

Wiring Diagrams

DIAGRAM INDEX

POWER SCHEMATICS

Unit 30GN,GT	Voltage	Figure Number	Label Diagram No. 30GT-
130,150*	208/230, 230-PW, XL	1	513262
130,150*	346-PW, XL	2	513834
130,150*	380, 380/415, 460, 575-PW	3	513264
130,150*	380, 380/415, 460, 575-XL	4	513266
170,190*	208/230, 230-PW, XL	5	513263
170,190*	346-PW, XL	6	513835
170,190*	380, 380/415, 460, 575-PW	7	513265
170,190*	380, 380/415, 460, 575-XL	8	513267
210*	208/230, 230-PW, XL	9	513854
210*	346 (PW, XL), 380, 380/415, 460, 575-PW	10	513855
240B,270B	208/230 (PW, XL), 346, 380, 380/415, 460, 575-PW	11	510571
240B,270B	346, 380, 380/415, 460, 575-XL	12	510519

*And Associated Modular Units

CONTROL SCHEMATICS

Unit	Voltage	Figure Number	Label Diagram No. 30GT-
30GN130-210*	24	13	513274
30GN240B, 270B	24	14	511204
30GN130-210*	115, 230	15	513273
30GN240B, 270B	115, 230	16	511203
30GT130-210*	24	17	513272
30GT240B, 270B	24	18	511202
30GT130-210*	115, 230	19	513271
30GT240B, 270B	115, 230	20	511201

*And Associated Modular Units.

COMPONENT ARRANGEMENTS

Unit	Voltage	Type	Figure Number	Label Diagram No. 30GT
30GN130-210*	All	Control Box	21	513273
30GN240B, 270B	All	Control and Power Box	22	511206
30GT130-210*	All	Control Box	23	513271
30GT240B, 270B	All	Control and Power Box	24	511205
30GN,GT130,150*	208/230, 230-PW, XL	Power Box	25	513262
30GN,GT130,150*	346-PW, XL	Power Box	26	513834
30GN,GT130,150*	380, 380/415, 460, 575-PW	Power Box	27	513264
30GN,GT130,150*	380, 380/415, 460, 575-XL	Power Box	28	513266
30GN,GT170,190*	208/230, 230-PW, XL	Power Box	29	513263
30GN,GT170,190*	346-PW, XL	Power Box	30	513835
30GN,GT170,190*	380, 380/415, 460, 575-PW	Power Box	31	513265
30GN,GT170-210*	380, 380/415, 460, 575-XL	Power Box	32	513267
30GN,GT210*	208/230, 230-PW, XL	Power Box	33	513854
30GN,GT210*	346 (PW, XL), 380, 380/415, 460, 575-PW	Power Box	34	513855

*And Associated Modular Units.

DIAGRAM INDEX (cont)

DIAGNOSTICS				
Unit	Type	Voltage	Figure Number	Label Diagram No. 30GT-
30GN130-210*, 240B,270B	Start-Up and Diagnostics	All	35	513269
30GN130-210*, 240B,270B	Channel Chart	All	36	—
30GT130-210*, 240B,270B	Start-Up and Diagnostics	All	37	513268

*And Associated Modular Units

FIELD WIRING				
Unit	Wiring Type	Voltage	Figure Number	Label Diagram Number
30GN,GT130-210*	Field Power	All	38	—
30GN,GT240B,270B	Field Power	All	39	—
30GN130-210*	Field Control	All	40	—
30GN240B,270B	Field Control	All	41	—
30GT130-210*	Field Control	All	42	—
30GT240B,270B	Field Control	All	43	—

*And Associated Modular Units

MOTORMASTER® DEVICE WIRING			
Unit 30GN,GT	Voltage	Figure Number	Label Diagram No. 30GT-
130-210*	575	44	513270
240B,270B	575	45	512207

*And Associated Modular Units

Dual Set Point Wiring

Fig 46

SAFETY CONSIDERATIONS

Installing, starting up, and servicing this equipment can be hazardous due to system pressures, electrical components, and equipment location (roofs, elevated structures, etc)

Only trained, qualified installers and service mechanics should install, start up, and service this equipment.

Untrained personnel can perform basic maintenance functions such as cleaning coils. All other operations should be performed by trained service personnel.

When working on the equipment, observe precautions in the literature and on tags, stickers, and labels attached to the equipment. Follow all safety codes. Wear safety glasses and work gloves. Use care in handling, rigging, and setting bulky equipment.

	ELECTRIC SHOCK HAZARD Open all remote disconnects before servicing this equipment.
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TERMINAL BLOCK DATA

208/230 and 230-V Units — These units have 3 terminal blocks with 9 parallel conductors from the fused disconnect

380, 380/415, 460, and 575-V Units — These units have 2 terminal blocks with 6 parallel conductors from the fused disconnect.

MODULAR UNIT INFORMATION

Unit sizes 240-420 are modular units which are shipped in separate sections as modules A and B. Installation directions specific to these units are noted in base unit installation instructions. See Unit Sizes and Modular Combinations table below for a listing of unit sizes and modular combinations

Unit Sizes and Modular Combinations

UNIT MODEL 30GN,GT	NOMINAL TONS	SECTION A UNIT	SECTION B UNIT
130	125	—	—
150	145	—	—
170	160	—	—
190	180	—	—
210	200	—	—
240	225	30GN,GT130	30GN,GT100
270	260	30GN,GT170	30GN,GT100
300	285	30GN,GT130	30GN,GT170
330	325	30GN,GT170	30GN,GT170
360	350	30GN,GT190	30GN,GT190/ 30GN,GT170*
390	380	30GN,GT210	30GN,GT190
420	400	30GN,GT210	30GN,GT210

*60 Hz units/50 Hz units

SEQUENCE OF OPERATION

30GN Units — During unit off cycle, crankcase heaters are energized

The unit is started by putting the LOCAL/ENABLE-STOP-CCN switch in LOCAL/ENABLE or CCN position. When the unit receives a call for cooling (either from the internal control or CCN network command) the unit stages up in capacity to maintain the cooler fluid set point. The first compressor starts 1½ to 3 minutes after the call for cooling. See base unit installation instructions for compressor loading sequences.

The lead circuit can be specifically designated or randomly selected by the controls, depending on how the unit is field configured. A field configuration is also available to determine if the unit should stage up both circuits equally or load one circuit completely before bringing on the other.

When the lead circuit compressor starts, the unit starts with a pumpout routine. The compressor starts and continues to run with the electronic expansion valve (EXV) closed, to purge the refrigerant lines and cooler of refrigerant, until the saturated suction temperature is 10° F (5.5° C) below the saturated suction temperature at initiation, or is 10° F (5.5° C) below the leaving water temperature, or reaches a saturated suction temperature of -15 F (-26 C). No pumpout is necessary if the saturated suction temperature is below -15 F (-26 C). When this condition is satisfied, the EXV begins to modulate to feed refrigerant into the cooler.

The head pressure is controlled by fan cycling. The desired head pressure set point is entered, and is controlled by EXV position or saturated discharge temperature measurement. For proper operation, maintain set point as shipped from factory. The usual head pressure control method (also field configured) is EXV control, which maintains the lowest head pressure that provides enough pressure drop across the valve. Refer to unit Troubleshooting literature for head pressure control configurations.

If temperature reset is being used, the unit controls to a higher leaving water temperature (cooler fluid set point 2), as the building load reduces. If demand limit is used, the

unit may temporarily be unable to maintain the desired leaving water temperature because of imposed power limitations.

When the occupied period ends, or when the building load drops low enough, the lag compressors shut down. The lead compressors continue to run as the EXV closes, and until the conditions of pumpout are satisfied. If a fault condition is signalled requiring immediate shutdown, pumpout is omitted.

NOTE: Temperatures and pressures are measured by thermistors and transducers. See base unit installation instructions for locations.

	ELECTRIC SHOCK HAZARD. Turn off all power to unit before servicing. The LOCAL/ENABLE-STOP-CCN switch on control panel does not shut off control power; <i>use field disconnect.</i>
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30GT Units — During unit off cycle, crankcase heaters are energized. If ambient temperature is below 36 F (2 C), cooler heaters and a microprocessor board heater are also energized.

When control ON-OFF switch is turned to ON, control first goes through a 2-minute initialization period, during which the display will continuously show **20**. Ninety (90) seconds after **20** leaves display, control begins to bring on compressors. Rate at which compressors are started depends on leaving chilled water temperature and rate of change of leaving water temperature.

On standard units, an automatic lead-lag feature in control system determines by random selection either circuit A or B to start first.

At first call for cooling, microprocessor starts first compressor, deenergizes crankcase heater, and starts one condenser fan.

All units have an electronic expansion valve (EXV). The EXV remains closed for 10 seconds to purge cooler and suction line of any liquid refrigerant that may have migrated to these areas during off period. After 10 seconds, expansion valve starts to open. As more cooling is required, control brings on additional stages of capacity. Loading sequence for compressors is shown in the base unit installation instructions. Automatic lead-lag control is provided on all units.

Once capacity has been satisfied, the lag compressor will shut down, and lead compressor will continue to run. After lag compressor has shut down, the EXV is signaled to close. Lead compressor remains on until EXV is less than 300 steps open, and the saturated suction temperature is less than 25 F (-4 C) as sensed by cooler thermistor T5 or T6, or one minute has elapsed.

Microprocessor controls EXV to maintain a superheat of 30° F (16.7° C) entering compressor cylinders. Microprocessor control also cycles condenser fans on and off to maintain an adequate pressure differential across expansion valves. Fans are controlled by position of EXV and saturated condensing temperature thermistors. When expansion valve is fully open and superheat is greater than 40 F (22 C), fan stages are removed; when the valve is approximately half open, fan stages are added. This allows unit to run at very low condensing temperatures at part load. Thus chiller has very high part-load EERs (energy efficiency ratios). Fan sequence is shown in the base unit installation instructions.

LOAD SHED — If load shed option is being used, control limits maximum capacity to load shed input value. Refer to Controls and Troubleshooting publication for details. If capacity is limited by a load shed signal, display shows a

22 when display button is pressed

TEMPERATURE RESET — If temperature reset is being used, microprocessor adjusts leaving water temperature to obtain greater part-load efficiency. Refer to Controls and Troubleshooting book for details. If leaving water temperature is being reset, display shows a

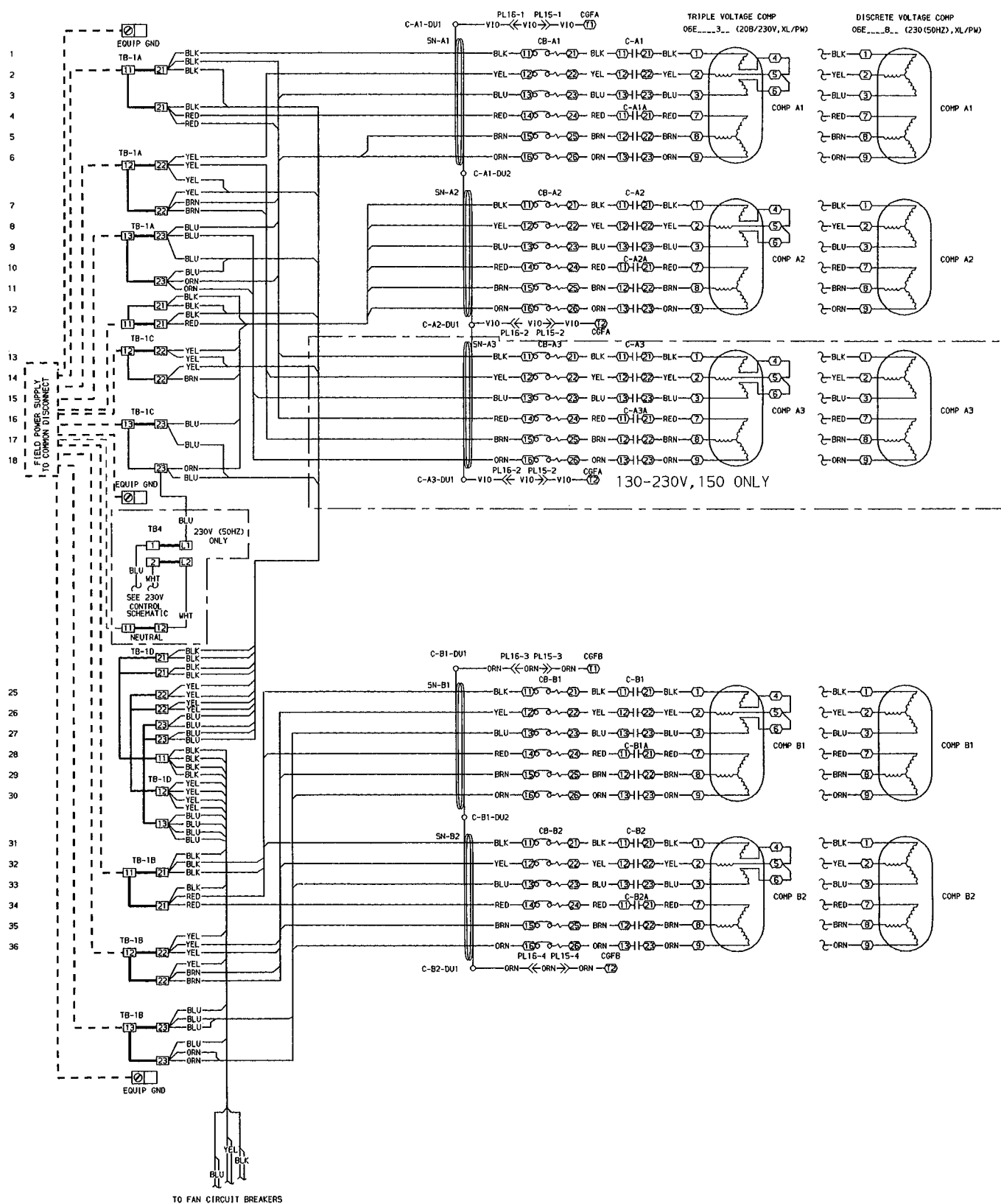
21 when the display button is pressed

LEGEND (FIG. 1-37, 42, AND 43)

ALM	— Alarm	FM	— Fan Motor	SN	— Sensor (Toroid)
ALMR	— Alarm Relay	FU	— Fuse	SNB	— Snubber
C	— Contactor, Compressor	GFI-CO	— Ground Fault Interrupter — Convenience Outlet	SPT	— Suction Pressure Transducer
CB	— Circuit Breaker	HG	— Hot Gas	SW	— Switch
CCB	— Control Circuit Breaker	HGBPR	— Hot Gas Bypass Relay	T1, T2, etc.	— Thermistor Numbers
CCN	— Carrier Comfort Network	HGBPS	— Hot Gas Bypass Solenoid	TB	— Terminal Block
CGF	— Circuit Ground Fault	HPS	— High-Pressure Switch	TDR	— Time Delay Relay
CH	— Crankcase Heater	HSIO, LID	— Keyboard and Display Module	TEMP	— Temperature
CHC	— Cooler Heater Cable	HTR	— Heater	TRAN	— Transformer
CHT	— Cooler Heater Thermostat	LCS	— Loss-of-Charge Switch	TXV	— Thermostatic Expansion Valve
CIO	— Communications Input/Output	LED	— Light-Emitting Diode	U	— Unloader
CIR, CKT	— Circuit	LID	— Local Interface Device	VAC	— Volts Alternating Current
CLHR	— Cooler Heater Relay	LLSV	— Liquid Line Solenoid Valve	VDC	— Volts Direct Current
COM, COMM	— Communications	MMSN	— Motormaster® Sensor	XL	— Across-the-Line Start
COMP	— Compressor	MOP	— Maximum Operating Pressure		
COND	— Condensing	NEC	— National Electrical Code (U S A)		Terminal Block Connection
CPCS	— Compressor Protection Control Module	OA	— Outdoor Air		Marked Terminal
CR	— Control Relay	OPS	— Oil Pressure Switch		Unmarked Terminal
CWFS	— Chilled Water Flow Switch	OPT	— Oil Pressure Transducer		Unmarked Splice
CWP	— Chilled Water Pump	P	— Potentiometer		Marked Wire
CWPI	— Chilled Water Pump Interlock	PL	— Plug Assembly		Marked Splice
DPT	— Discharge Pressure Transducer	POT	— Potentiometer		Factory Wiring
DSIO (EXV)	— EXV Driver	PRI	— Primary		Field Control Wiring
DSIO (LV)	— Relay Module, Low Voltage	PS	— Power Supply		Field Power Wiring
DU	— Dummy Terminal	PSIO	— Processor Module		Indicates Common Potential
EPROM	— Erasable Programmable Read-Only Memory	PW	— Part Wind Start		Does not Represent Wiring
EQUIP GND	— Equipment Ground	PWR	— Power		Accessory or Option Wiring
EXV	— Electronic Expansion Valve	R	— Red (Light)		
FC	— Fan Contactor	RB	— Relay Board		
FCB	— Fan Circuit Breaker	RBPL	— Relay Board Plug		
FIOF	— Factory-Installed Option	RES	— Resistor		
		SAT	— Saturated		

NOTES

- Fan motors thermally protected. Three-phase motors protected against primary single-phasing conditions.
- Replacement of original wires must be with type 105° C wire or its equivalent.
- Numbers on the right side of label diagrams indicate the line location of applicable contacts. An underlined number signifies normally closed contacts, a plain number denotes normally open contacts. Line numbers are shown on the left side of the diagrams.
- Factory wiring is in accordance with National Electrical Code (NEC). Field modifications or additions must be in compliance with all applicable codes.
- Wiring for main field power supply must be rated 75° C minimum. Use copper, copper-clad aluminum or aluminum conductors for all units, except use copper only for the 30GN, GT210 208/230 v and associated modular units (part wind and across-the-line start).
- Power for control circuit should be supplied from a separate source through a field supplied disconnect with 30 amp maximum protection for 115-v control circuits and 15 amp maximum protection for 230-v control circuit. Connect control circuit power to terminals 1 and 2 of TB4. Connect neutral side of supply to terminal 2 of TB4. Control circuit conductors for all units must be copper only.
- 30GT Units:** Terminals 3 and 4 on TB6 are for field connection for CWFS or remote on-off. The contacts must be rated for dry circuit application capable of handling a 5 vdc, 5 mA load. Remove jumper between terminals 3 and 4 of TB6 if remote on-off is installed.
- 30GN Units:** Terminals 1, 2, 3 and 4 of TB6 are for field external interlock connection for remote on-off or CWP interlock and CWFS. The contacts must be rated for dry circuit application capable of handling a 5 VDC, 1 mA to 20 mA load. Remove jumper between terminals 3 and 4 of TB6 if remote on-off is installed.
- 30GT Units:** Terminals 1 and 2 on TB5 are for field remote alarm connections. Electrical rating for remote alarm is 115 v, 60 Hz/230 v, 50 Hz and 380-3-60. Maximum load is 75 va sealed, 360 va inrush. Remove resistor across terminals 1 and 2 on TB5 when using remote alarm.
- 30GN Units:** Separate field supplied 115 v or 230 v power circuit. Terminals 1 and 2 on TB3 are for control of remote alarm function. Terminals 3 and 4 on TB3 are for control of chilled water pump starter. The maximum allowable load for each of these circuits is 125 va sealed.



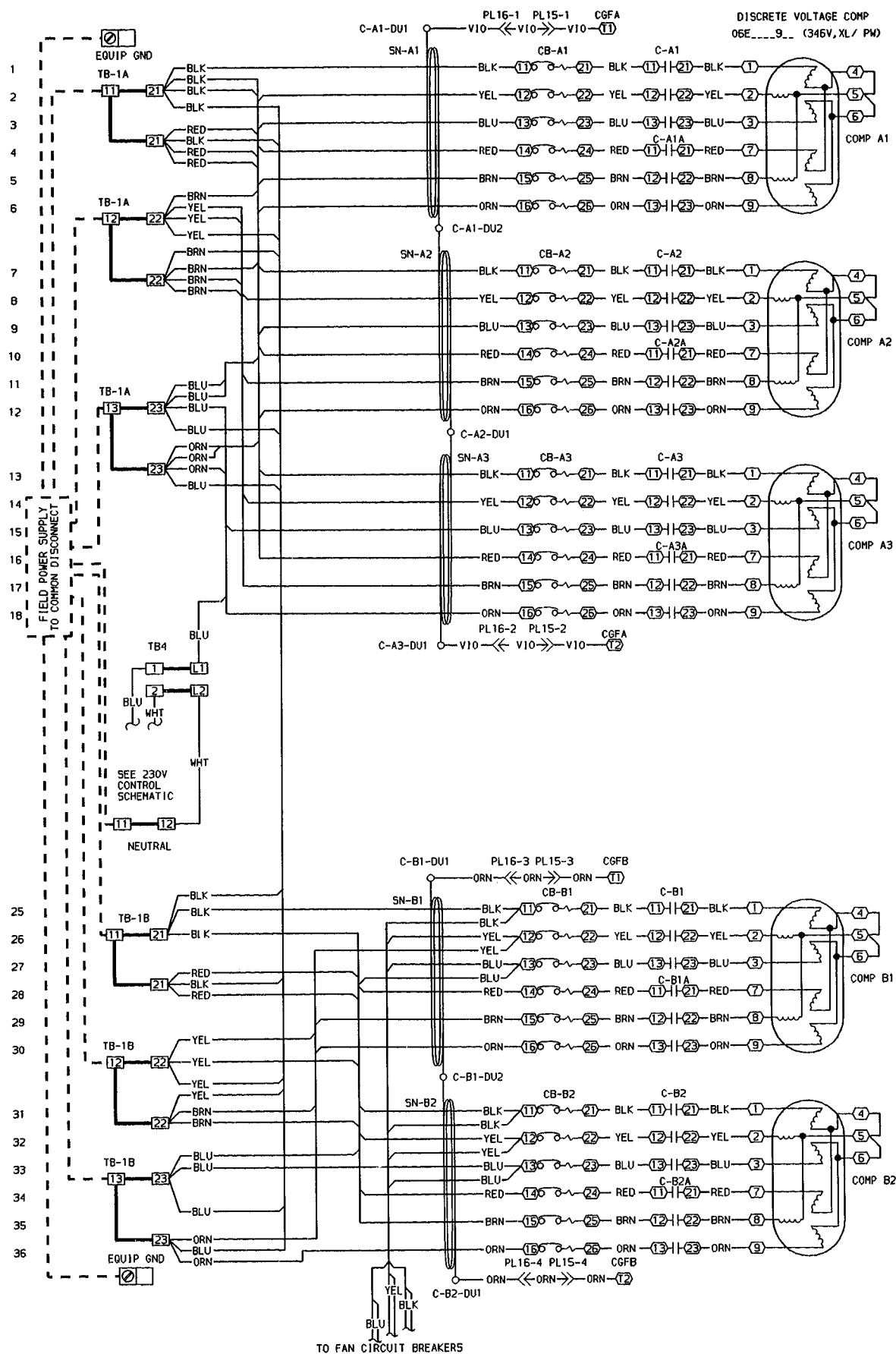


Fig. 2 – Power Schematic; 30GN,GT130,150, and Associated Modular Units;
346-v – PW and XL

