

INSTALLATION, MAINTENANCE & OPERATION MANUAL

A2L PACKAGED REFRIGERATION SYSTEM



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Due to continuing product development, specifications are subject to change without notice.

INSPECTION

Check all items against the bill of lading to make sure all crates or cartons have been received. If there is any damage, report it immediately to the carrier and file a claim. Make sure the voltage on the unit nameplate agrees with the power supply available.

GENERAL SAFETY INFORMATION

- 1. Installation and maintenance are to be performed only by qualified personnel who are familiar with this type of equipment.
- 2. Make sure that all field wiring conforms to the requirements of the equipment and all applicable national and local codes.
- **3.** Avoid contact with sharp edges and coil surfaces. They are potential injury hazards.
- **4.** All power sources must be disconnected prior to any servicing or maintenance of this unit. After disconnecting power, allow 5 minutes for capacitor discharge before servicing motors.
- **5.** Refrigerant recovery devices must be used during installation and service of this equipment. It is illegal for ALL refrigerants to be released into the atmosphere.

UNIT PLACEMENT REQUIREMENTS

See dimensions and weight tables on pages 11-14 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 PRS unit, use top of walk-in for storage, or install the PRS 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 around 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.** Outdoor installation requires a roof kit and condensate drain heater. Roof Kit sold separately.
- **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 the requirements in this manual will void the unit warranty.

INDOOR MODELS

General

Installation and servicing must be performed by qualified personnel with appropriate training and experience in commercial refrigeration systems. All work must comply with applicable local, state, and national codes and regulations.

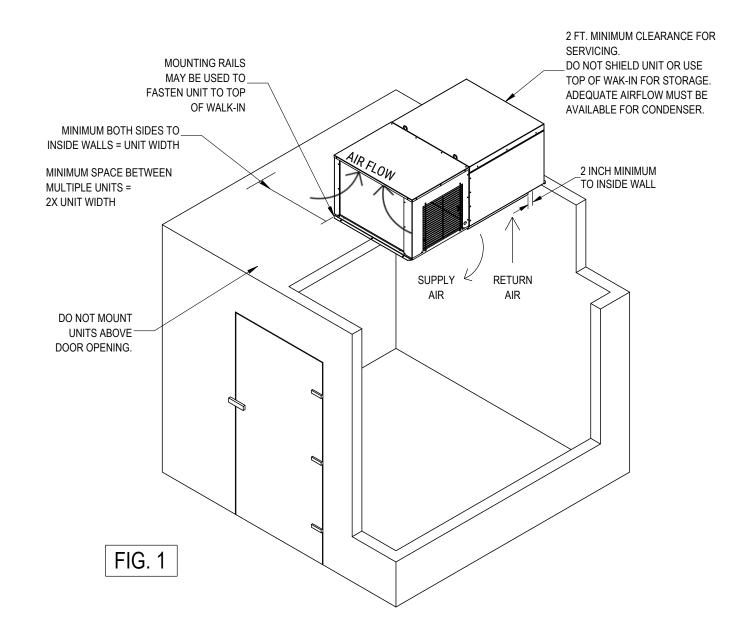
WARNING

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

The PRS cabinet units have lifting eyes. Use a spreader bar when rigging to prevent damage and to reduce stress on the unit cabinet.

IMPORTANT: The compressor compartment cover must be left on units when lifting using the lifting eyes.

- 1. Inspect packaging for shipping damage. Open package and inspect unit for concealed damage.
- 2. Follow Figure 1 requirements on page 5.
- 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 14 for unit weights.
- **4.** Make sure that the surface of the box is clean and level 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 5). Be careful not to damage the grill during installation.
- 8. Make sure that the condenser air flow is not obstructed.
- 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. In high moisture environments, the condensate should be drained to a sink or floor drain using flexible tubing.
- 10. Install the trim pieces around the inside opening.



NOTE: Units are <u>ONLY</u> designed for top mount applications

Installation, Maintenance & Operation Manual A2L Packaged Refrigeration System

OUTDOOR MODELS

General

Installation and servicing must be performed by qualified personnel with appropriate training and experience in commercial refrigeration systems. All work must comply with applicable local, state, and national codes and regulations.

! WARNING

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

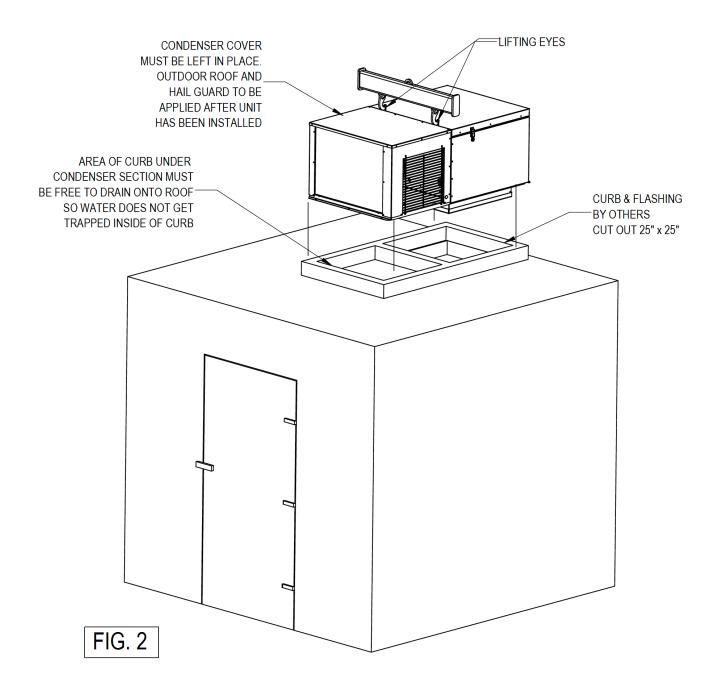
The PRS cabinet units have lifting eyes. Use a spreader bar when rigging to prevent damage and to reduce stress on the unit cabinet.

IMPORTANT: The compressor compartment cover must be left on units when lifting using the lifting eyes.

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 pages 10-11 which show unit footprint dimensions for each cabinet size. Curb height should be limited to 6 inches. The curb should be insulated and divide supply and return air flows.
- 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 provided with an air trap.
- **5.** Secure unit to curb using the base mounting rail.
- **6.** Install roof kit and optional condenser hail guard.

NOTE: Roof membrane (supplied by others) must be cut to allow for evaporator air flow from the unit into the cooled environment (box).

