



# Installation and Operations Manual

Bulletin H-IM-PSM

May 2013

Part Number 25008001

## PRO<sup>3</sup> Side Mount Packaged Refrigeration System



**PRO<sup>3</sup>**  
Side Mount

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## Inspection

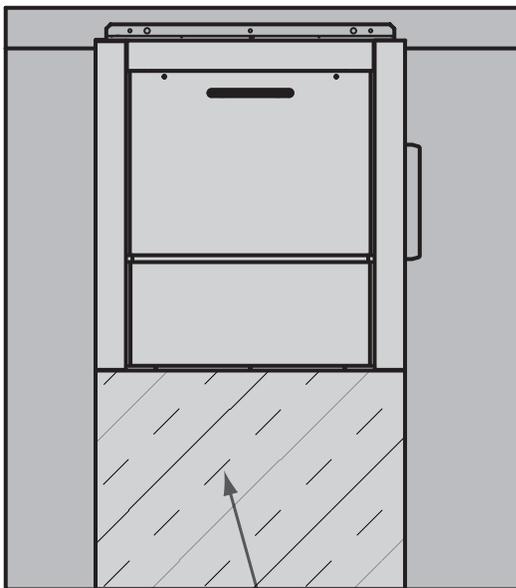
1. Each shipment should be carefully checked against the bill of lading.
2. The shipping receipt should not be signed until all items listed on the bill of lading have been accounted for.
3. Check packaging for signs of damage.
4. Any shortage or damages should be immediately reported to the delivering carrier.
5. Damaged material becomes the delivering carrier's responsibility, and should not be returned to the manufacturer unless prior approval is given to do so.
6. All units are shipped on heavy skids and enclosed in open crating. Generally, it is advisable to bring the unit as close to its final location as possible before removing crating.
7. When unpacking the system, care should be taken to prevent damage.
8. Avoid removing the shipping base until the unit has been moved to the final destination.

## Installation Requirements

### Recommended Unit Placement

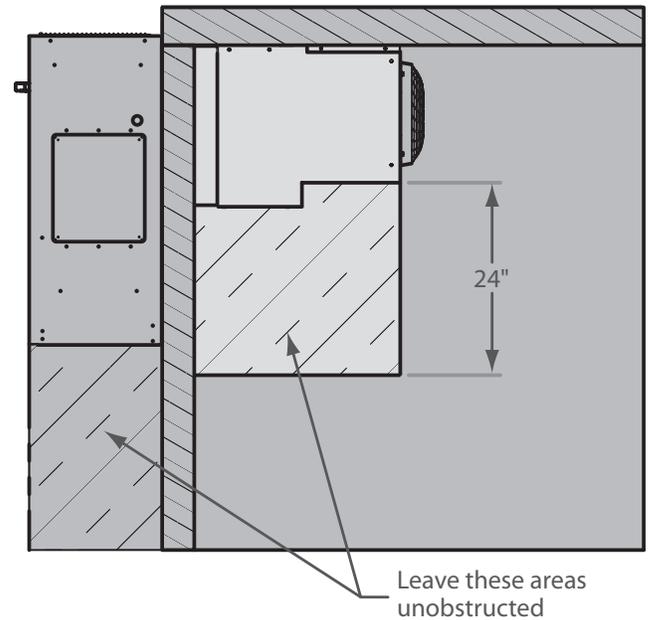
1. Ensure that the structural integrity of the box can withstand the weight of the side-mounted equipment.
2. The air pattern must cover the entire room.
3. Location of aisles, racks, etc. must be known.
4. For space requirements, see FIGURES 1 and 2.

FIGURE 1: System Space Requirements | Back View



Leave this area unobstructed

FIGURE 2: System Space Requirements | Side View

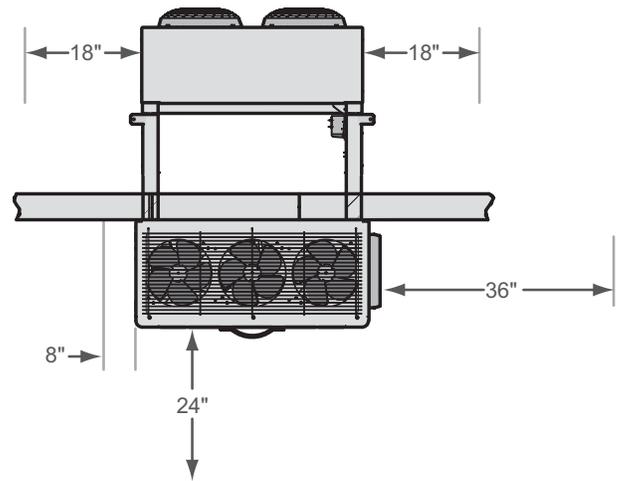


## Access Requirements

### Condensing Unit Section (Exterior of box)

Provide adequate access space (minimum 36") on the right side of the unit for electric box clearance. The front of the unit should have a minimum of 24" clearance for compressor and fan motor service. The left side of the unit should be a minimum of 8" clearance.

FIGURE 3: Access Requirements | Top View



### Evaporator Section (Interior of box)

The front of the evaporator should have no obstructions since this is the leaving airside of the evaporator. There should also be no obstructions under the evaporator. A minimum of 18" clearance should be held on each side of the evaporator for drain pan removal.

## Installation Procedures

**NOTE:** Installation and maintenance to be performed only by qualified personnel who are familiar with local codes and regulations and are experienced with this type of equipment.

**CAUTION:** Make sure all power sources are disconnected before any service work is done on units.

- A.) Inspect packaging/unit for shipping damage
- B.) Review the space and location requirements provided for your method of installation.
- C.) Follow installation instructions listed in method #1 or #2

## Installation Method #1

Top Installation (See FIGURES 4, 5 and 6)

This installation method is the recommended installation method in applications where it is feasible.

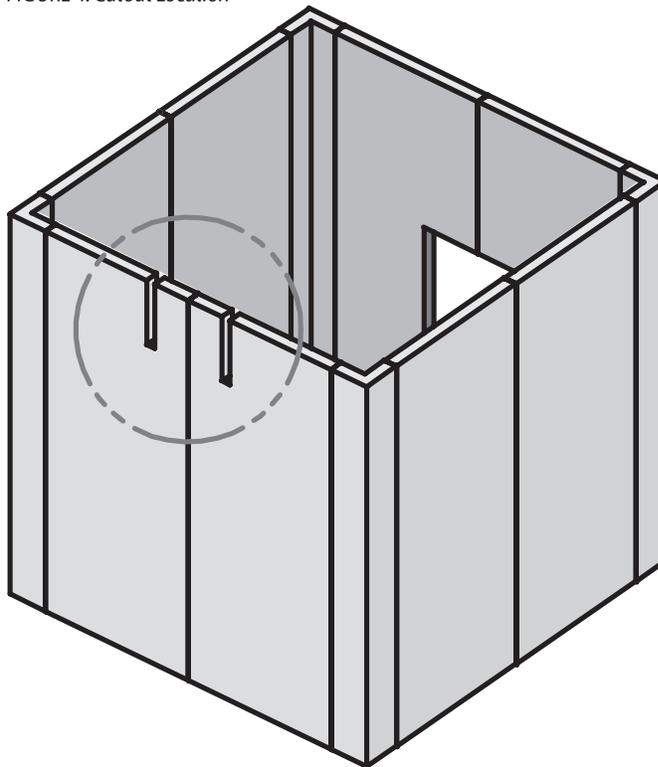
In order to install a unit using this method, you will need to provide cutout slots for the "arms." The unit should be placed on the wall prior to setting and securing the roof of the box.

Please use the following guidelines when completing the installation in this manner.

1. You will need to provide finished slots with the appropriate dimensions in the box wall. See FIGURES 5 and 6.
2. The slots can straddle a seam but they should not be on a seam. See FIGURE 4.
3. The cut-out sections should not be placed in a location where they would interfere with any cam locks.
4. It is preferred that a cam lock be placed in between the cutouts to give additional support

5. The unit will need to be lifted to the appropriate height and inserted into the open slots. The bottom of the unit should be temporarily supported during the remainder of the installation process (no portion of the unit should be supported by the bottom of the evaporator section as this WILL cause damage to the drain pan).
6. Set and secure the roof of the box and firmly attach the unit to the box and carefully seal all seams and penetration points.

FIGURE 4: Cutout Location



**CAUTION:** Do not support any portion of the unit by the drain pan.

FIGURE 5: Cutout Dimensions | Small Cabinet

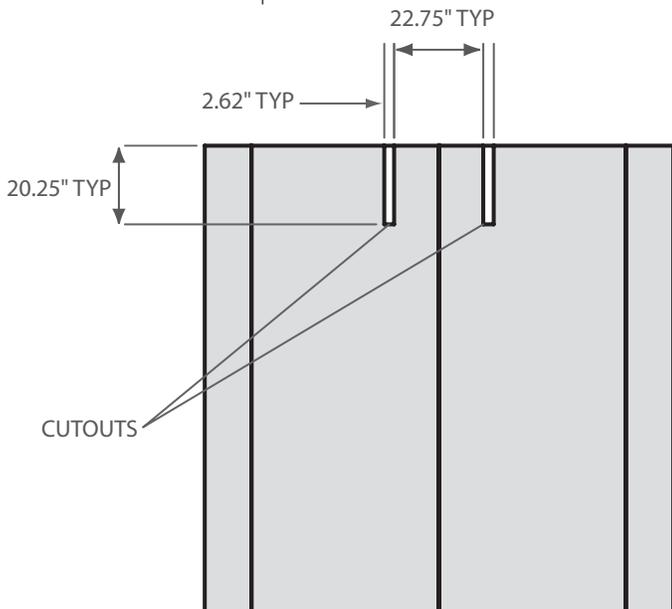
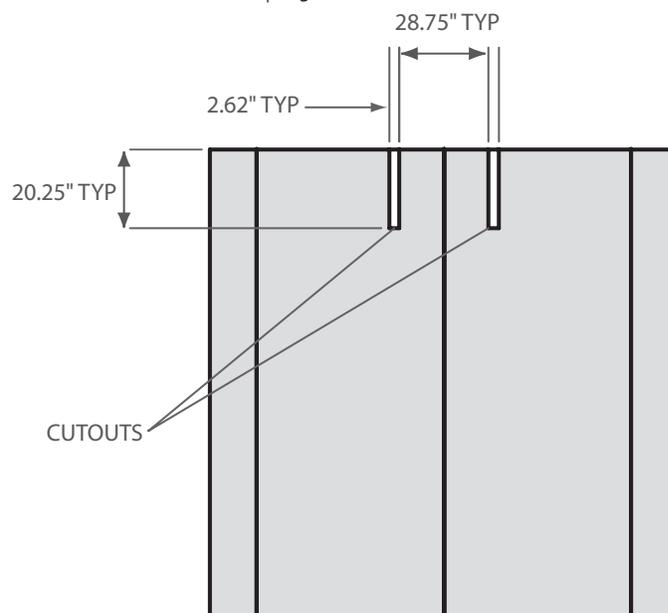


FIGURE 6: Cutout Dimensions | Large Cabinet



## Installation Method #2

Side Installation (See FIGURES 7, 8, and 9)

This installation method is intended for applications that have height restrictions that do not allow the unit to be installed from above (see method #1) and installations into pre-existing boxes where it is impractical to remove the roof.