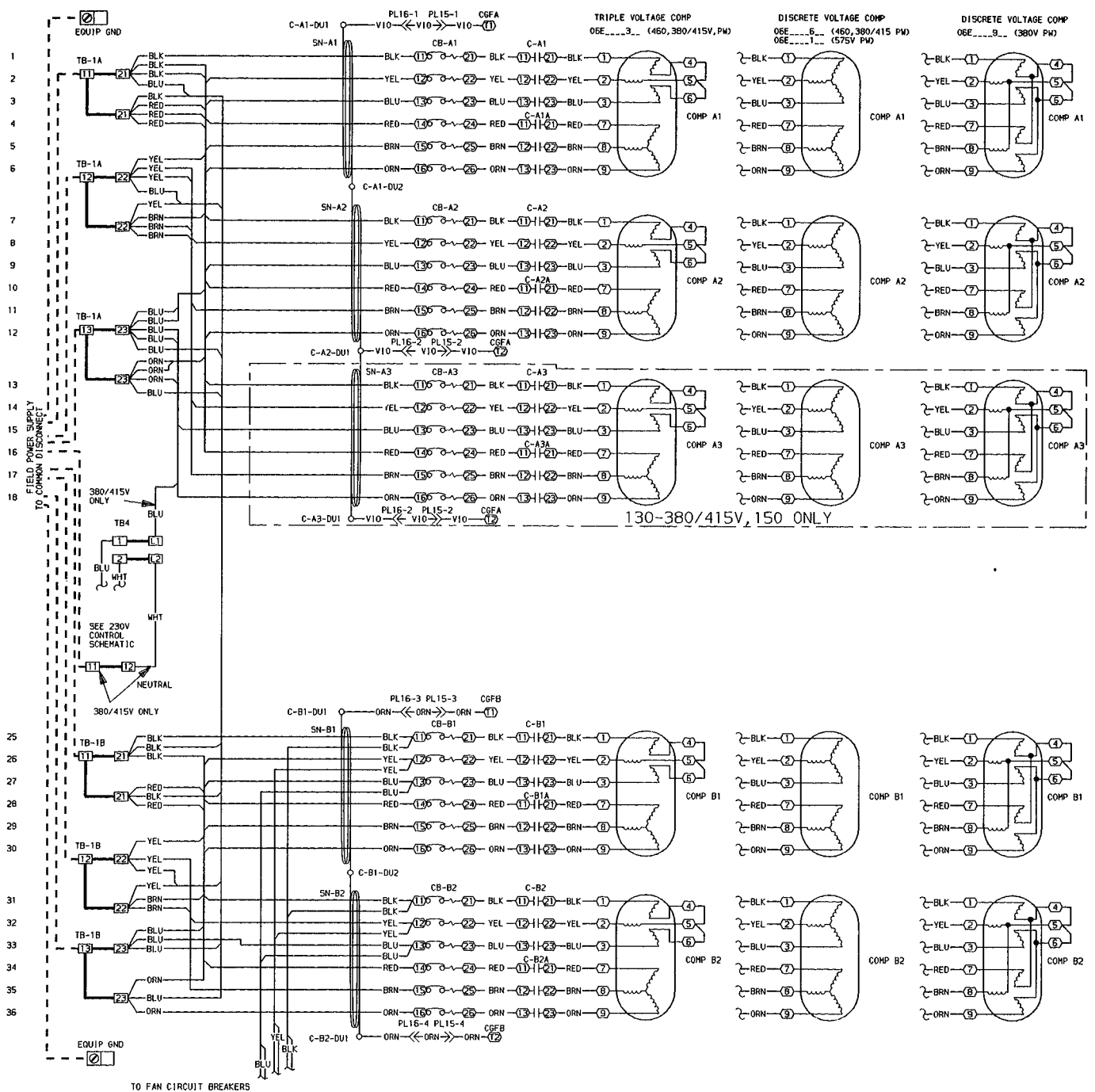


**Fig. 3 – Power Schematic; 30GN,GT130,150, and Associated Modular Units;
380, 380/415, 460, 575-v – PW**

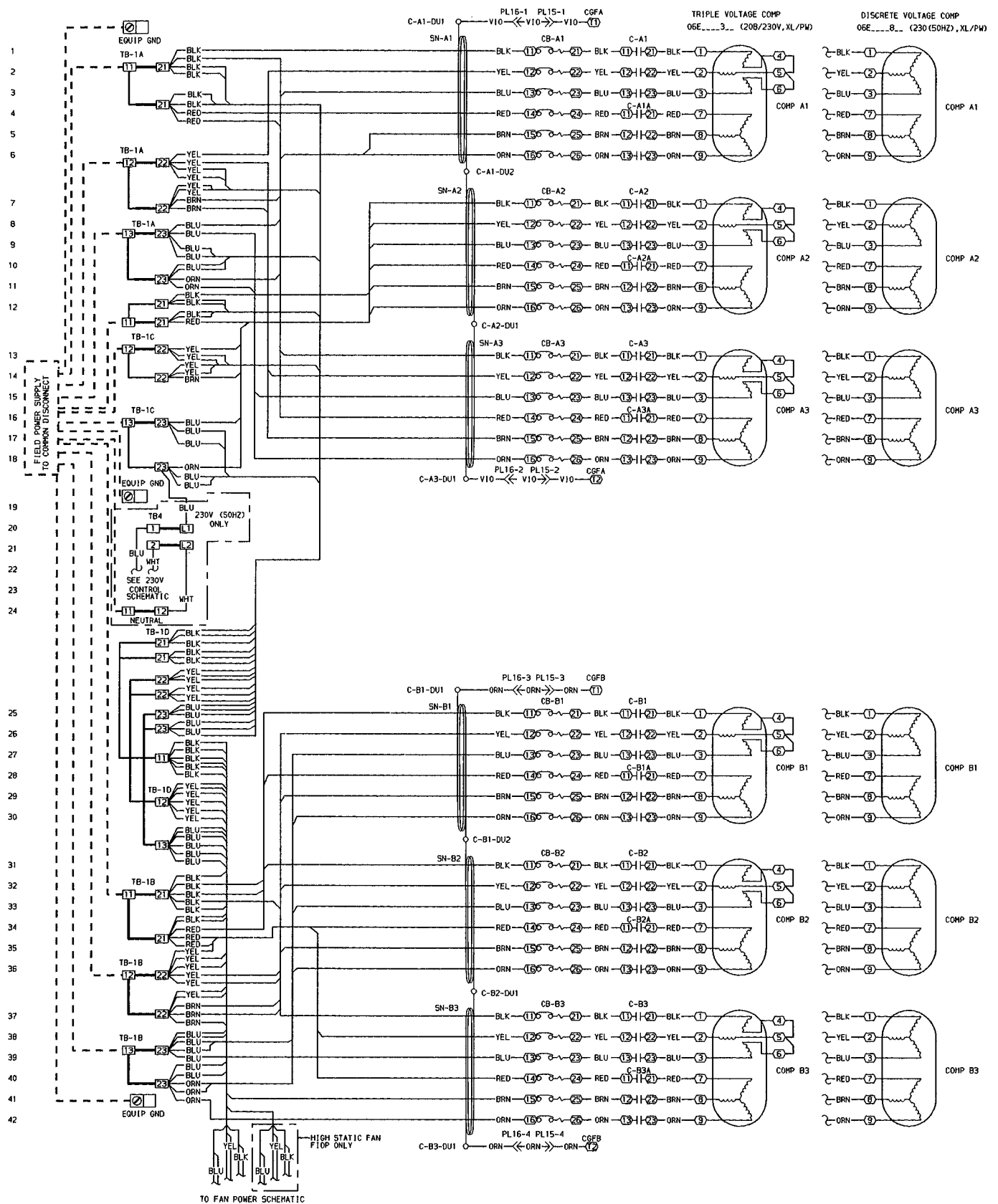


Fig. 5 — Power Schematic; 30GN,GT170,190, and Associated Modular Units; 208/230, 230-v — PW and XL

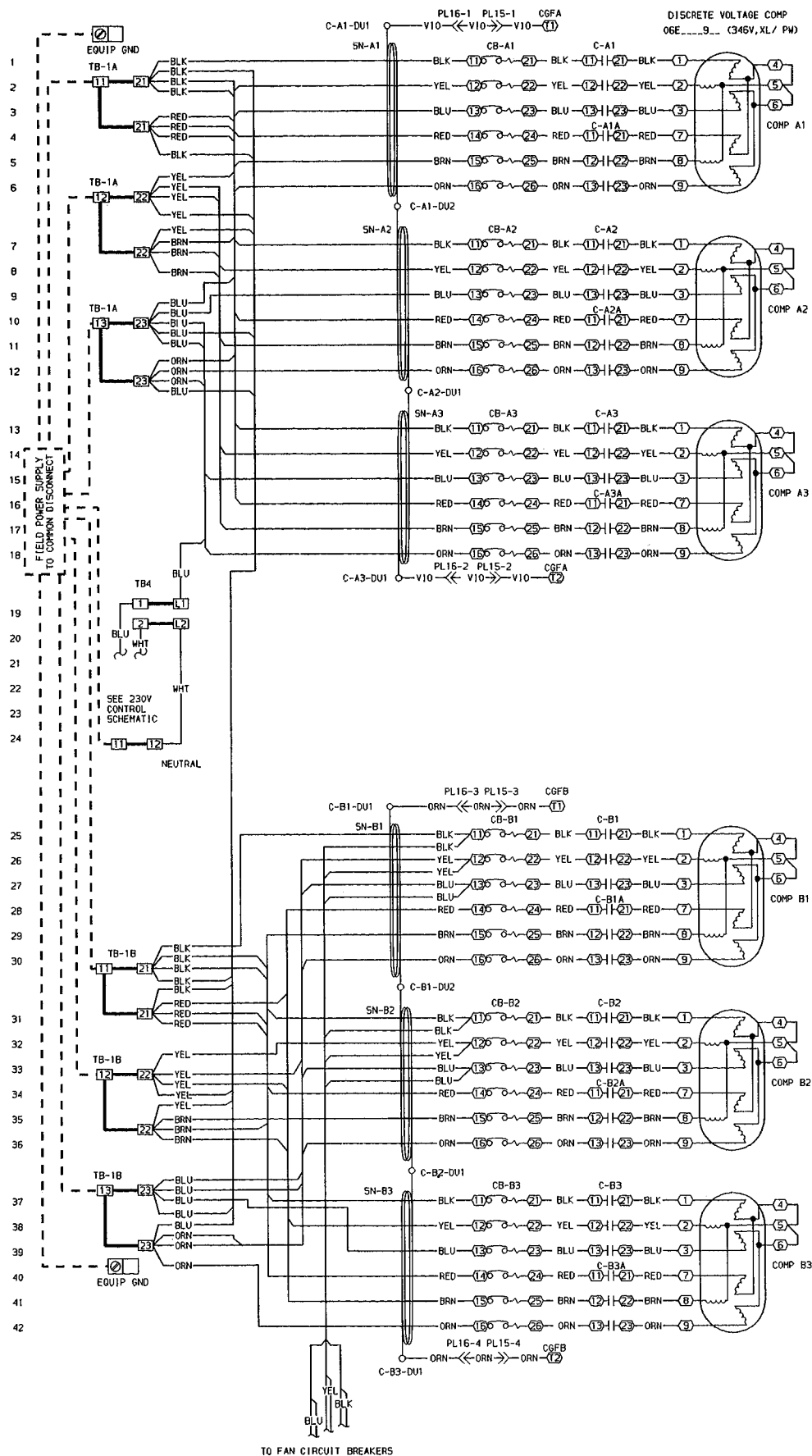
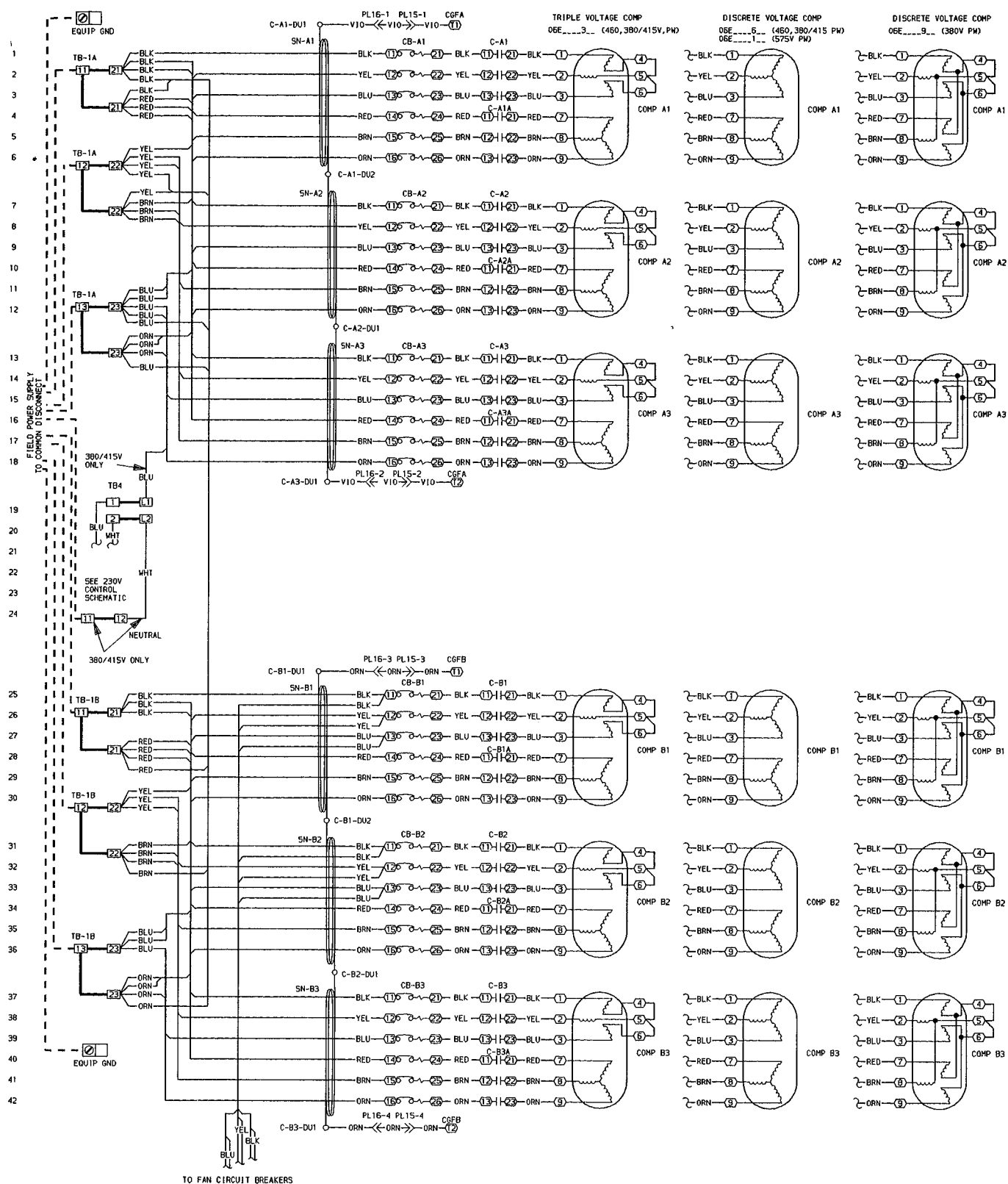


Fig. 6 – Power Schematic; 30GN,GT170,190, and Associated Modular Units;
346-v – PW and XL



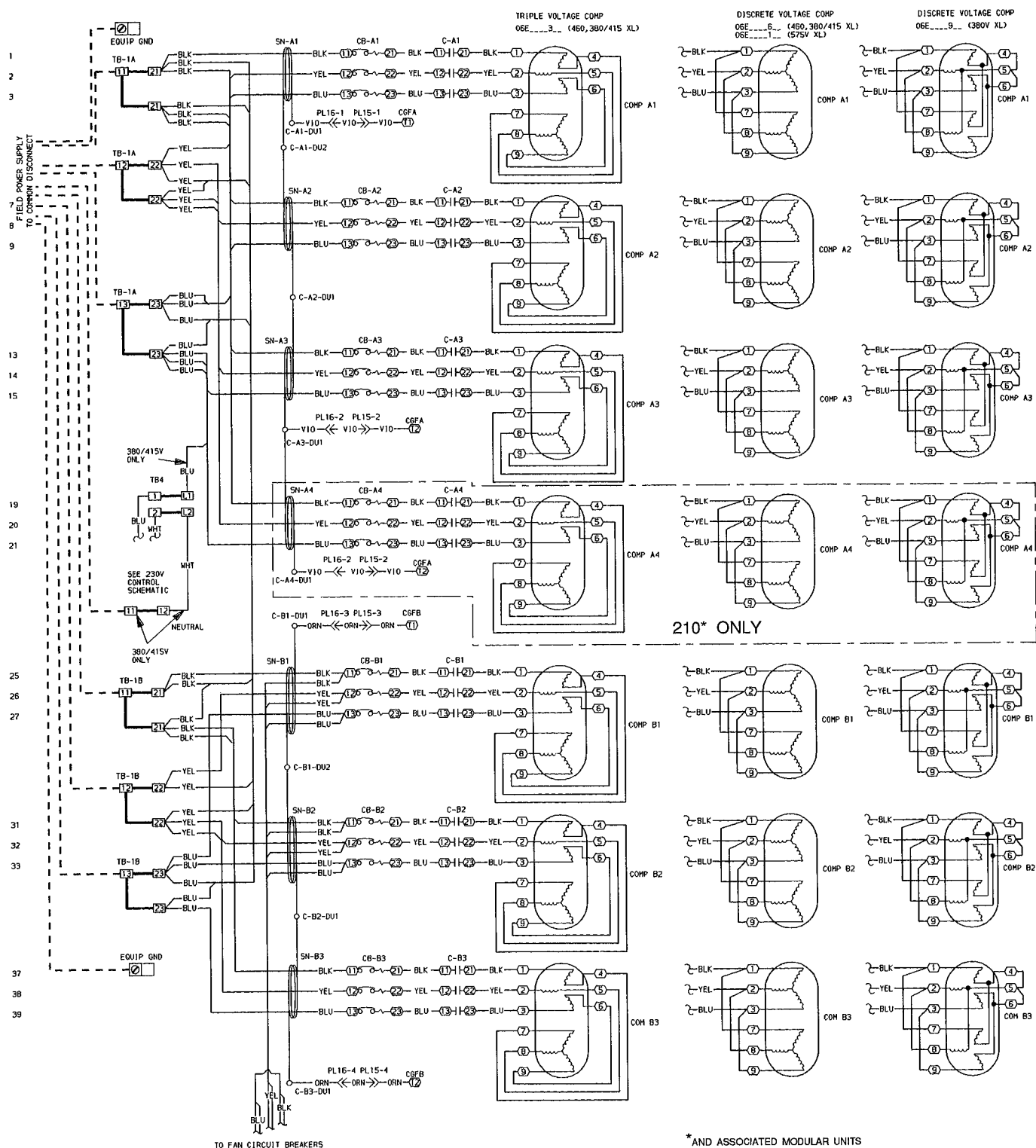


**Fig. 8 – Power Schematic; 30GN,GT170-210, and Associated Modular Units;
380, 380/415, 460, 575-v – XL**

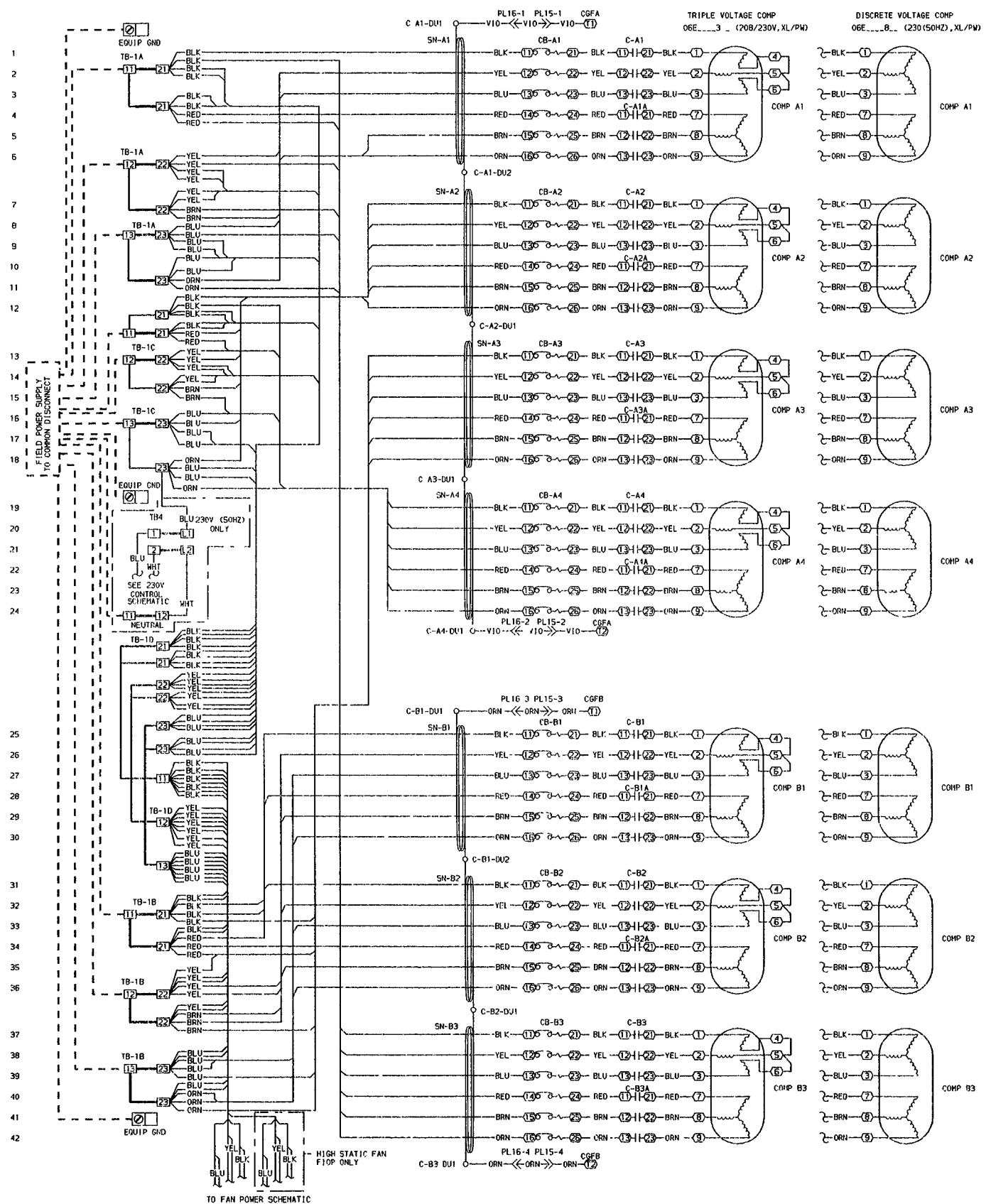
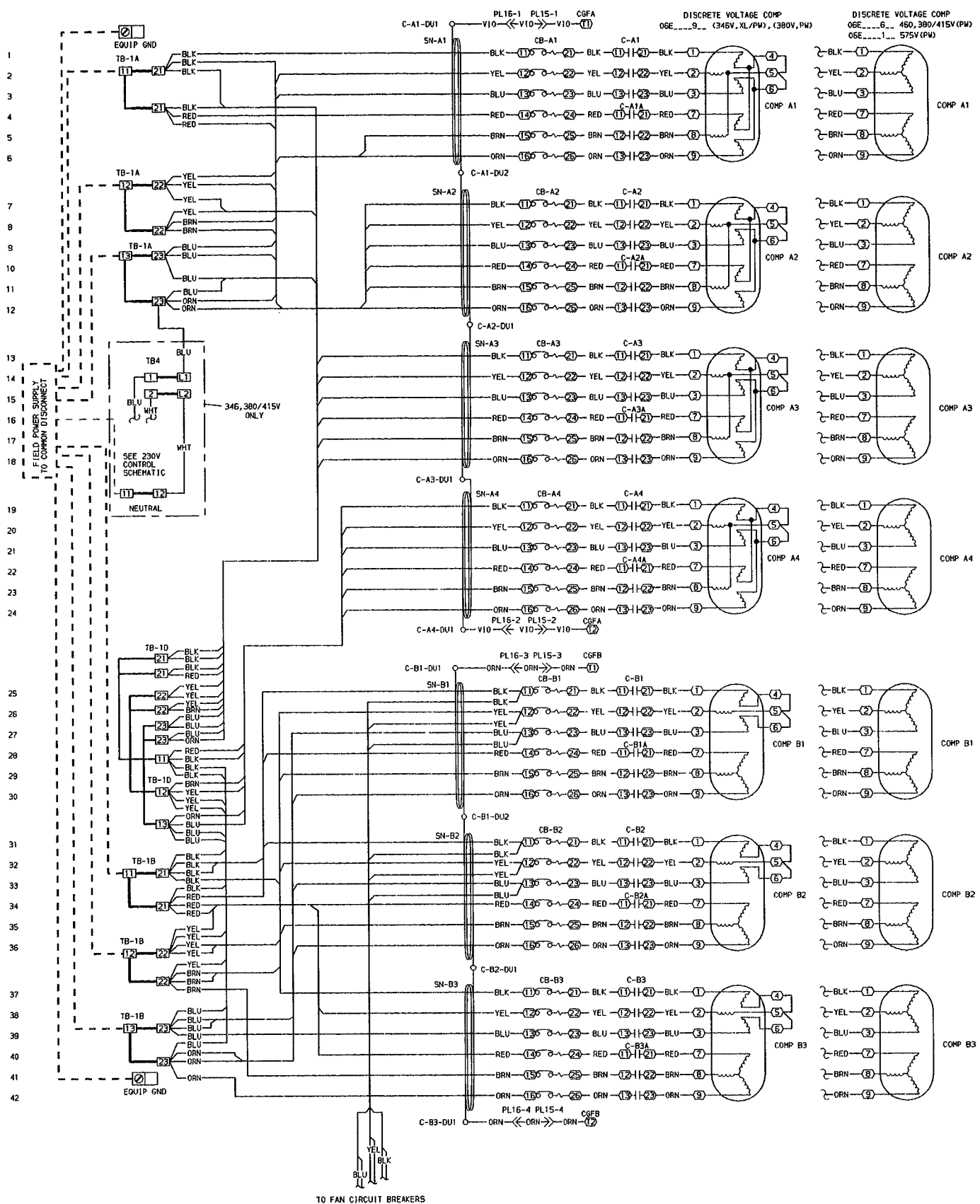


