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# REFRIGERATORS AND FREEZERS

## Installation, Operation and Maintenance Instructions

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### INSPECTION

When the equipment is received, all items should be carefully checked against the bill of lading to insure all crates and cartons have been received. All units should be inspected for concealed damage by uncrating the units immediately. If any damage is found, it should be reported to the carrier at once, and a claim should be filed with the carrier. This equipment has been inspected and tested in the manufacturing facility and has been crated in accordance with transportation rules and guidelines. Manufacturer is not responsible for freight loss or damage.

### INSTALLATION

#### GENERAL

After the unit crate and crate base have been removed, locate the casters or legs found inside the cabinet. (Not applicable for Roll-In models). Attach the casters or legs to the unit base by screwing them into the same threaded fittings that were used to secure the crate base to the cabinet. Insure that the legs or casters are screwed completely into the base. The cabinet should also be levelled when it is placed in its permanent location.

For shipping purposes, the condensing unit compressor is secured on the **extra low temperature** models. **Remove the spring clips and loosen the mounting bolts prior to operation.** See the label attached to the condensing unit.

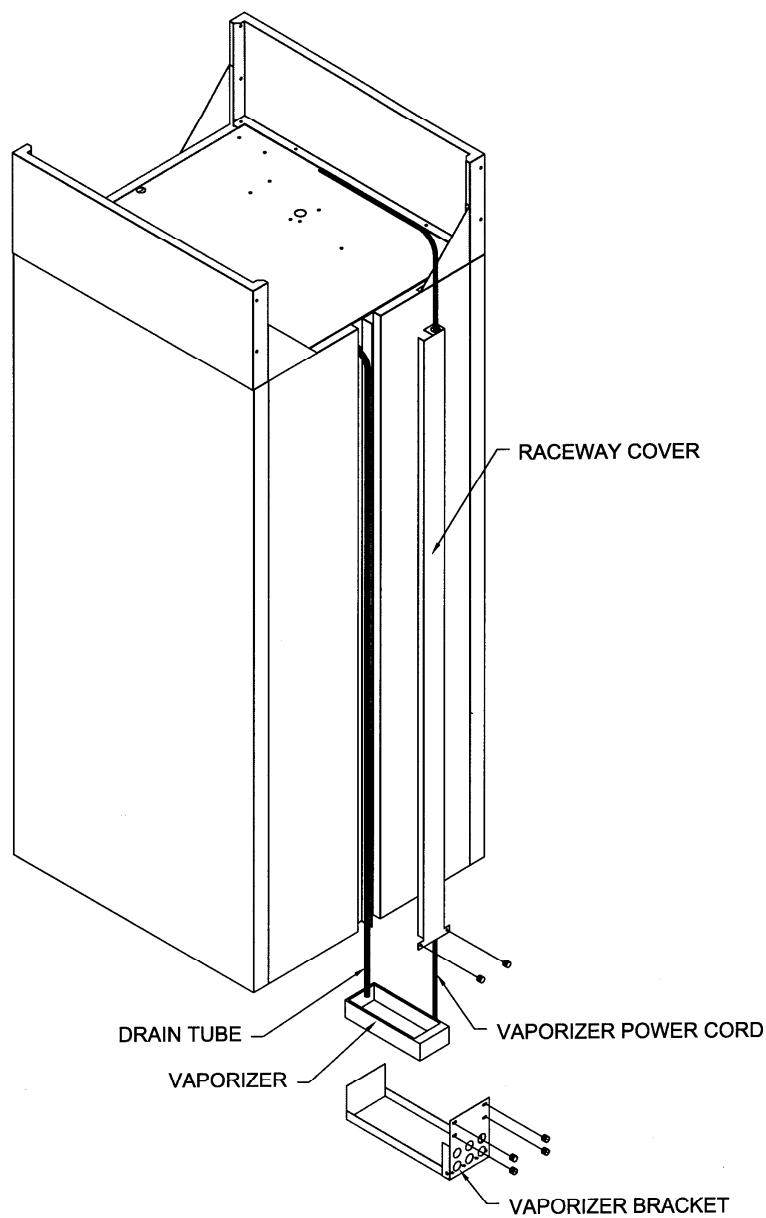
If the doors are out of alignment on the cabinet, the doors can be adjusted. This can be accomplished by opening the door(s) and loosening the screws that hold both the top and bottom hinges to the cabinet. After adjusting the door so that it is aligned correctly, tighten the screws to securely hold the hinges in place.

