

ISSUE DATE: 8/95

# **OPERATIONS AND MAINTENANCE MANUAL REPLACEMENT PARTS LIST FOR:**



**STORE NAME:** \_\_\_\_\_

**INSTALLATION DATE:** \_\_\_\_\_

**LOW TEMP**  
MANUFACTURING COMPANY

DIVISION OF LOW TEMP INDUSTRIES, INC  
9192 TARA BOULEVARD P.O. BOX 795 JONESBORO, GEORGIA 30237  
TELEPHONE: (770) 476-6803

CUSTOM FABRICATORS OF STAINLESS STEEL FOOD SERVICE EQUIPMENT

# ATTENTION KITCHEN MANAGER

## **IMPORTANT** **TECHNICAL NOTICE** **REFRIGERATION AIR FILTERS**

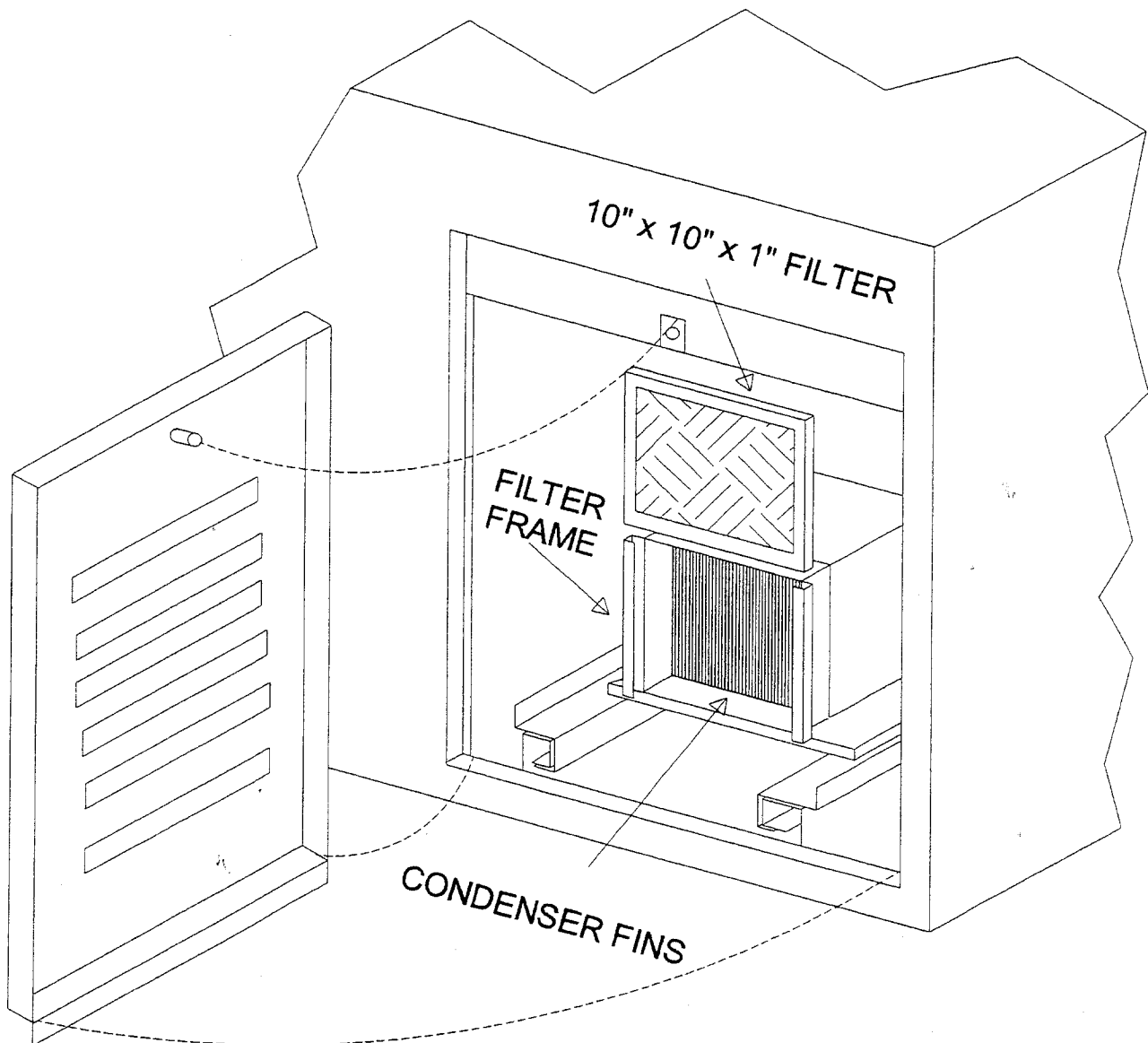
All self contained refrigeration systems provided by Low Temp Industries are provided with a 10" x 10" x 1" air filter located at the face of the condenser directly behind the louver panel. It is important to check this filter every 30 days and replace if necessary to ensure the proper operation of the unit. Failure to check this filter and replace if clogged can and will cause premature compressor failure and will not be covered by factory warranty.

If construction is not complete when the equipment is started be sure that the filters are checked and replaced if necessary once the final clean up is completed.

The purpose for this filter is to keep the condenser fins as clean as possible. If the filter is removed and discarded the fins will become clogged and will require a chemical rinse to clear them. When the condenser fins become clogged or the filter is not checked and replaced the compressor work harder to maintain temperature and the box interior cabinet temperature will rise.

It is **very important** that the **MAINTENANCE PERSONNEL** be informed of this feature provided on our equipment. Your cooperation in maintaining this feature is greatly appreciated. If you have any questions or problems concerning this matter please contact Casey Hammonds or Ben Shackelford in the Low Temp Engineering Department 770-478-8803

## CONDENSER FILTER ACCESS CHANGE EVERY 30 DAYS



1. TO REMOVE THE LOUVERED PANEL LOOSEN THE THUMB SCREW LOCATED AT THE TOP OF THE PANEL.
2. TILT THE TOP OUT AND LIFT THE PANEL STRAIGHT UP.
3. LIFT THE FILTER STRIAIGHT UP OUT OF THE TRACK.
4. WHEN REPLACING THE FILTER NOTE THE AIR FLOW DIRECTION. IT SHOULD BE POINTING TOWARD THE CONDENSER FINS.

CAUTION: THIS FILTER MUST BE CHANGED EVERY 30 DAYS TO ENSURE PROPER OPERATION OF THE UNIT. FAILURE TO CHANGE THE FILTER WILL CAUSE THE COMPRESSOR TO RUN HOT AND CAUSE PREMATURE COMPRESSOR FAILURE. IF THE FILTER IS REMOVED AND NOT REPLACED THE CONDENSER FINS WILL BECOME CLOGGED AND REQUIRE A CHEMICAL RINSE TO CLEAR .

THIS MANUAL COVERS EQUIPMENT SUPPLIED BY LOW TEMP INDUSTRIES TO PERKINS FAMILY RESTAURANT. THIS MANUAL IS APPLICABLE TO ALL EQUIPMENT SHIPPED AFTER SEPTEMBER 1, 1995. SOME DESIGNS MAY VARY FOR EQUIPMENT SHIPPED PRIOR TO THAT DATE.

**THIS MANUAL SHOULD BE RETAINED FOR FUTURE REFERENCE**

This manual is intended to provide Operational, Maintenance and Cleaning instructions to the owners of Low Temp Industries Custom Equipment. This manual covers the basic design concepts used by Low Temp. Because of the custom nature of the equipment there may be some variations from the information provided in this manual.

This manual shall be divided into three (3) separate sections.

- Section 1: GENERAL CARE AND MAINTENANCE OF STAINLESS STEEL EQUIPMENT
- Section 2: OPERATIONAL, MAINTENANCE AND CLEANING OF HOT FOOD UNITS
  - A. Hot Food Wells
- Section 3: OPERATIONAL, MAINTENANCE AND CLEANING OF REFRIGERATION SYSTEMS
  - A. Tempest-Aire Cold Rail Systems
    - Self contained or Remote
  - B. Refrigerated and Freezer Base Systems
    - Self contained or Remote
  - C. Multiplex Refrigeration Systems
    - Self Contained

FOR TECHNICAL ASSISTANCE CONTACT:

ENGINEERING DEPARTMENT OF  
LOW TEMP INDUSTRIES  
9192 TARA BOULEVARD  
P.O. BOX 795  
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PHONE 770-478-8803  
FAX 770-471-3715

ALL EQUIPMENT THAT IS SUPPLIED BY LOW TEMP INDUSTRIES IS CONSTRUCTED OF TYPE 304 STAINLESS STEEL. THE CONSTRUCTION METHODS USED BY LOW TEMP PROVIDE YOU WITH ONE OF THE MOST DURABLE PRODUCT ON THE MARKET. IF PROPERLY MAINTAINED AND CLEANED THIS EQUIPMENT WILL PROVIDE YOU WITH MANY YEARS OF QUALITY SERVICE.

THE FOLLOWING SECTION PROVIDES SOME BASIC INFORMATION ON HOW TO PROPERLY CLEAN AND MAINTAIN STAINLESS STEEL EQUIPMENT.

### HOW TO CLEAN STAINLESS STEEL

THE FOLLOWING INFORMATION WAS TAKEN FROM A PAMPHLET BY MR. RICHARD E. PARET, STAINLESS STEEL SPECIALIST, AMERICAN IRON AND STEEL INSTITUTE.

STAINLESS STEEL IS ONE OF THE EASIEST MATERIALS TO CLEAN AND KEEP CLEAN.

THE REASONS FOR STAINLESS STEEL'S EASE OF CLEANING ARE EASY TO SEE; THEY LIE IN THE NATURE OF THE METAL ITSELF.

1. IT'S HARD, TOUGH SURFACE. STAINLESS STEEL WILL WORK HARDEN, THAT IS, THE MORE IT IS USED, THE MORE RESISTANT TO WEAR IT BECOMES. STAINLESS STEEL WILL NOT DEVELOP ROUGH SPOTS THAT HARBOR BACTERIA AND SOIL.

2. HIGH CORROSIVE RESISTANCE. STAINLESS STEEL IS PRACTICALLY UNTOUCHED BY THE CORROSIVE ATTACKS OF MOISTURE, DETERGENTS, FOOD ACIDS, BLOOD SALTS AND OTHER CORRODENTS CONNECTED WITH FOOD PREPARATION. THIS MEANS THAT STAINLESS STEEL ALWAYS HAS A BRIGHT SURFACE FREE FROM OXIDES THAT CAN AFFECT THE FLAVOR OF FOODS.

THE SECRET OF MAINTAINING STAINLESS STEEL IS FREQUENT, SCHEDULED CLEANING THAT WILL PREVENT BUILD UP OF SURFACE DEPOSITS. SURFACE DEPOSITS, IF ALLOWED TO REMAIN FOR LONG PERIODS OF TIME CAN HAM STAINLESS STEEL. STAINLESS STEEL THRIVES ON EXPOSURE TO AIR; UNDER CERTAIN CONDITIONS, THE LENGTHY DEPRIVATION OF OXYGEN BY HEAVY SOIL DEPOSITS CAN CAUSE LOCALIZED PITTING OR STAINING.

