DH FREEZER

INSTRUCTIONS

USER MANUAL

WARNING: READ BEFORE CONTINUING	
To reduce the risk of fire, electric shock or injury to persons using this freezer, read all instructions and follow basic safety precautions before using the unit, including the following:	
	Do not modify the plug provided with the unit. If it will not fit the outlet, have a proper outlet installed by a qualified electrician.
	Do not position equipment so it is difficult to disconnect from the power supply.
	While under warranty, do not attempt to repair or replace any part of the freezer for servicing without first contacting the So-Low Service Department.
	**BEFORE CALLING THE MANUFACTURER'S TECHNICAL SUPPORT DEPARTMENT** Please have the model number of the unit, box identification number, and serial number ready as well as the problem description. The model, serial number and box id number can be found on the serial tag, which is located on the interior left upper wall, or back of the unit.
SAVE THESE INSTRUCTIONS	

So-Low Environmental Equipment Company
10310 Spartan Drive
Cincinnati, OH 45215-1221
Tel: 513-772-9410
http://www.so-low.com

For customer service:
Email: sales@so-low.com

For parts replacement:
Email: parts@so-low.com

For technical support:
Email: service@so-low.com

CONTENTS

MODEL	AMPS / HP / Heat Rejection BTU/HR	REFRIGERANT
DH25-23SD	6.34 A / 3/4 HP / 3145	R290 – 3.35OZ.
DH25-27SD	10.0 A / 3/4 HP / 4158	R290 – 3.53 OZ.
DH25-49SD	10.0 A / 2X 3/4 HP / 6291	R290 – 3.35 OZ (X2)
DH25-23SD-SS	6.34 A / 3/4 HP / 3145	R290 – 3.35OZ.
DH25-27SD-SS	10.0 A / 3/4 HP / 4158	R290 – 3.53 OZ.
DH25-49SD-SS	10.0 A / 2X 3/4 HP / 6291	R290 – 3.35 OZ (X2)
DH29-23SD	11.0 A / 3/4 HP / 2891	R290 – 4.05 OZ
DH29-34SD	11.0 A / 3/4 HP / 2891	R290 – 4.05 OZ
DH29-46SD	10.0 A / 3/4+ HP / 3870	R290 – 4.05 OZ

*SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

CLEARANCE AND PLACEMENT INSTRUCTIONS

PLEASE READ ALL REQUIREMENTS BEFORE USING THIS EQUIPMENT

1) **Ambient Temperature** - Unlike a household refrigerator, this equipment is designed for scientific / medical application. Many components are heavy duty and extra sized, to meet the ultimate temperature performance. Therefore, the sounds generated from its operation may not be accepted by everyone in the room. Please take the operations sound factor into consideration and locate this refrigerator accordingly. Please ensure the ambient temperature is climate controlled between 60°F to 80°F to achieve the ultimate temperature performance.

2) **Placement** - Find a suitable location to install this freezer.

- **Models beginning with DH29 require 12 inches of clearance from the top.**
- **All other models require 3 inches of clearance from the back.**

3) **Floor Load -** The floor on which the unit is located must be even and level, free from vibrations, and strong enough to support the combined weights of the unit and maximum product load.

4) **Ventilation** - Grille area at front must be free and clear of any object or wall.

5) **Power Outlet** - Dedicated power outlet is located within the length of the unit's power cord. This is a cord-connected unit and must be connected to its own dedicated power supply. Check the data plate on the unit to confirm the voltage and per the data plate use the correct fuses or HACR circuit breakers.

6) **Power Cord -** This unit has been pre-wired at the factory and includes 8' long cord and plug set. If the power cord becomes damaged, it must be replaced with an identical cord. This Unit Must Be Grounded.

GFCI: Units that utilize variable speed compressor technology can experience nuisance tripping on Class A GFCI outlets which have a trip limit of 4 to 6 mA. To avoid this issue in a location that requires GFCI circuit protection, it is recommended to use HUBBEL Model Number GFRST83W 20A Heavy Duty Hospital Grade Self-Test GFCI Receptacle. Follow All National and Local Codes This Unit Must Be Grounded. Do not use extension cords and do not disable or by-pass ground prong on electrical plug.