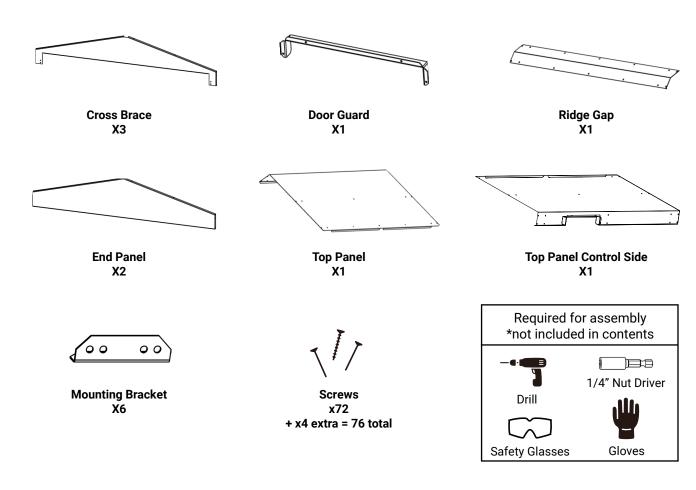


NOTE: Units are <u>ONLY</u> designed for top mount applications

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ROOF KIT

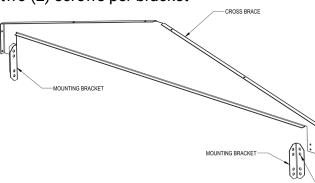
Package Contents:



For best results, find a level and stable area to work.

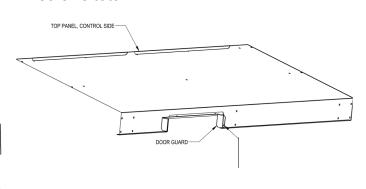
Step 1

Apply Mounting Bracket to Cross Brace using one (1) screw per hole, two (2) screws per bracket



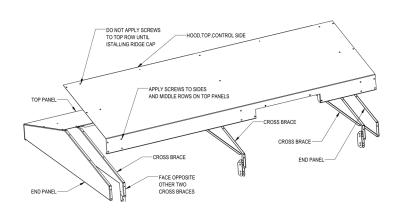
Step 2

Insert four (4) screws into Door Guard starting from outside of the unit, four (4) screws total



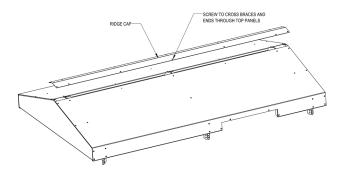
Step 3

- 1. For ease of assembly, start with roof upside down
- 2. Apply side screws on both sides, ten (10) on each side, twenty (20) total screws
- **3.** Flip roof over and apply the screws to middle rows, ten (10) total screws



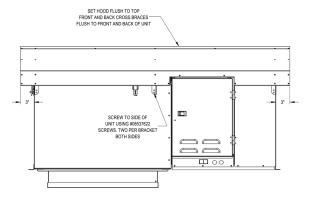
Step 4

- 1. Apply two screws to each end of Ridge Cap, four (4) total screws
- **2.** Apply the remaining screws in each of the open holes, ten (10) total screws



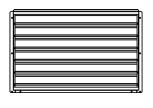
Step 5

- 1. Set hood flush to top, front, and back cross braces as well as flush to front and back of unit.
- 2. Using the bracket holes on each side, screw hood to side of unit using two (2) per bracket, twelve (12) total screws



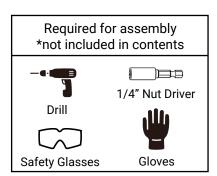
HAIL GUARD

Package Contents:



Hail Guard X1





Step 1

Remove screws from front of unit. Screws are aligned vertically down each side (three (3) per side, six (6) total)

Step 2

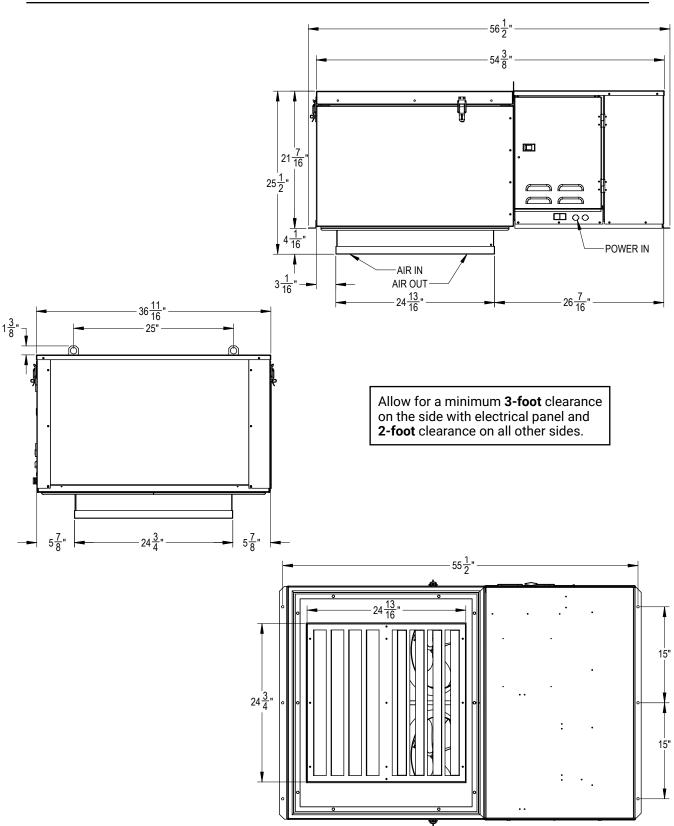
Place Hail Guard with top flange under cabinet lid and align holes on each side. Replace screws (three (3) per side, six (6) total)

Step 3

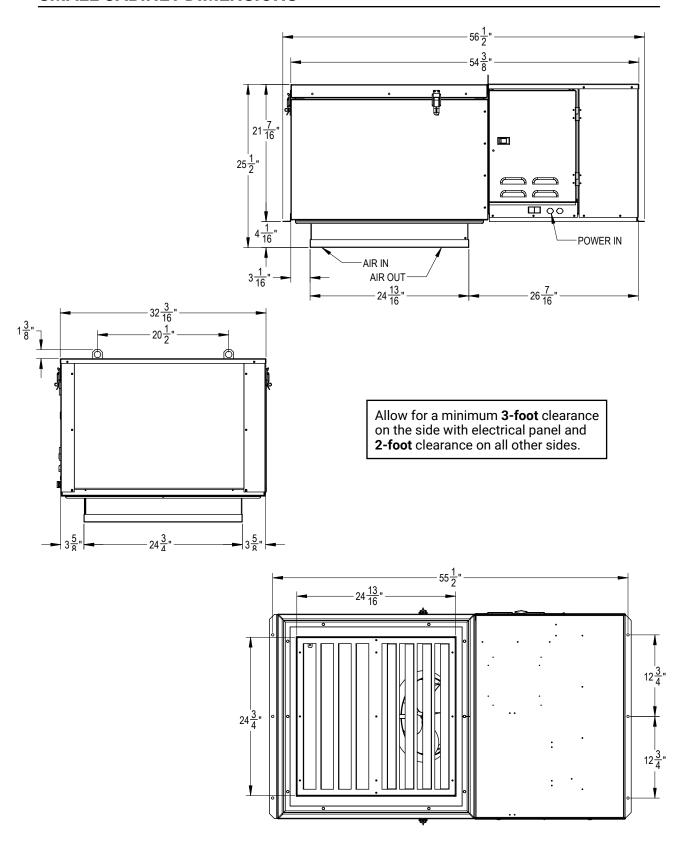
Add 2 screws at the bottom into unit base. Screws will align on the inside of vertical screws just placed in previous step.

