Table 27 — Configuring Demand Limit

MODE	KEYPAD ENTRY	SUB-MODE	KEYPAD ENTRY	ITEM	DISPLAY	ITEM EXPANSION	COMMENT
CONFIGURATION	ENTER	DISP	ENTER	TEST	ON/OFF	Test Display LEDs	
	▼	UNIT	ENTER	TYPE	X	Unit Type	
	▼	OPT1	ENTER	FLUD	X	Cooler Fluid	
	▼	OPT2	ENTER	CTRL	X	Control Method	
	▼	RSET	ENTER	CRST	X	Cooling Reset Type	
			▼	DMDC*	X	Demand Limit Select	Default: 0 0 = None 1 = Switch 2 = 4 to 20 mA Input 3 = CCN Loadshed
			▼	DM20	XXX %	Demand Limit at 20 mA	Default: 100% Range: 0 to 100
			▼	SHNM	XXX	Loadshed Group Number	Default: 0 Range: 0 to 99
			▼	SHDL	XXX%	Loadshed Demand Delta	Default: 0% Range: 0 to 60%
			▼	SHTM	XXX MIN	Maximum Loadshed Time	Default: 60 min. Range: 0 to 120 min.
			▼	DLS1	XXX %	Demand Limit Switch 1	Default: 80% Range: 0 to 100%
			▼	DLS2	XXX %	Demand Limit Switch 2	Default: 50% Range: 0 to 100%

*Seven items skipped in this example.

TROUBLESHOOTING

Complete Unit Stoppage and Restart — Possible causes for unit stoppage and reset methods are shown below. (See Table 28 also.) Refer to Fig. 22-26 for Component Arrangement and Control Wiring Diagrams.

GENERAL POWER FAILURE — After power is restored, restart is automatic through normal MBB start-up.

UNIT ENABLE-OFF-REMOTE CONTACT SWITCH IS OFF — When the switch is OFF, the unit will stop immediately. Place the switch in the ENABLE position for local switch control or in the REMOTE CONTACT position for control through remote contact closure.

CHILLED FLUID PROOF-OF-FLOW SWITCH OPEN — After the problem causing the loss of flow has been corrected, reset is manual by resetting the alarm with the Scrolling Marquee as shown in Table 24.

OPEN HIGH-PRESSURE SWITCH(ES) — Determine and correct the cause of the failure. The switch automatically resets, but the unit must be reset manually by resetting the alarm with the Scrolling Marquee as shown in Table 24.

OPEN COMPRESSOR INTERNAL THERMAL PROTECTION — This switch provides compressor over temperature protection. Determine and correct the cause of the problem. The switch resets automatically, but the unit must be reset manually resetting the alarm with the Scrolling Marquee as shown in Table 24.

OPEN 24-V CONTROL CIRCUIT BREAKER(S) — Determine the cause of the failure and correct. Reset circuit breaker(s). Restart is automatic after MBB start-up cycle is complete.

COOLING LOAD SATISFIED — Unit shuts down when cooling load has been satisfied. Unit restarts when required to satisfy leaving fluid temperature set point.

THERMISTOR FAILURE — If a thermistor fails in either an open or shorted condition, the unit will be shut down. Replace T1, T2, or T9 as required. Unit restarts automatically, but must be reset manually by resetting the alarm with the Scrolling Marquee as shown in Table 24.

⚠ CAUTION

If unit stoppage occurs more than once as a result of any of the safety devices listed, determine and correct cause before attempting another restart.

LOW SATURATED SUCTION — Several conditions can lead to low saturated suction alarms and the chiller controls have several override modes built in which will attempt to keep the chiller from shutting down. Low fluid flow, low refrigerant charge and plugged filter driers are the main causes for this condition. To avoid permanent damage and potential freezing of the system, do NOT repeatedly reset these alert and/or alarm conditions without identifying and correcting the cause(s).

