Copeland Scroll®
Outdoor Condensing Unit

Installation and Reference Manual

EMERSON
Climate Technologies

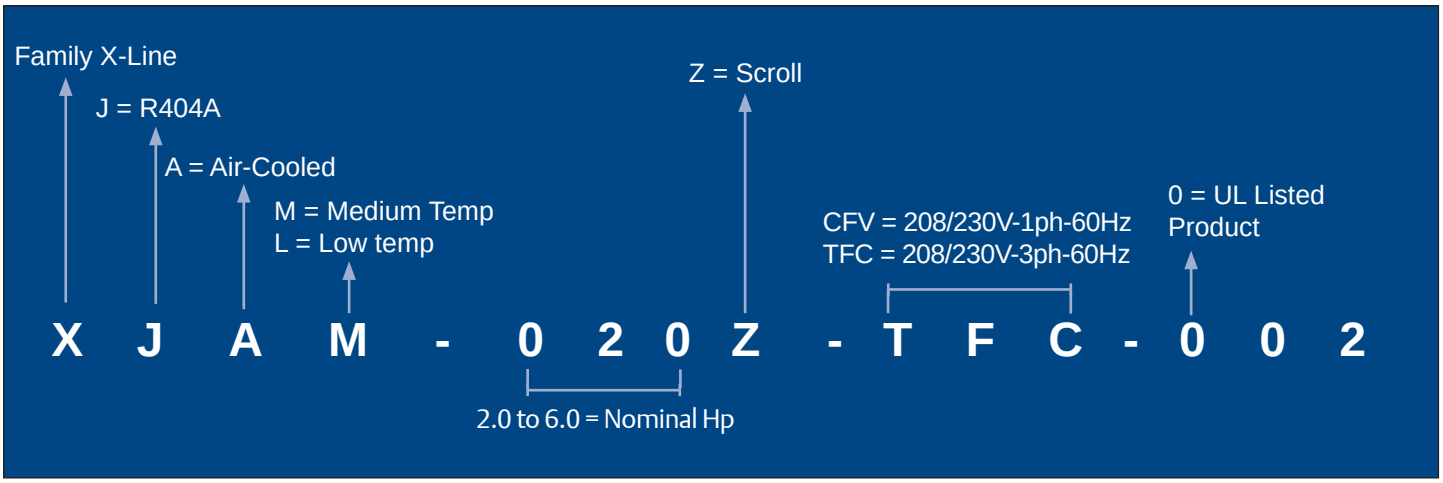
Contents

1. Introduction

Copeland Scroll® outdoor condensing units provide the many benefits of scroll compressor technology, coupled with advanced diagnostic controls, to ensure reliable performance and operation in foodservice applications. Electronics are used extensively in its protection and diagnostic features. These features are controlled by an electronic integrated control board. The control board provides base control functions related to temperature controller, defrost, evaporator fan control, compressor protection e.g. current overload, phase reversal, liquid/vapor injection control, self diagnostics and warnings. These error codes can be seen by an LED display for easy and rapid troubleshooting and maintenance.

A complete product offering for medium and low temperature HFC-404A units is being offered in single and three phase 208/230 volts.

2. Nomenclature



3. Performance Data

Table 1

H.P.	Medium Temperature Model Number	Btu/hr @ +25°F Sat. Suction Temp / 90°F Ambient	Btu/hr @ +25°F Sat. Suction Temp / 100°F Ambient	Refrigerant / Oil Type
2	XJAM-020Z-CFV	19600	17900	R404A / POE
2	XJAM-020Z-TFC	19600	17900	R404A / POE
3	XJAM-030Z-CFV	28500	25900	R404A / POE
3	XJAM-030Z-TFC	28500	25900	R404A / POE
4	XJAM-040Z-CFV	38600	35300	R404A / POE
4	XJAM-040Z-TFC	38600	35300	R404A / POE
5	XJAM-050Z-CFV	47100	43800	R404A / POE
5	XJAM-050Z-TFC	47100	43800	R404A / POE
6	XJAM-060Z-TFC	54600	50200	R404A / POE

Table 2

H.P.	Low Temperature Model Number	Btu/hr @ -10°F Sat. Suction Temp / 90°F Ambient	Btu/hr @ -10°F Sat. Suction Temp / 100°F Ambient	Refrigerant / Oil Type
2	XJAL-020Z-CFV	13100	12700	R404A / POE
2	XJAL-020Z-TFC	13100	12700	R404A / POE
3	XJAL-030Z- TFC	17200	16400	R404A / POE
3	XJAL-035Z- CFV	19700	18100	R404A / POE
4	XJAL-040Z-CFV	24700	23700	R404A / POE
4	XJAL-040Z-TFC	24700	23700	R404A / POE
5	XJAL-050Z-CFV	27600	25700	R404A / POE
5	XJAL-050Z-TFC	27600	25700	R404A / POE
6	XJAL-060Z-TFC	34700	32700	R404A / POE