NEGLECTING THE MATERIAL IN THIS MANNER IS **DEFINITE ABUSE** WHICH EVEN STAINLESS STEEL IS NOT IMMUNE.

TWO BASIC RULES:

1. CLEAN FREQUENTLY, AND ON A FIXED SCHEDULE.
2. SELECT THE SIMPLEST METHOD.

TO REMOVE ORDINARY DIRT AND FOOD RESIDUE FROM STAINLESS STEEL EQUIPMENT THAT OPERATES AT LOW TEMPERATURES, USE ORDINARY SOAP AND WATER AND APPLY WITH A SPONGE, FIBER BRUSH OR CLOTH. TO HASTEN ACTION, ADD EITHER SODA ASH, BAKING SODA, BORAX OR ANY OF SEVERAL NON-ABRASIVE COMMERCIAL CLEANSING AGENTS.

TO REMOVE SPLATTER OR CONDENSED VAPOR WHICH HAVE "BAKED" ONTO THE EQUIPMENT, THE TREATMENT OUTLINED ABOVE IS OFTEN SUFFICIENT. IN OTHER CASES A GENTLE TO VIGOROUS POLISHING ACTION MAY BE NECESSARY.

FIRST TRY A PASTE MADE WITH WATER AND AMMONIA AS THE LIQUID AND EITHER MAGNESIUM OXIDE, FINELY POWDER PUMICE OR FRENCH CHALK AS THE SOLID. YOU CAN ALSO USE ONE OF SEVERAL COMMERCIAL CLEANERS LISTED IN THE FOLLOWING TABLE.

**HOW TO CLEAN STAINLESS STEEL**  
**(CONT.)**

RUB AS GENTLY AS POSSIBLE IN THE DIRECTION OF THE POLISHING MARKS ON THE STEEL, USING A SOFT CLOTH. FOR MORE RESISTANT DEPOSITS, USE A STAINLESS STEEL SCOURING SPONGE OR STAINLESS STEEL WOOL OF THE FINEST POSSIBLE TEXTURE.

**WHAT NOT TO DO:**

DO NOT USE COMMON STEEL WOOL, SCOURING PADS, SCRAPERS, WIRE BRUSHES, FILES OR OTHER STEEL TOOLS, SINCE THESE CAN MAR THE STAINLESS STEEL. THESE PARTICLES WILL EVENTUALLY RUST AND STAIN THE SURFACE, AND YOU MAY HAVE TO REFINISH IT.

SLIGHTLY DARKENED AREAS SOMETIMES APPEAR ON STAINLESS STEEL SURFACES WHERE HEAT HAS BEEN APPLIED DURING FABRICATION OR IN SERVICE.

THESE ARE CAUSED BY THICKENING OF THE PROTECTIVE SURFACE OF STAINLESS STEEL, AND ARE NOT HARMFUL. REMOVAL CALLS FOR ENERGETIC SCOURING, AGAIN USING A STAINLESS STEEL WOOL OR SCOURING PAD, COMBINED WITH A SCOURING POWDER OR ONE OF THE HEAT-TINT REMOVERS LISTED IN THE TABLE.

THREE RULES WILL PREVENT HEAT TINTING:

- 1) USE ONLY ENOUGH HEAT TO DO THE JOB EFFICIENTLY.
- 2) DO NOT APPLY HEAT TO EMPTY EQUIPMENT.
- 3) AVOID CONCENTRATING HEAT ON A SMALL AREA.

**\*\*\* CAUTION IS ADVISED \*\*\***

IN STERILIZING STAINLESS STEEL EQUIPMENT, PAY PARTICULAR ATTENTION TO AGENTS CONTAINING CHLORINE COMPOUNDS SUCH AS POTASSIUM HYPOCHLORITE. THESE COMPOUNDS MAY BREAK DOWN AND RELEASE FREE CHLORINE, OR HYDROLYZE TO FORM HYDROCHLORIC ACID.

STAINLESS STEEL RESISTS ATTACK BY SUCH COMPOUNDS FOR UP TO TWO HOURS. SEVERE LOCALIZED PITTING MAY OCCUR FROM LONGER EXPOSURE. FOR SAFE USE OF THESE AGENTS, KEEP CONTACT TIME SHORT, FLUSH THOROUGHLY WITH WATER, AND OPERATE EQUIPMENT NORMALLY BETWEEN APPLICATIONS. USING THESE PRECAUTIONS, THE STERILIZATION PROCESS CAN BE REPEATED ANY NUMBER OF TIMES.

## **CLEANERS AND THEIR EFFECT ON STAINLESS STEEL**

<b>Cleaning agent</b>	<b>Method of Application</b>	<b>Effect on Finish</b>
<b>1. Tightly adhering deposits of "baked on" spatter, oil, grease, weather stain, dyes or other light discoloration may be removed with any of the following cleaners.</b>		
Grade FFF Italian pumice whiting or bon ami pressure on no.7	scour or rub with damp cloth	satisfactory for all finishes use light
Liquid NuSteel	scour with small amount on dry cloth	satisfactory for all finishes if rubbing pressure is light
Paste NuSteel or Temp	scour with small amount on dry cloth	satisfactory for no. 4 finish. Will scratch no.7
House hold cleaners such as Old Dutch, Sunbrite, Wyandotte, Bob-O, Gold Dust and Sapolio	Rub with damp cloth	Will scratch no. 4 finish slightly
Grade F Italian Pumice	Rub with damp cloth	Will scratch no.4 finish slightly
Cooper's stainless steel polish for no.4	satisfactory	Rub with damp cloth finish
Allen stainless steel polish considerably	Rub with damp cloth	Scratches but leaves mirror reflection
Best effect chemical co. cleaner & Passivator	Rub with damp cloth	May scratch no.4 finish slightly
<b>2. Heat tint or heavy discoloration with the following (see notes below)</b>		
Allen stainless polish	Small amount on damp cloth	Excellent heat tint remover
Birdsall's "Staybright"	Rub with damp cloth	Very good for heat tint removable. Doesn't scratch no.4 finish but does scratch no.7
Wyandotte or Bob-O removal	Rub with damp cloth	Good for heat tint
Oxalic acid (use warm) or 5-15% nitric acid	Swab or immerse. Always follow with a 5% sodium carbonate or neutralizer rinse	Good discoloration remover
Best effect chemical co. cleaner & Passivator surface	Rub with damp cloth	May scratch no 4 finish but leaves clean

**CLEANERS AND THEIR EFFECT ON**  
**STAINLESS STEEL**  
**(Cont.)**

Cleaning agent	Method of Application	Effect on Finish
3. The following detergents and solvents are excellent removers of grease, oil and fatty acids, where swabbing or rubbing is not practical.		
4 to 6% solution of (sodium Metasilicate) (Trisodium Phosphate) (Sodium Metaphosphate) (Sodium Pyrophosphate)		All excellent removers of grease, oil, and milkstone
5-15% caustic soda (hot or cold)		Will remove grease and milkstone
4. The following organic solvents may be used for removing oils and grease deposits:		
Carbon-tetrachloride, Naphtha, Trichlorethylene Acetone, Kerosene, Gasoline, Ether, Alcohol, Benzene		No affect on finish, however, take all precautions against fire.

Notes: ordinary wool or steel brushes should never be used on stainless steel surfaces. Particles of steel may become imbedded in the stainless steel surface, and rusting of these particles will eventually appear as stains. Use stainless steel wool or sponge on stainless steel equipment. Heat tint removers will usually scratch stainless steel surfaces. This, however, is necessary in removing heat tint by hand. Oakite, a fibrous material, may be used in place of metal sponges or cloth pads for applying cleaners and polishes. This material is effective in aiding in removal of milkstone.

For heavy hard water deposits, 15-20% (by volume) nitric acid is very effective. Acid treatment should be followed by a thorough water rinse.

The action of soldering fluxes should be neutralized immediately with a 5% sodium carbonate solution.

Soap and water followed by a water rinse will not harm stainless steel.



## **HOT FOOD SECTION**

### **OPERATING INSTRUCTIONS**

THE LOW TEMP "LT" SERIES HOT FOOD UNIT DESIGNED FOR DISPENSING OF FOOD. THIS UNIT IS DESIGNED TO HELP MAINTAIN A PRODUCT TEMPERATURE AT A MINIMUM OF 140 DEGREES FAHRENHEIT DURING SERVING PERIODS.

PLUG THE UNIT INTO THE PROPER GROUNDED ELECTRICAL OUTLET. THE UNIT IS NOW READY FOR OPERATION.

SINCE THE FOOD WARMING UNIT IS DESIGNED FOR HOLDING OR WARMING PRECOOKED FOOD, IT WILL NOT OVERCOOK FOOD WHEN PROPERLY USED. THERE ARE THREE (3) WAYS OF MAINTAINING HOT FOOD IN THE RECEPTACLE: 1. DRY HEATING, 2. STEAM HEATING AND 3. HOT WATER HEATING.

#### **1. DRY HEATING**

- A. PLACE THE CONTROL KNOB ON THE DESIRED POSITION AND ALLOW THE RECEPTACLE TO PREHEAT FOR 15 TO 20 MINUTES.
- B. PLACE THE CONTAINER OF FOOD IN THE RECEPTACLE. KEEP THE FOOD COVERED WHEN NOT SERVING.

#### **\*\*\* WARNING \*\*\***

**NEVER POUR COLD WATER INTO A HOT FOOD PAN RECEPTACLE. IF THE WATER BOILS OUT, REFILL WITH HOT WATER OR WAIT UNTIL WELL HAS COOLED DOWN. IF COLD WATER IS POURED ON A HOT, EMPTY RECEPTACLE IT WILL CAUSE THE WELL TO SPLIT OR CRACK.**

#### **2. STEAM HEATING**

- A. PLACE A FEW QUARTS OF COLD WATER OR HOT WATER (FOR A FASTER PRE-HEAT) IN TO THE RECEPTACLE. THE WATER SHOULD NOT BE IN CONTACT WITH THE FOOD PAN.
- B. PLACE A COVER OR EMPTY FOOD PAN OVER THE RECEPTACLE AND SET THE THERMOSTAT TO A POSITION FOR MODERATE BOILING. ALLOW UNIT TO PREHEAT UNTIL WATER BOILS.
- C. PLACE THE CONTAINER OF FOOD IN THE RECEPTACLE. KEEP FOOD COVERED WHEN NOT BEING SERVED.
- D. ADJUST THE THERMOSTAT TO A POINT WHERE THE WATER JUST BOILS.

#### **2. HOT WATER**

- A. FILL THE RECEPTACLE WITH HOT WATER TO A DEPTH SO THAT THE FOOD CONTAINER WILL BE IN CONTACT WITH THE WATER.
- B. PLACE A COVER OR EMPTY FOOD PAN OVER THE RECEPTACLE AND SET THE THERMOSTAT TO A POSITION FOR MODERATE BOILING. ALLOW UNIT TO PREHEAT UNTIL WATER BOILS.
- C. LOWER THE SETTING ON THE THERMOSTAT SLIGHTLY SO THAT THE WATER TEMPERATURE IS JUST BELOW THE BOILING POINT.
- D. PLACE THE CONTAINER OF FOOD IN THE RECEPTACLE. KEEP FOOD COVERED WHEN NOT BEING SERVED.

