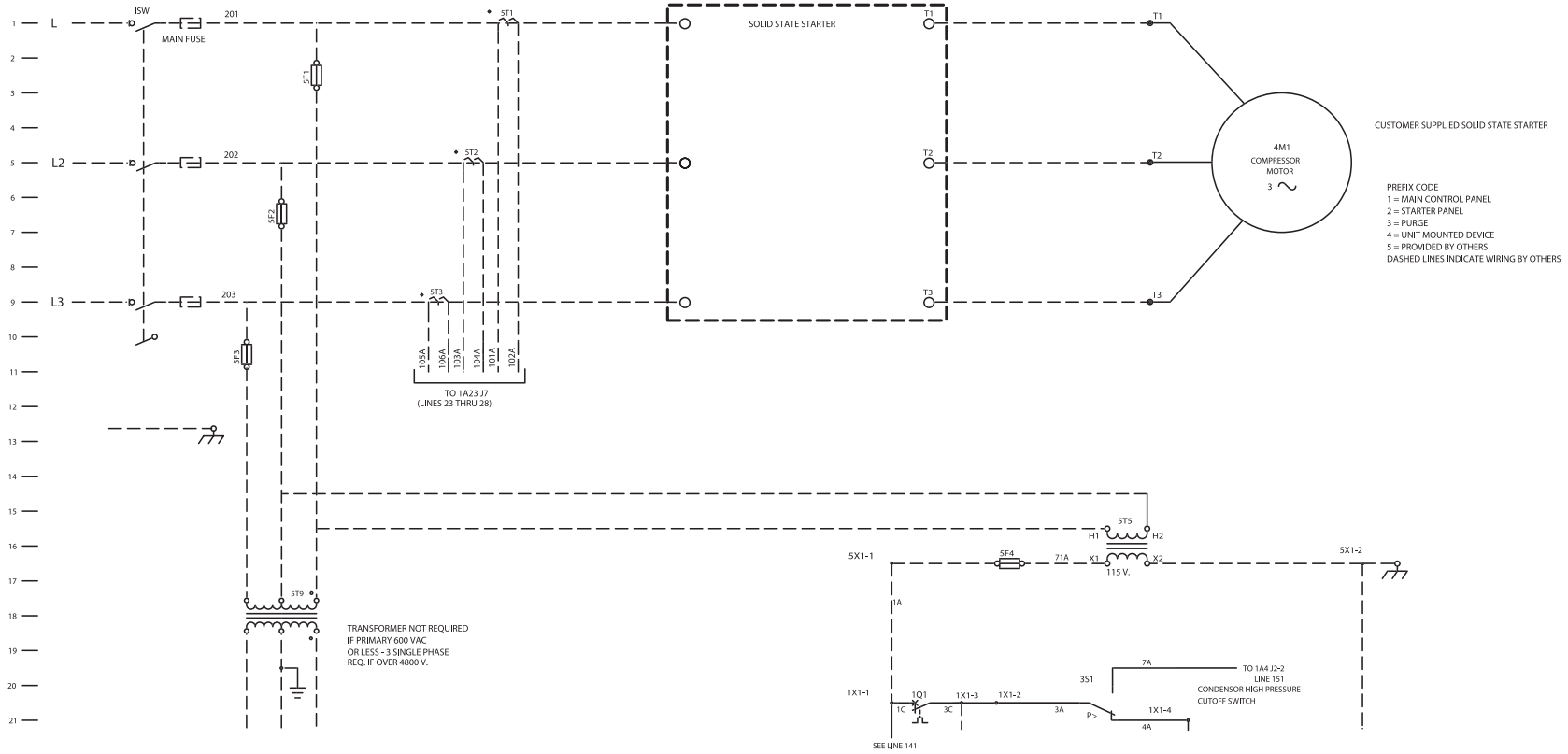
HERMETIC CENTRIFUGAL LIQUID CHILLER

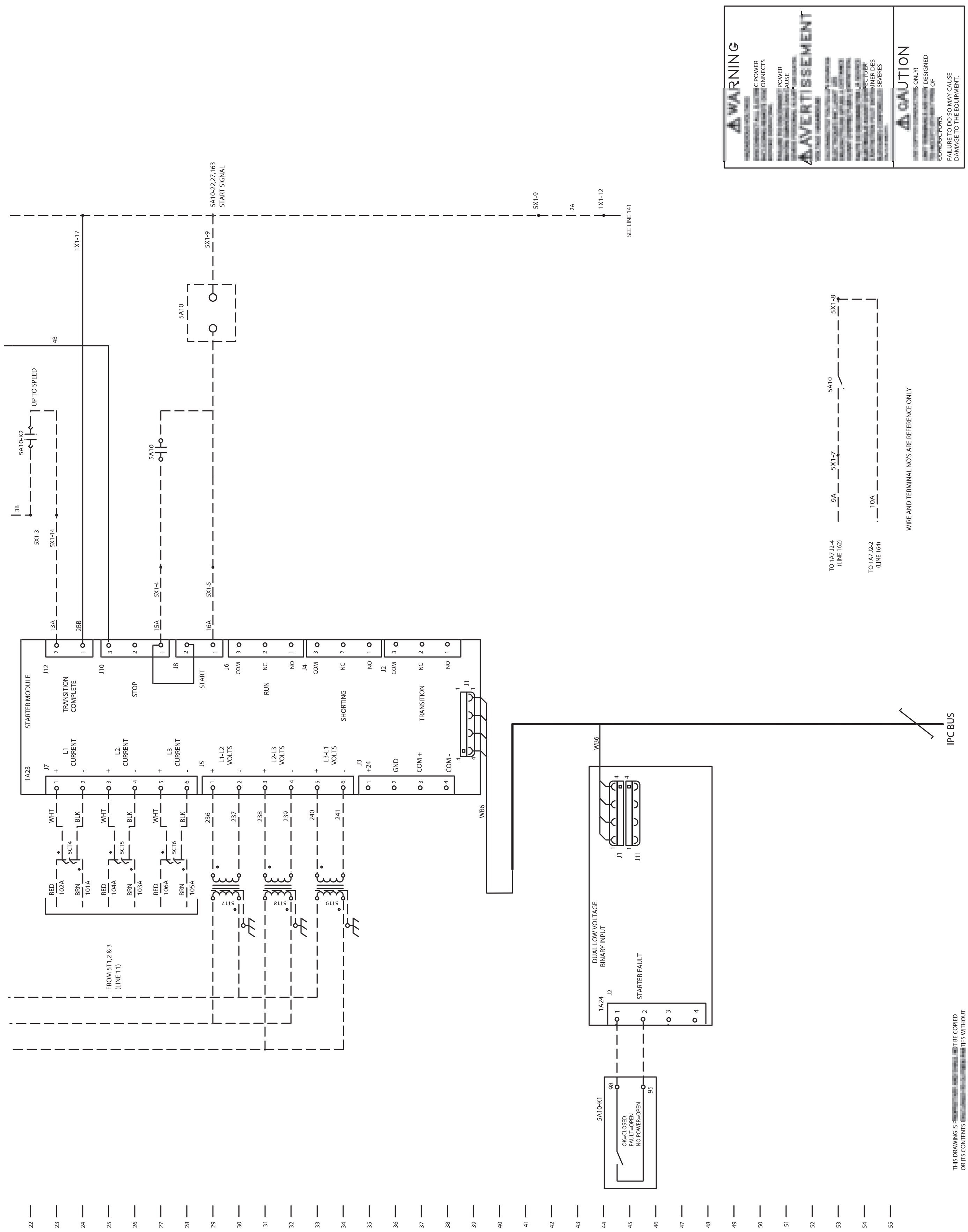
CENTRAVAC ®

CH530 SCHEMATIC WIRING CVHE, CVHF, CVHG, CDHF AND CDHG

CUSTOMER SUPPLIED SOLID STATE STARTER

2309-4916 F

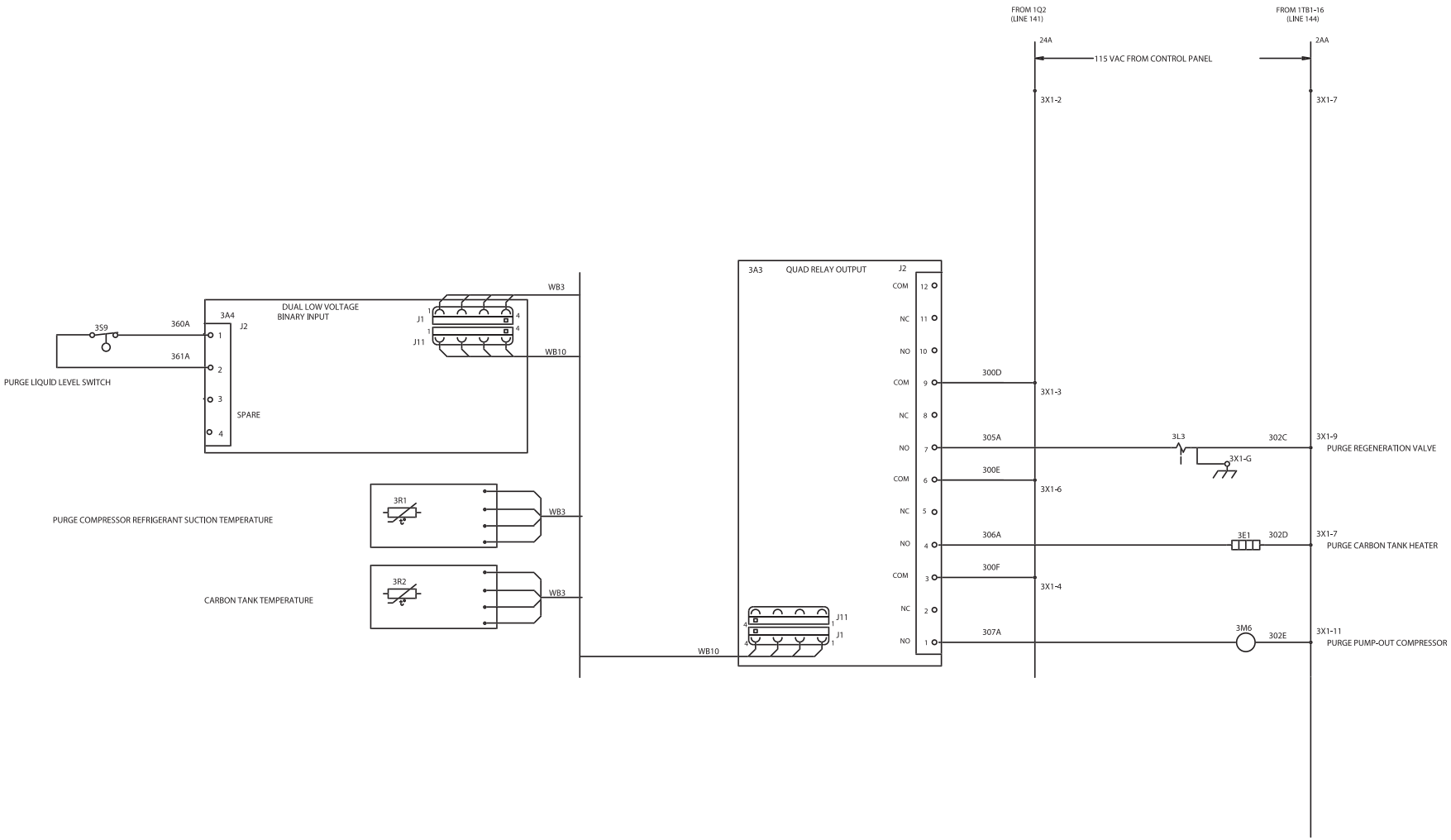



STARTER MODULE
1A23
TRANSITION COMPLETE
STOP
START
RUN
SHORTING
TRANSITION
L1 CURRENT
L2 CURRENT
L3 CURRENT
L1-L2 VOLTS
L2-L3 VOLTS
L3-L1 VOLTS
UP TO SPEED
5A10-22,27,163
START SIGNAL
SEE LINE 141
FROM ST1,2 & 3 (LINE 11)
IPC BUS
DUAL LOW VOLTAGE BINARY INPUT
1A24
STARTER FAULT
5A10-K1
OK=CLOSED
FAULT=OPEN
NO POWER=OPEN
TO 1A7 J2-4 (LINE 162)
TO 1A7 J2-2 (LINE 164)
WIRE AND TERMINAL NO'S ARE REFERENCE ONLY
WARNING
AVERTISSEMENT
CAUTION
FAILURE TO DO SO MAY CAUSE DAMAGE TO THE EQUIPMENT.