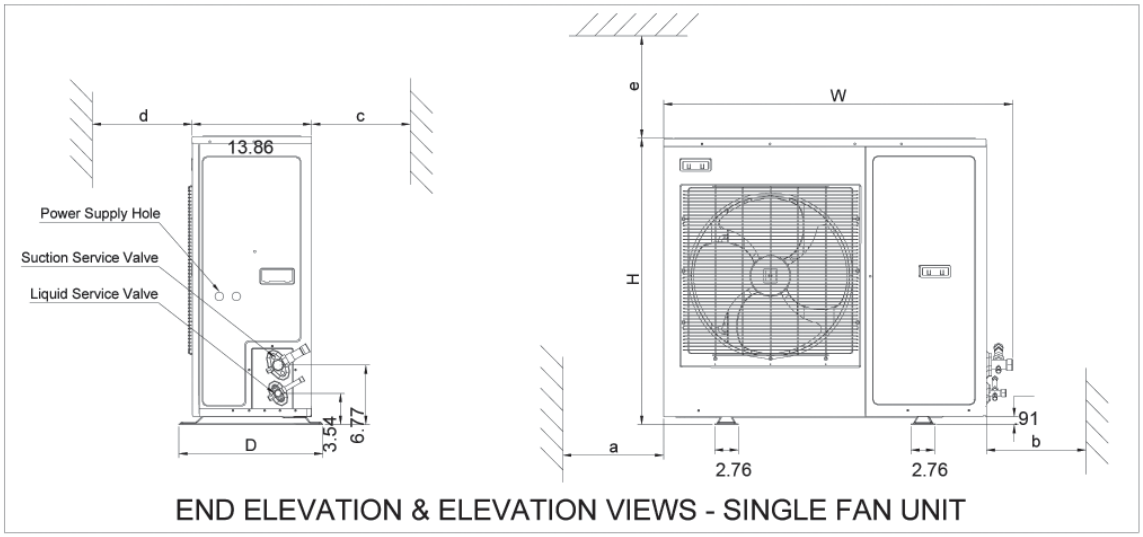
4. Electrical / Physical Data

Table 3

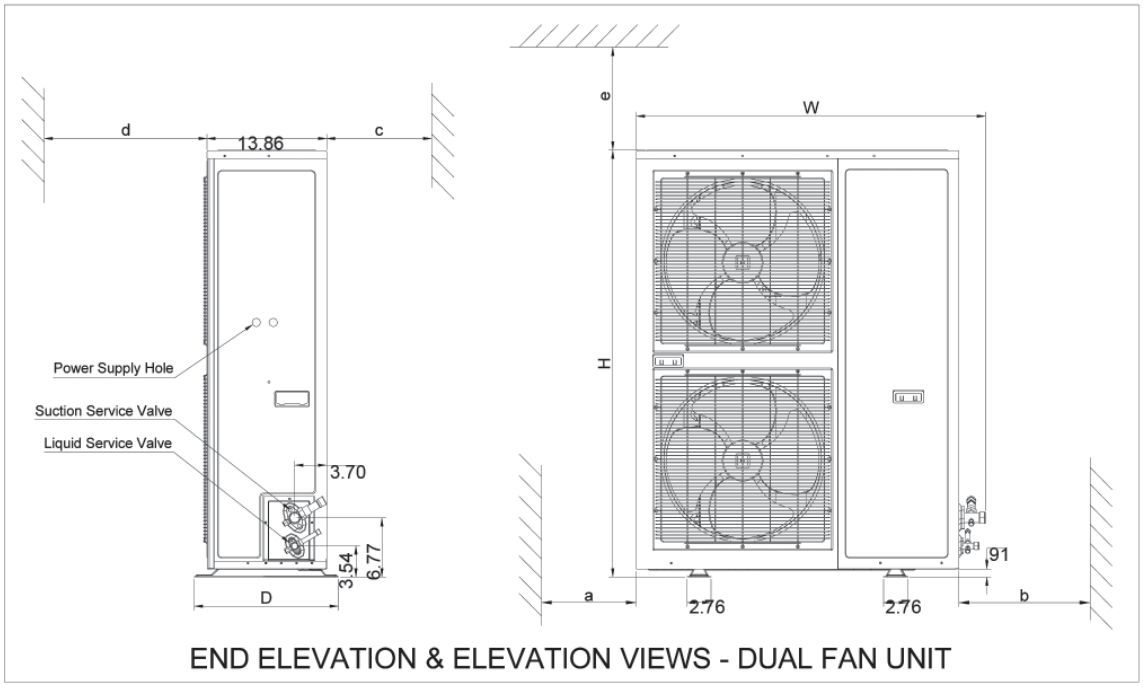
Unit Model	Compressor	H.P.	Dimensions (in)			Connection Lines		# of Fans	Min Circuit Ampacity / Max Fuse (Amps)		Pump Down Capacity (lbs)	Unit Weight (lbs)
			L	W	H	Suction	Liquid		208/230V 1ph-60hz	208/230V 3ph-60hz		
XJAM-020Z	ZX15KCE	2	16.7	40.5	33	3/4 "	1/2 "	1	18.7 / 30	11.1 / 15	7.5	182
XJAM-030Z	ZX21KCE	3	16.7	40.5	33	3/4 "	1/2 "	1	24.3 / 40	14.7 / 25	7.5	194
XJAM-040Z	ZX30KCE	4	16.7	40.5	49	7/8 "	1/2 "	2	32.1 / 50	19.7 / 30	11	250
XJAM-050Z	ZX38KCE	5	16.7	40.5	49	7/8 "	1/2 "	2	36.6 / 60	29.0 / 50	11	258
XJAM-060Z	ZX45KCE	6	16.7	40.5	49	7/8 "	1/2 "	2		28.1 / 45	11	270
XJAL-020Z	ZXI06KCE	2	16.7	40.5	33	3/4 "	1/2 "	1	19.4 / 30	14.7 / 25	7.5	188
XJAL-030Z	ZXI09KCE	3	16.7	40.5	33	3/4 "	1/2 "	1		15.4 / 25	7.5	192
XJAL-035Z	ZXI11KCE	3.5	16.7	40.5	33	7/8 "	1/2 "	1	30.7 / 50		7.5	213
XJAL-040Z	ZXI14KCE	4	16.7	40.5	49	7/8 "	1/2 "	2	36.1 / 60	24.5 / 40	11	251
XJAL-050Z	ZXI15KCE	5	16.7	40.5	49	7/8 "	1/2 "	2		26.1 / 45	11	267
XJAL-050Z	ZXI16KCE	5	16.7	40.5	49	7/8 "	1/2 "	2	40.4 / 70		11	287
XJAL-060Z	ZXI18KCE	6	16.7	40.5	49	7/8 "	1/2 "	2		30.7 / 50	11	291

*Assume Each Fan @ .75 Amps

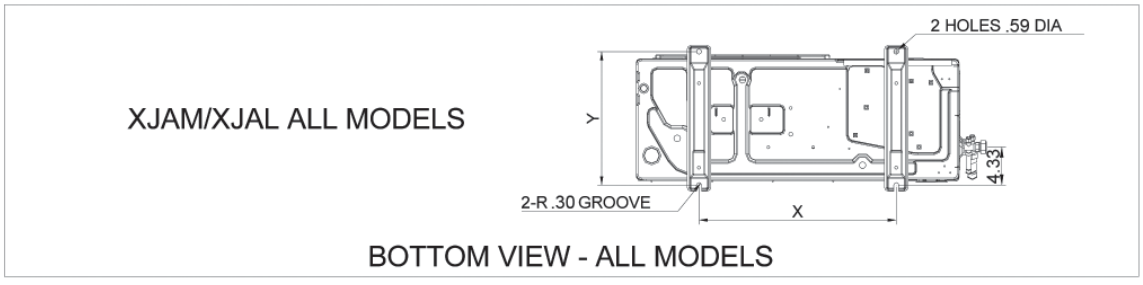
5. Physical Dimensions



END ELEVATION & ELEVATION VIEWS - SINGLE FAN UNIT



END ELEVATION & ELEVATION VIEWS - DUAL FAN UNIT



BOTTOM VIEW - ALL MODELS

Figure 1

PHYSICAL DATA													
MODEL	WIDTH	HEIGHT	DEPTH	MTG. CENTERS		CONN. SIZE		INSTALLATION CLEARANCES				
	W	H	D	X	Y	Suction	Liquid	a	b	c	d	e
SINGLE FAN UNIT	40.51	33.07	16.69	22.84	15.28	3/4"	1/2"	11.81	19.69	11.81	19.69	19.69
DUAL FAN UNIT	40.51	48.90	16.69	22.84	15.28	7/8"	1/2"	11.81	19.69	11.81	19.69	19.69

6. Installation / Piping Instructions

The prior diagrams show the overall dimensions of the units. It is recommended that a clearance of 12 inches from the wall (or the next unit) be maintained from the unit's left and rear panel where as a clearance of 20 inches is to be maintained from the units right, top and front panels. Both service access and airflow have been considered in making these recommendations. Where multiple units are to be installed in the same location, careful consideration for proper clearance needs to be given to each individual unit.

Ideally, the unit should be mounted level on a solid concrete slab with rubber strips between unit feet and concrete. However, these units have been designed for mounting on suitable brackets for wall mounting. In this case it is equally important that the spatial guidelines given above are followed and additional consideration needs to be given for possible air recycling if units are stacked above and below each other. In general terms, air by-pass around each condenser and between each unit should be avoided at all times.

Pipe sizing should not only be of sufficient size to ensure optimum performance and good oil return but it also needs to take into account the full capacity range through which this particular unit will need to operate. Follow the ASHRAE guidelines for proper piping practices.