Fig. 9 – Power Schematic; 30GN,GT210, and Associated Modular Units; 208/230, 230-v (50 Hz) – PW, XL



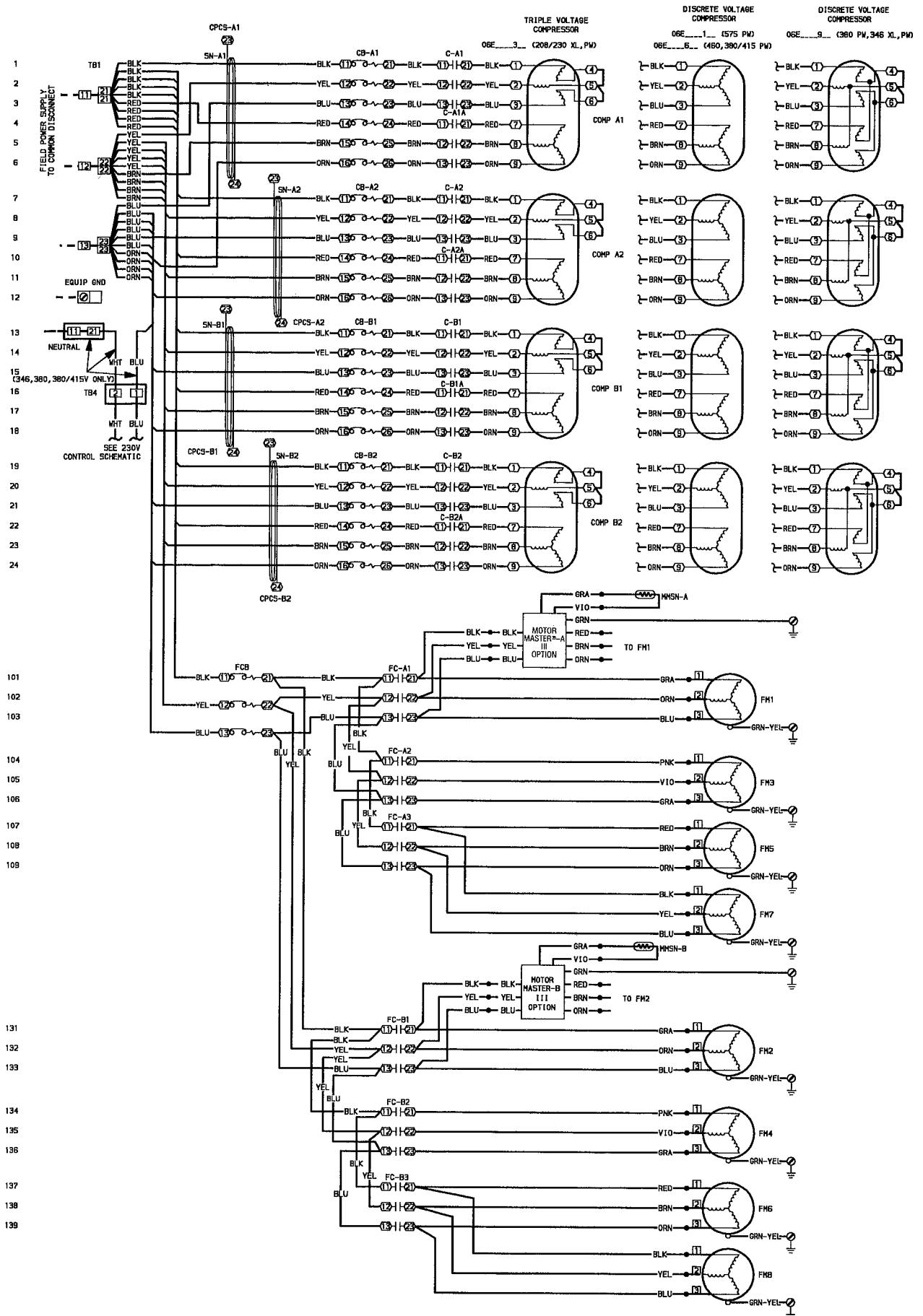


**Fig. 11 – Power Schematic; 30GN,GT240B,270B; 208/230 v – PW, XL;
 346, 380, 380/415, 460, 575-v – PW**

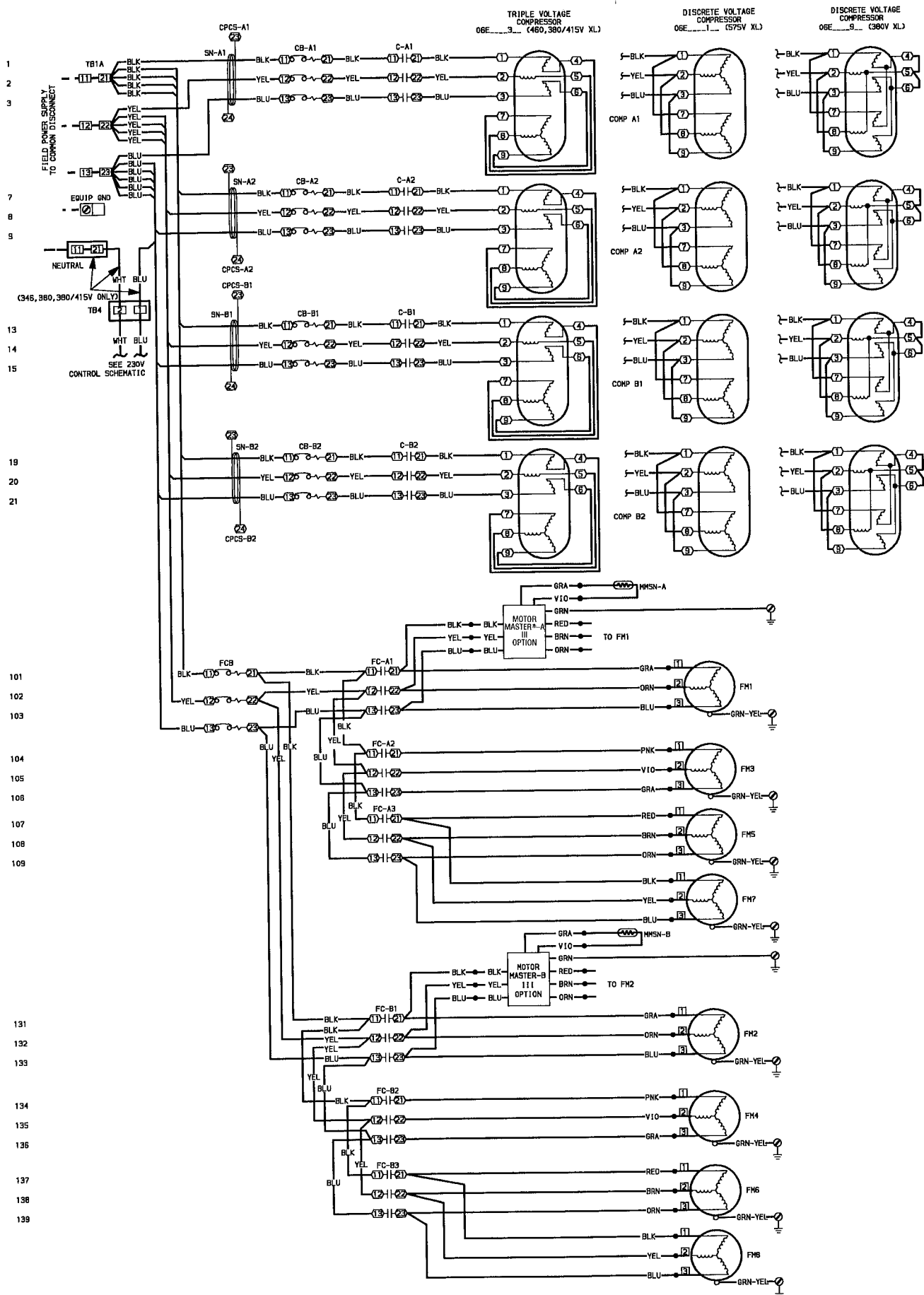


Fig. 12 — Power Schematic; 30GN,GT240B,270B;
346, 380, 380/415, 460, 575-v — XL



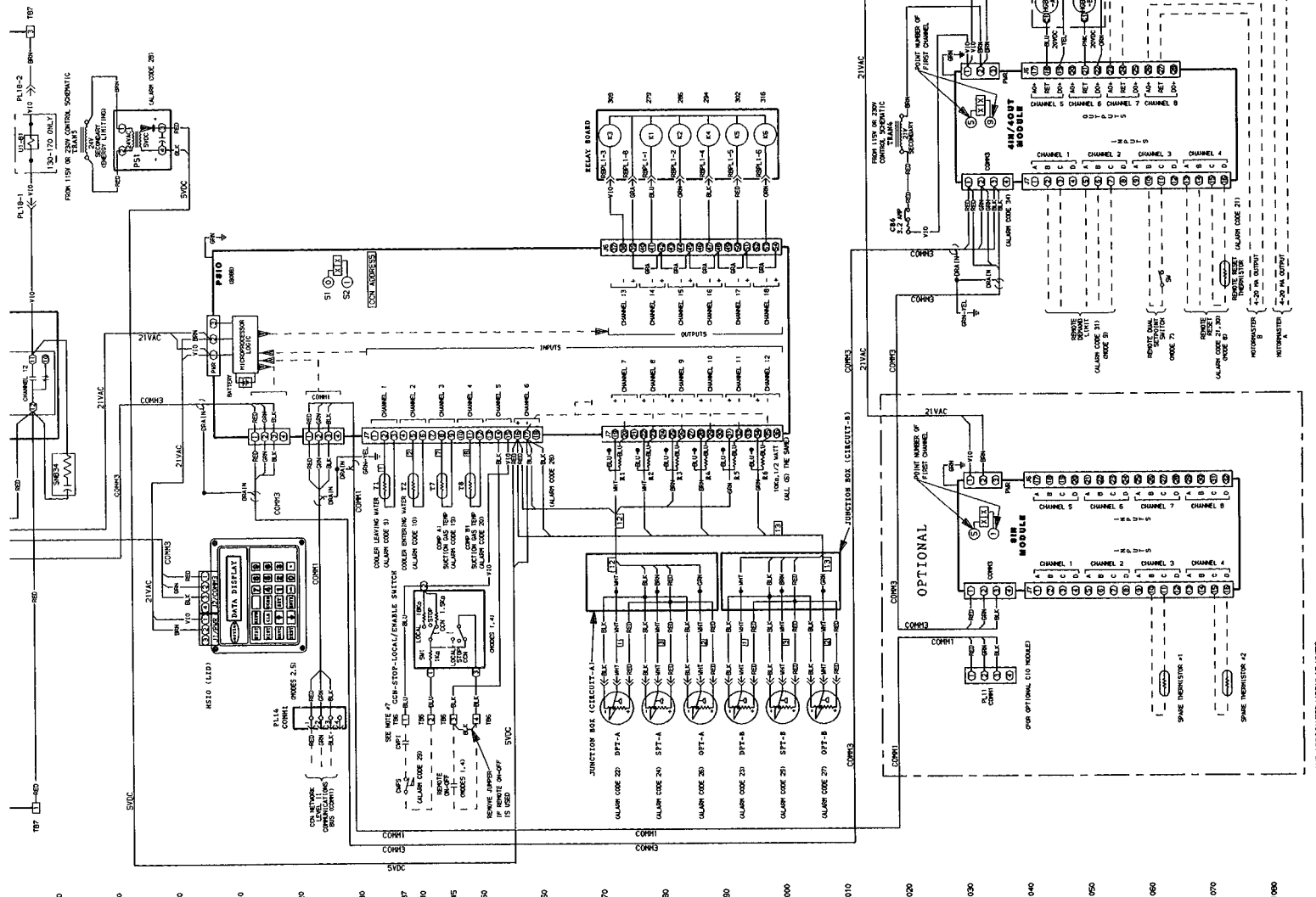
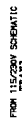


Fig. 13 — Control Label; 30GN130-210 and Associated Modular Units: 24 v

FLOTRONIC™ II



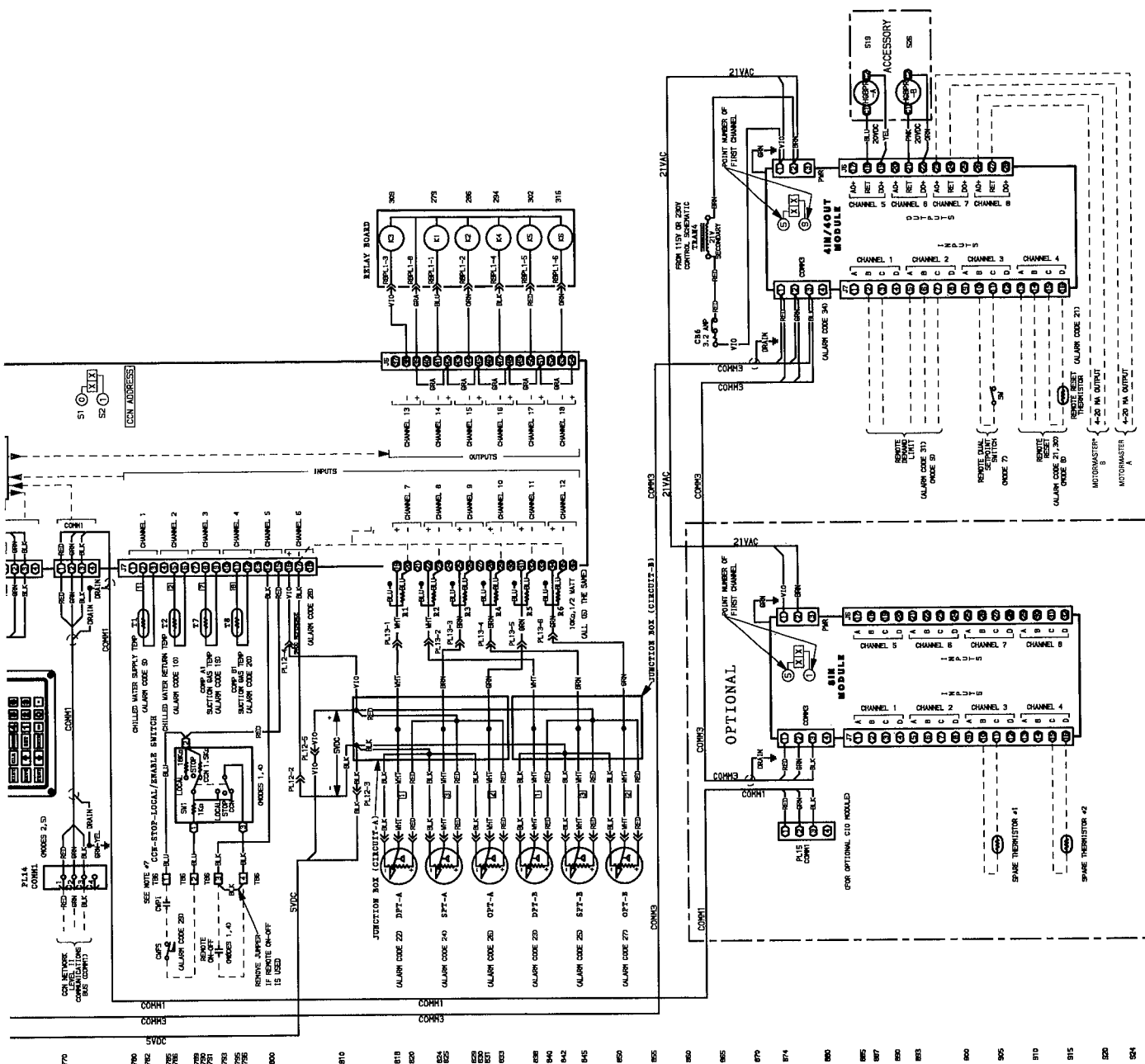


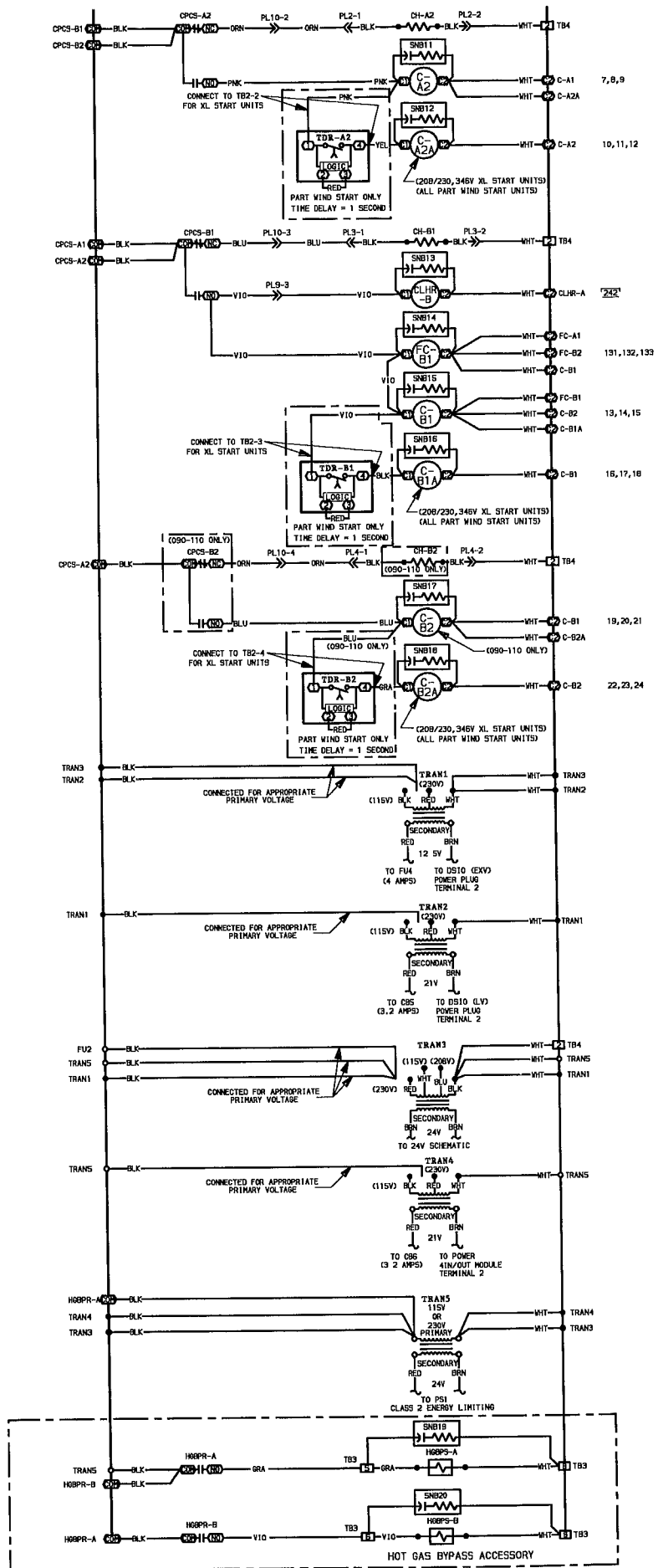
Fig. 14 — Control Label; 30GN240B,270B; 24 v

