



Wiring

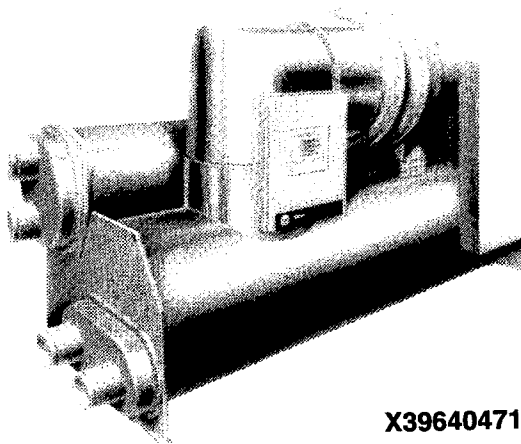
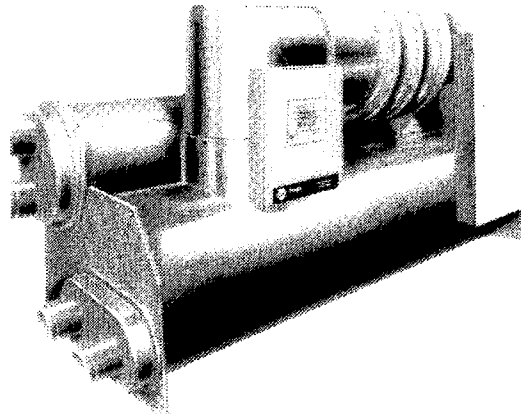
CVHE-W-8A

Library	Service Literature
Product Section	Refrigeration
Product	Centrifugal Liquid Chillers
Model	CVHE, CVHF, CVHG,
Literature Type	Wiring
Sequence	8A
Date	June 6, 1996
File No.	SV-RF-CTV-CVHE-W-8A-
Supersedes	SV-RF-CTV-CVHE-W-8 - 5/94

CenTraVac® Liquid Chillers

50 and 60 HZ
CVHE, CVHF, CVHG

Cooling-Only and
Heat-Recovery, Direct-Drive
CenTraVacs with UCP2
Control Panels



X396404710-10

Index of Diagrams

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Schematic Wiring Legend

Device Designation	Description	Line Number
1CB1	Circuit Breaker - Starter	19
1CB2	Circuit Breaker - Purge	65
1CB3	Circuit Breaker - Unit Control	145
1F2	Oil Pump Fuse	167
1T1	Control Power Transformer	122
1TB1	Control Panel Term Block	
1U1	Chiller Module	Page 4
1U10	I.O. Module	Page 5
1U2	Circuit Module	Page 3
1U3	Stepper Module	Page 3
1U4	Clear Language Display	Page 3
1U5	Options Module	Page 5
1U7	Printer COM Module	Page 4
1U8	Tracer COM 3 Module	Page 4
1U9	IPC Buffer Module	Page 4
1U11	Tracer COM 4 Module	Page 4
2BP1,2,3	By-Pass Contactor	3,6,9
2CB1	Circuit Breakr (Shunt Trip)	30
2F1,2,3	Primary Starter Fusing	3,6,10
2F4	Secondary Control Power Fuse	13
2K1	Start Contactor	27
2K2	Run Contactor	30
2K3	Shorting Contactor	33
2K4	Transition Contactor	36
2R1	Heat Sink Temp Sensor	32
2T1, 2,3	Current Transformers	2,5,8
2T4	24V Power Supply	14
2T5	Control Power Transformer	12
2T6, 7, 8	Potential Transformer (OPT)	18, 20, 22
2TB1	Control Term. Strip	
2TB2	IPC Term Strip	
2TB3	Line Terminal Block	
2U2	Starter Control	
2U1	Starter Module	Page 1
3B5	Purge RFGT Compressor	78
3B6	Purge Pump-Out Compressor	80
3L1	Tank Valve Solenoid	76
3L3	Exhaust Valve Solenoid	74
3R3	Cond. RFGT Press.	165
3RT2	RFGT Comp Suction Temp	75
3S1	Cond high Press Switch	19
3S2	Service Pumpout Switch	79
3S3	Liquid Level Sensor	77
3T1	Purge Power Supply Trans	68
3U1	Purge Module	Page 2

Prefix Code	
1 =	Main Control Panel
2 =	Starter Control
3 =	Purge
4 =	Unit Mounted Device
5 =	Provided By Others

Note: Dashed Lines Indicate Wiring By Others

Continued next page

Schematic Wiring Legend

Device Designation	Description	Line Number
4B1	Compressor Motor	5
4B12	Free Cooling Actuator	266
4B13	Free Cooling Actuator	274
4B1R2,3,4	Motor Winding Temp	150-155
4B2	Stepper Motor Vane Actuator	133
4B3	Oil Pump Motor	169
4B3	Dual Filter Transfer Valve	162
4B4	Dual Filter Transfer Valve	163
4B5	Hot Gas By-Pass Valve	251
4C1	Capacitor - Oil Pump	168
4HR1	Oil Tank Heater	165
4K8	Oil Pump Starter Relay	169
4L1	Vent Line Solenoid	157
4L2	Evap Wtr Press, Soenoid	211
4L3	Cond Wtr Press, Solenoid	213
4R1	Oil Sump Press	170
4R2	Oil Pump Discharge Press	175
4R3	Evap Ent & Lvn Wtr Press	209
4R4	Cond Ent & Lvn Wtr Press	237
4RT1	Sat Cond Temp (Retrofit Only)	73
4RT1	Evap Entering Water Temp.	232
4RT11	Aux Heat Rec Ent Temp	258
4RT12	Aux Heat Rec Lvn Temp	260
4RT2	Evap Leaving Water Temp	211
4RT3	Cond Entering Water Temp	213
4RT4	Cond Leaving Water Temp	215
4RT5	Sat Evap Rfqt Temp	132
4RT6	Discharge Temp	134
4RT7	Bearing Temp 1	136
4RT8	Bearing Temp 2	138
4RT9	Sat Cond Rfqt Temp	142
4S1	Dual Filter Switch	162
5DS1	Alarm Light (Latching)	225
5DS2	Alarm Light (Non-Latching)	229
5DS3	Pump-Out Running (Tracer) Relay	84
5K1	Chilled Wtr Pump Relay	217
5K10	Purge Alarm Relay	86
5K2	Cond Wtr Pump Relay	219
5K3	Comp Running Relay	222
5K4	Alarm Relay	224
5K5	Limit Warning Relay	227
5K6	Ice Making Relay	260
5K7	Head Relief Request Relay	262
5K8	Maximum Capacity Relay	264
5K9	Tracer Controlled Relay	270
5RT1	Tracer Temp Sensor	272
5S1	Chilled Water Flow Switch	231
5S2	Cond Water Flow Switch	232
5S3	External Auto Stop	217
5S4	Emergency Stop	219
5S5	Heat Pump Control	225
5S6	Ext Free Cooling	262
5S7	Ice Making	264
5U1	Refrigerant Monitor	280

Prefix Code	
1 =	Main Control Panel
2 =	Starter Control
3 =	Purge
4 =	Unit Mounted Device
5 =	Provided By Others

Note: Dashed Lines Indicate Wiring By Others

General Information

Literature Change History

CVHE-W-8A - June 1996

Addition of CVHG models and general update.

CVHE-W-8 - May 1994

Original issue of manual covering CVHE and CVHF models.

Design Sequences

CVHE units, A2 - 2J

CVHE units, A0 - T0

CVHE units, A0 - K0

Unit Models		
CVHE 60 HZ		
230	250	280
320	360	400
450	500	560
630	710	800
CVHE 50 HZ		
190	210	240
270	300	330
370	420	470
530	590	660
CVHF 60 HZ		
555	640	650
770	910	1060
1280		
CVHG 50 HZ		
670	780	920
1067		

Unit Information

To determine the electrical characteristics of a specific chiller, always refer to the unit nameplate. The unit nameplate is mounted on the left-hand side of the unit control panel and lists the installation and maintenance manuals required for the chiller. Example: CVHE-IN-8 and CVHE-M-7. The nameplate also provides electrical data for the compressor motor, oil pump motor, oil tank heater and purge compressor motor.

Use the chiller model number or product description block on the unit to determine the following information.

1. Machine design sequence;
2. Starter location (i.e., unit mounted versus remote-mounted);
3. Unit type (i.e., standard unit, heat recovery, auxiliary condenser, or free-cooling).
4. Whether the unit has Hot Gas By Pass.

For specific electrical connection and schematic information, always refer to the wiring diagrams and schematics that shipped with the unit.

As you review this manual, keep in mind that all field-installed wiring must conform to NEC guidelines, as well as to any applicable state and local codes. Be sure to satisfy any special grounding requirements that may be necessary.

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

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.

Caution!

▲ The diagrams illustrated in this manual are typical for the above design sequence units. Refer to the "as-built" diagrams for specific information.

WARNING!

▲ When servicing the machine, disconnect electrical power source to prevent injury or death due to electrical shock.

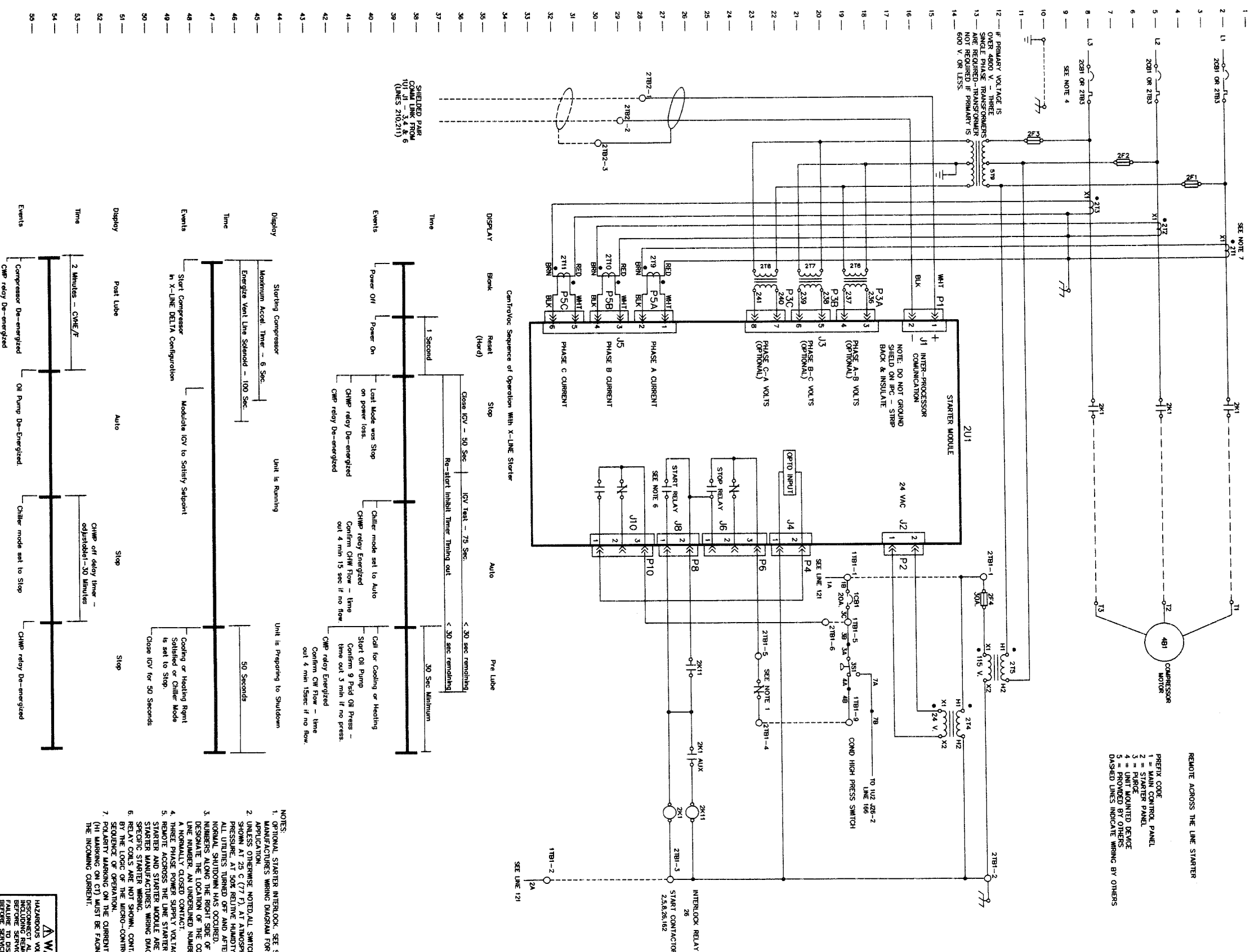
Adaptive Frequency Drive™

An overall field wiring layout of the Adaptive Frequency Drive is shown in this manual. The following information is offered when installing Adaptive Frequency Drive enclosure to provide electrical access. **DO NOT CUT ADAPTIVE FREQUENCY DRIVE ENCLOSURE.** Refer to the installation manual (AFDA-IN-1) which shipped with the Adaptive Frequency Drive.