These units are equipped with brass service valves.

7. Condensing Unit Operational Control

The electronic control board controls the operation of the condensing unit. Whenever there is a control input asking to start or stop the condensing unit, the control board will execute a set of pre-programmed procedures to do so. It also monitors the compressor operating parameters, so as to protect the system from unsafe operating parameters.

For example, when the low temperature unit experiences an extreme temperature day, the control board decides to switch from vapor-injection-optimization to discharge gas temperature control to allow the compressor to run safely and pass the extreme weather hours.

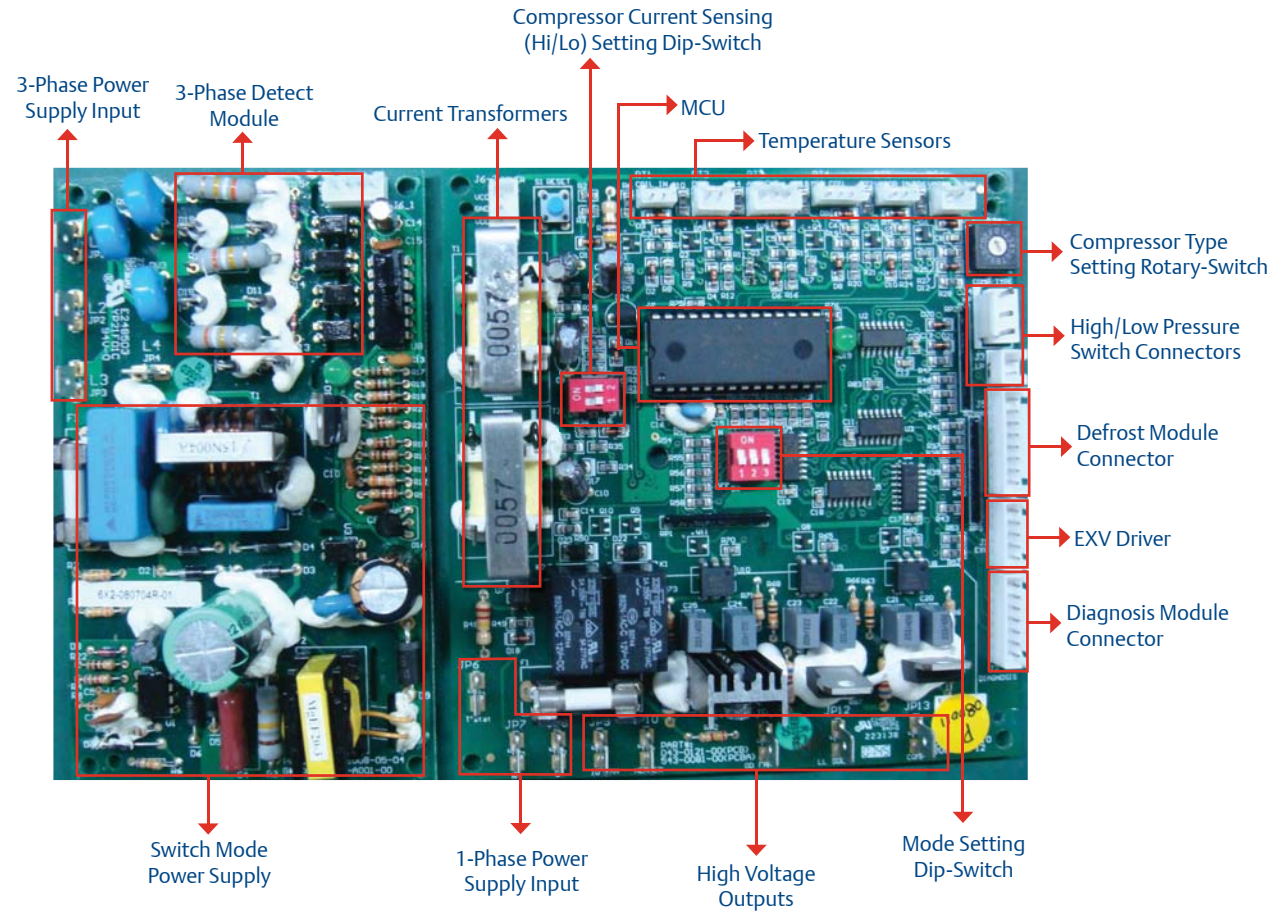


Figure 2

8. Control Features

The base control function is for the following standard features. See **Section 10** for additional input options and **Section 11** for additional output options of the control board.

8.1 Fresh Start Program

This fresh start program is a bump start procedure that will energize and start the compressor for 3 seconds and then will be followed by a 20 second off cycle time. This will occur for 3 cycles and then continuous power will be supplied to the compressor for normal operation.

The "Fresh Start Program" will be executed on initial start up or anytime power is reapplied when the ambient temperature is lower than 95°F. In addition the "Fresh Start Program" will be executed for any start when the unit has been cycled off for more than an hour when the ambient temperature is lower than 95°F.

8.2 Stop Program

When the unit is satisfied, or there is any error which requires the unit to be shut down, the controller will execute a Stop Program. The compressor and the condenser fans will cycle off and the injection valves will close.

For low temperature units only, when the unit is satisfied the EXV (see **Section 9.1**) will start closing immediately, but the compressor will delay 5 seconds before shut down to prevent reverse rotation of the compressor.

8.3 Automatic Liquid Injection (Medium temperature units only)

Automatic Liquid Injection ensures that the scroll compressor operates within a safe temperature limit. This unit employs a patented liquid injection system that injects a saturated refrigerant into the suction line at the compressor. Activation of the liquid injection valve is in response to a thermistor which is attached to the compressor discharge line. A signal is sent to the stepper motor of the injection valve, opening the valve in response to increasing discharge temperatures and injecting saturated refrigerant to reduce the discharge temperature.

8.4 Compressor Phase Reversal

Compressor Phase Reversal senses for the correct phase sequence on three phase applications. Reset is automatic once the correct phase sequence is sensed. An error message will be shown on the diagnostic LED.

8.5 Loss of Phase Protection

If three phase supply is incorrectly connected to the contactor terminals, or if a missing phase is sensed, an error message will be shown on the diagnostic LED. Reset is automatic once the correct phasing is sensed.

8.6 Motor Current Overload

- All scroll compressors used in these condensing units have an internal inherit motor protector.
- The Copeland Scroll Outdoor Condensing Unit is also equipped with two current sensors (CT1, CT2) to monitor the electrical current of the condensing unit. If the condensing unit current exceeds a pre-defined current limit, the controller will take the following actions:
  - Stop the compressor for 3 minutes
  - LED signal will display an Over Current Error for 3 minutes
  - After a 3 minute delay the compressor will go through a normal start
  - The system will lock out after 6 trips within an hour

For this function to operate, two of the power leads are routed through the current sensing coils (CT1, CT2), prior to the contactor, from the factory.

8.7 Non-Adjustable High And Low Pressure Switches

8.7.1 Non-Adjustable High Pressure Control

This pressure sensing device is a nonadjustable, low voltage pressure switch that will open at 435psig and reset at 348psig in the event of high discharge pressure. Its signal is monitored by the control board.

- In the event of a high pressure trip, the unit will stop and then restart after a 3-minute delay.
- After 6 successive HP cut-outs within 1 hour, the unit will lock-out.
- The lockout feature can be reset by disconnecting the power source and then reconnection of the power source.