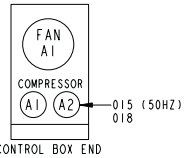
Table 28 — Troubleshooting

SYMPTOMS	CAUSE	REMEDY
Cooler Circulating Pump Does Not Run	Power line open	Reset circuit breaker.
	Control fuse or circuit breaker open	Check control circuit for ground or short. Reset breaker and replace fuse.
	Compressor over temperature sensor open (06D)	Find cause of high temperature and reset controls.
	Tripped power breaker	Check the controls. Find the cause of trip and reset breaker.
	Cooler circulating pump not running	Power off — restart.
		Pump binding — free pump.
		Incorrect wiring —rewire.
		Pump motor burned out — replace.
	Loose terminal connection	Check connections.
	Improperly wired controls	Check wiring and rewire if necessary.
	Low line voltage	Check line voltage — determine location of voltage drop and remedy deficiency.
	Compressor motor defective	Check motor winding for open or short. Replace compressor if necessary.
	Seized compressor	Replace compressor.
Compressor Cycles Off on Loss of Charge	Loss of charge control erratic in action	Repair leak and recharge.
		Replace control.
	Low refrigerant charge	Add refrigerant.
	Low suction temperature	Raise cooler leaving fluid temperature set point.
Compressor Cycles Off on Out of Range Condition	Thermistor failure	Replace thermistor.
	System load was reduced faster than controller could remove stages	Unit will restart after fluid temperature rises back into the control band. Avoid rapidly removing system load.
	Temperature controller deadband setting is too low	Raise deadband setting.
Compressor Shuts Down on High-Pressure Control	High-pressure control acting erratically	Replace control.
	Compressor discharge valve partially closed	Open valve or replace (if defective).
	Noncondensables in system	Purge system.
	Condenser scaled/dirty	Clean condenser.
	Condenser water pump or fans not operating	Start pump — repair or replace if defective.
	System overcharged with refrigerant	Reduce charge.
Unit Operates Too Long or Continuously	Low refrigerant charge	Add refrigerant.
	Control contacts fused	Replace control.
	Air in system	Purge system.
	Partially plugged or plugged expansion valve or filter drier	Clean or replace as needed.
	Defective insulation	Replace or repair as needed.
	Service load	Keep doors and windows closed.
	Inefficient compressor	Check valves, and replace if necessary.
Unusual or Loud System Noises	Piping vibration	Support piping as required.
		Check for loose pipe connections
	Expansion valve hissing	Add refrigerant.
		Check for plugged liquid line filter drier.
	Compressor noisy	Replace compressor (worn bearings).
		Check for loose compressor holddown bolts.
Compressor Loses Oil	Leak in system	Repair leak.
	Mechanical damage (Failed seals or broken scrolls)	Replace compressor.
	Oil trapped in line	Check piping for oil traps.
Hot Liquid Line	Shortage of refrigerant due to leak	Repair leak and recharge.
Frosted Liquid Line	Shutoff valve partially closed or restricted	Open valve or remove restriction.
	Restricted filter drier	Replace filter drier.
Frosted Suction Line	Expansion valve admitting excess refrigerant (note: this is a normal condition for brine applications)	Adjust expansion valve. Replace valve if defective.
Freeze-Up	Improper charging	Make sure a full quantity of fluid is flowing through the cooler while charging, and suction pressure in cooler is equal to or greater than pressure corresponding to 32 F (0° C) (58 psig [400 kPa] for Refrigerant 22).
	System not drained for winter shutdown	*Recommended that system be filled with an appropriate glycol mixture to prevent freezing of pumps and fluid tubing.*
	Loose Thermistor	Verify thermistors are fully inserted in wells.