STARTING INSTRUCTIONS

1. Move the unit to an indoor location and plug the unit into an appropriate outlet with an adequate power supply. Consult your maintenance department for additional information on the proper electrical configuration for this unit.

2. Once plugged in, the compressor(s) will start to operate and pull down to the setpoint on the temperature control.

3. Allow the unit to reach the setpoint temperature.
   Depending on the size of the unit, this may take up to 1-2 hours.

4. Product can now be loaded into the unit for storage. **Shelf weight limit is 75 Lbs. per shelf.**

RELEASE OF LIABILITY

IF THIS EQUIPMENT IS BEING USED TO STORE IRREPACEABLE AND / OR HIGH VALUE PRODUCTS, YOU (THE USER) MUST TAKE PROPER PRECAUTIONS TO ENSURE THAT THE PRODUCT IS NOT LOST.

SO-LOW WILL NOT BE ACCOUNTABLE FOR, CONSENT TO HAVE OBLIGATION TO, OR INHERIT RESPONSIBILITY OF PRODUCTS STORED INSIDE THE FREEZER / REFRIGERATOR REGARDLESS OF WARRANTY STATUS. THIS PERTAINS TO ANY DIRECT OR INDIRECT LOSSES (PHYSICAL OR ECONOMIC). PLEASE CONSULT THE WARRANTY OF THIS PRODUCT FOR ADDITIONAL CLARIFICATION.

Before this Refrigerator / Freezer can be placed into operation, complete all the applicable tasks listed below. You may need to consult your own departments for additional assistance with these tasks.

1) Connect your company remote alarm contacts system, or auto dialer, to the refrigerator's alarm system. If your model does not have an alarm system, you can install your 3rd party alarm into our refrigerator 1/2" access porthole.

2) Develop an emergency backup plan, and designate a separate back-up refrigerator, freezer, or similar appropriate device to store your product, if this equipment has an unforeseen issue.

MOISTURE DURING THE SUMMER SEASON

Due to the increase in ambient humidity in most locations during the summer season, the amount of moisture, condensation, or high humidity related issues may increase during this period.

Please note that in most cases, seasonal humidity related issues will resolve on their own when the ambient humidity levels around the unit reach under 40%.

Also, please note that the refrigeration system does not generate moisture; but instead condenses the moisture that is already in the chamber from the humidity in the air.

To prevent excess seasonal humidity related issues, please see the following.

1) Keeping the unit in an air conditioned, low humidity space.

2) Check that the door gasket is sealing properly and limit the frequency of door openings.

3) Make sure there is a water trap (u-shaped loop) in the drain tube near the end. (This clear tube is in the back of the unit and loops down to the drain pan behind the compressor) This will "trap" a small amount of water in the loop and prevent air from entering the chamber though the tube.

TEMPERATURE CONTROL

FUNCTION	#1 SET/ENTER - ⏻	#2 DEFROST ❄	#3 UP ⌃	#4 DOWN ⌄
QUICK PRESS & RELEASE	NO FUNCTION	ACTIVATES MANUAL DEFROST *	INCREASES SET POINT	DECREASES SET POINT
LONG PRESS AND RELEASE	TOGGLE BETWEEN °C / °F	ENTER STAND-BY MODE	INCREASES DISPLAY BRIGHTNESS	DECREASES DISPLAY BRIGHTNESS

(*The freezer will automatically defrost as needed, there is no set time for defrost.)

Defrost LED	
On fixed:	Defrost active
Off:	Defrost is off

Alarm LED	
On fixed:	ALARM Present
Flashing:	ALARM Silenced
Off:	No Alarm

Fan LED	
On fixed:	Fan active
Off:	Fan Off

Compressor LED	
On fixed:	Compressor active
Flashing:	Delay, protection or activation blocked
Off:	No Alarm

Alarms

Hi	HIGH TEMPERATURE ALARM	Confirm Doors Are Closed
d0r	DOOR OPEN ALARM	Close Door
E01, E02, E03, E04	SENSOR ERROR	
dEF	UNIT IS DEFROSTING	Normal Operations

Press any button to acknowledge an alarm.

