Apex Packaged Refrigeration System

INSTALLATION AND MAINTENANCE MANUAL

Publication IOM H900.1
January, 2009

Table of Contents

Inspection ---- 1
Unit Placement Requirements ---- 2
Installation Instruction ---- 2
Before Unit Start-Up ---- 3
After Start-Up ---- 3
Clearances and Unit Placement ---- 4
Unit Weights ---- 5
Cabinet Footprint ---- 5
Maintenance ---- 6
Sequence of Operation ---- 6
Electronic Controller Operation ---- 7-10
Controller Parameters and Settings ---- 11 - 12
Electrical Wiring Diagrams ---- 13 - 19
Replacement Parts ---- 20
Troubleshooting Guide ---- 21
Warranty ---- 22

Inspection

When the equipment is received, check the quantity of cartons and crates against the bill of lading. Inspect all containers for visible damage. Report any damage or shortages to the freight company immediately. **It is the customers responsibility to file all claims with the freight company.**
Do not return damaged equipment to the factory without prior approval. A returned material authorization (RMA) is required.

ITEMS RETURNED WITHOUT AN RMA LABEL WILL BE REFUSED!

HTPG 201 Thomas French Dr., Scottsboro, AL 35769 • Tel: (256) 259-7400 • Fax: (256) 259-7474

Part # 08499055

Unit Placement Requirements

See Figures and Weight tables on pages 4 & 5, and follow these guidelines:

1. Make sure that the structural integrity of the box can withstand the weight of the unit(s).
2. Do not remove the shipping skid from the unit until it is ready to be lifted into place on top of the walk-in.
3. Do not locate the evaporator section of the unit over a door.
4. The unit supply air pattern must cover the entire walk-in.
5. Leave one unit width between sides of unit and walls. Leave two unit widths between units.
6. Provide adequate space at the compressor compartment end of the unit and a minimum of two feet above the unit for servicing.
7. Adequate airflow must be available for condenser. Do not shield the Apex unit, use top of walk-in for storage or install the Apex unit in a non-ventilated space. Lack of attention to this detail will cause poor performance and possibly unit failure.
8. Do not locate unit in the area of steam, hot air or fume exhausts.
9. Indoor units are designed for use in areas that range in temperature from 50°F to 110°F.
10. Indoor units are not designed for outdoor installation.
11. Do not install units in noise sensitive areas. Units must be properly supported to prevent excessive noise and vibration.
12. Installations that do not conform to all of the requirements in this manual will void the unit warranty.

Installation Instructions

General

Installation and maintenance are to be performed by qualified personnel who are familiar with local codes and regulations. Installers should have previous experience with commercial refrigeration equipment.
CAUTION: Avoid contact with sharp edges and coil surfaces. They are potential hazards.
Small cabinet units can be set in place by hand. Medium and large cabinet units have lifting eyes. Use a spreader bar when rigging to prevent damage to and undo stress on the unit cabinet. Remove the weather hood from outdoor units. **IMPORTANT: The compressor compartment cover must be left on units when lifting using the lifting eyes.**

Indoor Models

1. Inspect packaging for shipping damage. Open package and inspect unit for concealed damage.
2. Follow Figure 1 requirements on page 4.
3. Cut a finished opening in the box ceiling to the dimensions shown in the footprint drawings on page 5. Make sure that the top with the cut-out has the structural integrity to hold the unit. See table on page 5 for unit weights.
4. Make sure that the surface of the box is clean where the unit gasket will seal around the opening.
5. Refer to the walk-in box manufacturer's instructions for any procedures that may be necessary to ensure the integrity of the exposed foam in the panels.
6. Make sure the unit is mounted level - no more than 1/8 inch drop per foot.
7. Place the unit into the provided opening with the evaporator air flow directed toward the door (See Figure 1 on page 4). Be careful not to damage the grill during installation.
8. Make sure that the condenser air flow is not obstructed.
9. On indoor units, condensate is evaporated by a discharge line loop run through the drain pan under the compressor, so a drain line is not required.
10. Install the trim pieces around the inside opening.

Outdoor Models

Installation is the same as indoor models except as follows:

1. Units must be curb mounted (curb provided by others). To help with curb sizing, see Figure 3 on page 5 which shows unit footprint dimensions for each cabinet size. (Only medium and large cabinet units are available for outdoor use.)
2. Make sure curb is level and properly flashed to prevent water leakage into walk-in.
3. Water from rain or snow may get into compressor section of unit. Make sure the curb under this part of unit is designed with openings so water will not collect inside the curbing.
4. The condensate drain outlet is located on the side of the unit. Field piping may be connected to the outlet provided it is adequately sloped and heated to prevent freezing, where necessary. The drain line in the unit is trapped and heated.
5. After connecting electrical power (see Before Unit Start-up), install compressor compartment cover and weather hood.

Before Unit Start-up

1. Check all mechanical and electrical connections for looseness developed during transit and tighten as necessary.
2. Adhere to all applicable building and electrical codes when wiring unit.
3. Make sure supply power is correct voltage and phase for unit and is fused properly.
4. If unit is supplied with a power cord, plug unit into power supply.

   IMPORTANT:
   Do not use extension cords to connect unit to power.
   Plug-in to grounded three prong outlet.
   Do not remove grounding prong.
   Do not use a power adapter.
5. If unit is not supplied with a cord, hard wire to power supply.

After Start-up

1. To protect the compressor (in the event of a brief power interruption), the electronic controller is programmed for a five minute start-up time delay.
2. See Electronic Controller Operation section to set box temperature (factory settings are 35ºF for coolers and -10ºF for freezers), and change any control parameters that may have to be changed to fit the application. Basic parameters are factory set as follows:
   a. Time between defrosts • 6 hours.
   b. Defrost termination temperature • 40°F Coolers, 50°F Freezers.
   c. Maximum defrost duration before defrost is terminated by time • 50 minutes.
3. Timing for defrosts starts when unit is started, so as set from factory, defrost will occur 6 hours after start-up and every 6 hours thereafter.
4. Unit defrosting operation should be checked after start-up and periodically thereafter. The amount and pattern of frosting can vary greatly. Frost build-up is dependent on the temperature of the room, the type of product being stored, how often new product is brought into the room and percentage of time the door to the room is open. It may be necessary to periodically change the number of defrost cycles or adjust the duration of defrost.