EXACT DIAL SETTING TO MAINTAIN DESIRED FOOD TEMPERATURE WILL VARY WITH THE CHARACTER OF THE FOOD, SUCH AS WHETHER OR NOT THE FOOD IS WATERY OR HAS A CONSIDERABLE AMOUNT OF GREASE. THE MOST SATISFACTORY TEMPERATURE SETTING MUST BE DETERMINED BY EXPERIENCE.

WITH STEAM AND HOT WATER HEATING THE DRYING THE DRYING OUT OF THE FOOD IS MINIMIZED BECAUSE THE WATER VAPOR FROM THE RECEPTACLES CREATES HUMID AIR OVER THE FOOD.

#### **THERMOSTAT:**

THE THERMOSTAT BULB IS CLAMPED TO THE OUTSIDE OF THE DEFLECTOR PLATE ON THE BOTTOM OF THE RECEPTACLE. A CAPILLARY TUBE EXTENDS FROM THE BULB TO THE THERMOSTAT CONTROL. WHENEVER THE HEATING UNIT IS ENERGIZED THE PILOT LIGHT BLOWS AND GOES OFF WHEN THE PRESET TEMPERATURE IS REACHED. THE CYCLING OF THE THERMOSTAT IS THEREFORE INDICATED BY THE PILOT LIGHT.

#### **SHUTDOWN:**

AT THE END OF THE DAY OR SERVING PERIOD, TURN THE THERMOSTAT CONTROLS TO THE OFF POSITION. THIS REMOVES ALL POWER TO THE HEATING UNITS. TO SHUT OFF THE EQUIPMENT FOR LONG PERIODS OF TIME OR TO PREVENT THE UNAUTHORIZED USE OF THE EQUIPMENT PLACE THE **CIRCUIT BREAKER** TO THE OFF POSITION.

#### **CLEANING**

##### **HOT FOOD WELLS:**

**WET OPERATION** - IF HOT WATER OR STEAM HEATING IS USED, ALL SURFACES ARE COVERED WITH A FILM OF WATER. FOOD SPILLAGE INTO THE RECEPTACLE WILL NOT STICK OR CARBONIZE. IT WILL DROP IN TO THE WATER AND FLOAT OR SETTLE TO THE BOTTOM. TO CLEAN THE RECEPTACLE, REMOVE THE WATER BY OPENING THE DRAIN VALVE LOCATED UNDER THE UNIT AND DRAIN THE WATER IN TO A SUITABLE CONTAINER AND SPONGE OUT THE REMAINING WATER. WASH THE RECEPTACLE WITH A MILD DETERGENT AND HOT WATER, RINSE AND DRY. SEE THE FOLLOWING SECTION ON "HOW TO CLEAN STAINLESS STEEL" FOR SPECIFIC RECOMMENDATIONS.

**DRY OPERATION** - WHEN THE FOOD WARMER IS USED DRY, FOOD SPILLAGE ON THE HOT SURFACES WILL BURN AND STICK. THE SAME COMMERCIAL CLEANERS USED ON STAINLESS STEEL UTENSILS MAY BE USED TO CLEAN THE RECEPTACLE. WASH THE INTERIOR SURFACES WITH WATER AND A MILD DETERGENT TO REMOVE DISCOLORATION. RINSE WITH PLAIN WATER AND DRY WITH AN ABSORBENT CLOTH. THE BOTTOM OF THE RECEPTACLE MAY TAKE ON A STRAW COLORED APPEARANCE WHEN IT IS USED DRY. THIS IS DUE TO THE INTENSE HEAT. THE DISCOLORATION WILL NOT COME OFF WITH NORMAL CLEANING PROCEDURES BUT DOES NOT POSE ANY PERFORMANCE OR HEALTH PROBLEMS. SEE THE SECTION ON "HOW TO CLEAN STAINLESS STEEL" FOR SPECIFIC RECOMMENDATIONS.

#### **\*\*\* WARNING \*\*\***

**DO NOT USE HARSH CHEMICALS, ACIDS OR ALKALIS IN CLEANING THIS TABLE OR HEATING RECEPTACLES. WITH ANY CLEANERS, READ INSTRUCTIONS CAREFULLY AND DILUTE AS INSTRUCTED BEFORE APPLYING TO STAINLESS STEEL EQUIPMENT.**

**THE FOOD WARMING RECEPTACLE IS MADE OF STAINLESS STEEL, BUT USE CARE DURING THE CLEANING OPERATION. HEAVY OBJECTS SHOULD NOT BE DROPPED IN THE RECEPTACLE.**

##### **CONTROL KNOB:**

TO CLEAN THE THERMOSTAT KNOB, PULL THE KNOB OUTWARD TO REMOVE IT FROM THE SHAFT. WASH THE KNOB WITH MILD SOAP AND WATER, RINSE AND DRY WITH A SOFT CLOTH. DO NOT USE ABRASIVE CLEANERS ON THE PLASTIC SURFACES OF THE KNOB.

**PREVENTATIVE MAINTENANCE OF**  
**LOW TEMP INDUSTRIES**  
**HOT FOOD UNITS**

*To insure that your equipment will continue to operate properly, please follow these simple steps:*

1. The food receptacle wells should be clean thoroughly every day. Food spillage left in the pans such as tomato paste can cause damage to the unit. The acidic base of foods over time can cause pitting of the units. For more cleaning information on these models, see the section on "HOW TO CLEAN STAINLESS STEEL" in this manual.
2. Always wipe the unit down with a damp cloth. Do not spray water directly in control panel areas or on areas with exposed heating elements.

## TROUBLE SHOOTING SERVICE CHART

SERVICE TO BE PERFORMED BY QUALIFIED SERVICE TECHNICIAN ONLY.

<u>COMPLAINT</u>	<u>PROBLEM</u>	<u>SOLUTION</u>
TABLE WILL NOT HEAT CONNECTIONS	1. PLUG DISCONNECTED	1. CHECK ALL ELECTRICAL
	2. LINE SWITCH OPEN	2. CLOSE SWITCH
	3. BREAKER TRIPPED	3. RESET BREAKER
	4. HEATER ELEMENT BURNED OUT OR DEFECTIVE	4. REPLACE
	5. THERMOSTAT DEFECTIVE	5. REPLACE
TABLE DOES NOT HEAT RATING.	1. LOW VOLTAGE	1. USING SUITABLE INSTRUMENT CHECK LINE VOLTAGE AND AMPERAGE. VOLTAGE MUST BE WITHIN 10 % OR NAME PLATE
	2. THERMOSTAT CALIBRATION NOT CORRECT	2. RECALIBRATE AS PER INSTRUCTIONS IN THIS MANUAL

### HOT FOOD WELL HEATING ELEMENT DATA

<u>VOLTAGE</u>	<u>WATTAGE</u>	<u>OHMS</u>	<u>AMPERAGE</u>
120	500	28.5	4.2
120	750	19.0	6.3
120	1000	14.4	8.3
208	500	86.6	2.4
208	750	57.7	3.6
<b>*208</b>	<b>*1000</b>	<b>*43.3</b>	<b>*4.8</b>
240	500	114.2	2.1
240	750	77.4	3.1
240	1000	58.5	4.1

\* STANDARD HEATING ELEMENT FOR LOW TEMP EQUIPMENT. OTHER ELEMENTS AVAILABLE UPON REQUEST.

### FOIL TYPE HEATING ELEMENT FOR HEATED BASE

DOUBLE HEATED BASE  
STANDARD ELECTRICAL 208V/ 214W/ 1.03A/ 208 OHMS

SINGLE HEATED BASE  
STANDARD ELECTRICAL 208V/ 225W/ 1.08A/ 192 OHMS

**REPLACEMENT PARTS LIST**  
**HOT FOOD COUNTERS**

ITEM NO.	DESCRIPTION	STOCK NO.	MFG. NO.	MANUFACTURER
1	HOT FOOD UNIT (1000W/208V COMPLETE UNIT WITH HEATING ELEMENT AND T-STAT READY TO INSTALL)	LT-1008	LT-1008	LOW TEMP
1A	HOT FOOD UNIT W/ DRAIN (1000W/208V COMPLETE UNIT WITH HEATING ELEMENT AND T-STAT READY TO INSTALL. STANDARD DRAIN 3/4" FPT)	LT-1008D	LT-1008D	LOW TEMP
2	HEATING ELEMENT 1000W/208V	195000	319871242007	CHROMALOX
3	THERMOSTAT	195400	KA-601-72	ROBERTSHAW
4	PILOT LIGHT	358000	515-5CL	JEMCO
5	SWITCH SINGLE POLE (BALL BAT LIGHT SWITCH)	335900	90-0001	McGILL
6	SWITCH DOUBLE POLE (BALL BAT HEAT LAMP SWITCH)	335920	0121-0001	McGILL
7	TUNGSTEN SWITCH (PADDLE SWITCH USED WITH BULLET TYPE HEAT LAMPS)	335911	TA115PWBXGC1	CARLING
8	FLUORESCENT FIXTURE	360700	M15L	NULITE
9	FLUORESCENT BULB	358100	F15T8/CW	SYLVANIA
10	BULB SLEEVE & CAP	493510	18" T8	TRU-TEST
11	SINGLE PORCELAIN SOCKET (USED WITH BULLET TYPE HEAT LAMP OR INCANDESCENT BULBS NOT IN HEAT LAMPS)	360610	10035-000	LEVITON
12	DOUBLE PORCELAIN SOCKET (USED WITH INCANDESCENT BULB NOT IN HEAT LAMPS)	533800	4010	LEVITON
13	BULLET HEAT LAMPS (250 W / 120 V / CLEAR WITH TOUGH SKIN COATING)	357800	250R40/1CVG	GENERAL ELECTRIC
14	INCANDESCENT BULBS (40 W / 120 V / APPLIANCE BULBS WITH TOUGH SKIN COATING)	494300	R79-0040	COMPONENT HARDWARE
15	FUSE HOLDER	358210	571027	LITTLE FUSE

**REPLACEMENT PARTS LIST**  
**HOT FOOD COUNTERS**  
**ADDITIONAL OPTIONS**  
**(CONT.)**

ITEM NO.	DESCRIPTION	STOCK NO.	MFG. NO.	MANUFACTURER
16	STOCK FUSES			
	1A	513800	SLC-1 CLASS G	LITTLE FUSE
	2A	513810	SLC-2 CLASS G	LITTLE FUSE
	4A	513820	SLC-4 CLASS G	LITTLE FUSE
	5A	513830	SLC-5 CLASS G	LITTLE FUSE
	6A	513840	SLC-6 CLASS G	LITTLE FUSE
	8A	513850	SLC-8 CLASS G	LITTLE FUSE
	10A	513860	SLC-10 CLASS G	LITTLE FUSE
	15A	513870	SLC-15 CLASS G	LITTLE FUSE
	20A	513880	SLC-20 CLASS G	LITTLE FUSE