## VAPORIZER INSTALLATION

Some of the Refrigerators and all of the Extra Low Temperature Freezers require the installation of the condensate vaporizer which is shipped inside the unit compartment. The vaporizer should be mounted to the cabinet bottom. Reference View 1. In lieu of the vaporizer, these units can be plumbed to a floor drain following local plumbing codes. The Freezers, Pass-Thru and Roll-In Refrigerators use a hot gas vaporizer. Customer installation is not required.

**Note: Disconnect power prior to installation.**

1. Connect the power cord to the vaporizer and place it in the vaporizer bracket.
2. Attach the vaporizer bracket to the back of the unit using the four screws as shown, making sure the plastic drain tube is in the vaporizer pan.



View 1

## LOCATION

The refrigeration system located at the top of the cabinet requires free air access for proper operation. Allow a minimum four (4) inch clearance on the top, rear, and sides of the cabinet. The cabinet should also be levelled when it is placed in its permanent location. There are no provisions for easily levelling the Roll-In models except by the use of shims. Only minimal shimming is allowable. A cabinet that will sit directly on the floor without casters should be levelled when placed in its permanent location. **If casters are not used**, it is required by NSF that the cabinet be sealed to the floor with an approved sealant such as Dow Corning #732 silicone.

## ELECTRICAL

Check the proposed outlet to be used to insure that the voltage, phase and current carrying capacity of the circuit from the electrical panel correspond to the requirements of the cabinet. NEVER use an extension cord to wire any unit. On permanently connected units, those not furnished with a plug-in service cord, all inter-wiring between the electrical panel and the unit must be done in accordance with the National Electric Code and all state and local codes. Refer to the serial tag for all pertinent electrical information.

**Observe all Warning Labels. Disconnect power supply to eliminate injury from electrical shock or moving parts when servicing equipment.**

## GENERAL OPERATION

The refrigerators and freezers employ a unit cooler evaporator located outside the cabinet as the heat removing source. Through the refrigeration process, heat is captured in the evaporator, transferred to the condensing unit on top of the cabinet, and expelled to the surrounding outside air. It is extremely important to allow a four (4) inch clearance on the top, rear, and sides of the unit for the refrigeration process to function properly.

**These refrigerators and freezers utilize a programmable controller to control the temperature and defrost settings. The controller, which is located on the facade of the unit, is factory set. Please see the default settings sheet and separate instructions that are included on the operation of this controller.**

## REFRIGERATORS

During the operation of a refrigerator unit, frost will periodically form on the coil surface. Each time the compressor cycles "off", the evaporator fans will continue to run, which will keep the internal temperature uniform and at the same time remove any frost build up on the coil. The water produced will collect in the unit cooler drain pan and travel down the drain tube to the condensate vaporizer.

## **FREEZERS**

After shutting the door on freezer models, a short amount of time must be allowed before the door can be reopened. This is due to the tight seal maintained between the door and the cabinet. Waiting a few moments for the pressure to equalize permits the door to be opened easily.

A positive defrost is required to remove frost from the coil in freezer models. This is accomplished by energizing heaters during the defrost cycle that are positioned on the coil surface. The programmable controller is factory set to allow four defrosts per day.

As the preset defrost time is reached, the controller automatically terminates the refrigeration process by turning off the condensing unit and unit cooler fan motors, and energizes the defrost heaters. As the coil temperature increases, the frost begins to melt producing water which runs down the coil to the unit cooler drain pan and exits through the drain tube to the vaporizer. After all the frost has been removed and the coil temperature reaches approximately 50°F [10°C], the defrost is terminated through the action of the defrost termination control located on the unit cooler, and the refrigeration process resumes. In order to insure that any excess water remaining on the coil is not sprayed into the cabinet interior, and all heat generated by the defrost is removed, **the unit cooler fans will not operate until the coil temperature reaches approximately 25°F [-4°C].**

**Note:** Running a cold wall model freezer in an unconditioned environment may result in frost build-up inside the cabinet.