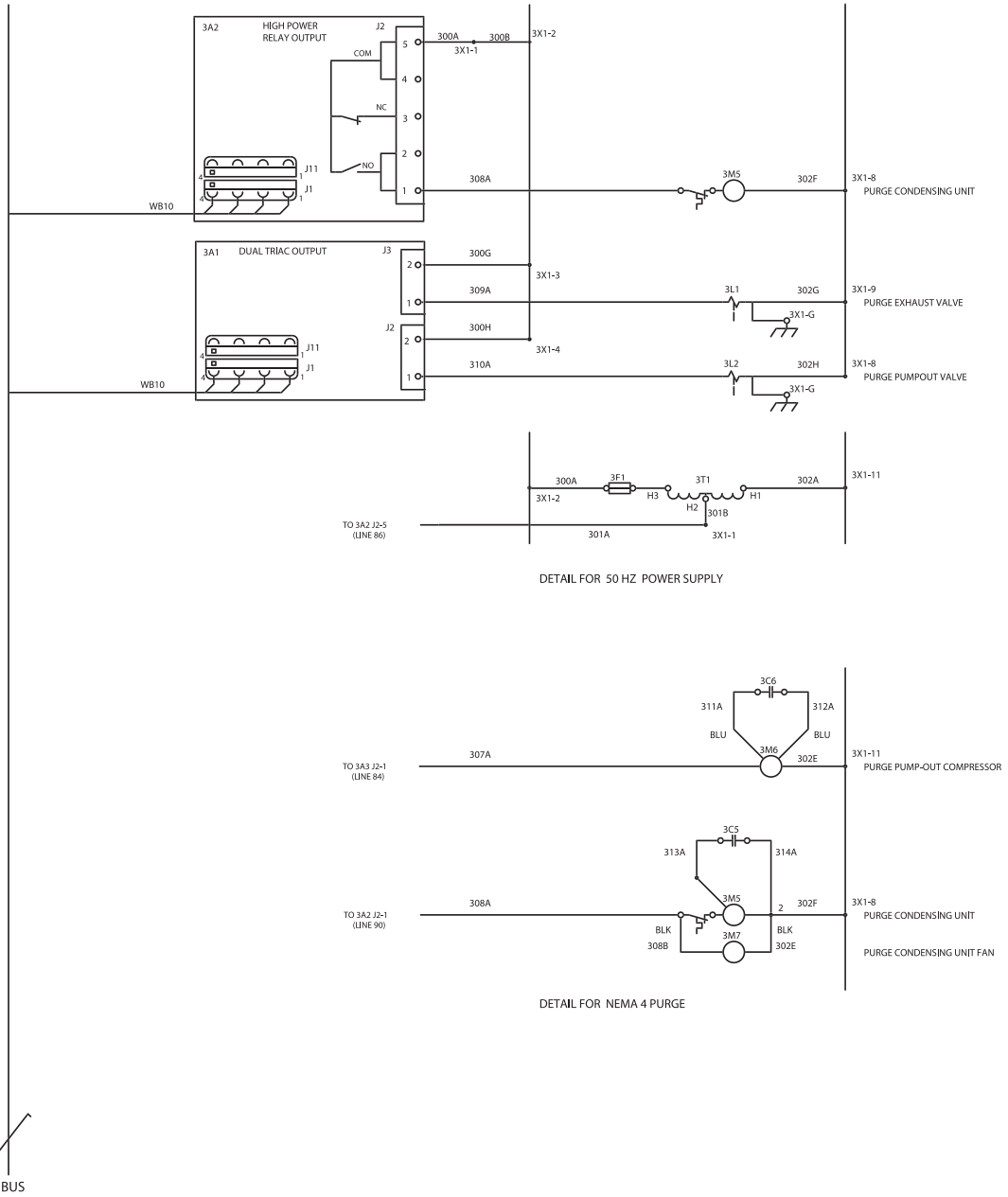
HERMETIC CENTRIFUGAL LIQUID CHILLER

CENTRAVAC®
CH530 SCHEMATIC WIRING CVHE, CVHF, CVHG, CDHF AND CDHG
PRODUCTION PURGE

2309-4917D



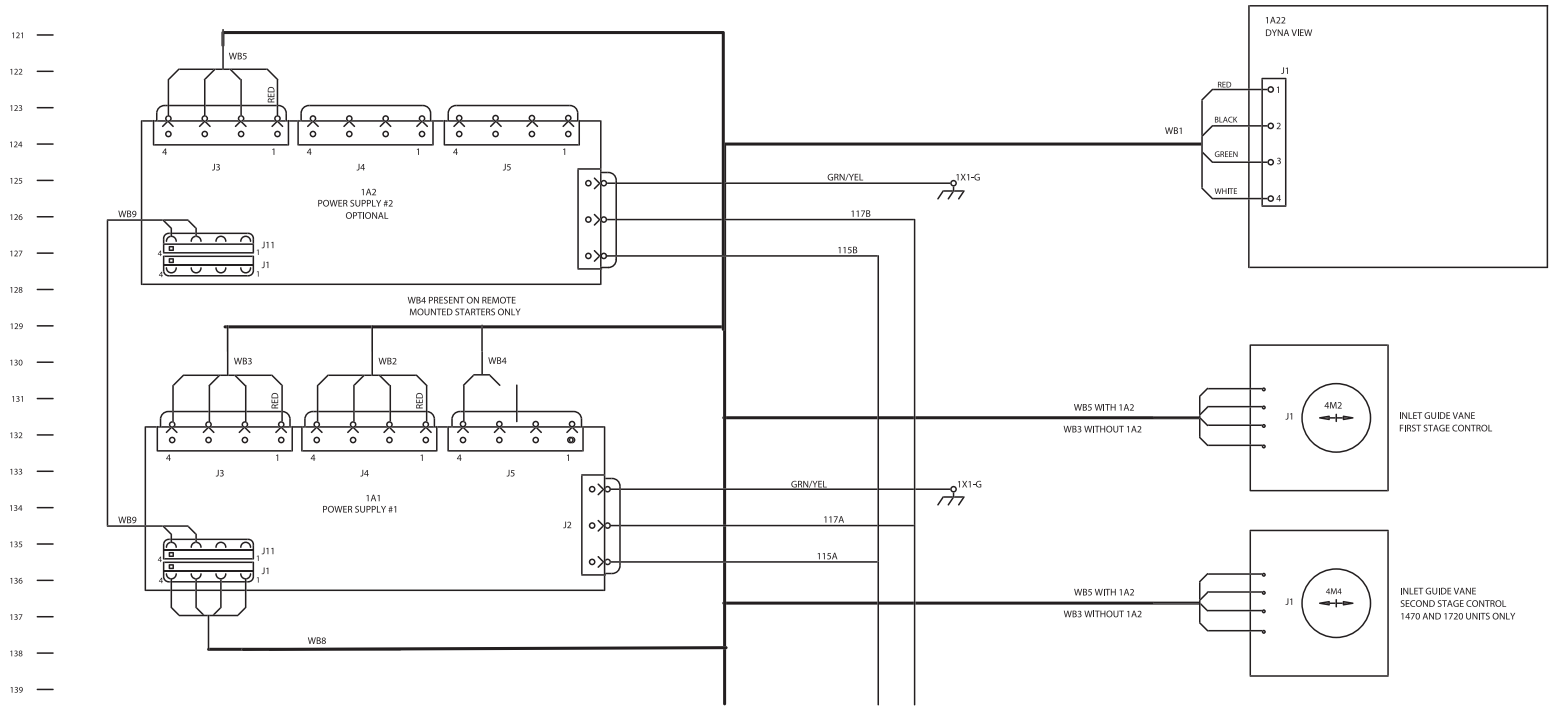

WARNING
AVERTISSEMENT
CAUTION
CONDUCTORS.
FAILURE TO DO SO MAY CAUSE
DAMAGE TO THE EQUIPMENT.

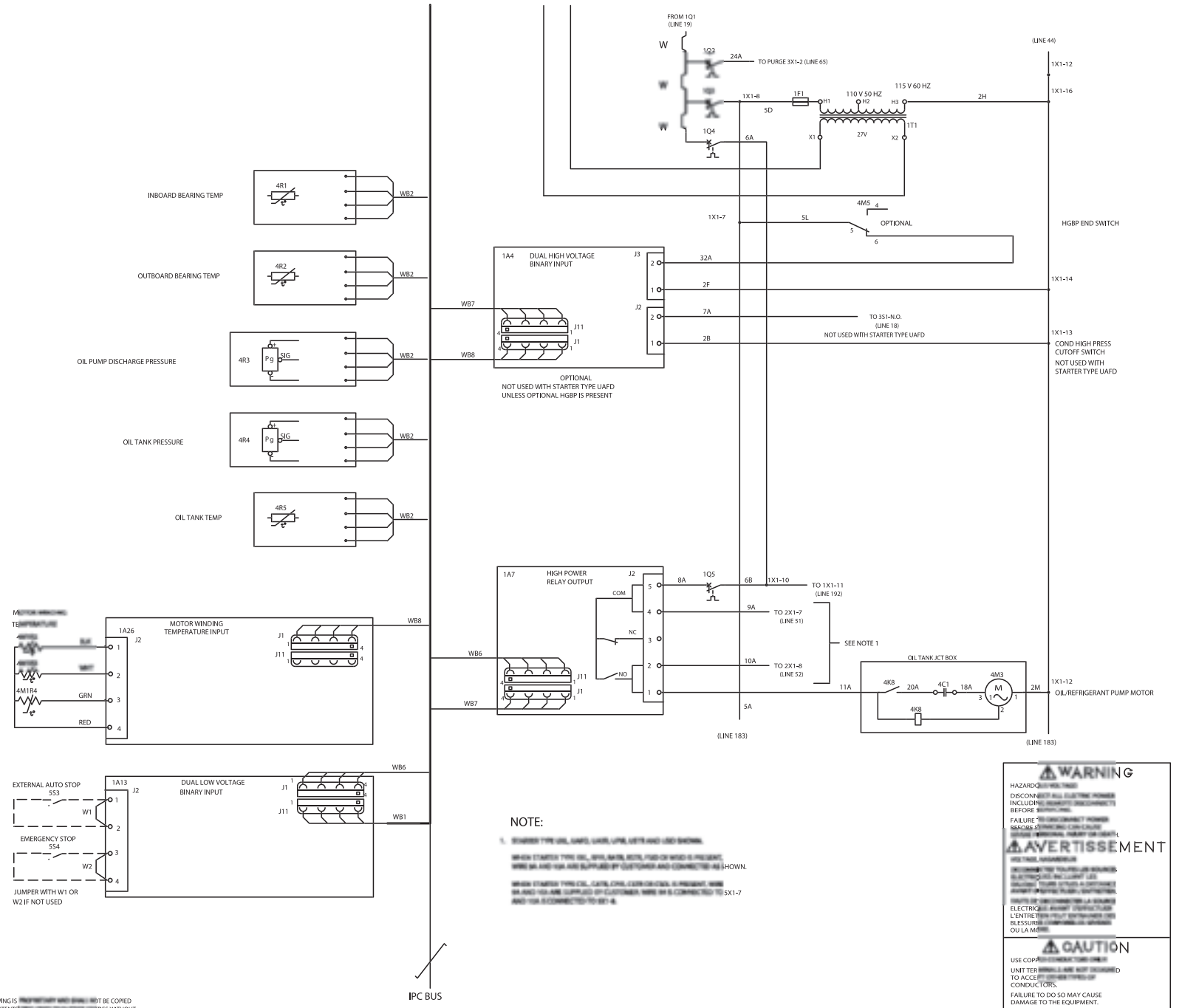

3A2
HIGH POWER
RELAY OUTPUT
J2
COM
NC
NO
J11
J1
WB10
300A
3X1-1
300B
3X1-2
308A
3M5
302F
3X1-8
PURGE CONDENSING UNIT
3A1
DUAL TRIAC OUTPUT
J3
300G
3X1-3
309A
3L1
302G
3X1-9
PURGE EXHAUST VALVE
3X1-G
300H
3X1-4
310A
3L2
302H
3X1-8
PURGE PUMPOUT VALVE
3X1-G
300A
3F1
3T1
302A
3X1-11
3X1-2
H3
H2
H1
301B
TO 3A2 J2-5
(LINE 86)
301A
3X1-1
DETAIL FOR 50 HZ POWER SUPPLY
3C6
311A
312A
BLU
BLU
3M6
307A
302E
3X1-11
PURGE PUMP-OUT COMPRESSOR
TO 3A3 J2-1
(LINE 84)
3C5
313A
314A
3M5
308A
2
302F
3X1-8
PURGE CONDENSING UNIT
TO 3A2 J2-1
(LINE 90)
BLK
BLK
3M7
308B
302E
PURGE CONDENSING UNIT FAN
DETAIL FOR NEMA 4 PURGE
IPC BUS

HERMETIC CENTRIFUGAL LIQUID CHILLER

CENTRAVAC®
CH530 SCHEMATIC WIRING CVHE, CVHF AND CVHG
UNIT CONTROLS SCHEMATIC

2309-4919E





NOTE:

1. [illegible]

[illegible] WHEN STARTER TYPE [illegible] IS PRESENT, WIRE [illegible] ARE SUPPLIED BY CUSTOMER AND CONNECTED AS SHOWN.

[illegible] WHEN STARTER TYPE [illegible] IS PRESENT, WIRE [illegible] ARE SUPPLIED BY CUSTOMER. WIRE 9A IS CONNECTED TO 5X1-7 AND 10A IS CONNECTED TO 5X1-8.

WARNING

HAZARDOUS VOLTAGE

DISCONNECT ALL ELECTRIC POWER INCLUDING REMOTE DISCONNECTS BEFORE SERVICING.

FAILURE TO DISCONNECT POWER BEFORE SERVICING CAN CAUSE SEVERE PERSONAL INJURY OR DEATH.

AVERTISSEMENT

TENSION DANGEREUSE

DÉCONNECTER TOUTES LES SOURCES ÉLECTRIQUES, Y COMPRIS LES DÉCONNECTEURS À DISTANCE AVANT L'ENTRETIEN.

L'OMISSION DE DÉCONNECTER LA SOURCE ÉLECTRIQUE AVANT D'EFFECTUER L'ENTRETIEN PEUT ENTRAÎNER DES BLESSURES GRAVES OU LA MORT.

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.