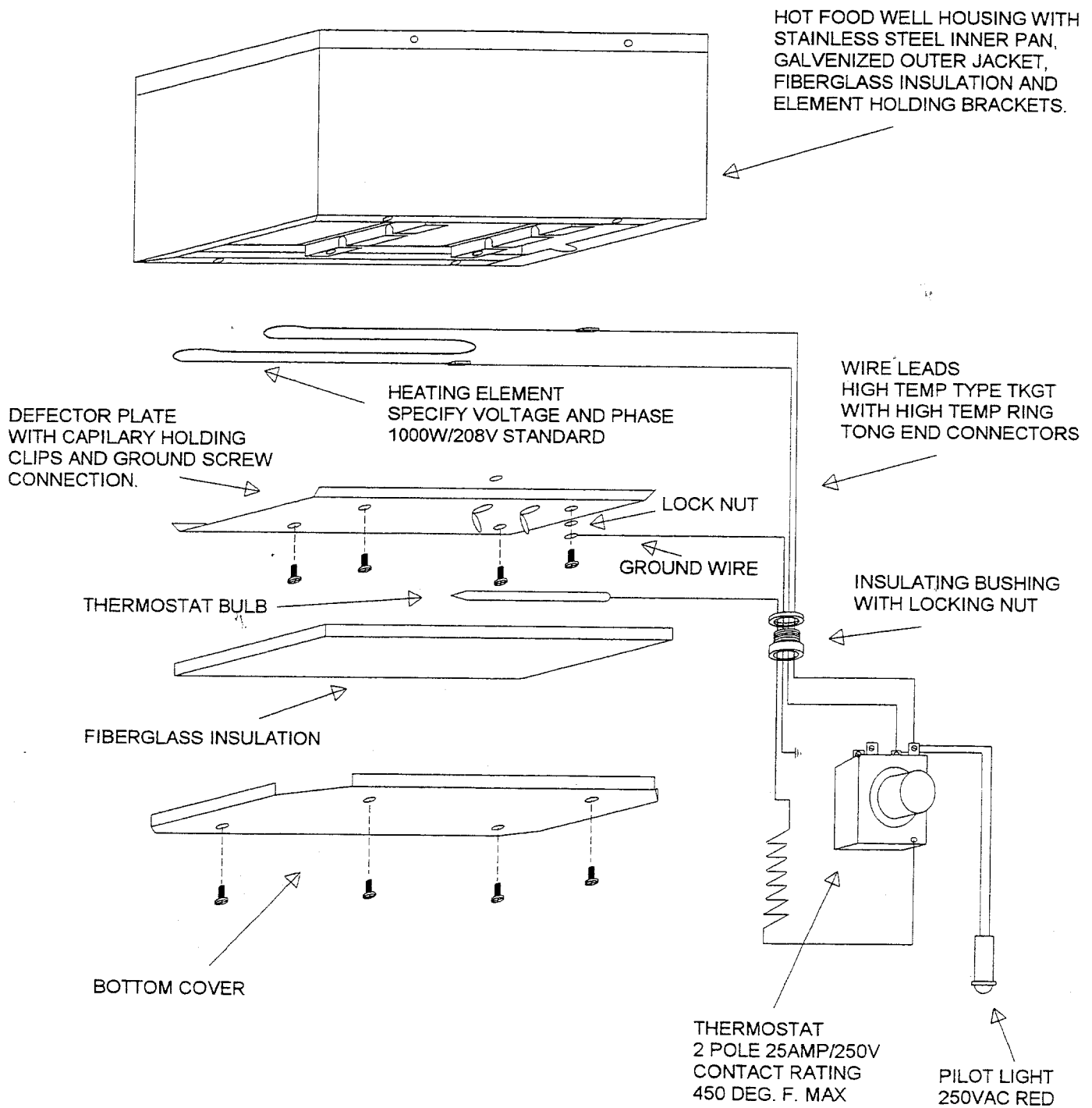
**NOTE! REPLACE WITH SAME TYPE AND AMPERAGE FUSE. CHECK YOUR UNIT FOR THE SPECIFIC FUSE USED.**

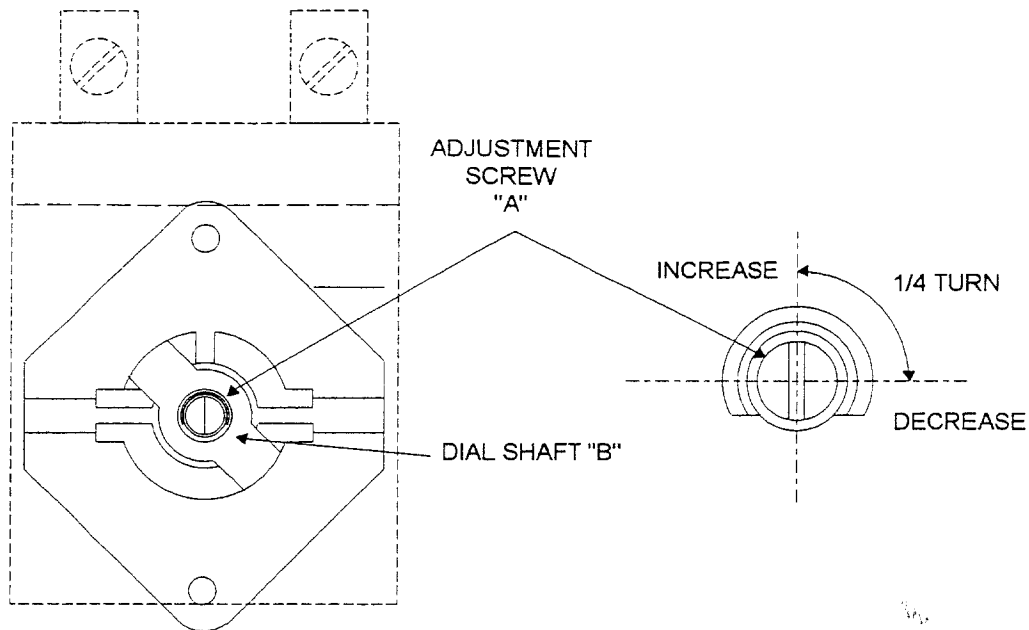
17	INFINITE CONTROL (USED WITH HEATED BASE & HEAT LAMPS)	190600	INF-240-3	ROBERTSHAW
28	THERMOMETER (USED WITH HEATED BASE)	500040	2215-01-4	COOPER

FOR REPLACEMENT HEATING SYSTEMS FOR HEATED BASES, SPECIFY SINGLE OR DOUBLE BASE. STANDARD VOLTAGE IS 208V.

FOR PARTS CONCERNING CALROD TYPE HEAT LAMPS STRIPS SUPPLIED WITH THIS SYSTEM CONTACT YOUR FACTORY REPRESENTATIVE.

# DRY/MOIST HOT FOOD UNIT EXPOLDED VIEW





## LOW TEMP INDUSTRIES CHECKING THERMOSTAT CALIBRATION

EACH THERMOSTAT IS ADJUSTED AT THE FACTORY AND CALIBRATED ON A PRECISION INSTRUMENT TO CONTROL TEMPERATURE ACCURATELY. ADJUSTMENT OR RECALIBRATION IS NOT NEEDED UNLESS THE THERMOSTAT HAS BEEN MISHANDLED IN TRANSIT OR CHANGED OR OTHERWISE ABUSED WHILE IN SERVICE.

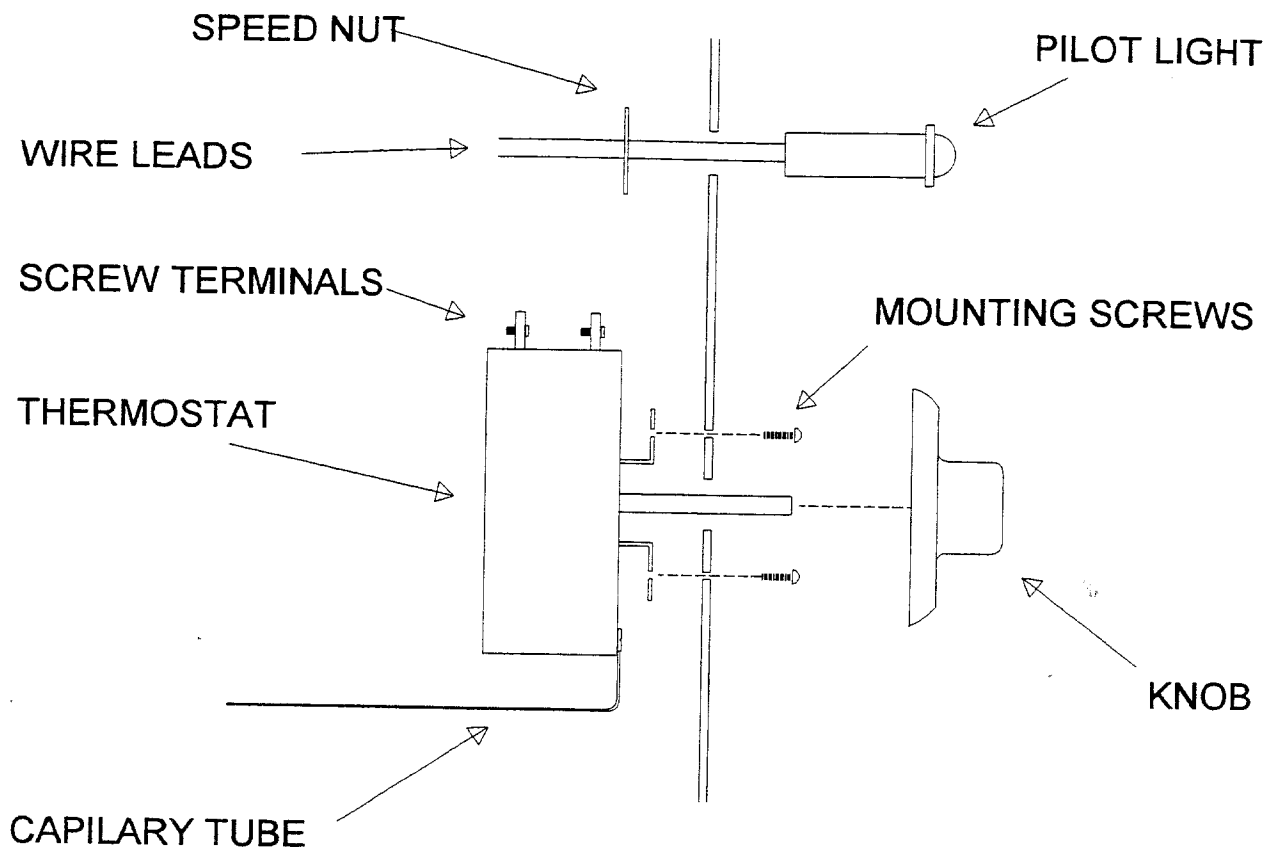
### TO CHECK CALIBRATION

1. USE A POTENTIOMETER OR A GOOD GRADE THERMOMETER TO DETERMINE TEMPERATURE AT LOCATION WHERE TEMPERATURE REGULATION IS REQUIRED.
2. TURN THE DIAL OF THE THERMOSTAT TO A MEDIUM TEMPERATURE SETTING.
3. ALLOW ENOUGH TIME FOR THE TEMPERATURE TO STABILIZE, OR UNTIL SEVERAL TEMPERATURE READINGS ARE IDENTICAL.