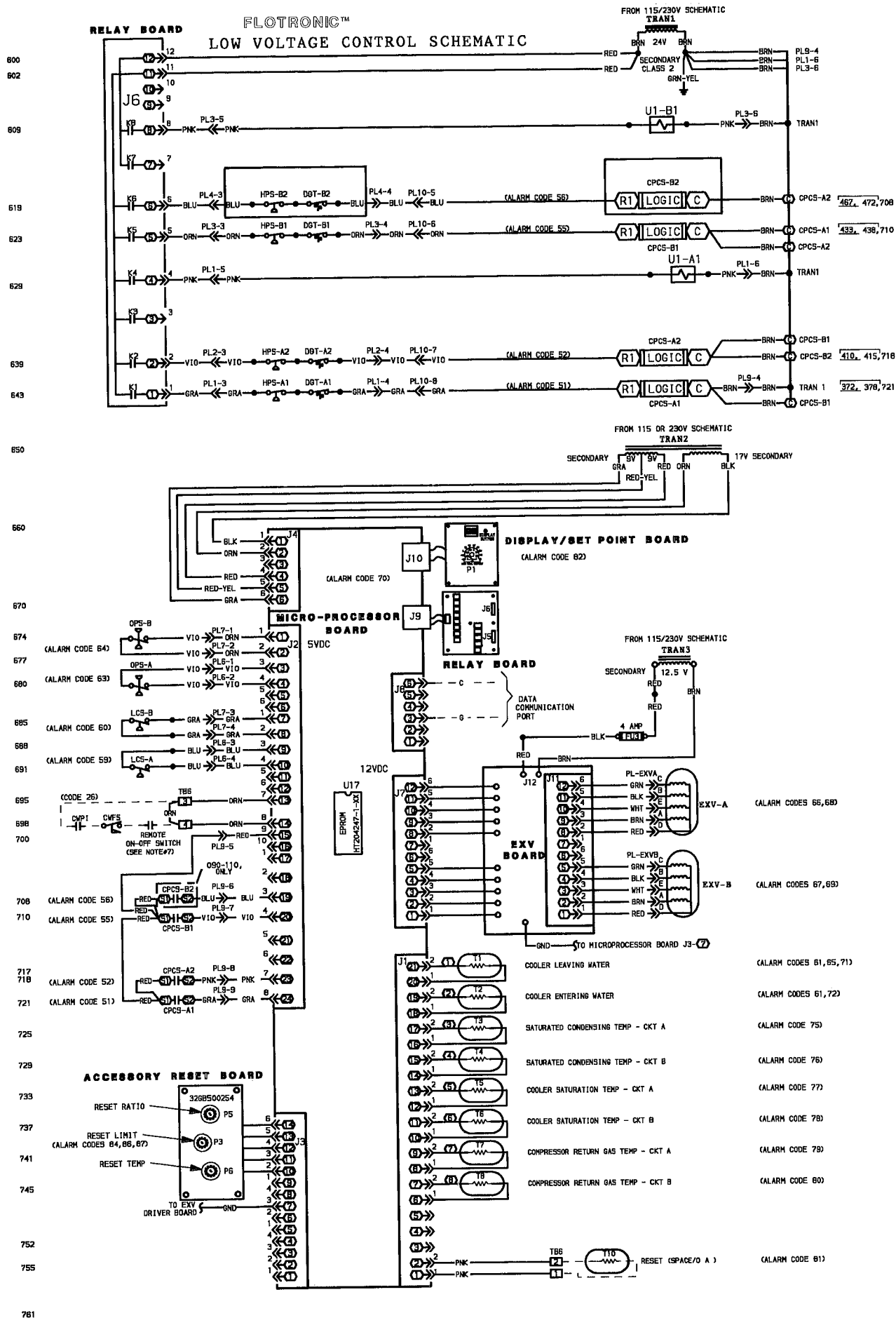


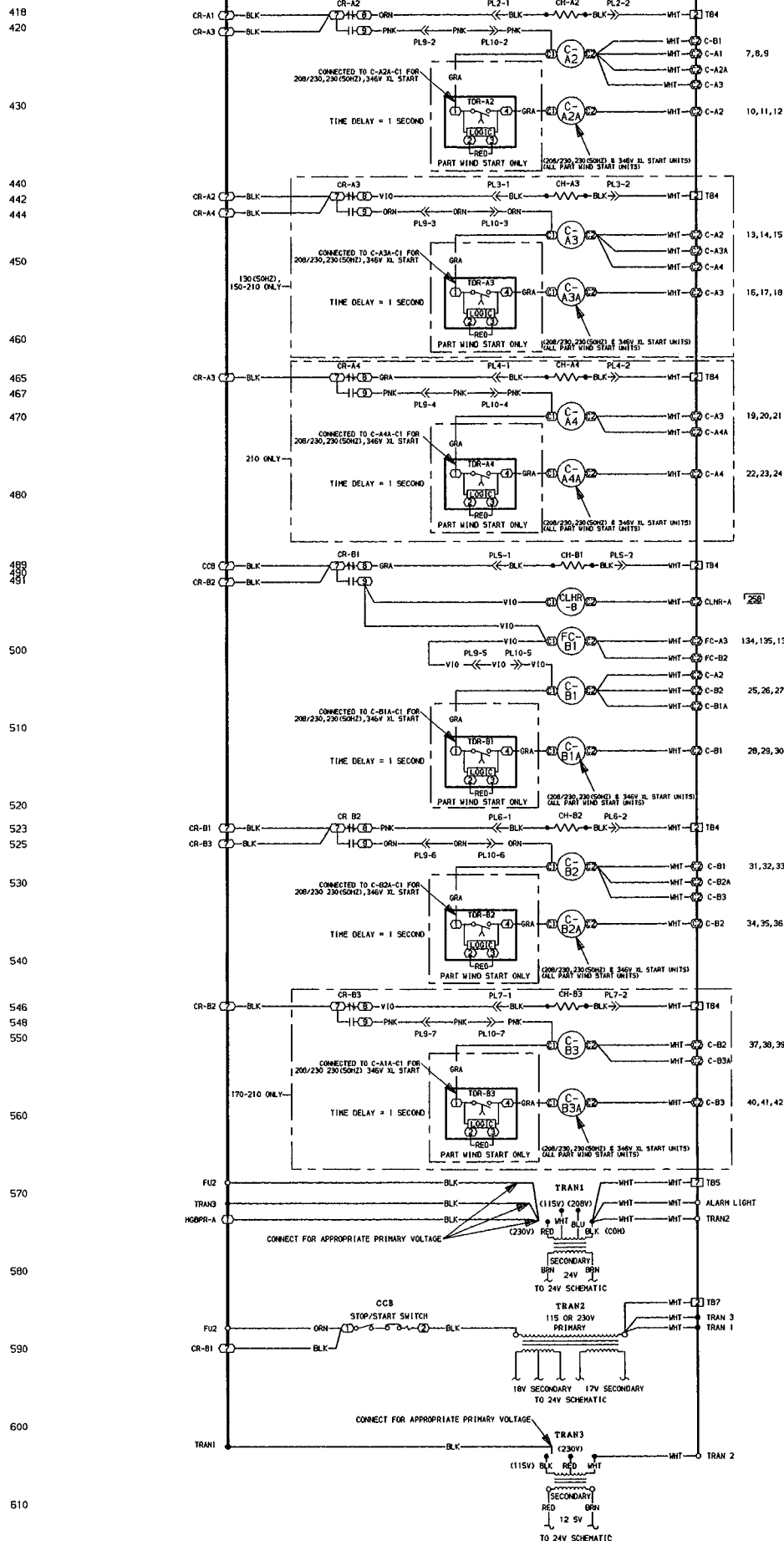
(115 OR 230V) CONTROL SCHEMATIC

Fig. 16 — Control Label

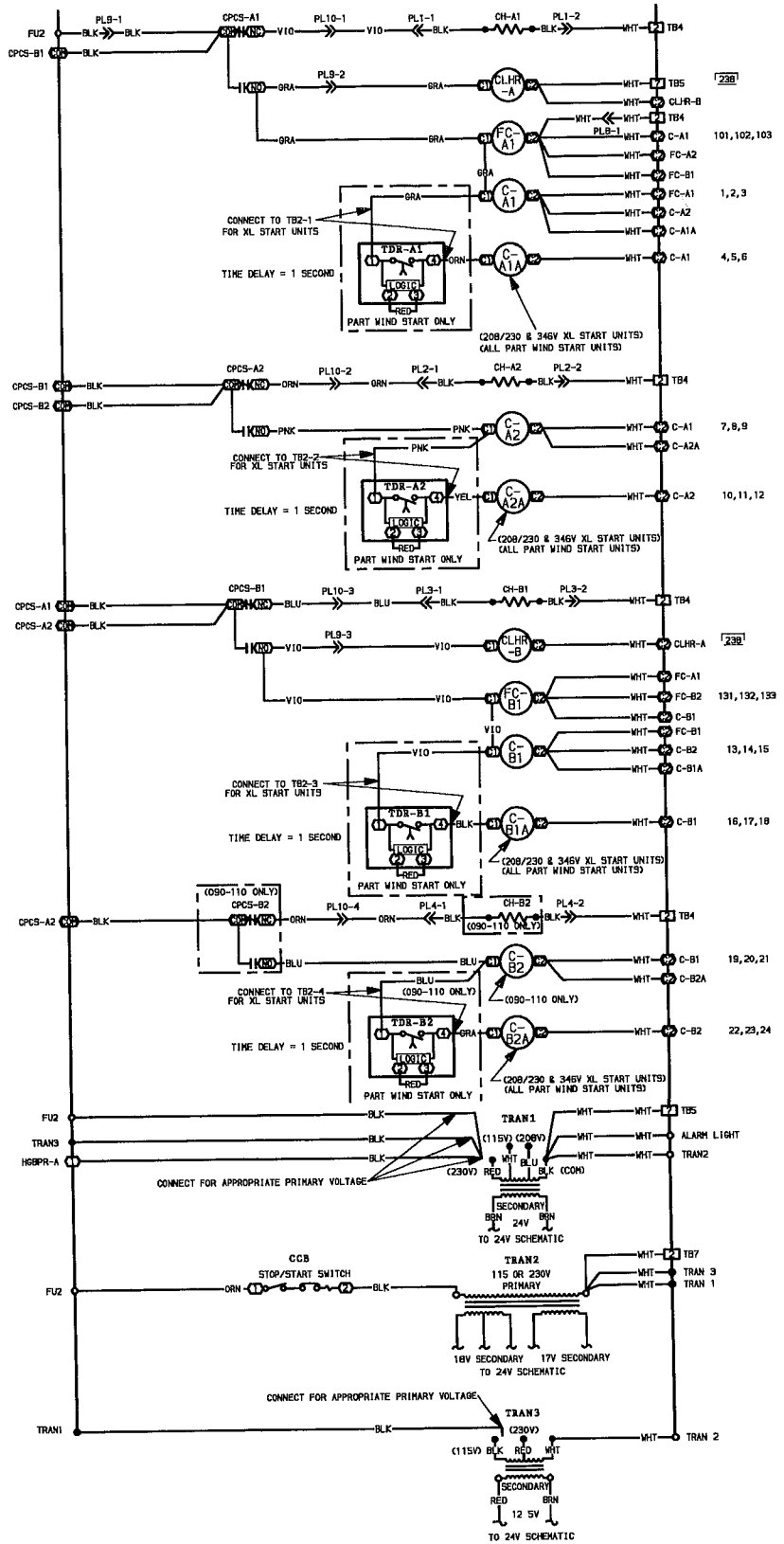
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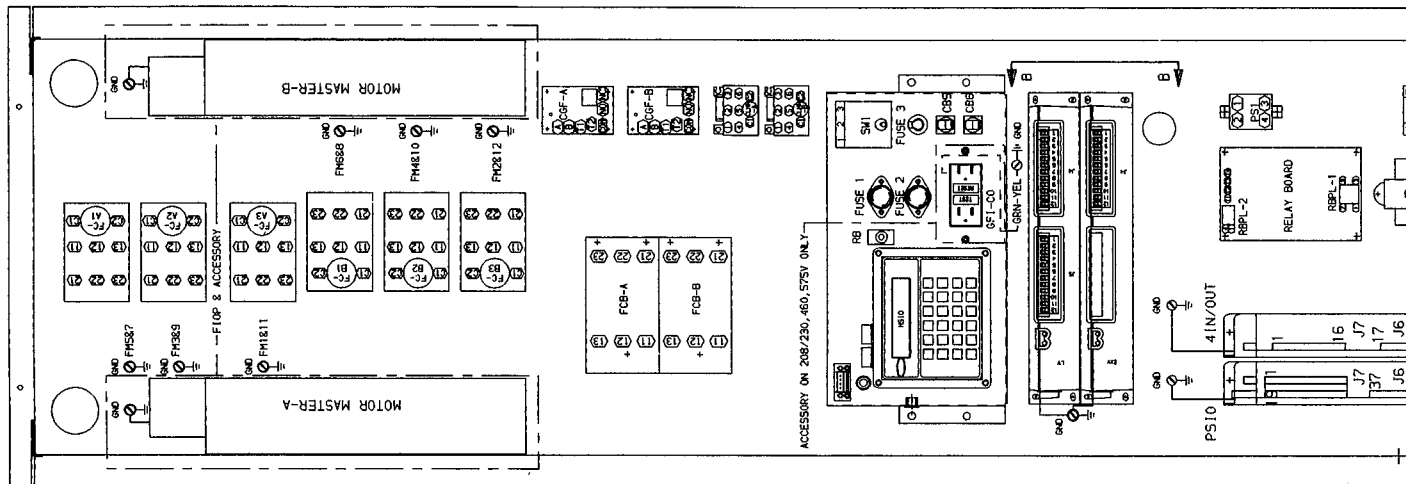


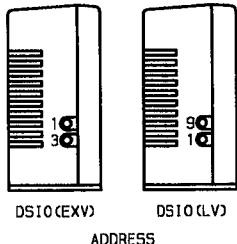
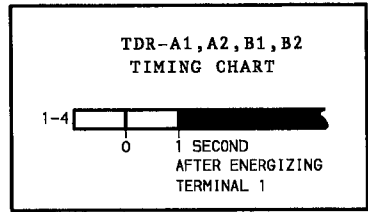
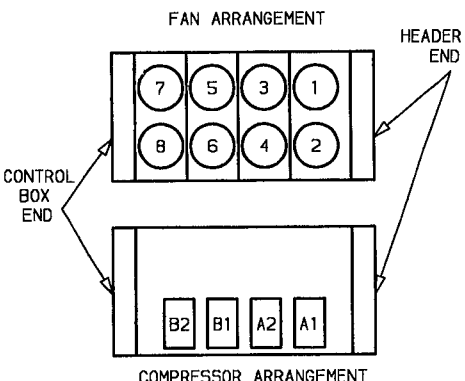
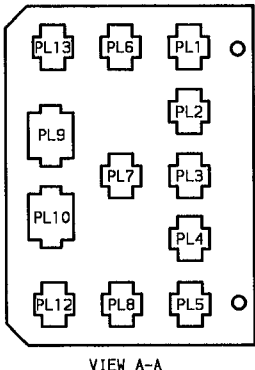
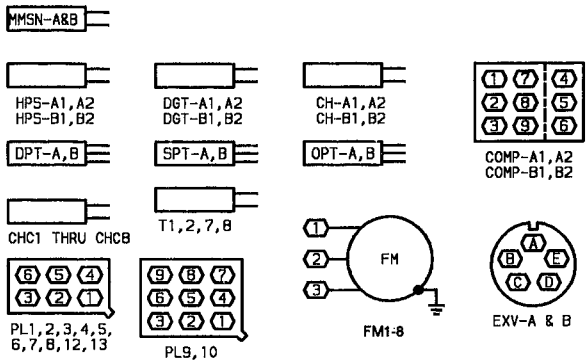
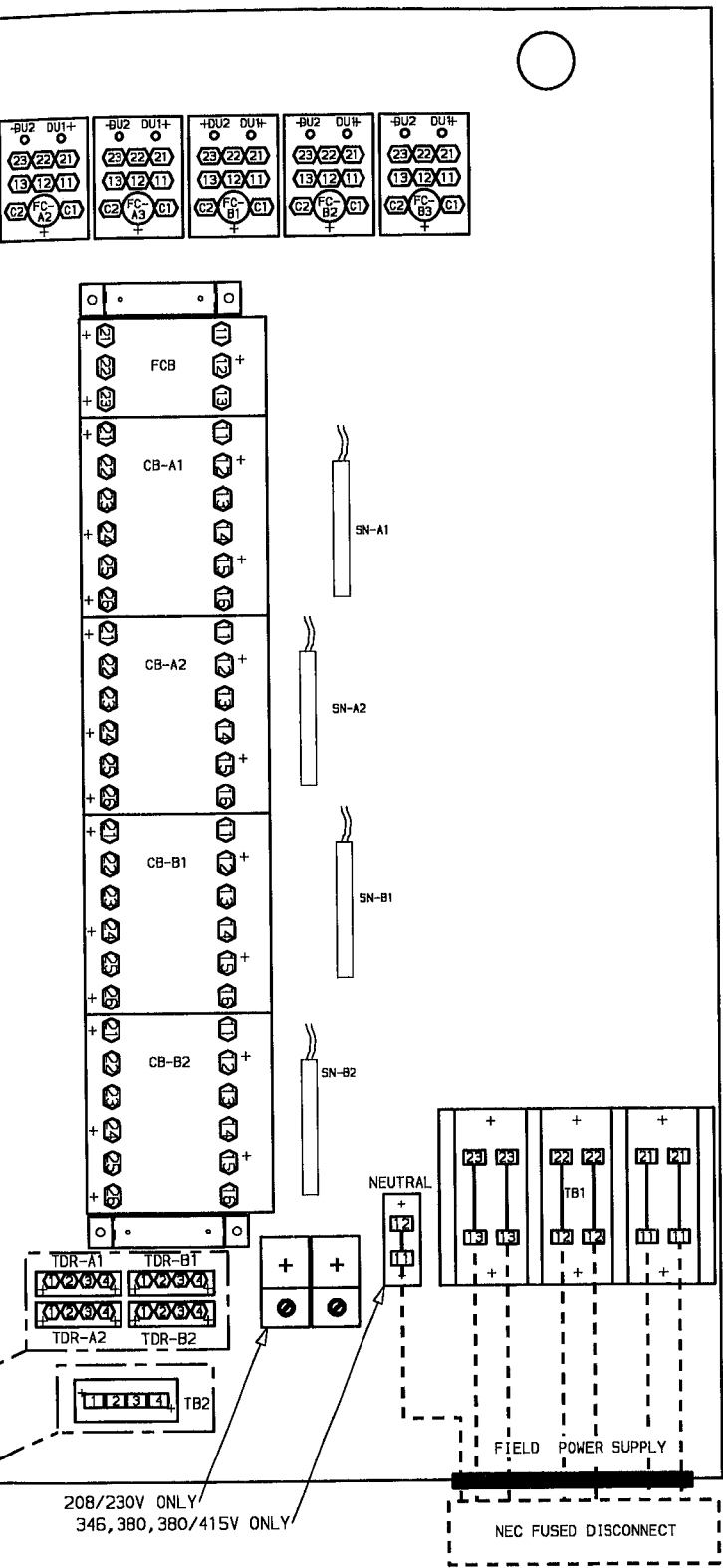




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rrangement; 30GN240B,270B

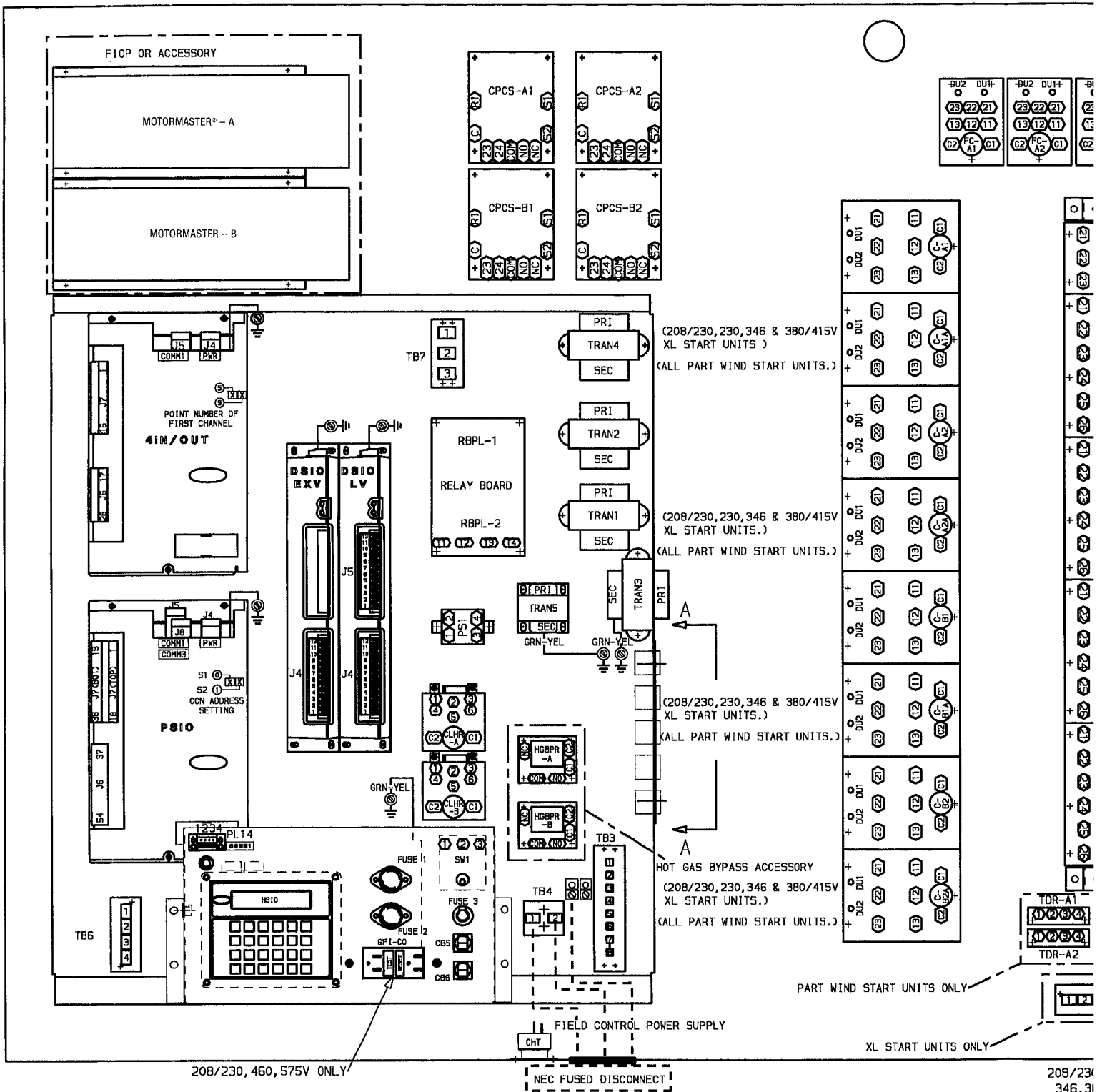
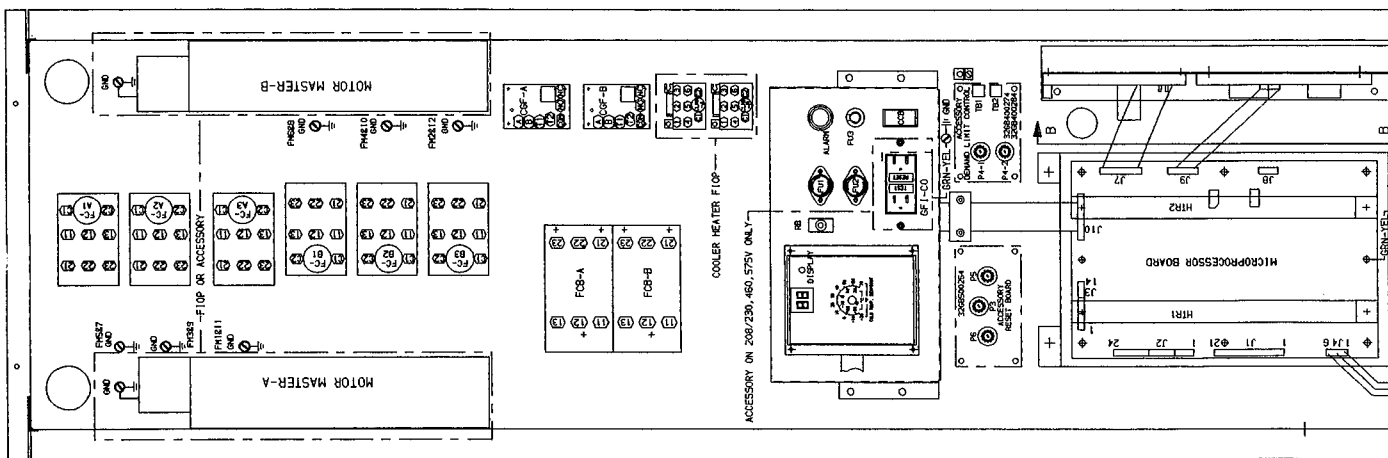