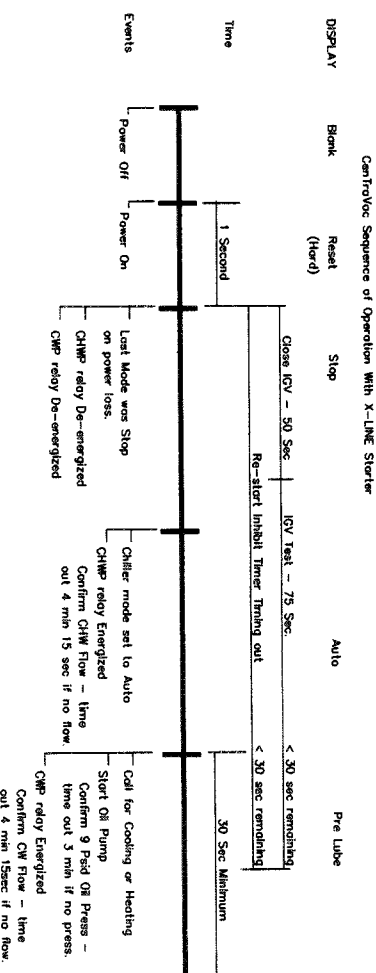
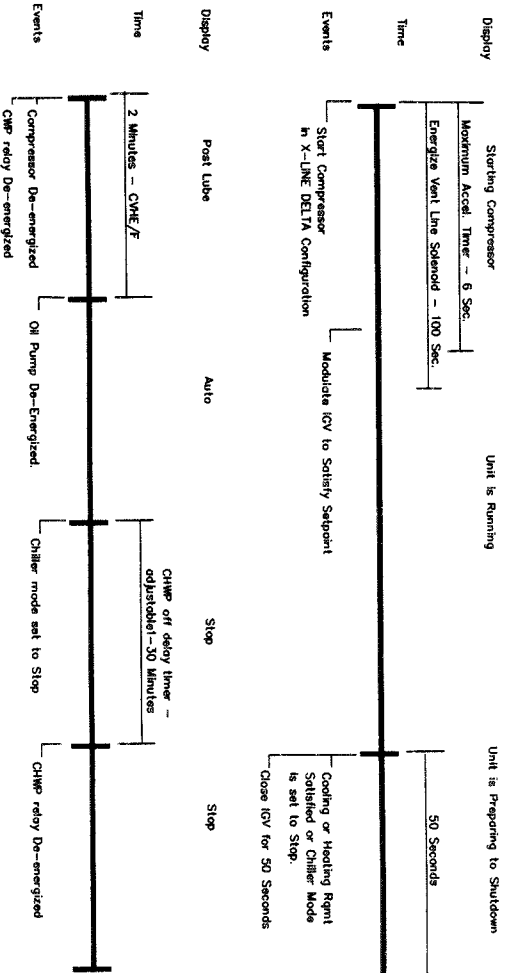
WARNING!

▲ **Do not cut Adaptive Frequency Drive enclosure. Debris falling inside frequency drive may cause failure of electronic components.**

Figure 1
Remote Across the Line Starter
Typical UCP2 Schematic CVHE, CVHF, CVHG



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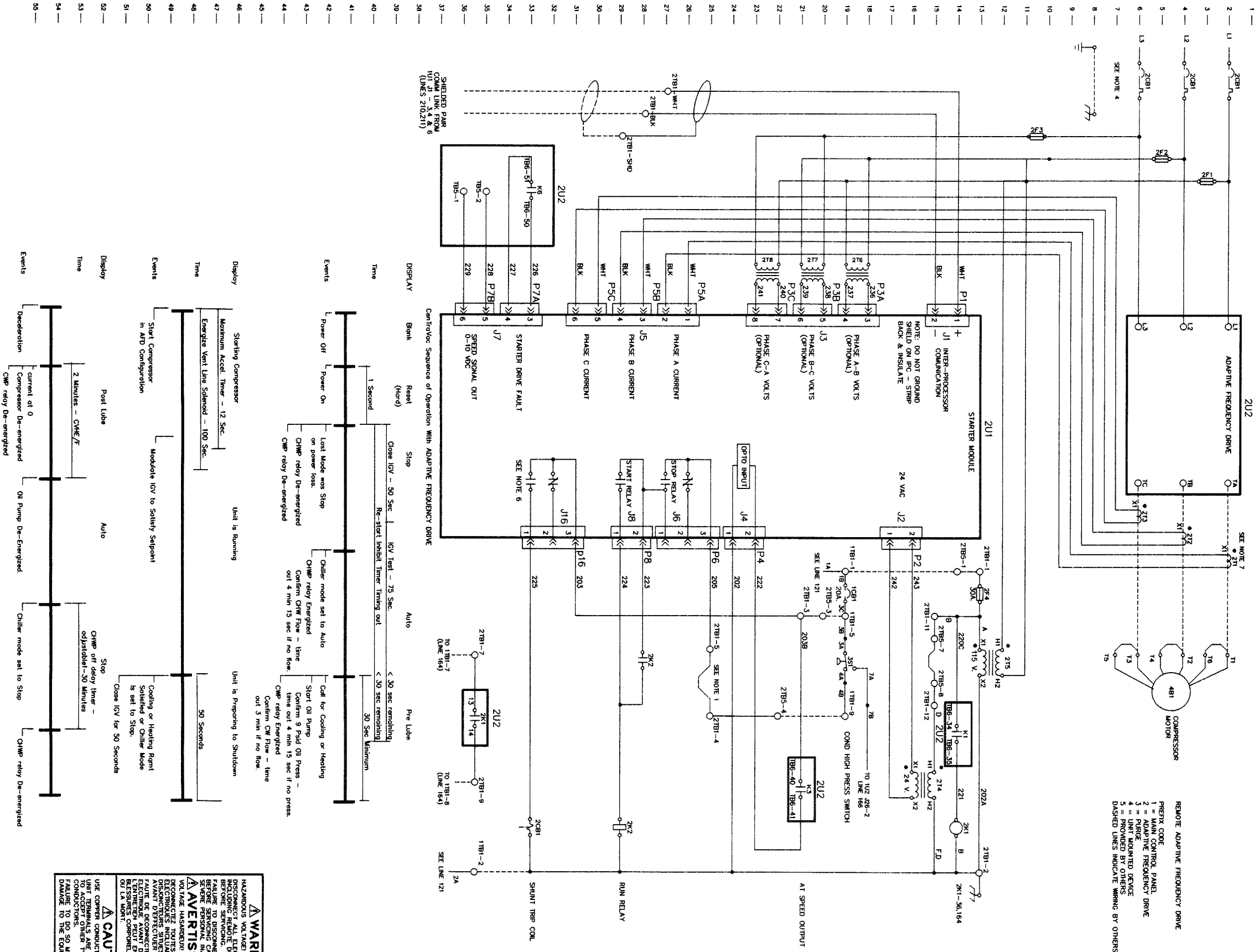


- NOTES:
1. OPTIONAL STARTER INTERLOCK. SEE STARTER APPLICATIONS WIRING DIAGRAM FOR SPECIFIC APPLICATION.
 2. UNLESS OTHERWISE NOTED, ALL SWITCHES ARE SHOWN AT 25 C (77 F), AT ATMOSPHERIC PRESSURE. AT 50K RELATIVE HUMIDITY, WITH ALL UTILITIES TURNED OFF AND AFTER A NORMAL SHUTDOWN HAS OCCURED.
 3. NUMBERS ALONG THE RIGHT SIDE OF THE SCHEMATIC LINE NUMBER, AND NUMBERS IN CIRCLES INDICATES THE NUMBER OF THE CONTACTS BY WHICH THE STARTER IS CONTROLLED.
 4. THREE PHASE POWER SUPPLY VOLTAGE—SEE UNIT NAMEPLATE.
 5. REMOTE ACROSS THE LINE STARTER WIRING BETWEEN STARTER AND STARTER MODULE ARE SHOWN. SEE STARTER MANUFACTURER'S WIRING DIAGRAM FOR SPECIFIC STARTER WIRING.
 6. RELAY COILS ARE NOT SHOWN. CONTACTS ARE CONTROLLED BY THE LOGIC OF THE MICRO-CONTROLLER. SEE SEQUENCE OF OPERATION.
 7. (H) MARKING ON (CT) MUST BE FACING TOWARDS THE INCOMING CURRENT.

WARNING
HAZARDOUS VOLTAGE!
BEFORE SERVICING, DISCONNECT POWER INCLUDING REMOTE DISCONNECTS BEFORE SERVICING.
FAILURE TO DISCONNECT POWER BEFORE SERVICING MAY CAUSE SEVERE PERSONAL INJURY OR DEATH.
AVERTISSEMENT
VOLTAJE HASARDEUX!
DECONNECTEZ TOUJOURS LES SOURCES DE PUISSANCE AVANT D'ENTREPRENDRE LE TRAVAIL D'ENTRETIEN.
L'ENTRETIEN SANS LA SOURCE DE PUISSANCE DÉCONNECTÉE PEUT CAUSER DES BLESSURES CORPORAELLES SÉVÈRES 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.