8.7.2 Non-Adjustable Low Pressure Control

This feature is only applied to the medium temperature units. The control board monitors the switching action of the non-adjustable low voltage pressure switch. This is a safety control and will open in event of an abnormally low suction pressure. Cutout is 14.5psig and cut in is 29.0psig.

- There is no lock out feature applied.
- An error message will be shown on diagnostic LED.
- The unit will stop and then restart automatically after a 3 minute delay.

8.8 Adjustable Low Pressure Switch

An adjustable low pressure switch is provided as standard equipment on both the medium and low temperature condensing units. This control can be used for a pump-down cycle if so desired. No error message will be shown for this adjustable control.

8.9 Liquid Floodback Protection

- Liquid refrigerant entering the compressor during the run cycle, in excessive quantities, can damage the compressor by diluting the lubricant, as well as excessive stress on several components in the compressor. Proper control of liquid refrigerant within the system is an application issue and is beyond control of this controller. However, the controller can perform checks and alert the user that liquid refrigerant floodback may be occurring and immediate field service is required. This is only a warning signal and will not terminate the operation of the unit.

- Liquid Floodback Protection is acquired by monitoring the compressor discharge temperature. When the discharge line temperature falls below a specified point, low suction line superheat may be the cause.

8.10 Crankcase Heater

The crankcase heater is wired through a normally closed contact of the compressor contactor becoming energized whenever the compressor cycles off.

8.11 Condenser Fan Speed Control

The Condenser Fan Speed Control will vary the speed of the condenser fan motor for head pressure control under low ambient conditions. Due to this function, the ambient operating range can be extended to -22ºF. There are two thermistor type sensors that are connected to the control board. These sensors monitor the condenser mid coil temperatures and ambient air temperatures to control the fan speed.

9. Enhanced Vapor Injection (EVI) Control (Low temperature units only)

The EVI system improves low temperature operational efficiency and provides a reliable low temperature envelope. It is used to optimize performance and to prevent the scroll set from overheating. This is done by controlling the discharge line temperature (DLT) and vapor injection superheat (VISH).

Enhanced vapor injection is accomplished by utilizing a subcooling circuit. A heat exchanger is used to subcool the liquid refrigerant before it enters the evaporator. As a result of the subcooling done by the heat exchanger, refrigerant will also be evaporated. This evaporated refrigerant is then injected into the mid compression cycle of the scroll compressor for overheat temperature control.

There are two thermistors sensing the discharge line temperature, one is located at the discharge line of the compressor and

the second one is placed at the inlet of the condenser coil. In order to have a higher temperature resolution, the discharge line thermistor and condenser coil inlet sensor cooperate to sense a temperature range from 50°F to 329°F. The discharge line thermistor has a sensing range from 163°F to 329°F and the condenser coil will sense temperature from 50°F to 176°F. The EVI system will keep the discharge line temperature below 230°F to ensure the safety of the compressor.

It is important to insulate the system liquid line from the condensing unit to the evaporator. The recommended insulation thickness is a minimum of ½". Also the lower liquid temperature can increase the evaporator expansion valve capacities. Please follow the valve manufactures recommended liquid temperature correction factors for proper selection of the evaporator expansion valve.

9.1 Electronic Expansion Value (EXV)

The Electronic Expansion Value (EXV) is a key part of the EVI system. It will regulate vapor injection flow to optimize the performance of system and cool the scroll set. Every second, the control chip will collect the thermistors reading and do a four second averaging. The EXV opening will be changed every 20 seconds and the variation is calculated by different ways based on different purposes.

10. Other Inputs to the Control Board

10.1 Customer Supplied Control (Thermostat)

The control board will accept a normal 220 volt AC input ON/OFF signal such as the switching action of a normal commercial thermostat and relay. If the system is controlled by low pressure control for a multiple evaporator system and/or pump down system, the control board will accept the signal directly from the control. See the wiring diagram for proper installation.

11. Other Outputs from the Control Board

11.1 Defrost Control Board

The defrost control board is a basic time initiated module which is standard on the low temperature units and is an add on feature for the medium temperature units. The defrost control board can control either off-cycle or electric defrost.

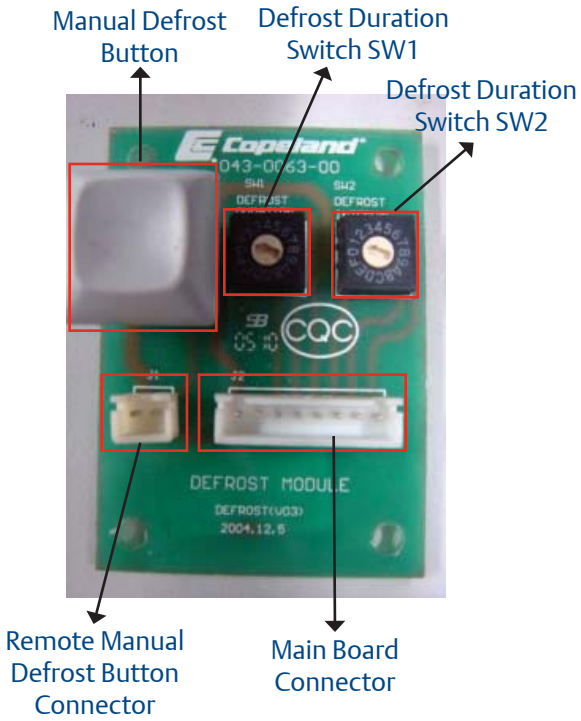


Figure 3

The defrost control board will control the liquid line solenoid valve. When defrost is initated the liquid line solenoid valve will close and the unit will go into a pumpdown cycle. When the suction pressure equals the setting of the low pressure control, the compressor will cycle off. After the defrost time has expired, the liquid line solenoid valve opens and then the low pressure control will allow the compressor to restart.

Due to heater amperage loads, electric defrost requires an additional relay or contactor to energize the defrost heater.

The defrost cycle can be executed either automatically or manually. There are two rotary dip switches by which the user can set up the defrost cycle, see **Figure 3**. One rotary dipswitch sets the defrost duration (SW1) and the second rotary dipswitch sets the time interval between defrost cycles (SW2). For automatic defrost set SW1 and SW2 as desired. See **Table 4** for time settings. The defrost control board also incorporates a manual defrost button that enables a manual defrost as an override to the rotary switch setting the defrost interval. Upon the completion of a manual defrost, the system will reset to the refrigeration cycle with the same procedures as automatic defrost and then the automatic defrost timer will reset.

For setting manual defrost only set SW1 as desired and set SW2 to "0". Whenever the manual defrost button is pressed, one defrost cycle will be executed and the duration of defrost will be determined by the setting of the rotary dipswitch SW1.

Note: There is no method to terminate a defrost cycle without resetting the control board.

Table 4 below lists the choices that can be made by the rotary dip switches.

Table 4

Switch 1	Defrost duration (minutes)
0	No defrost (manual defrost only)
1	5 minutes
2	10 minutes
3	15 minutes
4	20 minutes
5	25 minutes
6	30 minutes
7	35 minutes

Switch 2	Time interval between defrost
0	No defrost (manual defrost only)
1	1 hour
2	2 hours
3	3 hours
4	4 hours
5	5 hours
6	6 hours
7	7 hours

An ON/OFF output connection is provided on the control board (JP10) for direct connection of a customer supplied contactor coil/relay when the defrost option is used. Terminals are male spade type. Coil voltage rating should be 220VAC and current ratings, 30VA (hold) and 330VA (inrush).