Clearances and Unit Placement

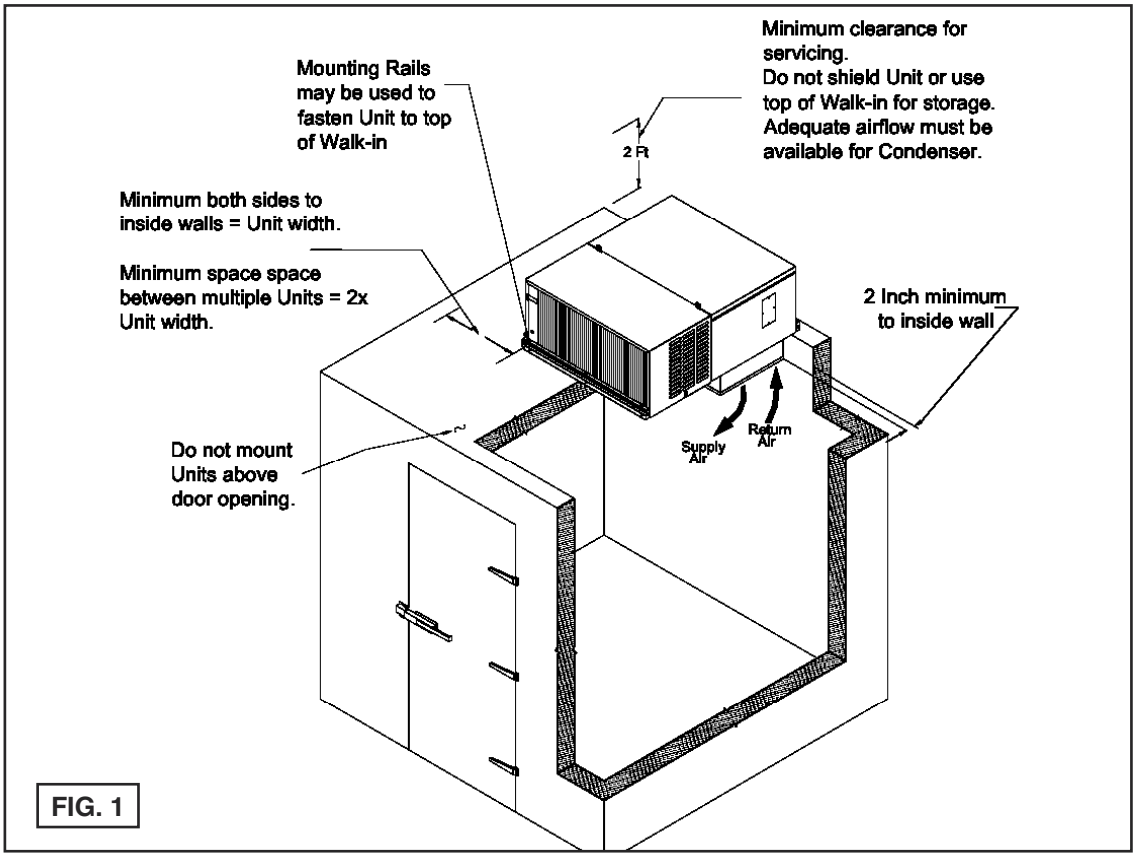


FIG. 1

Outdoor Rigging

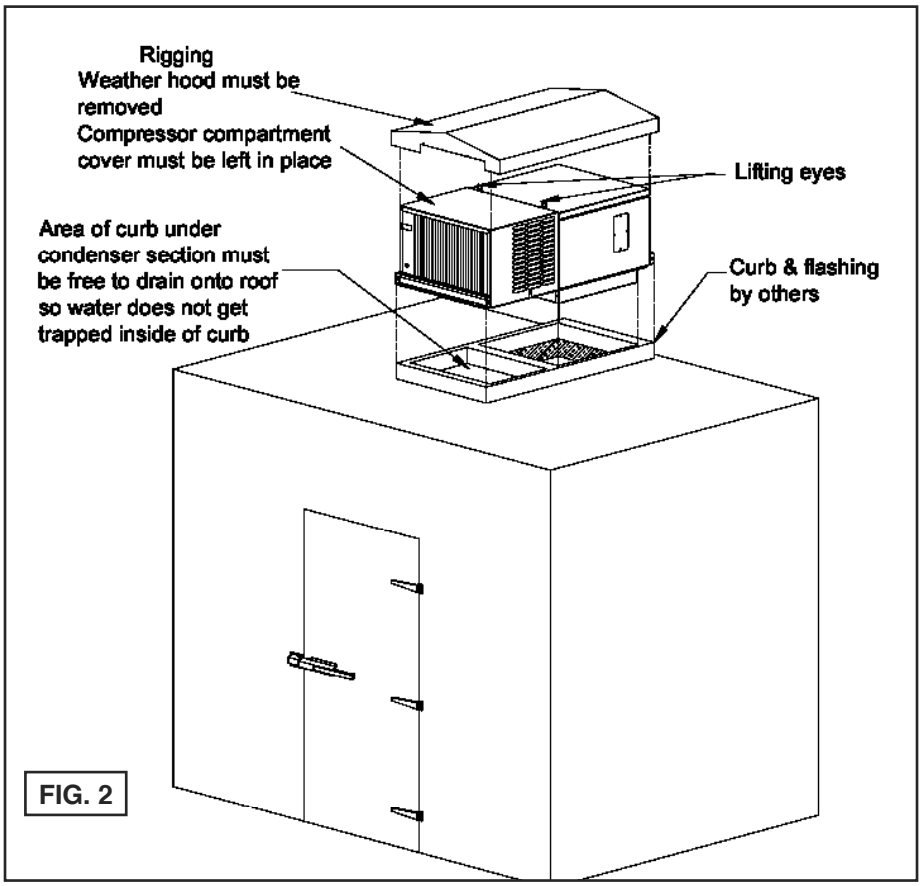


FIG. 2

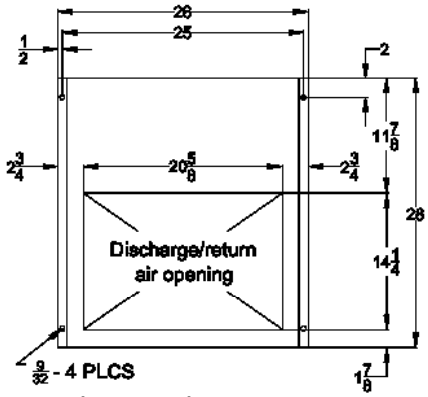
Unit Weights

	Model Number	Cabinet Size	INDOOR NET/SHIP WT. (lbs.)	OUTDOOR NET/SHIP WT. (lbs.)
COOLER UNITS	XN026MA**A*	Small	120 / **185**	—
	XN029MA**A*	Small	120 / **185**	—
	XN037MA**A*	Small	125 / **190**	—
	XN050MA**A*	Medium	210 / **305**	—
	X*050MA**D*	Medium	210 / **305**	220 / **360**
	X*068MA**D*	Medium	220 / **315**	230 / **370**
	X*076MA**D*	Medium	220 / **315**	230 / **370**
	X*106MA**D*	Large	295 / **420**	310 / **485**
	X*106MA**E*	Large	305 / **430**	320 / **495**
	X*134MA**D*	Large	310 / **435**	325 / **500**
	X*134MA**E*	Large	310 / **435**	325 / **500**

	Model Number	Cabinet Size	INDOOR NET/SHIP WT. (lbs.)	OUTDOOR NET/SHIP WT. (lbs.)
FREEZER UNITS	XN018LE44A*	Small	140 / **200**	—
	XN024LE44A*	Medium	210 / **305**	—
	X*024LE44D*	Medium	210 / **305**	225 / **365**
	X*031LE44D*	Medium	245 / **340**	255 / **400**
	X*043LE44D*	Medium	245 / **340**	255 / **400**
	X*051LE44D*	Large	315 / **445**	330 / **510**
	X*051LE44E*	Large	315 / **445**	330 / **510**
	X*068LE44D*	Large	320 / **450**	335 / **515**
	X*068LE44E*	Large	320 / **450**	335 / **515**

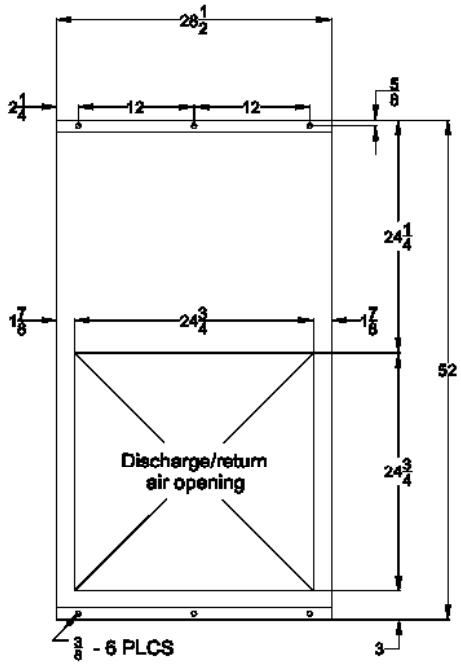
Cabinet Footprints

FIG. 3

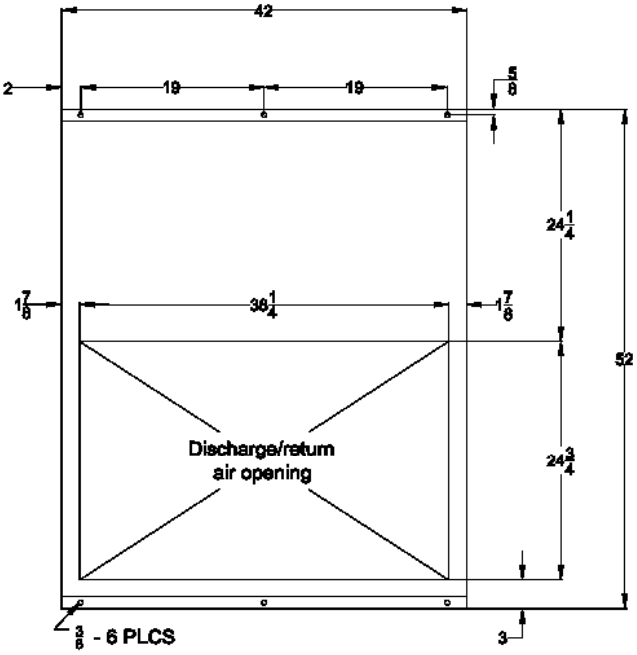


SMALL CABINET

Note:
All dimensions are in inches.



MEDIUM CABINET



LARGE CABINET

Maintenance

The following items should be checked every six months. Make sure all power is shut off to unit before performing any maintenance or service.

1. Tighten all electrical connections.
2. Check all wiring and insulators.
3. Check contactor for proper operation.
4. Check all fan motors. Tighten motor mount screws/nuts and fan set screws.
5. Clean the condenser and evaporator coil surfaces.

CAUTION: Avoid contact with sharp edges and coil surfaces. They are potential hazards.

6. Check the operation of the control system. Make sure all safety controls are operating properly.
7. Make sure evaporator is defrosting properly. See item 4 under "After Start-up".
8. Clean the drain pan and drain lines. Check the drain pan and drain line for proper drainage.
9. On outdoor units make sure the crankcase and drain line heaters, and thermostat are functioning properly.

Sequence of Operation

Coolers

1. When power is supplied to the unit, the compressor, condenser motor(s) and evaporator motor(s) will run until the box temperature setting is reached.
2. When the box temperature setting is reached, the compressor and condenser motor(s) shut off but the evaporator motor(s) continue to run. This will provide an off-cycle defrost of the evaporator coil.
3. When the box temperature rises above the set point and the minimum compressor off-time has elapsed, the compressor and condenser motor(s) will be re-energized.
4. When a defrost is initiated, as set by the electronic controller parameters, the compressor and condenser motor(s) are shut off until the defrost sensor reaches the termination temperature.
5. Indoor units are not furnished with crankcase heaters, drain line heaters or condenser fan cycling controls.

Freezers

1. When power is supplied to the unit, the compressor, condenser motor(s) and evaporator motor(s) will run until the box temperature setting is reached. For outdoor units, depending on the ambient temperature, condenser fan motor(s) may be off.
2. When the box temperature setting is reached, the compressor and condenser motor(s) shut off but the evaporator motors continue to run.
3. When the box temperature rises above the set point and the minimum compressor off-time has elapsed, the compressor and condenser motor(s) will be re-energized.
4. When a defrost is initiated, as set by the electronic controller parameters, the compressor, condenser motor(s), and evaporator motor(s) are shut off and the defrost heaters are energized.
5. The unit will stay in defrost until the defrost sensor reaches the termination temperature, then the defrost heaters will de-energized and the unit will go into the drip mode as set on the controller (see parameter dd).

6. After the drip time, the compressor and condenser motor(s) start but the evaporator motor(s) stay off until defrost sensor reaches the controller parameter settings.
   (see parameters F0, F1 & A0)
7. Then the refrigeration cycle is resumed.

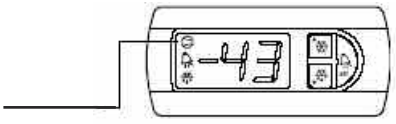
ELECTRONIC CONTROLLER OPERATION

The electronic controller controls all of the functions of the APEX system. The following paragraphs explain the operation of the controller and how to change the settings of the controller parameters. Table 1 shows a listing of parameteres and settings.

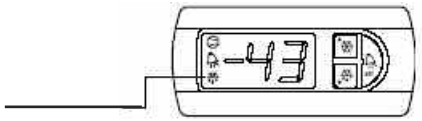
CONTROLLER DISPLAY

During normal operating conditions, the display shows the value measured by the box temperature probe. In case of an active alarm, the temperature flashes alternately with the alarm code.

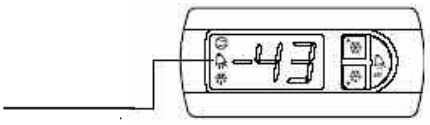
LED INDICATIONS ON DISPLAY



Compressor icon illuminated indicates compressor ON
or
Compressor icon flashing indicates compressor in a time delay status.



Defrost icon illuminated indicates unit in defrost.