In order to install a unit using this method, you must provide an additional “plug” section of the box to fill in the open space between evaporator arms after installation. This section should contain cam locks to anchor it in place.

Please use the following guidelines when completing the installation in this manner.

1. Provide a finished opening with the appropriate dimensions from FIGURE 8 or 9.
2. The cut-out section should not be placed in a location where it would degrade the structural integrity of the box (*should not interfere with cam locks*)
3. The unit will need to be lifted to the appropriate height and inserted into the open slot. The bottom of the unit should be temporarily supported during the remainder of the installation process (no portion of the unit should be supported by the bottom of the evaporator section as this WILL cause damage to the drain pan).
4. You should use cam locks to re-connect the “plug” section after installing the unit, firmly attach the unit to the box and carefully seal all seams.

FIGURE 7: Plug Detail

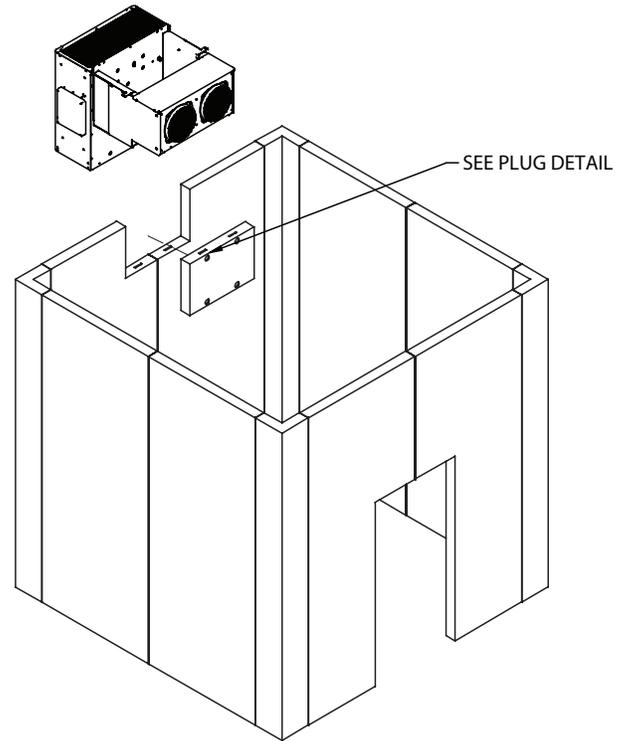


FIGURE 8: Plug Detail | Small Cabinet

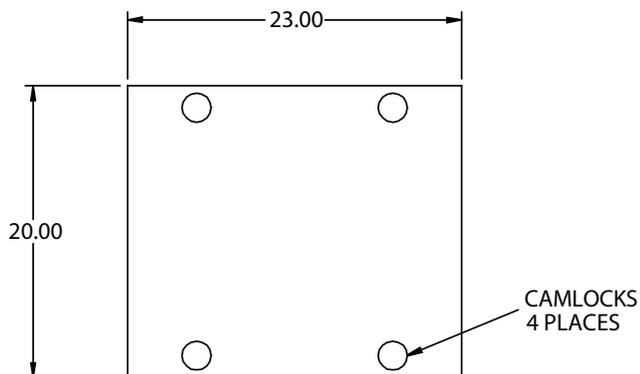
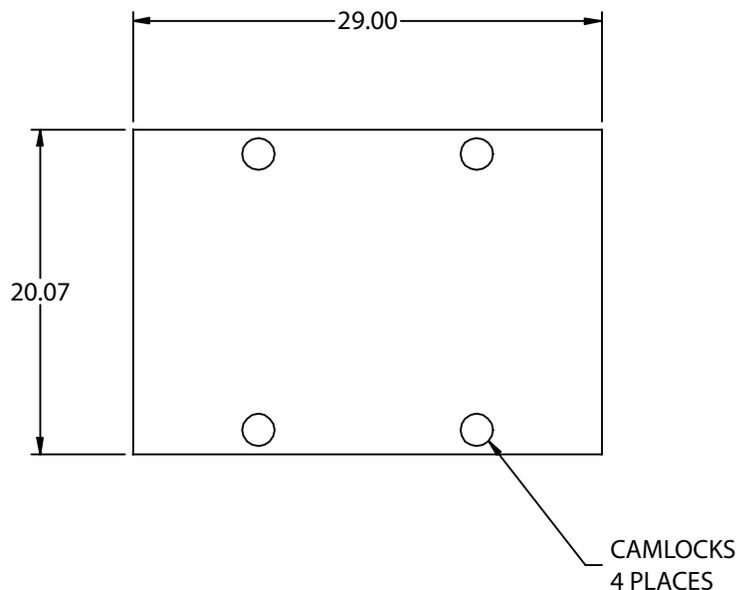


FIGURE 9: Plug Detail | Large Cabinet



## Rigging

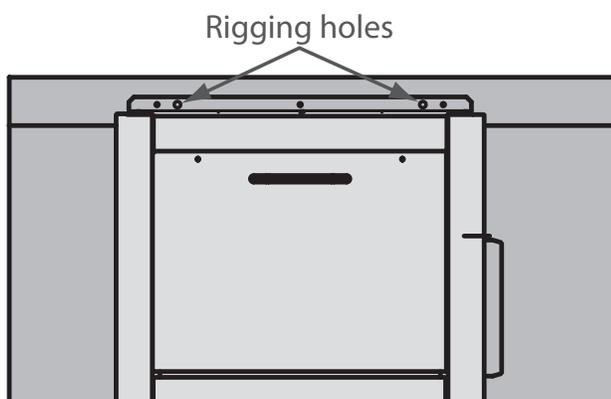
**CAUTION: Avoid contact with sharp edges and coil surfaces. They are a potential injury hazard. Wear gloves during moving and rigging.**

Caution should be exercised when moving these units. To prevent damage to the unit housing during rigging, cables or chains used must be held apart by spacer bars. Rigging holes are provided on all models. See FIGURES 10 and 11.

FIGURE 10: Rigging Holes



FIGURE 11: Rigging Holes | Front View



## Mounting

The system requires two through-bolts to be used to connect to the roof panel. A minimum of four through-bolts should be used to connect to the side panel of the box. The opposite side of the box should be reinforced with wood or metal to prevent the bolts from pulling through the panel. See FIGURES 12, 13 and 14 for locations.

Through bolts should be insulated or non-conductive to prevent sweating. All penetrations to the box should be caulked to prevent moisture from entering the box.

1. Install two through bolts to secure the unit to the wall. The inside of the box should be reinforced with wood or metal for proper when mounting of the unit to the box with through bolts.
2. Install and secure the roof of the box. Inside the box, provisions have been made to secure the evaporator section to the roof panel with through bolts.
3. The area between the evaporator section and the roof panel should be caulked to meet NSF codes. In addition, the openings where the unit was lowered into the box panel area should be caulked to prevent any infiltration from the outside area into the box.

4. Ensure that the condensing unit airflow is not obstructed after removing the temporary support.
5. Do not obstruct the evaporator airflow with shelving. The area below the evaporator should be left completely open.
6. Connect unit to power supply through knock-out provided above electrical box using all local wiring codes.
7. Apply power to unit. All controls are preset to factory default settings. See Table 4 (next page).
8. Check the unit for proper operation.

FIGURE 12: Mounting Holes | Side View

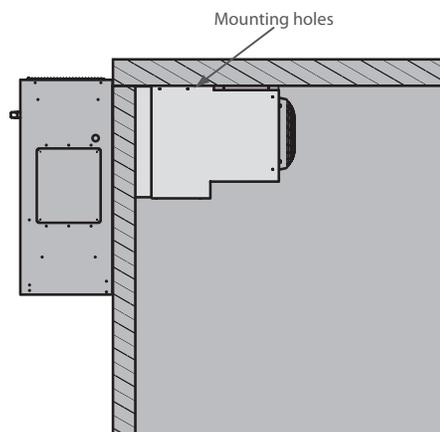


FIGURE 13: Mounting Holes | Front View

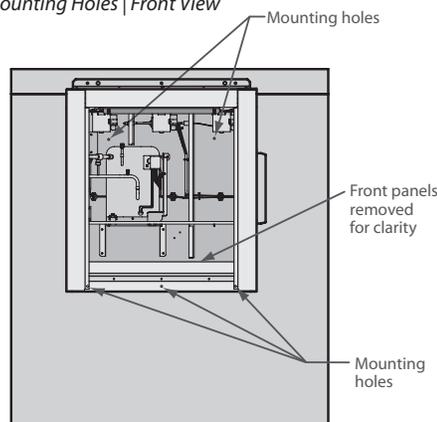
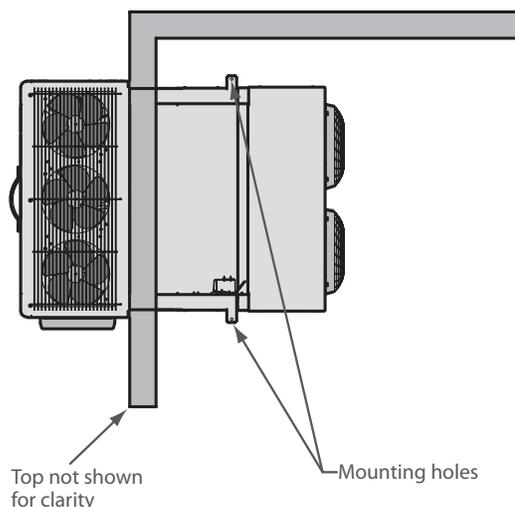


FIGURE 14: Mounting Holes | Top View



## Inspection

- Each shipment should be carefully checked against the bill of lading.
- The shipping receipt should not be signed until all items listed on the bill of lading have been accounted for.
- Check packaging for signs of damage.
- Any shortage or damages should be immediately reported to the delivering carrier.
- Damaged material becomes the delivering carrier's responsibility, and should not be returned to the manufacturer unless prior approval is given to do so.
- When unpacking the system, care should be taken to prevent damage.
- Avoid removing the shipping base until the unit has been moved to the final destination.
- Complete warranty return card for each unit and mail to Heatcraft Refrigeration Products.
- Clean the roof of the box to provide a good sealing surface for the unit weatherstrip. Refer to box manufacturer's instructions for any procedures or processes necessary to ensure the integrity of the exposed foam in the panels is not compromised.
- Check the mounting surface with a level. PRO<sup>3</sup> units require a surface that is within 1° of level or better and no more than a 5/8" drop per 3 feet (17mm drop per meter).
- For walk-in boxes with aluminum top panels, it is recommended that a thermal break be placed on the roof adjacent to the opening to prevent the possibility of sweating.
- Place the unit gently into the provided opening with the evaporator air flow directed toward the door (See page 4). Be careful not to damage the grill during installation.
- Ensure that the condenser air flow is not obstructed.
- Install the trim around the inside opening with the hardware provided.
- Connect unit to power supply using the cord with plug, if provided, or hard wire. Adhere to local electrical/wiring codes.
- Apply power to unit. **All controls are preset to factory default settings** (See Table 4).
- Check unit for proper operation.

## General Safety Information

- Installation and maintenance to be performed only by a licensed contractor.**
- Ensure that the structural integrity of the box can withstand the weight of the PRO<sup>3</sup> (See page 25, Table 7 for unit weights).
- Avoid contact with sharp edges and coil surfaces. They are a potential injury hazard. Wear gloves during moving and rigging.
- Make sure all power sources are disconnected before any service work is done on units.