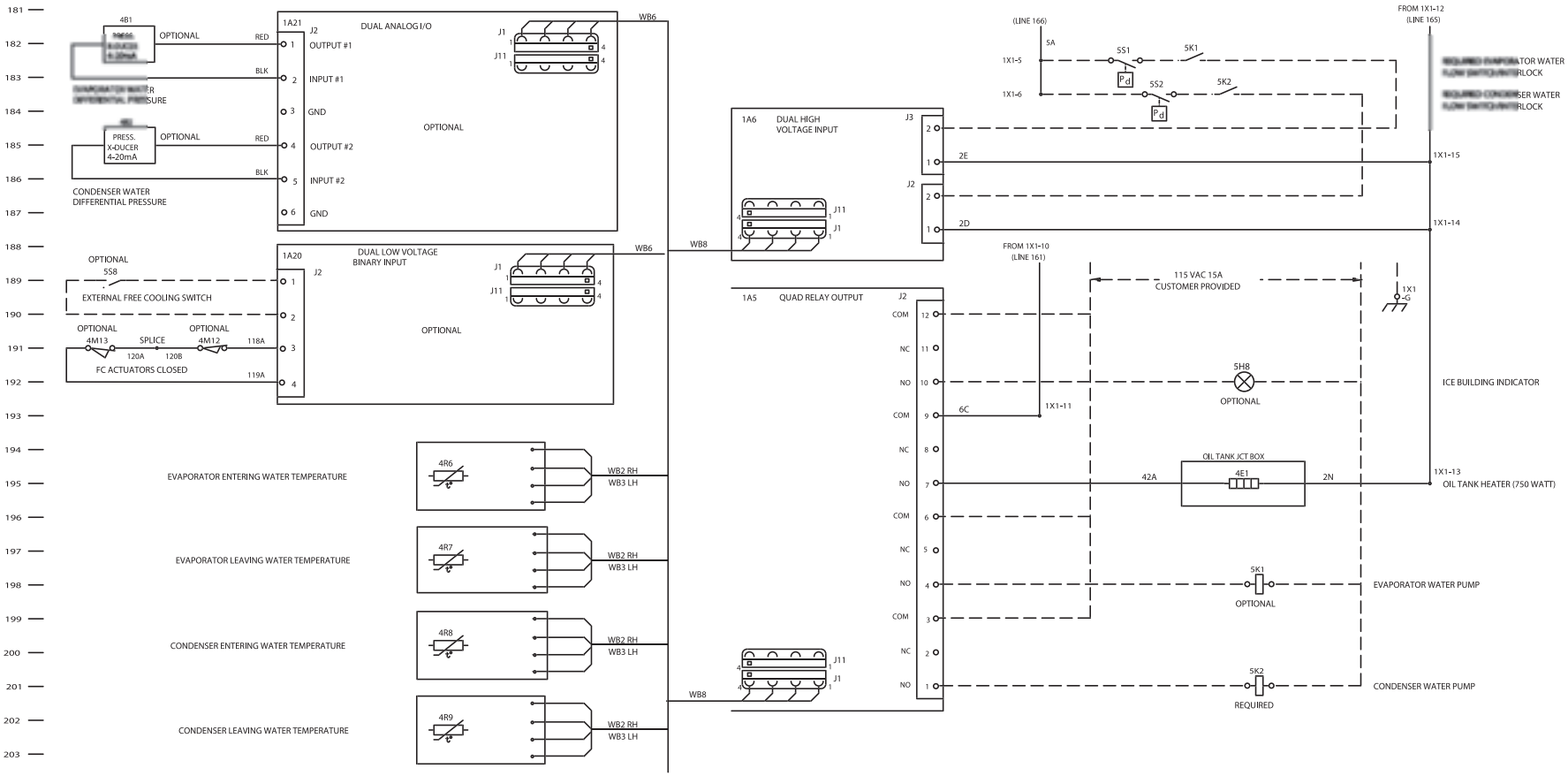
HERMETIC CENTRIFUGAL LIQUID CHILLER

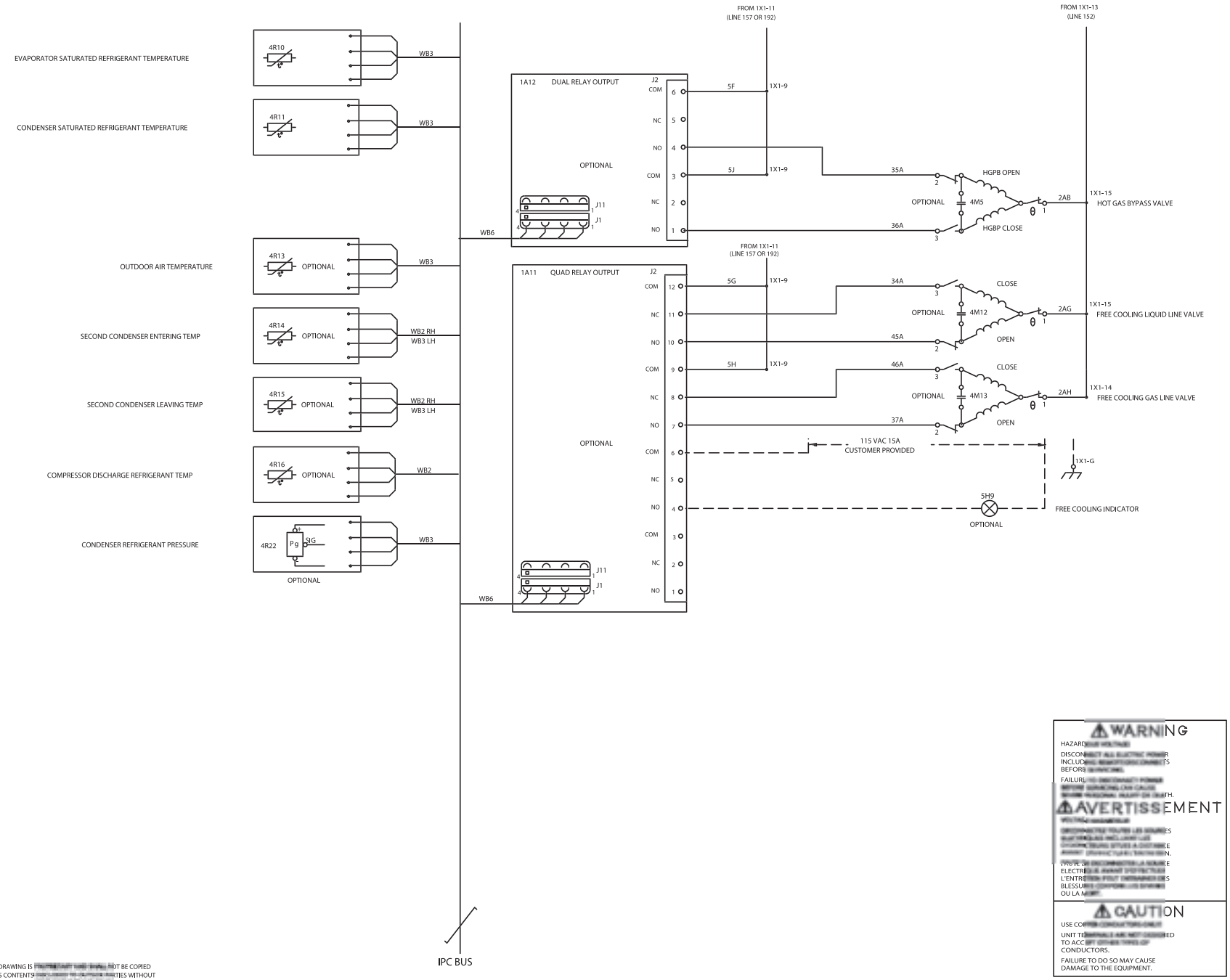
CENTRAVAC©

CH530 SCHEMATIC WIRING CVHE, CVHF AND CVHG

SYSTEM CONTROLS SCHEMATIC

2309-4920E





WARNING

HAZARD[illegible]
DISCON[illegible]
INCLUD[illegible]
BEFORE [illegible].
FAILURE [illegible]
[illegible] DEATH.

AVERTISSEMENT

[illegible]
ELECTRI[illegible]
L'ENTRE[illegible]
BLESSU[illegible]
OU LA M[illegible].

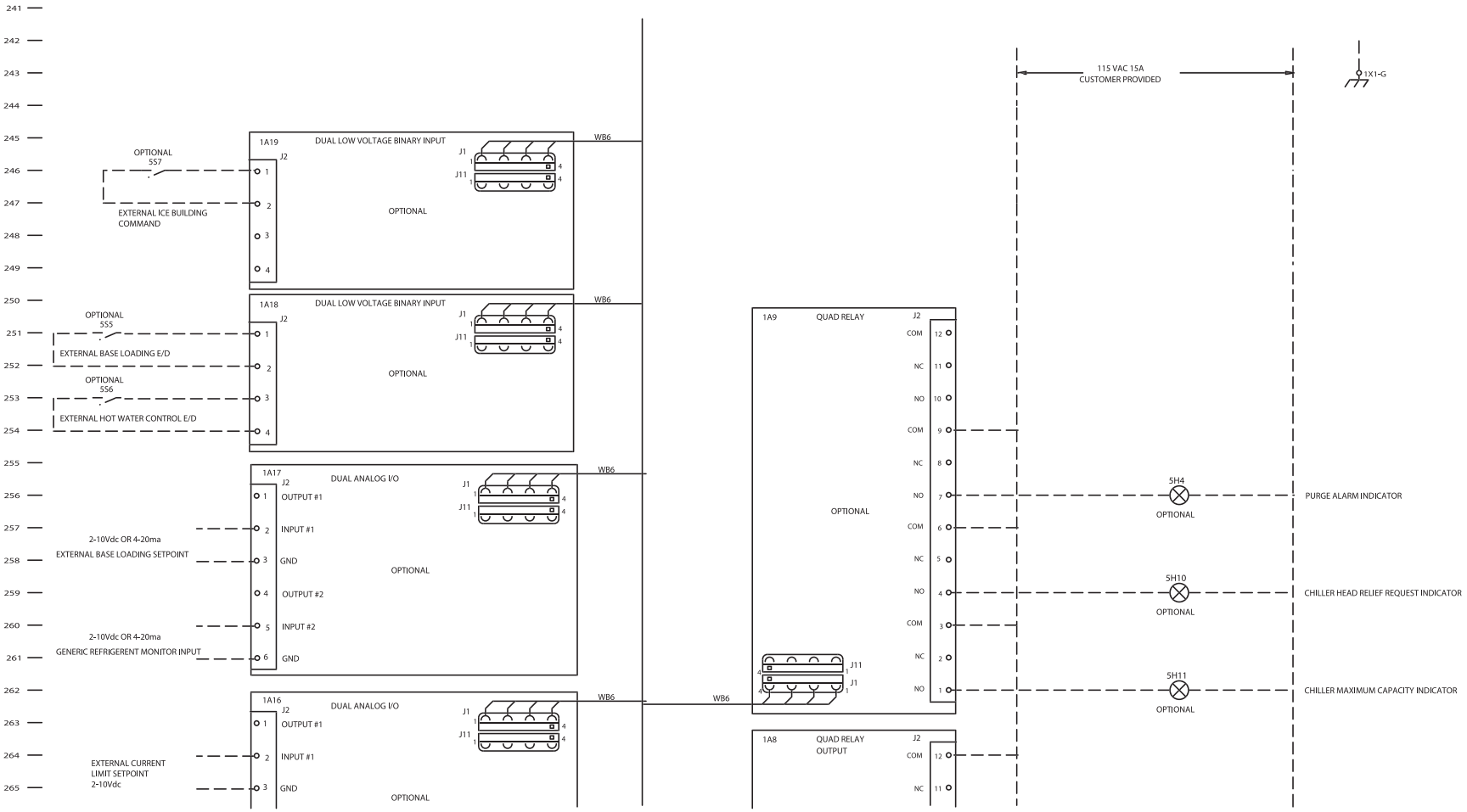
CAUTION

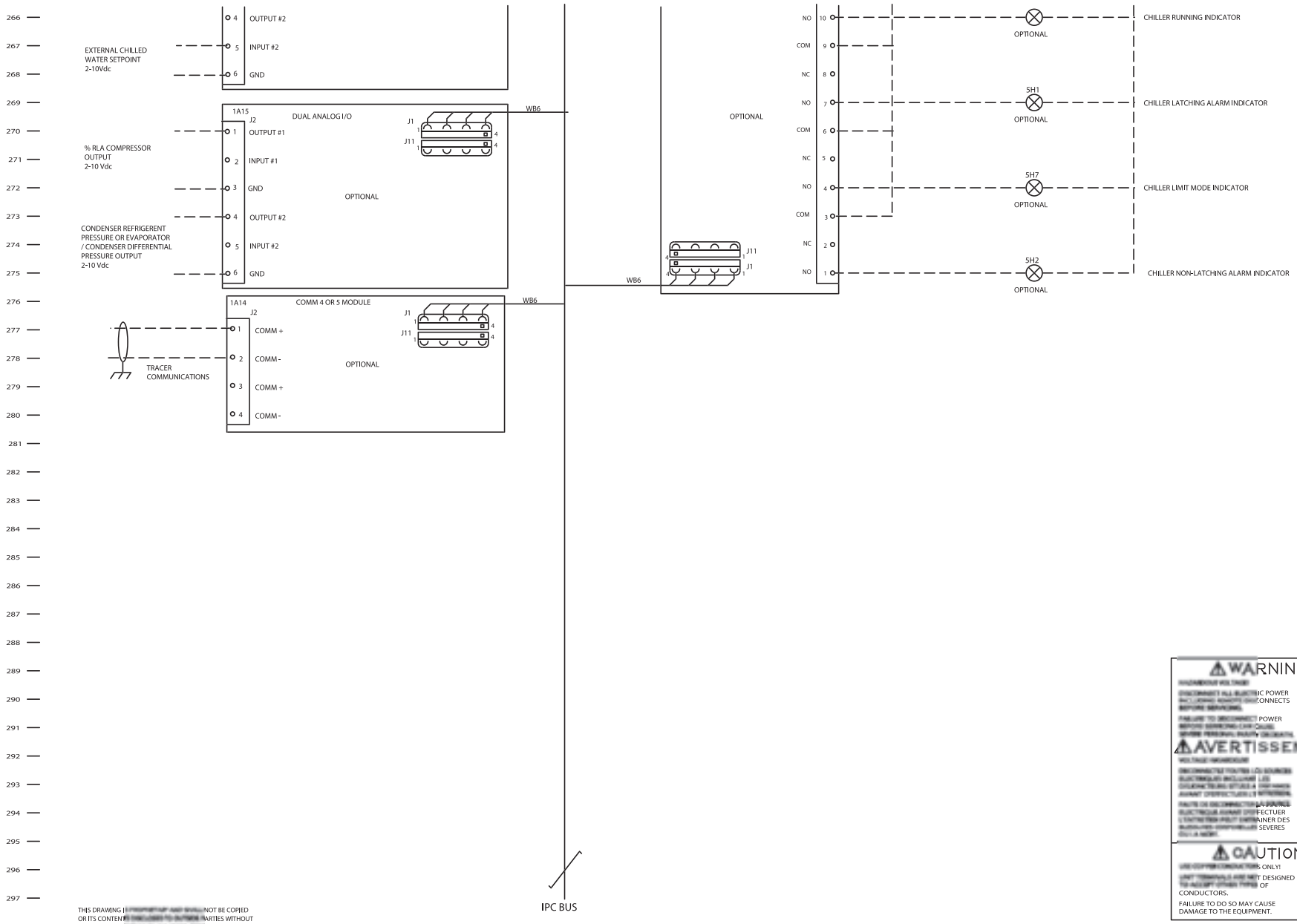
USE CO[illegible]
UNIT TE[illegible]
TO ACC[illegible]
CONDUCTORS.
FAILURE TO DO SO MAY CAUSE
DAMAGE TO THE EQUIPMENT.