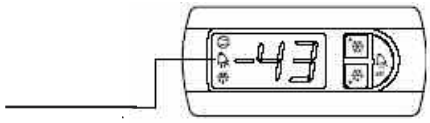
Alarm icon illuminated indicates the presence of an alarm.

ELECTRONIC CONTROLLER OPERATION - Continued

ALARMS AND SIGNALS

When the controller detects malfunctions or special operating conditions, it activates the appropriate visual signal as follows:

- alarm icon is illuminated.



- The alarm code (see below) is displayed and alternates with the temperature display. In the case of more than one alarm, all are displayed in sequence. The alarm code and the red LED go off only when the cause of the alarm no longer exists.

Alarm code	Description
"E0" on or flashing	Box temperature probe not working: signal is interrupted or short-circuit ed. The alarm signal stays on if only this alarm is present (the box temperature can no longer be displayed). Signal flashes if other alarms are also present.
"**E1" flashing** circuited.	Defrost temperature probe not working: signal is interrupted or short
"**LO" flashing**	Low temperature alarm. The box temperature probe is reading a temperature lower than the set point by a value greater than AL. Check parameters AL, Ad and A0. The alarm automatically resets when the temperature returns within the limit set by AL.
"**HI" flashing**	High temperature alarm. The box temperature probe is reading a temperature higher than the set point by a value greater than AH. Check parameters AH, Ad and A0. The alarm automatically resets when the temperature returns within the limit set by AH.
"**EE"** — — —	Indicates controller error in reading parameters from memory. The controller repeatedly tries to reset the parameters. This is indicated by three dashes alternating with EE. If the anomalous condition remains, the controller must be replaced.
"**Ed" flashing**	The last defrost was terminated on time rather than temperature. Check parameters dt, dP and r3. The message will disappear if the next defrost terminates on temperature.
dF flashing	Defrost in progress. This is not an alarm signal. It indicates the unit is in a defrost. It is displayed only if parameter d6 = 0.

MANUAL DEFROST

To activate a manual defrost, press the button for more than 5 seconds.

ELECTRONIC CONTROLLER OPERATION - Continued

CHANGING TEMPERATURE SET-POINT

1) Press the  button for one second to display the set-point value, after a few seconds, the set value blinks.

2) Press  or  to increase or decrease the set-point value.

3) Press  once more to confirm the new value.

CONTROLLER PARAMETERS

Operating parameters can be modified to meet application requirements. These parameters are grouped into two families: frequent parameters (**TYPE F**) and configuration parameters (**TYPE C**). See Table 1 for a listing of parameters and settings.

Accessing TYPE F Parameters (no password required)

1) Press the  button for more than 5 seconds.

2) The display shows **PS**.

3) Press  or  to scroll through all of the F parameters.

Accessing both F and C parameters (password required)

1) Press the  button for more than 5 seconds;

2) The display shows **PS**.

3) Press  , the display shows 0.

4) Press  or  , until 22 (PASSWORD) is displayed.

5) Press  to confirm; the display shows PS.

6) Press  or  to scroll through all of the F and C parameters.

CHANGING PARAMETERS (see Table 1.)

1) Press  or  to scroll the parameter to be changed.

2) Press  to display the current value.

ELECTRONIC CONTROLLER OPERATION - Continued

3) Press  or  to change the value.

4) Press  to **temporarily** confirm the new value and return to the parameter symbol display.

5) Press  or  again to reach the next parameter that is to be changed and repeat steps 2 through 4.

SAVING NEW PARAMETER VALUES

IMPORTANT: New values will not be saved unless step 1) is performed

1) Press  for 5 seconds to permanently save the new value(s) and exit the "Changing Parameters" procedure. For timing parameters only, turn the power to the unit “Off” and then “On” in order to make the new value(s) immediately effective without waiting for the following cycle.

2) To exit without modifying any parameter, do not press any button for at least 60 seconds (exit by time out). By doing this, the controller returns to normal operation without saving any of the "changed" parameters values.

Listing of Controller Parameters and Settings

Parameter	Symbol	Type	Factory Setting	Range/Options
Password	PS	F	22	Fixed setting. Required to access Type C parameters.
Probe Parameters	⌐			
Ambient probe calibration	⌐ C	F	0	Range: -127 to127 Allows box display temperature to be corrected. Correction = setting x 0.1. Does not act on defrost probe.
Temperature response	⌐ 2	C	4	Range: 1 to 15 Higher numbers slow response to temperature change.
Not used	⌐ 4	C	0	Leave at factory setting.
Temperature format	⌐ 5	C	1	Options: 0 = Celsius, 1 = Fahrenheit When changed, all values of temperature parameters must be changed to reflect new format.
Regulator Parameters	**r**			
Control differential	rd	F	3	Range: 0 to 19 Sets on/off control differential. 0 = 0.5°
Minimum allowable set point	r1	C	35° Clrs -20° Fzrs	Leave at factory setting.
Maximum allowable set point	r2	C	50° Clrs 10° Fzrs	Leave at factory setting.
Alarm if defrost terminated by time (Ed)	r3	C	0	Options: 0 = no, 1 = yes Display indicates defrost end due to maximum time (dP) being reached.
Not used	r4	C	0	Leave at factory setting.
Defrost Parameters	**d**			
Time between defrosts	dI	F	6	Range: 0 to 199 hours Interval is counted from beginning of previous defrost.
Defrost termination temperature	dt	F	40° Clrs 50° Fzrs	Range: -50 to 127 degrees Terminates defrost when when defrost probe temperature reaches set-point.
Maximum defrost duration	dP	F	50	Range: 1 to 199 minutes Terminates defrost when set-point is reached.
Dripping time after defrost	dd	F	0 Clrs 2 Fzrs	Range: 0 to 15 minutes Keeps compressor and evaporator fans off until set-point is reached.
Alarm delay after defrost	d8	F	1	Range 0 to 15 hours Time high temperature alarm is bypassed after a defrost.
Defrost probe reading	d ⌐	F	-	Selecting d/ displays the temperature of the defrost probe. Used for service only.
Type of defrost	d0	C	0	Leave at factory setting. Keeps compressor "off" during defrost.
Defrost at start-up	d4	C	0	Options: 0 = no, 1 = yes Selects whether or not a defrost is initiated when controller is energized.
Defrost delay	d5	C	0	Range: 0 to 199 minutes Delays defrost initiation when controller is energized.
Blocked temperature display	d6	C	0	Options: 0 = no, 1 = yes If unblocked,display alternates between measured temperature and dF to indicate unit is in defrost. If blocked, holds display at last temperature before defrost.
Defrost priority	d9	C	1	0 = no, 1 = yes Gives defrost priority over compressor parameters c1, c2, and c3.
Time base	dC	C	0	Options: 0 = hours/minutes, 1 = minutes/seconds Sets time base for time between defrosts (dI) and for defrost duration (dP). Can be used to test defrost function with reduced times.