CLEARANCES & UNIT PLACEMENTS

LARGE CABINET DIMENSIONS



SMALL CABINET DIMENSIONS



BEFORE UNIT START-UP

- **1.** Inspect all mechanical and electrical connections for looseness that may have occurred during transit. Tighten as needed.
- 2. Ensure all wiring complies with applicable building, electrical, and safety codes.
- **3.** Verify that the supply power matches the unit's required voltage and phase, and that appropriate overcurrent protection is in place.
- **4.** If the unit includes a factory-installed power cord, connect it to a properly rated power outlet.

!\IMPORTANT SAFETY INFORMATION

- Do not use extension cords.
- Connect only to a grounded, three-prong outlet.
- Do not remove the grounding prong.
- Do not use plug adapters or modify the power connection.
- **5.** If the unit is not supplied with a power cord, it must be hard wired to a suitable power source by a qualified electrician in accordance with all applicable codes.

AFTER UNIT START-UP

- 1. The electronic controller includes a five-minute start-up delay to protect the compressor in the event of a brief power interruption. This delay helps prevent short cycling and potential damage to the system.
- 2. Set the box temperature and adjust control parameters as needed by referring to the EcoNet Controller Operation section. The factory default settings are 35°F for air-defrost coolers and -10°F for freezers. These values may need to be modified depending on the specific application.
- **3.** Confirm that the defrost cycle is functioning properly after start-up and continue to monitor it periodically. Frost accumulation will vary based on ambient room temperature, the type of product stored, and how frequently the unit is accessed.

PRS WEIGHT

Medium Temp **Approx Net Weight Approx Ship Weight** Model **Cabinet Size** LB KG 206 93.4 286 129.7 HPO080M4CAA** Small HP0100M4CAA** 206 93.4 286 129.7 Small HP0120M4CAA** 235 106.6 313 142 Large HP0080*4CDA** Small 206 93.4 286 129.7 206 93.4 286 129.7 HP0100*4CDA** Small HP0120*4CDA** 235 106.6 313 142 Large 142 HP0150*4CDA** 235 106.6 313 Large

Low Temp					
Madal	Approx Net Weight Approx Ship We				nip Weight
Model	Cabinet Size	LB	KG	LB	KG
HP0150L4CDA**	Small	218.5	99.1	298.5	135.4
HP0250L4CDA**	Small	218.5	99.1	298.5	135.4
HP0300L4CDA**	Large	264	119.7	342	155.1
HPO350L4CDA**	Large	264	119.7	342	155.1

ACCESSORY WEIGHT

Don't II	L	Approx. Net Weight				
Part #	Item	LB	KG			
08537719	SM ROOF KIT	21.6	9.8			
08537720	LRG ROOF KIT	24.5	11.1			
08537721	SM SNOW/HAIL GUARD	4.3	1.9			
08537722	LRG SNOW/HAIL GUARD	4.9	2.2			

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.

WARNING

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.
- **8.** Clean the drain pan and drain lines. Check the drain pan and drain line for proper
- 9. On outdoor units make sure the crankcase and drain line heaters, and thermostat are functioning properly.
- **10.** On low temperature units make sure drain line heater is operating properly.

SERVICE

- All service to the evaporator section is performed by removing the top panel.
- The PRS uses an EEV controlled by the EcoNet Controller.
- Drain pan and defrost heaters on electric defrost models are retained with clips and can be removed for service.
- The electrical compartment is accessed by the lift off hinged door.
- The compressor and condenser fans are serviced by removing the condenser section top panel.
- The PRS unit is factory charged with R454C.

REFRIGERANT CHARGE

NOTE: The remainder of this document applies to standard stock models. Units with customerspecific configurations may have additional requirements. Refer to the unit's wiring diagram for model-specific details, and contact your HTPG representative for support if needed.

Medium Temp		
Model	Compressor	Published Charge (R-454C; lbs)
HP0080*4C***	YB06KAE	2.6
HP0100*4C***	YB07KAE	2.7
HP0120*4C***	YB08KAE	2.9
HP0150*4C***	YS11KAE	3.1

Low Temp		
Model	Compressor	Published Charge (R-454C; lbs)
HPO150L4CDALD	YF05KAE	2.6
HPO250L4CDALD	YF07KAE	2.6
HPO300L4CDALD	YF07KSE	3.0
HPO350L4CDALD	YF09KSE	3.8

^{*} Asterisk represents a variable in the model nomenclature.

As part of our commitment to quality, continuing analysis will be performed regularly.

This data is confirmed as of September 2025.

MODEL NOMENCLATURE

Н	Р	0	100	М	4C	D	Α	LD
HTPG	Product	Compressor	Horsepower	Temperature	Refrigerant	Voltage	Vintage	Pre-Config Code
	Packaged Refrigeration System	O = Scroll	100 = 1 HP	M = Medium L = Low D = Medium Electric Defrost	4C = R-454C	A = 115/1/60 D = 208- 230/1/60	Α	LD = Leak Mitigation Package

SEQUENCE OF OPERATION

COOLING

- 1. Set the rocker switch by the access panel to the ON position to power up the EcoNet controller.
- 2. On start-up, the controller will zero the Electronic Expansion Valve (EEV) and turn on Aux Relay 1 to start the evaporator fans.
 - **After 1 minute**, If the Space Temperature is greater than the Setpoint + Setpoint Control, the controller will begin a cooling cycle and the EEV will open. The controller will maintain an active cooling cycle for a minimum of 5 minutes by default (configurable via Settings ► Equipment ► Cmp. Min. Run Time).
 - With the EEV open, the Suction Pressure will begin to increase. When the Suction Pressure is greater than the Cut-Out Setpoint + Cut-In Offset, the controller will turn ON Aux Relay 2 to start the compressor and the condenser 7. When the Space Temp Setpoint is fans.
 - 1) If the condensing pressure is below 120 PSIG, the fan speed control switch (FS) will close causing the condenser fans to operate at low speed.
 - 2) If the condensing pressure rises above 180 PSIG the fan speed control switch (FS) will open causing the condenser fans to operate at high speed.
- 3. Immediately after the compressor starts, the Suction Pressure will temporarily decrease as the controller starts metering the EEV to seek balanced system operation.

- 4. The evaporator fans (Aux Relay 1) will turn ON when Evap Temp 1 drops below 35°F (Freezer) or 55°F (Cooler).
- **5.** When the EEV is open, the controller will ignore the low pressure Cut-Out Setpoint for the first 60 seconds of compressor (Aux Relay 2) operation. This bypass period is to prevent any possible unwanted low pressure cut-out during the initial decrease in Suction Pressure, and it is only applied on an active cooling cycle while the EEV is open.
- **6.** After the bypass time has elapsed, if the Suction Pressure drops below the Cut-Out Setpoint, the Aux Relay 2 will turn OFF and stop the compressor. The controller is still in an active cooling cycle with the EEV open, which will cause the Suction Pressure to rise again and turn the compressor (Aux Relay 2) back ON and reset the 60 second bypass timer.
- satisfied, the cooling cycle ends, and the controller will close the EEV causing a pump down. The compressor (Aux Relay 2) will turn OFF when the Suction Pressure drops below the Cut-Out Setpoint.
- **8.** While the EEV is closed, if the Suction Pressure rises above Cut-Out Setpoint + Cut-In Offset, the compressor (Aux Relay 2) will momentarily turn ON to keep the system pumped down, then immediately turn OFF when Suction Pressure falls below the Cut-Out Setpoint. There is no low pressure bypass timer when the EEV is closed.