CONTROL PROGRAMMING & CALIBRATION

DESCRIPTION	DEFAULT SETTINGS
TEMPERATURE ALARM DELAY (SETTING **Htd** & **Ltd**)	5 Minutes
ALARM – HIGH AIR TEMPERATURE (SETTING **Hat**)	-15°C (5°F)
ALARM – LOW AIR TEMPERATURE (SETTING **Lat**)	-30°C (–22°F)
ALARM – DOOR OPEN ALARM DELAY (SETTING **dod**)	5 Minutes
MAXIMUM RANGE LIMIT- (SETTING **Hse**)	-15°C (5°F)
MINIMUM RANGE LIMIT – (SETTING **Lse**)	-25°C (-13°F)
DISPLAY CALIBRATION (GLYCOL SENSOR) - (SETTING **doF**)	0.0

*** Long press and release the ⏻ key to change units from °C to °F, all settings will automatically convert.**

CALIBRATION INSTRUCTIONS

Calibration is a simple and quick process which does not require any refrigeration experience. Any in-house personnel with basic knowledge of the electronic controller can calibrate the control on the unit. Please follow the below procedure for assistance in completing the calibration process.

- To accomplish calibration, you will need a calibrated thermometer of your own.
- Place the additional thermometer as close as possible to the glycol bottle in the cabinet.
- Let the unit run for about 15-20 minutes with the door closed.

***** IF THERE IS NO DIFFERNCE IN TEMPERATURE, DO NOT PROCEED FURTHER *****

1. If there is a significant difference between your thermometer and the control, follow the below instructions below to re-calibrate your equipment to display what your calibrated sensor reads:

   - Press and hold both the **(DOWN)** ⌄ arrow and the **(UP)** ⌃ keys together until **PAS** appears**.**
   - Press the **(DOWN)** ⌄ arrow until the display reads 990. Press ⏻.
   - Press the **(DOWN)** ⌄ arrow until the display reads **dis**. Press ⏻.
   - Press the **(UP)** ⌃ arrow until the display reads **doF.**
   - Press the ⏻ to access the display calibration setting.
     (Input the difference between your thermometer and the display temperature into this screen.)
     Press and release **(UP)** ⌃ or **(DOWN)** ⌄ to adjust the setting to the desired value.
     - If the unit is too warm inside, put a positive number in **doF**.
     - If the unit is too cold inside, put a negative number in **doF**

     Press the ⏻ key to save your changes. The calibration procedure is now complete. Once the control sits idle for 60 seconds it will return to display the unit temperature.

CLEANING AIR CONDENSER

Large amounts of dust build-up on the air-cooled condenser can cause excess stress for the refrigeration system. This excess stress may increase the chance of a refrigeration issue and reduce the life expectancy of the refrigeration system.

ATTENTION

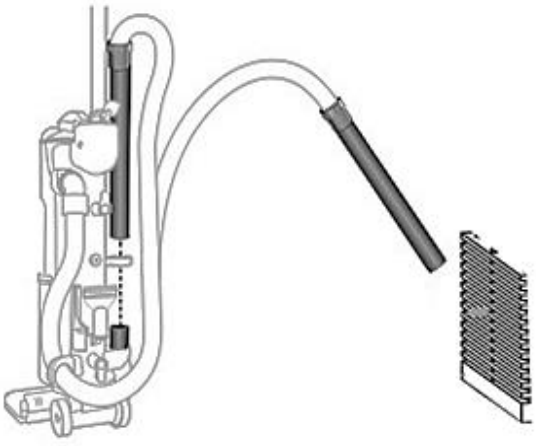
IT IS RECOMMENDED TO CLEAN THE CONDENSER AT LEAST ONCE EVERY 180 DAYS TO PREVENT DUST BUILDUP.

1. Using a Philips Head screwdriver, remove the screw(s) for grill located on front of unit. Once the screws are removed, the front grill can be lifted up and removed allowing easy access to the air-cooled condenser.

   Note: It is recommended to keep the screw(s) in a safe location, so they can be used to re-attach the grill once cleaning is completed.

2. Use a vacuum cleaner to pull up any dust built up on the condenser fins. The most efficient method of doing this is using a furniture cleaning attachment (if available).

Note: Cans of compressed air can also be used to blow away dust, however this is not the most recommended way to clean the condenser as the dust may float through the air and eventually return to clog up the condenser.