Fig. 22 – Component Arrangement



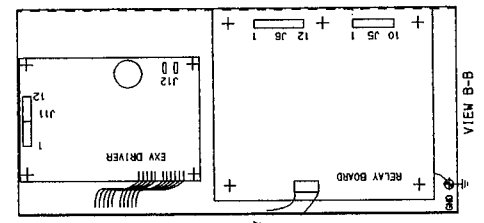
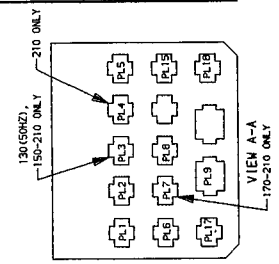
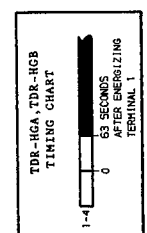
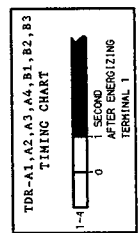
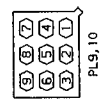
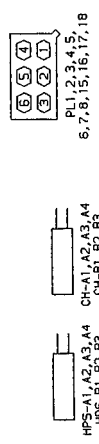
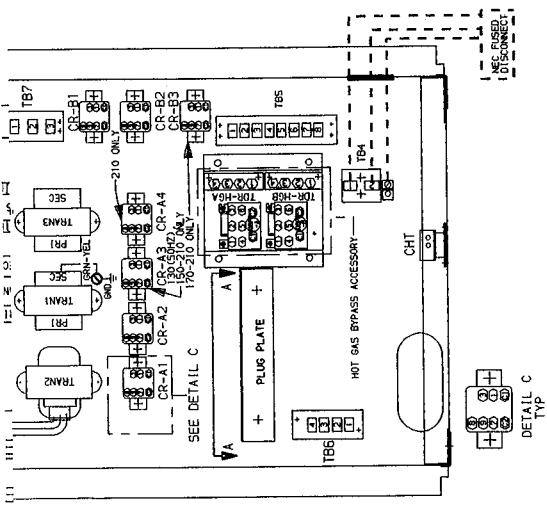
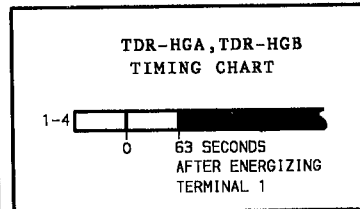
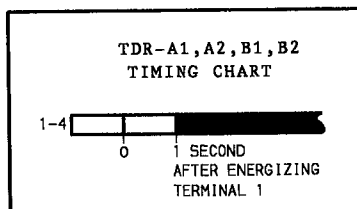
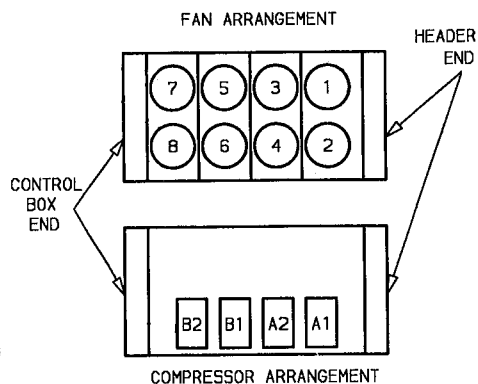
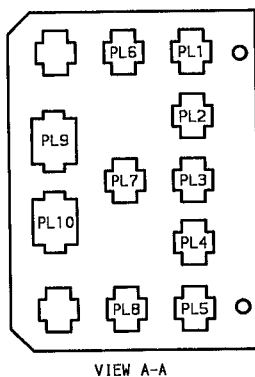
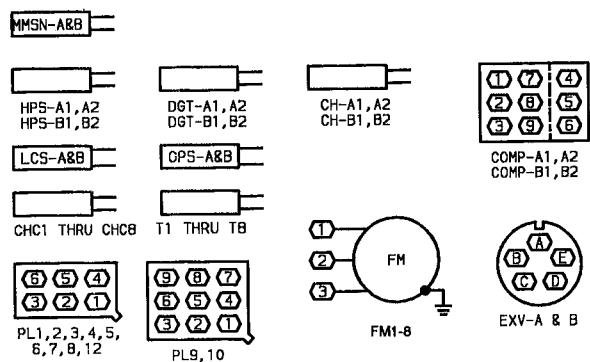
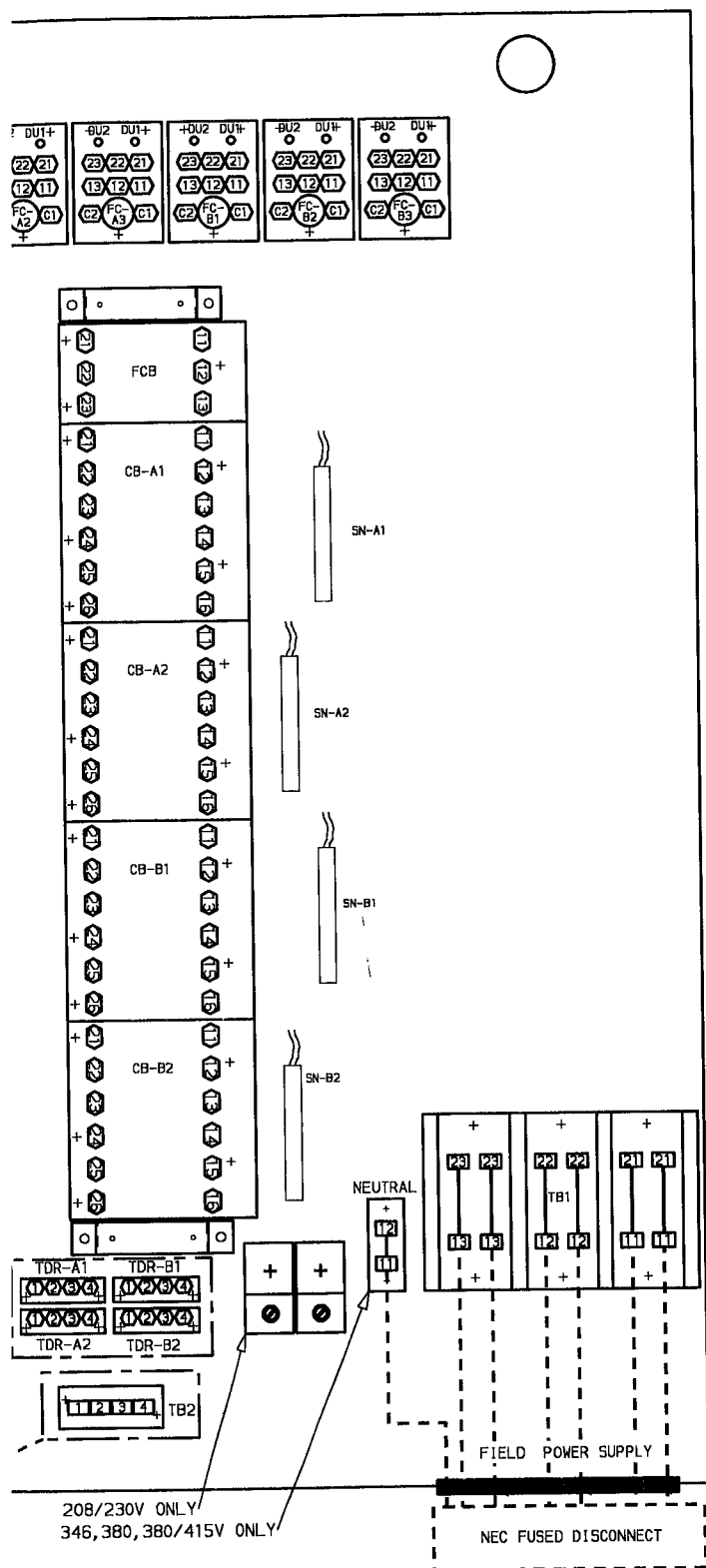


Fig. 23 — Control Box Component Arrangement; 30GT130-210 and Associated Modular Units



range; 30GT240B, 270B

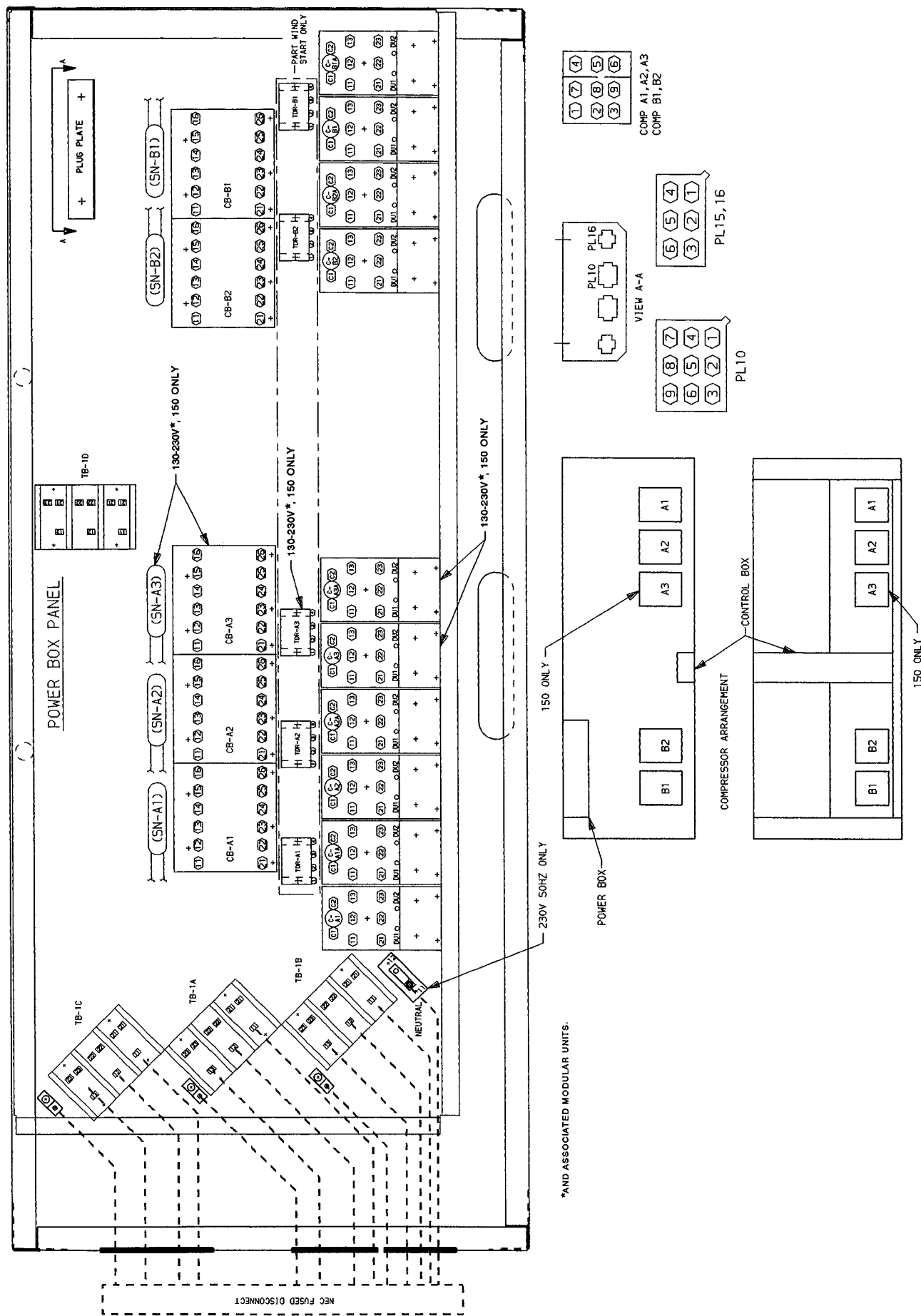


Fig. 25 — Power Box Location and Component Arrangement; 30GN,GT130,150, and Associated Modular Units; 208/230, 230-v — PW and XL

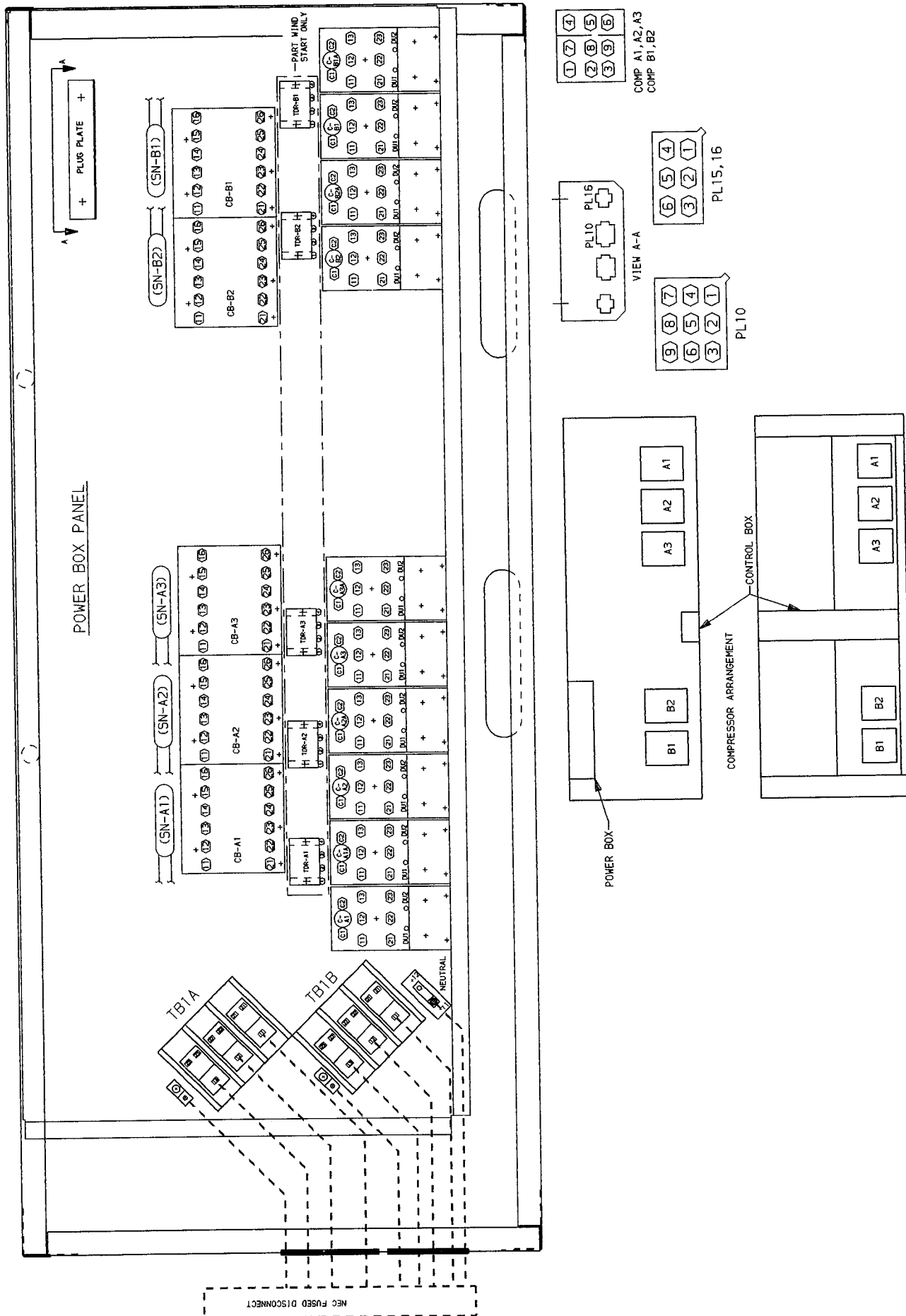
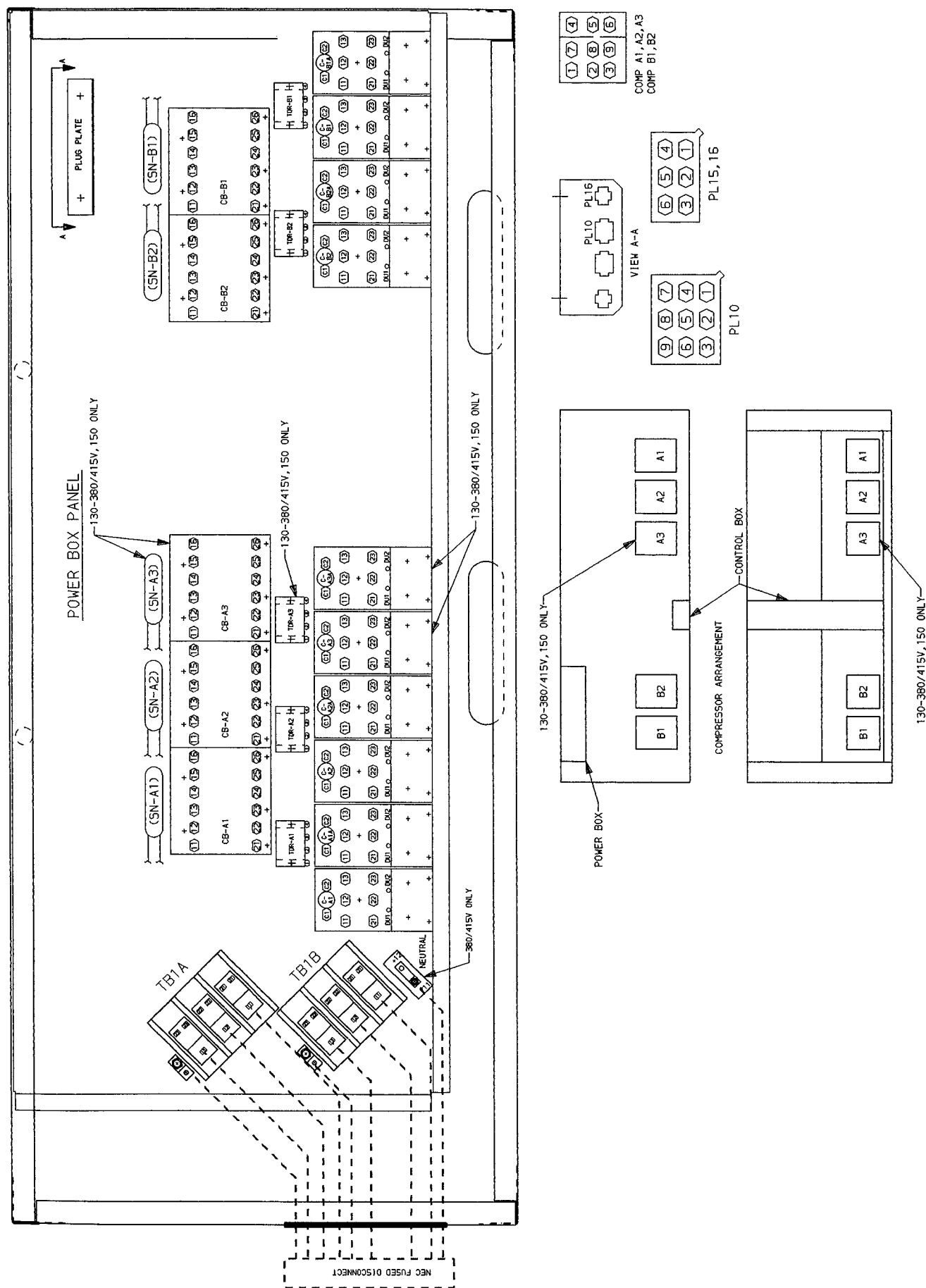


Fig. 26 — Power Box Location and Component Arrangement; 30GN,GT130,150, and Associated Modular Units; 346-v — PW and XL





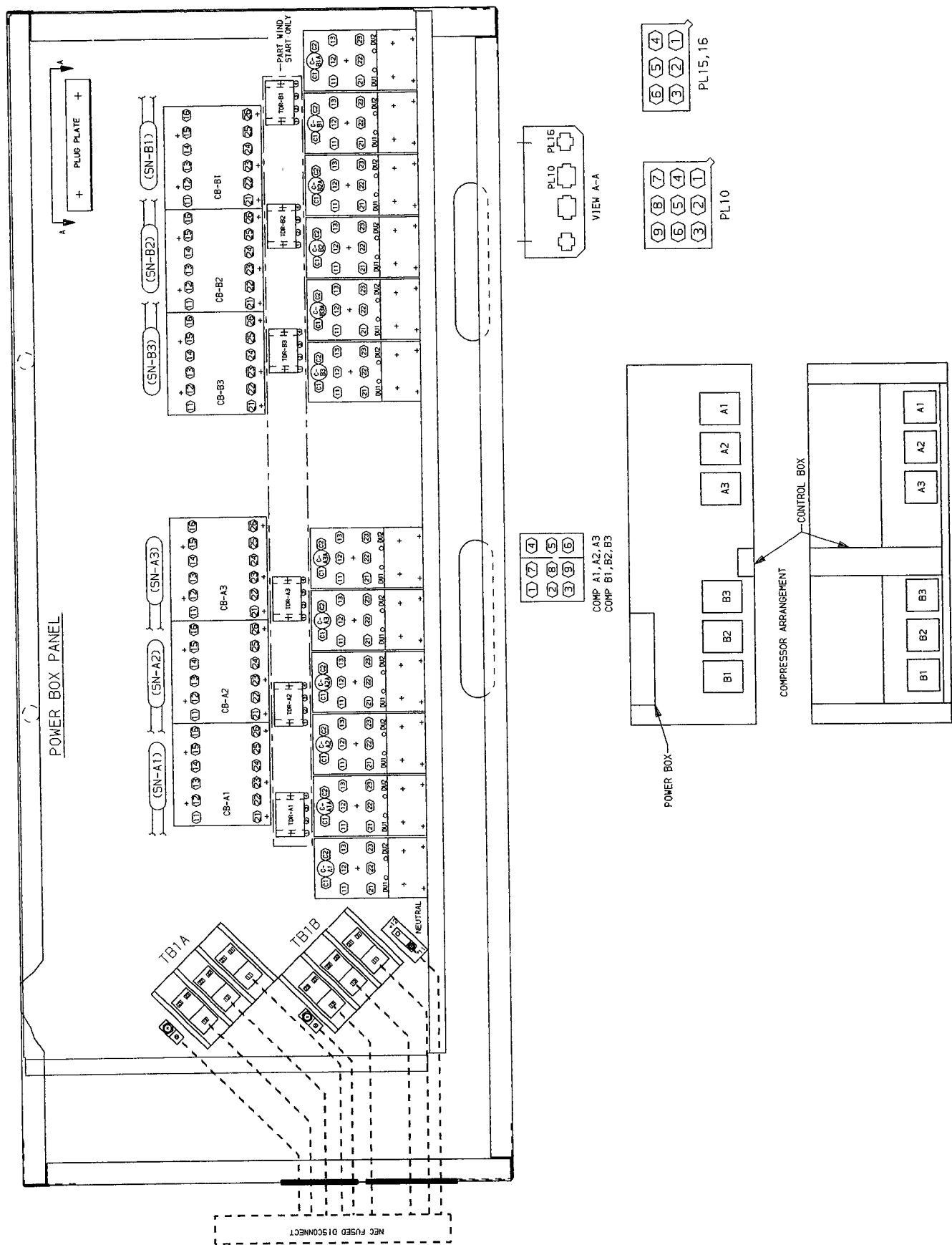


Fig. 30 — Power Box Location and Component Arrangement; 30GN, GT170, 190, and Associated Modular Units; 346-v — PW and XL