ELECTRIC DEFROST

- Default defrost logic is based on cooling run time (default 6 hours; can be adjusted via Settings ► Equipment ► Def. Cmp. Run Time). Optional alternate defrost logic is Adaptive (Settings ► Equipment ► Defrost Type). See EcoNet Evaporator Controller Installation Manual for more information on Adaptive Defrost.
- 2. When the defrost cycle starts, the controller will close the EEV and wait 1 minute to allow the compressor to pump down before turning on the defrost heaters. (This pump down delay can be adjusted via Settings ► Equipment ► Def. Pmp. Dn. Delay.)
- 3. After this delay, the evaporator fans will turn OFF, and the defrost heaters will turn ON. While the controller is undergoing a defrost cycle ("Defrosting" indicated on the controller display), the compressor will remain OFF.

- 4. The defrost termination will occur when Evap Temp 1 reaches 55°F (adjustable via Settings ➤ Equipment ➤ Defrost Termination Temp), or when the 1 hour defrost time limit is reached (adjustable via Settings ➤ Equipment ➤ Def. Max Run Time).
- 5. When the defrost cycle ends, the controller will allow a 5-minute Drain Time with the EEV still closed and evaporator fans turned off. At this time, if the Suction Pressure has risen above the Cut-Out Setpoint + Cut-In Offset, the compressor (Aux Relay 2) will be allowed to momentarily turn on if needed to keep the system pumped down. When the Drain Time ends, the controller will open the EEV to begin the next cooling cycle.

AIR DEFROST

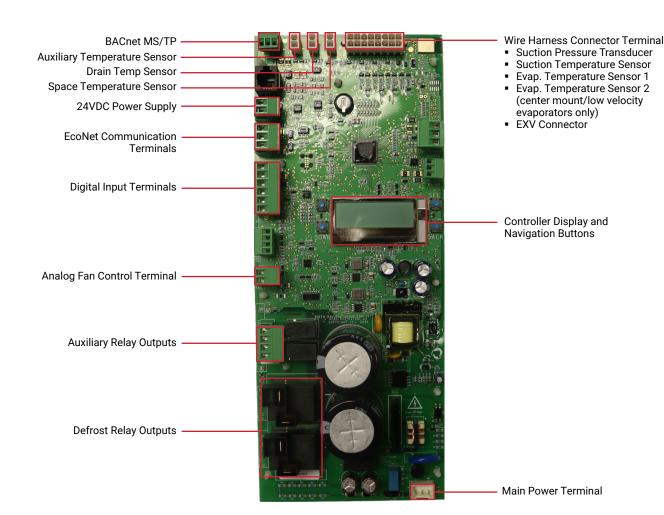
- Default defrost logic is based on cooling run time (default 6 hours; can be adjusted via Settings ► Equipment ► Def. Cmp. Run Time). Adaptive Defrost is not applicable for Cooler (air defrost) setting.
- 2. When the defrost cycle starts, the controller will close the EEV to force a pump down and keep the evaporator fans running at low speed after the compressor has turned OFF. While the controller is undergoing a defrost cycle ("Defrosting" indicated on the controller display) the compressor will remain OFF.
- 3. The defrost termination will occur when Evap Temp 1 reaches 40° F (adjustable via Settings ► Equipment ► Defrost Termination Temp), or when the 1 hour defrost time limit is reached (adjustable via Settings ► Equipment ► Def. Max Run Time).
- **4.** When the defrost cycle ends, the controller will open the EEV to begin the next cooling cycle.

CONTROLLER OPERATION

ECONET

■ EcoNet 2.0 or newer is required for PRS operation.

EcoNet Board



PACKAGED REFRIGERATION UNITS

The EcoNet Evaporator Controller can be set to cycle the compressor **ON** or **OFF** via Aux Relay 2 by configuring the Aux Relay Config. setting to Comp-Fan Control. The controller will use the Suction Pressure transducer reading to determine if the compressor needs to run. This setting is required for Packaged Refrigeration Units.

Configuration Parameter	Adjustment Range	Default Setting				
Aux Relay Config.	Comp-Fan Control; Fan Control	"Comp-Fan Control"				
Cut-Out Setpoint	-2 PSIG to 60 PSIG	"0 PSIG" for Freezer units;" 20 PSIG" for Cooler units				
Cut-In Offset	10 PSIG to 50 PSIG	"20 PSIG"				

NOTE: Packaged Refrigeration Units MUST be set to Comp Fan Control or damage to equipment could result!

1. Aux Relay Config: Controller will use Auxiliary Relay 1 for Evaporator Fan ON/OFF control and Auxiliary Relay 2 for Compressor ON/OFF control based on Suction Pressure transducer reading.



2. Cut-Out Setpoint: Pressure setpoint at which the compressor will turn off when Aux Relay Config. is set to Comp-Fan Control.



3. Cut-In Offset: Pressure differential for compressor to turn on when Aux Relay Config. is set to Comp-Fan Control.



COMPRESSOR OPERATION

ECONET

When a cooling cycle starts, the controller will open the Electronic Expansion Valve (EEV) which will cause the Suction Pressure to increase.

The compressor will turn ON when:

Suction Pressure (PSIG) is greater than Cut-Out Setpoint + Cut-In Offset. The controller will keep the compressor on for a minimum amount of time while the EEV is open, even if the Suction Pressurebriefly gets below the Cut-Out Setpoint to prevent compressor from short cycling.

Example 1 - Low Temperature Unit

Cut-Out Setpoint = 0 PSIG | Cut-In Offset= 20 PSIG Compressor will turn ON when Suction Pressure is greater than 20 PSIG. Compressor will turn OFF when Suction Pressure is less than 0 PSIG.

Example 2 - Medium Temperature Unit

Cut-Out Setpoint = 20 PSIG | Cut-In Offset= 20 PSIG Compressor will turn ON when Suction Pressure is greater than 40 PSIG. Compressor will turn OFF when Suction Pressure is less than 20 PSIG.

When a cooling cycle ends (setpoint is satisfied, defrost starts, etc.) the controller will close the EEV and the compressor will turn OFF.