### TO RECALIBRATE

1. REMOVE DIAL FROM SHAFT "B"
2. WHILE HOLDING SHAFT "B" TURN THE ADJUSTMENT SCREW "A" CLOCKWISE TO DECREASE OR COUNTER CLOCKWISE TO INCREASE. IT IS RECOMMENDED THAT ADJUSTMENTS BE NO MORE THAN 1/4 TURN AT A TIME.
3. REPLACE DIAL
4. AFTER A CALIBRATION CHANGE HAS BEEN MADE LET THE UNIT OPERATE UNTIL THE TEMPERATURE HAS STABILIZED, THEN RECHECK TO DETERMINE WHETHER OR NOT THE CALIBRATION HAS BEEN CORRECTED.





## THERMOSTAT & PILOT LIGHT MOUNTING

### TO REMOVE THERMOSTAT

1. DISCONNECT ELECTRICAL POWER
2. REMOVE THERMOSTAT MOUNTING PANEL BY REMOVING SCREWS AND PULLING PANEL FORWARD.
3. REMOVE WIRE LEADS FROM THERMOSTAT SCREW TERMINALS.
4. PULL KNOB OFF AND REMOVE THE TWO MOUNTING SCREWS ON THE FRONT OF THE THERMOSTAT.
5. REMOVE THE BOTTOM COVER PLATE FROM THE HOT FOOD WELL
6. REMOVE THE CAPILLARY BULB FROM THE DEFLECTOR PLATE.

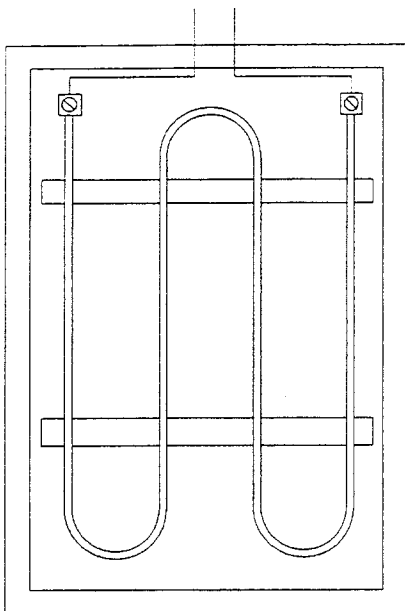
TO REPLACE THE THERMOSTAT REVERSE THE ABOVE PROCEDURE.

### TO REMOVE PILOT LIGHT

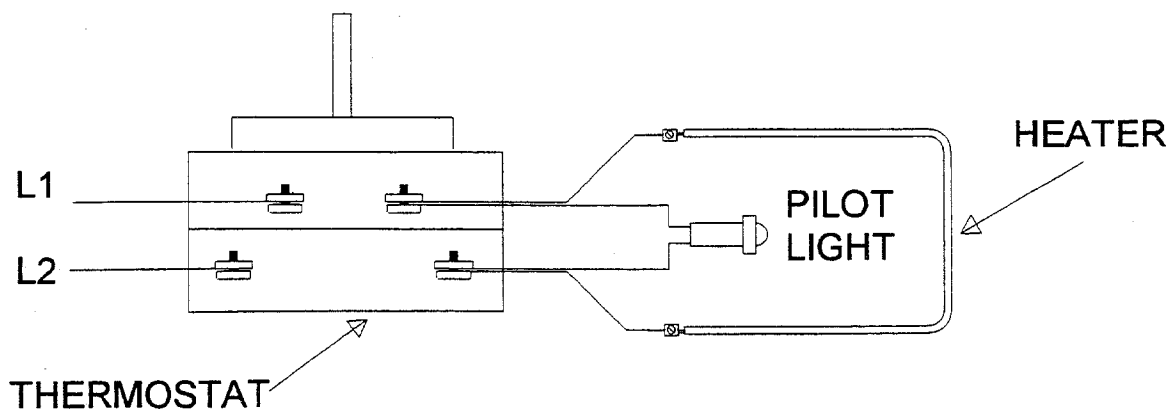
1. DISCONNECT ELECTRICAL POWER
2. REMOVE THE THERMOSTAT MOUNTING PANEL BY REMOVING SCREWS AND PULLING PANEL FORWARD.
3. REMOVE THE WIRE LEADS FROM THERMOSTAT SCREW TERMINALS.
4. REMOVE THE SPEED NUT ON BACK OF PILOT LIGHT.
5. PULL PILOT LIGHT FORWARD.

TO REPLACE THE PILOT LIGHT REVERSE THE ABOVE PROCEDURE.

## HEATING ELEMENT REPLACEMENT



1. DISCONNECT POWER FROM UNIT
2. REMOVE THE BOTTOM COVER AND INSULATION FROM UNIT.
3. REMOVE THE BOTTOM DEFLECTOR PLATE. NOTE THE THERMOSTAT CAPILARY MOUNTED TO THE DEFLECTOR PLATE.
4. REMOVE THE OLD HEATER FROM THE HOLDING BRACKETS.
5. REMOVE THE WIRE LEADS FROM TERMINALS.
6. REINATALL WIRE LEADS TO NEW HEATER.
7. PLACE THE NEW ELEMENT INTO THE HOLDING BRACKETS.
8. REPLACE DEFELCTOR PLATE, INSULATON AND BOTTOM COVER.



THE REFRIGERATION SYSTEMS SUPPLIED BY LOW TEMP INDUSTRIES MAY BE EITHER SELF CONTAINED (WITH THE CONDENSING UNIT INSIDE THE KITCHEN ADJACENT TO THE REFRIGERATED SYSTEM) OR REMOTE (WITH THE CONDENSING UNIT LOCATED AWAY FROM THE REFRIGERATED SYSTEM). IN EITHER CASE THE SYSTEMS OPERATE ON THE SAME PRINCIPLE.

THE FINNED COIL UNIT COOLERS USED IN THE REFRIGERATOR, FREEZER BASES AND THE **Tempest-Aire**® SYSTEMS ARE CONTROLLED BY A THERMOSTAT THAT IS WIRED TO A LIQUID LINE SOLENOID. WHEN THE SYSTEM IS SATISFIED THE LIQUID LINE SOLENOID IS CLOSED AND THE SYSTEM PUMPS DOWN AND CYCLES OFF ON THE LOW PRESSURE CONTROL WHICH IS LOCATED AT THE CONDENSING UNIT. THIS DESIGN IS THE SAME FOR SELF CONTAINED OR REMOTE SYSTEMS.

THE FOLLOWING SECTION IS A MORE DETAILED DESCRIPTION OF THE BASIC REFRIGERATION SYSTEM SUPPLIED BY LOW TEMP.

### **BASIC SYSTEM OPERATION (REFRIGERATION SYSTEM)**

FOLLOWING SECTION IS DESIGNED TO GIVE A BASIC WORKING KNOWLEDGE OF OUR SYSTEM. IT SHOULD NOT BE USED AS A TRAINING MANUAL FOR NON QUALIFIED REFRIGERATION TECHNICIANS.

ALL LOW TEMP INDUSTRIES REFRIGERATED EQUIPMENT EMPLOY A COMPRESSION CYCLE SYSTEM. THERE ARE TWO PRESSURES WHICH EXIST IN A COMPRESSION SYSTEM; THE EVAPORATING OR LOW PRESSURE, AND THE CONDENSING OR HIGH PRESSURE.

THE REFRIGERANT WORKS AS A TRANSPORTATION MEDIUM TO MOVE HEAT FROM THE EVAPORATOR TO THE CONDENSER WHERE IT IS GIVEN OFF TO THE AMBIENT AIR. THE CHANGE OF STATE FROM LIQUID TO VAPOR AND BACK ALLOWS THE REFRIGERANT TO ABSORB AND DISCHARGE LARGE QUANTITIES OF HEAT EFFICIENTLY.

#### **THE BASIC SYSTEM OPERATES AS FOLLOWS:**

HIGH PRESSURE LIQUID REFRIGERANT IS FED FROM THE RECEIVER THROUGH THE LIQUID LINE AND THROUGH THE FILTER DRIER AND SIGHT GLASS TO THE EXPANSION VALVE WHICH WORKS AS A METERING DEVICE SEPARATING THE HIGH PRESSURE SIDE OF THE SYSTEM FROM THE LOW PRESSURE EVAPORATOR.

THE THERMOSTATIC EXPANSION VALVE CONTROLS THE FEED OF LIQUID REFRIGERANT TO THE EVAPORATOR, AND BY MEANS OF AN ORIFICE REDUCES THE PRESSURE OF THE REFRIGERANT TO THE EVAPORATING OR LOW PRESSURE SIDE.

THE REDUCTION OF PRESSURE ON THE LIQUID REFRIGERANT CAUSES IT TO BOIL OR VAPORIZE UNTIL THE REFRIGERANT IS AT THE SATURATED TEMPERATURE CORRESPONDING TO ITS PRESSURE. AS THE LOW TEMPERATURE REFRIGERANT PASSES THROUGH THE EVAPORATOR COIL, HEAT FLOWS THROUGH THE WALLS OF THE EVAPORATOR TUBING TO THE REFRIGERANT, CAUSING THE BOILING ACTION TO CONTINUE UNTIL THE REFRIGERANT IS COMPLETELY VAPORIZED.

THE EXPANSION VALVE REGULATES THE FLOW THROUGH THE EVAPORATOR AS NECESSARY TO MAINTAIN A PRESET TEMPERATURE DIFFERENCE OR SUPER HEAT BETWEEN THE EVAPORATING REFRIGERANT AND VAPOR LEAVING THE EVAPORATOR. AS THE TEMPERATURE OF THE GAS LEAVING THE EVAPORATOR VARIES THE EXPANSION VALVE POWER ELEMENT BULB SENSES ITS TEMPERATURE, AND ACTS TO MODULATE THE FEED THROUGH THE EXPANSION VALVE AS REQUIRED.

THE REFRIGERANT VAPOR LEAVING THE EVAPORATOR TRAVELS THROUGH THE SUCTION LINE TO THE COMPRESSOR INLET. THE COMPRESSOR TAKES THE LOW PRESSURE VAPOR AND COMPRESSES IT, INCREASING BOTH THE PRESSURE AND THE TEMPERATURE. THE HOT, HIGH PRESSURE GAS IS FORCED OUT THE COMPRESSOR DISCHARGE VALVE AND INTO THE CONDENSER.

AS THE HIGH PRESSURE GAS PASSES THROUGH THE CONDENSER, IT IS COOLED BY A FAN BLOWING OVER A FIN-TYPE CONDENSER SURFACE. AS THE TEMPERATURE OF THE REFRIGERANT VAPOR REACHES THE SATURATION TEMPERATURE CORRESPONDING TO THE HIGH PRESSURE IN THE CONDENSER, THE VAPOR CONDENSES INTO A LIQUID AND FLOWS BACK INTO THE RECEIVER TO REPEAT THE CYCLE.