3. Once clean, re-align the front grill and attach it using a screwdriver.

MAINTENANCE PROCEDURES

BEFORE PERFORMING MAINTENANCE

To reduce the risk of fire, electric shock or injury to persons using this unit, read all instructions and follow basic safety precautions.

CAUTION

DISCONNECT THIS UNIT FROM THE POWER SUPPLY BEFORE PERFORMING MAINTENANCE ON THE UNIT.

CLEANING PROCEDURE

- Wipe down the exterior of the unit with a soft cloth and spray type polish.
- If excessive ice builds up in the evaporator, the unit can be manually defrosted (see below).

FULL DEFROST PROCEDURE

1. Remove any product in the unit and store it in a back-up unit or elsewhere.
2. Unplug the unit and open the front door.
3. The evaporator drain pan will catch the water that drips from the evaporator and funnel it to the drain pan. (The drain pan may overflow depending on the amount of ice buildup.)
4. Air out the unit for 8-12 hours, allowing the unit to reach room temperature.
5. Take a rag and wipe up all the excess water in the unit.
6. After the defrost plug your unit back in.
7. Once the desired temperature is reached, add the product back into the unit.

DOOR REVERSAL AND GASKET REPLACEMENT

DOOR REVERSAL INSTRUCTIONS

WARNING

Before performing any adjustments or modifications, ensure that the door is secured, wrapped, or protected in some way to prevent damage during this process. This is particularly necessary for glass doors. You may wish to have additional personnel assist you with this process.

1. Remove the hinge cover.
2. Remove the door from the unit, including the hinge mounting brackets.
3. On the side you would like the hinges to be located, remove all white hole plugs from the side of the door opening on the unit (**Do not throw these white hole covers away**).
4. On the bottom of the door remove the white hole plugs.
5. Use the removed hole plugs from step 3 and insert them into the screw holes where the hinges were originally located on the unit.
6. Install the hinge bracket upright on the unit.
   Note: The thick portion of the hinge bracket should be on the bottom as you mount them.
7. The door portion of the hinges needs to be removed and rotated 180 degrees and remounted.
8. In the holes where the first handle was previously mounted, install the hole plugs which were removed from the bottom of the door in step 4.
9. Slide the door back into position and gently lower into the white pivot cam, and then re-attach the removed hinge cover.

DOOR GASKET REPLACEMENT

1. Remove existing gasket from mounting track.
2. Verify mounting track is free of any remaining gasket material.
3. Align the new gasket with the mounting track and press firmly in place.
4. Open and close the door, checking for proper gasket seal without pinching against refrigerator.

MONITOR PROBE FOR FIELD INSTALLATION

Each freezer is equipped with a 1/2” probe access port hole on the left-hand side for your independent probe installation. The port hole is generally located on the side of the freezer. Simply remove the black cap, run your probe through, and seal the hole with black cap, or electrical putty to prevent air from getting into chamber.

DO NOT RUN YOUR PROBE THROUGH THE DOOR GASKET
Doing so may cause serious condensation or frozen evaporator issue.
The port hole is specifically designed to allow you to install the monitor probe.

This freezer is factory set to run at its ultimate temperature performance. There should be no need to adjust the temp settings. If you feel the temp settings must be adjusted, please refer to the temperature adjustment section in the manual for details.

** FOR SERVICE TECHNICIANS ONLY **

FLAMMABLE REFRIGERANT GAS

RISK OF FIRE OR EXPLOSION. FLAMMABLE REFRIGERANT USED.
ALL SAFETY PRECAUTIONS MUST BE FOLLOWED.
DO NOT PUNCTURE REFRIGERANT TUBING.

REFRIGERATION SERVICE SHOULD ONLY BE ATTEMPTED BY A TRAINED TRADE PROFESSIONAL CERTIFIED TO WORK ON R290 SYSTEMS.

CRITICAL SERVICE ITEMS ARE LISTED BELOW

THIS LIST IS ONLY A REMINDER AND CHECKLIST FOR THE SERVICE TECH
THIS LIST DOES NOT QUALIFY ANYONE TO SERVICE THE UNIT

Keep these in mind for **R290 service**:

- ✓ Wire nuts are NOT to be used when changing an electrical part.
- ✓ The switches in this product are sealed. **Only exact replacements may be used**.
- ✓ The process tubes are to be used for service access only.
- ✓ Cut out (with tubing cutter) refrigeration components that are to be replaced. **Do NOT un-braze**.
- ✓ If R290 is to be vented into the air during service, the venting MUST be in an area free from flame or spark. **It must be near an open window or door.**
- ✓ A sign noting the service of a system containing propane must be attached to the unit during refrigeration service.
- ✓ A combustible gas leak detector must be used to inform anyone in the area when propane is present in the air.