For customers using their existing defrost timer, remove the defrost cable connecting the defrost control board to the unit control board. Also on the unit control board change the mode setting dip-switch bit 2 to ON and proceed to standard defrost wiring.

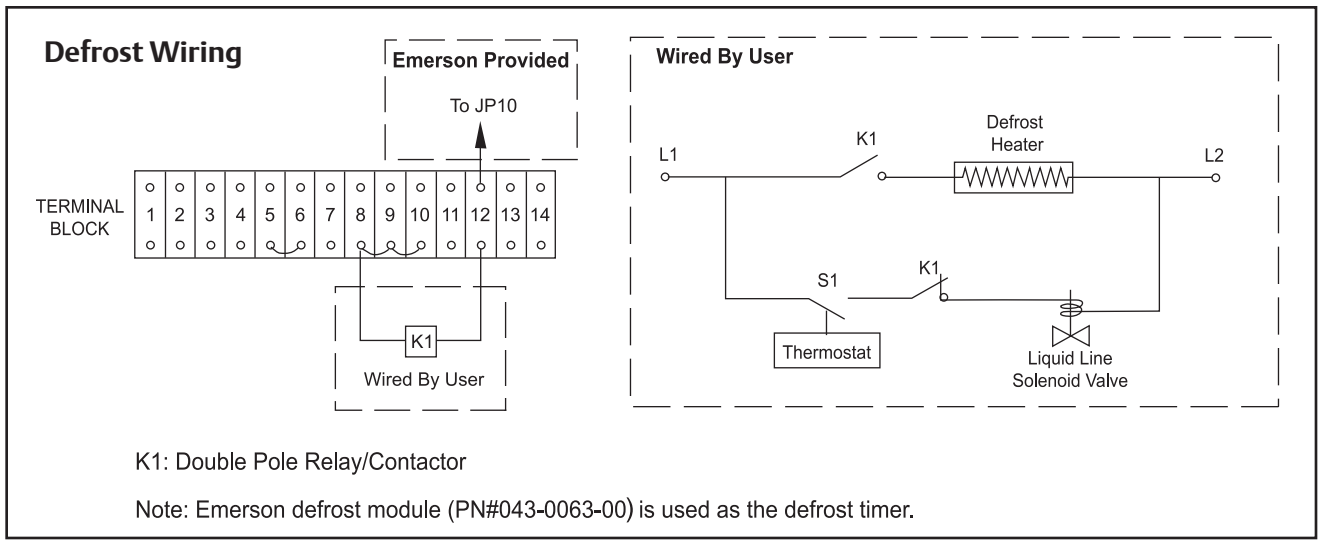


Figure 4

11.2 Evaporator Fan Control

An ON/OFF output connection is also provided on the control board (JP9) for direct connection of a customer supplied contactor coil controlling the evaporator fans. Terminals are the male spade type. Coil voltage rating is to be 220VAC and a maximum power rating of 30VA (hold) and 330VA (inrush).

Table 5
Main Control Board Setting For XJAM

Model Name**	Rotary Switch	2bit Dip-Switch	3bit Dip-Switch
Control Board Default Setting	0	ON/ON	Bit 1: To set evaporator fan control mode - "ON": Evaporator fan will be ON all the time no mater whether compressor is ON/ OFF or defrosting Bit 2: To set defrost mode - "OFF": Using Emerson defrost module - "ON": Using customer defrost module Bit 3: Not used yet.
ZX15KCE-TF5	1	ON/ON	
ZX15KCE-PFV	2	ON/ON	
ZX21KCE-TF5	3	ON/ON	
ZX21KCE-PFV	4	OFF/OFF	
ZX30KCE-TF5	5	ON/ON	
ZX30KCE-PFV	6	OFF/OFF	
ZX38KCE-TF5	7	OFF/OFF	
ZX38KCE-PFV	8	OFF/OFF	
ZX45KCE-TF5	9	OFF/OFF	

Main Control Board Setting For XJAL

Model Name**	Rotary Switch	2bit Dip-Switch	3bit Dip-Switch
Control Board Default Setting	0	ON/ON	Bit 1: To set evaporator fan control mode - "OFF": Evaporator Fan On/Off Logic Same As Compressor - "ON": Evaporator fan will be ON all the time no mater whether compressor is ON/ OFF or defrosting Bit 2: To set defrost mode - "OFF": Using Emerson defrost module - "ON": Using customer defrost module Bit 3: Not used yet.
ZXI06KCE-TF5	1	ON/ON	
ZXI06KCE-PFV	2	ON/ON	
ZXI09KCE-TF5	3	ON/ON	
ZXI11KCE-PFV	4	OFF/OFF	
ZXI14KCE-TF5	5	OFF/OFF	
ZXI14KCE-PFV	6	ON/ON	
ZXI15KCE-TF5	7	OFF/OFF	
ZXI16KCE-PFV	8	OFF/OFF	
ZXI18KCE-TF5	9	OFF/OFF	

** **Please set the switches to the correct position according to compressor model.**

12. Diagnostic Display Board

Each condensing unit is supplied with a diagnostic display board, see **Figure 5**. A two character display will make up the diagnostic/error code. The first character will display the unit status as shown in **Table 6**. The second character will display the error/warning code as shown in **Table 6**.

The Main Board Connector terminal will accept the cable connecting the display board to the main control board. The Reset Button will reset the diagnostic display board only. The Message Recall Button will display the last error signal received by the display board.