## **GENERAL MAINTENANCE**

### **PERIODIC CLEANING**

Beginning with the initial installation, the interior surfaces of the cabinet should be periodically wiped down with a solution of warm water and baking soda. This solution will remove any odors from spillage that has occurred. The exterior of the cabinet should also be cleaned frequently with a commercial grade of glass cleaner.

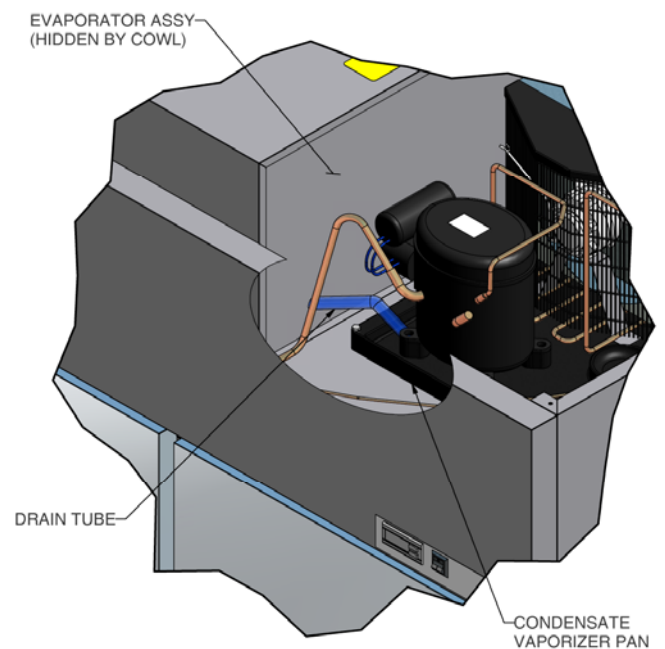
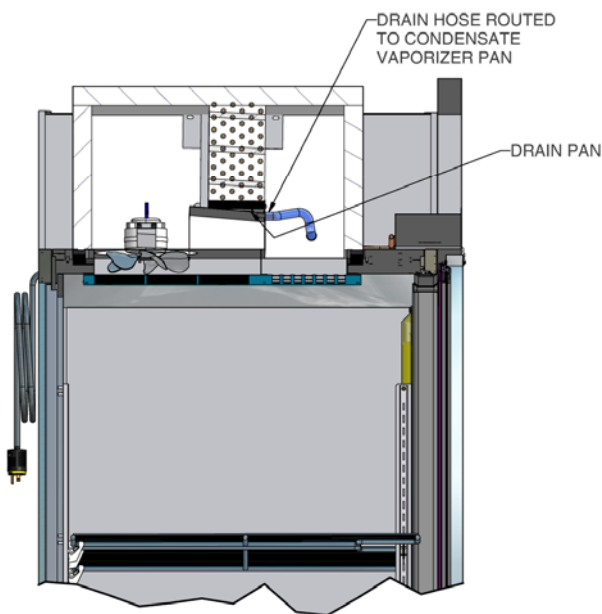
Monthly cleaning of the condenser will aid the heat transfer characteristics of the refrigeration system and increase its efficiency. To accomplish this, remove the cover panel from the cabinet and use a wire brush to loosen any dirt particles that are attached to the fins. Use a vacuum cleaner to remove the loosened particles. **Failure to keep the condenser coil clean and clear of obstructions could result in temperature loss and damage to the compressor.**

The shelving and pilasters should be periodically cleaned. The shelving should be removed from the cabinet interior and washed with warm water and mild detergent using a soft bristle brush or may be washed in a dishwasher large enough to accommodate the shelving size. Pilasters may be removed from the cabinet interior by using a Philips screwdriver. Unscrew the Philips head screws securing the pilasters to the cabinet interior walls. Retain the screws in a secure place for re-installation. Wash the pilasters with warm water and a mild detergent in a suitable place suitable for this effort such as a deep sink. A soft bristle brush is recommended to reach the interior area of the pilasters. Re-install the pilasters and shelving when the cleaning procedure is complete.

Drain connections to the evaporator pan and the evaporator pan should be periodically cleaned to prevent any build up of debris, fungi, etc. See the cleaning instructions on the following page (B13351).

See the instructions below for cleaning the evaporator drain pan.