## Standard Installation Procedure

- Inspect packaging for shipping damage. Open package and inspect unit for concealed damage.
- Review the space and location requirements on page 4.
- Provide a finished opening in the box ceiling, to the appropriate dimensions and structural strength as stated on page 2, Table 3.
- DO NOT remove or disengage any box cam-locks in order to install the PRO<sup>3</sup> unit.
- To change defaults as a group follow these steps:
  - Press Set button and hold in until the display flashes "PS".
  - Press the Set Button and the display will change to "0" and will begin to flash.
  - Press the up button until "22" is displayed.
  - Press the Set button.
  - Press the down button 2 times. "EZY" will be displayed.
  - Press the Set button.
  - Select the proper number for the model needed by pressing the up or down key.
    - 1 - L Low temperature model
    - 2 - M Med temperature model
    - 3 - H High temperature model
  - Press "SET" and wait for unit to return out of programming mode.
  - Turn power off
  - Press "SET" key while turning unit on
  - "CE" should display to verify programming display

**TABLE 4 Control Factory Default Settings**

PST Models	Temperature Set Points	Defrost Start Times	Defrost Duration (Maximum)	Drip Time	Fan Delay	Defrost Termination Set Point	EZY Default
H - Cooler Models Air Defrost	38°F	4 / day	40 min.	-	-	40°F	3
M - Cooler Models Electric Defrost	35°F	4 / day	40 min.	2 min.	1 min.	65°F	2
L - Freezer Models Electric Defrost	-10°F	4 / day	40 min.	2 min.	1 min.	65°F	1

## Electrical Connection

1. Refer to all local codes for proper connection
2. A knock-out provider for 1" conduit on the side of the condensing unit section above the electrical box. See FIGURE 12.
3. Wire will be brought into the electrical box through the bottom of the electrical box and connected to the top of the contactor.

## Refrigeration/Defrost Sequence of Operation

The sequence of operation varies depending on the model that has been installed. The three basic models are Low Temperature, Medium Temperature, and High Temperature models. The particular model can be determined by the seventh digit of the model number. See Tables 1-3 for details and settings.

Control of the refrigeration and defrost system is provided by the Carel controller along with a space (box) temperature sensor and a coil (defrost) temperature sensor. The controller will control on and off switching for the compressor, condenser fan motor(s) (cycles with the compressor), evaporator fan motor(s) and electric defrost heaters for electric defrost.

The Carel controller is pre-programmed for all three applications. This is done with the use of the parameter list. The parameter list can be changed by entering the Carel Controller and changing the "EZY" setting. See page 14.

**TABLE 1 Model PST | Low Temperature Models | EZY SETTING =1**

SET POINT IS -10° F

These models are intended for freezer applications and require electric defrost.

Status		Compressor	Condenser Fans	Evaporator Fans	Defrost Heaters	Notes
Off	Display alternates "OFF" and Room Temperature	Off	Off	Off	Off	If unit shows "OFF", depress the "^" button and hold for three seconds.
On	Automatic Defrost on start up	Off	Off	Off	On	If coil temperature is below 65° F. If it is above, defrost is not initiated. Drip Time and Freeze Time are ignored.
On	Defrost Sensor reaches 65° F and defrost is terminated	Off	Off	Off	Off	
On	Cooling cycle initiated - Drip Time	Off	Off	Off	Off	System Timer Begins/ 2 min drip time
On	Drip Time of 2 minutes ends - coil freeze begins	On	On	Off	Off	Compressor starts and evaporator fans delay for 2 minutes to freeze the coil.
On	Evaporator fans start after 2 min delay	On	On	On	Off	
On	Box Temperature (-10.1° F) is satisfied	Off	Off	On	Off	
On	Box Temperature rises to -8.0° F	On	On	On	Off	2° F Differential, Minimum Compressor Off time is 4 minutes
On	Defrost Initiated (Manually or 6 hour counter)	Off	Off	Off	On	Electric Defrost
On	Cooling cycle initiated - Drip Time	Off	Off	Off	Off	System Timer Begins/ 2 min drip time
On	Drip Time of 2 minutes ends - coil freeze begins	On	On	Off	Off	Compressor starts and evaporator fans delay for 1 minute to freeze the coil.
On	Evaporator fans start after 1 min delay	On	On	On	Off	

**TABLE 2 Model PST | Medium Temperature Models | EZY SETTING =2**

SET POINT IS 35° F

These models are intended for cooler applications and have electric defrost. These models are intended for coolers that may be operated at a lower saturated suction temperature and require electric defrost to clear the coil.

Status		Compressor	Condenser Fans	Evaporator Fans	Defrost Heaters	Notes
Off	Display alternates "OFF" and Room Temperature	Off	Off	Off	Off	If unit shows "OFF", depress the "^" button and hold for three seconds.
On	Automatic Defrost on start up	Off	Off	Off	On	If coil temperature is below 65° F. If it is above, defrost is not initiated. Drip Time and Freeze Time are ignored.
On	Defrost Sensor reaches 65° F and defrost is terminated	Off	Off	Off	Off	
On	Cooling Cycle initiated - Drip Time	Off	Off	Off	Off	System Timer Begins/2 min drip time
On	Drip Time of 2 minutes ends	On	On	On	Off	Compressor and evaporator fans start
On	Box Temperature (33.9° F) is satisfied	Off	Off	On	Off	
On	Box temperature rises to 36° F	On	On	On	Off	2° F Differential, Minimum Compressor Off Time is 4 minutes
On	Defrost Initiated (manually or 6 hour counter)	Off	Off	Off	On	Electric Defrost
On	Defrost terminated by temperature 65° F	On	On	On	Off	
On	Drip Time of 2 minutes ends	On	On	On	Off	Compressor starts and evaporator fans delay for 1 minute to freeze coil

**TABLE 3 Model PST | High Temperature Models | EZY SETTING =3**

SET POINT IS 38° F

These models are intended for cooler applications and have air (Off-cycle) defrost. The controller is pre-programmed for 4 defrost per day. These periods are reprogrammable.

Status		Compressor	Condenser Fans	Evaporator Fans	Defrost Cycle	Notes
Off	Display alternates "OFF" and Room Temperature	Off	Off	Off	Off	If unit shows "OFF", depress the "^" button and hold for three seconds.
On	Cooling Cycle initiated	On	On	On	Off	System Timer Begins
On	Box Temperature (37.9° F) is satisfied	Off	Off	On	Off	
On	Box temperature rises to 40.0° F	On	On	On	Off	2° F Differential, Minimum Compressor Off Time is 4 minutes
On	Defrost Initiated (Manually or 6 hour counter)	Off	Off	On	On	Air Defrost
On	Defrost Terminated by temperature of 38° F	On	On	On	Off	

## Programming the PJEZC Carel Electronic Controller

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The Carel PJEZC control is a fully configurable electronic refrigeration controller. The Side Mount packaged refrigeration system uses the Carel controller on all three temperature designated models. The models differ by a pre-programmed parameter list that is specific for each application.

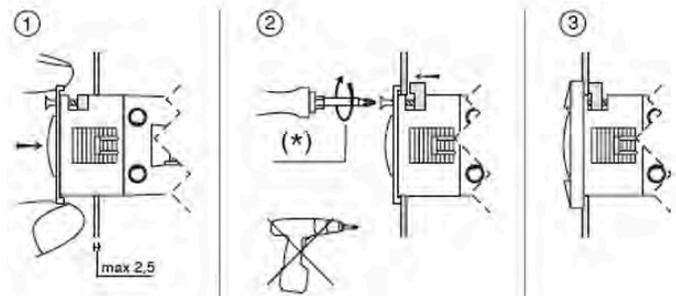
There are two levels of programming with the C controller. The first level can be accessed through the keypad. Set Point (st), Interval between defrost (do), Maximum Defrost Duration (dP), and Dripping Time (dd) are examples of first level parameters. Second level parameters can be accessed by entering a password. See "Modifying Parameters" (page 16).



## Installation and Removal

### PANEL INSTALLATION FROM THE FRONT USING SCREWS

- The thickness of the fastening panel must not exceed 3 mm;
- Remove the front frame and make sure that the two catches are in place (these must not protrude from the outline of the drilling template). If necessary, unscrew the two screws. Do not unscrew excessively, the screws must not be detached from the front panel (phase 1);
- Insert the instrument in the opening in the panel and hold it in position by the centre of the front panel (phase 1);
- Using the screwdriver, tighten the bottom screw 90°, the catch must come out of its slot and click onto the panel, then tighten until the front panel is secure; Do not over-tighten, when the front panel is secured blocks simply make another ½ turn to compress the gasket; If the catch does not click onto the panel, unscrew the screw, applying pressure at the same time with the screwdriver so that the catch moves back. Do not unscrew too much, the head of the screw must not be raised from the surface of the front panel (phase 2);
- Repeat the same operation for the top screw (phase 2);
- Apply the front frame (phase 3).



\* Do not over-tighten the screws.

### DISMANTLING USING THE SCREWS FROM THE FRONT

- Unclip the front frame;
- Unscrew the bottom screw, at the moment the front panel detaches from the panel keep pressure on the screw and unscrew a further 90° to make the catch go back into its slot;
- Repeat for the top screw;
- Remove the instrument from panel, keeping it horizontal

## Electrical Connections

### WARNINGS:

The electrical connections must only be completed by a qualified electrician;

A power supply other than the type specified may seriously damage the system;

Separate as much as possible the probes and digital input signal cables from the cables carrying inductive loads and power cables to avoid possible electromagnetic disturbance. Never lay power cables (including the electrical cables) and probe signal cables in the same conduits. Do not install the probe cables in the immediate vicinity of power devices (contactors, circuit breakers or similar);

Reduce the path of the probe and sensor cables as much as possible, and avoid spiral paths that enclose power devices. The probes must be connected using shielded cables (minimum cross-section of each wire: 0.5 mm<sup>2</sup>);

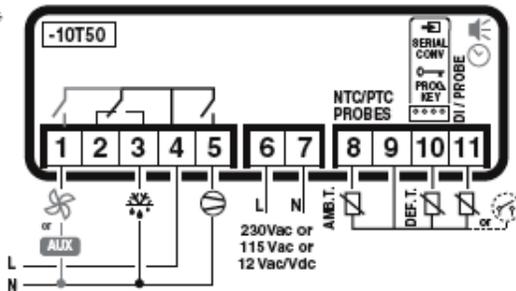
Avoid direct contact with internal electronic components;

Connection errors (and connections other than those indicated in this manual) may involve danger to the safety of the users and cause faults on the instruments and the components connected;

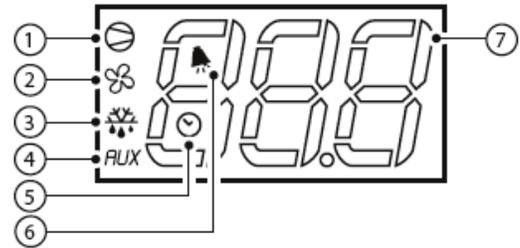
Fit the unit with all the electromechanical safety devices required to guarantee correct operation and the complete safety of the user.