TROUBLESHOOTING GUIDE

MODES OF OPERATION - MEDIUM TEMP AIR DEFROST

	CONTROL CIRCUIT INPUTS									SYST	EM RES	SPONS	E	
Rocker Switch	Control Mode	LP Bypass Timer*	LP Control*	Pump Down Delay*	Drain time*	Fan Delay*	HP	FS	HS	Comp	ССН	Cond. Fans	Evap. Fans	Dr Line Htr
0	_	_	_	_	_	_	_	_	_	Off	Off	Off	Off	Off
•	Cooling Active	Bypass	_	_	_	_	•	•	_	On	Off	Slow	Fast	On
•	Cooling Active	Bypass	_	_	_	_	•	0	_	On	Off	Fast	Fast	On
•	Cooling Active	_	0	-	_	_	_	_	_	Off	On	Off	Slow	On
•	Cooling Active	_	•	_	_	_	_	•	_	On	Off	Slow	Fast	On
•	Cooling Active	_	•	_	_	_	•	0	_	On	Off	Fast	Fast	On
•	Cooling Active	_	_	_	_	_	0		_	Off	On	Off	Slow	On
•	Cooling Satisfied	_	_	_	_	_	_	_	_	Off	On	Off	Slow	On
•	Defrost	_	_	_	_	_	_	_	_	Off	On	Off	Slow	On

[•] Closed – Feature is either not applicable or that the feature does not affect this mode of operation.

TROUBLESHOOTING GUIDE

MODES OF OPERATION - LOW & MEDIUM TEMP ELECTRIC DEFROST

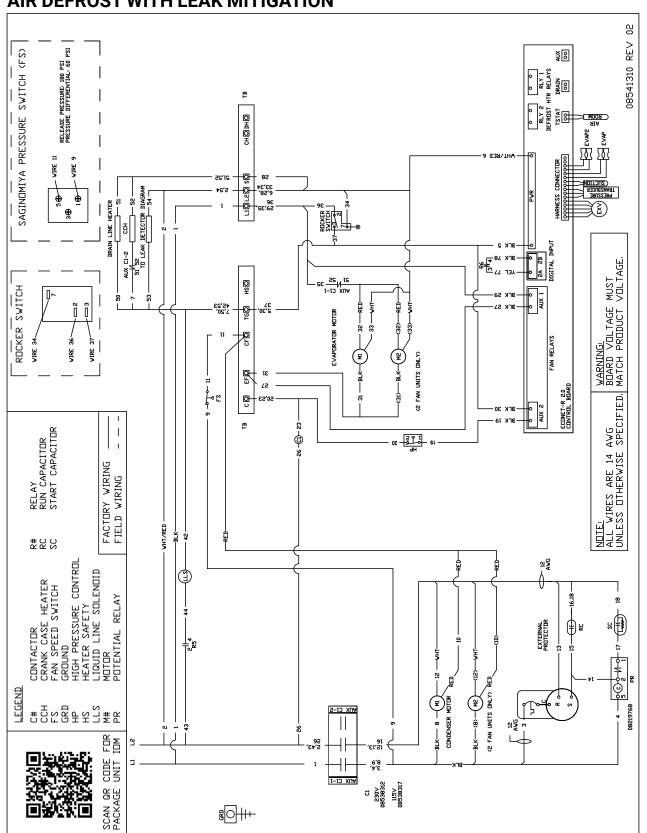
CONTROL CIRCUIT INPUTS							SYSTEM RESPONSE								
Rocker Switch	Control Mode	LP Bypass Timer*	LP Control*	Pmp Down Delay*	Drain Time*	Fan Delay*	HP	FS	HS	Comp	ССН	Cond Fans	Evap Fans	Dr Line Htr	Def Htrs
0	_	_	_	_	_	_	_	_	_	Off	Off	Off	Off	Off	Off
•	Cooling Active	Bypass	_	_	_	_	•	•	_	On	Off	Slow	Fast	On	_
•	Cooling Active	Bypass	_	_	_	_	•	0	_	On	Off	Fast	Fast	On	_
•	Cooling Active	_	0	_	_	_	_	_	_	Off	On	Off	Slow	On	_
•	Cooling Active	_	•	_	_	_	•	•	_	On	Off	Slow	Fast	On	_
•	Cooling Active	_	•	_	_	_	•	0	_	On	Off	Fast	Fast	On	_
•	Cooling Active	_	_	_	_	_	0		_	Off	On	Off	Slow	On	_
•	Cooling Satisfied	_	0	_	_	_			_	Off	On	Off	Slow	On	_
•	Defrost	_	•	Pump down	_	_	•	•	_	On	Off	Slow	Fast	On	Off
•	Defrost	_	•	Pump down	_	_	•	0	_	On	Off	Fast	Fast	On	Off
•	Defrost	_	0	Delay	_	_	_	_	_	Off	On	Off	Slow	On	Off
•	Defrost	_	0	_	_	_	_	_	•	Off	On	Off	Off	On	On
•	Defrost	_	0	_	_	_	_	_	0	Off	On	Off	Off	On	Off
•	Defrost	_	0	_	Delay	_	_	_	_	Off	On	Off	Off	On	Off
•	Cooling Active	Bypass	-	_	_	Delay	•	0	_	On	Off	Slow	Off	On	Off
•	Cooling Active	Bypass	_	_	_	Delay	•	•	_	On	Off	Fast	Off	On	Off

[•] Closed - Feature is either not applicable or that the feature does not affect this mode of operation.

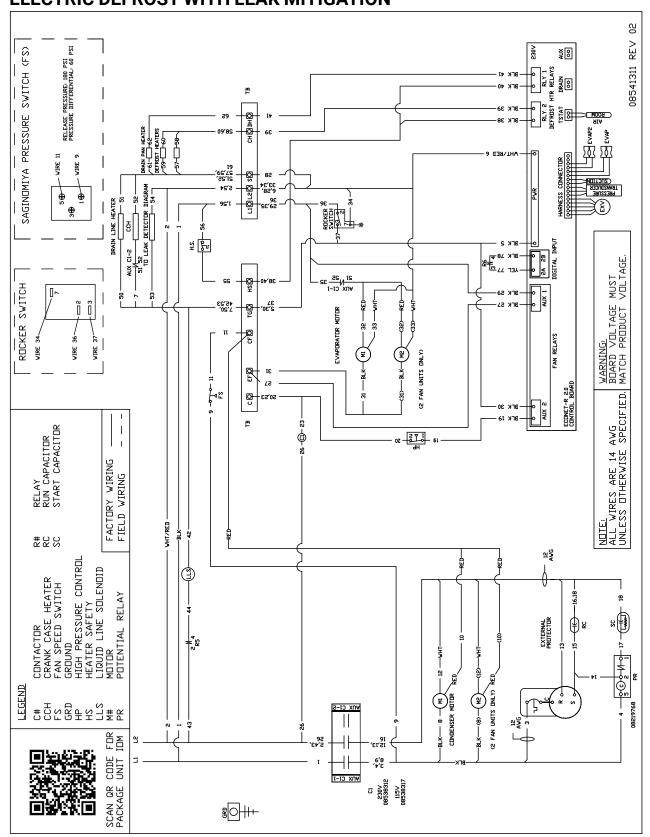
^{*} Control inputs on board the EcoNet 2.0 controller.

Open * Control inputs on board the EcoNet 2.0 controller.