Other Information:

Evacuation: It is critical that a refrigeration system be leak free and internally dry. A thorough evacuation with a good vacuum pump with a micron gauge attached is the only way to ensure that the system is dry and ready for a charge of refrigerant.

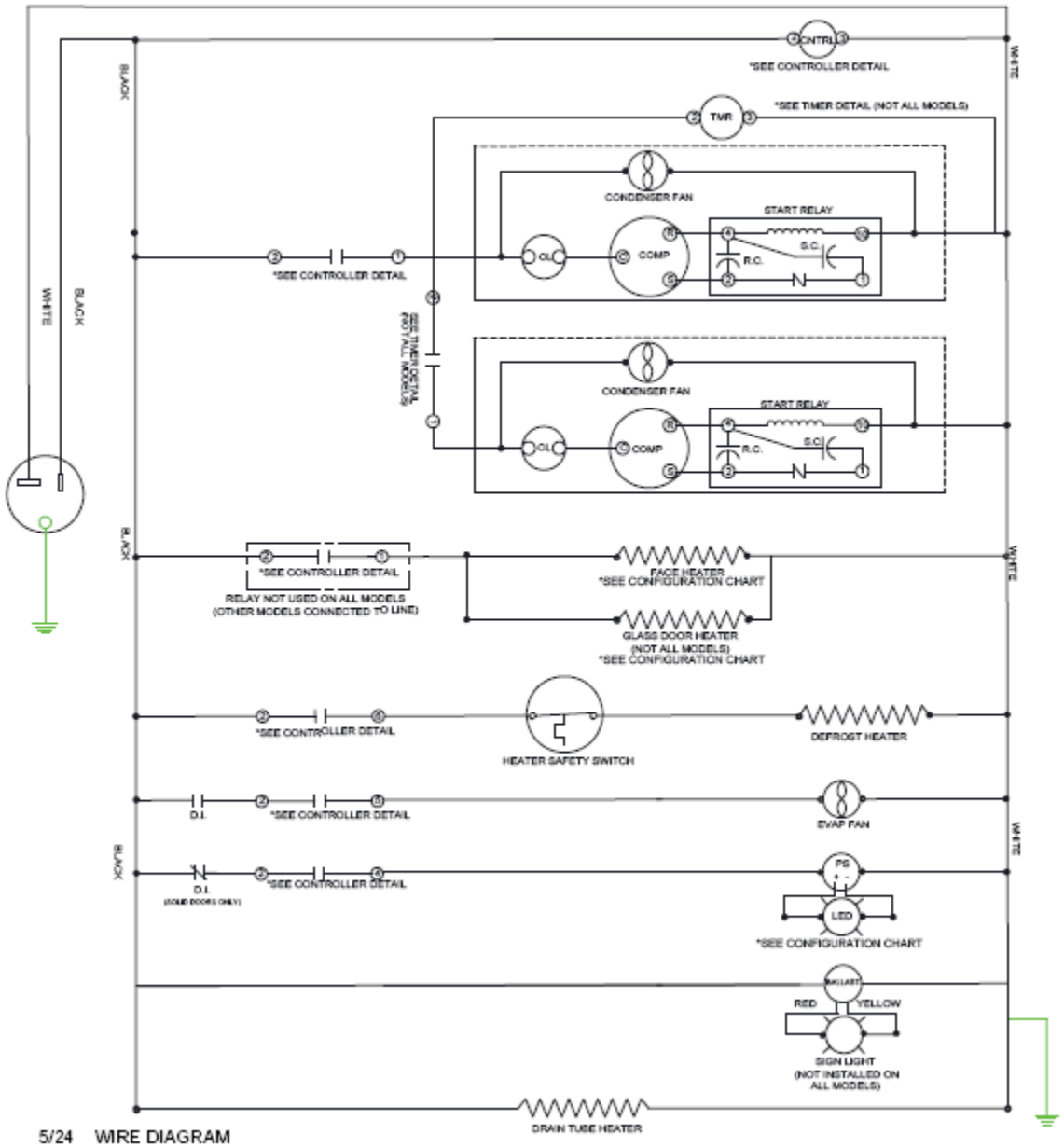
Charging: The system is critically charged, and the proper type and amount MUST be weighed in.