### CONTROLLER WIRING

PJZ(C, Y)\*

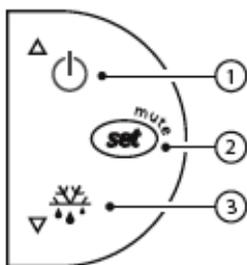


## Display



BUT. NO.	FUNCTION	NORMAL OPERATION			START UP
		ON	OFF	flash	
1	compressor	on	off	call	on
2	fan	on	off	call	on
3	defrost	on	off	call	on
4	auxiliary output (AUX)	output active	output not active	-	on
5	clock (RTC)	RTC available, enabled (tEN=1) and at least one time band has been set)	RTC not available or not enabled (tEN=0) or no time band set		on (if the clock is fitted)
6	alarm	alarm in progress	no alarm in progress	-	on
7	digits	three digits with decimal point and range -199 to 999. See parameters /4, /5, /6 for the type of probe displayed, values in °C/°F and decimal point			

## Keypads



BUT. NO.	NORMAL OPERATION		START UP
	pressing the button alone	pressing with other buttons	
1	more than 3 s: switch ON/OFF	pressed together with 3 activates/deactivates the continuous cycle	-
2	- 1 s: displays/sets the set point - more than 3 s: accesses the parameter setting menu (enter password 22) - mutes the audible alarm (buzzer)	-	for 1 s RESET current EZY set
3	more than 3 s: activates/deactivates the defrost	pressed together with 1 activates/deactivates the continuous cycle	for 1 s displays firmware version

## Preliminary Configurations

Once the electrical connections have been completed, simply power-up the controller to make it operative.

Heatcraft recommends that you check the parameters listed on page 18.

Control Parameters	
st	set point
rd	set point differential

Defrost Parameters	
d0	type of defrost
dl	interval between two defrosts
dt	end defrost temperature
dP	maximum defrost duration

Alarm Parameters	
Ad	temperature alarm delay
AL	low temperature alarm threshold/deviation
AH	high temperature alarm threshold/deviation

## Functions Available from Keypad

### ON AND OFF

**Switching the instrument ON:** press UP for more than 3 s (when pressing the button, the display shows ON).

**Switching the instrument OFF:** press UP for more than 3 s. The display shows the message "OFF", alternating with the temperature measured by the set probe.

In off status, the following functions are disabled (if featured by the model):

- compressor control / duty setting / continuous cycle;
- defrost;
- fan control;
- alarms : 'LO', 'HI', 'IA', 'cht', 'CHT';
- door switch (A4= 7/8 );
- buzzer (when available)

While the following are enabled:

- temperature display, alternating with the message "OFF";
- parameter display and setting;
- alarms: "E0", "E1", "E2";
- the internal timer relating to parameter 'dl' is updated. If 'dl' expires in OFF status, a defrost is performed when restarting;
- auxiliary relay management, only in the following configurations:
  - H1= = 1/2 ("E0" alarm only)
  - H1= 3, A4= 6;

(dd) and postdripping (Fd).

## SET POINT SETTING (DESIRED TEMPERATURE VALUE)

The easy and easy compact devices control the desired temperature (set point) inside the cabinet or cold room directly and dynamically.

To view and modify the set point:

- press SET for 1 s, the set value will start flashing;
- increase or decrease the value using UP or DOWN;
- press SET to confirm the new value.

## MANUAL DEFROST

Press DOWN for more than 3 s (activated only if the temperature conditions are right).

## CONTINUOUS CYCLE

Press UP+DOWN for more than 3 s (activated only if the temperature conditions are right).

The continuous cycle is used to maintain refrigeration active in the cabinet or cold room, regardless of the temperature inside the unit. This may be useful for rapidly bringing the temperature below the set point value.

## RAPID DISPLAY OF THE TEMPERATURE READ BY THE OTHER PROBES

Press the DOWN button to scroll the temperatures read by the probes. Each time the DOWN button is pressed, the display will show the name of the probe Pr1, Pr2 or Pr3 (only on the models with 3 inputs and with multifunction input configured as a probe) and after 1 s the temperature measured by the selected probe will be displayed.

To display the other probes, press DOWN again.

To return to the normal display, wait 3 s without pressing any buttons (exit by timeout).

## Temperature Display

The temperature displayed, the unit of measure and the decimal resolution can be set according to the following parameters: /4, /5 and /6.

### /4 : select probe displayed

Used to choose whether to display the temperature read by the control probe (Probe 1), Probe 2 or the status of the multifunction input (analogue or digital).

Parameter /4 selects the probe shown on the display, all the other display and control modes remain unchanged.

**IMPORTANT:** the easy compact models can display up to 2 probes.

### /5: select °C/°F

Defines the unit of measure used for temperature control.

/5=0 to work in °C

/5=1 to work in °F.

## WARNING:

**when changing from one unit of measure to the other, all the values of the temperature parameters are modified to the new unit of measure.**

**The max and min limits of the absolute temperature parameters are the same for both °C that °F. The range of temperatures allowed is therefore different between °C and °F:**

### /6: disable decimal point

Used to enable or disable the temperature display with the resolution to the tenths of a degree between -20 and +20 (easy) or -10 and +10 (easy compact).

/6=0 temperature displayed to the tenth of a degree;

/6=1 temperature displayed without the tenths of a degree.

**NOTE:** the decimal point is only disabled in relation to the reading shown on the display (the calculations performed by the controller remain unchanged).

## Temperature Control

The following parameters are used to control the temperature: St, r1, r2, r3, r4 and rd.

### St: set point, r1 minimum value and r2 maximum value of the set point

Parameter St determines the desired temperature to be maintained inside the cabinet or cold room (set point). Parameters r1 (minimum value) and r2 (maximum) set the range of temperatures for setting the set point.

**NOTE:** the set point can be set by pressing the SET button (see par. "Setting the set point (desired temperature value)").

### r3: select direct/reverse operation

Defines the operating mode of the device:

- r3=0: direct with defrost. Used to request the activation of the compressor when the temperature measured by probe 1 rises above the set point. This mode also includes defrost
- r3=1: direct without defrost
- r3=2: reverse without defrost. Used to request the activation of the compressor when the temperature measured by probe 1 falls below the set point. This mode does NOT include defrost.

## Table of Alarms and Signals

When an alarm is activated, the display shows the corresponding message that flashes alternating with the temperature; if fitted and enabled, the buzzer and the alarm relay are also activated.

All the alarms have automatic reset (that is, they stop when the causes are no longer present), except for alarm 'CHt' which has manual reset (instrument on/off using the UP button or by disconnecting the power supply)

## Rapid Parameter Set Selection (EZY)

The easy controller features the EZY parameter which is used to quickly choose a list of parameters, with corresponding values, for the control of the refrigeration system.

and the alarm relay only go off when the causes of the alarm have been resolved. The alarm codes are shown in the table below:

### NOTE:

- to restore the selected rapid parameter set at any time, turn the controller off and on again, while holding SET. The display shows "CE" to indicate that the selected rapid set (EZY= 1, 2, 3) has again overwritten the operating parameters, thus restoring the original set of parameters;
- to restore all the parameters and return to the original default values (factory settings), turn the controller off and on again while holding DOWN and SET, until the display shows "CF". Use this procedure with extreme care, as it may compromise the fundamental control settings;
- EZY=0 brings no change;

Pressing the SET button mutes the buzzer, while the code displayed and the alarm relay only go off when the causes of the alarm have been resolved.

The alarm codes are shown in the table below:

Alarm Code	Buzzer and Alarm Relay	LED	Alarm Description	Reset	Enable Alarm parameters involved
E0	active	ON	probe 1 error= control	automatic	-
E1	not active	ON	probe 2 error= defrost	automatic	d0= 0 / 1 / 4, F0= 1
E2	not active	ON	probe 3 error= condenser/ product	automatic	[A4=10]
IA	active	ON	external alarm	automatic	[A4 = 1] [+A7]
dOr	active	ON	open door alarm	automatic	[A4 = 7/8][+A7]
LO	active	ON	low temperature alarm	automatic	[AL] [Ad]
HI	active	ON	high temperature alarm	automatic	[AH] [Ad]
EE	not active	ON	unit parameter error	not possible	-
EF	not active	ON	operating parameter error	manual	-
Ed	not active	ON	defrost ended by timeout	on first defrost ended correctly	[dP] [dt] [d4] [A8]
dF	not active	OFF	defrost running	automatic	[d6=0]
cht	not active	ON	dirty condenser pre-alarm	automatic	[A4=10]
CHt	active	ON	dirty condenser alarm	manual	[A4=10]
EtC	not active	ON	clock alarm	by setting the time	if bands active

## Description of the Main Signals and Alarms

### LED flashing

The activation of the corresponding function is delayed by a timer, awaiting an external signal or disabled by another procedure that is already in progress. e.g. if is a continuous cycle in progress and a defrost is called, the latter will remain pending until the end of the continuous cycle, and the corresponding LED (defrost) will flash.

### E0 steady or flashing

Control probe error:

- probe not working: the probe signal is interrupted or short-circuited;
- probe not compatible with the instrument;

The alarm signal E0 is steady if it is the only active alarm (the temperature value is not displayed), while it flashes if other alarms are active or the second probe is displayed.

### E1 flashing

Evaporator probe or food conservation probe error:

- probe not working, the probe signal is interrupted or short-circuited;
- probe not compatible with the instrument;

### E2 flashing

Condenser probe or food conservation probe error:

- probe not working, the probe signal is interrupted or short-circuited;
- probe not compatible with the instrument;

### LO flashing

Low temperature alarm. The probe has measured a temperature lower than the set point by a value that exceeds parameter AL:

- check parameters AL, Ad and A0.

The alarm is automatically reset when the temperature returns within the set limits (see parameter AL).

### HI flashing

High temperature alarm. The probe has measured a temperature higher than the set point by a value that exceeds parameter AH.

- check parameters AH, Ad and A0.

The alarm is automatically reset when the temperature returns within the set limits (see parameter AH).

### EE displayed during operation or on power-up

unit parameter reading error. See Data errors.

### EF displayed during operation or on power-up

operating parameter reading error. See Data errors.

### Ed flashing

The last defrost ended after exceeding the maximum duration rather than when reaching the end defrost set point.

- check parameters dt, dP and d4;
- check the efficiency of the defrost.

The message disappears when the next defrost ends correctly.

### dF flashing

Defrost running:

- this is not an alarm signal, but rather a message that the instrument is running a defrost. Only shown if d6= 0.

## Data Error

In certain operating conditions, the instrument may detect errors in the data saved. These errors may compromise the correct operation of the instrument. If the microprocessor detects a data saving error, the display shows the message "EE".

If the fault persists, the controller needs to be replaced. If, on the other hand, the message disappears, it can continue to be used. When "EE" error occurs frequently and/or remains for some time, the controller should be checked, as the original precision may not be guaranteed.

## Modifying the Parameters

### PARAMETER NAVIGATION

The operating parameters, modifiable using the keypad, are divided into two types: frequent (type F) and configuration (type C). Access to the latter is protected by password (default= 22) to prevent accidental or unauthorized modifications.

#### Accessing the type F parameters:

- press the SET button for more than 3 s (if there are active alarms, mute the buzzer), the display shows the parameter code 'PS' (password);
- use the UP and DOWN buttons to scroll the parameters. The LED corresponding to the category of parameters will be on;
- press SET to display the value associated with the parameter increase or decrease the value using the UP or DOWN button respectively;
- press SET to temporarily save the new value and display the parameter again;
- repeat the procedure for any other parameters that need to be modified;
- press the SET button for more than 3 s to permanently save the parameters and exit the parameter setting procedure.