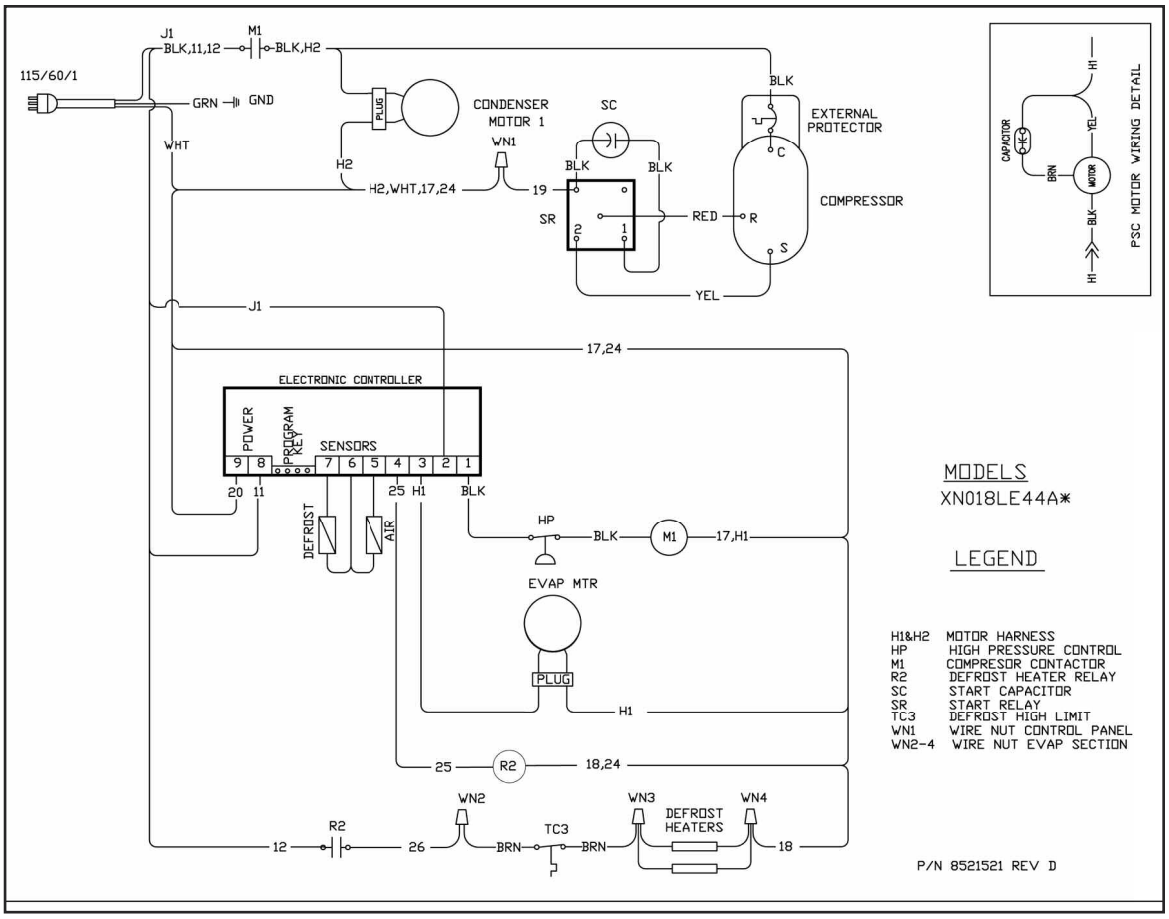
Table 1

Listing of Controller Parameters and Settings - Continued

Parameter	Symbol	Type	Factory Setting	Range/Options
Compressor Parameters	**c**			
Delay compressor start	c0	C	5	Range: 0 to 15 minutes Delays compressor start when controller is energized.
Compressor restart minimum time	c1	C	0	Range: 0 to 15 minutes Sets minimum time between two successive compressor start-ups.
Compressor "off" minimum time	c2	C	5	Range: 0 to 15 minutes Sets the minimum time the compressor stays "off".
Compressor "on" minimum time	c3	C	0	Range: 0 to 15 minutes. Sets the minimum time the compressor stays "on".
Compressor operation if probe fails	c4	C	20	Range: 0 to 100 minutes Ensures compressor operation if box probe fails. Compressor alternates between being "on" for minutes set and "off" for 15 minutes. 0 = always off, 100 = always on
Continuous cycle duration	cc	C	0	Range: 0 to 15 hours Allows compressor to run continuously for time set or until AL is reached.
Alarm bypass after continuous cycle	c6	C	0	Range: 0 to 15 hours Bypasses alarm after continuous cycle.
Evaporator Fan Parameters	**F**			
Fan management	F0	C	0 Clrs 1 Fzrs	0 = fans "on" except as dictated by dd, Fd, F2 and F3. 1 = fans "on" when defrost probe temperature < F1 - A0, fans "off" when defrost probe temperature > F1
Fan power "off" temperature	F1	F	NA Clrs 40° Fzrs	NA when F0 = 0 Fan "off" when F0 = 1 and defrost probe temperature > setting.
Fan Delay	Fd	F	0	Range: 0 to 15 minutes Delays fan start when compressor starts after a defrost.
Fan "off" when compressor "off"	F2	C	0	Options: 0 = no, 1 = yes If "no", fans run continuously during refrigeration (excluding FD and dd).
Fans "off" during defrost	F3	C	0 Clrs 1 Fzrs	Options: 0 = no, 1 = yes
Alarm Parameters	**A**			
Alarm and evaporator fan differential	A0	C	10	Range: 0 to 19° (0° = 0.5°) Sets differential for AL, AH and F0 = 1.
Low temperature alarm	AL	F	3 Clrs 10 Fzrs	Range: 0 to 127° (0 = alarm inhibited) Degrees below box temperature setpoint that will initiate alarm.
High temperature alarm	AH	F	12	Range: 0 to 127° (0 = alarm inhibited) Degrees above box temperature setpoint that will initiate alarm.
Temperature alarm delay	Ad	C	15	Range: 0 to 199 minutes Alarm delay after fault is detected.
Not Used	A7	C		
Other Selections	**H**			
Serial address	H0	C	1	Range: 0 to 199 (0 is reserved) Assigns controller an address when connected to a supervisory or telemaintenance system.
Not used	H1	C	0	Leave at factory setting.
Keypad disabled	H2	C	1	Options: 0 = disabled, 1 = enabled
Not used	H5	F	0	Leave at factory setting.
External parameters	t	F	-	Used only for serial options.

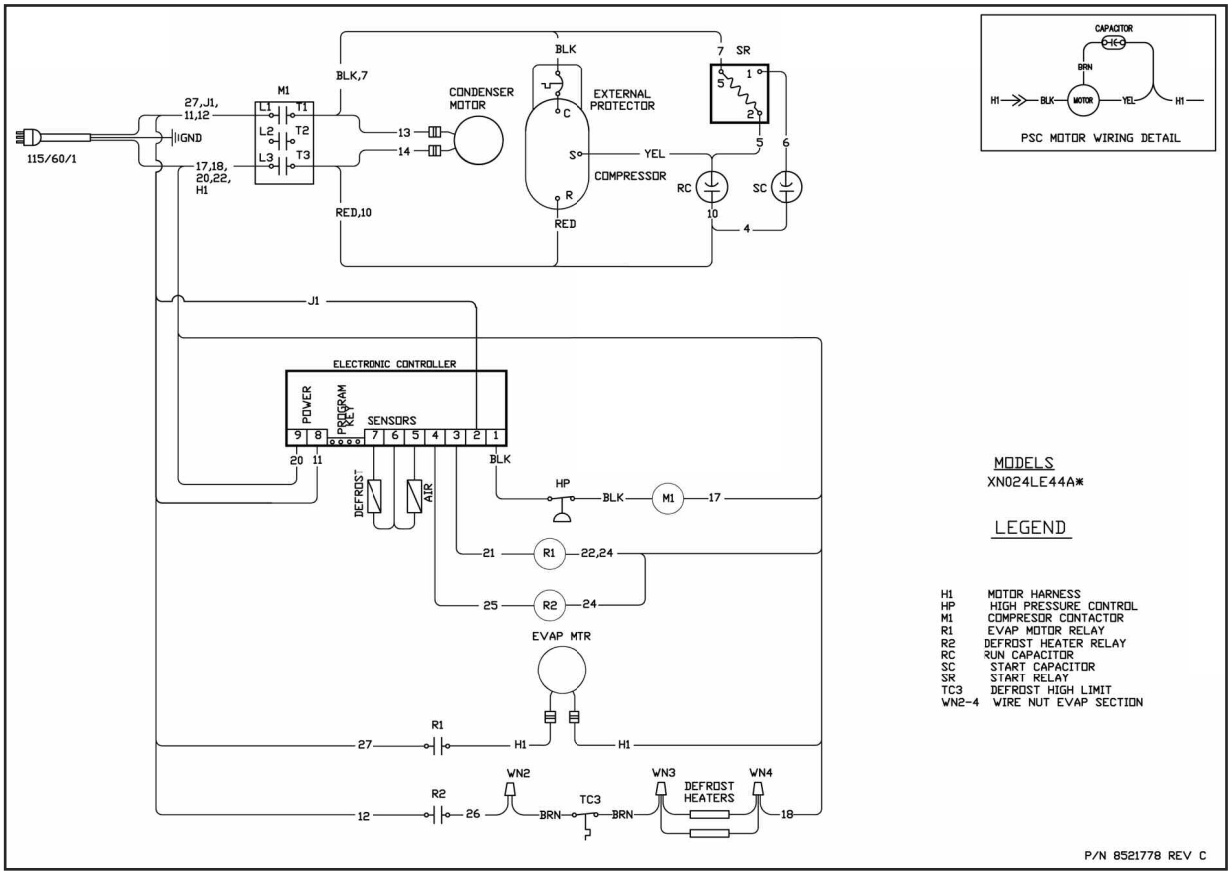
Table 1 (continued)