Figure 5
Typical UCP2 Schematic CVHE, CVHF, CVHG
Remote Adaptive Frequency™ Drive



REMOTE ADAPTIVE FREQUENCY DRIVE
PREFIX CODE
1 = MAIN CONTROL PANEL
2 = RIGID
3 = UNIT MOUNTED DEVICE
4 = PROVIDED BY OTHERS
5 = PROVIDED BY OTHERS
DASHED LINES INDICATE WIRING BY OTHERS

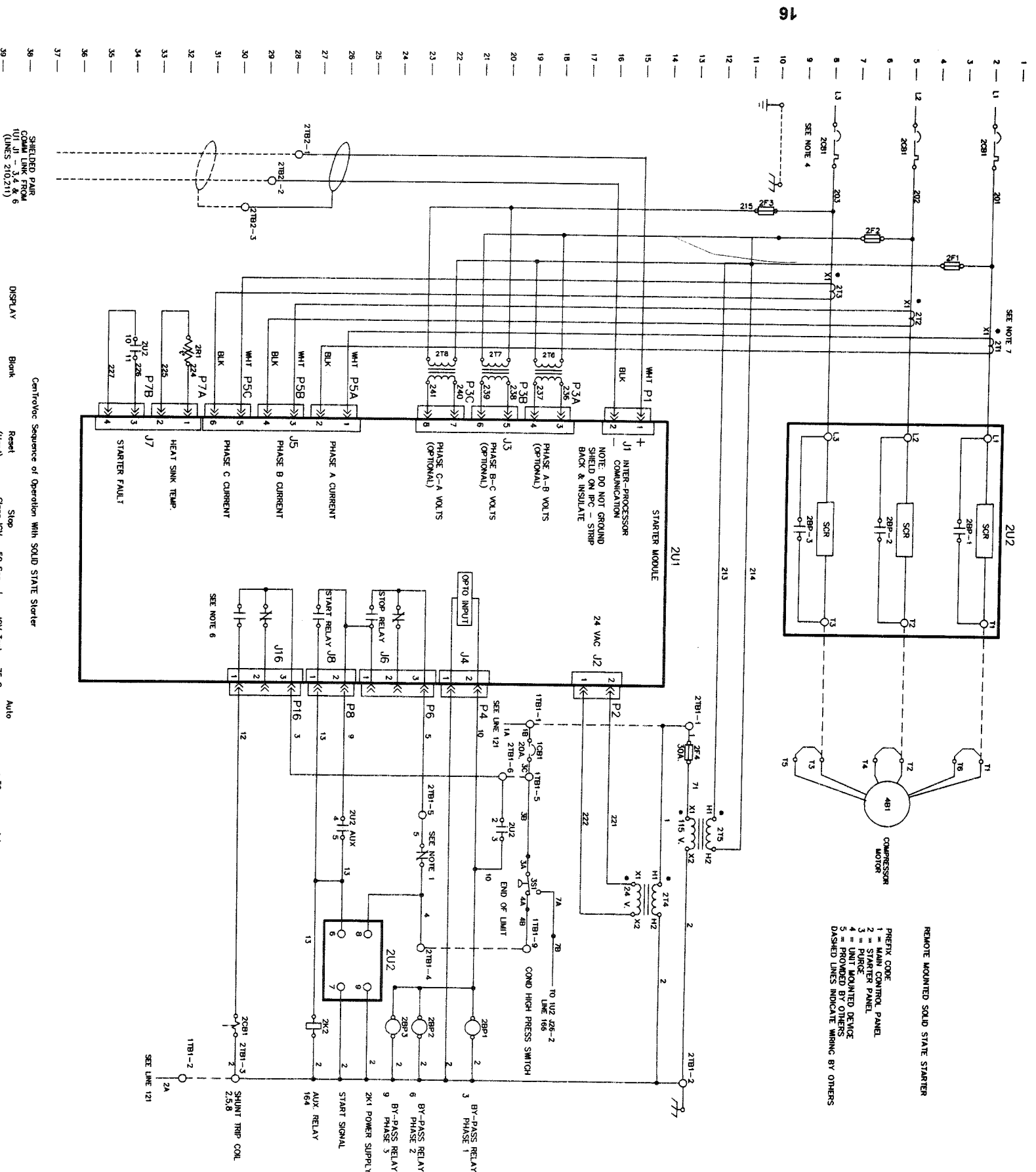
⚠ WARNING
HAZARDOUS VOLTAGE
DISCONNECT ALL ELECTRICAL POWER INCLUDING REMOTE DISCONNECTS BEFORE SERVICING.
BEFORE SERVICING CAN CAUSE SEVERE PERSONAL INJURY OR DEATH.
⚠ AVERTISSEMENT
VOLTAGE HASARDEUX
DECONNECTEZ TOUTES LES SOURCES ELECTRIQUES INCLUANT LES SOUTIENS AVANT D'ENTREPRENDRE LE TRAVAIL.
FAUTE DE DECONNECTER LA SOURCE ELECTRIQUE PEUT ENTRAINER DES BLESSURES CORPORELLES SEVERES OU LA MORT.

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

- NOTES:
- OPTIONAL ADAPTIVE FREQUENCY DRIVE (ATD) INTERLOCK. SEE ATD MANUFACTURER'S WIRING DIAGRAM FOR SPECIFIC APPLICATION.
 - UNLESS OTHERWISE NOTED, ALL SWITCHES ARE SHOWN AT 25 C (77 F). AT ATMOSPHERIC PRESSURE. AT 50% RELATIVE HUMIDITY WITH NORMAL SEASONAL VARIATION. OCCUR AFTER A NORMAL SHUTDOWN AND OCCUR AFTER A SEQUENCE OF OPERATION.
 - NUMBERS ALONG THE RIGHT SIDE OF THE SCHEMATIC DESIGNATE THE LOCATION OF THE CONTACTS BY LINE NUMBER. AN UNDERLINED NUMBER INDICATES A NORMALLY CLOSED CONTACT.
 - THREE PHASE POWER SUPPLY VOLTAGE--SEE UNIT NAMEPLATE
 - REMOTE ATD WIRING BETWEEN ATD AND MANUFACTURER'S WIRING DIAGRAM FOR SPECIFIC APPLICATION.
 - RELAY COILS ARE NOT SHOWN. CONTACTS ARE CONTROLLED BY THE LOGIC OF THE MICRO-CONTROLLER. SEE SCHEMATIC OF OPERATION.
 - ON THE CURRENT TRANSFORMER, DASHED LINES INDICATE WIRING BY OTHERS.

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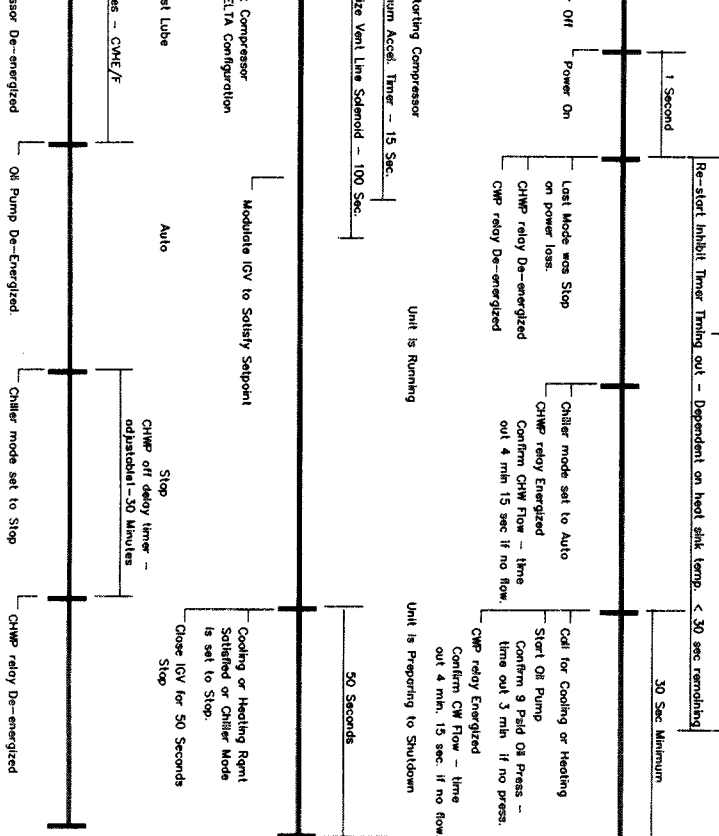
Figure 7
Remote Mounted Solid State Starter
Typical UCP2 Schematic CVHE, CVHF, CVHG



SHIELDED PAIR
COPPER WIRE FROM
LINE 5 (LINES 210/211)

21B2-1
21B2-2
21B2-3

21B1-1
21B1-2
21B1-3
21B1-4
21B1-5
21B1-6
21B1-7
21B1-8
21B1-9
21B1-10
21B1-11
21B1-12
21B1-13
21B1-14
21B1-15
21B1-16
21B1-17
21B1-18
21B1-19
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21B1-41
21B1-42
21B1-43
21B1-44
21B1-45
21B1-46
21B1-47
21B1-48
21B1-49
21B1-50
21B1-51
21B1-52
21B1-53
21B1-54
21B1-55



NOTES:

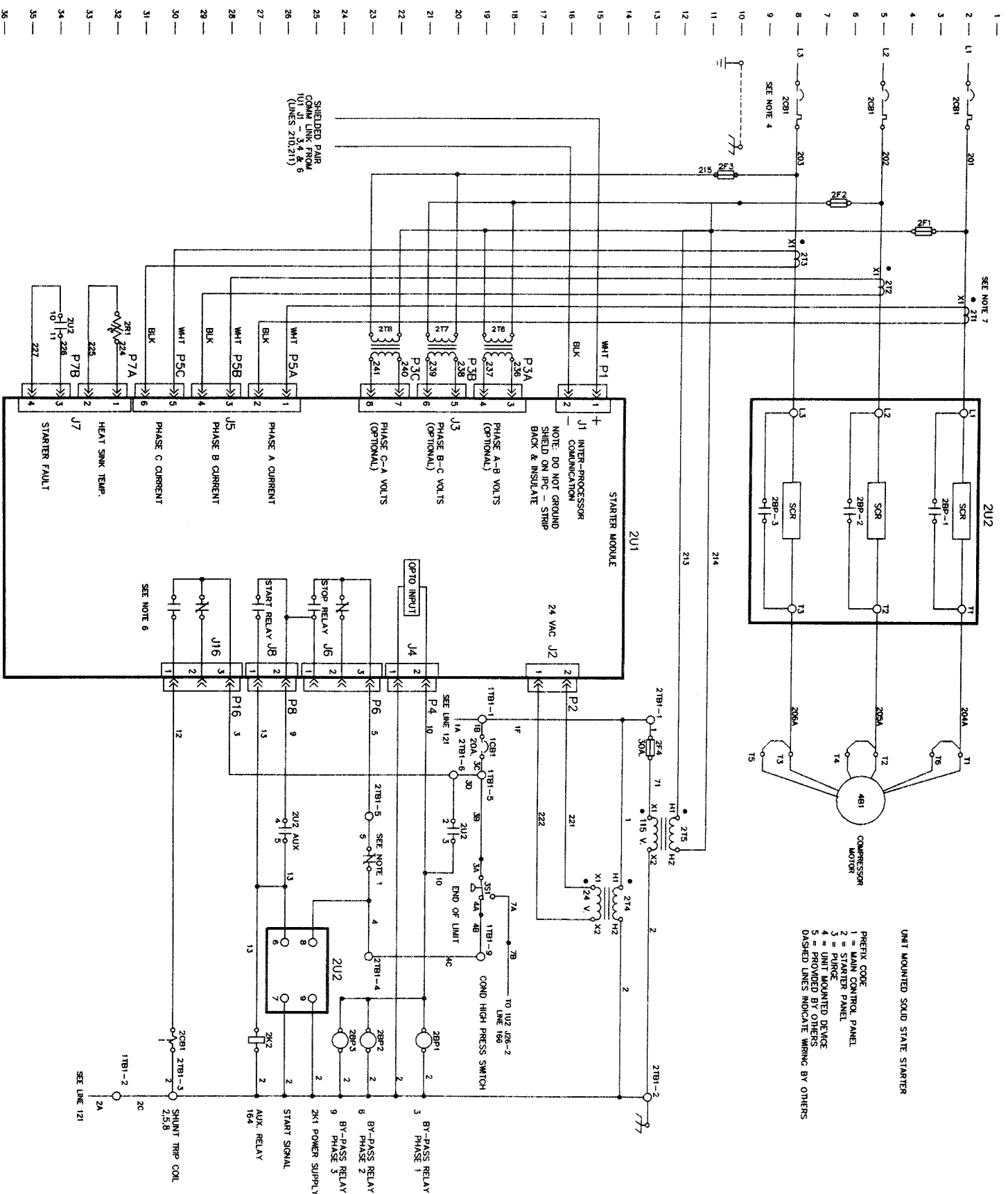
- OPTIONAL STARTER INTERLOCK. SEE STARTER MANUFACTURERS WIRING DIAGRAM FOR SPECIFIC APPLICATION.
- UNLESS OTHERWISE NOTED, ALL SWITCHES ARE SHOWN AT 25 C (77 F). AT ATMOSPHERIC PRESSURE, AT 50% RELATIVE HUMIDITY, WITH NORMAL SHOWN ON COND AFTER A NORMAL STARTER WIRING.
- NUMBERS ALONG THE RIGHT SIDE OF THE SCHEMATIC LINE NUMBER. AN UNDERLINED NUMBER INDICATES A NORMALLY CLOSED CONTACT.
- THREE PHASE POWER SUPPLY VOLTAGE-SEE UNIT NAMEPLATE
- REMOTE SOLID STATE STARTER WIRING BETWEEN STARTER AND CONTROL MODULE ARE SHOWN. SEE STARTER MANUFACTURERS WIRING DIAGRAM FOR SPECIFIC STARTER WIRING.
- STARTER PHASES ARE NOT APPRO-CONTROLLED. SEE BY THE LOCK.
- POLARITY MARKING ON THE CURRENT TRANSFORMER (HI MARKING ON CT) MUST BE FACING TOWARDS THE INCOMING CURRENT.