LEGEND

C	—	Contactor, Compressor
CB	—	Circuit Breaker
CHC	—	Cooler/Pump Heater Contactor
CWP	—	Chilled Water Pump
EMM	—	Energy Management
FC	—	Fan Contactor
FIOP	—	Factory-Installed Option
FU	—	Fuse
GND	—	Ground
MBB	—	Main Base Board
MM	—	Motormaster®
MMPT	—	Motormaster Pressure Transducer
MS	—	Manual Starter
NEC	—	National Electrical Code
SW	—	Switch
TB	—	Terminal Block
TRAN	—	Transformer
———		Factory Wiring
- - - -		Field Wiring
—-—-—		Accessory or Option Wiring

LOW AMBIENT OPERATION (MOTORMASTER V) FIOP/ACCESSORY		
UNIT VOLTAGE	CONFIGURATION JUMPER LOCATION	CONFIGURATION JUMPER COMMON LOCATION
575-3-60	1	2
380-3-60	13A	
230-3-60	1	
208-3-60	13A	
460-3-60	1	
230-3-50	13B	
380/415-3-50	13C	



NOTES:
1. FACTORY WIRING IS IN ACCORDANCE WITH UL 1995 STANDARDS. ANY FIELD MODIFICATIONS OR ADDITIONS MUST BE IN COMPLIANCE WITH ALL APPLICABLE CODES.
2. USE 75°C MIN WIRE FOR FIELD POWER SUPPLY.
3. ALL COMPRESSOR MANUAL STARTERS "MUST TRIP AMPS" ARE EQUAL TO OR LESS THAN 156% RLA. ALL OTHER MANUAL STARTERS "MUST TRIP AMPS" ARE EQUAL TO OR LESS THAN 140% FLA.
4. ALL FIELD INTERLOCK CONTACTS MUST HAVE A MIN RATING OF 2 AMPS @ 24VAC SEALED. SEE FIELD INTERLOCK WIRING.
5. COMPRESSOR AND FAN MOTORS ARE THERMALLY PROTECTED-- THREE PHASE MOTORS PROTECTED AGAINST PRIMARY SINGLE PHASE CONDITIONS.
6. INTERCHANGE FAN MOTOR CONNECTIONS 1 AND 3 TO ENSURE COUNTER CLOCKWISE FAN ROTATION.
7. TERMINALS 9 & 10 OF TB5 ARE FOR FIELD CONNECTION OF REMOTE ON-OFF. THE CONTACT MUST BE RATED FOR DRY CIRCUIT APPLICATION CAPABLE OF HANDLING A 5VDC 1 MA TO 20 MA LOAD.
8. COMPRESSORS ON MODELS 015 (50 HZ) AND 018 ARE PROTECTED BY INTERNAL LINE BREAK DEVICES NOT THERMOSTATS.
9. ALARM RELAY MUST BE INSTALLED FOR HEATING/BOILER RELAY OPERATION. DPST RELAY MUST BE USED FOR HEAT RELAY.
10. FOR 500 SERIES UNIT OPERATION AT 208-3-60V LINE VOLTAGE, TRAN1 PRIMARY CONNECTIONS MUST BE MOVED TO TERMINALS H3 & H4.

FUSE NUMBER	UNIT VOLTAGE	TRANSFORMER SIZE	REPLACE WITH
FU1 & FU2	380-3-60,460-3-60,575-3-60	100VA	FNQ-R-3/4
	208/230-3-60,230-3-50,380/415-3-50		FNQ-R-2
FU3 (24V)	380-3-60,460-3-60,575-3-60	100VA	FNM-6
	208/230-3-60,230-3-50,380/415-3-50		
FU4 (115V)	460-3-60,575-3-60	500VA	FNM-6
	208/230-3-60,230-3-60		
FU5 & FU6	460-3-60,575-3-60	500VA	FNQ-R-2 1/2
	208/230-3-60,230-3-60		FNQ-R-3 1/2