AIR DEFROST WITH LEAK MITIGATION



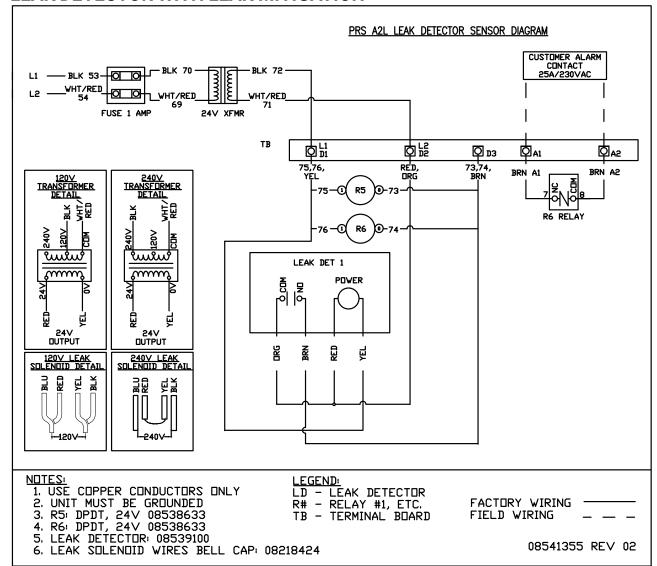
ELECTRIC DEFROST WITH LEAK MITIGATION



AIR DEFROST WITHOUT LEAK MITIGATION ZOCITON IBANZDOCES LIBANZDOCES LIBANZDOCES MUST VOLTAGE. WARNING: BOARD VOLTAGE 1 MATCH PRODUCT \ AWG SPECIFIED. NDTE. ALL WIRES ARE 14 A UNLESS DTHERWISE S CONTACTOR CRANK CASE HEATER FAN SPEED SWITCH GROUND HIGH PRESSURE CONTROL HEATER SAFETY LIQUID LINE SOLENDID MOTOR POTENTIAL RELAY BLK— 8 — MI 12 CONDENSER MOTOR RED RLK—(8)—(M2)—(1) PED (1) PED (1) SCAN QR CDDE PACKAGE UNIT 1

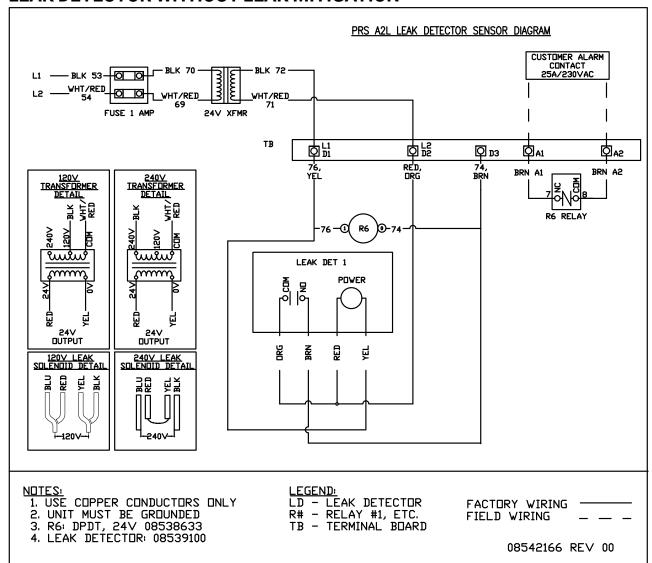
ELECTRIC DEFROST WITHOUT LEAK MITIGATION MUST VOLT AWG SPECIFIED. S0,23 NOTE: ALL WIRES ARE 14 A UNLESS OTHERWISE S BLK— 8 MI CONDENSER MOTOR **g**○+++

LEAK DETECTOR WITH LEAK MITIGATION

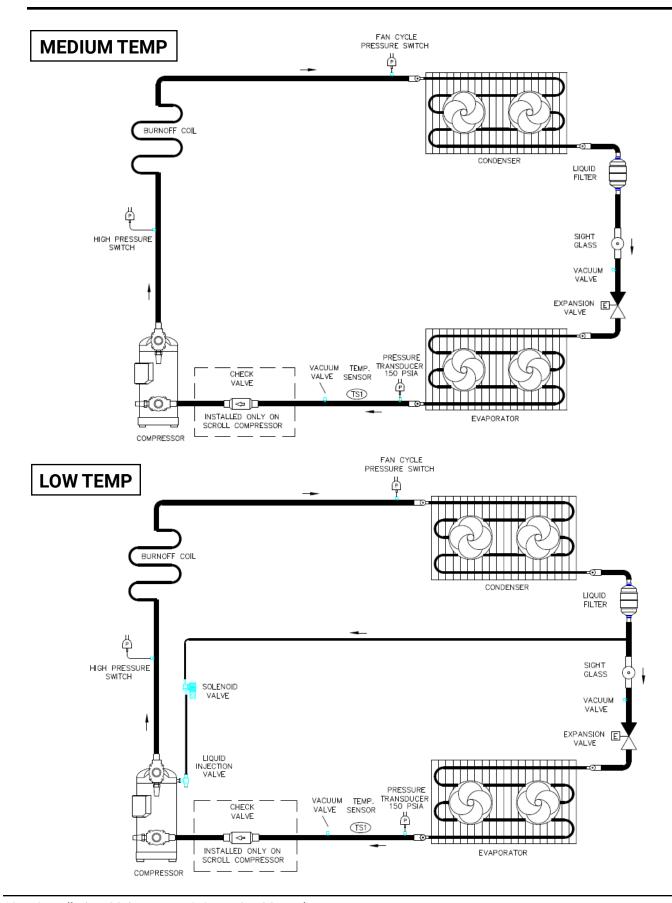


ELECTRICAL WIRING DIAGRAMS

LEAK DETECTOR WITHOUT LEAK MITIGATION



PIPING DIAGRAMS



A2L REFRIGERANT REQUIREMENTS

General

This section describes requirements related to use of an A2L refrigerant in Packaged Refrigeration System. This equipment is intended to be installed on a **WICF** in compliance with the requirements of **ANSI/ASHRAE 15** sections **8.13.6.1** and **8.13.6.2**

! WARNING - INSTALLATION SAFETY

These precautions are required when installing a Packaged Refrigeration System using an A2L refrigerant:

- Installation must be performed only by a suitably qualified person to reduce flammability hazards.
- Do not install this equipment in public corridors or lobbies.
- Keep all ventilation openings clear of obstructions in the appliance enclosure.

MARNING - REFRIGERANT SAFETY

To prevent fire, explosion, or exposure risks associated with A2L refrigerants:

- Do not use any method to accelerate defrosting or cleaning other than those recommended by the manufacturer.
- Store the appliance in a room without continuously operating ignition sources, such as open flames, gas appliances, or electric heaters.
- Do not pierce or burn the appliance.
- Be aware that **refrigerants may not contain an odor**, making leaks harder to detect.