Electrical Wiring Diagram
Small & Medium Cabinet / Freezer / 115V



Models -

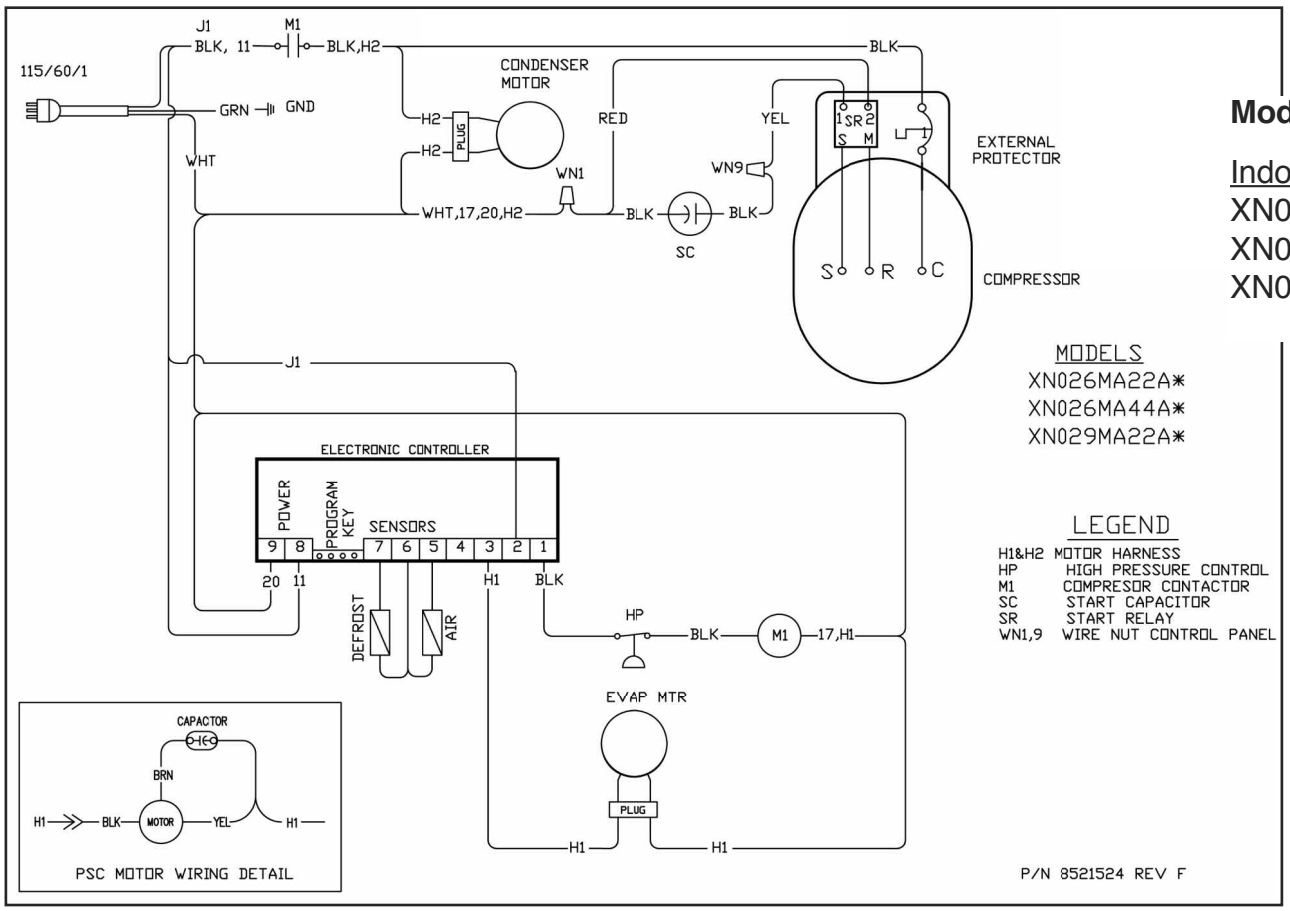
Indoor Units
XN018LE44A*



Models -

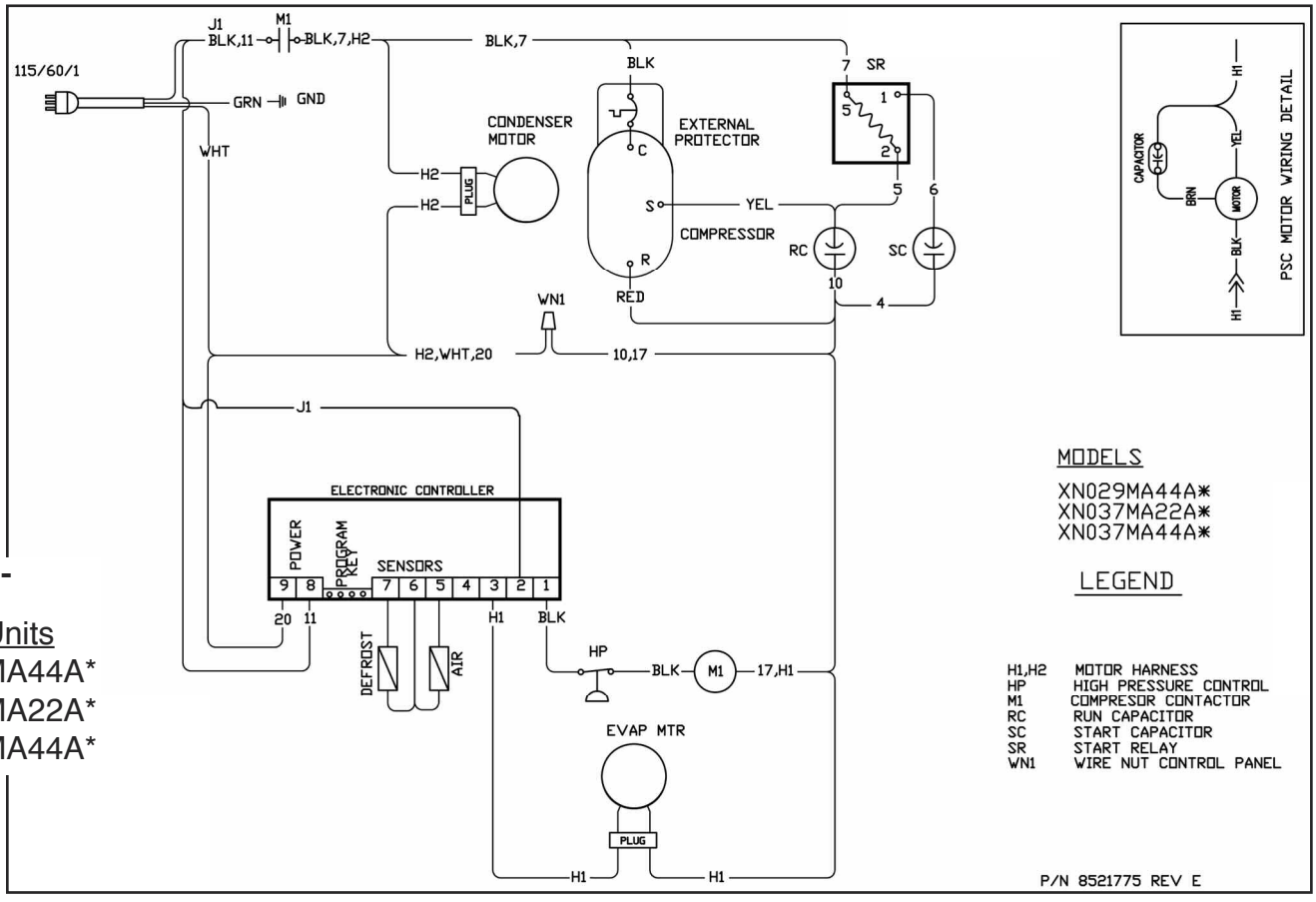
Indoor Units
XN024LE44A*

Electrical Wiring Diagram
Small Cabinet / Cooler / 115V



Models -

Indoor Units
XN026MA22A*
XN026MA44A*
XN029MA22A*



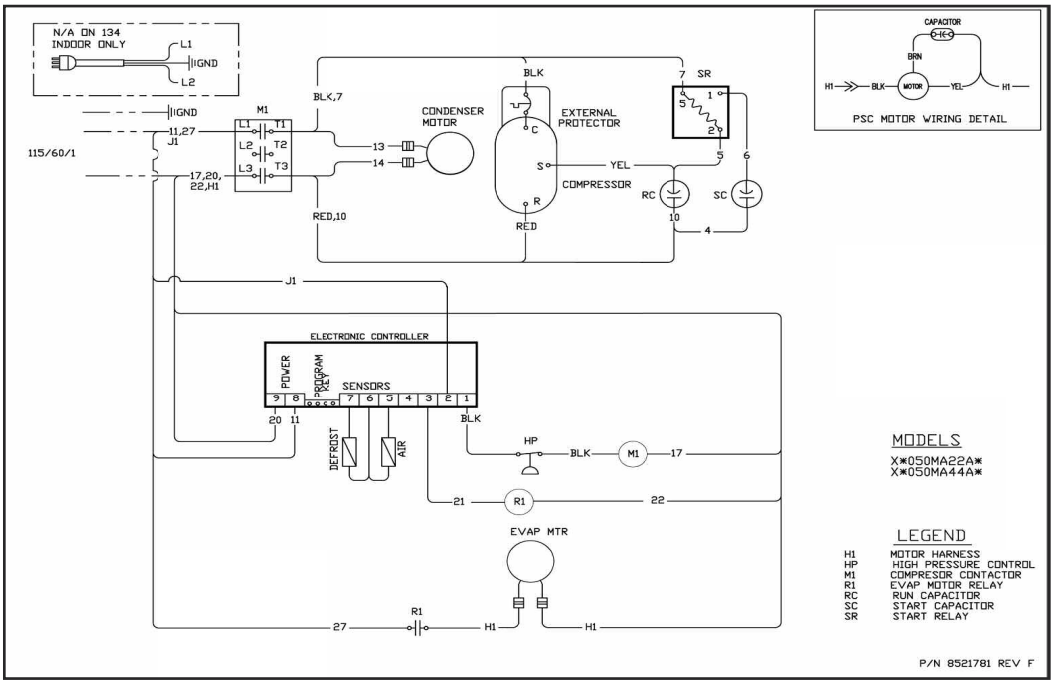
Models -

Indoor Units
XN029MA44A*
XN037MA22A*
XN037MA44A*

Electrical Wiring Diagram — Medium Cabinet / Cooler / 115V

Models -

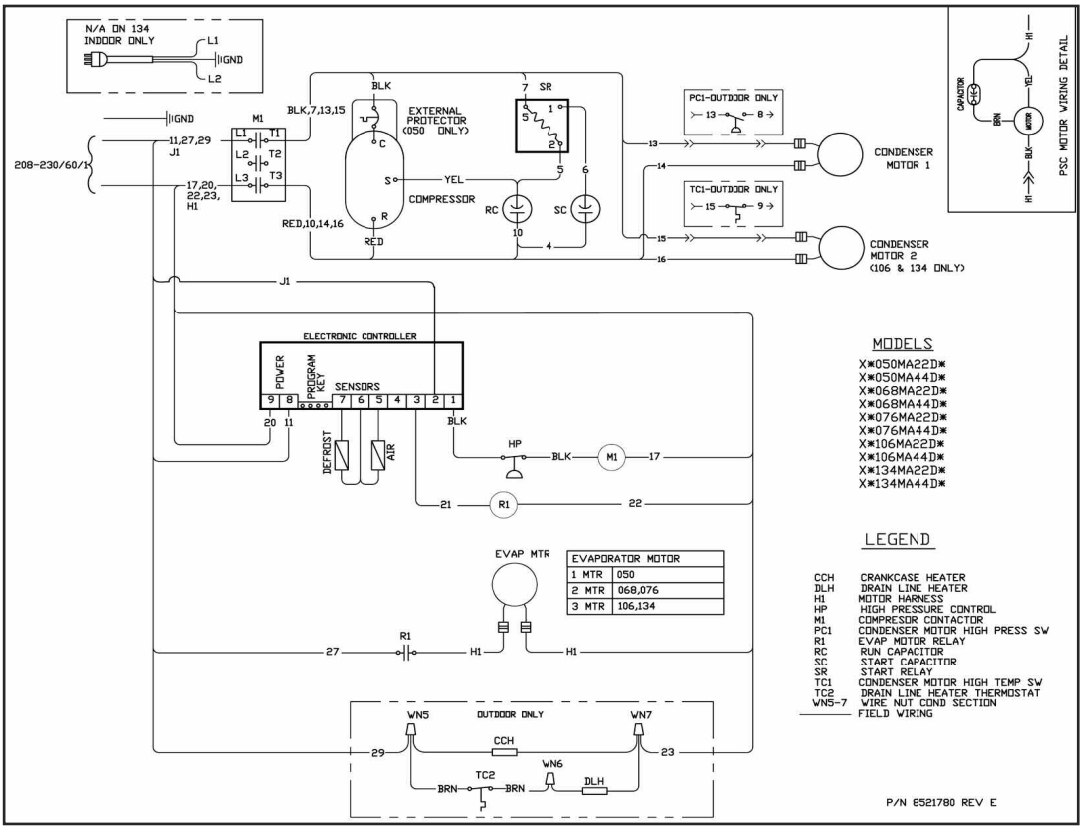
Indoor Units
XN050MA22A*
XN050MA44A*



Electrical Wiring Diagram
Medium & Large Cabinet / Cooler / 208-230/1