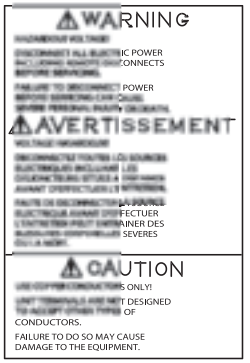
HERMETIC CENTRIFUGAL LIQUID CHILLER

CENTRAVAC®
CH530 SCHEMATIC WIRING CVHE, CVHF AND CVHG
OPTIONS SCHEMATIC

2309-4921 D

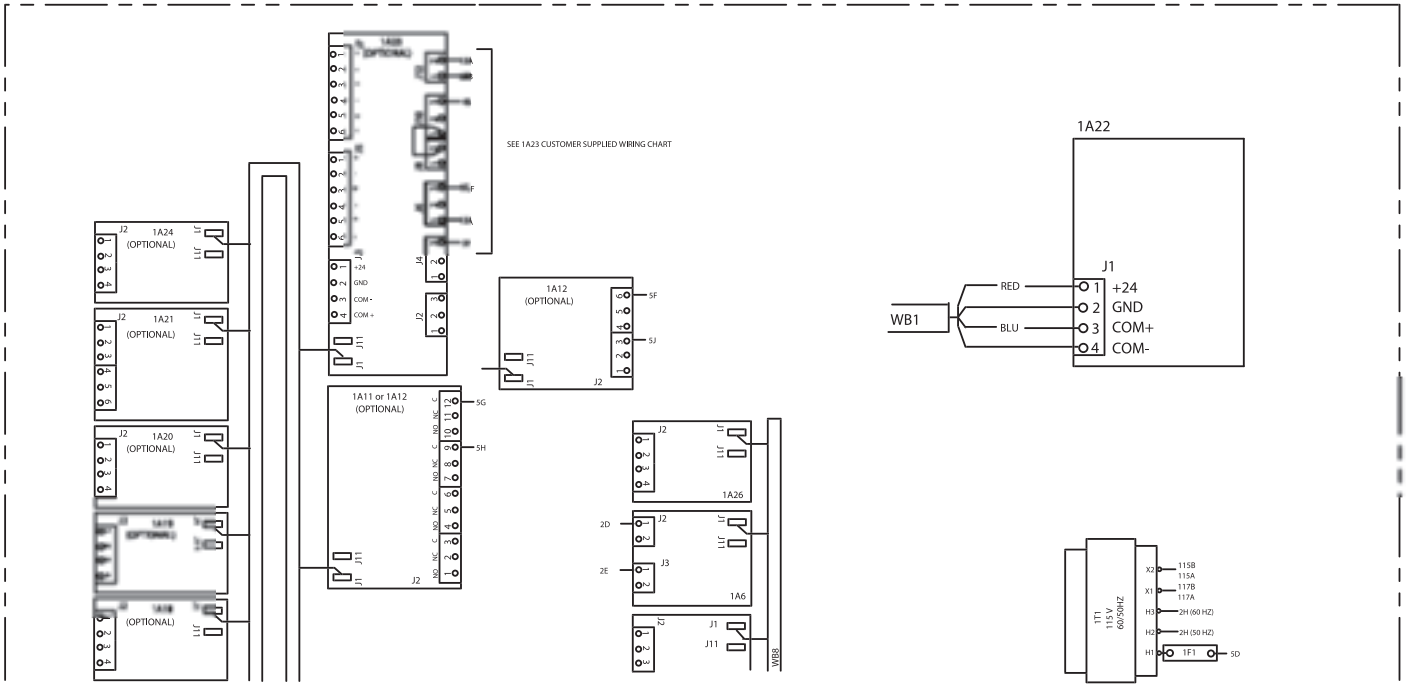






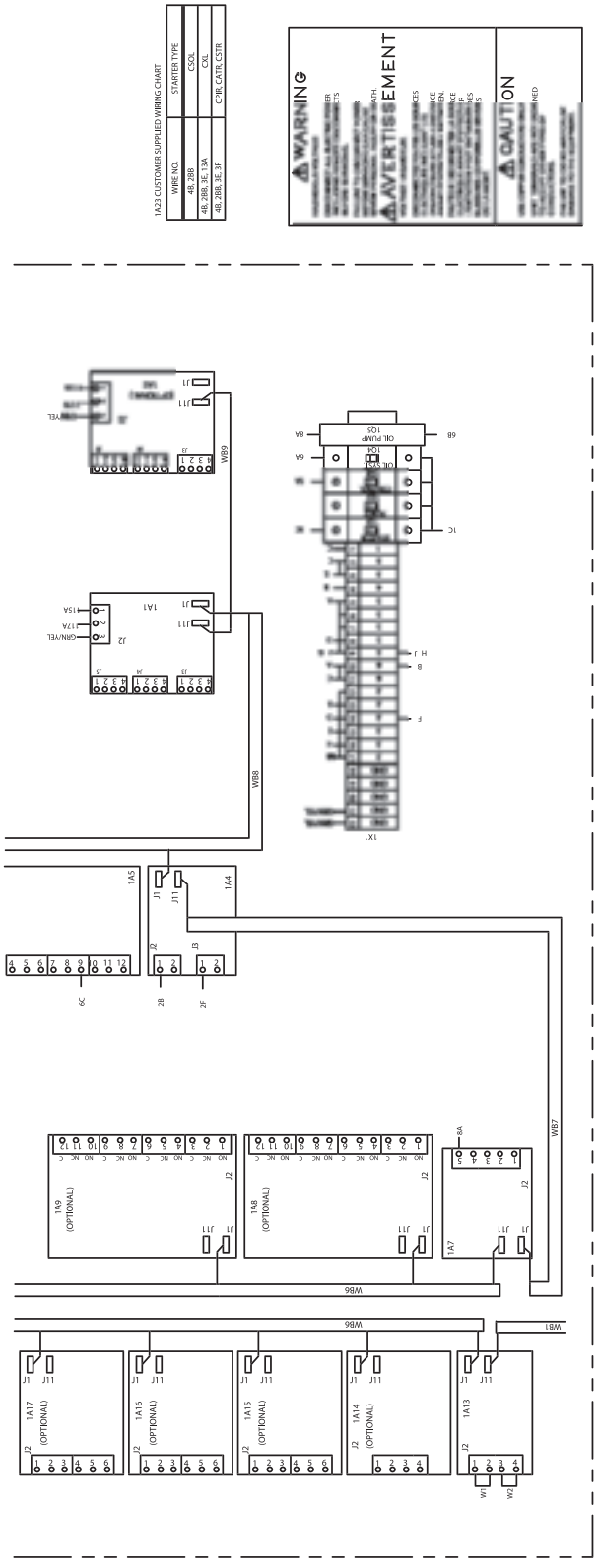
CONNECTION DIAGRAM
UNIT CONTROL PANEL
CH 530
CVHE,CVHF,CVHG

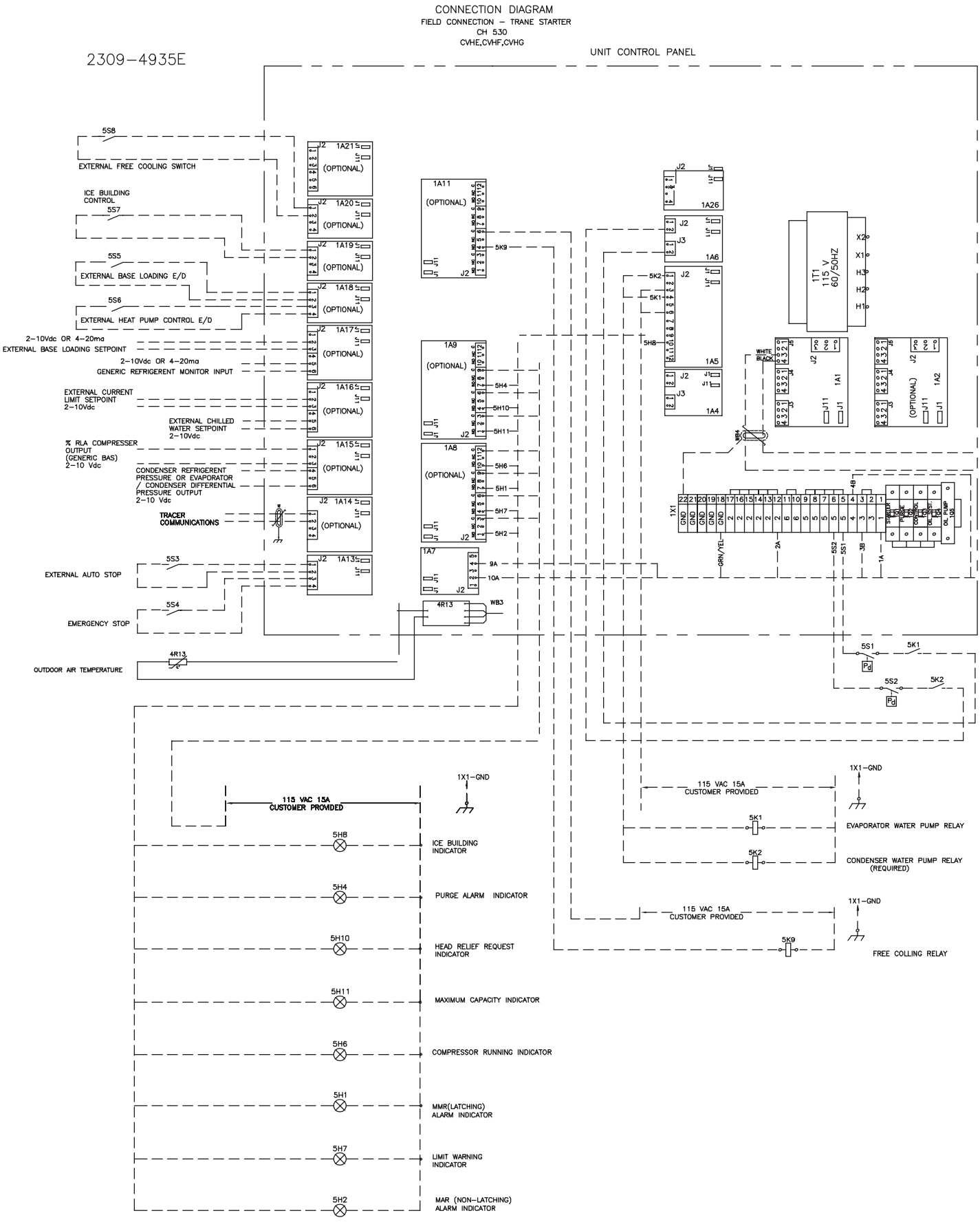
2309-4923E

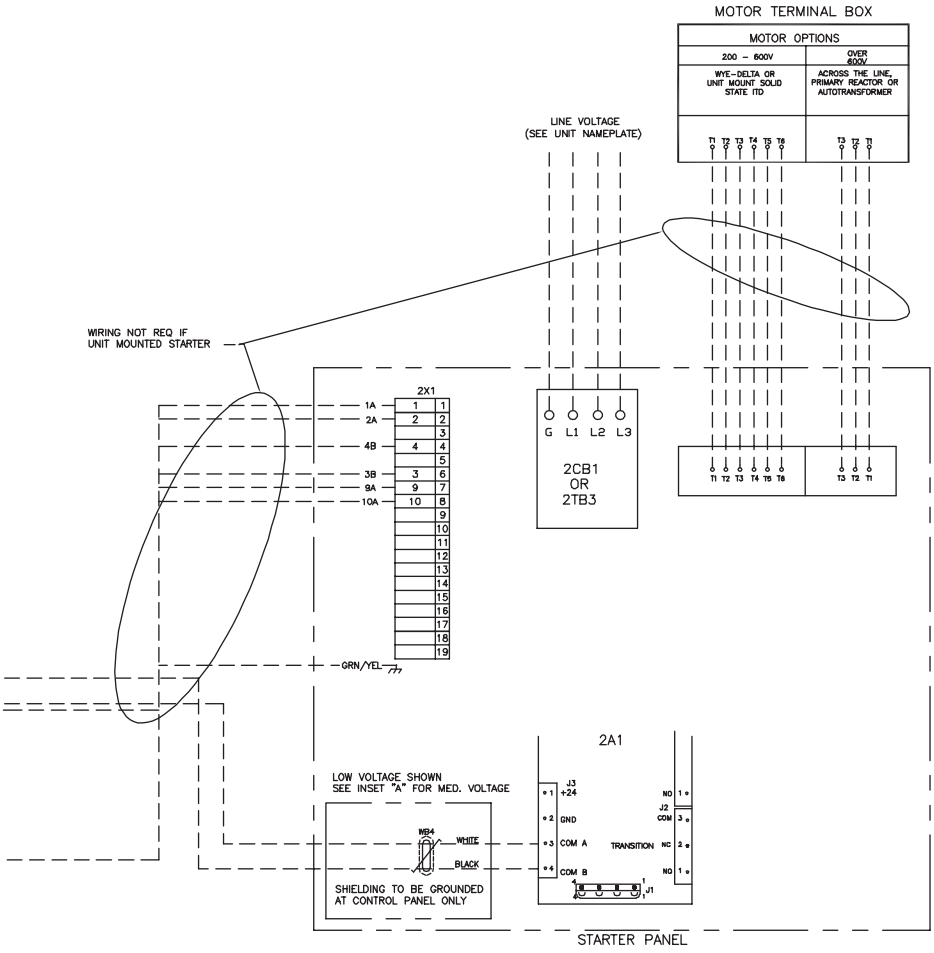


NOTES:

WIRE NO.	
1C	
6A	
6B	
8A	
GND	#14 GREEN / YELLOW
ALL OTHERS	#16 RED


1A23 CUSTOMER SUPPLIED WIRING CHART
WIRE NO.
STARTER TYPE
4B, 28B
CSOL
4B, 28B, 3E, 13A
CAL
4B, 28B, 3E, 3F
CPIR, CATR, CSTR
WARNING
AVERTISSEMENT
CAUTION
1A9 (OPTIONAL)
1A8 (OPTIONAL)
1A7
1A17 (OPTIONAL)
1A16 (OPTIONAL)
1A15 (OPTIONAL)
1A14 (OPTIONAL)
1A13
W89
W88
W86
W87
W81

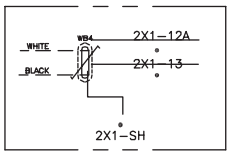

CONNECTION DIAGRAM
FIELD CONNECTION – TRANE STARTER
CH 530
CVHE,CVHF,CVHG
2309–4935E
UNIT CONTROL PANEL
5S8
EXTERNAL FREE COOLING SWITCH
ICE BUILDING CONTROL
5S7
5S5
EXTERNAL BASE LOADING E/D
5S6
EXTERNAL HEAT PUMP CONTROL E/D
2–10Vdc OR 4–20ma
EXTERNAL BASE LOADING SETPOINT
2–10Vdc OR 4–20ma
GENERIC REFRIGERENT MONITOR INPUT
EXTERNAL CURRENT LIMIT SETPOINT 2–10Vdc
EXTERNAL CHILLED WATER SETPOINT 2–10Vdc
% RLA COMPRESSER OUTPUT (GENERIC BAS) 2–10 Vdc
CONDENSER REFRIGERENT PRESSURE OR EVAPORATOR / CONDENSER DIFFERENTIAL PRESSURE OUTPUT 2–10 Vdc
TRACER COMMUNICATIONS
5S3
EXTERNAL AUTO STOP
5S4
EMERGENCY STOP
4R13
OUTDOOR AIR TEMPERATURE
1A21 (OPTIONAL)
1A20 (OPTIONAL)
1A19 (OPTIONAL)
1A18 (OPTIONAL)
1A17 (OPTIONAL)
1A16 (OPTIONAL)
1A15 (OPTIONAL)
1A14 (OPTIONAL)
1A13 (OPTIONAL)
1A11 (OPTIONAL)
1A9 (OPTIONAL)
1A8 (OPTIONAL)
1A7
1A26
1A6
1A5
1A4
1A1
1A2 (OPTIONAL)
5K9
5K2
5K1
5H8
5H4
5H10
5H11
5H6
5H1
5H7
5H2
9A
10A
WB3
WB4
1T1 115 V 60/50HZ
X2
X1
H3
H2
H1
WHITE
BLACK
1X1
GND
GRN/YEL
2A
5S2
5S1
3B
1A
4B
SWITCH LOGIC
PUMP CONTROL
OIL PUMP CONTROL
OIL PUMP CNTCT
OIL PUMP CNTCT
5S1
5K1
5S2
5K2
Pd
115 VAC 15A CUSTOMER PROVIDED
1X1–GND
5H8
ICE BUILDING INDICATOR
5H4
PURGE ALARM INDICATOR
5H10
HEAD RELIEF REQUEST INDICATOR
5H11
MAXIMUM CAPACITY INDICATOR
5H6
COMPRESSOR RUNNING INDICATOR
5H1
MMR(LATCHING) ALARM INDICATOR
5H7
LIMIT WARNING INDICATOR
5H2
MAR (NON–LATCHING) ALARM INDICATOR
115 VAC 15A CUSTOMER PROVIDED
1X1–GND
5K1
EVAPORATOR WATER PUMP RELAY
5K2
CONDENSER WATER PUMP RELAY (REQUIRED)
115 VAC 15A CUSTOMER PROVIDED
1X1–GND
5K9
FREE COLLING RELAY



EVAPORATOR WATER FLOW INTERLOCK (REQUIRED)

CONDENSER WATER FLOW INTERLOCK (REQUIRED)

INSET "A" MEDIUM VOLTAGE



SIMPLEX FIELD WIRING CIRCUIT SELECTION INFORMATION

WIRE # OR DEVICE	CIRCUIT SELECTION INFORMATION
Supply and Motor leads	See name plate; minimum circuit ampacity
1A, 2A, GRN/ YEL	4000VA @ 115 VAC
3B, 4B, 13A*, 15A*, 16A*, 18A*	Contact Rating – 2.88A Inductive, 1/3 HP, 0.25KW @ 115VAC
9A, 10A	Pump Motor – 1 phase 3/4 HP, 11.7 Full Load Amps @ 115VAC
5H1, 2, 4, 6, 7, 8, 10, 11	Contact Rating – 2.88A Inductive, 1/3 HP, 0.25KW @ 115VAC
5K1, 2	Contact Rating – 2.88A Inductive, 1/3 HP, 0.25KW @ 115VAC
5A7, WB4	Twisted Shielded pair, 30 Volts, max length 1500 feet, Beldon type 8760 recommended
5S3, 4, 5, 6, 7, 8	24 VDC 12mA resistive load
5A1, 2, 3, 4, 5, 6	2–10 VDC or 4–20mA Input/Output
236*, 237*, 238*, 239*, 240*, 241*	See Trane Specification S6516–0513
5CT4*, 5CT5*, 5CT6*; white/ black	See Trane Specification S6516–0513

*indicates customer supplied starter wiring

NOTES:

1. DASHED LINES INDICATE FIELD WIRING BY OTHERS. CHECK SALES ORDER TO DETERMINE WHICH OPTIONS ARE SPECIFIED.
2. DO NOT ROUTE LOW VOLTAGE (30V MAX) WITH CONTROL VOLTAGE (115V) AND DO NOT POWER UNIT UNTIL CHECK–OUT AND START–UP PROCEDURES HAVE BEEN COMPLETED.
3. EVAPORATOR AND CONDENSER FLOW SWITCHES ARE REQUIRED. THEY CONTAIN DPDT CONTACTS. THE SEPERATE FLOW SWITCHES ARE RUN IN SERIES WITH SEPERATE AUX CONTACTS FOR THE CONDENSER PUMP AND SEPERATE AUX CONTACTS FOR THE EVAPORATOR PUMP. THEY MUST BE INSTALLED AND WIRED TO THE APPROPRIATE TRANE PANEL BY THE INSTALLING CONTRACTOR. PURCHASE OF SWITCHES FROM THE TRANE CO. IS OPTIONAL.
4. SEE INSET "A" FOR CONNECTIONS OF MEDIUM VOLTAGE STARTERS, REMOTE ACROSS THE LINE, REMOTE AUTO TRANSFORMER AND REMOTE PRIMARY REACTOR.

⚠ WARNING

HAZARDOUS VOLTAGE!

DISCONNECT ALL ELECTRIC POWER INCLUDING REMOTE DISCONNECTS BEFORE SERVICING.

FAILURE TO DISCONNECT POWER BEFORE SERVICING CAN CAUSE SEVERE PERSONAL INJURY OR DEATH.

⚠ AVERTISSEMENT

VOLTAGE HASARDEUX!

DECONNECTEZ TOUTES LES SOURCES ELECTRIQUES INCLUANT LES DISJONCTEURS SITUES A DISTANCE AVANT D'EFFECTUER L'ENTRETIEN.

FAUTE DE DECONNECTER LA SOURCE ELECTRIQUE AVANT D'EFFECTUER L'ENTRETIEN PEUT ENTRAINER DES BLESSURES CORPORELLES SEVERES OU LA MORT.

⚠ CAUTION

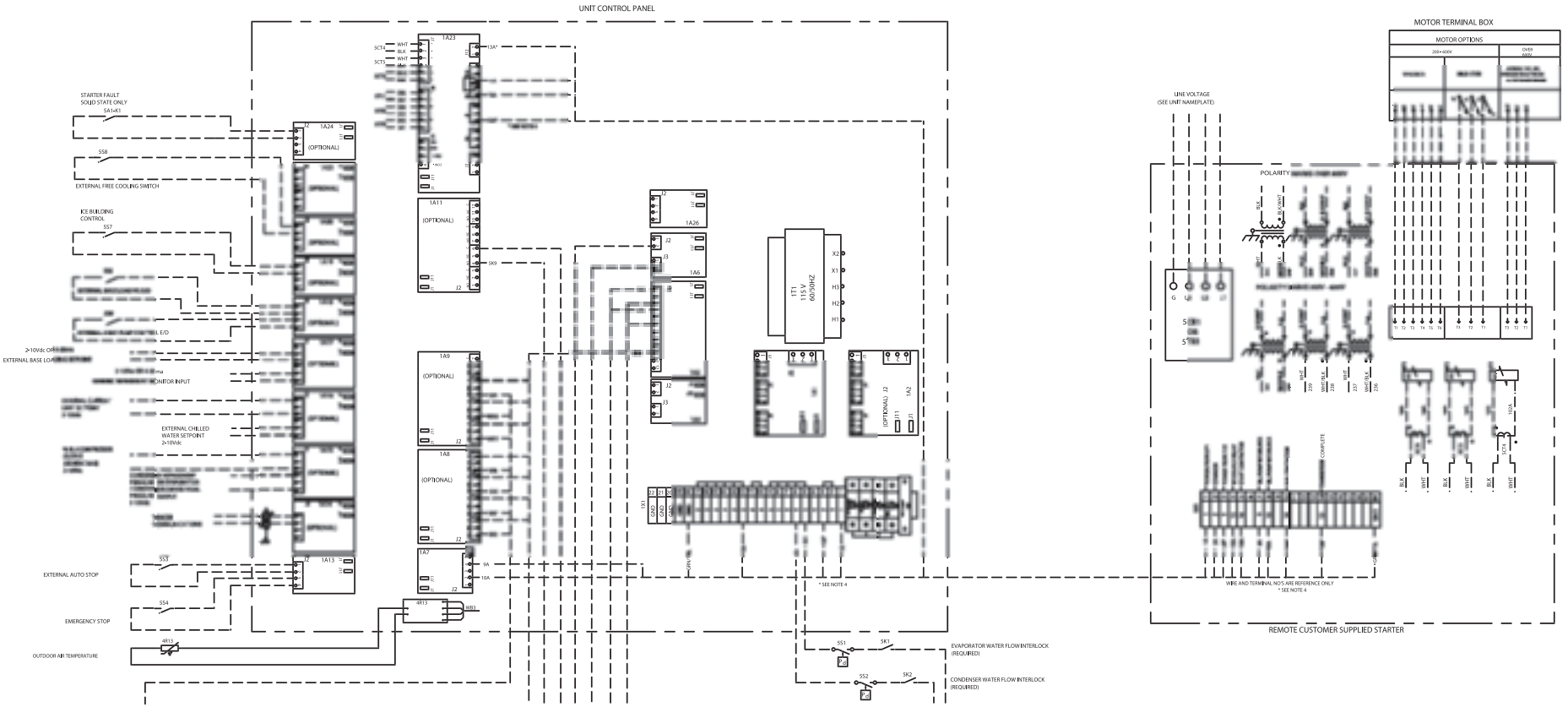
USE COPPER CONDUCTORS ONLY!

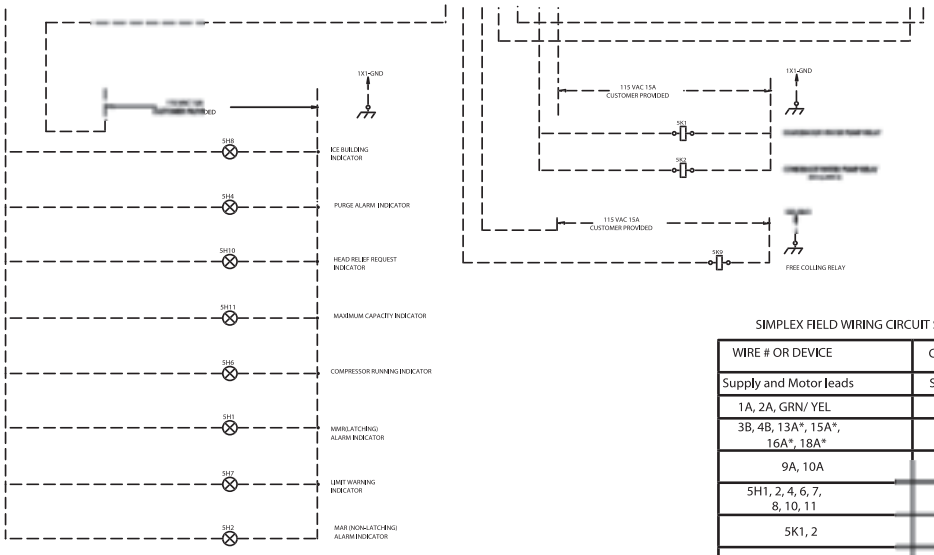
UNIT TERMINALS ARE NOT DESIGNED TO ACCEPT OTHER TYPES OF CONDUCTORS.

FAILURE TO DO SO MAY CAUSE DAMAGE TO THE EQUIPMENT.