#### Accessing the type C parameters:

- press the SET button for more than 3 s (if there are active alarms, mute the buzzer), the display shows the parameter code "PS" (password);
- press the SET button to access the password setting;
- use the UP and DOWN buttons to scroll the numbers until displaying "22" (password to access the parameters);
- press the SET button to confirm the password;
- use the UP and DOWN buttons to scroll the parameters. The LED corresponding to the category of parameters will be on (see Table below);
- press SET to display the value associated with the parameter increase or decrease the value using the UP or DOWN button respectively;
- press SET to temporarily save the new value and display the parameter again;
- repeat the procedure for any other parameters that need to be modified;
- press the SET button for more than 3 s to permanently save the parameters and exit the parameter setting procedure.

#### Warnings:

**If no button is pressed for 60 s, all the changes made to the parameters, temporarily saved in the RAM, will be cancelled and the previous settings restored.**

**The dAY, hr, Min parameters are not restored, as these are saved instantly when entered.**

**If power is disconnected from the instrument before saving the settings (pressing the SET button for 3 s), all the changes made to the parameters and temporarily saved will be lost.**

Category	Initial	Icon
Probe parameters	/	-
Control parameters	r	-
Compressor parameters	c	
Defrost parameters	d	
Alarm parameters	A	
Fan parameters	F	
AUX output configuration parameters	H1	AUX
RTC parameters	-	

## Setting the Default Parameters

### Warnings:

**Running this procedure overwrites any custom parameter settings.**

To reset the default parameters:

- disconnect power from the instrument;
- reconnect power while holding the SET and DOWN buttons;
- the display will show the message "CF";
- after a few seconds the instrument starts operating with the default configuration. Any different parameter settings will need to be updated.

## Troubleshooting

The following table shows a number of situations that may occur on the various models.

The most frequent causes and corresponding checks are described:

<b>Problem</b>	<b>Cause</b>	<b>Checks</b>
the compressor does not start (signalled by the compressor LED flashing)	<ul style="list-style-type: none"> <li>• compressor delay set defrost post</li> <li>• dripping in progress</li> </ul>	parameters c0, c1 and c2 and dd
the temperature is over the set limits but there is no alarm message and the buzzer, if fitted, does not sound	alarm delay set	parameters Ad, c6, d8
alarm IA is signalled (multifunction input) without actually being active	the multifunction input generates an alarm when the contact opens	connection of the input and whether this is closed in normal operation
the alarm connected to the multifunction input is not detected	alarm delay set or parameter programming error	<ol style="list-style-type: none"> <li>1. if A4=1</li> <li>2. the status of digital input A7</li> </ol>
the defrost is not activated	defrost duration too short (dP) interval between defrosts dI=0: in this case the defrost is not activated	parameters dP and dI
	the end defrost temperature is too low or the evaporator temperature is too high	parameters dt and d/ (defrost probe)
the manual defrost is not activated and the defrost LED flashes	compressor protection times set	parameter d9 (select d9=1)
the high temperature alarm is shown after a defrost	the alarm delay after defrost is too short or the alarm threshold is too low	parameters d8 and AH
the display remains frozen even after the defrost	the ambient temperature has not yet reached the set point or alternatively the time d8 has not elapsed	wait or reduce d8
after modifying a parameter the controller continues working with the old values	the instrument has not updated the old value or alternatively the parameter setting procedure has not been ended correctly by pressing the SET button for 3 s	turn the instrument off and on again or alternatively reprogram the parameters correctly
the evaporator fan does not start	<ol style="list-style-type: none"> <li>1. a compressor and fan start delay has been set</li> <li>2. if F0=1 (fan managed by fan controller)                             <ul style="list-style-type: none"> <li>• the evaporator is "hot": the evaporator temperature can be read by selecting parameter /d;</li> <li>• dripping in progress;</li> <li>• F1 (evaporator fan control set point) too low.</li> <li>• post-dripping delay set</li> </ul> </li> <li>3. if F0=0                             <ul style="list-style-type: none"> <li>• F2=1 and the compressor is off</li> <li>• dripping in progress</li> <li>• post-dripping in progress</li> </ul> </li> </ol>	<ol style="list-style-type: none"> <li>1. parameter c0</li> <li>2. parameters F0, F1, Fd, dd and d/</li> <li>3. parameters F0, F2, dd and Fd</li> </ol>

## Device Setup

### Set 1 - Low Temperature Models - L6 w/ -10° F Set Point

Set 0	Set 1	Set 2	Set 3	Set 4
Parameter	Description	Min	Max	Default
St	Set point	-30	30	-10
r1	Minimum set point value	-50	303	-30
r2	Maximum set point value	-30	150	30
c2	Minimum compressor off time	0	100	4
do	Type of Defrost	0	4	0
dl	Interval between defrost	0	199	6
dt	End defrost temperature set point	-50	127	65
dP	Maximum defrost duration ALARM_ED	1	199	40
d4	Defrost on power-up	0	1	1
dd	Dripping time	0	15	2
F0	Enable evaporator fan control	0	1	1
F2	Stop evaporator fan if compressor off	0	1	0
F3	Evaporator fan status during defrost	0	1	1
Fd	Post-dripping time	0	15	1

### Set 2 - Medium Temperature Models - M6 w/ 35° F Set Point

Set 0	Set 1	Set 2	Set 3	Set 4
Parameter	Description	Min	Max	Default
St	Set point	0	50	35
r1	Minimum set point value	-50	50	0
r2	Maximum set point value	0	150	50
c2	Minimum compressor off time	0	100	4
do	Type of Defrost	0	4	0
dl	Interval between defrost	0	199	6
dt	End defrost temperature set point	-50	127	65
dP	Maximum defrost duration ALARM_ED	1	199	40
d4	Defrost on power-up	0	1	1
dd	Dripping time	0	15	2
F0	Enable evaporator fan control	0	1	1
F2	Stop evaporator fan if compressor off	0	1	0
F3	Evaporator fan status during defrost	0	1	1
Fd	Post-dripping time	0	15	1

### Set 3 - High Temperature Models - H6 w/ 38° F Set Point

Set 0	Set 1	Set 2	Set 3	Set 4
Parameter	Description	Min	Max	Default
St	Set point	0	50	38
r1	Minimum set point value	-50	50	0
r2	Maximum set point value	0	150	50
c2	Minimum compressor off time	0	100	4
do	Type of Defrost	0	4	2
dl	Interval between defrost	0	199	6
dt	End defrost temperature set point	-50	127	40
dP	Maximum defrost duration ALARM_ED	1	199	40
d4	Defrost on power-up	0	1	0
dd	Dripping time	0	15	0
F0	Enable evaporator fan control	0	1	0
F2	Stop evaporator fan if compressor off	0	1	0
F3	Evaporator fan status during defrost	0	1	0
Fd	Post-dripping time	0	15	0

## Service Information

All PRO<sup>3</sup> packaged refrigeration system units are designed for maximum durability, reliability and simplicity. The PRO<sup>3</sup> packaged refrigeration system comes to you ready for operation, fully charged and with all controls preset at the factory. The following information is provided as an aid in the event that service is required.

## Maintenance

The evaporator section of a PRO<sup>3</sup> packaged refrigeration system should be checked at least once for proper defrosting because the amount and pattern of frosting can vary greatly.

The 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.

## System Standard Maintenance Guidelines

After first year of operation and under normal usage, maintenance should cover the following items at least once every six months:

1. Check and tighten ALL electrical connections.
2. Check all wiring and insulators.
3. Check contactors for proper operation and for worn contact points.

4. Check all fan motors. Tighten motor mount bolts/ nuts and tighten fan set screws.
5. Clean the condenser coil surface.
6. Check the operation of the control system. Make certain all safety controls are operating properly.
7. Check all defrost controls for proper function.
8. Clean the evaporator coil surface.
9. Clean the drain pan and check the drain pan and drain line for proper drainage.

**CAUTION: Unit is critically charged, care must be taken not to reduce the system refrigerant charge while taking pressure readings. Technician must compensate for any refrigerant that might escape the unit into the gauge tubing.**

## Drain Pan Removal

1. Remove screws from evaporator side panels
2. Remove evaporator side panels
3. Remove screws connecting drain pan to evaporator supports (2)
4. Remove screws attaching the drain pan bracket to evaporator supports (2)
5. Remove the screws attaching the drain pan bracket to the coil endplates (4)
6. Lower the drain pan/heater/bracket assembly
7. Remove nuts and retainers attaching heater.