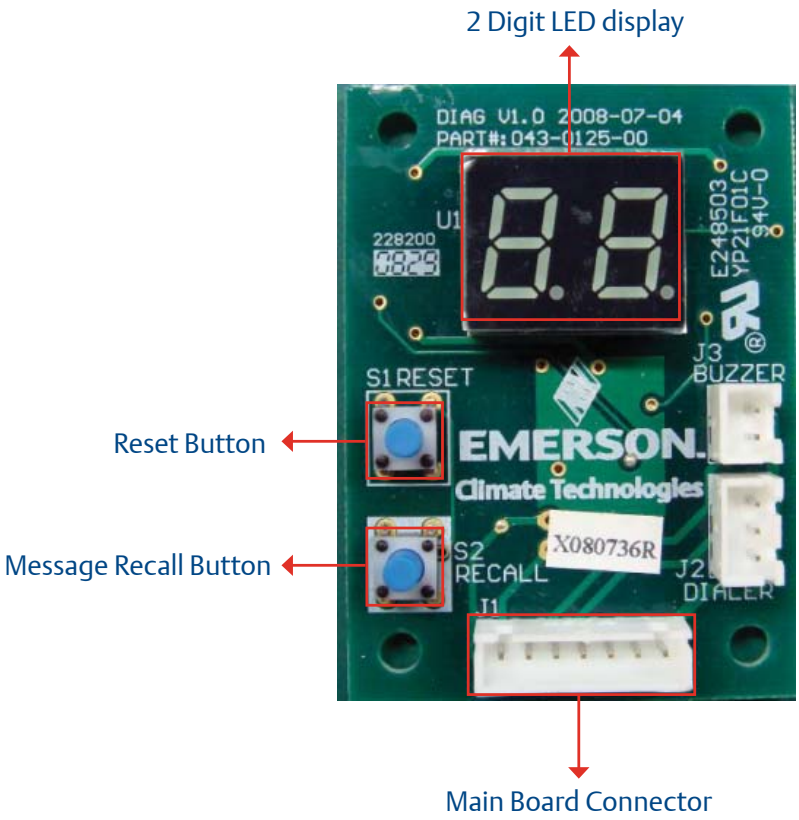


Figure 5

Table 6

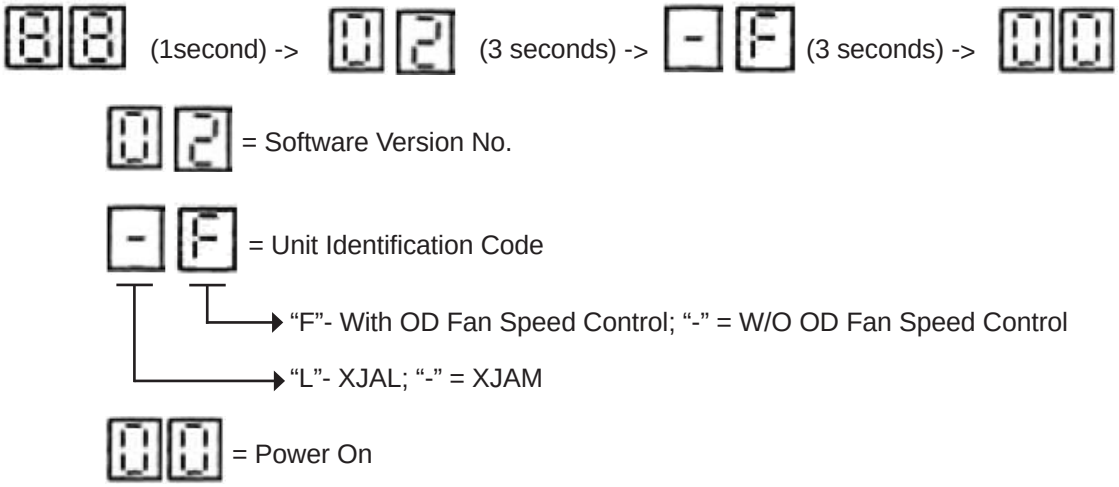
LED1 - Unit Status	
Display	Status
0	Idle (Stop When Reach To Set-point)
1	Run
2	About To Start [1]
3	Defrost
4	Stop Due To Error
5	Lockout

LED2- Error/Warning Code	
Display	Error/Warning
	No error/warnings
	Compressor Phase Error (Wrong Phase Sequence/Loss Of Phase)
	Compressor Inside Thermal Protector Trip
	Compressor Over Current
	Discharge Gas Overheat
	Compressor High Pressure Cut Out
	Compressor Low Pressure Cut Out [2]
	DLT Thermistors Failure
	Ambient Temperature Sensor Failure
	Mid-coil Temperature Sensor Failure
	PHE Vapor In Temperature Sensor Failure or over range [3]
	PHE Vapor Out Temperature Sensor Failure or over range [3]
	System Liquid Flood Back Warning

Note: [1] This signal is for Fresh Start, Normal Start Program and any start request delay.
[2] "LP Cutout" signal is not applicable for the XJAL condensing unit.
[3] PHE Vapor In/Out Temperature Sensor is not applicable in XJAM condensing unit.

All error/warning messages are priority-ranked from highest to lowest.

If unit is initially powered on, the diagnosis module will show signal as follows:



*Lockout feature can be reset by disconnecting the unit power source and then reconnection of the unit power source.