⚠ WARNING
HAZARDOUS VOLTAGE!
DISCONNECT POWER INCLUDING REMOTE DISCONNECTS BEFORE SERVICING.
FAILURE TO DISCONNECT POWER BEFORE SERVICING MAY CAUSE SEVERE PERSONAL INJURY OR DEATH.
⚠ AVERTISSEMENT
DÉCONNECTEZ TOUTES LES SOURCES ÉLECTRIQUES INCLUANT LES MANÈGES AVANT D'EFFECTUER L'ENTRETIEN.
L'ÉCARTÈREMENT INAPPROPRIÉ DES BRESSURES CORPORELLES SEVERES OU LA MORT.

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

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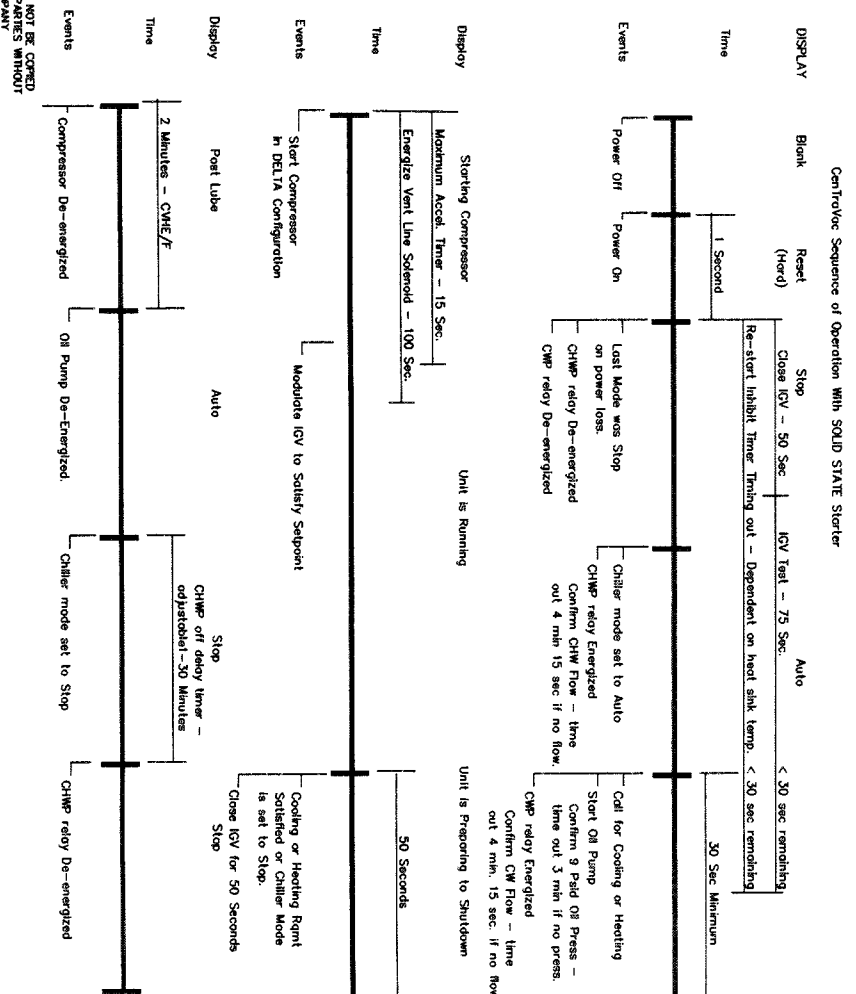
Figure 8
Typical UCP2 Schematic CVHE, CVHF and CVHG
Unit Mounted Solid State Starter



UNIT MOUNTED SOLID STATE STARTER

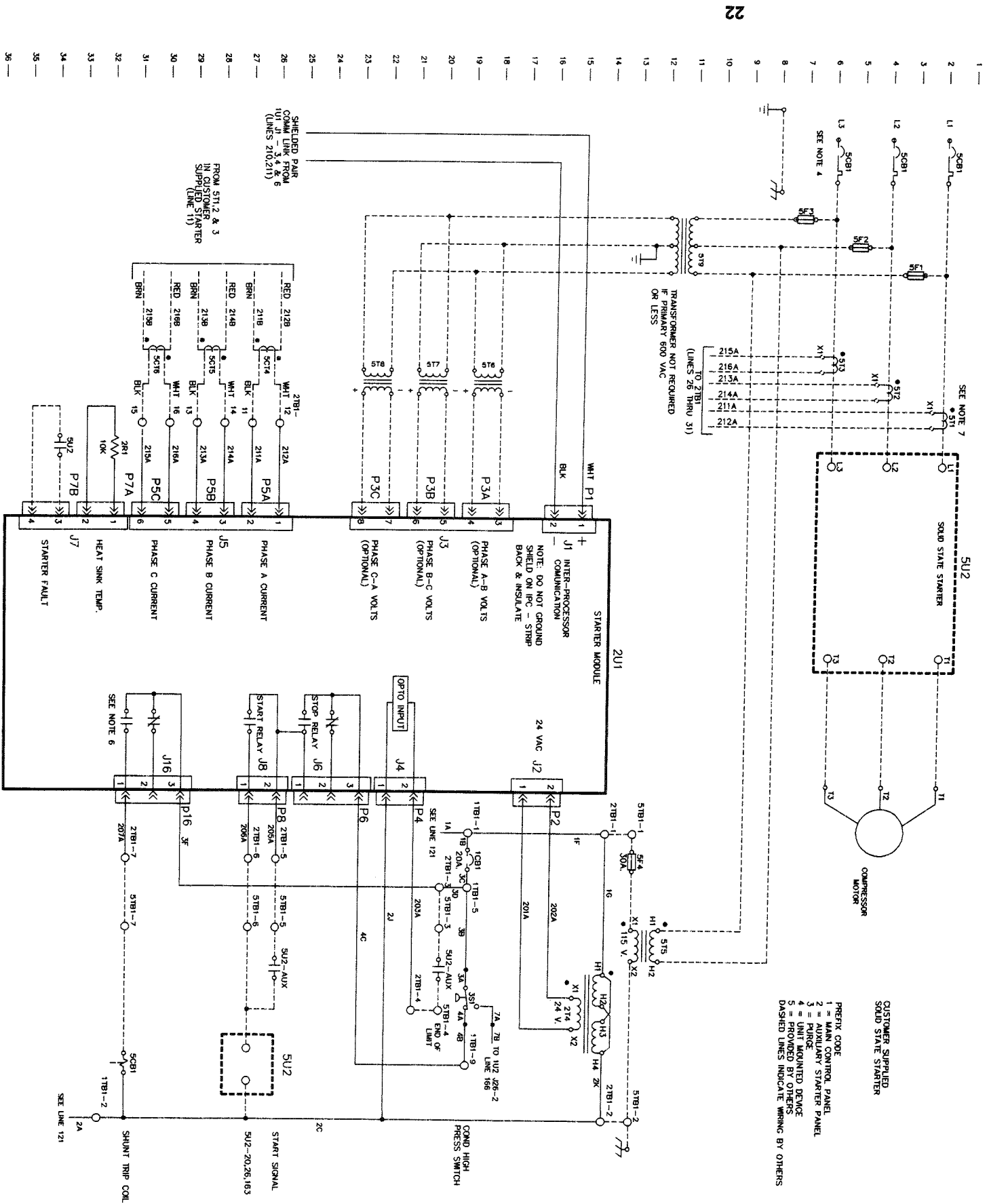
PREFIX CODE
 1 = MAIN CONTROL PANEL
 2 = STARTER PANEL
 3 = PHASE
 4 = FACTORY MOUNTED DEVICE
 5 = PROVIDED BY OTHERS
 DASHED LINES INDICATE WIRING BY OTHERS

- NOTES:
- OPTIONAL STARTER INTERLOCK. SEE STARTER MANUFACTURERS WIRING DIAGRAM FOR SPECIFIC UNITS.
 - UNLESS OTHERWISE NOTED, ALL SWITCHES ARE SHOWN AT 25 C (77 F). AT ATMOSPHERIC PRESSURE, AT 50% RELATIVE HUMIDITY, WITH ALL UTILITIES TURNED OFF AND AFTER A NORMAL SHUTDOWN HAS OCCURRED.
 - NUMBERS ALONG THE RIGHT SIDE OF THE SCHEMATIC DESIGNATE THE LOCATION OF THE CONTACTS BY LINE NUMBER. AN UNDERLINED NUMBER INDICATES A NORMALLY CLOSED CONTACT.
 - THREE PHASE POWER SUPPLY VOLTAGE. SEE UNIT NAMEPLATE FOR VOLTAGE. THE STARTER AND CONTROL MODULE ARE SHOWN BETWEEN STARTER MANUFACTURERS WIRING DIAGRAM FOR SPECIFIC STARTER WIRING.
 - RELAY COILS ARE NOT SHOWN. CONTACTS ARE CONTROLLED BY THE LOGIC OF THE MICRO-CONTROLLER. SEE SEQUENCE OF OPERATION.
 - POLARITY MARKING ON THE CURRENT TRANSFORMER, (HI MARKING ON CT) MUST BE FACING TOWARDS THE INCOMING CURRENT.