**Reverse process to replace drain pan**

FIGURE 15: Drain Pan Removal | View A

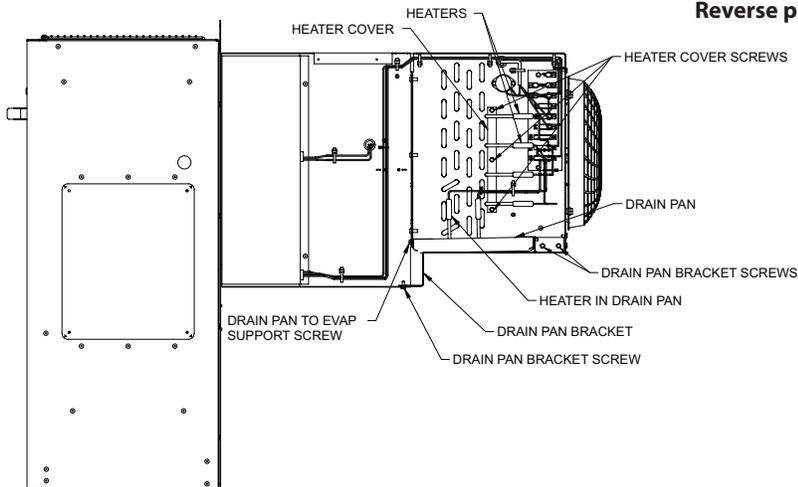
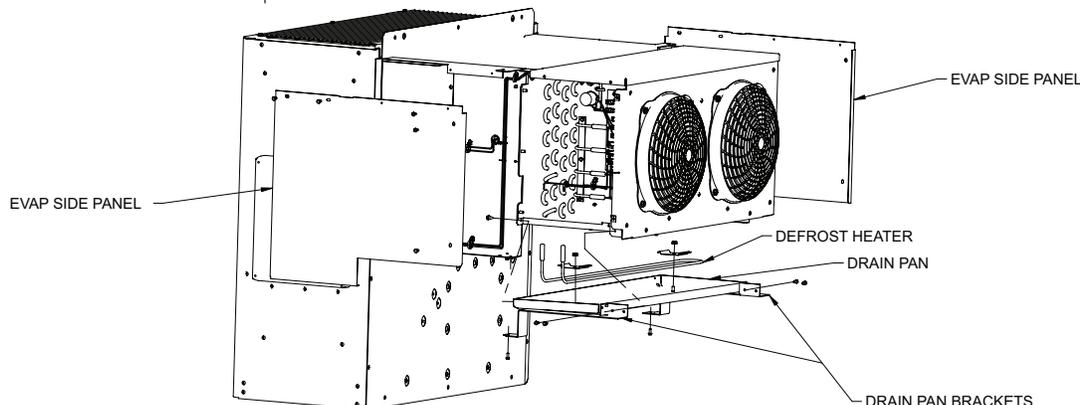
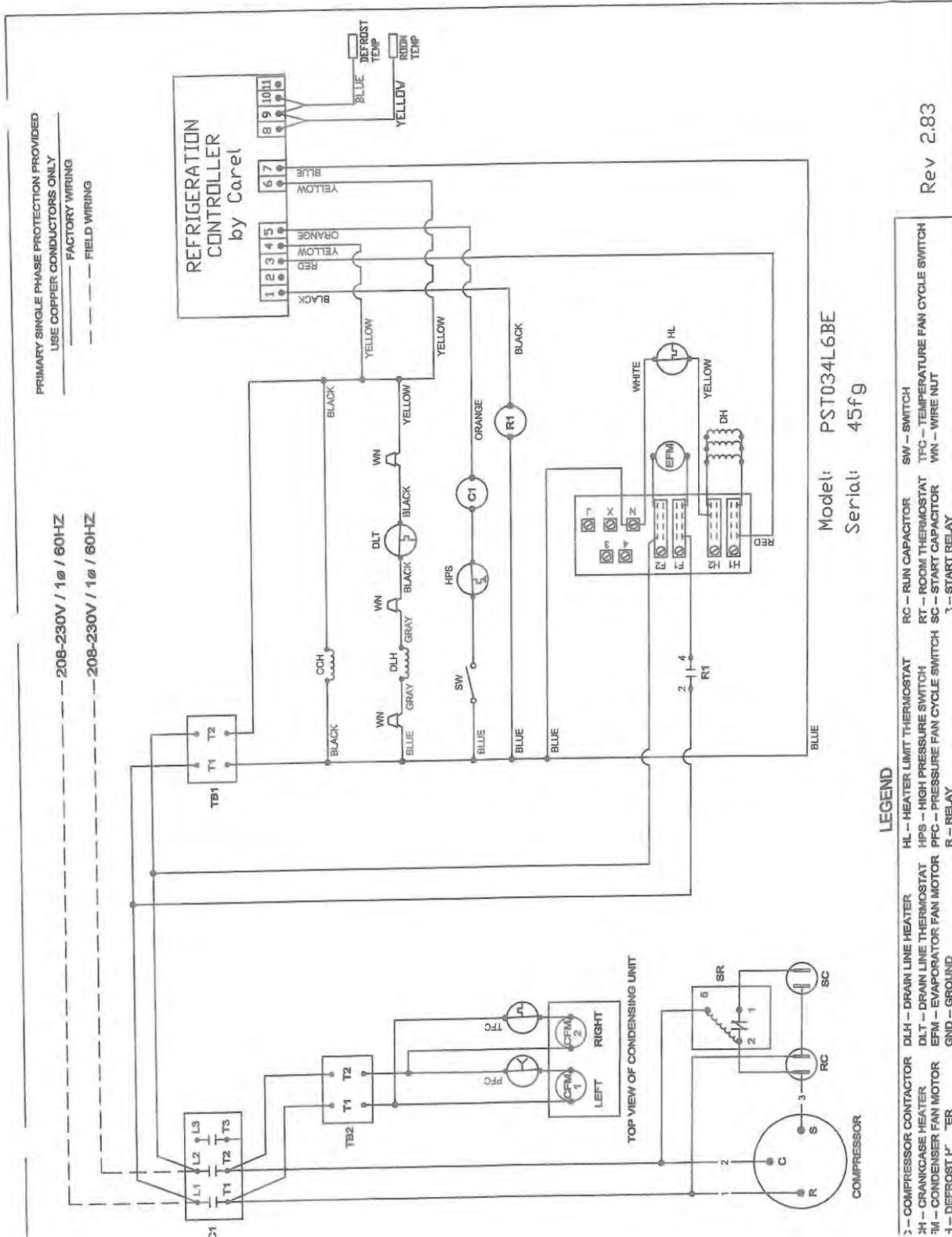


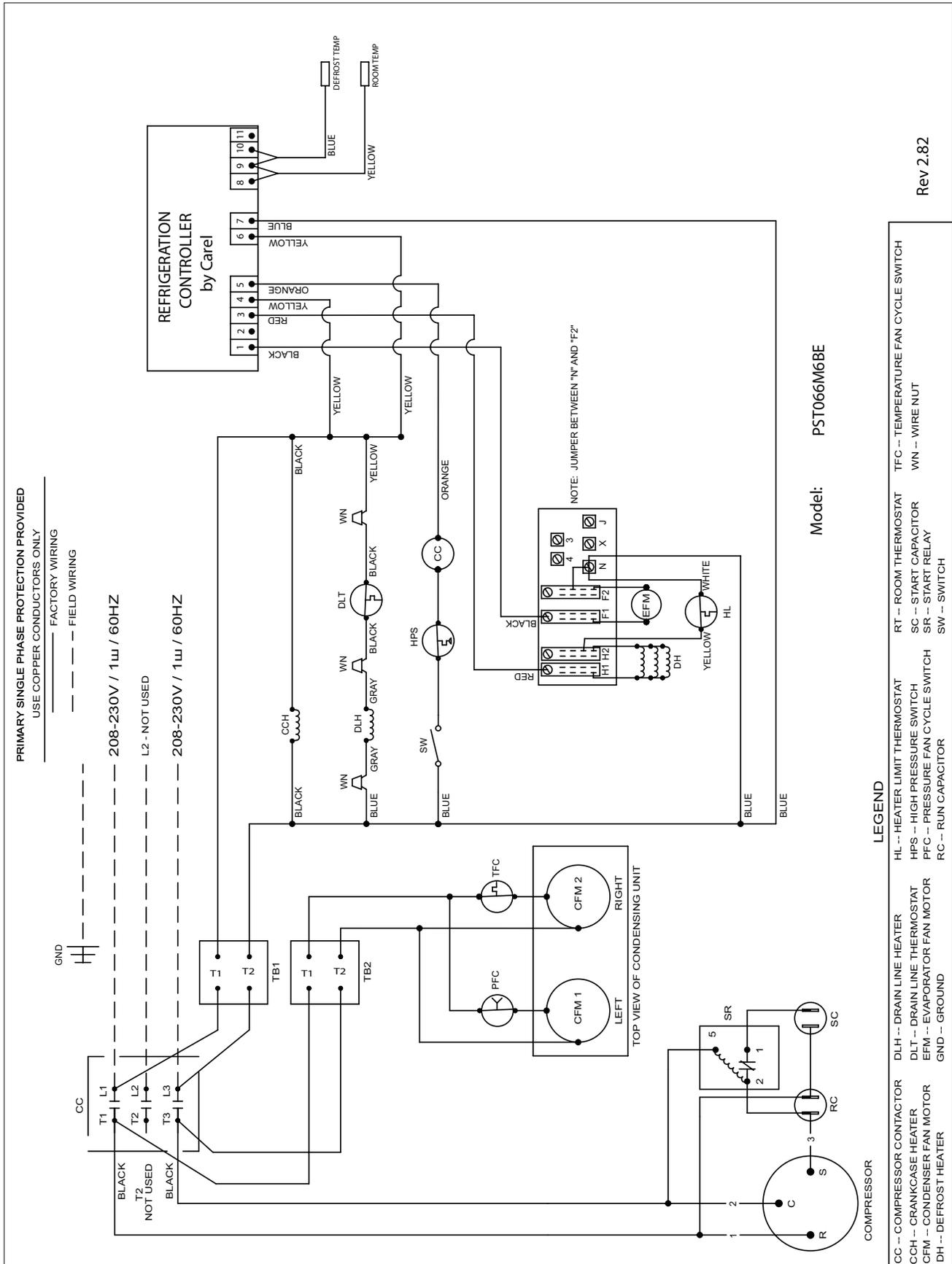
FIGURE 16: Drain Pan Removal | View B



**DIAGRAM 1: Wiring Diagram | Typical Low Temperature Model**

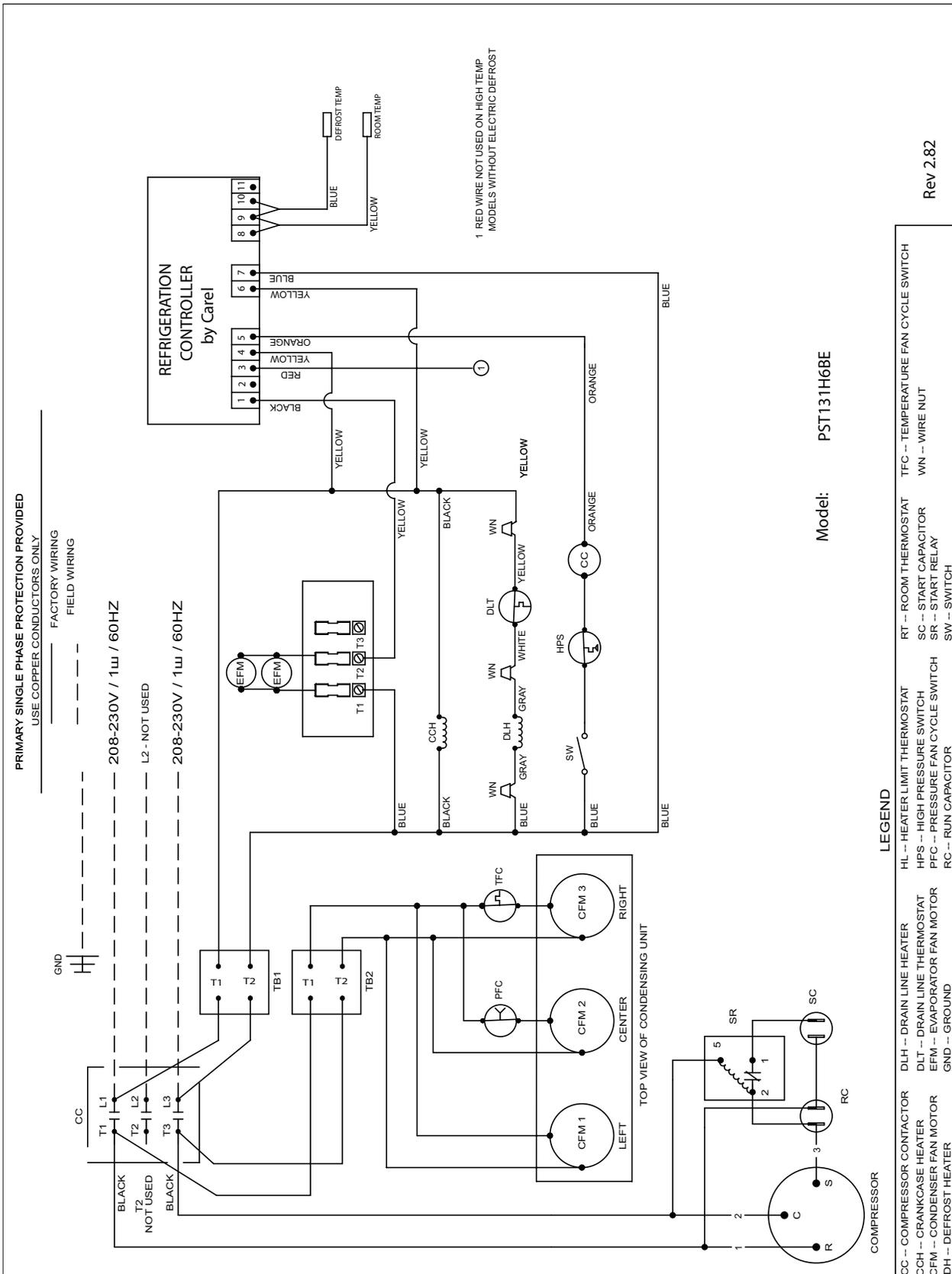


## DIAGRAM 2 Wiring Diagram | Typical Medium Temperature Model



Rev 2.82

## DIAGRAM 3: Wiring Diagram | Typical High Temperature Model



Rev 2.82

## Performance, Capacities and Specifications

**TABLE 4 Model PST | Cooler Application | Air Defrost | BTUH at 95°F Ambient Temperature**

Model	Box Temperature		Voltage	MCA	MOPD	Evaporator CFM	Dimensions Figure
	35°F	38°F					
PST070H6B*	6,641	6,968	208-230/1/60	15	20	625	A
PST090H6B*	8,643	9,064	208-230/1/60	15	20	625	A
PST131H6B*	12,448	13,107	208-230/1/60	15	20	1,350	B
PST147H6B*	14,081	14,758	208-230/1/60	15	20	1,350	B