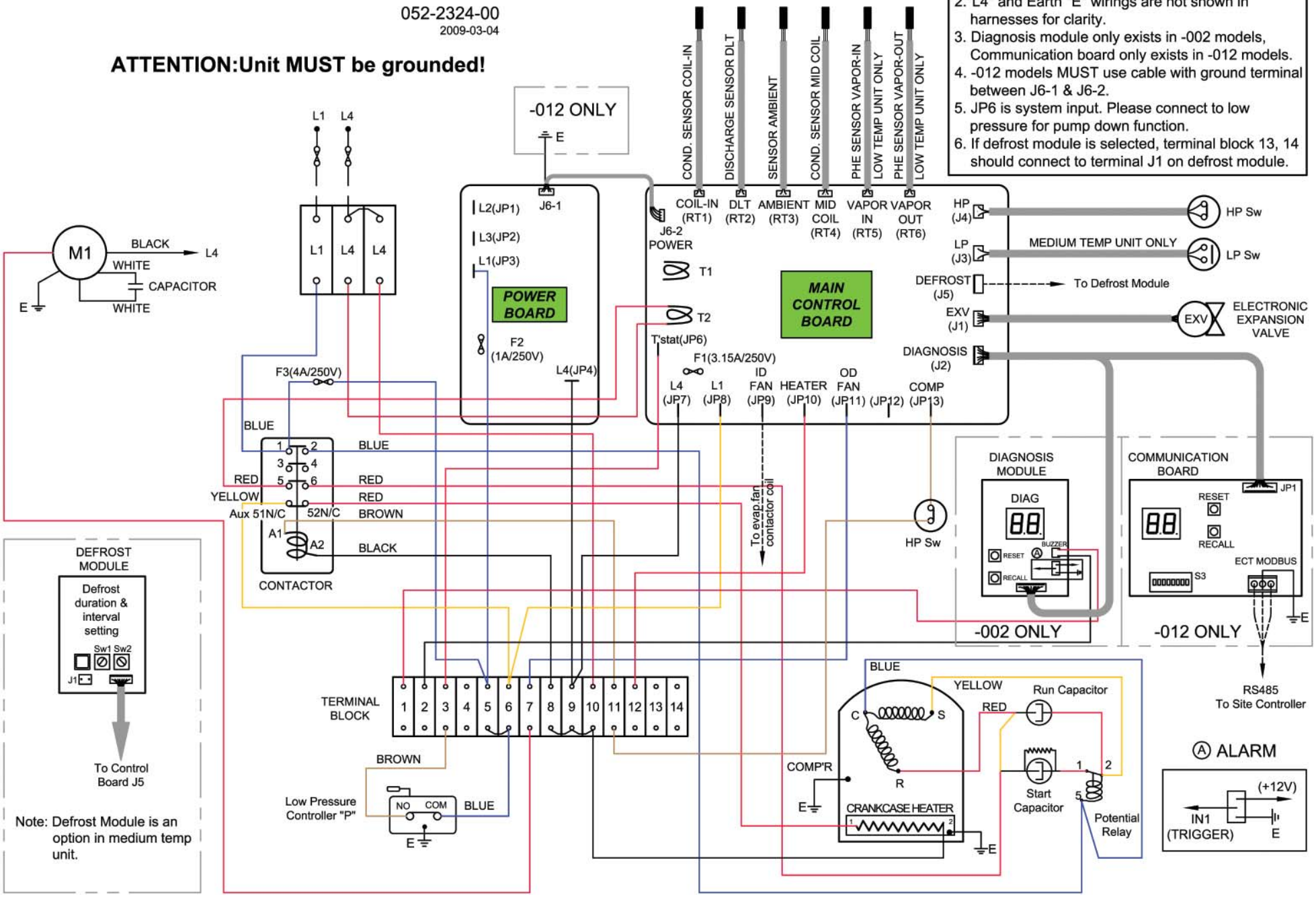
13. System Diagnostic Information Table

Fault Type	Trip Set Point	Control Board Actions	Auto Resets	Possible Error And Solution
Reverse Phase / Loss Of Phase (3 Phase Only)	Incorrect voltage Sequence	-Stop the unit -Display Incorrect Phase Sequence on diagnostic -Display waiting to restart on diagnostic -Check the phase sequence after 3 minutes	Auto Start	- Check voltage sequence of the control board whether it is same as the compressor; - Change voltage sequence at circuit break.
Fresh Start	Occurs on: - Initial unit start, - When power is reset < 95°F ambient - Compressor is cycled off > than 1 hour < than 95°F ambient	-Compressor runs 3 sec and stops 20 sec -After 3 cycles, compressor runs continuously. -Display fresh start on diagnostic	Auto start	- Nothing is wrong, just wait till compressor runs continuously.
High Pressure Trip	Contact Open At 435psig ±22psig Contact Close At 348psig ±22psig	-Stop the unit -Display HP trip on diagnostic -Display waiting to restart on diagnostic -Auto start the unit after 3 minutes -Lockout unit if 6 trips in less than 1 hour -Display HP lockout on diagnostic	5 Auto starts in 1 Hour	-Check whether HP cutout functions properly or is connected to control board; -Check whether condenser fan can run; -Check liquid line solenoid valve, liquid service valve, make sure they are open;
Low Pressure Trip (Only in XJAM CDU)	Contact Open At 14.5psig ±7psig Contact Close At 29psig ±7psig	-Stop the unit -Display LP trip on diagnostic -Display waiting to restart on diagnostic -Auto start the unit after 3 minutes	Auto Start	-Check whether evaporator needs defrost; -Check return gas service valve, make sure it is open; -Check whether LP cutout functions properly or is connected to control board

Fault Type	Trip Set Point	E2 Control Actions	Auto Resets	Possible Error And Solution
Discharge Gas Overheat	Discharge Temperature Over 270°F	-Stop the unit -Display DLT trip on diagnostic -Display waiting to restart on diagnostic -Auto start the unit after 3 minutes -Lockout unit if 6 trips in less than 1 hour -Display DLT overheat lockout on diagnostic	5 Auto starts in 1 Hour	-Check liquid line sight glass, -Check the injection feature for proper operation
Over Current	Set Based On Compressor	-Stop the unit -Display over current trip on diagnostic -Display waiting to restart on diagnostic -Auto start the unit after 3 minutes -Lockout unit if 6 trips in less than 1 hour -Display over current lockout on diagnostic	5 Auto starts in 1 Hour	-Check rotary switch, make sure it is on the right position according to unit model; -Check oil level through compressor sight glass (Low temp unit only); -Check accumulator (Low temp unit only), inlet should connect to return gas service valve.
Electrical Failure	Compressor intends to start but current transformers sense no current	-Display compressor protector trip on diagnostic -Auto start when protector reset	Auto start	-Check whether contactor is pull-in? If not, check wiring of contact coil; -Check wiring, make sure compressor is connected to contactor, and is powered; -Compressor motor thermal protector trips, wait till it reset.
Compressor Rapid Cycling	Minimum 3 minutes OFF time between starts	-Delay comp start, if minimum off time is less than 3 min -Display about to turn on diagnostic	Auto start	-Compressor start signal is active when unit stops; the only thing needed to do is wait until the unit starts.
Ambient Temperature Sensor Failure	Ambient sensor reads < -22°F or >145°F	-Display ambient temp sensors failure on diagnostic -Continue to run the unit on default mode	Run	-Check whether actual Ambient temperature is out of range; -Check whether Ambient sensor is OK and connected to control board.
Condenser Mid-Coil Sensor Failure	Mid coil sensor reads < -22°F or >145°F	-Display mid coil temp sensors failure on diagnostic -Continue to run the unit on default mode	Run	-Check whether actual mid-coil temperature is out of range; -Check whether mid-coil sensor is OK and connected to control board.

Fault Type	Trip Set Point	E2 Control Actions	Auto Resets	Possible Error And Solution
Discharge Line And Coil In Temperature Sensors Failure	(A) Actual DLT>320°F (B) DLT Sensor fails and Actual DLT> 176°F (C) Both coil-in and DLT sensor fail (short circuit) (D) Coil in sensor fails (short) and actual DLT<163°F	(Only In XJAL) -Stop the unit -Display DLT sensor failure on the diagnostic -Display waiting to restart on diagnostic -Auto start the unit after 3 minutes -Lockout unit if 6 trips in less than 1 hour -Display DLT sensor failure lockout on diagnostic	5 Auto start in 1 Hour	-Check liquid level in sight glass, -Check whether DLT sensor is connected to control board; -Check whether DLT sensor is OK. -Check whether Coil in sensor is OK.
		(Only In XJAM) -Display DLT sensor failure on diagnostic -Continue to run the unit on default mode	Run	
	(A) Coil in sensor fails (open) and actual DLT<163°F (B) Both coil-in and DLT sensor fail (open circuit)	(Both XJAL & XJAM) -Display DLT sensor failure on diagnostic -Continue to run the unit on default mode	Run	-Check whether the sensors are connected to control board; -Check whether Coil-in is OK. -Check for liquid flood back.
PHE Vapor In Sensor Failure (Only In XJAL CDU)	Vapor In sensor reads <3.2°F or >163°F And ambient temp > 50°F	-Display sensor error on diagnostics -Continue to run the unit on default mode	Run	-Check whether actual temperature is out of range; -Check whether the sensor is connected to control board; -Check whether the sensor is mounted at the right position; -Check whether the sensor is in the heat isolation material; -Check whether the sensor has failed.
PHE Vapor Out Sensor Failure (Only In XJAL CDU)	Vapor out sensor reads <3.2°F or >163°F And ambient temp > 50°F	-Display sensor error on diagnostics -Continue to run the unit on default mode	Run	-Check whether actual temperature is out of range; -Check whether the sensor is connected to control board; -Check whether the sensor is mounted at the right position; -Check whether the sensor is in the heat isolation material; -Check whether the sensor has failed.