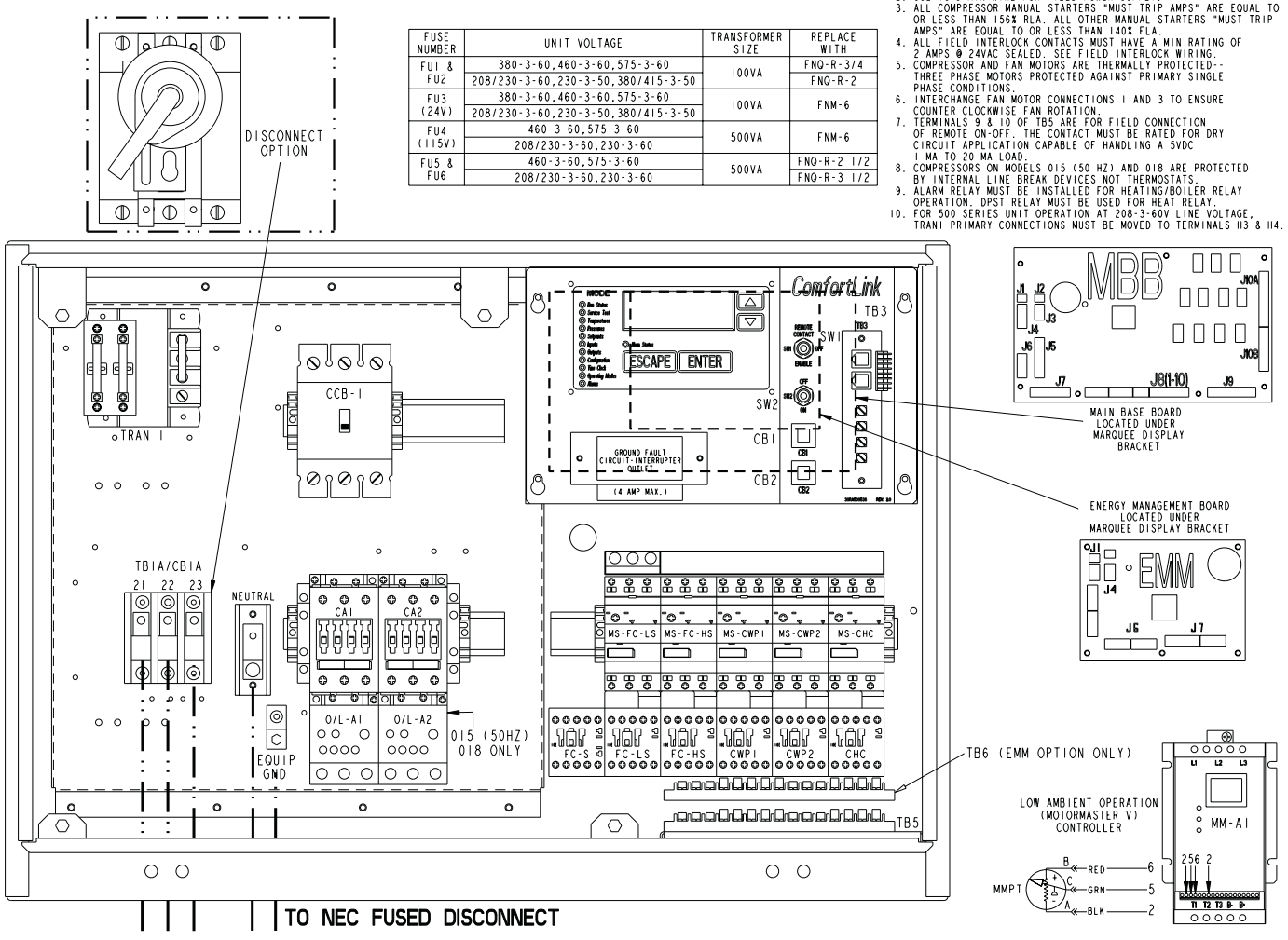
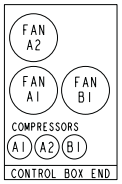


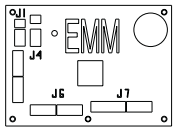
Fig. 22 — Component Arrangement — 30RA010-030