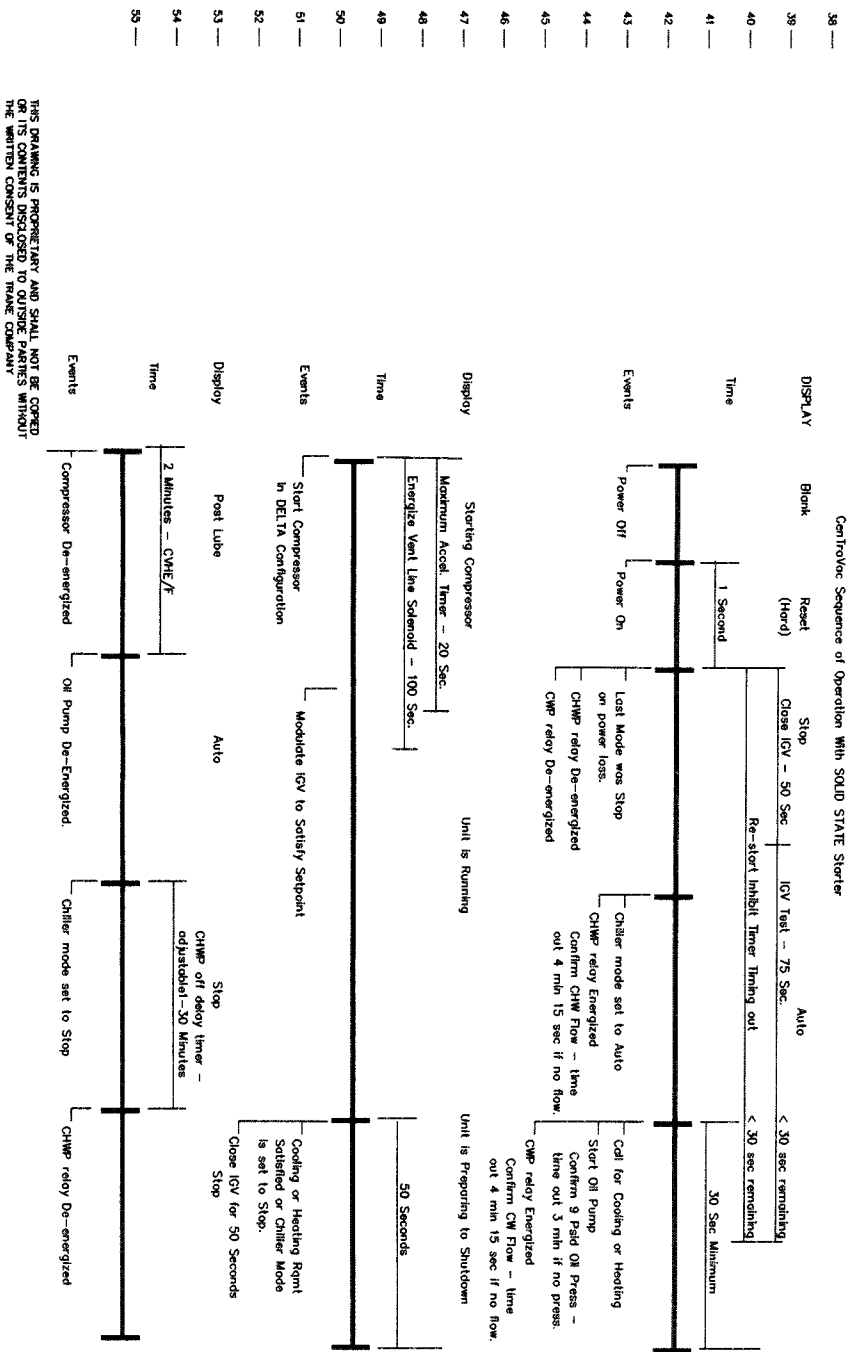


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Figure 10
Typical UCP2 Schematic CVHE, CVHF, CVHG
Customer Supplied Solid State Starter



PREFIX CODE
 1 = MAIN CONTROL PANEL
 2 = AUXILIARY STARTER PANEL
 3 = FUSE RACKED DEGREE
 4 = FUSE RACKED DEGREE
 5 = PROVIDED BY OTHERS
 DASHED LINES INDICATE WIRING BY OTHERS

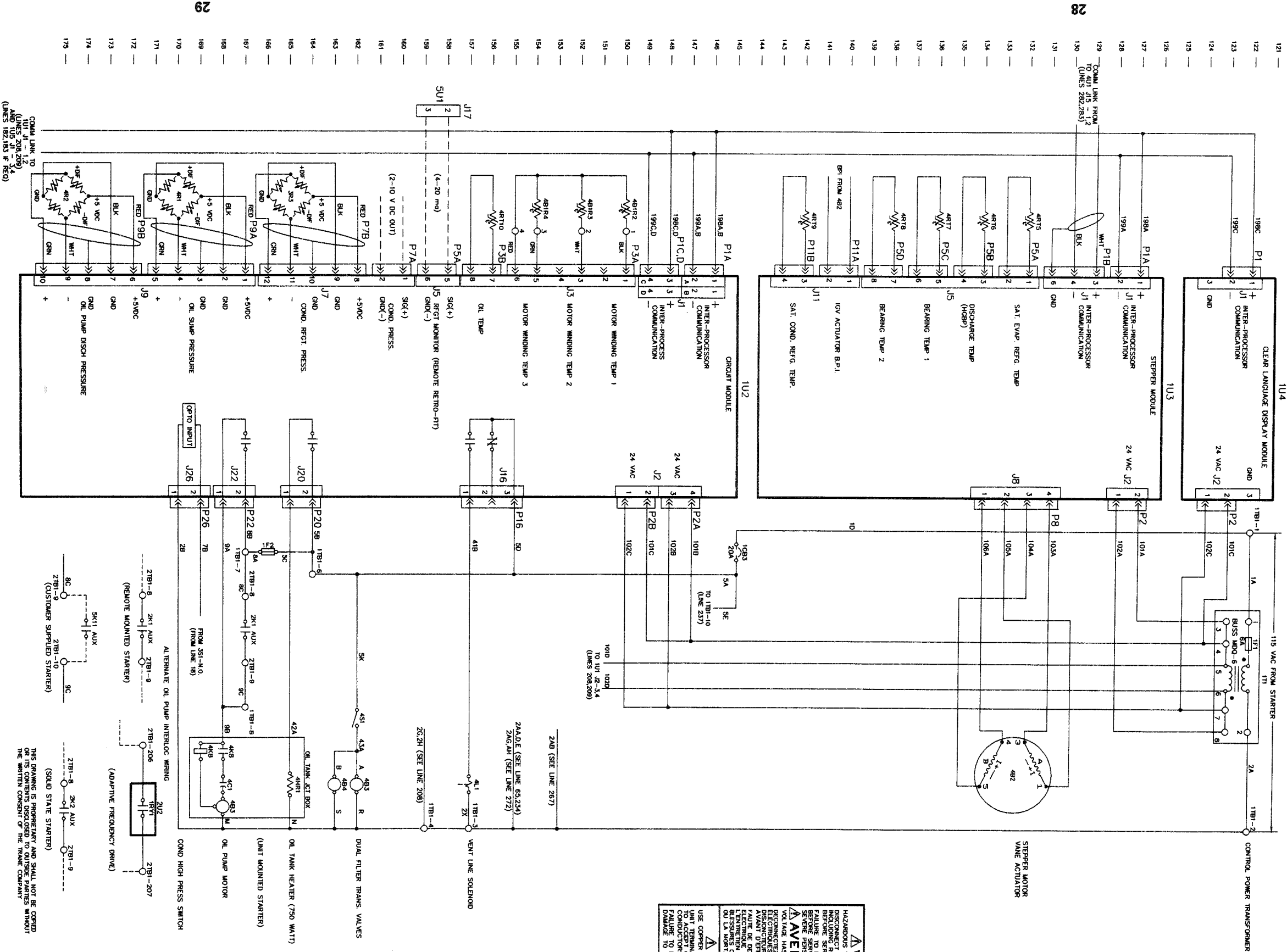


- CentriVoc Sequence of Operation with Solid State Starter
- NOTES:
- OPTIONAL STARTER INTERLOCK. SEE STARTER MANUFACTURER'S WIRING DIAGRAM FOR SPECIFIC APPLICATION.
 - UNLESS OTHERWISE NOTED, ALL SWITCHES ARE SHOWN AT 25 C (77 F). AT AMBOSPHERE. SWITCHES SHOULD BE OPENED IMMEDIATELY AFTER A NORMAL SHUTDOWN HAS OCCURRED.
 - NUMBERS ALONG THE RIGHT SIDE OF THE SCHEMATIC DESIGNATE THE LOCATION OF THE CONTACTS BY LINE NUMBER. AN UNDERLINED NUMBER INDICATES A NORMALLY CLOSED CONTACT.
 - THREE PHASE POWER SUPPLY VOLTAGE--SEE UNIT NAMEPLATE
 - SOLID STATE STARTER WIRING BETWEEN STARTER AND CONTROL MODULE ARE SHOWN. SEE STARTER MANUFACTURER'S WIRING DIAGRAM FOR SPECIFIC APPLICATION.
 - RELAY COILS ARE NOT SHOWN. CONTACTS ARE CONTROLLED BY THE LOGIC OF THE MICRO-CONTROLLER. SEE SEQUENCE OF OPERATION.
 - POLARITY MARKING ON THE CURRENT TRANSFORMER. (H) MARKING ON CT MUST BE FACING TOWARDS THE INCOMING CURRENT.

WARNING
HAZARDOUS VOLTAGE
DISCONNECT ALL ELECTRIC POWER INCLUDING REMOTE DISCONNECTS BEFORE SERVICING.
BEFORE SERVICING, VERIFY POWER IS OFF BY TESTING WITH A VOLTAGE METER.
AVERTISSEMENT
RECONNECTEZ TOUS LES SOURCES D'ÉLECTRICITÉ À LA DISTANCE AVANT D'ÉFFECTUER L'ENTRETIEN. FAUTE DE DÉCONNECTER LA SOURCE D'ÉLECTRICITÉ PEUT ENTRAINER DES LÉZES GRAVES À L'ÉQUIPEMENT.
VOLTAGE HASARDEUX!
RECONNECTEZ TOUS LES SOURCES D'ÉLECTRICITÉ À LA DISTANCE AVANT D'ÉFFECTUER L'ENTRETIEN. FAUTE DE DÉCONNECTER LA SOURCE D'ÉLECTRICITÉ PEUT ENTRAINER DES LÉZES GRAVES À L'ÉQUIPEMENT.

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.