THE REFRIGERATION PROCESS IS CONTINUED AS LONG AS THE COMPRESSOR OPERATES. THE COMPRESSOR OPERATION IS CONTROLLED BY A LOW PRESSURE CONTROL. WHEN THE REFRIGERANT VAPOR ENTERING THE SUCTION SIDE OF THE COMPRESSOR REACHES A PRESET VALUE ON THE CONTROL, IT WILL OPEN A SET OF CONTACTS AND SHUT THE COMPRESSOR OFF. THE TEMPERATURE IN THE UNITS ARE CONTROLLED BY A THERMOSTAT WHICH IS WIRED TO A SOLENOID LOCATED IN THE LIQUID LINE. WHEN THE THERMOSTAT SETTING IS SATISFIED THE LIQUID LINE SOLENOID IS CLOSED AND THE SYSTEM PUMPS DOWN TO PRESET VALUE ON THE PRESSURE CONTROL.

THE PRESSURE CONTROL IS SET BY A "CUT-IN" AND A "DIFFERENTIAL" SETTING. THE "CUT-IN" IS THE PRESSURE AT WHICH YOU WANT THE COMPRESSOR TO START. THIS PRESSURE CORRESPONDS TO THE TEMPERATURE OF THE EVAPORATOR SURFACE WHICH MUST BE MAINTAINED. TO CUT THE UNIT OFF THE "DIFFERENTIAL" SETTING IS USED. FIRST CHOOSE THE PRESSURE SETTING THAT CORRESPONDS TO THE TEMPERATURE WHICH YOU WANT THE UNIT TO **START (CUT-IN)**. THEN CHOOSE THE PRESSURE SETTING THAT CORRESPONDS TO THE TEMPERATURE WHICH YOU WANT THE UNIT TO **STOP (CUT-OUT)**. THE DIFFERENCE BETWEEN THE "CUT-IN" AND "CUT-OUT" IS THE VALUE OF THE "DIFFERENTIAL".

WHEN USING THERMOSTATS IT IS BEST TO SET THE CUT-IN AT A PRESSURE SLIGHTLY ABOVE THE MAXIMUM TEMPERATURE THAT YOU WANT THE BOX TO REACH AND SET THE DIFFERENTIAL AT A SETTING LOWER THAN YOU WANT THE BOX TO REACH. THIS ALLOWS FOR THE THERMOSTAT TO BE IN COMPLETE CONTROL OF THE SYSTEM. IF THE PRESSURE CONTROLS ARE SET TO CLOSE TO THE SYSTEM REQUIREMENTS THEN THE COMPRESSOR MAY TRY TO SHORT CYCLE WHEN THE THERMOSTAT IS OFF.

### **WARNING:**

**Contains or 'Manufactured with'  
CFC or HCFC refrigerants, a  
substance which harms public  
health and environment by  
the ozone in the  
upper atmosphere.**

# ***Tempest-Aire®* SYSTEM**

8-95

PATENT NO. 5,388,429

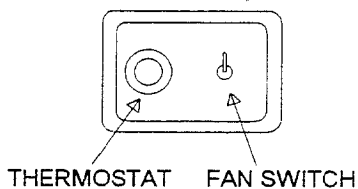
BY LOW TEMP INDUSTRIES  
JONESBORO, GEORGIA

## **COLD RAIL SYSTEM**

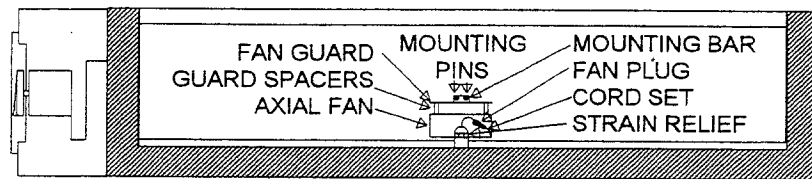
THIS DESIGN MAINTAINS ITS COMPARTMENT TEMPERATURE BY THE USE OF OUR PATENTED **TEMPEST-AIRE®**

REFRIGERATION SYSTEM. THIS SYSTEM PROVIDES A CHAMBER WHICH CIRCULATES COLD AIR UP AROUND THE PRODUCT RECEPTACLES AND WILL MAINTAIN A PRODUCT TEMPERATURE OF 40 DEGREES OR LESS IN AN AMBIENT OF 90 DEGREES F. OR LESS.

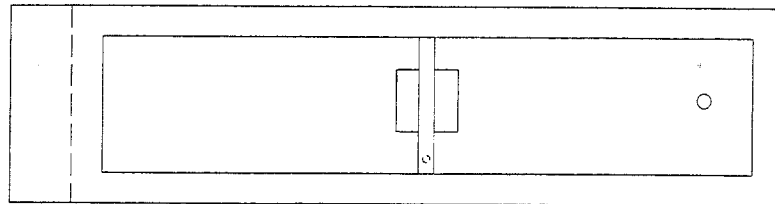
### **WARNING! NEVER POUR WATER OVER FAN OR PACK IN ICE**



**CONTROL  
PANEL**



**SECTION VIEW**



**TOP VIEW**

THIS SYSTEM USES A MODIFIED COLD WALL TYPE DESIGN WHICH IS ENHANCED BY THE USE OF THE AXIAL FAN. THE AXIAL FAN USED IN THESE SYSTEMS IS A 12 VDC SYSTEM. THE MASTER SWITCH LOCATED AT THE END OF THE RAIL CONTROLS THE FAN AND THE LIQUID LINE SOLENOID WHICH FEEDS REFRIGERANT TO THE SYSTEM. WHEN THE SWITCH IS IN THE OFF POSITION ALL POWER TO THE RAIL IS DISCONNECTED.

ALWAYS DISCONNECT THE POWER FROM THE SYSTEM BEFORE REMOVING THE FAN SYSTEM.

WHEN CLEANING THE SYSTEM THE FAN MUST BE REMOVED. THIS FAN IS NOT A WASHDOWN GRADE FAN AND WILL BE DAMAGED IF SUBMERSED IN WATER. THE SYSTEM IS PROVIDED WITH ENOUGH WIRE LEAD THAT THE FAN MOUNTING BAR CAN BE LIFTED OFF THE MOUNTING PINS WITHOUT HAVING TO DISCONNECT THE PLUG. IF NECESSARY DISCONNECT THE PLUG ASSEMBLY TO REMOVE THE FAN COMPLETELY FROM THE SYSTEM.

THE THERMOSTAT LOCATED NEXT TO THE SWITCH CONTROLS THE TEMPERATURE IN THE RAILS. THE THERMOSTAT HAS A CONSTANT 37 DEGREE CUT-IN WHICH ALLOWS THE PAN TO DEFROST ON EVERY OFF CYCLE.

FOR THE SYSTEM TO OPERATE PROPERLY THE ENTIRE AREA OF THE COLD RAIL MUST BE KEPT COVERED. IF THERE IS A SPACE THAT IS NOT BEING USED, FILL IT WITH AN EMPTY PAN. IF THE RAIL IS LEFT OPEN IT DISRUPTS THE AIR FLOW AND LESSENES THE EFFICIENCY OF THE SYSTEM.

**IF FANS BECOME WET, DRY COMPLETELY BEFORE REINSTALLING.  
DO NOT WASH FANS DOWN OR PACK IN ICE**

**CONDIMENT RAIL SYSTEM  
INTRODUCTION**

THE LOW TEMP *Tempest-Aire*® UNIT IS A PATENTED REFRIGERATION SYSTEM DESIGNED FOR SHORT TERM DISPLAY AND DISPENSING OF FOOD AND DESERTS. THIS UNIT IS DESIGNED TO MAINTAIN A PRODUCT TEMPERATURE AT A MAXIMUM OF 40 DEGREES FAHRENHEIT FOR PERIODS UP TO FOUR (4) HOURS. THESE UNITS ARE DEPENDENT UPON THE AMBIENT TEMPERATURE IN WHICH THEY ARE INSTALLED AND THE PRODUCT TEMPERATURE WHEN IT IS PLACED IN THE UNITS. THE PRODUCT SHOULD BE CAREFULLY MONITORED AND ROTATED AS NECESSARY TO MEET LOCAL HEALTH REQUIREMENTS.

THIS SYSTEM DESIGN REQUIRES THAT THE TOTAL PRODUCT AREA BE COVERED AT ALL TIMES. IF THE SYSTEM IS LEFT OPEN TO THE AMBIENT IT WILL DISRUPT THE AIR FLOW INSIDE THE CHAMBER AND AFFECT THE COOLING CAPABILITY OF THE SYSTEM. THIS WILL ALSO PRODUCE ADDITIONAL ICE BUILD UP ON THE SIDE WALLS DUE TO MOIST AMBIENT AIR BEING PULLED INTO THE CHAMBER BY THE FANS.

**OPERATING INSTRUCTIONS**

**START UP:**

THE REFRIGERATION SYSTEM SUPPLIED WITH THESE SYSTEMS ARE OF THE HERMETIC TYPE. REFRIGERANT IS METERED BY EXPANSION VALVES WHICH ARE LOCATED IN AN ACCESSIBLE AREA ADJACENT TO THE *Tempest-Aire*® UNIT. EACH REFRIGERATION SYSTEM HAS BEEN LEAK TESTED, CHARGED WITH REFRIGERANT AND OPERATED TO ENSURE THE PROPER OPERATION AND SETTING OF THE CONTROLS.

THE APPROPRIATE ELECTRICAL SERVICE FOR THIS UNIT IS 115 VAC, 60 HZ, SINGLE PHASE ENERGIZE THE UNIT BY (ATTACHING THE PLUG FOR MOBILE EQUIPMENT TO AN APPROPRIATE ELECTRICAL SUPPLY) OR (ENERGIZING THE PROPER BREAKER FOR PERMANENTLY WIRED EQUIPMENT) AND TURNING ON THE SERVICE SWITCH LOCATED AT THE END OF THE RAILS. AFTER APPROXIMATELY ONE (1) HOURS OF OPERATION THE UNIT WILL BE READY FOR USE.

NOTE! FOR REMOTE SYSTEMS THE POWER SUPPLY TO THE CONDENSING UNIT IS SEPARATE FROM THE POWER TO THE INDIVIDUAL RAILS. BE SURE THAT BOTH THE RAILS CIRCUIT AND THE CONDENSING UNIT CIRCUIT ARE ON.

**OPERATION:**

THE SYSTEM TEMPERATURE IS CONTROLLED BY A THERMOSTAT WHICH IS LOCATED AT THE END OF THE COLD RAILS. THE THERMOSTAT CONTROLS A LIQUID LINE SOLENOID WHICH CONTROLS THE FLOW OF REFRIGERANT TO THE COOLING COILS. A LOW PRESSURE CONTROL (PHYSICALLY LOCATED IN THE FRONT OF THE COMPRESSOR COMPARTMENT) IS USED TO CYCLE OFF THE COMPRESSOR. THE LOW PRESSURE CONTROL IS SHOULD NOT BE ADJUSTED FROM THE FACTORY SETTINGS. ADJUSTMENT OF THIS CONTROL MAY CAUSE PERFORMANCE PROBLEMS WITH THE UNIT. THE TEMPERATURE IS DIRECTLY CONTROLLED BY THE THERMOSTAT.