LEGEND

C	—	Contactor, Compressor
CB	—	Circuit Breaker
CHC	—	Cooler/Pump Heater Contactor
CWP	—	Chilled Water Pump
EMM	—	Energy Management
FC	—	Fan Contactor
FIOP	—	Factory-Installed Option
FU	—	Fuse
GND	—	Ground
MBB	—	Main Base Board
MM	—	Motormaster®
MMPT	—	Motormaster Pressure Transducer
MS	—	Manual Starter
NEC	—	National Electrical Code
SW	—	Switch
TB	—	Terminal Block
TRAN	—	Transformer
———		Factory Wiring
- - - -		Field Wiring
——- - - ——-		Accessory or Option Wiring

LOW AMBIENT OPERATION (MOTORMASTER V) FIOP/ACCESSORY		
UNIT VOLTAGE	CONFIGURATION JUMPER LOCATION	CONFIGURATION JUMPER COMMON LOCATION
575-3-60	1	2
380-3-60	13A	
230-3-60	1	
208-3-60	13A	
460-3-60	1	
230-3-50	13B	
380-3-50	13C	
415-3-50	13C	

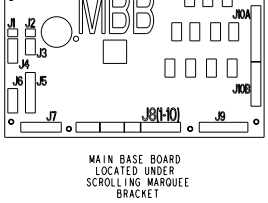




ENERGY MANAGEMENT BOARD LOCATED UNDER SCROLLING MARQUEE BRACKET

NOTES:
1. FACTORY WIRING IS IN ACCORDANCE WITH UL 1995 STANDARDS. ANY FIELD MODIFICATIONS OR ADDITIONS MUST BE IN COMPLIANCE WITH ALL APPLICABLE CODES.
2. USE 75°C MIN WIRE FOR FIELD POWER SUPPLY.
3. ALL COMPRESSOR MANUAL STARTERS "MUST TRIP AMPS" ARE EQUAL TO OR LESS THAN 156% RLA. ALL OTHER MANUAL STARTERS "MUST TRIP AMPS" ARE EQUAL TO OR LESS THAN 140% FLA.
4. ALL FIELD INTERLOCK CONTACTS MUST HAVE A MIN RATING OF 2 AMPS @ 24VAC SEALED. SEE FIELD INTERLOCK WIRING.
5. COMPRESSOR AND FAN MOTORS ARE THERMALLY PROTECTED--THREE PHASE MOTORS PROTECTED AGAINST PRIMARY SINGLE PHASE CONDITIONS.
6. INTERCHANGE FAN MOTOR CONNECTIONS 1 AND 3 TO ENSURE COUNTER CLOCKWISE FAN ROTATION.
7. TERMINALS 9 & 10 OF TB5 ARE FOR FIELD CONNECTION OF REMOTE ON-OFF. THE CONTACT MUST BE RATED FOR DRY CIRCUIT APPLICATION CAPABLE OF HANDLING A 5VDC 1 MA TO 20 MA LOAD.
8. ALARM RELAY MUST BE INSTALLED FOR HEATING/BOILER RELAY OPERATION. DPST RELAY MUST BE USED FOR HEAT RELAY.
9. FOR 500 SERIES UNIT OPERATION AT 208-3-60V LINE VOLTAGE, TRAN1 PRIMARY CONNECTIONS MUST BE MOVED TO TERMINALS H3 & H4.

FUSE NUMBER	UNIT VOLTAGE	TRANSFORMER SIZE	REPLACE WITH
FU1 & FU2	380-3-60,460-3-60,575-3-60	200VA	FNQ-R-1 1/2
	208/230-3-60,230-3-50,380/415-3-50		FNQ-R-3
FU3 (24V)	380-3-60,460-3-60,575-3-60	200VA	FNM-10
	208/230-3-60,230-3-50,380/415-3-50		
FU4 (115V)	460-3-60,575-3-60	500VA	FNM-6
	208/230-3-60,230-3-60		
FU5 & FU6	460-3-60,575-3-60	500VA	FNQ-R-2 1/2
	208/230-3-60,230-3-60		FNQ-R-3 1/2