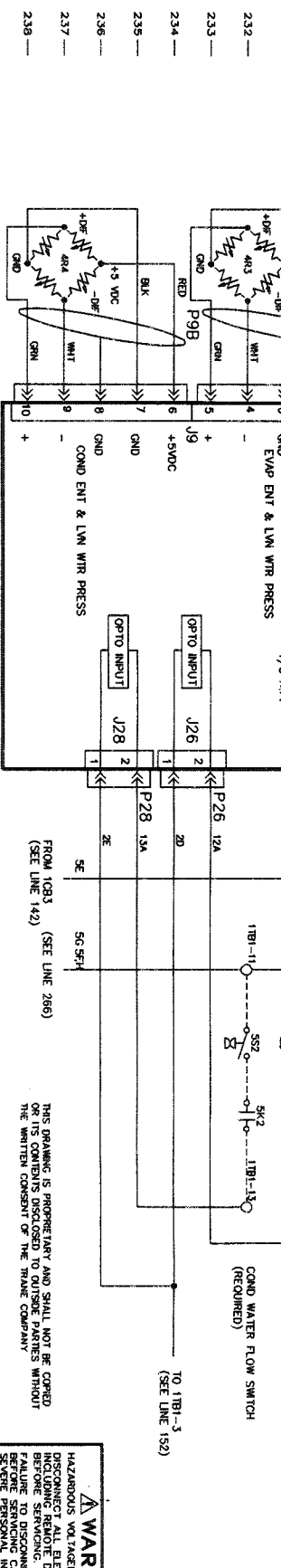
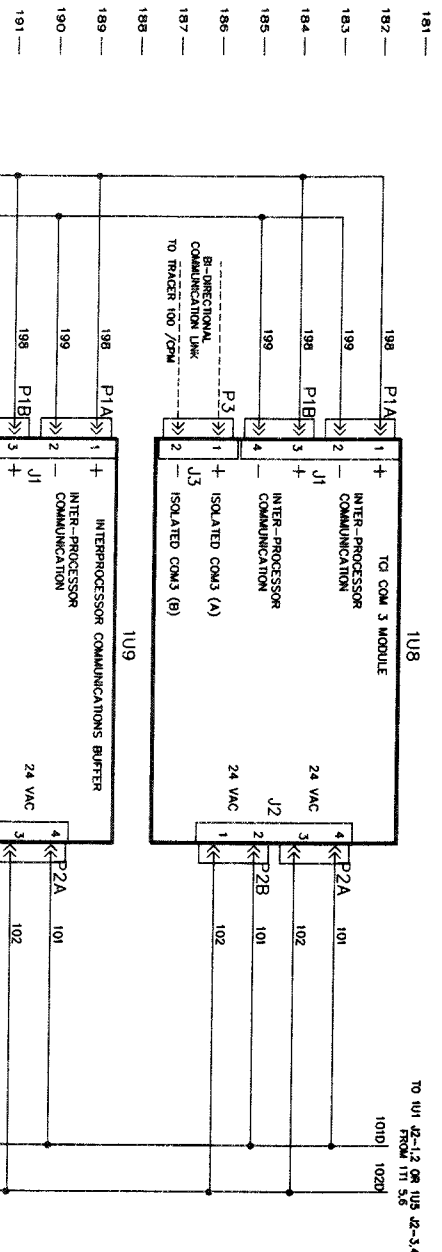
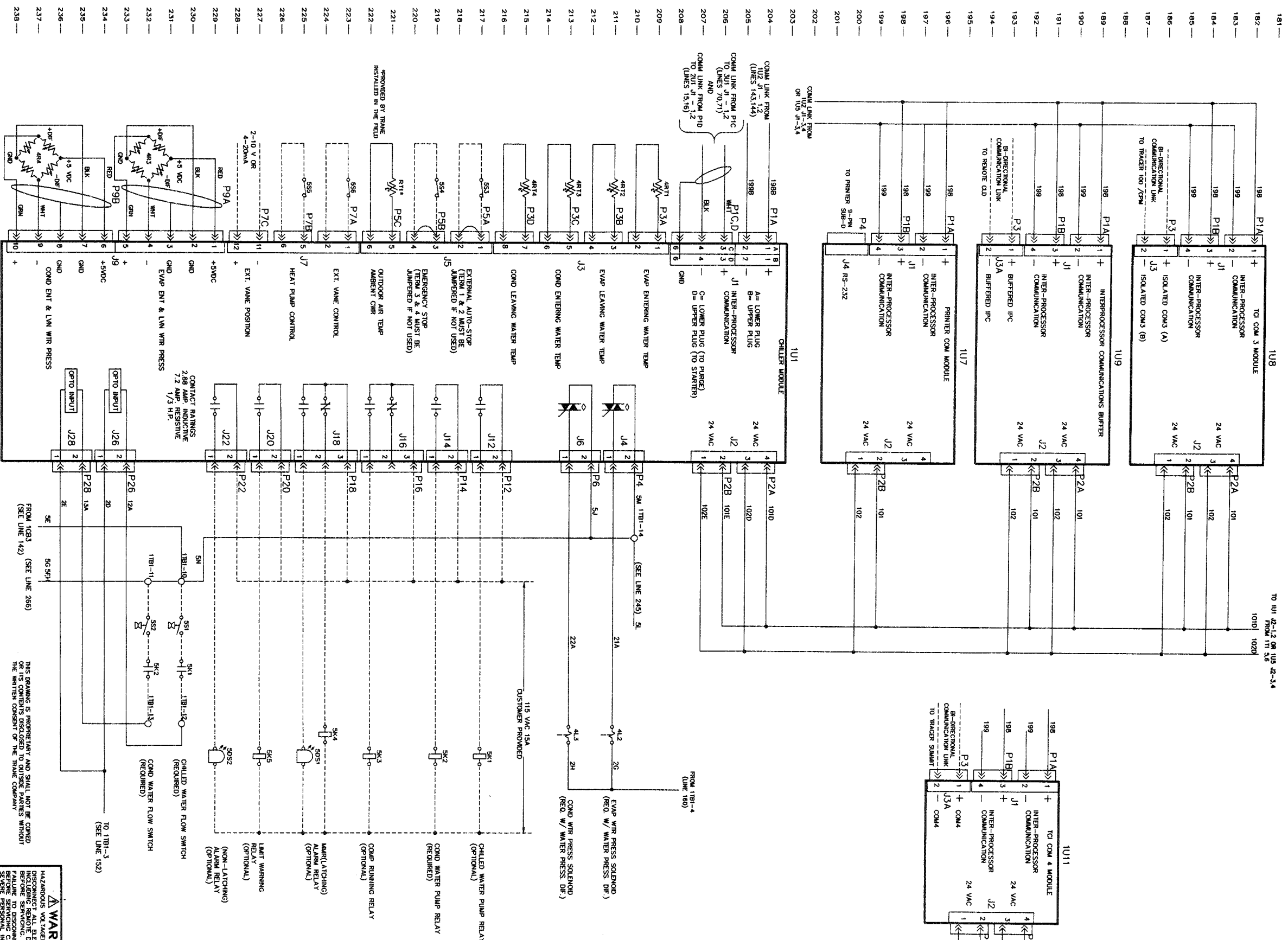
Figure 13
Typical UCP2 Schematic CVHE, CVHF, CVHG
Human Interface, Stepper and Circuit Modules



⚠ WARNING
HAZARDOUS VOLTAGE INCLUDING POWER INCLUDING REMOTE DISCONNECTS BEFORE SERVICING.
FAILURE TO DISCONNECT POWER FROM THE UNIT MAY CAUSE SEVERE PERSONAL INJURY OR DEATH.
⚠ AVERTISSEMENT
VOLTAGE DANGEREUX! RECONNECTER TOUTES LES SOURCES DE ENERGIE INCLUANT LES DISCONNECTS REMOTE AVANT D'EFFECTUER L'ENTRETIEN. 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 WIRING. FAILURE TO DO SO MAY CAUSE DAMAGE TO THE EQUIPMENT.

Figure 14
Typical UCP2 Schematic CVHE, CVHF, CVHG
Chiller and Communications Modules



WARNING
HAZARDOUS VOLTAGE!
DISCONNECT ALL ELECTRIC POWER
BEFORE SERVICING. DISCONNECT
FAILURE TO DISCONNECT POWER
ELECTRONICS INQUIRY LES SOURCES
ELECTRIQUES INCLUANT LES PILES
AVANT D'ENTREPRENDRE LE TRAVAIL.
FAUTE DE DECONNECTER LA SOURCE
ELECTRIQUE AVANT D'ENTREPRENDRE
LE TRAVAIL PEUT CAUSER DE GRAVES
BLESSURES CORPORELLES SERIEUSES
OU LA MORT.

AVERTISSEMENT
DECONNECTEZ TOUTES LES SOURCES
ELECTRIQUES INCLUANT LES PILES
AVANT D'ENTREPRENDRE LE TRAVAIL.
FAUTE DE DECONNECTER LA SOURCE
ELECTRIQUE AVANT D'ENTREPRENDRE
LE TRAVAIL PEUT CAUSER DE GRAVES
BLESSURES CORPORELLES SERIEUSES
OU LA MORT.

CAUTION
USE CORRECT CONNECTIONS
UNIT TERMINALS ARE DESIGNED
TO ACCEPT OTHER TYPES OF
CONDUCTORS, SO ANY GROUND
FAILURE TO THE EQUIPMENT
MAY BE CAUSED.

THIS DRAWING IS PROPRIETARY AND SHALL NOT BE COPIED
OR ITS CONTENTS DISCLOSED TO OUTSIDE PARTIES WITHOUT
THE WRITTEN CONSENT OF THE TRANE COMPANY.

Figure 16
UCP2 Field Lay-Out Diagram
CVHE, CVHF, CVHG

PURPOSE: THIS DRAWING IS TO BE USED FOR ESTIMATING FIELD WIRING REQUIREMENTS.

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. THE FOLLOWING OPTIONS ARE AVAILABLE. REFER TO MECHANICAL SPECIFICATION FOR DESCRIPTION:
 - [A] OPTIONS MODULE: REQUIRED W/FLAGGED FEATURES (REFER TO CONTROL SCHEMATICS)
 - [B] COMMUNICATIONS INTERFACE - COMM3 OR COMM4 (CONSULT SALES OFFICE FOR SELECTION)
 - [C] UNIT DISCONNECT, NON FUSED (STARTER OPTION)
 - [D] CHILLED WATER RESET-OUTDOOR AIR
4. 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.

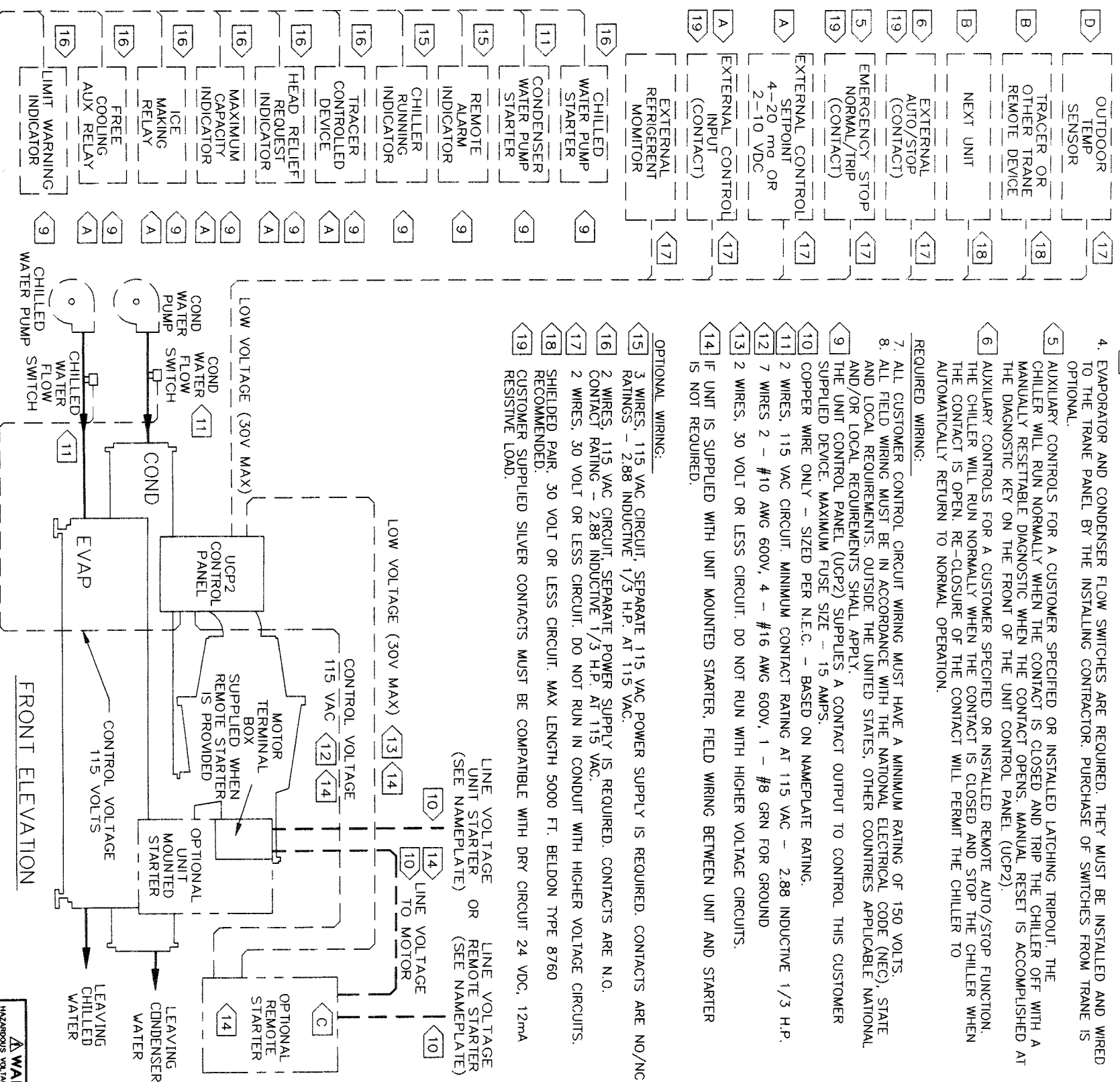
5. AUXILIARY CONTROLS FOR A CUSTOMER SPECIFIED OR INSTALLED LATCHING TRIP/OUT. THE CHILLER WILL RUN NORMALLY WHEN THE CONTACT IS CLOSED AND TRIP THE CHILLER OFF WITH A MANUALLY RESETTABLE DIAGNOSTIC WHEN THE CONTACT OPENS. MANUAL RESET IS ACCOMPLISHED AT THE DIAGNOSTIC KEY ON THE FRONT OF THE UNIT CONTROL PANEL (UCP2).
6. AUXILIARY CONTROLS FOR A CUSTOMER SPECIFIED OR INSTALLED REMOTE AUTO/STOP FUNCTION. THE CHILLER WILL RUN NORMALLY WHEN THE CONTACT IS CLOSED AND STOP THE CHILLER WHEN THE CONTACT IS OPEN. RE-CLOSURE OF THE CONTACT WILL PERMIT THE CHILLER TO AUTOMATICALLY RETURN TO NORMAL OPERATION.