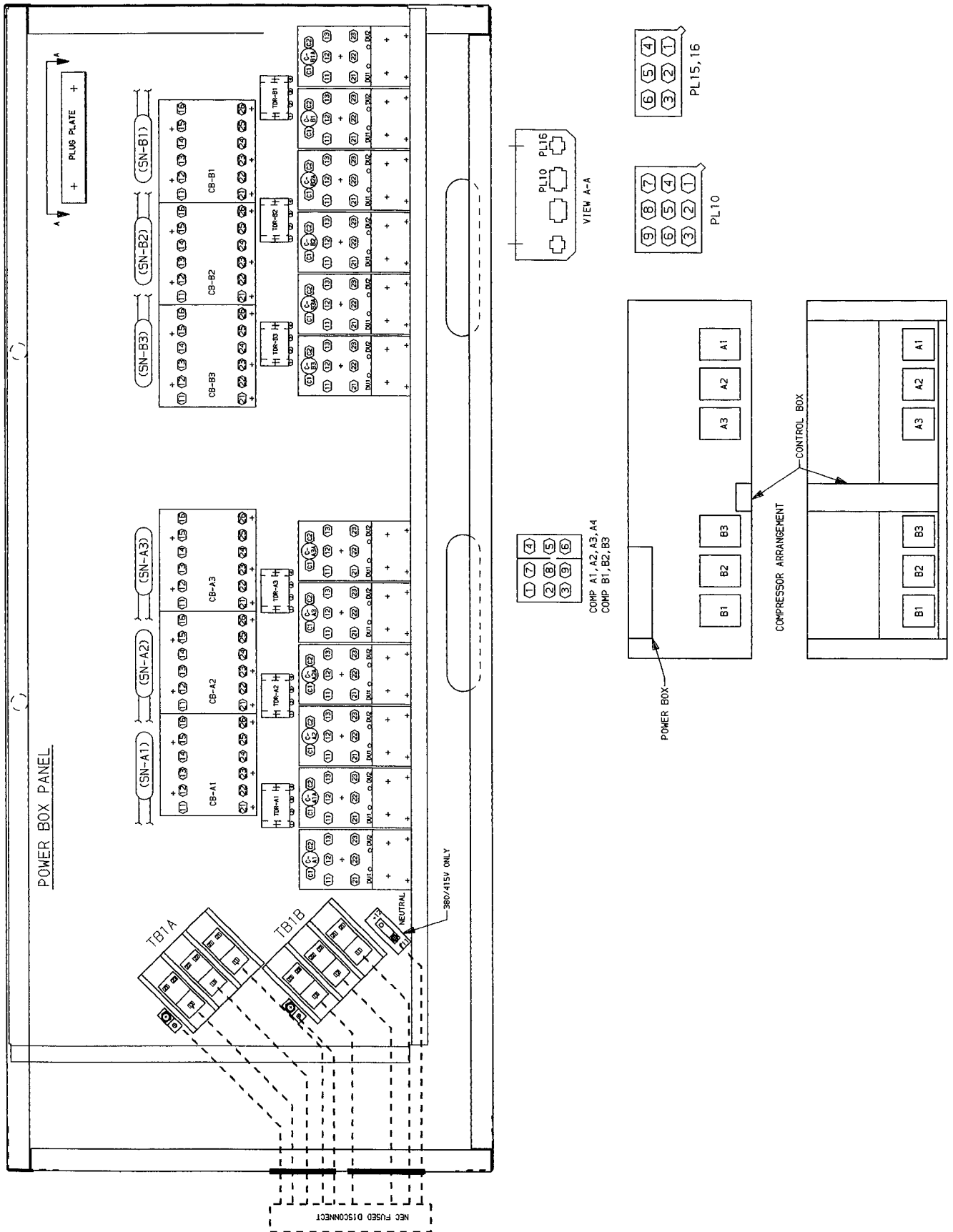
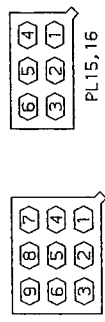
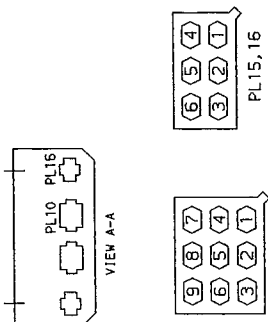
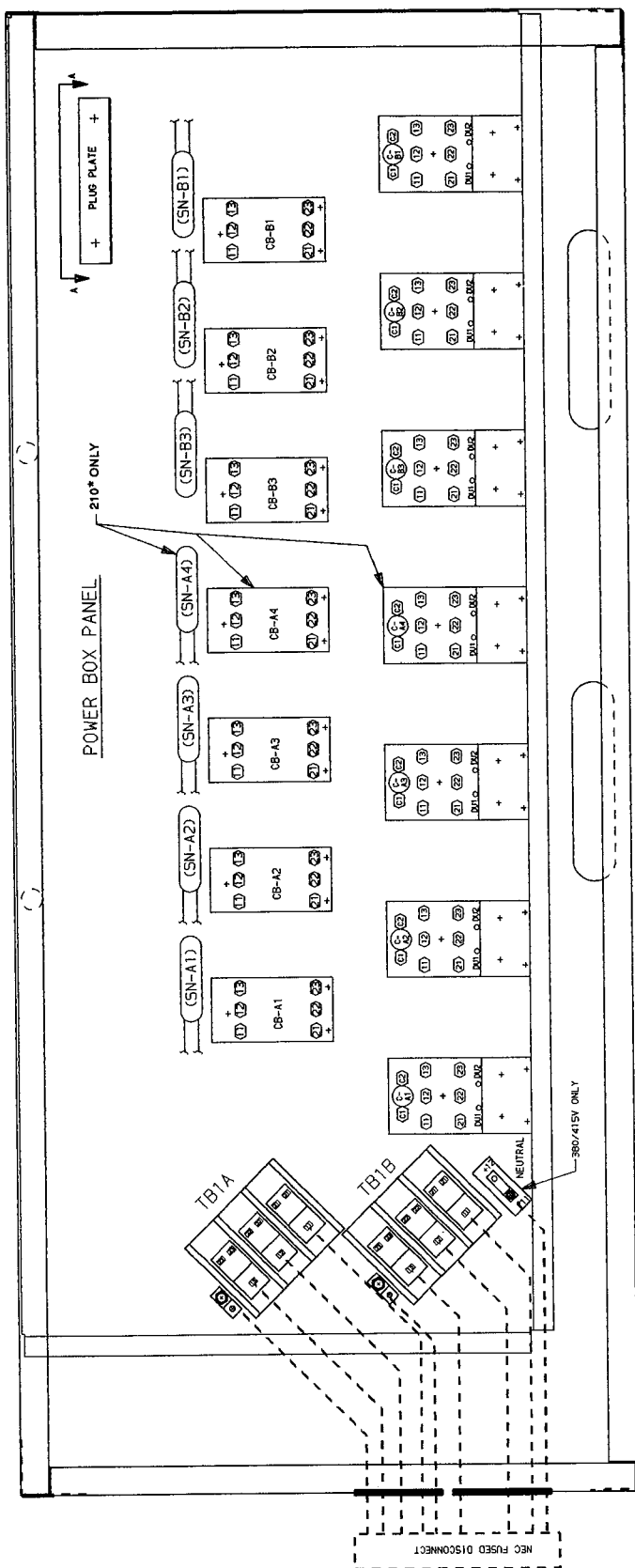


Fig. 31 — Power Box Location and Component Arrangement; 30GN,GT170,190, and Associated Modular Units; 380, 380/415, 460, 575-v — PW



*AND ASSOCIATED MODULAR UNITS.

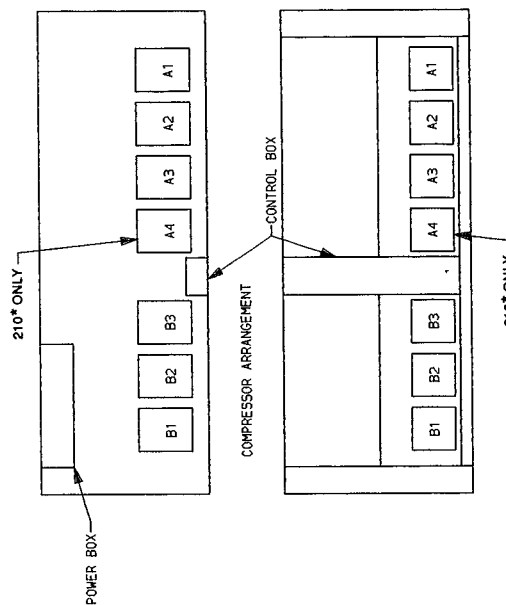


Fig. 32 — Power Box Location and Component Arrangement; 30GN,GT170-210 and Associated Modular Units; 380, 380/415, 460, 575-v — XL

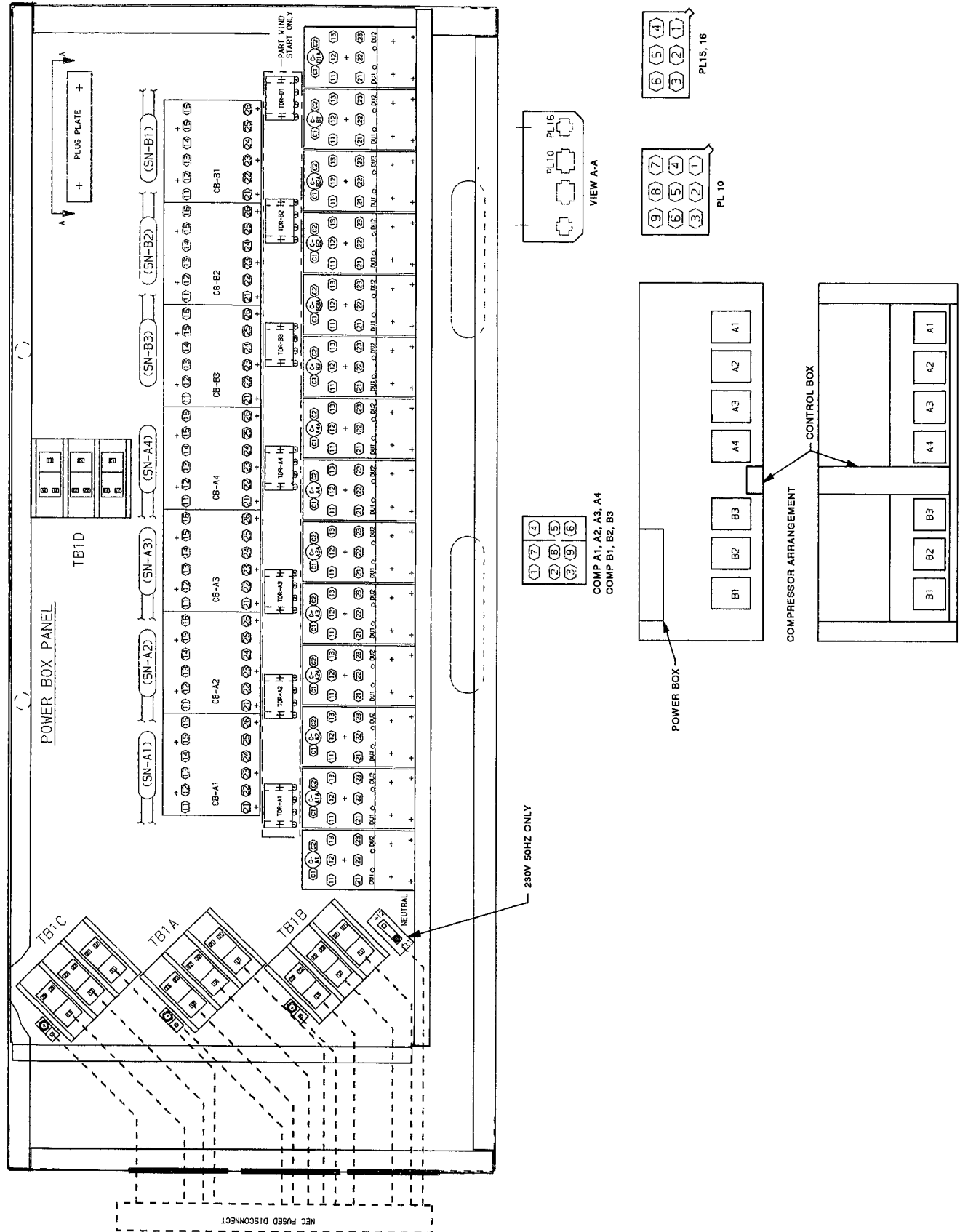


Fig. 33 — Power Box Location and Component Arrangement; 30GN,GT210 and Associated Modular Units; 208/230, 230-v — PW, XL

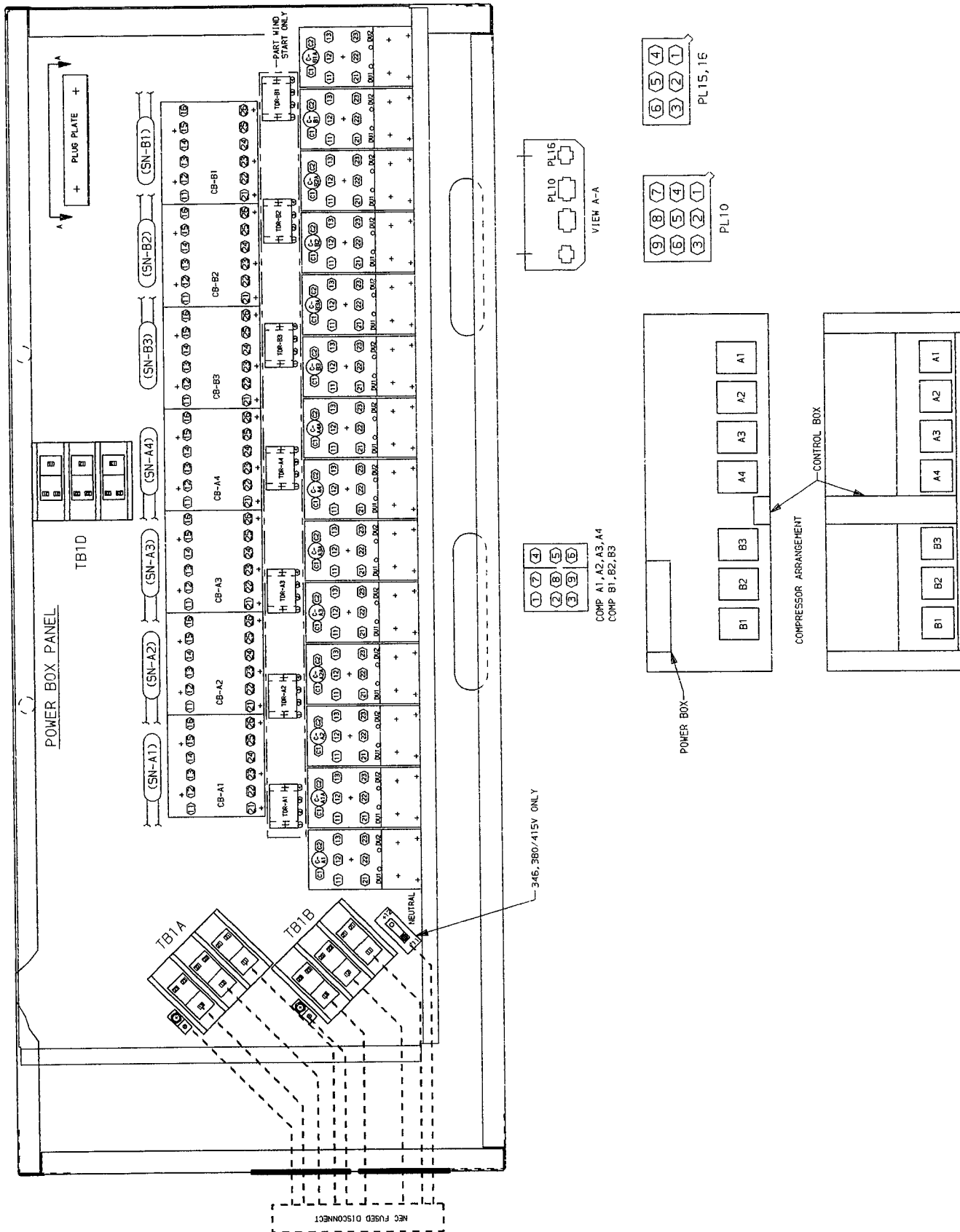
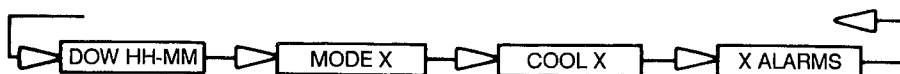


Fig. 34 — Power Box Location and Component Arrangement; 30GN,GT210 and Associated Modular Units;
346-v (PW, XL), 380, 380/415, 460, 575-v — PW

AUTOMATIC DISPLAY OPERATION/DEFAULT DISPLAY



In this mode, the keypad displays the current time (24-hour format), current operating modes, cooling capacity stages, and total number of alarms.

The default display is displayed every 2 seconds if there has been no manual input from the keypad for 10 minutes. To return to automatic display, at any time, press **1** **STAT**

LEGEND

DOW — Day-of-the-Week
HH — Hour
MM — Minute

KEYPAD OPERATING INSTRUCTIONS

NOTES:

1. The white keys on left side of keypad are denoted by boxes in the instructions. For example, keypad entry **1** **SRVC** means press the "1" then the white key marked SRVC
2. The standard display uses abbreviations. Expanded information will scroll through the display whenever **EXPN** is pressed.
3. All functions are made up of a group of subfunctions. To enter a subfunction, press the number of the subfunction desired, then press the function key in which the subfunction resides. To move within that subfunction, press the up **↑** or down **↓** arrows.

For example, a **6** **STAT**, enters the temperature information subfunction.

4. Another subfunction may be entered at any time by pressing the subfunction number, then the function key.

5. Prior to starting unit, check leaving fluid set point for correct setting.

6. Depending on chiller model and configuration, all displays may not be shown. Displays will be displayed all the time unless marked with the following symbol

*Must be configured.

For a more detailed explanation of keypad operation and for start-up procedure of unit, refer to the base unit Installation, Start-Up, and Service instructions.

STATUS FUNCTION

SUBFUNCTION	KEYPAD ENTRY	DISPLAY	COMMENT
1 AUTOMATIC DISPLAY	1 STAT	Refer to Automatic Display Operation described above.	
2 ALARMS	2 STAT	X ALARMS	Number of Tripped Alarms } Displays Tripped Alarms
	↓	ALARM X	
	↓	ALARM X	
	↓	ALARM X	
	↓	ALARM X	
	↓	ALARM X	
3 MODES	3 STAT	X MODES	Number of Modes in Effect } Displays Mode in Effect
	↓	MODE X	
	↓	MODE X	
	↓	MODE X	
	↓	MODE X	

Fig. 35 — Start-Up and Diagnostic Information; 30GN130-210,240B,270B, and Associated Modular Units

STATUS FUNCTION			
SUBFUNCTION	KEYPAD ENTRY	DISPLAY	COMMENT
4 STAGE	4 STAT	STAGE	Capacity Staging Information
	↓	STAGE X	Number of Requested Stages
	↓	CAPT X	Percent of Total Capacity
	↓	CAPA X	Percent Circuit A Capacity
	↓	CAPB X	Percent Circuit B Capacity
	↓	LMT X*	Demand Limit Set Point
	↓	LOAD X*	Load Limit Set Point
	↓	CIRA X	Circuit A Compressor Relay Status
	↓	CIRB X	Circuit B Compressor Relay Status
	↓	SMZ X	Load/Unload Factor for Compressors
			Factor = 1 Unloader Factor = 0.6
5 SET POINT	5 STAT	SET POINT	Fluid Set Point Information
	↓	SP X	Set Point
	↓	MSP X	Modified Set Point = Set Point + Reset
	↓	TW X	Cooler Leaving Fluid Temperature
6 TEMPERATURE	6 STAT	TEMPS	Temperature Information
	↓	EWT X	Cooler Entering Fluid Temperature
	↓	LWT X	Cooler Leaving Fluid Temperature
	↓	SCTA X	Circuit A Saturated Condenser Temperature
	↓	SSTA X	Circuit A Saturated Suction Temperature
	↓	CTA X	Compressor A1 Suction Temperature
	↓	SHA X	Circuit A Suction Superheat
	↓	SCTB X	Circuit B Saturated Condenser Temperature
	↓	SSTB X	Circuit B Saturated Suction Temperature
	↓	CTB X	Compressor B1 Suction Temperature
	↓	SHB X	Circuit B Suction Superheat
	↓	RST X*	Reset Temperature
7 PRESSURE	7 STAT	PRESSURE	Refrigerant System Pressure (psig)
	↓	DPA X	Circuit A Discharge Pressure
	↓	SPA X	Circuit A Suction Pressure
	↓	XXXX	Circuit A Discharge/Suction
	↓	OPA X	Circuit A Oil Pressure Differential
	↓	DPB X	Circuit B Discharge Pressure
	↓	SPB X	Circuit B Suction Pressure
	↓	XXXX	Circuit B Discharge/Suction
	↓	OPB X	Circuit B Oil Pressure Differential

Fig. 35 — Start-Up and Diagnostic Information; 30GN130-210,240B,270B,
and Associated Modular Units (cont)

STATUS FUNCTION (cont)			
SUBFUNCTION	KEYPAD ENTRY	DISPLAY	COMMENT
8 ANALOG	8 STAT	ANALOG	Status of Analog Inputs
	↓	REF X*	Transducer Supply Voltage
	↓	LMT X*	Demand 4-20 mA Signal
	↓	RST X*	Reset 4-20 mA Signal
9 INPUTS	9 STAT	INPUT	Status of Switch Inputs
	↓	SPW X*	Dual Set Point Switch
	↓	OPSA X*	Oil Pressure Switch 1
	↓	OPSB X*	Oil Pressure Switch 2
	↓	DL1 X*	Demand Limit Switch 1
	↓	DL2 X*	Demand Limit Switch 2
10 OUTPUTS	10 STAT	OUTPUTS	Status of Outputs
	↓	ALMR X	Alarm Relay K3
	↓	FRA1 X	Fan Relay K1
	↓	FRA2 X	Fan Relay K2
	↓	FRB1 X	Fan Relay K4
	↓	FRB2 X	Fan Relay K5
	↓	CHWP X*	Cooler Water Pump Relay K6
	↓	ULA1 X*	Unloader A1
	↓	ULA2 X*	Unloader A2
	↓	ULB1 X*	Unloader B1
	↓	ULB2 X*	Unloader B2
	↓	EXVA X	EXVA Percent Open
	↓	EXVB X	EXVB Percent Open
	↓	HGBA X*	Hot Gas Bypass Relay Circuit A
	↓	HGBB X*	Hot Gas Bypass Relay Circuit B
	↓	MMA X*	Motormaster® A Output Percent
	↓	MMB X*	Motormaster B Output Percent

Fig. 35 — Start-Up and Diagnostic Information; 30GN130-210,240B,270B, and Associated Modular Units (cont)

TEST FUNCTION			
SUBFUNCTION	KEYPAD ENTRY	DISPLAY	COMMENT
To use Test function, LOCAL/ENABLE-STOP-CCN switch must be in STOP position To operate a test, scroll to desired test, then press  to start test. Press  to stop test.			
1 OUTPUTS	 	OUTPUTS	Test Outputs
		8.8.8.8.8.8.8 8	Display Check
		ALMR X	Energize Alarm Relay K3
		FRA1 X	Energize Fan Relay A1 K1
		FRA2 X	Energize Fan Relay A2 K2
		FRB1 X	Energize Fan Relay B1 K4
		FRB2 X	Energize Fan Relay B2 K5
		CHWP X*	Energize Cooler Water Pump K6
		EXVA X	Enter Desired EXVA Position
		EXVB X	Enter Desired EXVB Position
		HGBRA X*	Energize Hot Gas Bypass Relay
		HGBRB X*	Energize Hot Gas Bypass Relay
		MMA X*	Enter Desired Motormaster® Device A Output Signal
		MMB X*	Enter Desired Motormaster Device B Output Signal

WARNING

During compressor test, compressors will start and run for 10 seconds. Compressor service valves and liquid line valves must be open. Energize crankcase heaters 24 hours prior to performing compressor tests.

2 COMPRESSORS	 	COMP	Compressor and Unloader Test
		CPA1 X	Test Compressor A1
		CPA2 X*	Test Compressor A2
		CPA3 X*	Test Compressor A3
		CPA4 X*	Test Compressor A4
		CPB1 X	Test Compressor B1
		CPB2 X*	Test Compressor B2
		CPB3 X*	Test Compressor B3
		CPB4 X*	Test Compressor B4
		ULA1 X*	Energize Unloader A1
		ULA2 X*	Energize Unloader A2
		ULB1 X*	Energize Unloader B1
		ULB2 X*	Energize Unloader B2

Fig. 35 — Start-Up and Diagnostic Information; 30GN130-210,240B,270B, and Associated Modular Units (cont)

SCHEDULE FUNCTION

The Schedule function key  is used to configure the unit occupancy schedule. The clock select subfunction can be used for unoccupied shutdown or unoccupied setback depending on the cooling set point control configuration. The Schedule function described is for clock 1, which is the internal clock. Password required for all subfunctions except override.

SUBFUNCTION	KEYPAD ENTRY	DISPLAY	COMMENT
1 OVERRIDE	 	OVRD X	Number of Override Hrs (0 - 4 Hrs)
For example: To extend current occupied mode for 3 hrs, press:	 	OVRD 3	Extended Occupied Time
2 CLOCK SELECT	 	CLOCK XX	Type of Clock Control 0 = No Clock, 1 = Clock 1 (Internal)
3 PERIOD 1 Yes = Schedule Operational for that day	          	PERIOD 1 OCC HH.MM UNO HH.MM MON X TUE X WED X THU X FRI X SAT X SUN X HOL X	Period 1 Time Schedule Occupied Time Unoccupied Time Monday Flag Tuesday Flag Wednesday Flag Thursday Flag Friday Flag Saturday Flag Sunday Flag Holiday Flag

To toggle between inputs (Yes/No) Press:  

4 PERIOD 2	 	PERIOD 2	Period 2 Time Schedule
5 PERIOD 3 ... 9 PERIOD 7	  ..  	PERIOD 3 PERIOD 7	Period 3 ... Period 7 Time Schedule
10 PERIOD 8	 	PERIOD 8	Period 8 Time Schedule
11 HOLIDAYS New = Unassigned Holiday Date MM = Month DD = Day of Month NN = Duration of Holiday Period in Days	     	HOLIDAYS MM DD NN MM DD NN MM.DD.NN MM.DD.NN	Define Calendar Holidays Holiday 1 Start Date and Duration Holiday 2 Start Date and Duration Holiday 29 Start Date and Duration Holiday 30 Start Date and Duration

For example: To enter July 4th holiday press: 07.04 01 . Display will show Jul 04 01. For further information on the Schedule function and its operation, refer to the base unit Installation, Start-Up, and Service instructions.