NOTE: THE EVAPORATOR ASSEMBLY IS COMPLETELY ENCLOSED BY A COWL AND IS ISOLATED FROM ANY FOOD CONTAMINATION AND INGRESS OF DIRT OR DEBRIS. PERIODIC INSPECTIONS SHOULD BE ACCOMPLISHED TO ENSURE THE EVAPORATOR COIL, DRAIN PAN AND CONDENSATE PAN IS CLEAN. IF CLEANING IS REQUIRED SEE INSTRUCTIONS BELOW.



1. DISCONNECT POWER TO UNIT.
2. REMOVE EVAPORATOR COWL COVER.
3. POUR FRESH WATER THROUGH EVAPORATOR COIL. WATER WILL FLUSH DIRT/DEBRIS TO THE DRAIN PAN. WATER WILL COLLECT IN THE DRAIN PAN AND BE ROUTED WITH ANY DIRT/DEBRIS TO THE CONDENSATE VAPORIZER PAN THROUGH THE DRAIN HOSE.
4. USE CLEAN RAG TO MOP UP WATER AND ANY DIRT/DEBRIS FROM THE CONDENSATE VAPORIZER PAN.

NOTE: DO NOT UTILIZE CLEANERS WITH WATER. THE CHEMICALS IN CLEANING SOLUTIONS CAN LEAVE RESIDUE THAT WILL HAMPER PROPER OPERATION OF THE EVAPORATOR COIL.

All moving parts have been permanently lubricated and will generally require no maintenance.

Door hinges should also be periodically cleaned. The door(s) must be removed to gain adequate access to the hinges. See the illustrations below for solid door and glass door removal.

## SOLID DOOR REMOVAL FOR HINGE CLEANING

1. Open door to stay position, locate top hinge of door.



2. Remove screws for hinge.

After screws are removed, grasp top hinge firmly and allow the hinge bracket to close to the door.

**!!CAUTION!! Hinge under high tension Pinch point hazard**

3. Once tension has been removed lift door up to remove. Wipe area clean with mild soap, do not use abrasives.
4. Reverse steps to re-install.



## GLASS DOOR REMOVAL FOR HINGE CLEANING



1. Open door, locate door heater power cord (if applicable) and remove screw.

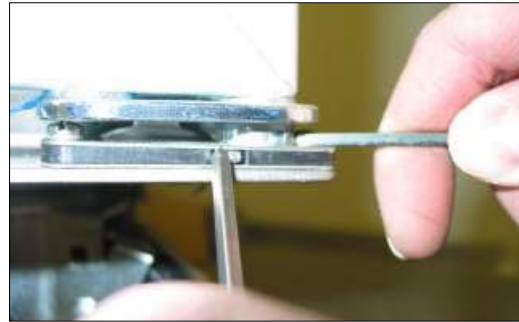
2. Remove black spacer clip.





3. Pry open hinge stay to clear stop pin.

4. Locate hinge tension tool (Taped on door upon delivery). Insert tool in spring notch on bottom of door, push toward cabinet and then release front trigger. *Skip this step for doors with full length handles.*