MAIN BASE BOARD LOCATED UNDER SCROLLING MARQUEE BRACKET

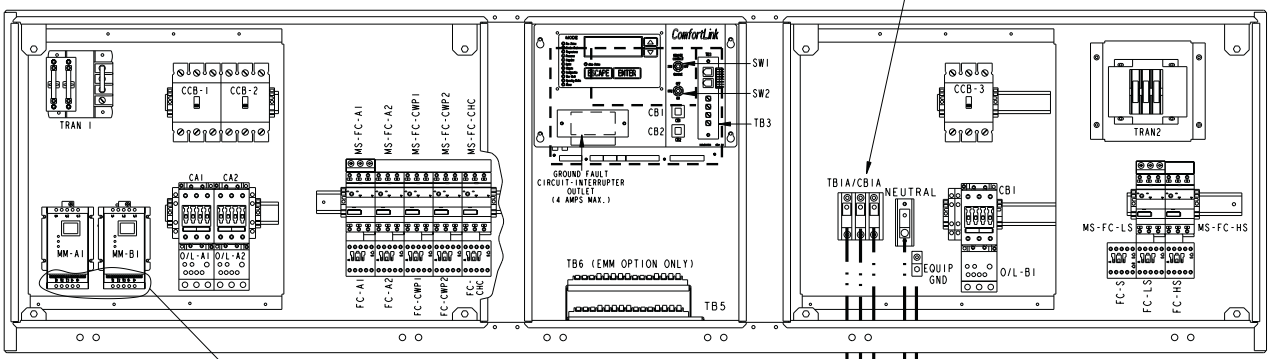
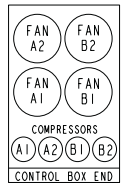


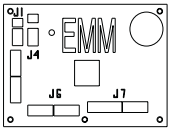
Fig. 23 — Component Arrangement — 30RA032-040

LOW AMBIENT OPERATION (MOTORMASTER V) FIOP/ACCESSORY		
UNIT VOLTAGE	CONFIGURATION JUMPER LOCATION	CONFIGURATION JUMPER COMMON LOCATION
575-3-60	1	2
380-3-60	13A	
230-3-60	1	
208-3-60	13A	
460-3-60	1	
230-3-50	13B	
380-3-50	13C	
415-3-50	13C	

LEGEND

C	—	Contactor, Compressor
CB	—	Circuit Breaker
CHC	—	Cooler/Pump Heater Contactor
CWP	—	Chilled Water Pump
EMM	—	Energy Management
FC	—	Fan Contactor
FIOP	—	Factory-Installed Option
FU	—	Fuse
GND	—	Ground
MBB	—	Main Base Board
MM	—	Motormaster®
MMPT	—	Motormaster Pressure Transducer
MS	—	Manual Starter
NEC	—	National Electrical Code
SW	—	Switch
TB	—	Terminal Block
TRAN	—	Transformer
———		Factory Wiring
- - - -		Field Wiring
—— - ——		Accessory or Option Wiring