**Fig. 35 — Start-Up and Diagnostic Information; 30GN130-210,240B,270B,
and Associated Modular Units (cont)**

SERVICE FUNCTION			
To view and modify configurations, the password must be entered under the log on subfunction.			
SUBFUNCTION	KEYPAD ENTRY	DISPLAY	COMMENT
1 LOG ON	1 SRVC	PASSWORD	Enter Password/Disable Password Protection
	1 1 1 1 ENTR	LOGGEDON	Logged On
At this time, configurations may be modified When finished viewing and/or modifying configurations, log out as follows:			
	1 SRVC	LOGGEDON	Logged On
	↓	LOG OFF	Disable Password Protection
	ENTR	EXIT LOG	Logged OFF/ENABLE Password Protection
2 VERSION	2 SRVC	VERSION	Software Information
	↓	XXXXXXX	Version No. of Software (CESRXX)
	↓	X	Language Options
The next 3 subfunctions provide the ability to modify configurations. Refer to base unit Installation, Start-Up, and Service Instructions for further information on changing configurations.			
To change a configuration, enter the new configuration and press ENTR while on the correct configuration			
3 FACTORY CONFIGURATION	3 SRVC	FACT CFG	Factory Configuration Codes
	↓	X	Configuration Code 1
	↓	X	Configuration Code 2
	↓	X	Configuration Code 3
	↓	X	Configuration Code 4
	↓	X	Configuration Code 5
4 FIELD CONFIGURATION	4 SRVC	FLD CFG	Adjustable Field Configurations
	↓	ENO X	CCN Element Address
	↓	BUS X	CCN Bus Number
	↓	BAUD X	CCN Baud Rate
	↓	FLUID X	Cooler Fluid Select
	↓	UNITS X	Display Unit Select
	↓	LANG X	Display Language Select
	↓	NULA X	No. Circuit A Unloaders
	↓	NULB X	No. Circuit B Unloaders
	↓	HGB X	Hot Gas Bypass Select
	↓	SEQT X	Loading Sequence Select
	↓	SEQF X	Lead/Lag Sequence Select
	↓	OPS X	Oil Pressure Switch Select
	↓	HEADT X	Head Pressure Control Type
	↓	HEADM X	Head Pressure Control Method

Fig. 35 – Start-Up and Diagnostic Information; 30GN130-210,240B,270B, and Associated Modular Units (cont)

SERVICE FUNCTION (cont)			
SUBFUNCTION	KEYPAD ENTRY	DISPLAY	COMMENT
4 FIELD CONFIGURATION (cont)		MM X	Motormaster® Device Select
		CSPTYP X	Cooling Set Point Control Select
		CRTYP X	Cooling Reset Control Select
		ERTYP X	External Reset Sensor Select
		LSTYP X	Demand Limit Control Select
		RAMP X	Ramp Load Select
		LOCK X	Cooler Pump Interlock Select
		CPC X	Cooler Pump Control Select
5 SERVICE CONFIGURATION	5	SRV CFG	Service Configurations
		X	Configuration Code 7
		X	Configuration Code 8
		REFRIG X	Refrigerant
		TDTYP X	Pressure Transducer Select
		OPS X	Oil Transducer Set Point
		LPS X	Low Pressure Set Point
		FANTYP X	Fan Staging Select
		SH X	EXV Superheat Set Point
		MOP X	EXV MOP Set Point
HISTORY FUNCTION			
SUBFUNCTION	KEYPAD ENTRY	DISPLAY	COMMENT
1 RUN TIME	1	RUN TIME	Run Time Information
		HR X	Total Hrs Unit Has a Comp Operating
		HRA X	Circuit A Run Time
		HRB X	Circuit B Run Time
2 STARTS	2	STARTS	Starts Information
		CY X	Cycles from Stage 0 to Stage 1
		CYA X	Circuit A Starts
		CYB X	Circuit B Starts
3 ALARM HISTORY	3	ALRMHIST	Last 5 Alarms
		ALARM X	} Alarm Description
		ALARM X	
		ALARM X	
		ALARM X	
		ALARM X	

**Fig. 35 – Start-Up and Diagnostic Information; 30GN130-210,240B,270B
and Associated Modular Units (cont)**

SET POINT FUNCTION

To read a set point, go to the proper subfunction and read desired set point. To change a set point, enter the new set point value, then press

 LOCAL/ENABLE-STOP-CCN switch must be in LOCAL or STOP position.

SUBFUNCTION	KEYPAD ENTRY	DISPLAY	COMMENT
1 SET POINTS	 	SET POINT	Unit Set Point
		CSP1 X	Chiller Fluid Set Point 1
		CSP2 X	Chiller Fluid Set Point 2
		HSPA X	Head Pressure Set Point Circuit A
		HSPB X	Head Pressure Set Point Circuit B
		CRAMP X	Pulldown Limit
2 RESET SET POINTS	 	RESET	Reset Set Points
		CRST2 X*	Cooling Max Reset
		CREF2 X*	Max Reset Occurs at X mA or Degree
		CRST1 X*	Cooling Minimum Reset
		CREF1 X*	Min Reset Occurs at X mA or Degree
3 DEMAND SET POINTS	 	DEMAND	Demand Set Points
		DLS1 X*	Demand Switch 1 Set Point
		DLS2 X*	Demand Switch 2 Set Point
		DMAX X*	4-20 mA Maximum Demand Limit
		RMAX X*	Maximum Demand Limit Occurs at X mA
		DMIN X*	4-20 mA Minimum Demand Limit
		RMIN X*	Minimum Demand Limit Occurs at X mA
		SHED X*	CCN Loadshed Amount
4 DATE AND TIME	 	DATE.TIME	Date, Time and Day of Week
		DAY.HR.MIN	Day 1 = Mon, 2 = Tues .7 = Sun Hours are displayed in 24-hr time. Decimal point serves as colon.
		MM.DD.YR	Month.Day Year When entering date, enter a decimal point between entries Each entry must be 2 numbers.

**Fig. 35 — Start-Up and Diagnostic Information; 30GN130-210,240B,270B,
and Associated Modular Units (cont)**

COMPONENT NAME	INPUTS/OUTPUTS	SOFTWARE POINT NO.	HARDWARE CHANNEL NO.	FUNCTION	UNIT					
					130*	150*	170*	190*	210*	240B, 270B
PSIO (12/6 Module)	12 Inputs	1	1	Chilled Water Supply Temperature	X	X	X	X	X	X
		2	2	Chilled Water Return Temperature	X	X	X	X	X	X
		3	3	Compressor A1 Suction Gas Temperature	X	X	X	X	X	X
		4	4	Compressor B1 Suction Gas Temperature	X	X	X	X	X	X
		5	5	Remote ON/OFF; CWP Interlock; LOCAL/ENABLE-STOP-CCN, CWFS	X	X	X	X	X	X
		6	6	5 vdc Reference Input	X	X	X	X	X	X
		7	7	Discharge Pressure, Circuit A	X	X	X	X	X	X
		8	8	Discharge Pressure, Circuit B	X	X	X	X	X	X
		9	9	Suction Pressure, Circuit A	X	X	X	X	X	X
		10	10	Suction Pressure, Circuit B	X	X	X	X	X	X
		11	11	Oil Pressure, Circuit A	X	X	X	X	X	X
		12	12	Oil Pressure, Circuit B	X	X	X	X	X	X
	6 Outputs	13	13	K3 Relay — Alarm Relay	X	X	X	X	X	X
		14	14	K1 Relay — Fan Relay (Stage 2, Circuit A)	X	X	X	X	X	X
		15	15	K2 Relay — Fan Relay (Stage 3, Circuit A)	X	X	X	X	X	X
		16	16	K4 Relay — Fan Relay (Stage 2, Circuit B)	X	X	X	X	X	X
		17	17	K5 Relay — Fan Relay (Stage 3, Circuit B)	X	X	X	X	X	X
		18	18	K6 Relay — Chilled Water Pump Relay	X	X	X	X	X	X
DSIO (LV)	4 Inputs	19	1	Compressor A1 Feedback	—	—	—	—	—	X
		20	2	Compressor A1 Feedback	—	—	—	—	—	X
		21	3	Compressor B1 Feedback	—	—	—	—	—	X
		22	4	Compressor B2 Feedback	—	—	—	—	—	X
	8 Outputs	23	5	Compressor A1 Safeties; Compressor A1 Relay; Fan Contactor (Stage 1, Circuit A)	X	X	X	X	X	X
		24	6	Compressor A2 Safeties; Compressor A2 Relay	X	X	X	X	X	X
		25	7	Unloader U2-A1 Relay (Accessory)	X (60 Hz)	—	—	—	—	X
				Compressor A3 Safeties; Compressor A3 Relay	X (50 Hz)	X	X	X	X	—
		26	8	Unloader U1-A1 Relay	X	X	—	X	—	X
				Compressor A4 Safeties; Compressor A4 Relay	—	—	—	—	X	—
		27	9	Compressor B1 Safeties; Compressor B1 Relay; Fan Contactor (Stage 1, Circuit B)	X	X	X	X	X	X
		28	10	Compressor B2 Safeties; Compressor B2 Relay	X	X	X	X	X	X
		29	11	Unloader U2-B1 Relay (Accessory)	X (60 Hz)	—	—	—	—	X
				Compressor B3 Safeties; Compressor B3 Relay	—	—	X	X	X	—
		30	12	Unloader U1-B1 Relay	X	X	X	—	—	X
DSIO (EXV)	4 Inputs	31	1	Not Used	X	X	X	X	X	X
		32	2	Not Used	X	X	X	X	X	X
		33	3	Not Used	X	X	X	X	X	X
		34	4	Not Used	X	X	X	X	X	X
	8 Outputs	35	5	EXV-A	X	X	X	X	X	X
		36	6							
		37	7							
		38	8							
		39	9	EXV-B	X	X	X	X	X	X
		40	10							
		41	11							
		42	12							
BIN MODULE (Optional)	8 Inputs	51	1	Not Used	X	X	X	X	X	X
		52	2	Not Used	X	X	X	X	X	X
		53	3	Spare Temperature Sensor No 1	X	X	X	X	X	X
		54	4	Spare Temperature Sensor No 2	X	X	X	X	X	X
		55	5	Not Used	X	X	X	X	X	X
		56	6	Not Used	X	X	X	X	X	X
		57	7	Not Used	X	X	X	X	X	X
		58	8	Not Used	X	X	X	X	X	X
4 IN/4 OUT MODULE	4 Inputs	59	1	Demand Limit by Switch Stage No 2	X	X	X	X	X	X
		60	2	Demand Limit by Switch No 1 or by 4-10 mA Signal	X	X	X	X	X	X
		61	3	Remote Dual Set Point Switch	X	X	X	X	X	X
		62	4	Remote Reset Thermistor or Remote Reset by 4-20 mA Signal	X	X	X	X	X	X
	4 Outputs	63	5	Hot Gas Bypass Relay A (Accessory)	X	X	X	X	X	X
				Unloader Relay A (Accessory)	X (50 Hz)	X	X	X	X	—
		64	6	Hot Gas Bypass Relay B (Accessory)	X	X	X	X	X	X
				Unloader Relay B (Accessory)	X (50 Hz)	X	X	X	X	—
		65	7	Motormaster® Device A 4-20 mA Control (Accessory)	X	X	X	X	X	X
		66	8	Motormaster Device B 4-20 mA Control (Accessory)	X	X	X	X	X	X

*And Associated Modular Units

Fig. 36 — 30GN130-210*,240B,270B Channel Chart

To start the unit, the START/STOP switch must be moved to the start position. The control will then proceed to the initialization mode and will remain in this mode for approximately 2 minutes. During this time period, the number **20** will be displayed at the LED on the set point board. If the display button is pushed during this time period, the control will go into the Quick Test mode, which is indicated by the number **88** being displayed in the display LED on the set point board. For more information on the Quick Test, see the base unit Installation and Start-Up book.

After the initial time delay has passed, the **20** will be removed from the display and the display will be turned off. To view the display, hold in the display button. The numbers shown in the display will have the following significance.

CODES	CATEGORY
0-12	Stage Number
20-26	Operating Status Information
51-87	Overload Information

Under normal operation only the stage number will be displayed. If status codes or overload codes are being displayed, then the display will rotate every 2 seconds and will display up to 3 codes.

The stage number represents the stage of capacity at which the unit is running. For more information on the actual capacity refer to the base unit Installation and Start-Up instructions.

The operating status information codes inform the operator of special controls that are in effect (for example, load shed or temperature reset). For more information on installation and operation of these special controls refer to the Controls and Troubleshooting instructions. Table A below lists all operating status codes.

The overload information codes indicate why a circuit, compressor, or the unit is shut off. For a more detailed explanation of the failures, action taken by the microprocessor, and the possible causes of the failure, see the Controls and Troubleshooting instructions. A summary of the codes is listed in Table B.

Table A – Operating Status Codes

CODES	CATEGORY
20	Initialization Mode
21	Temperature Reset in Effect
22	Demand Limit in Effect
24	Pulldown Control in Effect
26	Remote Off in Effect
88	Quick Test

Thermistors

CODE NAME	DESCRIPTION	LOCATION
T1	Leaving Cooler Water	Leaving Water Nozzle
T2	Entering Cooler Water	Entering Water Baffle Space
T3	Saturated Condensing Temperature — Circuit A	Header End of Coil (Fig. B)
T4	Saturated Condensing Temperature — Circuit B	Header End of Coil (Fig. B)
T5	Saturated Suction Temperature — Circuit A	Cooler Head Near Liquid Nozzle
T6	Saturated Suction Temperature — Circuit B	Cooler Head Near Liquid Nozzle
T7	Superheated Gas Entering Piston — Circuit A	Lead Compressor — Circuit A (Fig. A)
T8	Superheated Gas Entering Piston — Circuit B	Lead Compressor — Circuit B (Fig. A)
T10	Reset Temperature Sensor (Accessory Only)	—

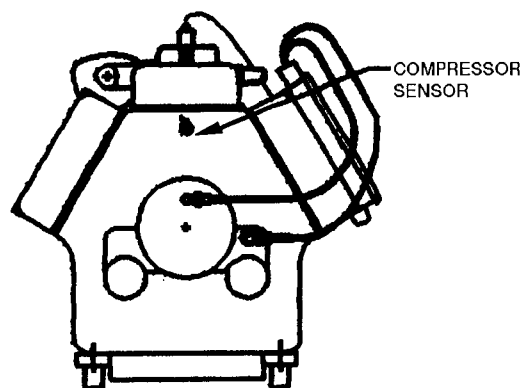


FIG. A — COMPRESSOR SENSOR LOCATION

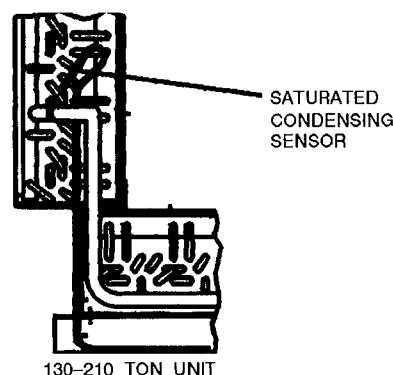


FIG. B — TYPICAL SATURATED CONDENSING TEMPERATURE LOCATION

Fig. 37 – Start-Up and Diagnostic Information; 30GT130-210,240B,270B, and Associated Modular Units

Table B – Overload Information Codes

DISPLAY	DESCRIPTION OF FAILURE		ACTION TAKEN BY CONTROL	RESET METHOD	PROBABLE CAUSE
	Unit 30GT*	Compressor No. Failure			
51	130 (60 Hz), 240B,270B	A1	Circuit A Shut Off	Manual	HPS or CGF on Circuit A (any Compressor in Circuit A)
	130 (50 Hz), 150	A1			
	170,190	A1			
	210	A1			
52	130 (60 Hz), 240B,270B	A2	Compressor Shut Off	Manual	HPS
	130 (50 Hz), 150	A2			
	170,190	A2			
	210	A2			
53	130 (60 Hz), 240B,270B	—	Compressor Shut Off	Manual	HPS
	130 (50 Hz), 150	A3			
	170,190	A3			
	210	A3			
54	130 (60 Hz), 240B,270B	—	Compressor Shut Off	Manual	HPS
	130 (50 Hz), 150	—			
	170,190	—			
	210	A4			
55	130 (60 Hz), 240B,270B	B1	Circuit B Shut Off	Manual	HPS or CGF on Circuit B (any Compressor in Circuit B)
	130 (50 Hz), 150	B1			
	170,190	B1			
	210	B1			
56	130 (60 Hz), 240B,270B	B2	Compressor Shut Off	Manual	HPS
	130 (50 Hz), 150	B2			
	170,190	B2			
	210	B2			
57	130 (60 Hz), 240B,270B	—	Compressor Shut Off	Manual	HPS
	130 (50 Hz), 150	—			
	170,190	B3			
	210	B3			
58	130 (60 Hz), 240B,270B	—	—	—	—
	130 (50 Hz), 150	—			
	170,190	—			
	210	—			
59	Loss-of-Charge — Circuit A		Circuit A Shut Off	Manual	Low Refrigerant Charge, or Loss-of-Charge Pressure Switch Failure
60	Loss-of-Charge — Circuit B		Circuit B Shut Off	Manual	
61	Low Cooler Flow		Unit Shut Off	Manual	No Cooler Flow or Reversed Cooler Flow
63	Low Oil Pressure — Circuit A		Circuit A Shut Off	Manual	Oil Pump Failure or Low Oil Level, or Switch Failure
64	Low Oil Pressure — Circuit B		Circuit B Shut Off	Manual	
65	Freeze Protection		Unit Shut Off	Auto.	Low Cooler Flow
66	High Suction Superheat — Circuit A		Circuit A Shut Off	Manual	Low Charge, or EXV Failure, or Plugged Filter Drier
67	High Suction Superheat — Circuit B		Circuit B Shut Off	Manual	
68	Low Suction Superheat — Circuit A		Circuit A Shut Off	Manual	EXV Failure
69	Low Suction Superheat — Circuit B		Circuit B Shut Off	Manual	
70	Illegal Unit Configuration		Unit Will Not Start	Manual	Configuration Error (See Note 2)
71	Leaving Water Thermistor Failure		Unit Shut Off	Auto.	Thermistor Failure, Wiring Error, or Thermistor Not Connected to Processor Board.
72	Entering Water Thermistor Failure		Use Default Valve	Auto.	
75	Saturated Condenser Thermistor Failure — Circuit A		Unit Shut Off	Auto.	
76	Saturated Condenser Thermistor Failure — Circuit B		Unit Shut Off	Auto.	
77	Cooler Thermistor Failure — Circuit A		Unit Shut Off	Auto.	
78	Cooler Thermistor Failure — Circuit B		Unit Shut Off	Auto.	
79	Compressor Thermistor Failure —Circuit A		Unit Shut Off	Auto.	
80	Compressor Thermistor Failure —Circuit B		Unit Shut Off	Auto.	
81	Reset Temperature Failure		Stop Reset	Auto.	Potentiometer Improperly Connected, Potentiometer Setting Out of Range — Potentiometer Failure, or Wiring Error.
82	Leaving Water Set Point POT Failure		Use Default Value	Auto.	
84	Reset Limit Set Point POT Failure		Stop Reset	Auto.	
85	Demand Limit POT Failure		Stop Demand Limit	Auto.	
86	Reset Ratio POT Failure		Stop Reset	Auto.	
87	Reset Set Point POT Failure		Stop Reset	Auto.	

*And associated modular units

NOTES:

- Freeze protection trips at 35 F (1.6 C) for water and 6° F (3.3° C) below set point for brine units. Resets at 6° F (3.3° C) above set point.
- Illegal unit configuration caused by missing programmable header or both unloader DIP switches on.

- All Auto. reset failures that cause the unit to stop will restart the unit when the error has been corrected.
- All manual reset errors must be reset by turning the control switch off and on.
- Valid resistance range for thermistors is 362,939 ohms to 216.65 ohms

Fig. 37 — Start-Up and Diagnostic Information; 30GT130-210,240B,270B, and Associated Modular Units (cont)

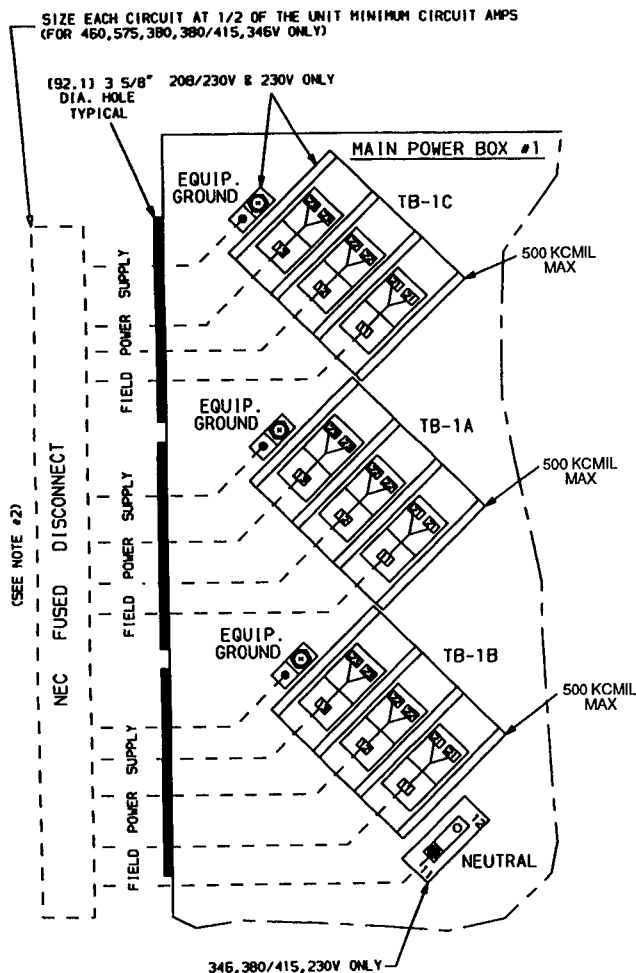


**Fig. 38 — Field Power Wiring;
Unit Sizes 130-210 and
Associated Modular Units**

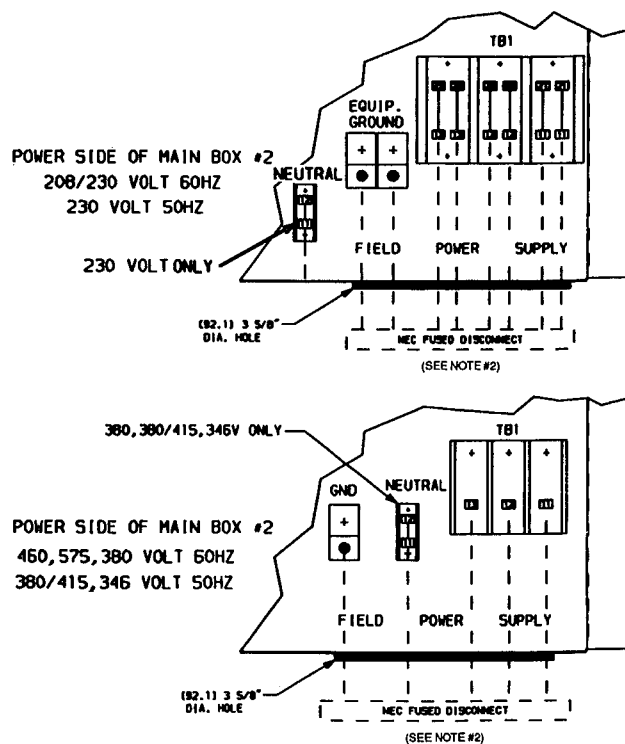


**Fig. 39 — Field Power Wiring;
Unit Sizes 240B,270B**

LEGEND AND NOTES FOR FIELD POWER AND FIELD CONTROL POWER WIRING DIAGRAMS (FIG. 38-41)

A	— Alarm
CCN	— Carrier Comfort Network
COMM	— Communications Bus
CWFS	— Chilled Water Flow Switch
CWP	— Chilled Water Pump
EQUIP	— Equipment
GND	— Ground
Kcmil	— Thousand Circular Mills
NEC	— National Electrical Code
PL	— Plug
RS	— Request to Send
TB	— Terminal Block
----	Field Power Wiring
----	Field Control Wiring
———	Factory Installed Wiring

NOTES:

1. Factory wiring is in accordance with NEC (U.S.A.). Field modifications or additions must be in compliance with all applicable codes.
2. Wiring for main field power supply must be rated 75° C minimum. Use copper, copper-clad aluminum, or aluminum conductors for all units, except use copper conductors only for the following units:
30GN,GT210, and associated modular units, 208/230-v part-wind and across-the-line start.