THE THERMOSTAT THAT IS USED IN THE *Tempest-Aire*® SYSTEMS HAS A CUT-OUT RANGE FROM 11 TO 26 DEGREES F. WITH A CONSTANT CUT-IN OF 37 DEGREE F. AND A NORMAL MID-RANGE SETTING OF 18 DEGREES F.. THIS CONSTANT CUT-IN OF 37 DEGREES F. INSURES THAT THE COOLING COILS WILL DEFROST DURING THE OFF CYCLE TO REDUCE ICE BUILD UP. THIS WILL NOT AFFECT THE PRODUCT TEMPERATURE.

THE *Tempest-Aire*® SYSTEM MUST BE KEPT CLOSED TO ENSURE A GOOD PRODUCT TEMPERATURE. THE SYSTEM USES THE COLD AIR GENERATED INSIDE THE CLOSED CHAMBER TO COOL THE PRODUCT. WHEN A PAN IS LEFT OUT THE SYSTEM PULLS WARM AIR IN AND GREATLY REDUCES THE SYSTEMS EFFICIENCY. FILL ALL OPEN SPACES WITH PANS AT ALL TIMES.

THE FANS USED IN THE *Tempest-Aire* ® SYSTEMS ARE 12VDC SYSTEM AND ARE **NOT WATER PROOF OR WASH DOWN RATED**. BEFORE STARTING THE CLEANING PROCEDURES PLACE THE FAN CONTROL SWITCH LOCATED AT THE END OF THE COLD RAIL TO THE OFF POSITION. THIS REMOVES ALL POWER TO THE RAIL. REMOVE THE FANS ASSEMBLY WHICH SITS ON TOP OF GUIDE PINS FROM THE UNIT.

**IF FANS BECOME WET, DRY COMPLETELY BEFORE REINSTALLING.  
DO NOT WASH FANS DOWN OR PACK IN ICE**

**CLEANING:**

THE INNER LINER OF THIS UNIT IS FABRICATED OF 304 STAINLESS STEEL. PLEASE SEE "HOW TO CLEAN STAINLESS STEEL" IN THIS MANUAL. NOTE THAT THIS IS A VERY BROAD SECTION ON CLEANING AND THE TYPE OF EQUIPMENT AND END USE SHOULD BE KEPT IN CONSIDERATION BEFORE SELECTING ANY SPECIAL CLEANERS.

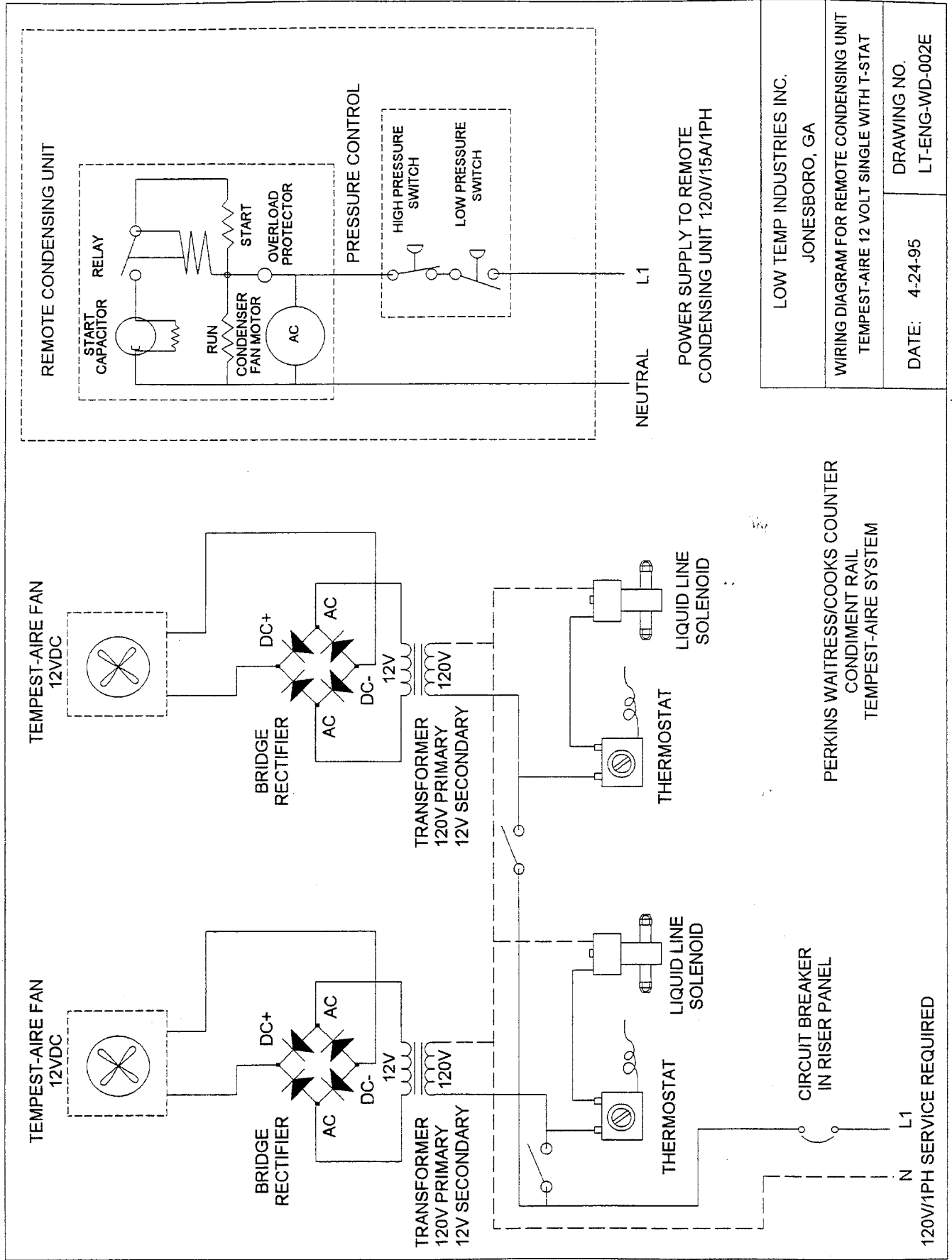
**ELECTRICAL SYSTEM:**

**\*\*\*\*\* WARNING \*\*\*\*\***

IN ORDER TO PREVENT ANY ELECTRICAL ACCIDENTS, THIS REFRIGERATION SYSTEM SHOULD BE INSTALLED AND SERVICED BY QUALIFIED MAINTENANCE PERSONNEL ONLY PER NATIONAL ELECTRICAL CODE STANDARDS.

**\*\*\*\*\* WARNING \*\*\*\*\***

INDIVIDUAL BREAKERS OR FUSES SHOULD BE PROVIDED FOR EACH COMPRESSOR MOTOR. GROUP FUSING, WHERE TWO OR MORE COMPRESSORS ARE INSTALLED ON ONE FUSE OR BREAKER IS **\*\*NOT RECOMMENDED\*\***. REFER TO THE NATIONAL ELECTRICAL CODE FOR APPROPRIATE LINE FUSE OR BREAKER SIZE.

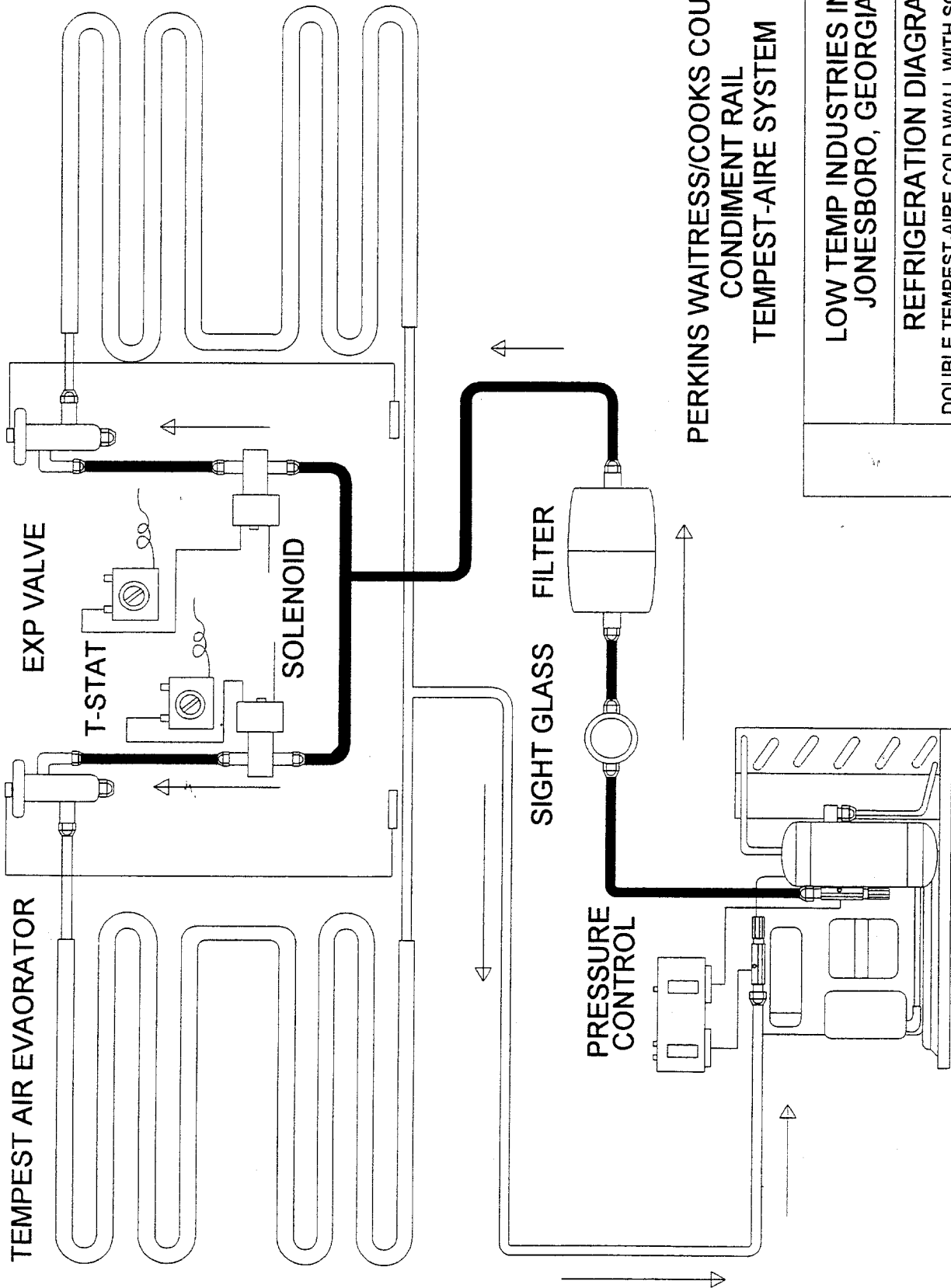


LOW TEMP INDUSTRIES INC. JONESBORO, GA	
WIRING DIAGRAM FOR REMOTE CONDENSING UNIT TEMPEST-AIRE 12 VOLT SINGLE WITH T-STAT	
DATE: 4-24-95	DRAWING NO. LT-ENG-WD-002E

PERKINS WAITRESS/COOKS COUNTER  
CONDIMENT RAIL  
TEMPEST-AIRE SYSTEM

120V/1PH SERVICE REQUIRED





PERKINS WAITRESS/COOKS COUNTER  
CONDIMENT RAIL  
TEMPEST-AIRE SYSTEM

LOW TEMP INDUSTRIES INC.  
JONESBORO, GEORGIA

REFRIGERATION DIAGRAM

DOUBLE TEMPEST-AIRE COLD WALL WITH SOL & T-STAT

DATE: 4-26-95

CONDENSING UNIT

DRAWING NO.  
LT-ENG-PD-002B

## **REFRIGERATED AND FREEZER BASE SYSTEMS INTRODUCTION**

THE LOW TEMP INDUSTRIES REFRIGERATED AND FREEZER BASE SYSTEMS ARE DESIGNED FOR ON LINE STORAGE OF FOOD PRODUCTS. THIS UNIT IS DESIGNED TO MAINTAIN A PRODUCT TEMPERATURE AT A MAXIMUM OF 40 DEGREES FAHRENHEIT IN REFRIGERATORS AND A MAXIMUM OF 0 DEGREES FAHRENHEIT IN FREEZERS.