**TABLE 5 Model PST | Cooler Application | Electric Defrost | BTUH at 95°F ambient temperature**

Model	35°F Box Temperature	Voltage	MCA	MOPD	Evaporator CFM	Dimensions Figure
PST066M6B*	6,641	208-230/1/60	15	20	625	A
PST086M6B*	8,643	208-230/1/60	15	20	625	A
PST124M6B*	12,448	208-230/1/60	15	20	1,350	B
PST141M6B*	14,081	208-230/1/60	15	20	1,350	B

**TABLE 6 Model PST | Freezer Application | Electric Defrost | BTUH at 95°F ambient temperature**

Model	Box Temperature			Voltage	MCA	MOPD	Evaporator CFM	Dimensions Figure
	0°F	-10°F	-20°F					
PST034L6B*	4,746	3,444	2,260	208-230/1/60	15.0	20	625	A
PST051L6B*	6,530	5,121	3,720	208-230/1/60	15.0	20	625	A
PST057L6B*	7,541	5,735	3,918	208-230/1/60	15.0	20	1,350	B
PST077L6B*	10,002	7,716	5,689	208-230/1/60	20.7	35	1,350	B

**TABLE 7 Model PST | Specifications**

Model	Refrigerant	Refrigerant Charge (oz.)	Approximate Net Weight	
			lbs.	kg
<b>Coolers</b>				
PST070H6B*	R-404A	36	260	118
PST090H6B*	R-404A	36	265	120
PST131H6B*	R-404A	40	320	145
PST147H6B*	R-404A	40	325	148
<b>Coolers with electric defrost</b>				
PST066M6B*	R-404A	36	260	118
PST086M6B*	R-404A	36	265	120
PST124M6B*	R-404A	40	320	145
PST141M6B*	R-404A	40	325	148
<b>Freezers</b>				
PST034L6B*	R-404A	36	260	118
PST051L6B*	R-404A	36	265	120
PST057L6B*	R-404A	40	320	145
PST077L6B*	R-404A	40	325	148

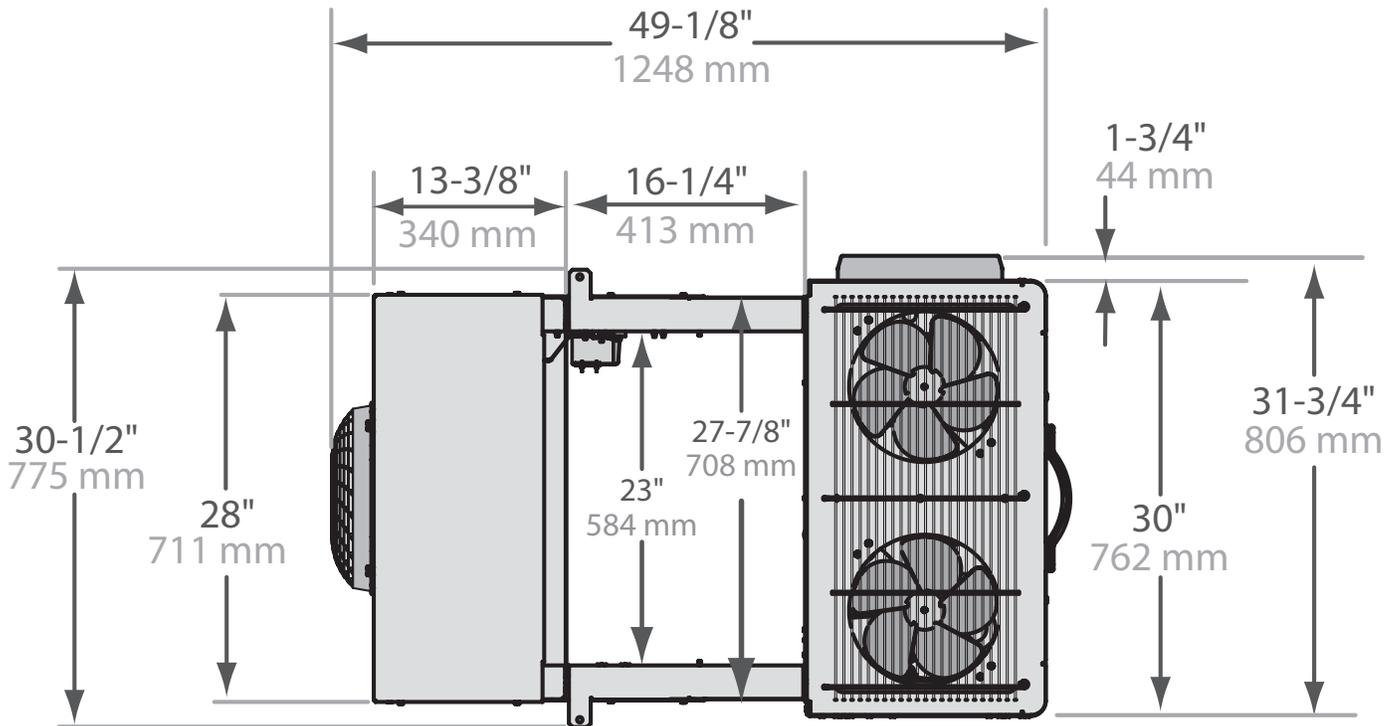
\* H for PSC, E for EC motor on evaporator section only.

**WARNING: This equipment may contain a substance that harms public health and the environment by destroying ozone in the upper atmosphere. Venting of certain refrigerants to the atmosphere may be illegal in your location. Refrigerant recovery devices should be used when installing or servicing this product. Consult your local codes for requirements in your location.**

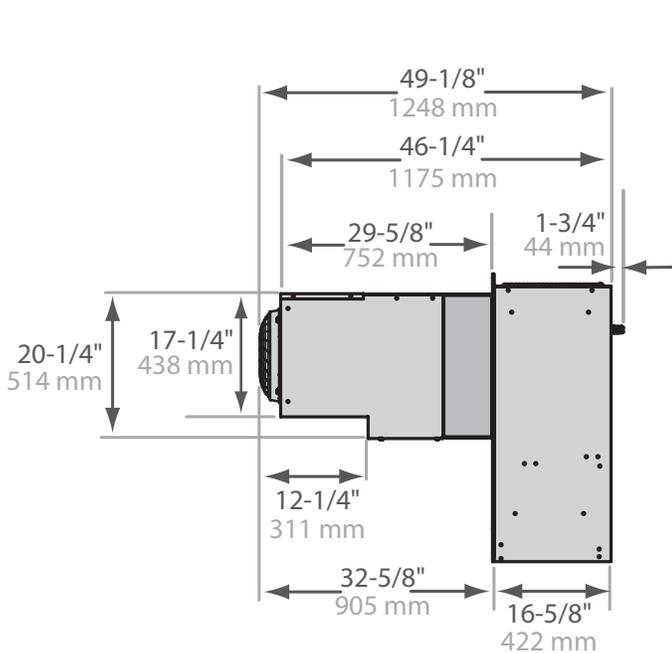
**WARNING: Refrigerant can be harmful if it is inhaled. Refrigerant must be used and recovered responsibly. Failure to follow this warning may result in personal injury or death.**

## Dimensions

DIAGRAM A Dimensions | Small Cabinet: 1-fan | Top View



Dimensions | Small Cabinet: 1-fan | Side View



Dimensions | Small Cabinet: 1-fan | Back View

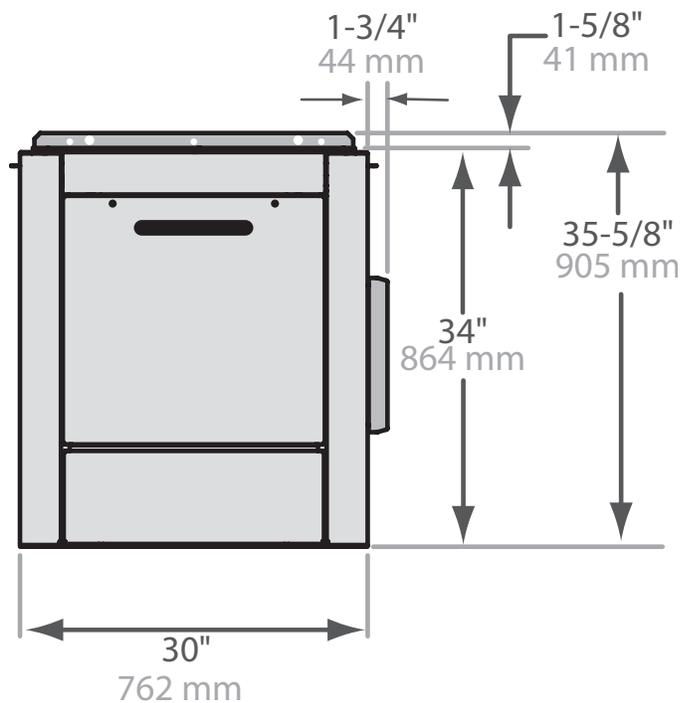
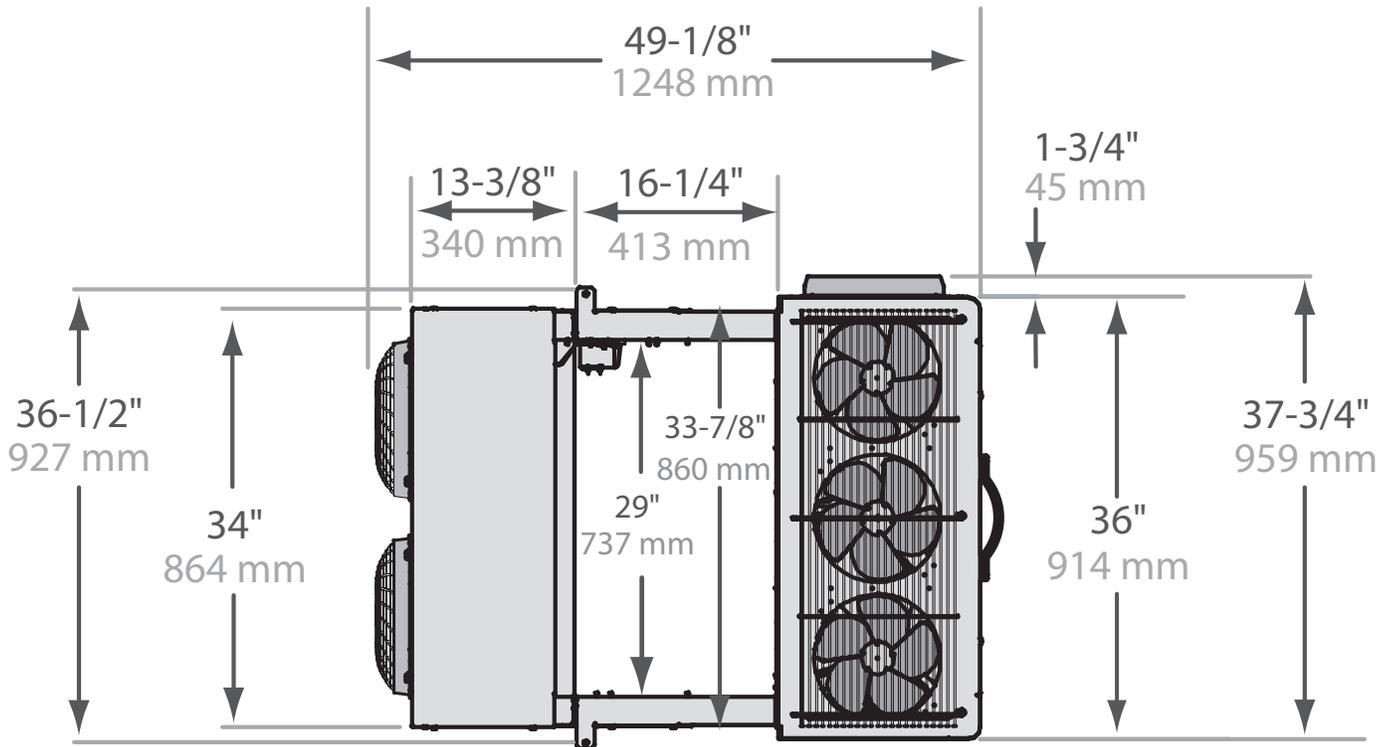
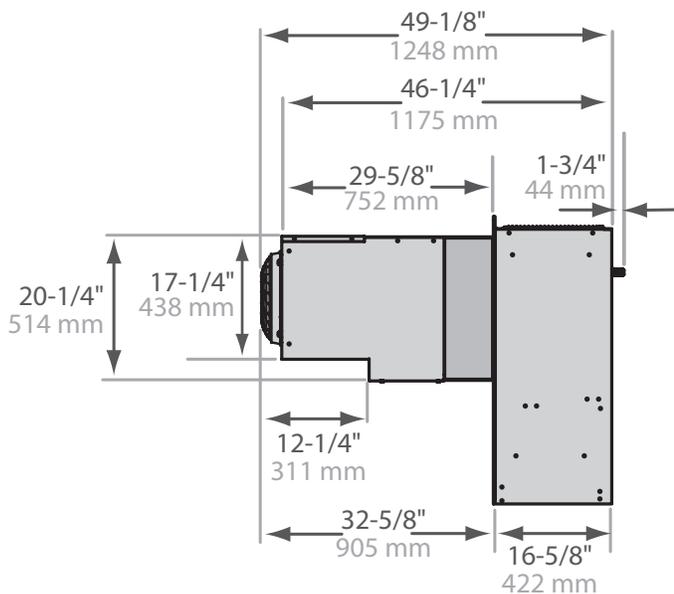