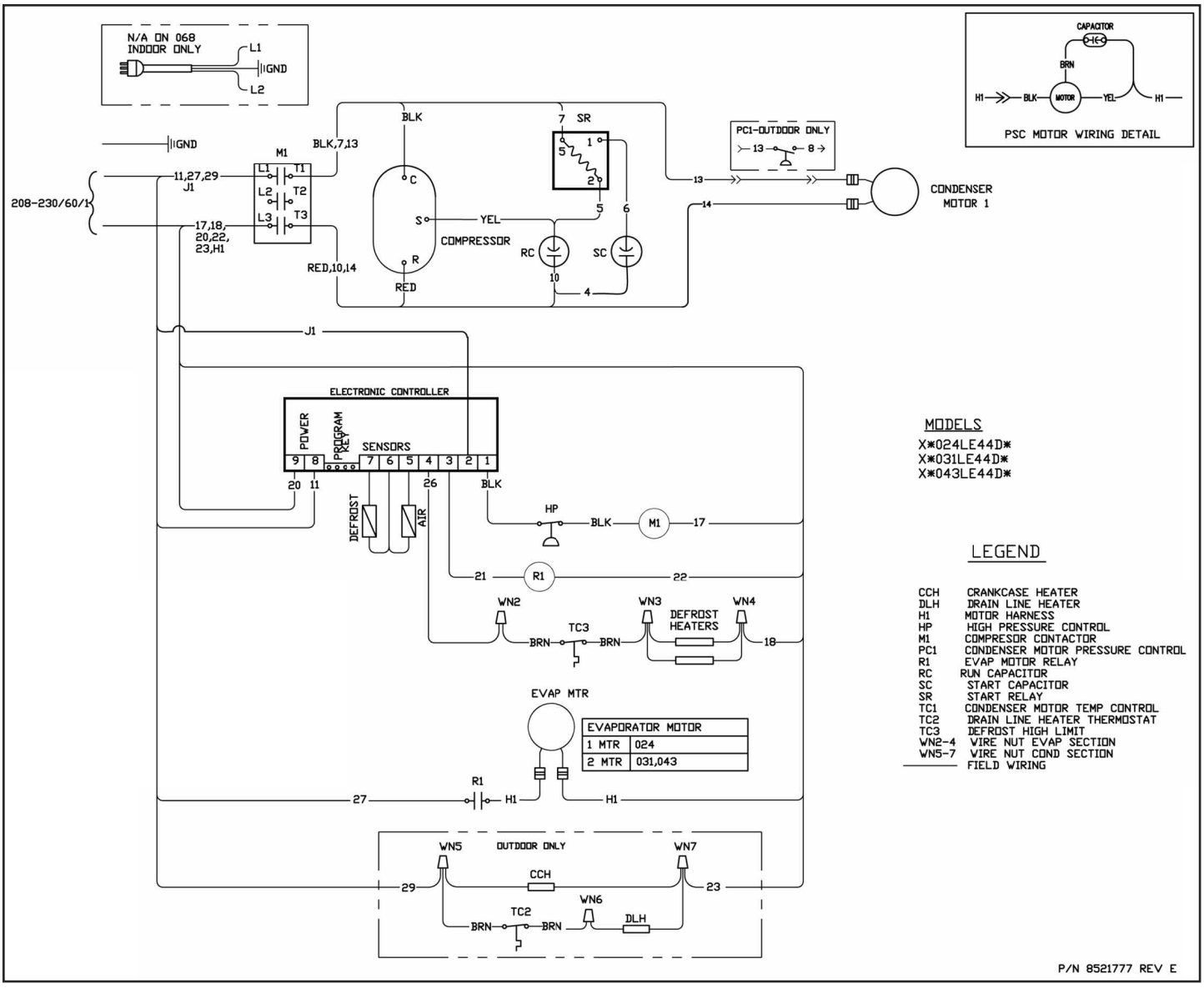
Models -

Indoor Units		Outdoor Units	
XN050MA22D*	XN106MA22D*	XT050MA22D*	XT106MA22D*
XN050MA44D*	XN106MA44D*	XT050MA44D*	XT106MA44D*
XN068MA22D*	XN134MA22D*	XT068MA22D*	XT134MA22D*
XN068MA44D*	XN134MA44D*	XT068MA44D*	XT134MA44D*
XN076MA22D*		XT076MA22D*	
XN076MA44D*		XT076MA44D*	



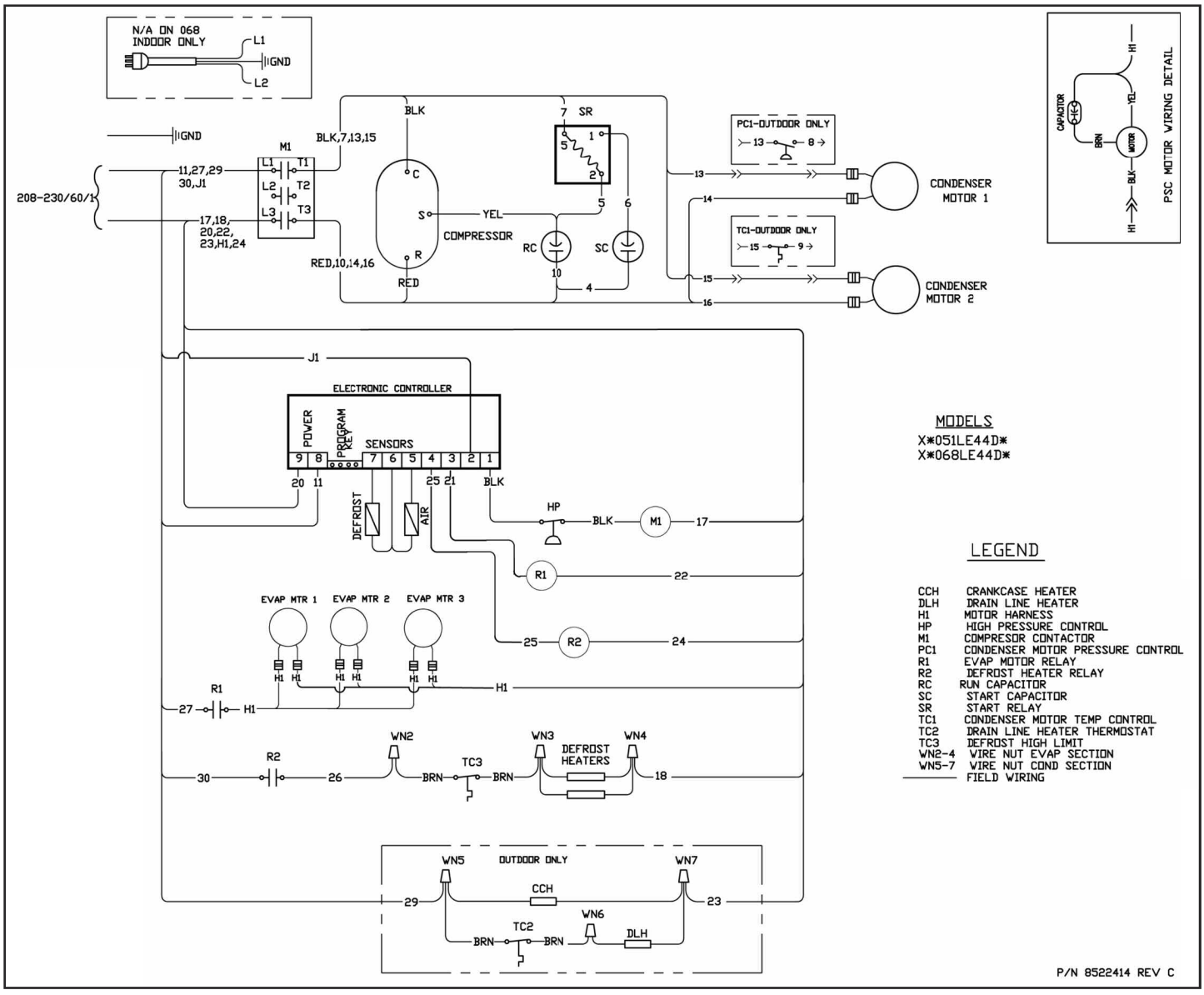
Electrical Wiring Diagram
Medium Cabinet / Freezer / 208-230/1

Models -	Indoor Units	Outdoor Units
	XN024LE44D*	XT024LE44D
*		
	XN031LE44D*	XT031LE44D*



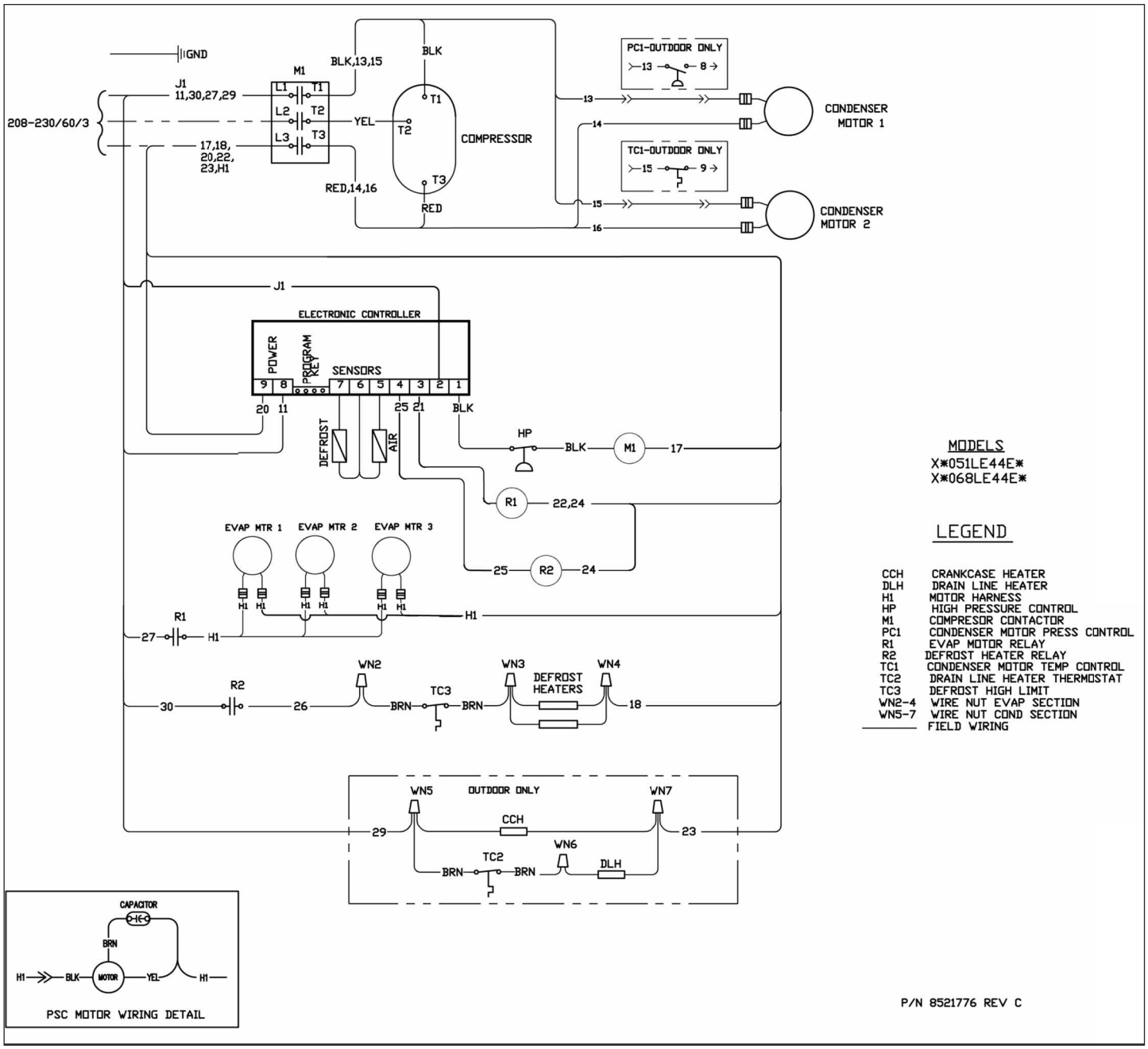
Electrical Wiring Diagram
Large Cabinet / Freezer / 208-230/1