CONNECTION DIAGRAM
FIELD CONNECTION
CUSTOMER SUPPLIED STARTER
CH 530
CVHE,CVHF,CVHG

2309-4936E





SIMPLEX FIELD WIRING CIRCUIT SELECTION INFORMATION

WIRE # OR DEVICE	CIRCUIT SELECTION INFORMATION
Supply and Motor leads	See name plate, minimum circuit ampacity
1A, 2A, GRN/ YEL	4000VA @ 115 VAC
3B, 4B, 13A*, 15A*, 16A*, 18A*	Contact Rating - 2.88A Inductive, 1/3 HP, 0.250W @ 115VAC
9A, 10A	Pump Motor - 1 phase 3/4 HP, 11.2 Full Load Amps @ 115VAC
5H1, 2, 4, 6, 7, 8, 10, 11	Contact Rating - 2.88A Inductive, 1/3 HP, 0.250W @ 115VAC
5K1, 2	Contact Rating - 2.88A Inductive, 1/3 HP, 0.250W @ 115VAC
5A7, WB4	Twisted Shielded pair, 30 Volts, max length 1500 feet, Belden type 8760 recommended
5S3, 4, 5, 6, 7, 8	24 VDC 12mA resistive load
5A1, 2, 3, 4, 5, 6	2-10 VDC or 4-20mA Input/Output
236*, 237*, 238*, 239*, 240*, 241*	See Trane Specification 50516-0513
5CT4*, 5CT5*, 5CT6*; white/ black	See Trane Specification 50516-0513

*indicates customer supplied starter wiring

NOTES:

1. DASHED LINES INDICATE FIELD WIRING BY OTHERS. CHECK SALES ORDER TO DETERMINE WHICH OPTIONS ARE SPECIFIED.
2. DO NOT ROUTE LOW VOLTAGE (30V MAX) WITH CONTROL VOLTAGE (115V) AND DO NOT POWER UNIT UNTIL CHECK-OUT AND START-UP PROCEDURES HAVE BEEN COMPLETED.
3. EVAPORATOR AND CONDENSER FLOW SWITCHES ARE REQUIRED. THEY CONTAIN DPDT CONTACTS. THE SEPERATE FLOW SWITCHES ARE RUN IN SERIES WITH SEPERATE AUX CONTACTS FOR THE CONDENSER PUMP AND SEPERATE AUX CONTACTS FOR THE EVAPORATOR PUMP. THEY MUST BE INSTALLED AND WIRED TO THE APPROPRIATE TRANE PANEL BY THE INSTALLING CONTRACTOR. PURCHASE OF SWITCHES FROM THE TRANE CO. IS OPTIONAL.
4. WIRE NOS 1A, 3A, 9A, 10A, 15A AND 16A ARE REQUIRED ON ALL CUSTOMER SUPPLIED STARTERS. IN ADDITION, 3B AND 13A ARE REQUIRED ON SOLID STATE STARTERS, AND 3B, 13A, AND 18A ARE REQUIRED ON PRIMARY REACTOR, AUTOTRANSFORMER AND WYE-DELTA STARTERS.

⚠ WARNING

HAZARDOUS VOLTAGE!

DISCONNECT ALL ELECTRIC POWER INCLUDING REMOTE DISCONNECTS BEFORE SERVICING.

FAILURE TO DISCONNECT POWER BEFORE SERVICING CAN CAUSE SEVERE PERSONAL INJURY OR DEATH.

⚠ AVERTISSEMENT

VOLTAGE HASARDEUX!

DECONNECTEZ TOUTES LES SOURCES ELECTRIQUES INCLUANT LES DISJONCTEURS SITUES A DISTANCE AVANT D'EFFECTUER L'ENTRETIEN.

FAUTE DE DECONNECTER LA SOURCE ELECTRIQUE AVANT D'EFFECTUER L'ENTRETIEN PEUT ENTRAINER DES BLESSURES CORPORELLES SEVERES OU LA MORT.

⚠ CAUTION

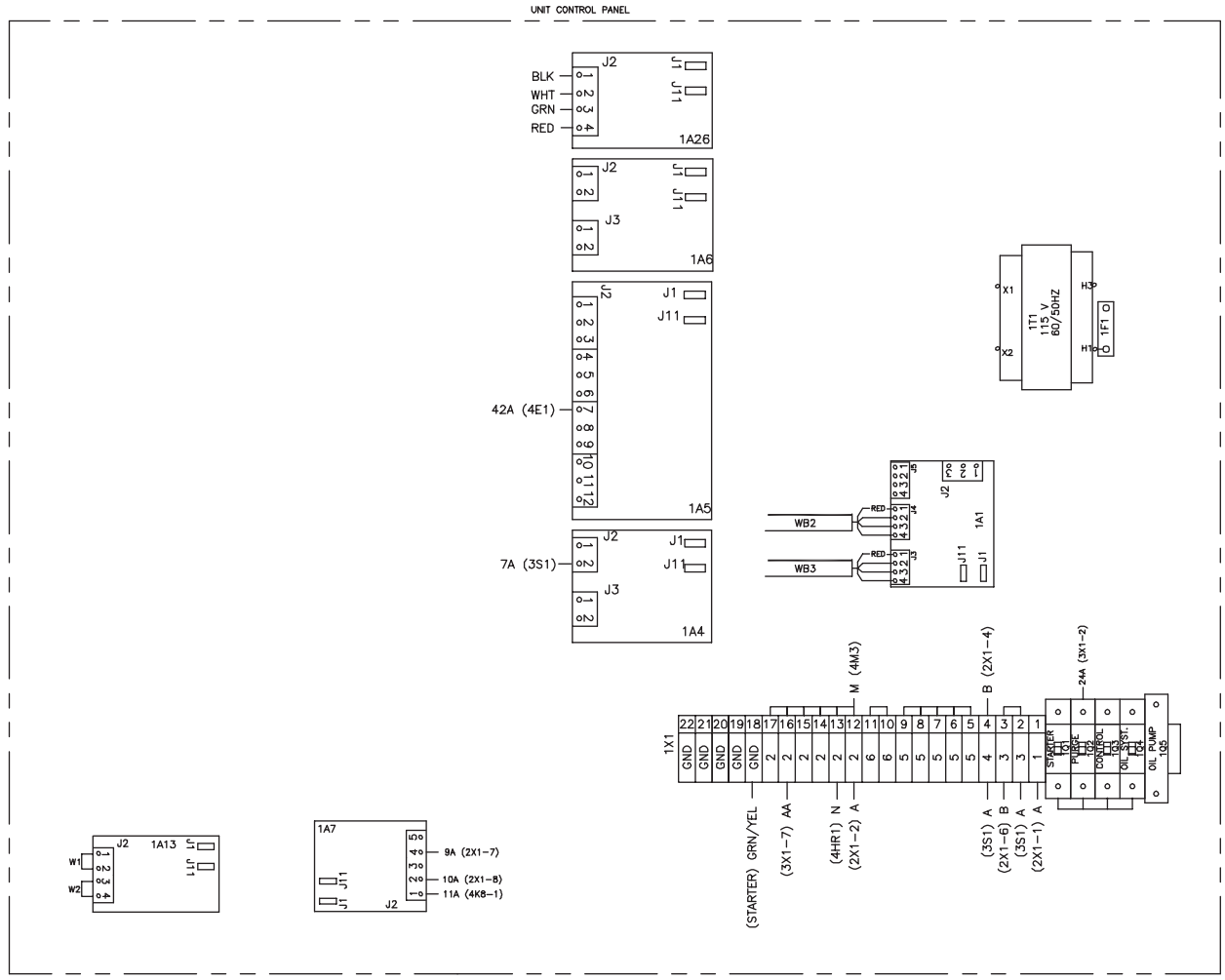
USE COPPER CONDUCTORS ONLY!

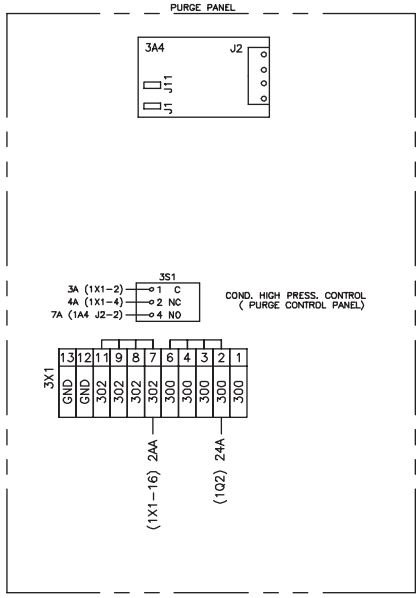
UNIT TERMINALS ARE NOT DESIGNED TO ACCEPT OTHER TYPES OF CONDUCTORS.

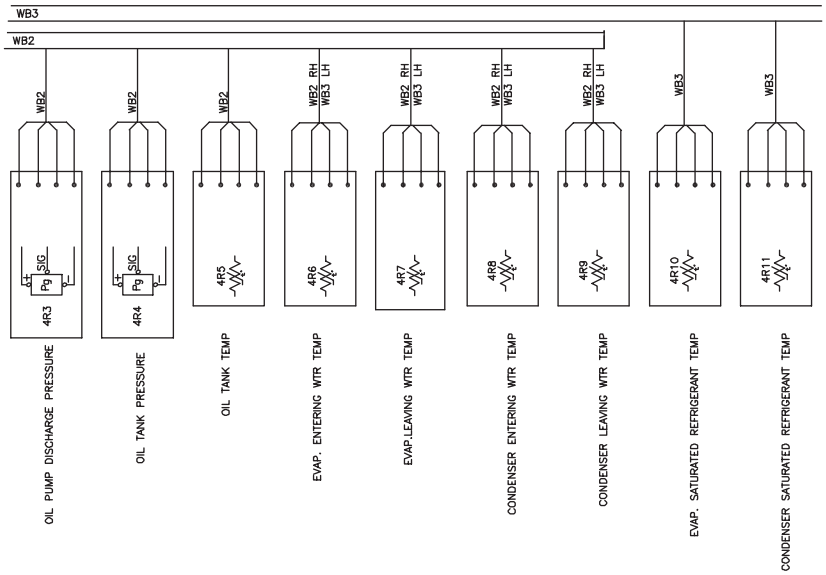
FAILURE TO DO SO MAY CAUSE DAMAGE TO THE EQUIPMENT.

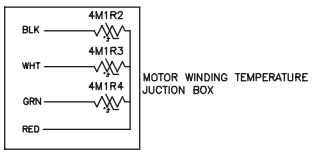
CONNECTION DIAGRAM

UNIT WIRING STANDARD
CH 530
CVHE,CVHF,CVHG



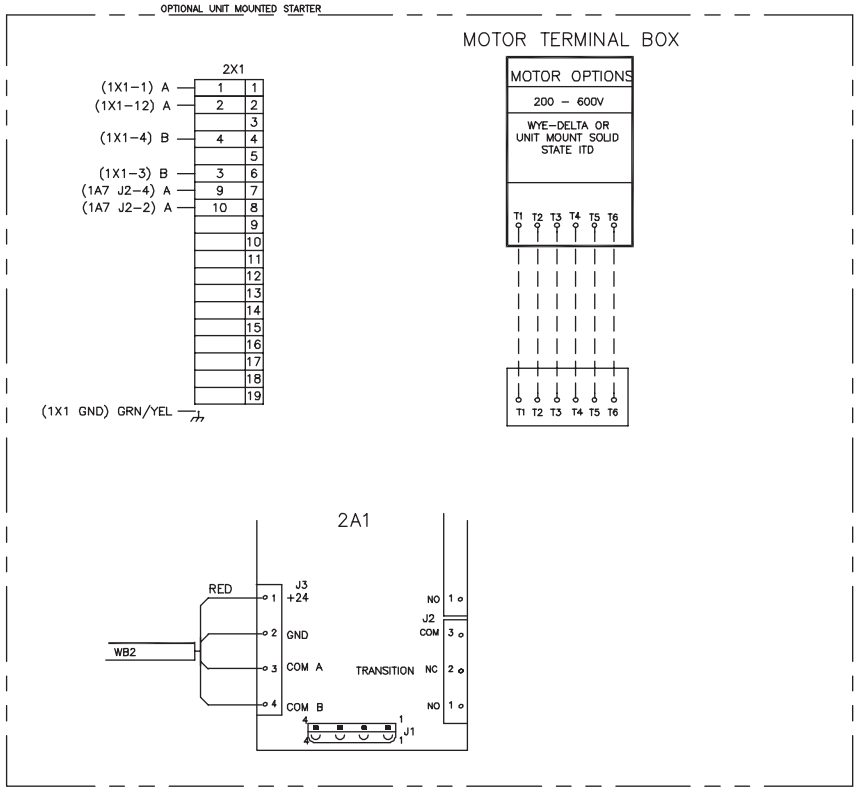


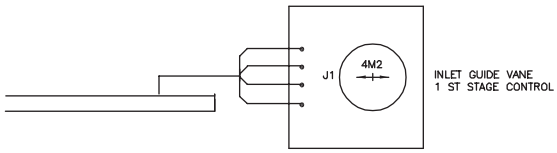


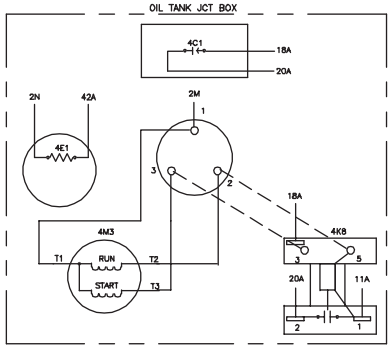


NOTES;
1. WATER TEMP. SENSORS MAY BE CONNECTED TO 4-WIRE COMMUNICATON LINK CABLE WB2 FOR RIGHT HAND END OR WB3 FOR LEFT HAND END DEPENDING ON WATER BOX PASS ARRANGEMENT.

2. WIRES 1A, 2A, 3B, 4B, 9A, 10A ARE INSTALLED WHEN YOU HAVE USTR OR USID STARTERS.







⚠ WARNING

HAZARDOUS VOLTAGE!

DISCONNECT ALL ELECTRIC POWER INCLUDING REMOTE DISCONNECTS BEFORE SERVICING.

FAILURE TO DISCONNECT POWER BEFORE SERVICING CAN CAUSE SEVERE PERSONAL INJURY OR DEATH.

⚠ AVERTISSEMENT

VOLTAGE HASARDEUX!

DECONNECTEZ TOUTES LES SOURCES ELECTRIQUES INCLUANT LES DISJONCTEURS SITUES A DISTANCE AVANT D'EFFECTUER L'ENTRETIEN.