5. Once tension has been removed lift door up to remove.

6. Remove screws for hinge.



7. Wipe clean with mild soap.



*Note: reverse process to install door.*

**MAINTENANCE SERVICE AND ANALYSIS GUIDE**  
**REFRIGERATION SYSTEMS - ALL MODELS**

<b><u>MALFUNCTION</u></b>	<b><u>POSSIBLE CAUSE</u></b>	<b><u>SOLUTION</u></b>
Compressor will not start - no hum	<ol style="list-style-type: none"> <li>1. Service cord unplugged</li> <li>2. Fuse blown or removed</li> <li>3. Overload tripped</li> <li>4. Control stuck open</li> <li>5. Wiring incorrect</li> </ol>	<ol style="list-style-type: none"> <li>1. Plug in service cord</li> <li>2. Replace fuse</li> <li>3. Determine reasons and correct</li> <li>4. Repair or replace</li> <li>5. Check wiring against the diagram</li> </ol>
Compressor will not start - hums but trips on overload protector	<ol style="list-style-type: none"> <li>1. Improperly wired</li> <li>2. Low voltage to unit</li> <li>3. Starting capacitor defective</li> <li>4. Relay failing to close</li> </ol>	<ol style="list-style-type: none"> <li>1. Check wiring against the diagram</li> <li>2. Determine reason and correct</li> <li>3. Determine reason and replace</li> <li>4. Determine reason, correct or replace</li> </ol>
Compressor starts and runs, but short cycles on overload protector	<ol style="list-style-type: none"> <li>1. Low voltage to unit</li> <li>2. Overload defective</li> <li>3. Excessive head pressure refrigeration system</li> <li>4. Compressor hot-return gas hot</li> </ol>	<ol style="list-style-type: none"> <li>1. Determine reason and correct</li> <li>2. Check current, replace overload protector</li> <li>3. Check ventilation or restriction in</li> <li>4. Check refrigerant charge, fix leak if necessary</li> </ol>
Compressor operates long or continuously	<ol style="list-style-type: none"> <li>1. Short of refrigerant</li> <li>2. Control contact stuck</li> <li>3. Evaporator coil iced</li> <li>4. Restriction in refrigeration system</li> <li>5. Dirty condenser</li> </ol>	<ol style="list-style-type: none"> <li>1. Fix leak, add charge</li> <li>2. Repair or replace</li> <li>3. Determine cause, defrost manually</li> <li>4. Determine location and remove restriction</li> <li>5. Clean condenser</li> </ol>
Compressor runs fine, but short cycles	<ol style="list-style-type: none"> <li>1. Overload protector</li> <li>2. Cold control</li> <li>3. Overcharge</li> <li>4. Air in system</li> <li>5. Undercharge</li> </ol>	<ol style="list-style-type: none"> <li>1. Check wiring diagram</li> <li>2. Differential too close - widen</li> <li>3. Reduce charge</li> <li>4. Purge and recharge</li> <li>5. Fix leak, add refrigerant</li> </ol>
Starting capacitor open, shorted or blown	<ol style="list-style-type: none"> <li>1. Relay contacts stuck</li> <li>2. Low voltage to unit</li> <li>3. Improper relay</li> </ol>	<ol style="list-style-type: none"> <li>1. Clean contacts or replace relay</li> <li>2. Determine reason and correct</li> <li>3. Replace</li> </ol>
Relay defective or burned out	<ol style="list-style-type: none"> <li>1. Incorrect relay</li> <li>2. Voltage too high or too low</li> </ol>	<ol style="list-style-type: none"> <li>1. Check and replace</li> <li>2. Determine reason and correct</li> </ol>
Refrigerated space too warm	<ol style="list-style-type: none"> <li>1. Control setting too high</li> <li>2. Refrigerant overcharge</li> <li>3. Dirty condenser</li> <li>4. Evaporator coil iced</li> <li>5. Not operating</li> </ol>	<ol style="list-style-type: none"> <li>1. Reset control</li> <li>2. Purge refrigerant</li> <li>3. Clean condenser</li> <li>4. Determine reason and defrost</li> <li>5. Determine reason, replace if necessary</li> </ol>
Standard temperature system freezes the product	<ol style="list-style-type: none"> <li>1. Control setting is too low</li> <li>2. Control points stuck</li> </ol>	<ol style="list-style-type: none"> <li>1. Reset the control</li> <li>2. Replace the control</li> </ol>
Objectionable noise	<ol style="list-style-type: none"> <li>1. Fan blade hitting fan shroud</li> <li>2. Tubing rattle</li> <li>3. Vibrating fan blade</li> <li>4. Condenser fan motor rattles</li> <li>5. General vibration</li> <li>6. Worn fan motor bearings</li> </ol>	<ol style="list-style-type: none"> <li>1. Reform or cut away small section of shroud</li> <li>2. Locate and reform</li> <li>3. Replace fan blade</li> <li>4. Check motor bracket mounting, tighten</li> <li>5. Compressor suspension bolts not loosened on applicable models - loosen them</li> <li>6. Replace fan motor</li> </ol>
Pan Area	<ol style="list-style-type: none"> <li>1. No cooling</li> <li>2. Too cold</li> <li>3. Too warm</li> </ol>	<ol style="list-style-type: none"> <li>1. Make sure switch is in the "on" position</li> <li>2. Adjust temperature control - see instructions under pan area</li> <li>3. Adjust temperature control - see instructions under pan area</li> </ol>