REQUIRED WIRING:

7. ALL CUSTOMER CONTROL CIRCUIT WIRING MUST HAVE A MINIMUM RATING OF 150 VOLTS.
8. ALL FIELD WIRING MUST BE IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE (NEC), STATE AND/OR LOCAL REQUIREMENTS. OUTSIDE THE UNITED STATES, OTHER COUNTRIES APPLICABLE NATIONAL AND/OR LOCAL REQUIREMENTS SHALL APPLY.
9. THE UNIT CONTROL PANEL (UCP2) SUPPLIES A CONTACT OUTPUT TO CONTROL THIS CUSTOMER SUPPLIED DEVICE. MAXIMUM FUSE SIZE - 15 AMPS.
10. COPPER WIRE ONLY - SIZED PER N.E.C. - BASED ON NAMEPLATE RATING.
11. 2 WIRES, 115 VAC CIRCUIT. MINIMUM CONTACT RATING AT 115 VAC - 2.88 INDUCTIVE 1/3 H.P.
12. 7 WIRES 2 - #10 AWG 600V, 4 - #16 AWG 600V, 1 - #8 GRN FOR GROUND
13. 2 WIRES, 30 VOLT OR LESS CIRCUIT. DO NOT RUN WITH HIGHER VOLTAGE CIRCUITS.
14. IF UNIT IS SUPPLIED WITH UNIT MOUNTED STARTER, FIELD WIRING BETWEEN UNIT AND STARTER IS NOT REQUIRED.

OPTIONAL WIRING:

15. 3 WIRES, 115 VAC CIRCUIT. SEPARATE 115 VAC POWER SUPPLY IS REQUIRED. CONTACTS ARE NO/NC RATINGS - 2.88 INDUCTIVE 1/3 H.P. AT 115 VAC.
16. 2 WIRES, 115 VAC CIRCUIT. SEPARATE POWER SUPPLY IS REQUIRED. CONTACTS ARE N.O. CONTACT RATING - 2.88 INDUCTIVE 1/3 H.P. AT 115 VAC.
17. 2 WIRES, 30 VOLT OR LESS CIRCUIT. DO NOT RUN IN CONDUIT WITH HIGHER VOLTAGE CIRCUITS.
18. SHIELDED PAIR, 30 VOLT OR LESS CIRCUIT. MAX LENGTH 5000 FT. BELDON TYPE 8760 RECOMMENDED.
19. CUSTOMER SUPPLIED SILVER CONTACTS MUST BE COMPATIBLE WITH DRY CIRCUIT 24 VDC, 12mA RESISTIVE LOAD.

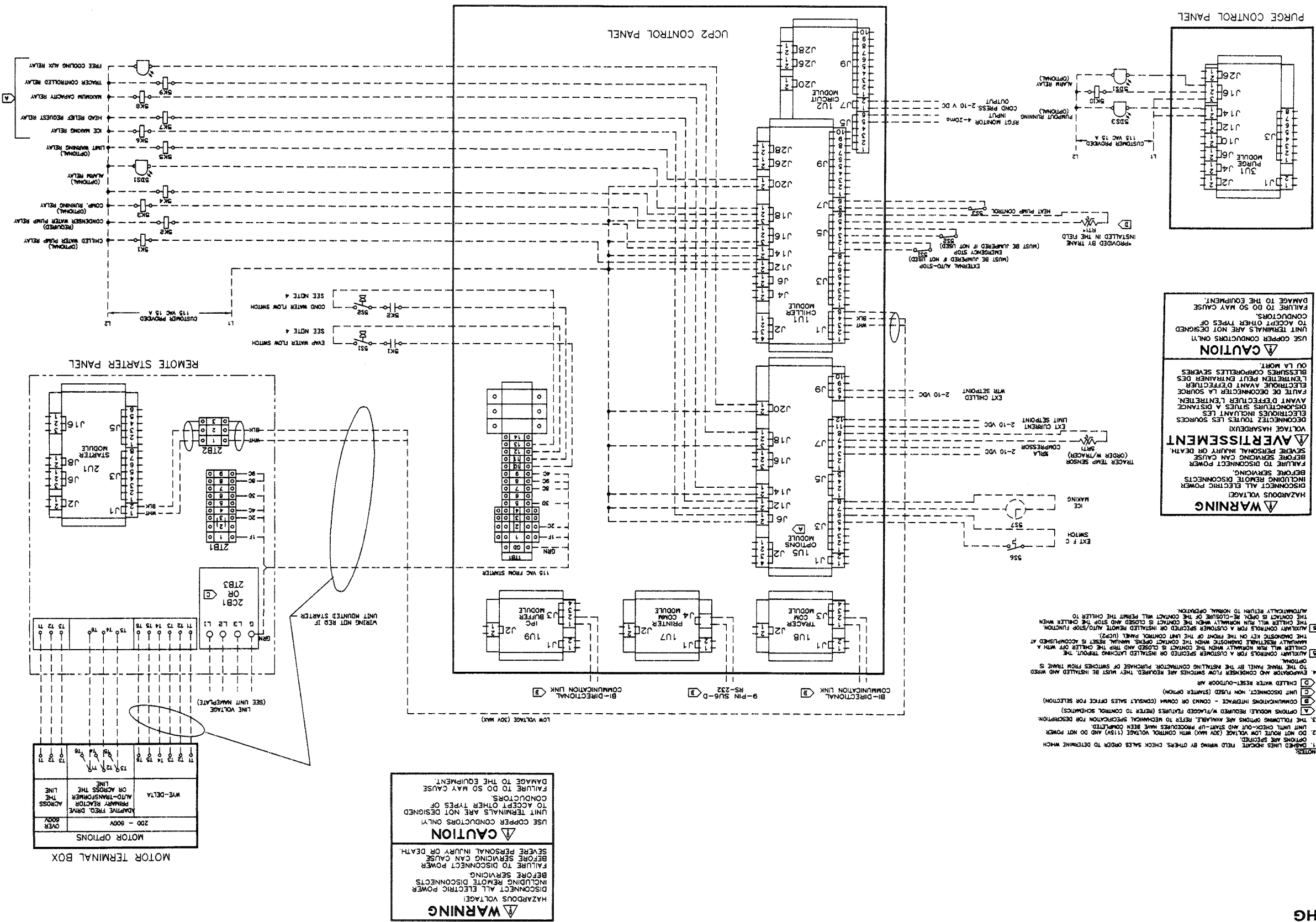


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WARNING
HAZARDOUS VOLTAGE!
DISCONNECT ALL ELECTRIC POWER BEFORE SERVICING.
FAILURE TO DISCONNECT POWER BEFORE SERVICING MAY CAUSE SEVERE PERSONAL INJURY OR DEATH.
AVERTISSEMENT
DÉCONNECTEZ TOUTES LES SOURCES ÉLECTRIQUES INCLUANT LES SOURCES À HAUTE TENSION AVANT D'ENTREPRENDRE DES TRAVAUX DE RÉPARATION ÉLECTRIQUE AVANT D'ÉTEINDRE LES ÉLÉMENTS ÉLECTRIQUES.
NE PAS TOUCHER LES ÉLÉMENTS ÉLECTRIQUES COMPOSÉS DES SERVEURS OU LA MORT!

CAUTION
USE CORRECT CONNECTIONS ONLY. USE TERMINALS AND WIRE NOT DESIGNED TO ACCEPT OTHER TYPES OF CONDUCTORS, SO ANY CAUSE DAMAGE TO THE EQUIPMENT.

Figure 17
Field Connection Wiring
CVHE, CVHF, CVHG



WARNING
HAZARDOUS VOLTAGE!
DISCONNECT ALL ELECTRIC POWER BEFORE SERVICING.
FAILURE TO DISCONNECT POWER BEFORE SERVICING CAN CAUSE SEVERE PERSONAL INJURY OR DEATH.
TRACER TEMP SENSOR (ORDER W/TRACER COMPRESSOR) 2-10 VDC
EXT CURRENT UNIT SETPOINT 2-10 VDC
EXT CALLED WTR SETPOINT 2-10 VDC
EXTR 2-10 VDC

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.

1. CHANGED LINES INDICATE FIELD WIRING BY OTHERS. CHECK SALES ORDER TO DETERMINE WHICH OPTIONS ARE SPECIFIED.
2. DO NOT ROUTE LOW VOLTAGE (24V MAX) WITH CONTROL VOLTAGE (115V) AND DO NOT POWER UNIT UNTIL CHECK-OUT AND START-UP PROCEDURES HAVE BEEN COMPLETED.
3. THE FOLLOWING OPTIONS ARE AVAILABLE. REFER TO MECHANICAL SPECIFICATION FOR DESCRIPTION:
 - A. OPTIONS MODULE: REQUIRED W/PLACED FEATURES (REFER TO CONTROL SCHEDULES)
 - B. COMMUNICATIONS INTERFACE - COMMS OR COMMA (CONSULT SALES OFFICE FOR SELECTION)
 - C. UNIT DISCONNECT, NON FUSED (STARTER OPTION)
 - D. CHILLED WATER RESET-OUTDOOR AIR
4. TO THE TRANE PANEL BY THE INSTALLING CONTRACTOR. PURCHASE OF SWITCHES FROM TRANE IS OPTIONAL.
5. ALARM CONTROL FOR A CUSTOMER SPECIFIED OR INSTALLED LATCHING TRIP-OUT THE CHILLER WILL RUN NORMALLY WHEN THE CONTACT IS CLOSED AND TRIP THE CHILLER OFF WITH A MANUALLY RESETTABLE DISCONNECT WHEN THE CONTACT OPENS. MANUAL RESET IS ACCOMPLISHED AT THE DIAGNOSTIC KIT ON THE FRONT OF THE UNIT CONTROL PANEL (UCP2).
6. ALARM CONTROL FOR A CUSTOMER SPECIFIED OR INSTALLED REMOTE AUTO/STOP FUNCTION. THE CHILLER WILL RUN NORMALLY WHEN THE CONTACT IS CLOSED AND STOP THE CHILLER WHEN THE CONTACT IS OPEN. RE-CLOSURE OF THE CONTACT WILL PERMIT THE CHILLER TO AUTOMATICALLY RETURN TO NORMAL OPERATION.