Models -	Indoor Units	Outdoor Units
	XN051LE44D*	XT051LE44D*
	XN068LE44D*	XT068LE44D*



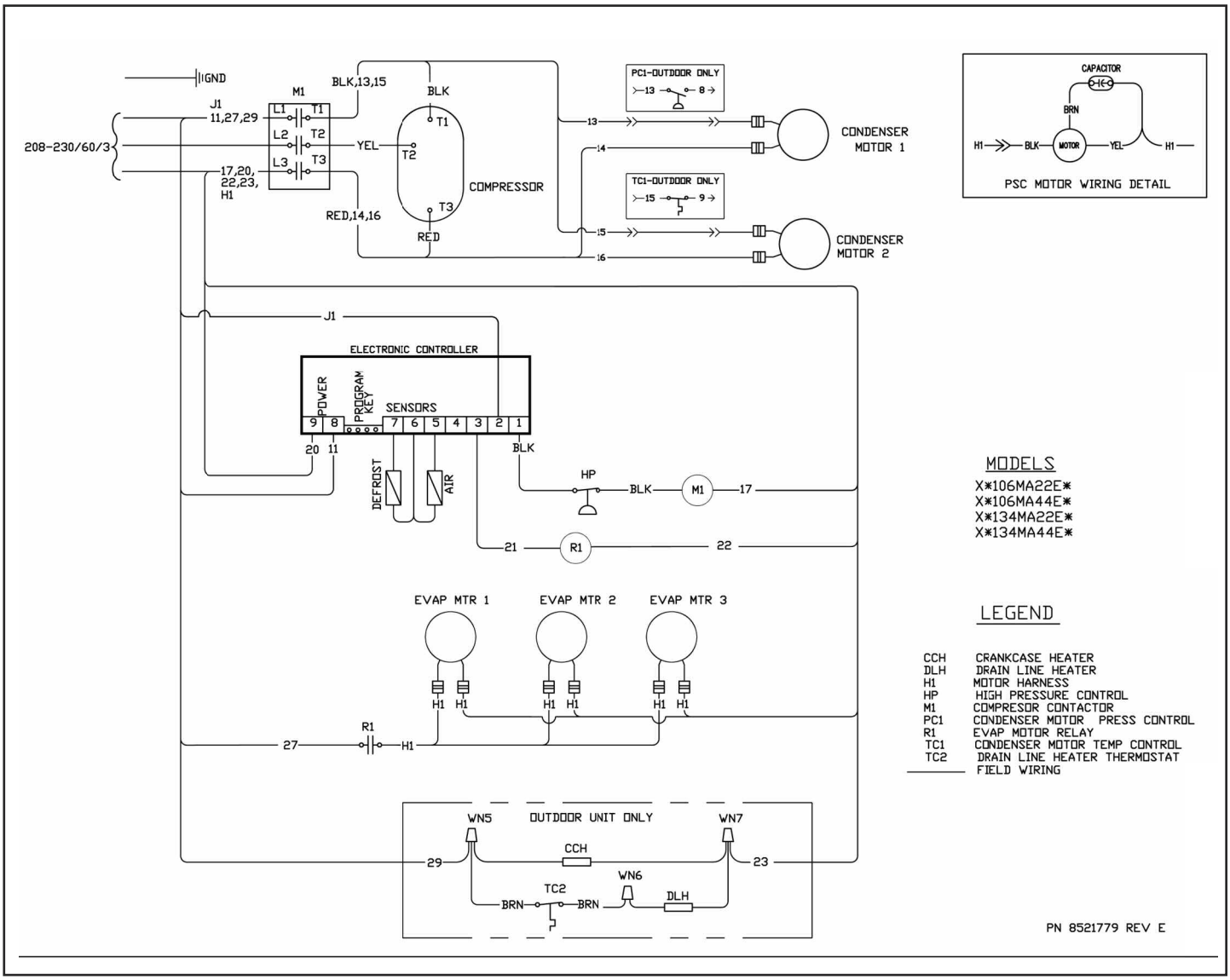
Electrical Wiring Diagram
Large Cabinet / Freezer / 208-230/3

Models -	Indoor Units	Outdoor Units
	XN051LE44E*	XT051LE44E*
	XN068LE44E*	XT068LE44E*



Electrical Wiring Diagram
Large Cabinet / Cooler / 208-230/3

Models -	Indoor Units	Outdoor Units
	XN106MA22E*	XT106MA22E*
	XN106MA44E*	XT106MA44E*
	XN134MA22E*	XT134MA22E*
	XN134MA44E*	XT134MA44E*



Replacement Parts

MODEL NUMBER	DESCRIPTION	PART NUMBER
XN026M THRU XN037M, XN018L	CONDENSER AND EVAPORATOR MOTOR, 115V, 16W, 1550 RPM, PSC CAPACITOR FOR THIS MOTOR, 5µF, 440V	107933001 202163004
	EVAPORATOR MOTOR, 115V, 16W, 1550 RPM, SP	103104007
	EVAPORATOR MOTOR, 115V, 16W, 1550 RPM, ECM	107933006
XN050M, XN024L	CONDENSER AND EVAPORATOR MOTOR, 115V, 1/20 HP, 1550 RPM, PSC CAPACITOR FOR THIS MOTOR, 3µF, 370V	8216074 202163010
	EVAPORATOR MOTOR, 115V, 1/20 HP, 1550 RPM, SP	8216072
	EVAPORATOR MOTOR, 115V, 50W, 1550 RPM, ECM	8216124
X*050M THRU X*134M, X*024L THRU X*068L	CONDENSER AND EVAPORATOR MOTOR, 208-230V, 1/20 HP, 1550 RPM, PSC CAPACITOR FOR THIS MOTOR, 2µF, 370V	8216073 202163009
	EVAPORATOR MOTOR, 208-230V, 1/20 HP, 1550 RPM, SP	8216071
	EVAPORATOR MOTOR, 208-230V, 50W, 1550 RPM, ECM	8216125
XN026M THRU XN037M, XN018L	CONDENSER MOTOR MOUNT	10243000
	EVAPORATOR MOTOR MOUNT	12003000
X*050M THRU X*134M, X*024L THRU X*068L	CONDENSER AND EVAPORATOR MOTOR MOUNT (FOR SP AND PSC MOTORS)	21062000
	CONDENSER AND EVAPORATOR MOTOR MOUNT (FOR ECM MOTORS, 3 PER MOTOR)	8522938
XN026M THRU XN037M, XN018L	CONDENSER FAN, 10 INCH DIAM., 31˚ PITCH, CCW	204395018
	EVAPORATOR FAN, 8 INCH DIAM., 36˚ PITCH, CW	8221167
X*050M THRU X*134M, X*024L THRU X*068L	CONDENSER FAN, 12 INCH DIAM., 23˚ PITCH, CCW	8221169
	EVAPORATOR FAN, 10 INCH DIAM., 31˚ PITCH, CW (FOR SP AND PSC MOTORS)	8221168
	EVAPORATOR FAN, 10 INCH DIAM., 30˚ PITCH, CW (FOR ECM MOTORS)	8221174
ALL	HIGH PRESSURE CONTROL, 400 PSIG	8219424
XT050M THRU XT134M, XT024L THRU XT068L	CONDENSER FAN MOTOR PRESSURE CONTROL	8219417
XT106M AND XT134M, XT051L AND XT068L	CONDENSER FAN MOTOR TEMPERATURE CONTROL	8219019
XN018L THRU X*068L	DEFROST HIGH LIMIT THERMOSTAT	103079003
XN018L THRU XN024L - 115 VOLT ONLY	DEFROST HEATER RELAY, 115 VOLT COIL	8218979
XN051L THRU XN068L	DEFROST HEATER RELAY, 208-230 VOLT COIL	8218181
XN050M AND XN024L	EVAPORATOR MOTOR RELAY, 115 VOLT COIL	8218979
X*050M THRU X*134M, X*024L THRU X*068L	EVAPORATOR MOTOR RELAY, 208-230 VOLT COIL	8218181
XN026M THRU XN037M, XN018L	COMPRESSOR CONTACTOR, 115 VOLT COIL	8218979
XN050M AND XN024L	COMPRESSOR CONTACTOR, 115 VOLT COIL	8219002
X*050M THRU X*134M, X*024L THRU X*068L	COMPRESSOR CONTACTOR, 208-230 VOLT COIL	8219018
ALL 115 VOLT FREEZER	ELECTRONIC CONTROLLER, 115 VOLT, LOW TEMP	8522796
ALL 208-230 VOLT FREEZER	ELECTRONIC CONTROLLER, 208-230 VOLT, LOW TEMP	8522797
ALL 115 VOLT COOLER	ELECTRONIC CONTROLLER, 115 VOLT, MEDIUM TEMP	8522798
ALL 208-230 VOLT COOLER	ELECTRONIC CONTROLLER, 208-230 VOLT, MEDIUM TEMP	8522799
ALL	ELECTRONIC CONTROLLER BOX AND DEFROST TEMPERATURE SENSOR	8219958
ALL	LATCHES FOR EVAPORATOR COVER	8326021
ALL	GASKET FOR TOP AND BOTTOM OF EVAPORATOR SECTION (ORDER/FT)	8343051
XN018L	DEFROST HEATER, COIL, 400 WATTS, 22.5" LONG, 120 VOLT	8215137
XN024L	DEFROST HEATER, COIL, 500 WATTS, 26.5" LONG, 120 VOLT	8215144
X*024L THRU X*043L	DEFROST HEATER, COIL, 500 WATTS, 26.5" LONG, 240 VOLT	8215138
X*051L AND X*068L	DEFROST HEATER, COIL, 600 WATTS, 40.5" LONG, 240 VOLT	8215139
XN018L	DEFROST HEATER, DP, 400 WATTS, 19.5" LONG, 120 VOLT	8215140
XN024L	DEFROST HEATER, DP, 500 WATTS, 22.0" LONG, 120 VOLT	8215145
X*024L THRU X*043L	DEFROST HEATER, DP, 500 WATTS, 22.0" LONG, 240 VOLT	8215141
X*051L AND X*068L	DEFROST HEATER, DP, 600 WATTS, 35.0" LONG, 240 VOLT	8215142
XT050M THRU XT134M, XT024L THRU XT068L	DRAIN LINE HEATER	8215143
XT050M THRU XT134M, XT024L THRU XT068L	DRAIN LINE THERMOSTAT	103079003