3. Power for control circuit should be supplied from a separate source through a field-supplied fused disconnect with 30-amp maximum protection for 115-v circuits, and 15-amp maximum protection for 230-v control circuit. For a unit with cooler heaters (unit sizes 240B, 270B), the field-supplied disconnect must have 30-amp maximum protection for 115-v control circuits, and 15-amp maximum protection for 230-v control circuit, 5-amp maximum for a unit without cooler heaters. Connect control circuit power to terminals 1 and 2 of TB4. Connect neutral side of supply to terminal 2 of TB4. Control circuit conductors for all units must be copper only.
4. Terminals 3 and 4 (30GT) or terminals 1, 2, 3, and 4 (30GN) of TB6 are for field connection for remote ON-OFF control or CWP interlock (30GN only). The contacts must be rated for dry circuit application capable of reliably switching a 5 vdc, .5 mA (30GT) or 1 to 20 mA (30GN) load. Remove jumper between 3 and 4 of TB6 if remote ON-OFF is installed.
5. a. 30GT units:
The maximum load allowed for the remote alarm circuit is 75 va sealed, 360 va inrush at 115- or 230-v, depending on model. Remove resistor across terminals 1 and 2 of TB5 when using remote alarm.
b. 30GN units:
Terminals 1, 2, 3, and 4 of TB3 are for chilled water pump and remote alarm control functions. The maximum load allowed for the alarm and chilled water pump circuits is 125 va sealed, 1250 va inrush at 115 or 230 v.
6. Dimensions in [] are millimeters.

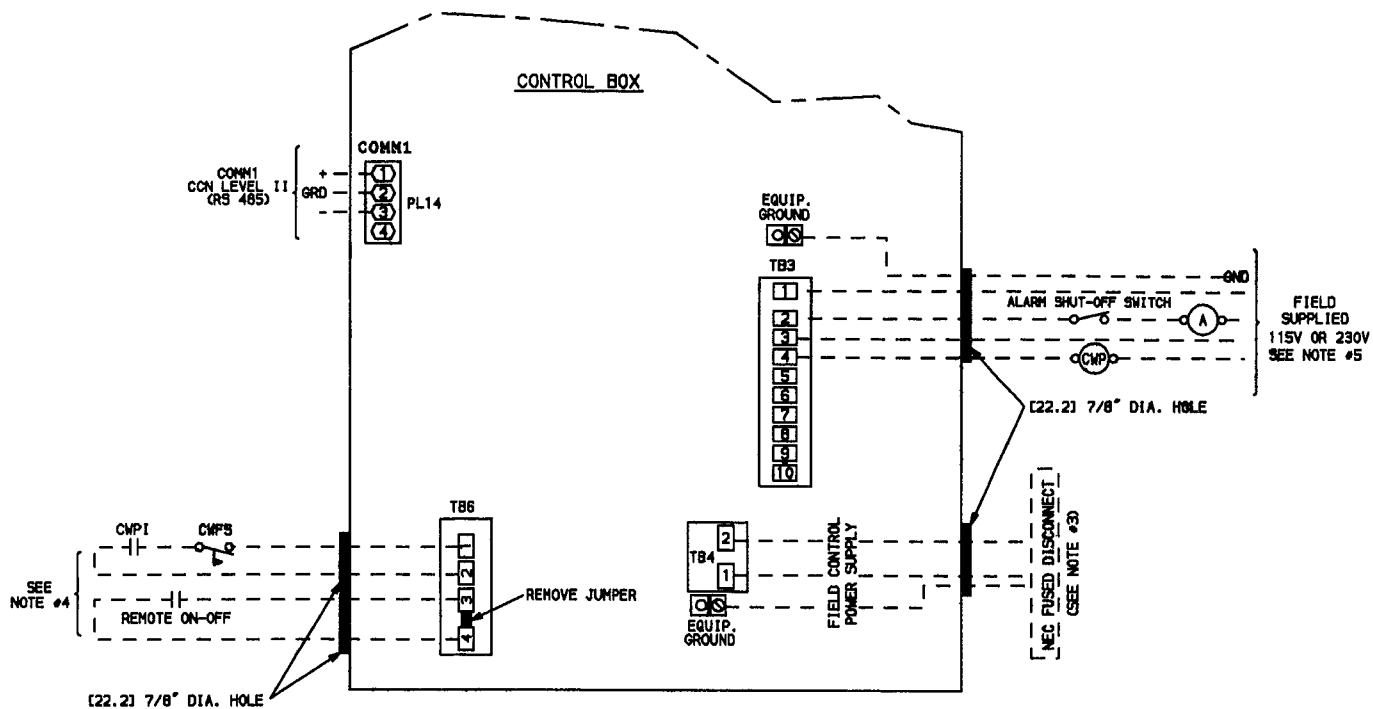


Fig. 40 - Field Control Power Wiring, Unit Sizes 30GN130-210 and Associated Modular Units

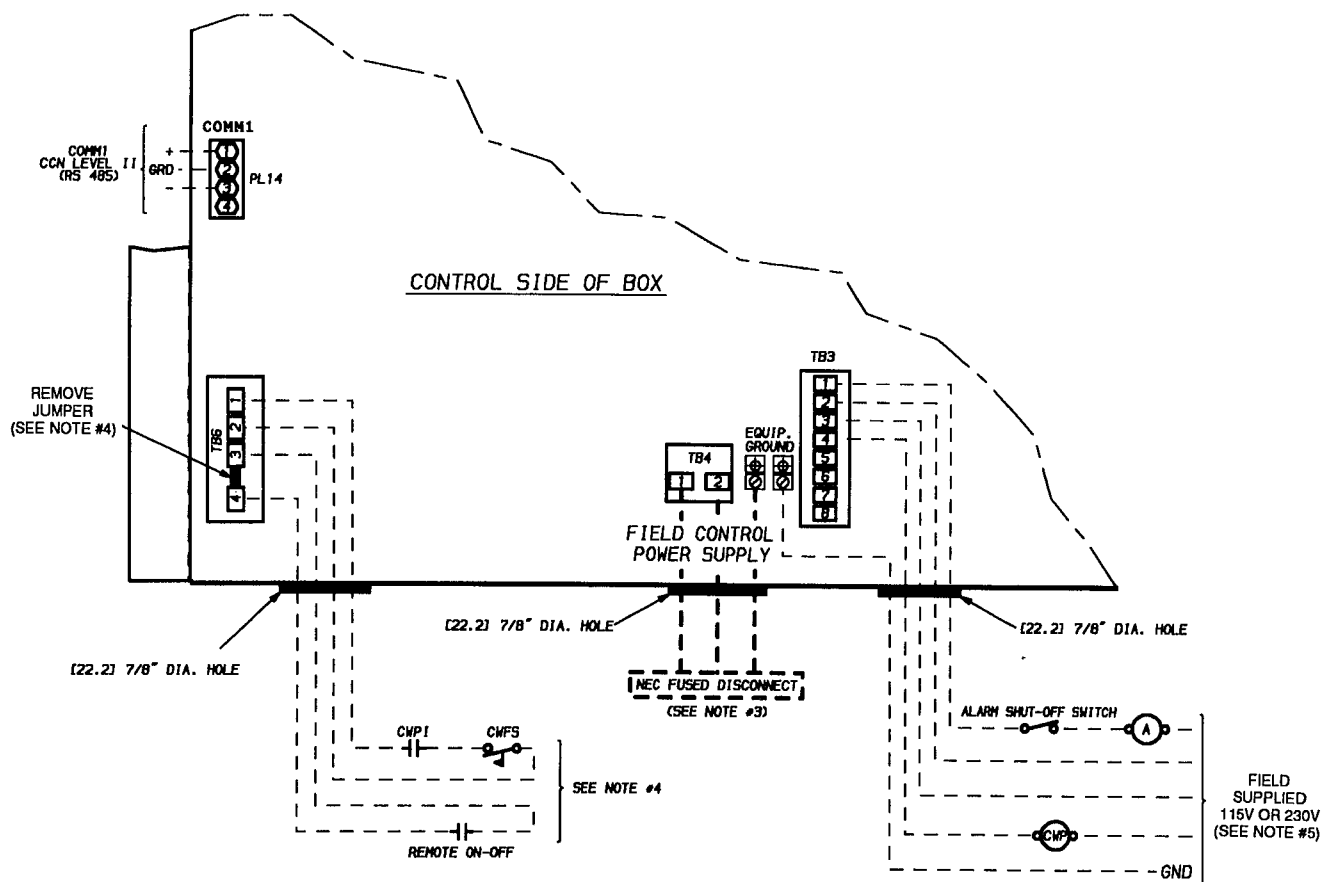


Fig. 41 - Field Control Power Wiring, Unit Sizes 30GN240B, 270B

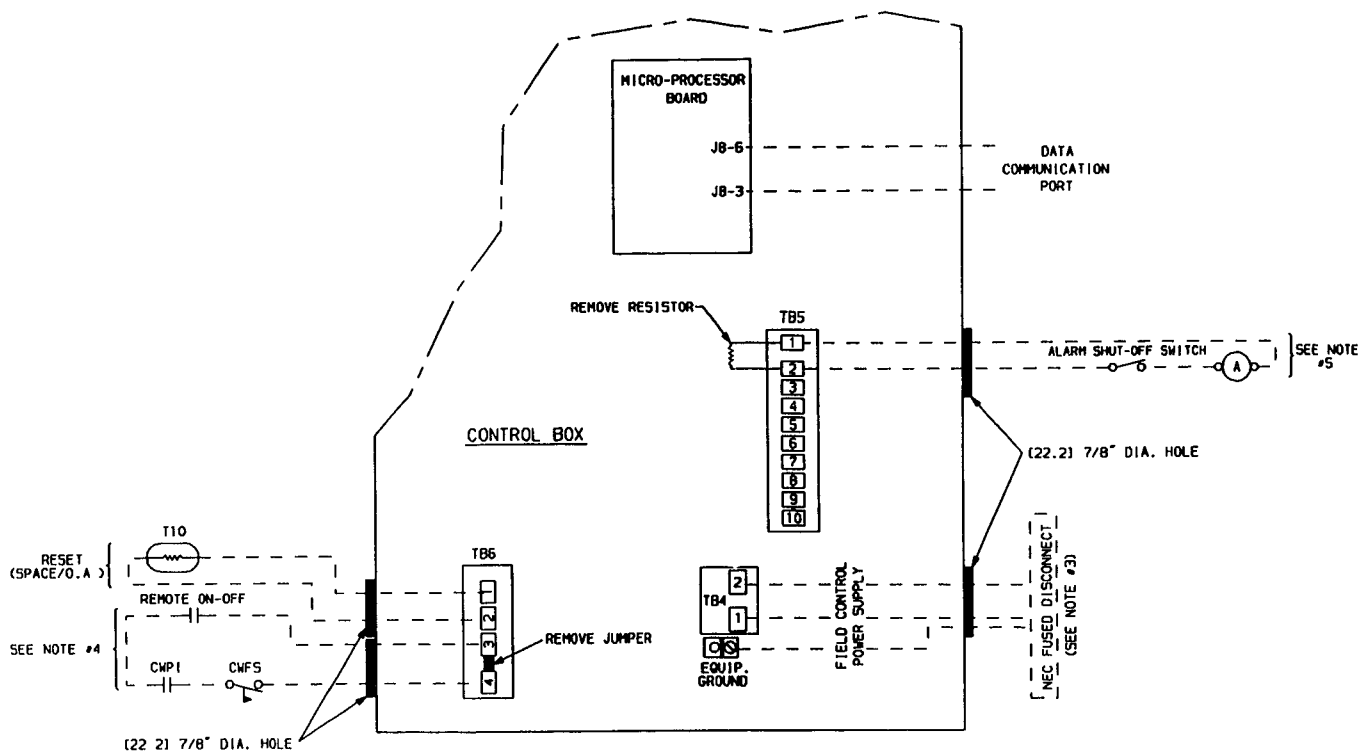


Fig. 42 - Field Control Power Wiring; Unit Sizes 30GT130-210 and Associated Modular Units

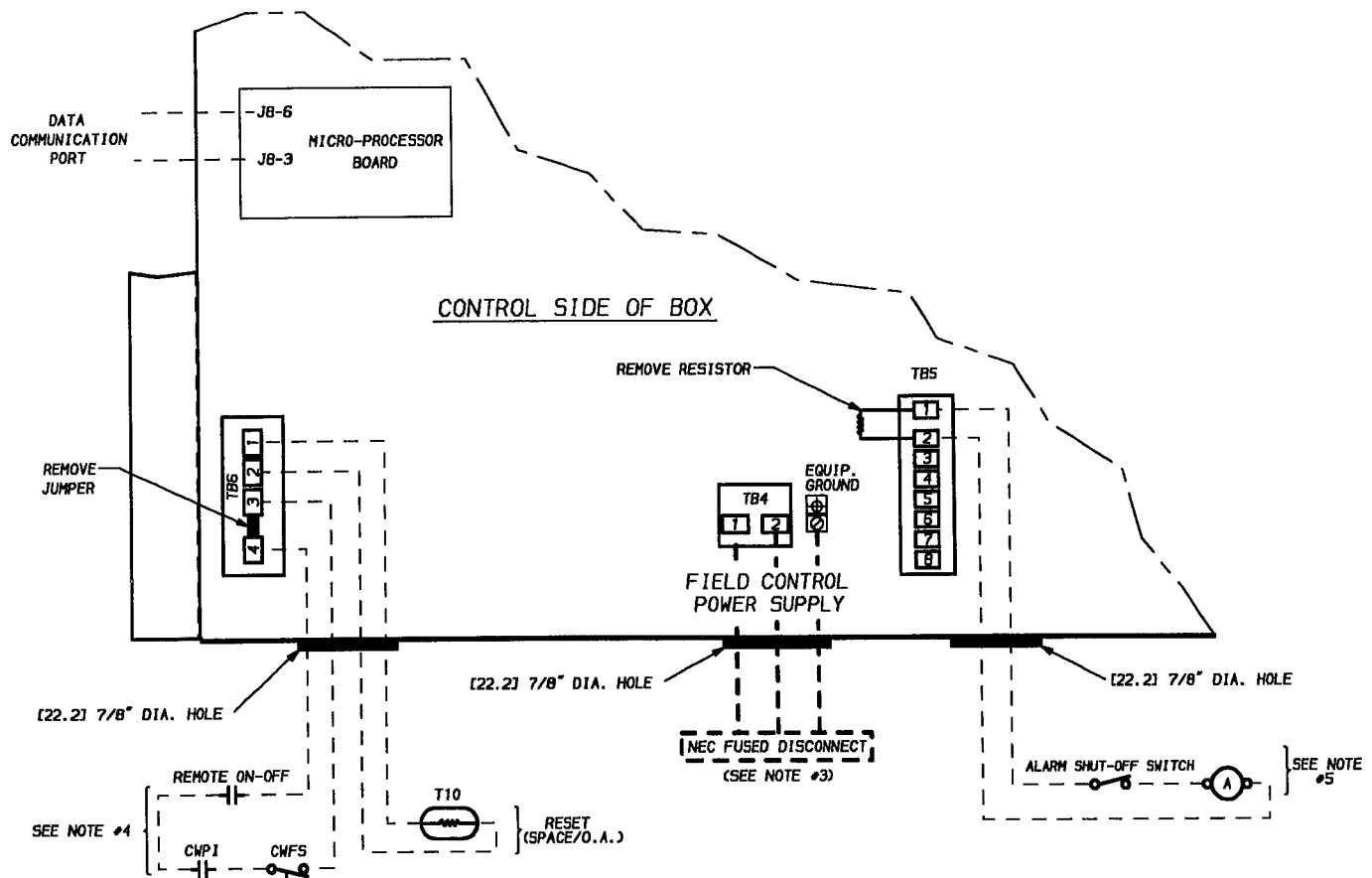


Fig. 43 - Field Control Power Wiring; Unit Sizes 30GT240B,270B

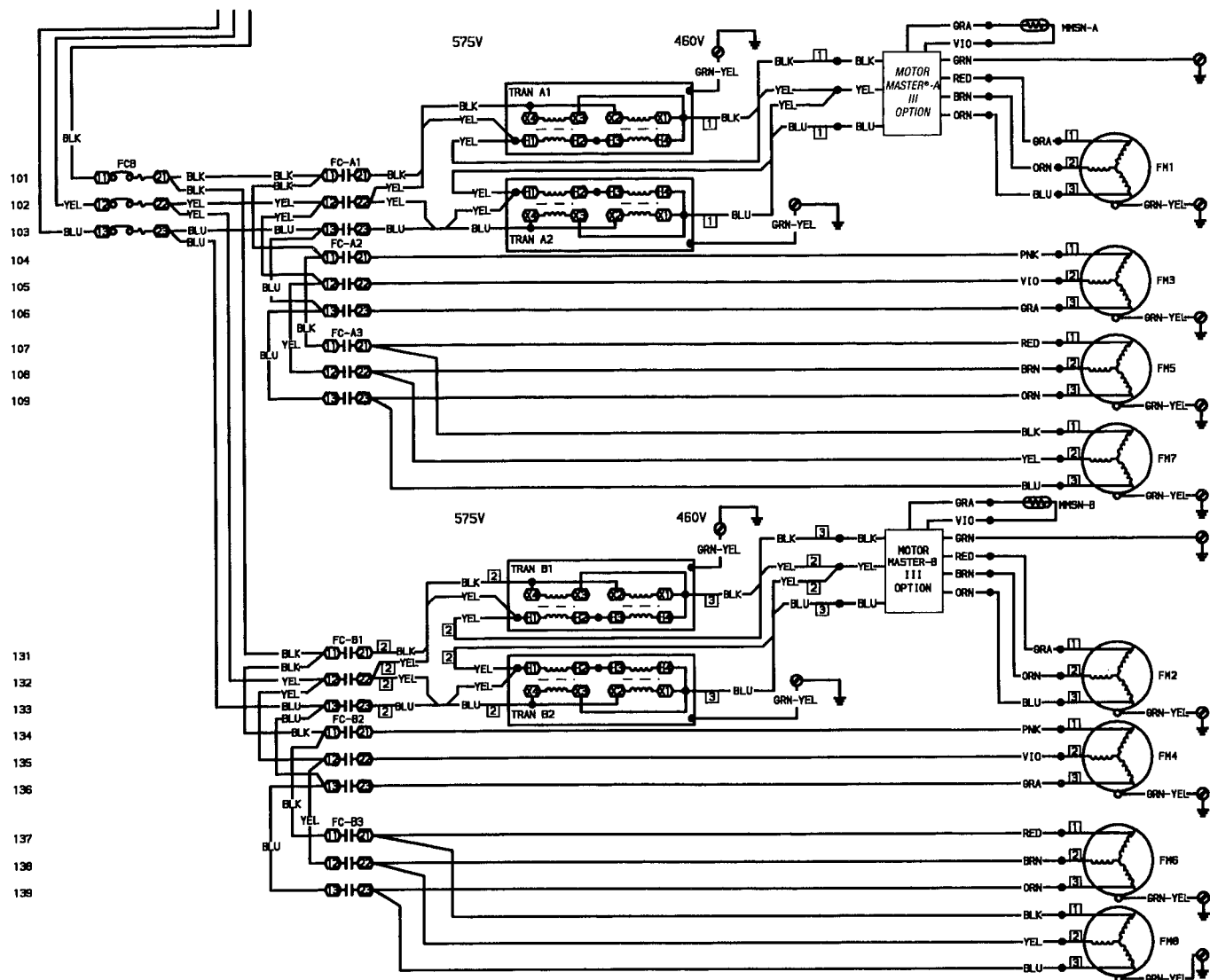


Fig. 45 — 30GN,GT240B,270B; 575-v Motormaster® Control Units

DUAL SET POINT REQUIREMENT

30GT Only — For installations requiring dual set point capability, the demand limit control module (DLCM) and the accessory reset board are required.

To operate the chiller with a dual set point, the fluid should be properly chosen for temperature application. The chilled water set point is achieved by field installation of a single-pole double-throw relay of the appropriate control voltage, with a single-pole single throw switch and resistors wired to TB6-1 and -2 as shown in Fig. 46.

On the processor board, remove the cover to the DIP (dual in-line package) switches. Set DIP switch no. 2 to ON to enable reset. ON-OFF switch must be OFF before changing the setting of the DIP switch.

The chilled liquid set point must be set to the lower of the 2 temperatures selected.

ACCESSORY RESET BOARD — Chilled reset temperature potentiometer should be set between 90 and 95 F (32 and 35 C). If a fault code of **87** is displayed on the LED (light-emitting diode), reduce the value slightly to eliminate the fault code. The reset limit potentiometer must be

set to the difference between the low and high set point temperature. The chiller reset ratio potentiometer should be set at 100%. If a fault code of **86** is displayed on the LED, reduce the value slightly to eliminate the fault code.

OPERATION — The chiller will supply water at the higher set point when no power is supplied to the dual set point relay (DSPR). When power is applied to the DSPR, the chiller will supply water (fluid) at the lower temperature. For example: For a dual set point requirement of 44 F (6.7 C) and 26 F (−3.3 C) water, the chiller will supply fluid at 26 F (−3.3 C) when the relay DSPR is energized, and 44 F (6.7 C) when it is not — with the necessary accessories installed and the following control devices set at these values:

	F	C
Chilled Liquid Set Point:	26	−3.3
Chiller Reset Temperature:	95	35
Reset Limit Potentiometer:	18°	10°
Reset Ratio	100%	

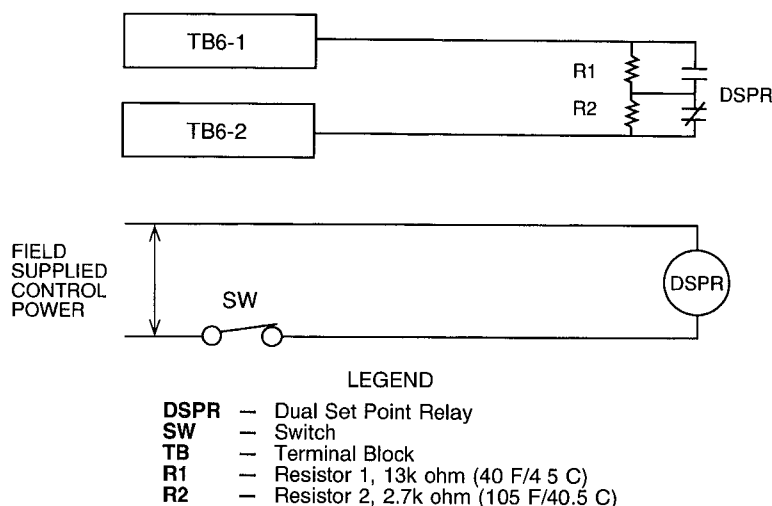


Fig. 46 — Dual Set Point Wiring