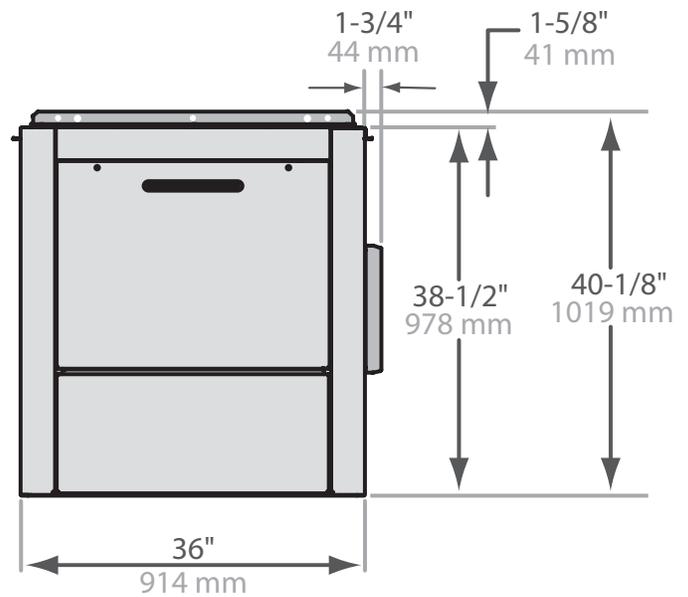
DIAGRAM B Dimensions | Large Cabinet: 2-fan | Top View



Dimensions | Large Cabinet: 1-fan | Side View



Dimensions | Large Cabinet: 1-fan | Back View



## Replacement Parts by



### Right source. Right parts. Right now.

InterLink™ is your link to a complete line of dependable and certified commercial refrigeration parts, accessories and innovative electronic controls for all Heatcraft Refrigeration Products equipment. At InterLink, we provide our wholesalers with a comprehensive selection of product solutions and innovative technologies for the installed customer base. And every product is built to ensure the same high performance standards with which all Heatcraft Refrigeration brands are built — backed by a dedicated team to serve every customer need, delivering at the best lead times in the industry.

### Dependable. Versatile. Courteous.

Finally, one simple source for all your replacement needs from a name you can trust.

For parts, please visit [www.interlinkparts.com](http://www.interlinkparts.com) or call (800) 686-7278.

**TABLE 8 Model PST | Replacement Parts List**

Part Description	Part Number	Coolers				Coolers with electric defrost				Freezers			
		PST070H6B*	PST090H6B*	PST131H6B*	PST147H6B*	PST066M6B*	PST086M6B*	PST124M6B*	PST141M6B*	PST034L6B*	PST051L6B*	PST057L6B*	PST077L6B*
<b>Fan Blades</b>													
Evaporator	5140C	1	1	2	2	1	1	2	2	1	1	2	2
Condenser	22901901	2	2	3	3	2	2	3	3	2	2	3	3
<b>Fan Motors</b>													
Evaporator, PSC - 208/230 volt	25308601	1	1	2	2	1	1	2	2	1	1	2	2
Evaporator, EC - 208/230 volt	25317701	1	1	2	2	1	1	2	2	1	1	2	2
Condenser - 208/230	25308301	2	2	3	3	2	2	3	3	2	2	3	3
Evaporator fan motor bracket	23103301	1	1	2	2	1	1	2	2	1	1	2	2
Condenser fan motor bracket	4000104	2	2	3	3	2	2	3	3	2	2	3	3
<b>Contactors</b>													
30A	2252330	1	1	1	1	1	1	1	1	1	1	1	1
<b>Temperature Control</b>													
Control kit -208/230 volt	89994801	1	1	1	1	1	1	1	1	1	1	1	1
Heater limit thermostat	5708L					1	1	1	1	1	1	1	1
<b>Defrost Heaters</b>													
Defrost heaters - 230 volt	24712701					3	3			3	3		
Defrost heaters - 230 volt	4342L							3	3			3	3
<b>Outdoor Parts</b>													
Fan pressure control	28917301	1	1	1	1	1	1	1	1	1	1	1	1
Fan temperature control	5521R	1	1	1	1	1	1	1	1	1	1	1	1
Drain line heater	24753401	1	1	1	1	1	1	1	1	1	1	1	1
Drain line heater thermostat	28917401	1	1	1	1	1	1	1	1	1	1	1	1

\* H for PSC, E for EC motor on evaporator section only.

## Warranty Statement

Heatcraft Refrigeration Products LLC warrants to its direct purchasers that the PRO<sup>3</sup> product, except Service Parts, manufactured by Heatcraft Refrigeration Products LLC shall be of a merchantable quality, free of defects in material or workmanship, under normal use and service for a period of two (2) years from date of original installation, or thirty (30) months from date of shipment by Heatcraft Refrigeration Products LLC, whichever first occurs. Service Parts, for product out of original warranty, should be so warranted for a period of twelve (12) months from date of shipment. Any product covered by this order found to Heatcraft Refrigeration Products LLC's satisfaction to be defective upon examination at Heatcraft Refrigeration Products LLC's factory will, at Heatcraft Refrigeration Products LLC's option, be repaired or replaced and returned to Buyer via lowest common carrier, or Heatcraft Refrigeration Products LLC may at its option grant Buyer a credit for the purchase price of the defective article. Upon return of a defective product to Heatcraft Refrigeration Products LLC's plant, freight prepaid, by Buyer, correction of such defect by repair or replacement, and return freight via lowest common carrier, shall constitute full performance by Heatcraft Refrigeration Products LLC of its obligations hereunder.

Hermetic compressors furnished by Heatcraft Refrigeration Products LLC are subject to the standard warranty terms set forth above, except that motor compressor replacements or exchanges shall be made through the nearest authorized wholesaler of the motor compressor manufacturer (not at Heatcraft Refrigeration Products LLC's factory) and no freight shall be allowed for transportation of the motor compressor to and from the wholesaler. The replacement motor compressor shall be identical to the model of the motor compressor being replaced. Additional charges which may be incurred throughout the substitution of other than identical replacements are not covered by this warranty.

The foregoing is in lieu of all other warranties, express or implied, notwithstanding the provisions of the uniform commercial code, the Magnuson-Moss Warranty-Federal Trade Commission Improvement Act, or any other statutory or common law, federal or state.

Heatcraft Refrigeration Products LLC makes no warranty expressed or implied, of fitness for any particular purpose, or of any other nature whatsoever, with respect to products manufactured or sold by Heatcraft Refrigeration Products LLC hereunder, except as specifically set forth above and on the face hereof. It is expressly understood and agreed that Heatcraft Refrigeration Products LLC shall not be liable to buyer, or any customer of Buyer, for direct or indirect, special, incidental, consequential or penal damages, or for any expenses incurred by reason of the use or misuse by Buyer or third parties of said products. To the extent said products may be considered "Consumer Products," as defined in Section 101 of the Magnuson-Moss warranty-Federal Trade Commission Improvement Act, Heatcraft Refrigeration Products LLC makes no warranty of any kind, express or implied, to "Consumers," except as specifically set forth above and on the face hereof.

This equipment is designed to operate properly and produce the rated capacity when installed in accordance with good refrigeration industry practices.

The following conditions should be adhered to when installing this unit to maintain the manufacturers warranty:

- (a) The power supply to the unit must meet the following conditions:
  - A. Single phase must be within +10% or -5% of nameplate ratings.
  - B. Phase imbalance cannot exceed 2%.
- (b) All control and safety switch circuits must be properly connected according to the wiring diagram.
- (c) The factory installed wiring must not be changed without written factory approval.

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### Optional Three-Year Extended Compressor Warranty

The Equipment Dealer may purchase for the Owner at the time of the original invoice of the equipment a Three-Year Limited Replacement Compressor Warranty. This entitles the owner to be reimbursed for the cost of a replacement compressor, during the third through fifth year of the life of the compressor.

The warranty program functions similarly to the standard warranty offered. When a compressor failure occurs and the unit is exchanged "over the counter" at the authorized wholesaler outlet a salvage credit is issued along with the invoice for the new compressor. Return copies of both the credit and invoice to the Equipment Dealer along with the model and serial number of the condensing unit. The Equipment Dealer will process this claim with the Manufacturer and subsequently reimburse the Owner for the cost of the new compressor.

This warranty covers the actual compressor only and does not extend to any labor, trip charges, crane rental, taxes or additional parts, refrigerant or processing/handling charges required to make the unit operational.



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*Since product improvement is a continuing effort, we reserve the right to make changes in specifications without notice.*