FAUTE DE DECONNECTER LA SOURCE ELECTRIQUE AVANT D'EFFECTUER L'ENTRETIEN PEUT ENTRAINER DES BLESSURES CORPORELLES SEVERES OU LA MORT.

⚠ CAUTION

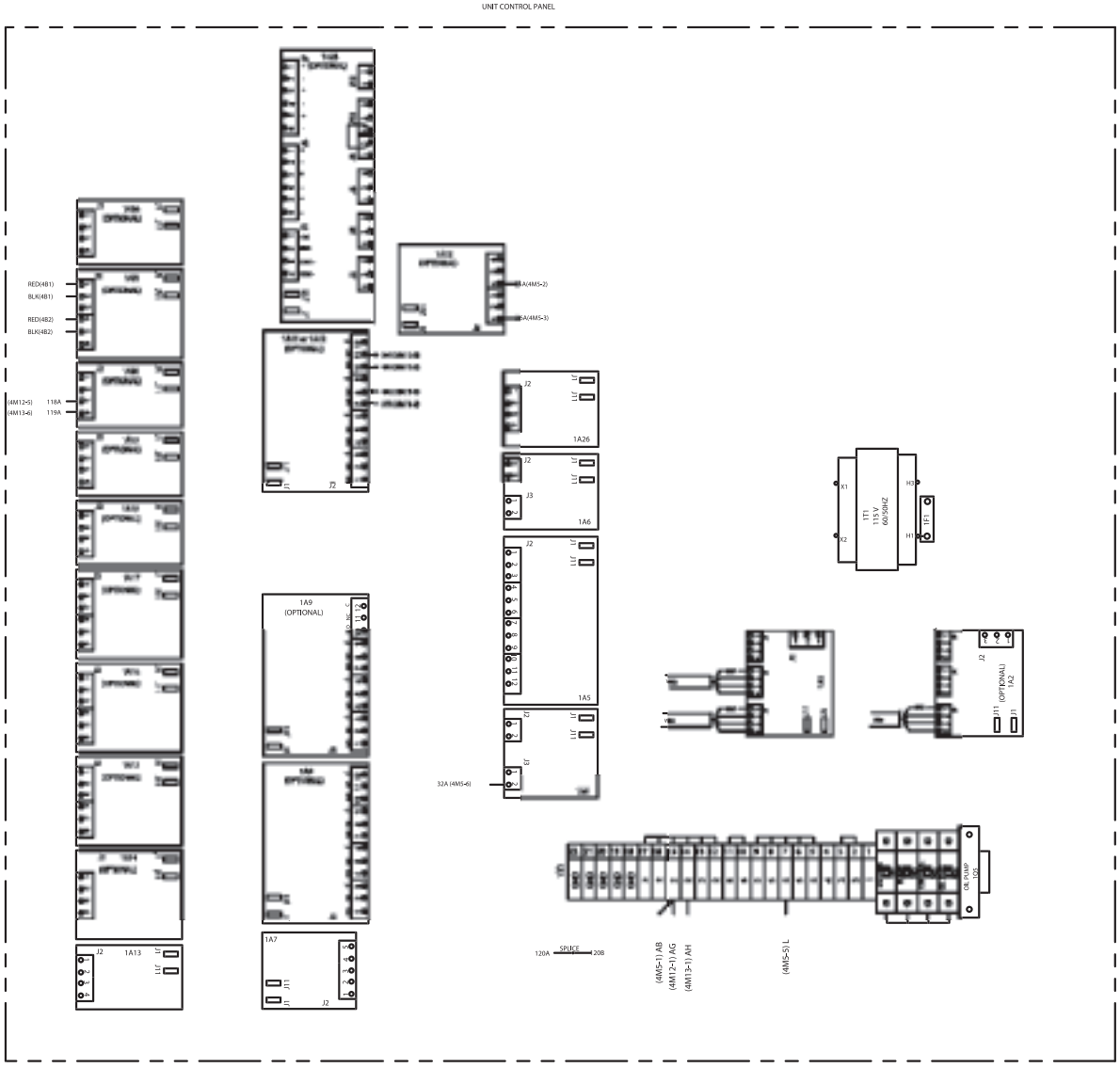
USE COPPER CONDUCTORS ONLY!

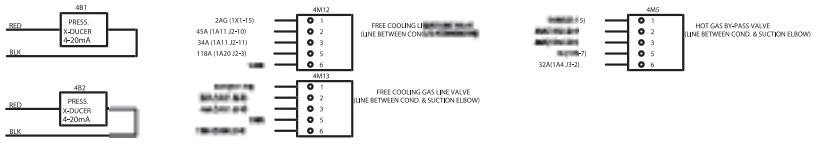
UNIT TERMINALS ARE NOT DESIGNED TO ACCEPT OTHER TYPES OF CONDUCTORS.

FAILURE TO DO SO MAY CAUSE DAMAGE TO THE EQUIPMENT.

CONNECTION DIAGRAM
UNIT WIRING OPTIONAL
CH 530
CVHE,CVHF,CVHG

2309-4938F

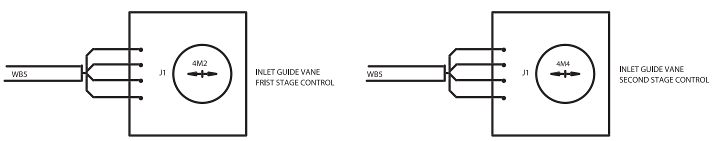


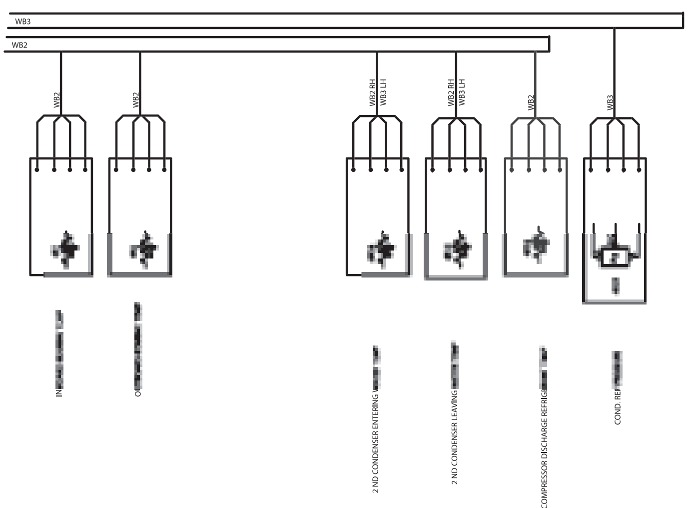


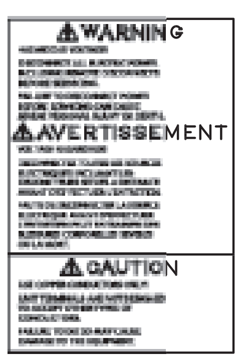
NOTES;

1. WATER TEM[illegible]2 FOR RIGHT HAND END OR WB3 [illegible]

2. WIRING SHO[illegible]309-4935 OR IF CUSTOMER SU[illegible]







CONNECTION DIAGRAM

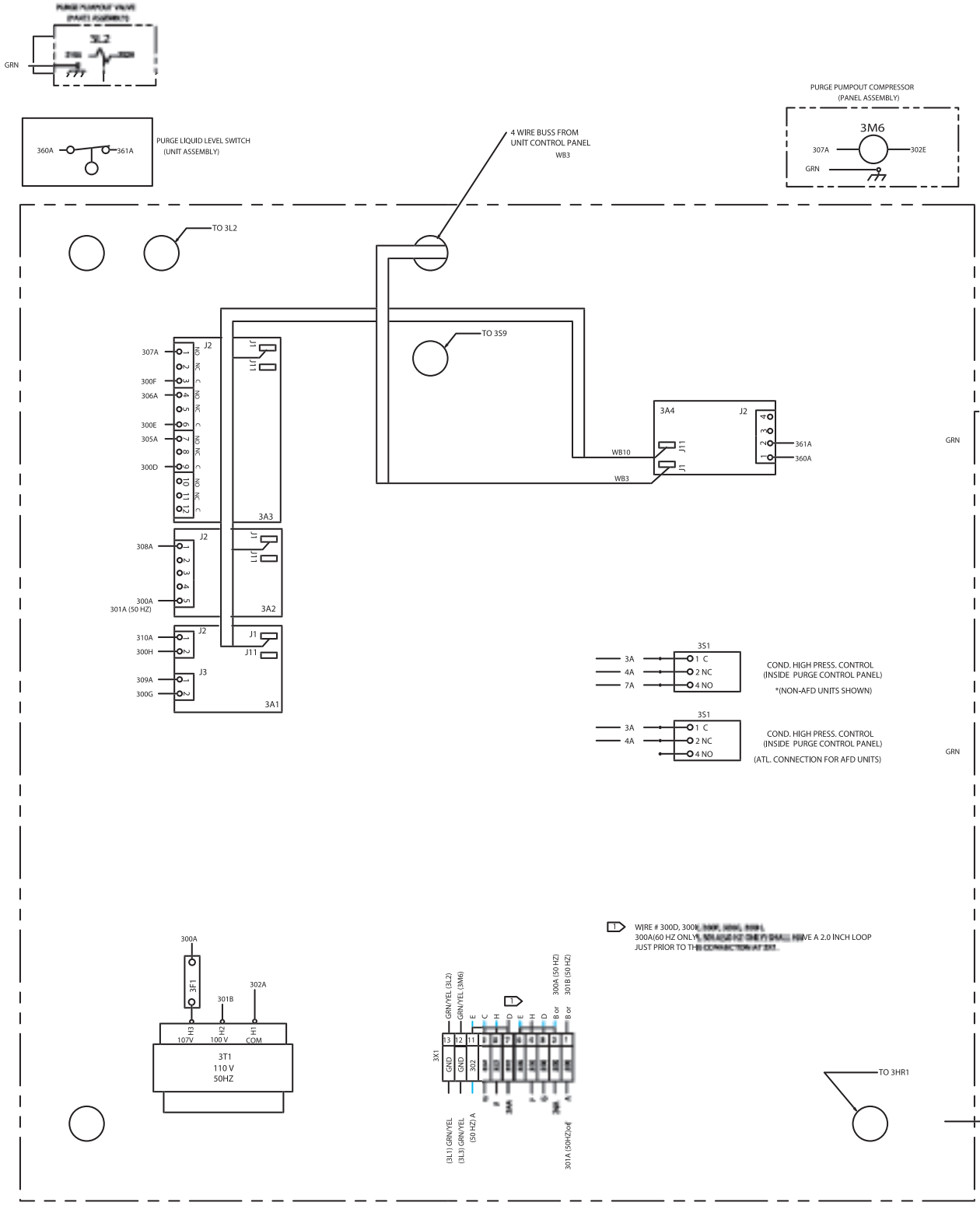
PURGE CONTROL PANEL

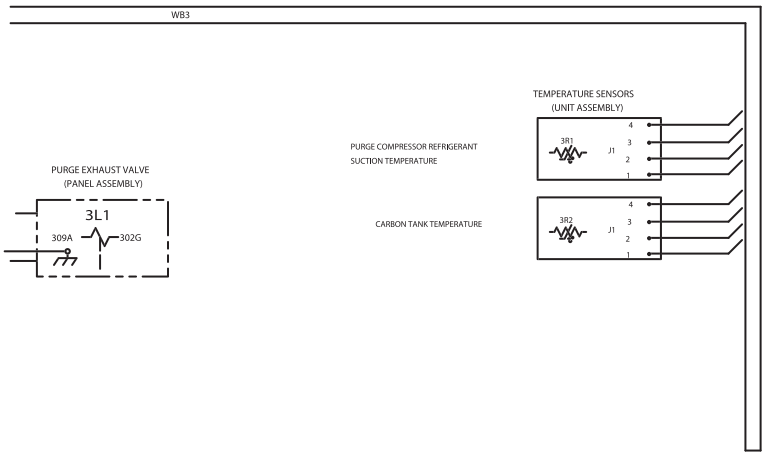
CH 530

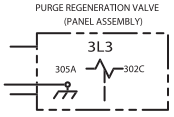
CVHE,CVHF,CVHG

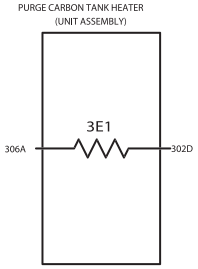
PRODUCTION

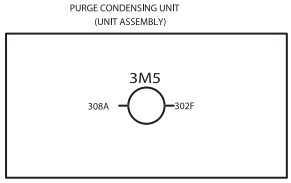
2309-4939 D




WB3
TEMPERATURE SENSORS
(UNIT ASSEMBLY)
PURGE COMPRESSOR REFRIGERANT
SUCTION TEMPERATURE
3R1
J1
4
3
2
1
CARBON TANK TEMPERATURE
3R2
PURGE EXHAUST VALVE
(PANEL ASSEMBLY)
3L1
309A
302G


PURGE REGENERATION VALVE
(PANEL ASSEMBLY)
3L3
305A
302C


PURGE CARBON TANK HEATER
(UNIT ASSEMBLY)
3E1
306A
302D


PURGE CONDENSING UNIT
(UNIT ASSEMBLY)
3M5
308A
302F


FROM
L TO 3X1
7A FROM
L TO 3S1)
BLY)