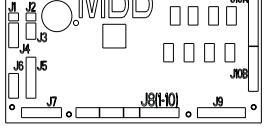




ENERGY MANAGEMENT BOARD LOCATED UNDER SCROLLING MARQUEE BRACKET

NOTES:
1. FACTORY WIRING IS IN ACCORDANCE WITH UL 1995 STANDARDS. ANY FIELD MODIFICATIONS OR ADDITIONS MUST BE IN COMPLIANCE WITH ALL APPLICABLE CODES.
2. USE 75°C MIN WIRE FOR FIELD POWER SUPPLY.
3. ALL COMPRESSOR MANUAL STARTERS "MUST TRIP AMPS" ARE EQUAL TO OR LESS THAN 156% RLA. ALL OTHER MANUAL STARTERS "MUST TRIP AMPS" ARE EQUAL TO OR LESS THAN 140% FLA.
4. ALL FIELD INTERLOCK CONTACTS MUST HAVE A MIN RATING OF 2 AMPS @ 24VAC SEALED. SEE FIELD INTERLOCK WIRING.
5. COMPRESSOR AND FAN MOTORS ARE THERMALLY PROTECTED-- THREE PHASE MOTORS PROTECTED AGAINST PRIMARY SINGLE PHASE CONDITIONS.
6. INTERCHANGE FAN MOTOR CONNECTIONS 1 AND 3 TO ENSURE COUNTER CLOCKWISE FAN ROTATION.
7. TERMINALS 9 & 10 OF TB5 ARE FOR FIELD CONNECTION OF REMOTE ON-OFF. THE CONTACT MUST BE RATED FOR DRY CIRCUIT APPLICATION CAPABLE OF HANDLING A 5VDC 1 MA TO 20 MA LOAD.
8. ALARM RELAY MUST BE INSTALLED FOR HEATING/BOILER RELAY OPERATION. DPST RELAY MUST BE USED FOR HEAT RELAY.
9. FOR 500 SERIES UNIT OPERATION AT 208-3-60V LINE VOLTAGE, TRAN1 PRIMARY CONNECTIONS MUST BE MOVED TO TERMINALS H3 & H4.

FUSE NUMBER	UNIT VOLTAGE	TRANSFORMER SIZE	REPLACE WITH
FU1 & FU2	380-3-60,460-3-60,575-3-60	200VA	FNQ-R-1 1/2
	208/230-3-60,230-3-50,380/415-3-50		FNQ-R-3
FU3 (24V)	380-3-60,460-3-60,575-3-60	200VA	FNM-10
	208/230-3-60,230-3-50,380/415-3-50		
FU4 (115V)	460-3-60,575-3-60	500VA	FNM-6
	208/230-3-60,230-3-60		
FU5 & FU6	460-3-60,575-3-60	500VA	FNQ-R-2 1/2
	208/230-3-60,230-3-60		FNQ-R-3 1/2



MAIN BASE BOARD LOCATED UNDER SCROLLING MARQUEE BRACKET

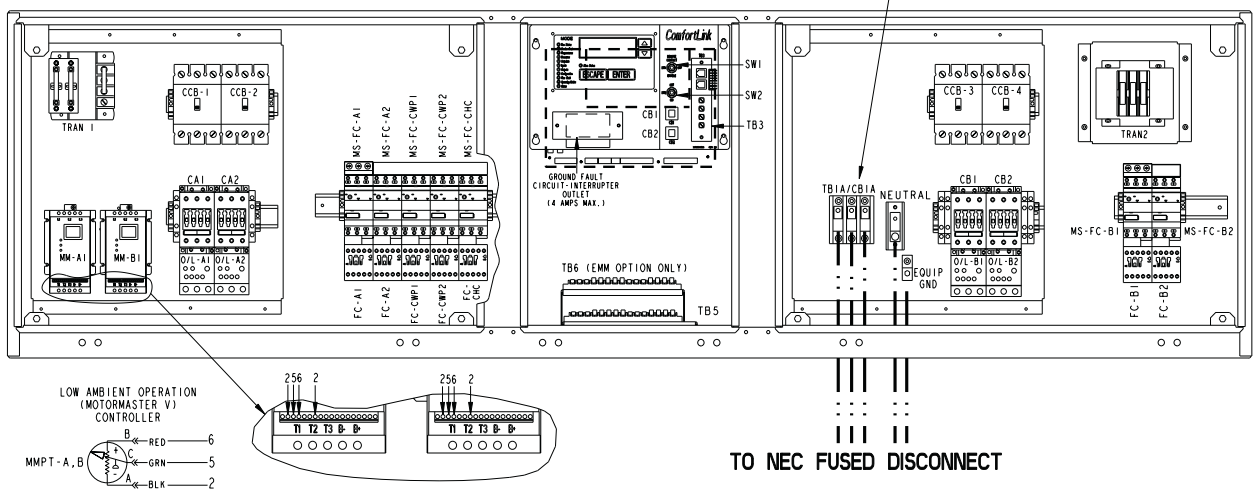


Fig. 24 — Component Arrangement — 30RA042-055