ATTENTION

- Ne pas utiliser de moyens autres que ceux recommandés par le fabricant pour accélérer le processus de dégivrage ou pour nettoyer l'appareil.
- L'appareil doit être entreposé dans un local contenant pas de sources d'inflammation ppermanentes (flammes nues, appareil à gaz ou dispositif de chauffage électrique en fonctionnement, par exemple).
- Ne pas percer ou brûler.
- Attention, les fluides frigorigé nes peuvent ne pas dé gager d'odeur.

Installation, Maintenance & Operation Manual A2L Packaged Refrigeration System

REFRIGERANT DETECTION SYSTEM

All Packaged Refrigeration Systems from HTPG come equipped with a Refrigerant Detection Device. This sensor shall only be replaced with an approved HTPG replacement. Models with the **LD suffix** are supplied with isolation valves which reduce the quantity of refrigerant that could be released in a leak event.

Models with the **LD** suffix respond to a leak in the following way:

- 1. Defrost is Terminated
- 2. Liquid Line Solenoid is Closed
- 3. Electronic Expansion Valve Opens
- 4. Compressor Stops Operation
- 5. Evaporator Fans Remain Active
- **6.** Alarm Relay Closes
- 7. Leak Event Logged
- 8. Controller Displays Reads "Leak Alarm Active"

Models without the LD suffix respond to a leak in the following way:

- 1. Defrost is Terminated
- 2. Compressor Stops Operation
- 3. Evaporator Fans Remain Active
- 4. Alarm Relay Closes
- 5. Leak Event Logged
- 6. Controller Displays Reads "Leak Alarm Active"

MINIMUM INTERIOR VOLUME & MITIGATION DETERMINATION



🔼 WARNING - FLAMMABILITY HAZARD

WARNING: This equipment contains A2L refrigerant, which is flammable. Installation must be designed to safely respond to leak events in accordance with UL 60335-2-89. Mitigation actions depend on refrigerant charge quantity and concentration in enclosed spaces.

The following tables show the minimum room sizes for each model:

Model	Mrel, Ib	Amin, ft ²	Vmin, ft³
HP0080M4CAALD	1.2	37.4	269.0
HP0100M4CAALD	1.2	37.5	269.8
HP0120M4CAALD	1.3	41.9	301.8
HP0080M4CDALD	1.2	37.4	269.0
HP0100M4CDALD	1.2	37.5	269.8
HP0120M4CDALD	1.3	41.9	301.8
HPO150M4CDALD	1.3	41.9	301.6
HP0080D4CDALD	1.2	37.4	269.0
HPO100D4CDALD	1.2	37.5	269.8
HPO120D4CDALD	1.3	41.9	301.8
HPO150D4CDALD	1.3	41.9	301.6
HPO150L4CDALD	1.0	30.3	218.1
HPO250L4CDALD	1.1	36.2	261.0
HPO300L4CDALD	1.3	40.5	291.5
HPO350L4CDALD	1.3	40.5	291.5
HP0080M4CAA	2.6	82.1	590.9
HP0100M4CAA	2.7	85.2	613.6
HP0120M4CAA	2.9	91.5	659.1
HP0080M4CDA	2.6	82.1	590.9
HP0100M4CDA	2.7	85.2	613.6
HP0120M4CDA	2.9	91.5	659.1
HP0150M4CDA	3.1	97.9	704.5
HPO080D4CDA	2.6	82.1	590.9

Model	Mrel, Ib	Amin, ft ²	Vmin, ft ³
HPO100D4CDA	2.7	85.2	613.6
HPO120D4CDA	2.9	91.5	659.1
HPO150D4CDA	3.1	97.9	704.5
HPO150L4CDA	2.6	82.1	590.9
HPO250L4CDA	2.6	82.1	590.9
HPO300L4CDA	3	94.7	681.8
HPO350L4CDA	3.8	119.9	863.6

M_{rel}, lb: Maximum releasable charge A_{min}, ft²: Minimum allowable area of room

V_{min} ft³: Minimum allowable volume of room

SERVICE GUIDELINES

General

- Service must be performed by qualified individuals. Safe working practices for normal service tasks must be adhered by to ensure minimal risk of ignition.
- Work shall be undertaken under a controlled procedure so as to minimize the risk of a flammable gas or vapor being present while the work is being performed.
- All maintenance staff and others working in the local area shall be instructed on the nature of work being carried out. Work in confined spaces shall be avoided.
- The area shall be checked with an appropriate refrigerant detector prior to and during work, to ensure the technician is aware of potentially toxic or flammable atmospheres. Ensure that the leak detection equipment being used is suitable for use with all applicable refrigerants, i.e., non-sparking, adequately sealed, or intrinsically safe.
- If any hot work is to be conducted on the refrigerating equipment or any associated parts, appropriate fire extinguishing equipment shall be available on hand. A dry chemical or CO2 fire extinguisher should be adjacent to the charging area.
- No person carrying out work in relation to a refrigeration system which involves exposing any pipe work shall use any sources of ignition in such a manner that it may lead to the risk of fire or explosion.
- All possible potential ignition sources, including cigarette smoking, should be kept sufficiently far away from the site of installation, repairing, removing and disposal, during which refrigerant can possibly be released to the surrounding space.

- Prior to work taking place, the area around the equipment shall be surveyed to make sure that there are no flammable hazards or ignition risks. "No Smoking" signs shall be displayed.
- Ensure that the area is in the open or that it is adequately ventilated before breaking into the system or conducting any hot work.
- A degree of ventilation shall continue during the period that the work is carried out.
- The ventilation should safely disperse any released refrigerant and preferably expel it externally into the atmosphere.

Electrical

- Where electrical components are being changed, they shall be fit for the purpose and to the correct specification. At all times, the manufacturer's maintenance and service guidelines shall be followed. If in doubt, consult the manufacturer's technical department for assistance.
- Repair and maintenance to electrical components shall include initial safety checks and component inspection procedures. If a fault exists that could compromise safety, then no electrical supply shall be connected to the circuit until it is satisfactorily dealt with. If the fault cannot be corrected immediately but it is necessary to continue operation, an adequate temporary solution shall be used. This shall be reported to the owner of the equipment, so all parties are advised.

Initial safety checks shall include:

- (a) A capacitors are discharged: this shall be done in a safe manner to avoid possibility of sparking;
- (b) No live electrical components and wiring are exposed while charging, recovering or purging the system;
- (c) There is continuity of earth bonding.
- During repairs to sealed components, all electrical supplies shall be disconnected from the equipment being worked upon prior to any removal of sealed covers, etc. If it is absolutely necessary to have an electrical supply to equipment during servicing, then a permanently operating form of leak detection shall be located at the most critical point to warn of a potentially hazardous situation.
- Particular attention shall be paid to the following to ensure that by working on electrical components, the casing is not altered in such a way that the level of protection is affected. This shall include damage to cables, excessive number of connections, terminals not made to original specification, damage to seals, incorrect fitting of strain relief devices, etc.
- Ensure that the apparatus is mounted securely. Ensure that seals or sealing materials have not degraded to the point that they no longer serve the purpose of preventing the ingress of flammable atmospheres.
- Replacement parts shall be in accordance with the manufacturer's specifications.
- Do not apply any permanent inductive or capacitance loads to the circuit without ensuring that this will not exceed the permissible voltage and current permitted for the equipment in use.