Troubleshooting Guide

PROBLEM	POSSIBLE CAUSES	POSSIBLE CORRECTIVE STEPS
Compressor will not run	1. Main switch open.	1. Close switch.
	2. Fuse blown.	2. Check electrical circuits and motor winding for shorts or grounds. Investigate for possible overloading. Replace fuse after fault is corrected.
	3. Thermal overloads tripped.	3. Overloads are automatically reset. Check unit closely when unit comes back on line.
	4. Defective contactor or coil.	4. Replace.
	5. High pressure control open.	5. Determine cause of shutdown and correct . Replace control if defective.
	6. Locked out by controller.	6. Review compressor parameters. Replace controller if necessary.
	7. Motor electrical trouble.	7. Check motor for open windings, short circuit or burn out.
	8. Loose wiring.	8. Check all wire junctions. Tighten all terminal screws.
	9. Time delay by controller	9. Allow time delay to expire. See table 1, symbol c0,c2 and c4.
Compressor noisy or vibrating	1. Flooding of refrigerant into crankcase.	1. Check setting of expansion valve.
	2. Worn compressor.	2. Replace.
High discharge pressure	1. Non-condensables in system.	1. Remove the non-condensables.
	2. Condenser fan not running.	2. Check electrical circuit. Motor may be "off" on fan cycling controls if ambient is low. Replace motor if defective.
	3. Dirty condenser coil.	3. Clean.
	4. System overcharged with refrigerant.	4. Reclaim refrigerant and recharge proper amount.
Low discharge pressure	1. Insufficient refrigerant in system.	1. Check for leaks. Repair and add charge.
	2. Low suction pressure.	2. See corrective steps for low suction pressure.
High suction pressure	1. Excessive load.	1. Reduce load or add additional equipment.
	2. Expansion valve over feeding.	2. Check remote bulb. Regulate superheat.
Low suction pressure	1. Insufficient refrigerant.	1. Check for leaks. Repair and recharge system (see refrigerant charge on unit nameplate).
	2. Evaporator dirty or iced.	2. Clean. Check defrost parameters and modify as required.
	3. Expansion valve malfunctioning.	3. Check and reset for proper superheat.
Fan(s) will not operate	1. Main switch open.	1. Close switch.
	2. Blown fuses.	2. Replace fuses. Check for short circuits or overload conditions.
	3. Defective motor.	3. Replace motor.
	4. Controller parameters locking fans out.	4. Review parameters. Replace controller if necessary.
	5. Controller sensor defective.	5. Replace sensor.
	6. Unit in defrost cycle.	6. Wait for completion of cycle.
Box temperature too high	1. Controller temperature set too high.	1. Adjust temperature.
	2. Superheat too high.	2. Adjust thermal expansion valve.
	3. System low on refrigerant.	3. Add refrigerant. See refrigerant charge chart.
	4. Coil iced-up.	4. Manually defrost coil. Check defrost parameters and defrost sensor for malfunction.
Ice accumulating on ceiling around grill	1. Defrost duration is too long.	1. Adjust defrost termination temperature parameter .
	2. Not enough fan delay after a defrost.	2. Review parameters F0 and F1. Check for defective defrost sensor or controller.
	3. Too many defrosts.	3. Reduce number of defrosts (parameter dI).
Coil not clearing of frost during defrost cycle.	1. Coil temperature not getting above freezir point during defrost.	1. Check heater operation.
	2. Not enough defrost cycles per day.	2. Adjust controller parameter for more defrost cycles.
	3. Defrost cycle too short.	3. Adjust defrost termination temperature (parameter dt) to higher setting.
	4. Defective defrost sensor or controller.	4. Replace defective component.
Ice accumulating in drain pan	1. Defective heater.	1. Replace heater.
	2. Unit not installed properly (out of level)	2. Check and adjust if necessary.
	3. Drain line plugged.	3. Clean drain line.
	4. Defective sensor or controller.	4. Replace defective component.

Warranty Statement

PRINCIPAL TERMS AND CONDITIONS OF SALE

1. Applicable Law and Terms of Sale: All orders shall be subject to the following terms and conditions notwithstanding any additional or contrary printed terms and conditions of Buyer. Such additional or contrary terms shall not bind Seller unless accepted in writing even though such terms do not materially alter the terms hereof. No oral statements, warranties, stipulations, representations or terms shall have any binding effect or be any part of the contract whatsoever.

2. Orders: All orders must be in writing and will be binding when our order acknowledgment is mailed. Orders are accepted subject to strikes, fires, accidents, and other causes beyond our reasonable control. Acceptance of your order is conditioned upon an agreement to hold us harmless by reason of delivery delays.

3. Prices: Prices are subject to change without notice, and all quotations, unless otherwise specified, are binding only for immediate acceptance. Prices are based on material made to Seller's standard tolerances, unless otherwise specified.

4. Freight: All Apex units are shipped FOB Point of Shipment. Routing and selection of freight carrier will be made by Seller. For special routing requests, Buyer will bear all additional costs for such routing. Equipment is shipped at Buyer's risk. Buyer should examine equipment before signing transportation receipt. If equipment is received damaged or if quantity received does not match freight bill, the Buyer should require agent to so indicate on freight bill and immediately file a damage/missing claim. Our liability ceases upon delivery of equipment in good order to the freight carrier.

5. Taxes: Any sales, use, excise, or similar tax payable by Seller which is or may be imposed by any taxing authority upon manufacture, sale or delivery of goods covered by any order or any increase in rate of any such tax now in force, shall be added to the sales price; if not collected at the time of payment of sales price, Buyer will hold Seller harmless.

6. Limited Warranty: Seller warrants against defect in materials and workmanship in products which it manufactures for (2) year from date of installation or up to (30) thirty months from the date of shipment, whichever event occurs first, when properly installed and operated under normal use. This guarantee does not include any labor or other charges made outside of the Seller's factory for replacement or repair of defective parts unless specifically stated in the body of the Sellers invoice. On parts not manufactured by Seller, such as motors, controls, valves and compressors we extend to the Buyer the same warranties made to us by the manufacturer. Sellers only liability under this warranty or otherwise shall be the repair or replacement (at Seller's option) of non-conforming goods or parts. Seller assumes no liability for incidental or consequential damages such as injury to person or property, or lost profits.

7. THIS GUARANTEE SUPERSEDES AND IS IN LIEU OF ANY AND ALL OTHER WARRANTIES BY LAW OR CUSTOM, EITHER EXPRESSED OR IMPLIED INCLUDING, BUT NOT LIMITED BY THIS ENUMERATION, ANY GUARANTEE AS TO QUALITY OR FITNESS FOR ANY PARTICULAR PURPOSE, EXCEPT AS SET FORTH ABOVE. NO PERSON, AGENT, OR DEALER IS AUTHORIZED TO GIVE ANY WARRANTIES ON BEHALF OF SELLER NOR TO ASSUME FOR SELLER ANY OTHER LIABILITY IN CONNECTION WITH ANY OF THE SELLER'S PRODUCTS.

8. Delivery: Seller shall not be liable for any delays in or failure of delivery due to acts of God or public authority, labor disputes, accidents, fires, floods, extreme weather conditions, failure of and delays by carriers, shortages of material, delays of a supplier, and any other cause beyond Seller's control. In no event shall Seller be liable for consequential or special damages arising out of a delay in or failure of delivery. Failure to meet estimated ship dates will not be considered sufficient cause of cancellation of orders.

9. Cancellations and Returned Goods: Permission to return any part or product must be obtained from Seller and may be subject to a restocking charge. Credits for new material accepted for return will be at the original sales price or current market price, whichever is lower, less handling and restocking charges. Buyer must prepay all transportation charges. Any costs for putting material in condition for resale will be charged to the Buyer. Shipment of material returned without factory authorization or not properly tagged with a Return Material Authorization Number or that is not shipped freight-prepaid cannot be received by Seller. Obsolete products or material made to special order are not returnable.

10. Catalog Materials and Drawings: Seller is not responsible for typographical errors or other errors of omission in Seller's catalogs or drawings.

11. Late Charge Provision: Buyer agrees to pay a late charge of 1-1/2% per month (18% per year) for any invoice or bill not paid within (30) thirty days of the date of the billing invoice.

12. Choices of law, Disputes: This agreement and the performance of the parties hereunder shall be construed in accordance with and governed by the laws of the State of California and shall be deemed made in the state. Buyer irrevocably consents to the exclusive jurisdiction of the courts of Orange County, California, on all matters arising out of or relating to this sale and Buyer further irrevocably consents to service of process by certified mail, return receipt requested, at Buyers address set froth in the order acknowledgement. The above terms and conditions apply to all orders placed with the Seller. Buyer acknowledges having read and understood these terms and conditions and agrees to abide by them upon placement of any order with the Seller. In the event it becomes necessary to refer the account to a collection agency or to institute legal action to obtain payment of the account, Buyer agrees to pay all reasonable attorney fees and court costs incurred by such action.