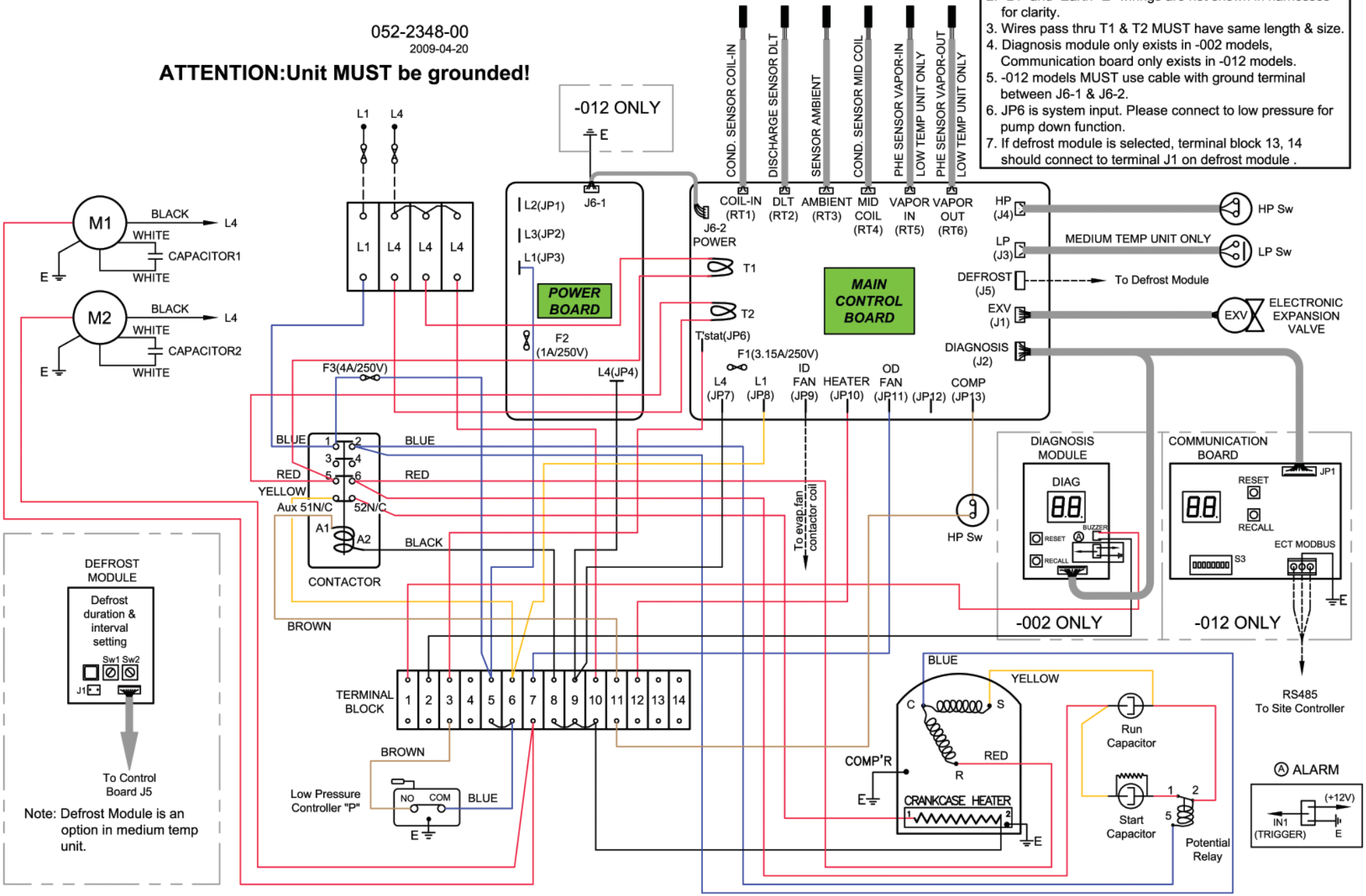
XJAM/XJAL-020Z/030Z/035Z-CFV-XXX



For technical support questions call 1-888-367-9950

Figure 6a

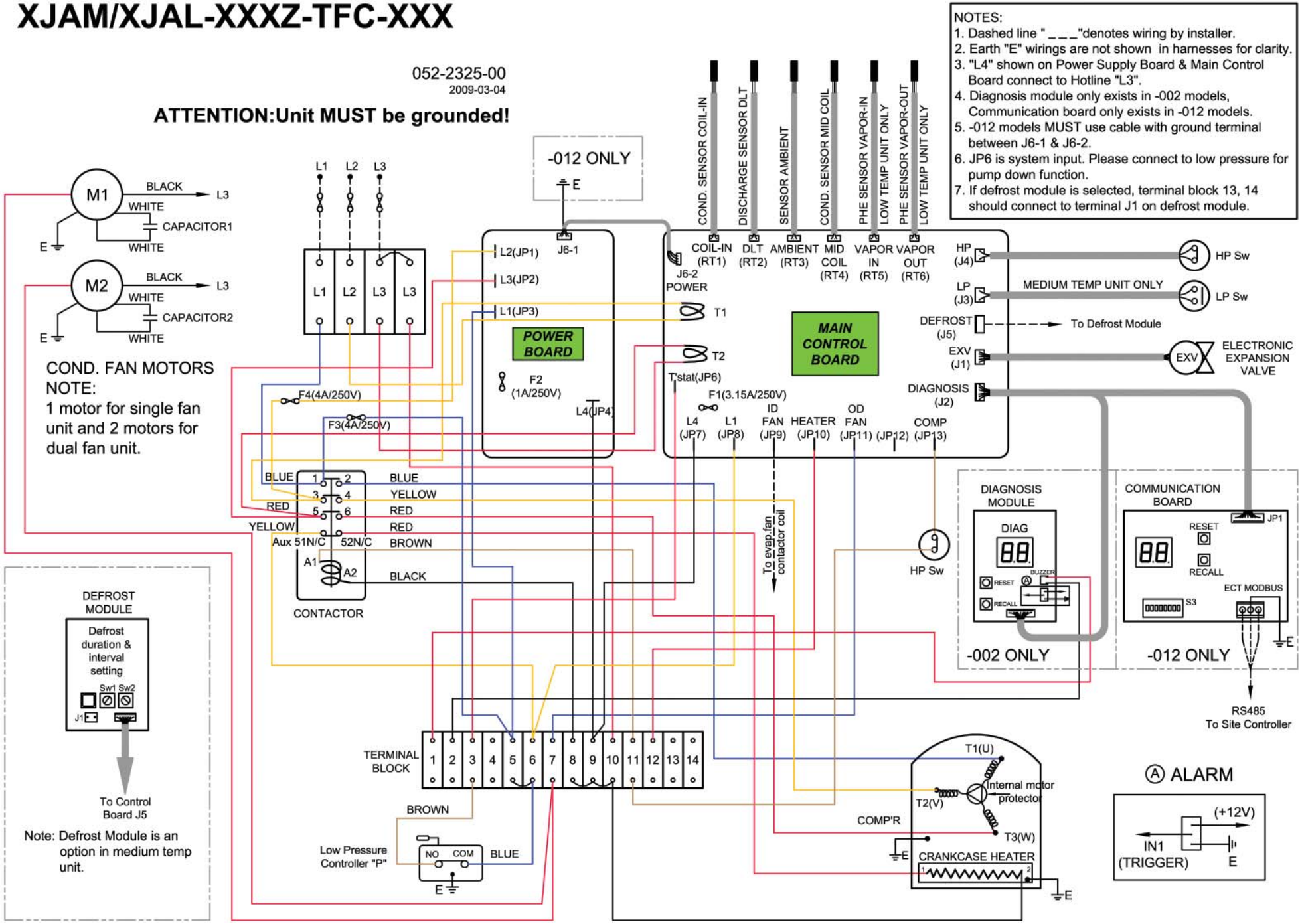
XJAM/XJAL-040Z/050Z-CFV-XXX



For technical support questions call 1-888-367-9950

Figure 6b

XJAM/XJAL-XXXZ-TFC-XXX



For technical support questions call 1-888-367-9950

Figure 7

For more information about Copeland Scroll Outdoor Units, please visit: EmersonClimate.com/copelandoutdoorunit

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