## REMOTE REFRIGERATION DATA

Model	BTU @ 100°F Solid Dr		Refrigt	Voltage	Amps	Exp valve	ELEC
	& 86°F Glass Dr						VAPORIZER
NR241SSS/OR	850 @ +28°F	EVAP	R134a	115/60/1	0.53	YES	NO
NR241SSG/OR	1260 @ +28°F	EVAP	R134a	115/60/1	0.53	YES	NO
NR242SSS/OR	850 @ +28°F	EVAP	R134a	115/60/1	0.53	YES	NO
NR242SSG/OR	1260 @ +28°F	EVAP	R134a	115/60/1	0.53	YES	NO
NR522SSS/OR	1580 @ +28°F	EVAP	R134a	115/60/1	0.9	YES	NO
NR522SSG/OR	2450 @ +28°F	EVAP	R134a	115/60/1	0.9	YES	NO
NR524SSS/OR	1580 @ +28°F	EVAP	R134a	115/60/1	0.9	YES	NO
NR524SSG/OR	2450 @ +28°F	EVAP	R134a	115/60/1	0.9	YES	NO
NR803SSS/OR	2250 @ +28°F	EVAP	R134a	115/60/1	1.1	YES	NO
NR803SSG/OR	3580 @ +28°F	EVAP	R134a	115/60/1	1.1	YES	NO
NR806SSS/OR	2255 @ +28°F	EVAP	R134a	115/60/1	1.1	YES	NO
NR806SSG/OR	3580 @ +28°F	EVAP	R134a	115/60/1	1.1	YES	NO
PR242SSS/OR	925 @ +28°F	EVAP	R134a	115/60/1	0.53	YES	NO
PR242SSG/OR	1860 @ +28°F	EVAP	R134a	115/60/1	0.53	YES	NO
PR524SSS/OR	1715 @ +28°F	EVAP	R134a	115/60/1	0.9	YES	NO
PR524SSG/OR	3655 @ +28°F	EVAP	R134a	115/60/1	0.9	YES	NO
PR806SSS/OR	2170 @ +28°F	EVAP	R134a	115/60/1	1.1	YES	NO
PR806SSG/OR	5110 @ +28°F	EVAP	R134a	115/60/1	1.1	YES	NO
WR331SSS/OR	1370 @ +28°F	EVAP	R134a	115/60/1	0.76	YES	NO
WR722SSS/OR	2635 @ +28°F	EVAP	R134a	115/60/1	1.36	YES	NO
PWR332SSS/OR	1500 @ +28°F	EVAP	R134a	115/60/1	1.0	YES	NO
PWR724SSS/OR	2875 @ +28°F	EVAP	R134a	208-230/60/1	1.82	YES	NO
NF241SSS/OR	1820 @ -10°F	EVAP	R404a	115/60/1	4.7	YES	NO
NF242SSS/OR	1820 @ -10°F	EVAP	R404a	115/60/1	4.7	YES	NO
NF522SSS/OR	2855 @ -10°F	EVAP	R404a	115/60/1	6.9	YES	NO
NF524SSS/OR	2855 @ -10°F	EVAP	R404a	115/60/1	6.9	YES	NO
NF803SSS/OR	3505 @ -10°F	EVAP	R404a	115/60/1	7.4	YES	NO
NF806SSS/OR	3505 @ -10°F	EVAP	R404a	115/60/1	7.4	YES	NO
NX211SSS/OR	3015 @ -35°F	EVAP	R404a	115/60/1	7.2	YES	YES
NX211SSG/OR	4140 @ -35°F	EVAP	R404a	115/60/1	7.2	YES	YES
NX482SSS/OR	3520 @ -35°F	EVAP	R404a	115/60/1	11.6	YES	YES
NX482SSG/OR	5835 @ -35°F	EVAP	R404a	115/60/1	11.6	YES	YES

**NOTES:**

- 1) Cord and plug are not supplied with these units
- 2) Compressor size to be determined by a qualified refrigeration technician based on the delivered BTU rating at the unit and actual jobsite requirements.
- 3) BTU rating shown is the required BTU's at the evap coil.
- 4) Standard five year compressor warranty does not apply to these units.
- 5) Condensate removal is the responsibility of the customer. A short drain line exiting the unit cooler section on the top of the cabinet is provided for the purpose of extending.
- 6) Legs are standard on remote systems as they are generally hard piped to the condensing unit.
- 7) The solenoid valve mounted on the cabinet is factory wired to the control. No connections are required between the cabinet and the remote compressor.