- Intrinsically safe components are the only types that can be worked on while live in the presence of a flammable atmosphere. The test apparatus shall be at the correct rating.
- Replace components only with parts specified by the manufacturer. Other parts can result in the ignition of refrigerant in the atmosphere from a leak.

NOTE: The use of silicon sealant can inhibit the effectiveness of some types of leak detection equipment. Intrinsically safe components do not have to be isolated prior to working on them.

Leak Detection Methodology

Under no circumstances shall potential sources of ignition be used in the searching for or detection of refrigerant leaks. A halide torch (or any other detector using a naked flame) shall not be used.

- The following leak detection methods are deemed acceptable for all refrigerant systems.
- Electronic leak detectors may be used to detect refrigerant leaks but, in the case of flammable refrigerants, the sensitivity might not be adequate, or might need re-calibration. (Detection equipment shall be calibrated in a refrigerant-free area.) Ensure that the detector is not a potential source of ignition and is suitable for the refrigerant used.
- Leak detection equipment shall be set at a percentage of the LFL of the refrigerant and shall be calibrated to the refrigerant employed, and the appropriate percentage of gas (25 % maximum) is confirmed.

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Leak detection fluids are also suitable for use with most refrigerants but the use of detergents containing chlorine shall be avoided as the chlorine can react with the refrigerant and corrode the copper pipework.

NOTE: Examples of leak detection fluids are:

- (a) bubble method
- (b) fluorescent method agents.
- If a leak is suspected, all naked flames shall be removed/extinguished.
- If a leakage of refrigerant is found which requires brazing, all of the refrigerant shall be recovered from the system, or isolated (by means of shut off valves) in a part of the system remote from the leak.

Leak Repair Guidance

When breaking into the refrigerant circuit for repairs—or for any other purpose—standard procedures shall be followed. However, when working with flammable refrigerants, it is critical to follow best practices, as flammability presents additional safety considerations.

The following procedure shall be adhered to:

- 1. Safely remove refrigerant in accordance with local and national regulations.
- 2. Purge the circuit with inert gas.
- 3. Evacuate the system.
- 4. Purge again with inert gas.
- **5. Open the circuit** by cutting or brazing.

- The refrigerant charge shall be recovered into the correct recovery cylinders if venting is not allowed by local and national codes.
- For appliances containing flammable refrigerants, the system shall be purged with oxygen-free nitrogen to render the appliance safe for flammable refrigerants. This process might need to be repeated several times.
- Compressed air or oxygen shall not be used for purging refrigerant systems.
- For appliances containing flammable refrigerants, refrigerants purging shall be achieved by breaking the vacuum in the system with oxygen-free nitrogen and continuing to fill until the working pressure is achieved, then venting to atmosphere, and finally pulling down to a vacuum.
- This process shall be repeated until no refrigerant is within the system. When the final oxygen-free nitrogen charge is used, the system shall be vented down to atmospheric pressure to enable work to take place.
- Ensure that the outlet for the vacuum pump is not close to any potential ignition sources and that ventilation is available.

DECOMMISSIONING

SERVICE GUIDELINES

General

Before carrying out this procedure, it is essential that the technician is completely familiar with the equipment and all its details. It is recommended good practice that all refrigerants are recovered safely. Prior to the task being carried out, an oil and refrigerant sample shall be taken in case analysis is required prior to re-use of recovered refrigerant. It is essential that electrical power is available before the task commences.

- 1. Become familiar with the equipment and its operation.
- 2. Isolate the system electrically.
- **3.** Before attempting the procedure, ensure that:
 - (a) mechanical handling equipment is available, if required, for handling refrigerant cylinders.
 - (b) all personal protective equipment is available and being used correctly.
 - (c) the recovery process is supervised at all times by a competent person.
 - (d) recovery equipment and cylinders conform to the appropriate standards.
- 4. Pump down refrigerant system, if possible.
- **5.** If a vacuum is not possible, make a manifold so that refrigerant can be removed from various parts of the system.
- **6.** Make sure that cylinder is situated on the scales before recovery takes place.
- **7.** Start the recovery machine and operate in accordance with instructions.
- 8. Do not overfill cylinders (no more than 80 % volume liquid charge).
- **9.** Do not exceed the maximum working pressure of the cylinder, even temporarily.
- **10.** When the cylinders have been filled correctly and the process completed, make sure that the cylinders and the equipment are removed from site promptly and all isolation valves on the equipment are closed off.
- **11.** Recovered refrigerant shall not be charged into another REFRIGERATING SYSTEM unless it has been cleaned and checked.
- **12.** Equipment shall be labeled stating that it has been de-commissioned and emptied of refrigerant. The label shall be dated and signed.

Refrigerant Reclaim

- When removing refrigerant from a system, either for servicing or decommissioning. it is recommended good practice that all refrigerants are removed safely.
- When transferring refrigerant into cylinders, ensure that only appropriate refrigerant recovery cylinders are employed. Ensure that the correct number of cylinders for holding the total system charge is available.
- All cylinders to be used are designated for the recovered refrigerant and labeled for that refrigerant (i.e., special cylinders for the recovery of refrigerant).
- Cylinders shall be complete with pressurerelief valve and associated shut-off valves in good working order. Empty recovery cylinders are evacuated and, if possible, cooled before recovery occurs.
- The recovery equipment shall be in good working order with a set of instructions concerning the equipment that is at hand and shall be suitable for the recovery of all appropriate refrigerants including, when applicable, FLAMMABLE REFRIGERANTS. In addition, a set of calibrated weighing scales shall be available and in good working order.
- Hoses shall be complete with leakfree disconnect couplings and in good condition.

- Before using the recovery machine, check that it is in satisfactory working order, has been properly maintained and that any associated electrical components are sealed to prevent ignition in the event of a refrigerant release. Consult manufacturer if in doubt.
- The recovered refrigerant shall be returned to the refrigerant supplier in the correct recovery cylinder, and the relevant waste transfer note arranged.
- Do not mix refrigerants in recovery units and especially not in cylinders.

Compressor

If compressors or compressor oils are to be removed, ensure that they have been evacuated to an acceptable level to make certain that FLAMMABLE REFRIGERANT does not remain within the lubricant.

- The evacuation process shall be carried out prior to returning the compressor to the suppliers.
- Only electric heating to the compressor body shall be employed to accelerate this process.
- When oil is drained from a system, it shall be carried out safely.

WARRANTY

- The Seller warrants against defect in materials and workmanship in products which it manufactures for (1) year from the date of installation or up to 18 (eighteen) 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 HTPG, such as motors, controls, valves and compressors we extend to the Buyer the same warranties made to us by the manufacturer.
- The Seller's only liability under this warranty or otherwise shall be the repair or replacement (at Seller's option) of nonconforming goods or parts. Seller assumes no liability for incidental or consequential damages such as injury to persons or property, or lost profits.
- Claims must be submitted to our Warranty Group within 90 days of the repair. To submit a claim, visit https://www.htpg.com/submit-a-claim/



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