Overcharge symptoms: Unit will cool properly but the suction line temperature will be unusually cold. Compressor run time will be longer than normal.

Undercharge symptoms: long run time, poor cooling and a hot compressor dome are the main symptoms of an undercharge.

WIRE DIAGRAM

WIRE DIAGRAM FOR ONE & TWO SYSTEM UITS



5/24 WIRE DIAGRAM

CONTROL WIRING:

100 – 240 V AC ± 10% 50/60 Hz 0T55

Outputs

1	2	3	4	5	6
DO1	L	N	DO2	DO3	DO4

Inputs

S1	S2	S3	S4	di

OUTPUTS

TERMINAL 1 - COMPRESSOR
TERMINAL 2 - LINE VOLTAGE
TERMINAL 3 - COMMON
TERMINAL 4 - ALARM RELAY
TERMINAL 5 - EVAPORATOR FAN
TERMINAL 6 - DEFROST HEATER

INPUTS

S1 - AIR SENSOR
S2 - EVAPORATOR SENSOR
S3 - (2ND SYSTEM EVAP SENSOR, IF APPLICABLE)
S4 - GLYCOL SENSOR
di - NOT USED

SO-LOW ENVIRONMENTAL EQUIPMENT COMPANY

CINCINNATI, OHIO, USA

WARRANTY

So-Low Environmental Equipment Company as the Manufacturer WARRANTS the quality of all parts used in the construction of this machine to be free from defects to the original purchaser.

a. This WARRANTY shall continue for 3 years from the original shipment date, i.e. 3 years from the time of shipment from So-Low Environmental Equipment Company at Cincinnati, Ohio, U.S.A. This WARRANTY shall not extend to shipments due to repairs or technical service after original WARRANTY has expired.

b. This WARRANTY shall have force and effect only if all items are used with proper circuits, voltages, and frequencies and the operation thereof is in accordance with instructions furnished by the manufacturer.

c. This WARRANTY shall not extend to such parts as refrigerants, finishes, belts, and dryers.

d. This WARRANTY shall not extend to ordinary wear and tear, or ordinary refrigeration service and refrigeration adjustments, unless specifically included in the equipment purchase contract.

e. This WARRANTY shall not extend in any way to liability (whether or not construed on tort or contract any other theory of law) to consequential damages resulting from:

1. Ordinary use of the machine.

2. Abuse or misuse of the machine; such as high room ambient temperature, or operating the unit out of the stated temperature range.

3. Interruption or cessation of the operation of the machine from any cause whatsoever, Including but not limited to power failure, LOW VOLTAGE, acts of God, explosion, negligent operation and the like.

"Consequential damages" shall be defined to include, but not limited to spoilage of, or damage to contents placed in the machine, loss of profits, expenses of delay resulting from interruption or cessation of the operation of the machine, loss of customers or business good will, any time element loss, or any other special damages. Also, there is no guarantee for plus or minus temperature.

f. This WARRANTY shall extend only to furnishing for replacement a part found by the manufacturer to be defective.

g. This WARRANTY shall not extend nor cover any part used as a replacement part beyond the original three year machine WARRANTY: nor does the manufacturer undertake any obligation in connection with this WARRANTY other than that specifically set forth above. No person is authorized to make any representation as to this WARRANTY except duly authorized officers of So-Low Environmental Equipment Company.

h. SO-LOW ENVIRONMENTAL EQUIPMENT COMPANY agrees if instructions as to operation and use are strictly followed, and power sources (circuits, voltages, frequencies, ect.) are properly applied, to provide within three years after original delivery to shipper, labor free of charge to maintain equipment in good working condition.

i. This WARRANTY shall extend replacement compressor parts to 4 additional years. This compressor WARRANTY shall not extend nor cover any labor during this extended period.

j. This WARRANTY is limited to products purchased and installed in the United States of America.