2309-4922 D

CH530 SCHEMATIC WIRING CVHE, CVHF, CVHG, CDHF AND CDHG
LEGEND

DEVICE	DESCRIPTION
1A1	24VDC POWER SUPPLY NO 1
1A2	24VDC POWER SUPPLY NO 2
1A4	CONDENSER HIGH PRESSURE CUTOUT SWITCH INPUT
1A5 (1)(2)	EVAPORATOR AND CONDENSER WATER PUMP, OIL TANK HEATER AND ICE BUILDING INDICATOR RELAYS
1A5 (3)	OIL TANK HEATER CONTROL RELAY
1A6	EVAPORATOR AND CONDENSER WATER FLOW SWITCH/INTERLOCK INPUTS
1A7	OIL/REFRIGERANT PUMP MOTOR CONTROL RELAY
1A8 (1)	NON-LATCHING AND LATCHING ALARM, LIMIT MODE AND RUNNING INDICATOR RELAYS
1A8 (2)	OPERATING STATUS PROGRAMMABLE RELAYS
1A9 (1)	LEAD/LAG/STANDBY, MAXIMUM CAPACITY AND PURGE ALARM INDICATOR RELAYS
1A9 (2)(3)	OPERATING STATUS PROGRAMMABLE RELAYS
1A11	FREE COOLING RELAY OUTPUTS
1A12	HOT GAS BYPASS VALVE CONTROL RELAY
1A13	EXTERNAL AUTO/STOP AND EMERGENCY STOP INPUTS
1A14	COMM4 OR COMM5 MODULE
1A15	% RLA COMPRESSOR AND CONDENSER REFRIGERANT PRESSURE OUTPUTS
1A16	EXTERNAL CURRENT LIMIT AND CHILLED WATER SETPOINT INPUTS
1A17	EXTERNAL BASE LOADING SETPOINT AND REFRIGERANT MONITOR INPUTS
1A18	EXTERNAL BASE LOADING AND EXTERNAL HOT WATER CONTROL ENABLE/DISABLE INPUTS
1A19	EXTERNAL ICE BUILDING COMMAND INPUT
1A20	EXTERNAL FREE COOLING COMMAND AND FREE COOLING VALVES CLOSED INPUTS
1A21	EVAPORATOR AND CONDENSER WATER DIFFERENTIAL PRESSURE INPUTS
1A22	DYNAVIEW
1A23	STARTER MODULE
1A24	STARTER FAULT INPUT
1A25	CIRCUIT 1 AND 2 EXTERNAL LOCKOUT INPUTS
1A26	MOTOR WINDING TEMPERATURE 1, 2 AND 3 INPUTS
1F1	CONTROL POWER FUSE
1Q1	STARTER CONTROL CIRCUIT BREAKER
1Q2	PURGE CONTROL CIRCUIT BREAKER
1Q3	UNIT CONTROL CIRCUIT BREAKER
1Q4	OIL/REFRIGERANT CONTROL CIRCUIT BREAKER
1Q5	OIL/REFRIGERANT PUMP MOTOR CIRCUIT BREAKER
1T1	CONTROL POWER TRANSFORMER
1X1	CONTROL PANEL TERMINAL BLOCK
2A1	STARTER MODULE
2A2	ADAPTIVE FREQUENCY DRIVE
2A3	STARTER POWER SUPPLY
2A4	SOLID STATE STARTER
2A4-K1	STARTER FAULT CONTROL RELAY
2A4-K2	AT-SPEED CONTROL RELAY
2A5	STARTER FAULT INPUT
2A5 (4)	INPUT INDUCTOR
2A6	FILTER CAPACITORS
2A7 (4)	LINE SYNC PCB
2A7 (5)	ENGINE-GENERATOR START/STOP CONTROL RELAY
2A8	ENGINE-GENERATOR UP-TO-SPEED/FREQUENCY AND STARTER DRIVE FAULT INPUTS
2A9	ENGINE-GENERATOR SPEED SIGNAL OUTPUT
2A12	ADAPTIVE FREQUENCY DRIVE AC LINE I/O
2A32	ADAPTIVE FREQUENCY DRIVE COMMUNICATION CARD

DEVICE	DESCRIPTION
3L2	PURGE PUMPOUT VALVE
3L3	PURGE REGENERATION VALVE
3M5	PURGE CONDENSING UNIT MOTOR
3M6	PURGE PUMPOUT COMPRESSOR MOTOR
3M7	PURGE CONDENSING UNIT FAN MOTOR
3R1	PURGE COMPRESSOR REFRIGERANT SUCTION TEMPERATURE SENSOR
3R2	PURGE CARBON TANK TEMPERATURE SENSOR
3R3	PURGE CONDENSER SATURATED REFRIGERANT TEMPERATURE SENSOR
3S1	CONDENSER HIGH PRESSURE CUTOUT SWITCH
3S9	PURGE LIQUID LEVEL SWITCH
3T1	PURGE AUTO-TRANSFORMER
3T2	PURGE CONTROL POWER TRANSFORMER
3X1	PURGE PANEL TERMINAL BLOCK
4B1	EVAPORATOR WATER DIFFERENTIAL PRESSURE TRANSDUCER
4B2	CONDENSER WATER DIFFERENTIAL PRESSURE TRANSDUCER
4C1	OIL/REFRIGERANT PUMP MOTOR CAPACITOR
4E1	OIL TANK HEATER
4K8	OIL/REFRIGERANT PUMP MOTOR CONTROL RELAY
4M1	COMPRESSOR MOTOR
4M2	INLET GUIDE VANE FIRST STAGE ACTUATOR
4M3	OIL/REFRIGERANT PUMP MOTOR
4M4	INLET GUIDE VANE SECOND STAGE ACTUATOR
4M5	HOT GAS BYPASS VALVE
4M6	COOLANT CIRCULATING PUMP MOTOR
4M12	FREE COOLING LIQUID LINE VALVE
4M13	FREE COOLING GAS LINE VALVE
4M1R2,3,4	MOTOR WINDING TEMPERATURE 1, 2 AND 3
4R1	INBOARD BEARING TEMPERATURE SENSOR
4R2	OUTBOARD BEARING TEMPERATURE SENSOR
4R3	OIL PUMP DISCHARGE PRESSURE TRANSDUCER
4R4	OIL TANK PRESSURE TRANSDUCER
4R5	OIL TANK TEMPERATURE SENSOR
4R6	EVAPORATOR ENTERING WATER TEMPERATURE SENSOR
4R7	EVAPORATOR LEAVING WATER TEMPERATURE SENSOR
4R8	CONDENSER ENTERING WATER TEMPERATURE SENSOR
4R9	CONDENSER LEAVING WATER TEMPERATURE SENSOR
4R10	EVAPORATOR SATURATED REFRIGERANT TEMPERATURE SENSOR
4R11	CONDENSER SATURATED REFRIGERANT TEMPERATURE SENSOR
4R13	OUTDOOR AIR TEMPERATURE SENSOR
4R14	SECOND CONDENSER ENTERING WATER TEMPERATURE SENSOR
4R15	SECOND CONDENSER LEAVING WATER TEMPERATURE SENSOR
4R16	COMPRESSOR DISCHARGE REFRIGERANT TEMPERATURE SENSOR
4R22	CONDENSER REFRIGERANT PRESSURE TRANSDUCER
4S2	COOLANT CIRCULATING PUMP PRESSURE SWITCH
5A10	SOLID-STATE STARTER
5A10-K1	STARTER FAULT CONTROL RELAY
5A10-K2	AT-SPEED CONTROL RELAY
5CT4,5,6	SECONDARY LINE CURRENT TRANSFORMERS
5F1,2,3	CONTROL POWER PRIMARY FUSING
5F4	CONTROL POWER SECONDARY FUSE
5H1	CHILLER LATCHING ALARM INDICATOR

2A33	ADAPTIVE FREQUENCY DRIVE GATE-KILL
2C1	POWER FACTOR CORRECTION CAPACITORS
2F1,2,3	CONTROL POWER PRIMARY FUSING
2F1,2 (4)	PRIMARY TRANSFORMER FUSING
2F3 (4)	CONTROL POWER SECONDARY FUSE
2F4	CONTROL POWER SECONDARY FUSE
2F4,5,6 (4)	PRIMARY FILTER CAPACITOR FUSING
2F7,8,9	PRIMARY LINE SYNC FUSING
2F10,11,12	PRIMARY PRECHARGE RESISTOR FUSING
2F13	CONTROL POWER SECONDARY FUSE
2K1	START CONTACTOR
2K2	RUN CONTACTOR
2K3	SHORTING CONTACTOR
2K3 (4)	COOLANT CIRCULATING PUMP PILOT CONTROL RELAY
2K4	TRANSITION CONTACTOR
2K4 (4)	PRECHARGE CONTACTOR
2K7	CONDENSER HIGH PRESSURE CUTOUT CONTROL RELAY
2K9	GROUND FAULT RELAY
2K10	POWER FACTOR CORRECTION CAPACITOR ISOLATION CONTACTOR
2K11	INTERLOCKING RELAY
2K11 (4)	OIL PUMP INTERPOSING RELAY
2M1,2,3	FAN MOTORS
2Q1	MAIN CIRCUIT BREAKER
2Q2	CONTROL POWER SECONDARY CIRCUIT BREAKER
2Q2K1	TEST RUN CONTROL RELAY
2R1,2,3	TRANSITION RESISTORS
2R4,5,6	PRECHARGE RESISTORS
2S1	CONTROL POWER DISCONNECT SWITCH
2T1,2,3	LINE CURRENT TRANSFORMERS
2T5	CONTROL POWER TRANSFORMER
2T8,9	LINE POTENTIAL TRANSFORMERS
2T15	GROUND FAULT TORROID
2T17,18,19	LINE POTENTIAL TRANSFORMERS
2V	METAL OXIDE VARISTOR
2X1,2	STARTER PANEL TERMINAL BLOCKS
2X3	LINE POTENTIAL TERMINAL BLOCK
2Z1	R/C SNUBBER
3A1	PURGE PUMPOUT AND EXHAUST VALVE CONTROL
3A2	PURGE CONDENSING UNIT CONTROL RELAY
3A3	PURGE PUMPOUT, CARBON TANK HEATER, REGENERATION VALVE AND ALARM RELAYS
3A4	PURGE LIQUID LEVEL SWITCH INPUT
3A5	PURGE POWER SUPPLY
3A6	PURGE CHILLER RUNNING INPUT
3A10	PURGE DYNAVIEW
3C5	PURGE CONDENSING UNIT CAPACITOR
3C6	PURGE PUMPOUT COMPRESSOR CAPACITOR
3E1	PURGE CARBON TANK HEATER
3F1	PURGE AUTO-TRANSFORMER FUSE
3F2	PURGE CONTROL POWER TRANSFORMER FUSE
3L1	PURGE EXHAUST VALVE

NOTE:
(1) = AS USED ON CVHE, CVHF AND CVHG UNITS.
(2) = AS USED ON LH CIRCUIT OF CDHF AND CDHG UNITS.
(3) = AS USED ON RH CIRCUIT OF CDHF AND CDHG UNITS.
(4) = AS USED WITH ADAPTIVE FREQUENCY DRIVE STARTERS.
(5) = AS USED WITH ENGINE-GENERATOR SET.

5H2	CHILLER NON-LATCHING ALARM INDICATOR
5H4	PURGE ALARM INDICATOR
5H4 (2)	CIRCUIT 2 PURGE ALARM INDICATOR
5H6	CHILLER RUNNING INDICATOR
5H7	CHILLER LIMIT MODE INDICATOR
5H8	ICE BUILDING INDICATOR
5H9	FREE COOLING INDICATOR
5H10	CHILLER HEAD RELIEF REQUEST INDICATOR
5H11	CHILLER MAXIMUM CAPACITY INDICATOR
5H12	CIRCUIT 1 PURGE ALARM INDICATOR
5H13	CIRCUIT 1 RUNNING INDICATOR
5H14	CIRCUIT 2 RUNNING INDICATOR
5H15	CHILLER ALARM INDICATOR
5H16	CIRCUIT 1 ALARM INDICATOR
5H17	CIRCUIT 2 ALARM INDICATOR
5H18	PURGE ALARM INDICATOR
5K1	EVAPORATOR WATER PUMP CONTROL RELAY
5K2	CONDENSER WATER PUMP CONTROL RELAY
5K11	INTERLOCKING RELAY
5K12	START CONTACTOR
5K13	RUN CONTACTOR
5K91	PURGE CHILLER RUNNING RELAY
5Q1	MAIN CIRCUIT BREAKER
5S1	EVAPORATOR WATER FLOW SWITCH/INTERLOCK
5S2	CONDENSER WATER FLOW SWITCH/INTERLOCK
5S3	EXTERNAL AUTO-STOP SWITCH
5S4	EMERGENCY STOP SWITCH
5S5	EXTERNAL BASE LOADING ENABLE/DISABLE SWITCH
5S6	EXTERNAL HOT WATER CONTROL ENABLE/DISABLE SWITCH
5S7	EXTERNAL ICE BUILDING COMMAND SWITCH
5S8	EXTERNAL FREE COOLING SWITCH
5S9	CIRCUIT 1 EXTERNAL LOCKOUT SWITCH
5S10	CIRCUIT 2 EXTERNAL LOCKOUT SWITCH
5T1,2,3	LINE CURRENT TRANSFORMERS
5T5	CONTROL POWER TRANSFORMER
5T6	12-PULSE AUTO-TRANSFORMER
5T9	LINE POTENTIAL TRANSFORMER
5T17,18,19	LINE POTENTIAL TRANSFORMERS
5X1	TERMINAL BLOCK
5X3	LINE POTENTIAL TERMINAL BLOCK
6K1	ENGINE-GENERATOR START-STOP CONTROL
6K2	ENGINE-GENERATOR DRIVE FAULT CONTROL
6K3	ENGINE-GENERATOR UP-TO-SPEED/FREQUENCY CONTROL
6Q1	ENGINE-GENERATOR CIRCUIT BREAKER
6X1,2,6	ENGINE-GENERATOR TERMINAL BLOCKS
7K2	RUN CONTACTOR
7K3	SHORTING CONTACTOR
7R1,2,3	TRANSITION RESISTORS
ISW	ISOLATION SWITCH

DEVICE LOCATION PREFIX CODE
1 = MAIN CONTROL PANEL
2 = STARTER PANEL OR ADAPTIVE FREQUENCY DRIVE
3 = PURGE
4 = UNIT MOUNTED DEVICE
5 = PROVIDED BY OTHERS
6 = ENGINE DRIVEN GENERATOR
7 = REDUCED VOLTAGE PANEL

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For more information contact your local district office or e-mail us at comfort@trane.com

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