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.

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.

MOTOR TERMINAL BOX

200 - 800V	STARTING REQ. DRIVE	LINE
WE-Delta	OR ACROSS THE	LINE
	LINE	

MOTOR OPTIONS

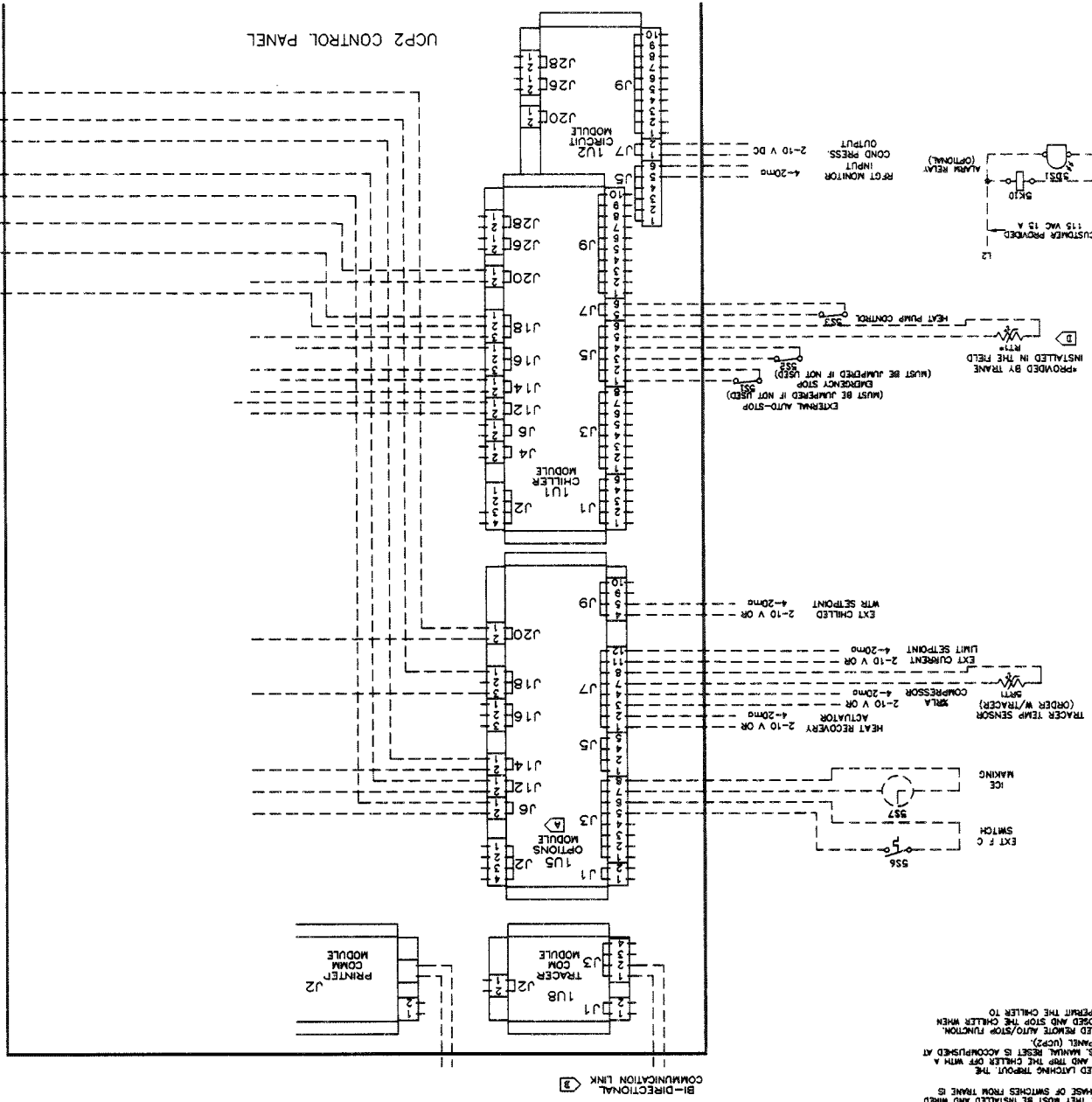
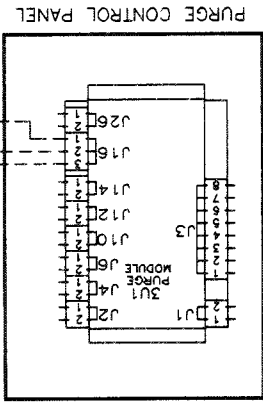
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11	12	13	14	15	16	17	18	19	20	21

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Figure 18
Field Connection Wiring - Starter by Others
CVHE, CVHF, CVHG

- NOTES:
1. DASHED LINES INDICATE FIELD WIRING BY OTHERS. CHECK SALES ORDER TO DETERMINE WHICH OPTIONS ARE SELECTED.
 2. DO NOT ROUTE LOW VOLTAGE (24V MAX) WITH CONTROL VOLTAGE (115V) AND DO NOT POWER UNIT UNTIL CHECK-OUT AND START-UP PROCEDURES HAVE BEEN COMPLETED.
 3. THE FOLLOWING OPTIONS ARE AVAILABLE: REFER TO CHANNEL SELECTION FOR DESCRIPTION.
 4. OPTIONS MODULE REQUIRES W/FLASHER FEATURES (REFER TO CONTROL SCHEDULES).
 5. COMMUNICATIONS INTERFACE - COMMAND OR COMMAND (CONSULT SALES OFFICE FOR SELECTION).
 6. UNIT DISCONNECT, NON-FLASHER (STARTER OPTION).
 7. CHILLED WATER REJECT-OUTDOOR AIR.
 8. EXHAUSTOR AND COMPRESSOR FLOW SWITCHES ARE REQUIRED. THEY MUST BE INSTALLED AND WIRED TO THE TRAME PANEL BY THE INSTALLING CONTRACTOR. PURCHASE OF SWITCHES FROM TRAME IS OPTIONAL.
 9. AIRFLOW CONTROL FOR A CUSTOMER SPECIFIED OR INSTALLED UNIT THROUGH THE CHILLER WILL RUN NORMALLY WHEN THE CONTACT IS CLOSED AND STOP THE CHILLER WHEN AIRFLOW CONTROL FOR A CUSTOMER SPECIFIED OR INSTALLED REWIRE AUTO/STOP FUNCTION. THE CHILLER WILL RUN NORMALLY WHEN THE CONTACT IS CLOSED AND STOP THE CHILLER WHEN THE CONTACT IS OPEN. NO LOSS OF OR THE CONTACT WILL PERMIT THE CHILLER TO AUTOMATICALLY RETURN TO NORMAL OPERATION.

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.
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.

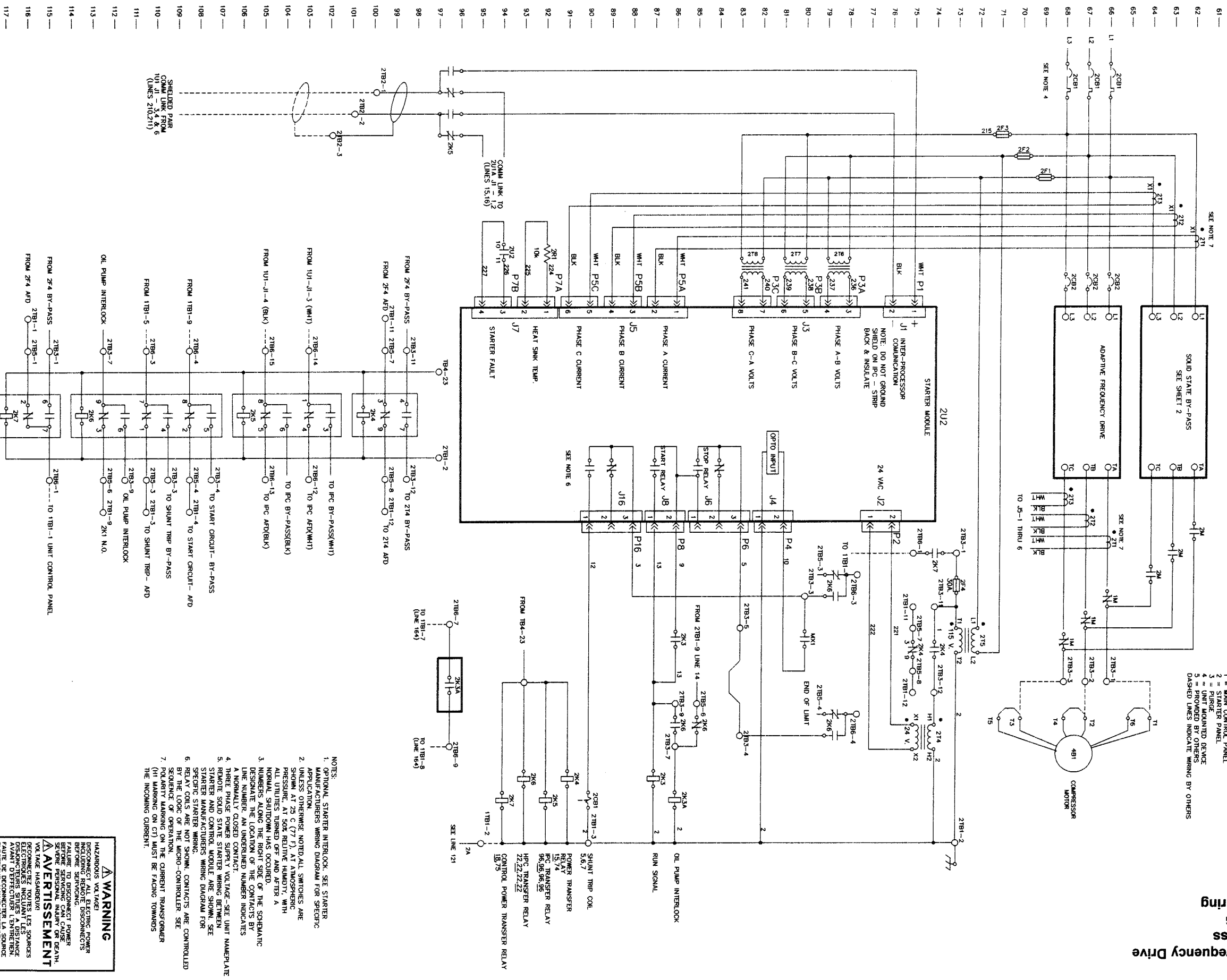


WARNING
HAZARDOUS VOLTAGE!
DISCONNECT ALL ELECTRIC POWER INCLUDING REMOTE DISCONNECTS BEFORE SERVICING.
FAILURE TO DISCONNECT POWER BEFORE SERVICING CAN CAUSE SEVERE PERSONAL INJURY OR DEATH.
AVERTISSEMENT
DÉCONNECTEZ TOUTES LES SOURCES DE TENSION ÉLECTRIQUE AVANT D'EFFECTUER L'ENTRETIEN. L'ENTRETIEN PEUT ENTRAÎNER DES BLESSURES CORPORELLES SÈVESES 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.

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SEE NOTE 7
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CONNECTION DIAGRAM - TRANSFER RELAYS