THE PERFORMANCE OF THESE BASE SYSTEMS DEPENDS UPON HOW THEY ARE USED. DOORS AND DRAWERS SHOULD BE KEPT CLOSED WHEN EVER NOT BEING ACCESSED. DOORS AND DRAWERS SHOULD BE CLOSED PROPERLY AND NOT SLAMMED OR KICKED CLOSED. GASKETS SHOULD BE CLEANED ON A REGULAR BASIS (SEE DETAIL ON GASKET CLEANING AND REPLACEMENT). EVAPORATOR UNIT COOLERS INTAKES AND DISCHARGES SHOULD BE KEPT CLEAN AND CLEAR OF ANY DEBRIS THAT MIGHT DISRUPT THE AIR FLOW. IF PROPERLY MAINTAINED THESE BASE UNITS WILL PROVIDE YEARS OF TROUBLE FREE SERVICE.

### **OPERATING INSTRUCTIONS**

#### **START UP:**

THE REFRIGERATION SYSTEM SUPPLIED WITH THESE SYSTEMS ARE OF THE HERMETIC TYPE. REFRIGERANT IS METERED BY EXPANSION VALVES WHICH ARE LOCATED IN THE EVAPORATOR UNIT COOLER. EACH REFRIGERATION SYSTEM HAS BEEN LEAK TESTED, CHARGED WITH REFRIGERANT AND OPERATED TO ENSURE THE PROPER OPERATION AND SETTING OF THE CONTROLS.

THE APPROPRIATE ELECTRICAL SERVICE FOR THIS UNIT IS 115 VAC, 60 HZ, SINGLE PHASE. ENERGIZE THE UNIT BY (ATTACHING THE PLUG FOR MOBILE EQUIPMENT TO AN APPROPRIATE ELECTRICAL SUPPLY) OR (ENERGIZING THE PROPER BREAKER FOR PERMANENTLY WIRED EQUIPMENT) AND TURNING ON THE SERVICE SWITCH LOCATED AT THE END OF THE RAILS. AFTER APPROXIMATELY ONE (1) HOURS OF OPERATION THE UNIT WILL BE READY FOR USE.

NOTE! FOR REMOTE SYSTEMS THE POWER SUPPLY TO THE CONDENSING UNIT IS SEPARATE FROM THE POWER TO THE INDIVIDUAL RAILS. BE SURE THAT BOTH THE RAILS CIRCUIT AND THE CONDENSING UNIT CIRCUIT ARE ON.

#### **OPERATION:**

THE SYSTEM TEMPERATURE IS CONTROLLED BY A THERMOSTAT WHICH IS LOCATED IN THE EVAPORATOR UNIT COOLER. THERE IS AN EXPOSED CONTROL KNOB OR AN ACCESS HOLE FOR A SCREWDRIVER ADJUSTMENT LOCATED ON THE SIDE OF THE EVAPORATOR UNIT COOLER. THE THERMOSTAT CONTROLS A LIQUID LINE SOLENOID WHICH CONTROLS THE FLOW OF REFRIGERANT TO THE COOLING COILS. A LOW PRESSURE CONTROL (PHYSICALLY LOCATED IN THE FRONT OF THE COMPRESSOR COMPARTMENT) IS USED TO CYCLE OFF THE COMPRESSOR. THE LOW PRESSURE CONTROL IS SHOULD NOT BE ADJUSTED FROM THE FACTORY SETTINGS. ADJUSTMENT OF THIS CONTROL MAY CAUSE PERFORMANCE PROBLEMS WITH THE UNIT. THE TEMPERATURE IS DIRECTLY CONTROLLED BY THE THERMOSTAT.

THE THERMOSTAT THAT IS USED IN THE REFRIGERATION SYSTEMS HAS A CUT-OUT RANGE FROM 11 TO 26 DEGREES F. WITH A CONSTANT CUT-IN OF 37 DEGREE F. AND A NORMAL MID-RANGE SETTING OF 18 DEGREES F.. THIS CONSTANT CUT-IN OF 37 DEGREES F. INSURES THAT THE EVAPORATOR UNIT COOLER WILL DEFROST DURING THE OFF CYCLE, BUT WILL NOT AFFECT THE PRODUCT TEMPERATURE.

THE THERMOSTAT THAT IS USED IN THE FREEZER SYSTEMS HAS A CUT-OUT RANGE FROM -30.5 TO +12.5 DEGREES WITH AN 11 DEGREE DIFFERENTIAL AND A NORMAL MID-RANGE OFF SETTING OF -12 DEGREES F. AND AN NORMAL ON SETTING OF -1 DEGREES F.

THE REFRIGERATOR AND FREEZER DOORS AND DRAWERS SYSTEM BE KEPT CLOSED TO ENSURE A GOOD PRODUCT TEMPERATURE. THE SYSTEM USES THE COLD AIR GENERATED INSIDE THE CLOSED CHAMBER TO COOL THE PRODUCT. WHEN A DOORS AND DRAWERS ARE LEFT OUT THE SYSTEM PULLS WARM AIR IN AND GREATLY REDUCES THE SYSTEMS EFFICIENCY. GASKETS SHOULD BE CHECKED REGULARLY FOR WEAR AND KEPT CLEAN.

#### **CLEANING:**

THE INNER LINER OF THIS UNIT IS FABRICATED OF 304 STAINLESS STEEL. PLEASE SEE "HOW TO CLEAN STAINLESS STEEL" IN THIS MANUAL. NOTE THAT THIS IS A VERY BROAD SECTION ON CLEANING AND THE TYPE OF EQUIPMENT AND END USE SHOULD BE KEPT IN CONSIDERATION BEFORE SELECTING ANY SPECIAL CLEANERS.

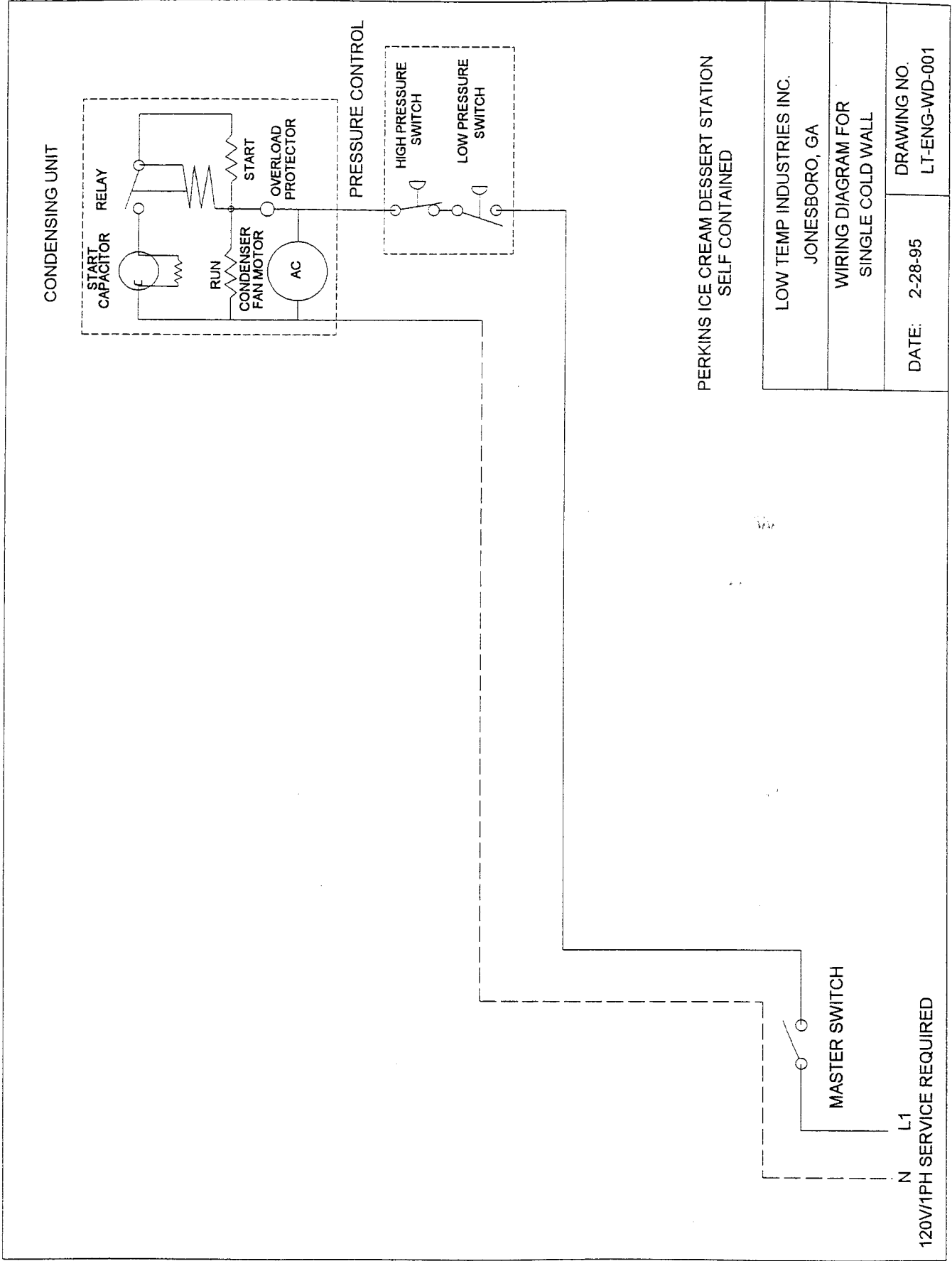
#### **ELECTRICAL SYSTEM:**

##### **\*\*\*\*\* WARNING \*\*\*\*\***

IN ORDER TO PREVENT ANY ELECTRICAL ACCIDENTS, THIS REFRIGERATION SYSTEM SHOULD BE INSTALLED AND SERVICED BY QUALIFIED MAINTENANCE PERSONNEL ONLY PER NATIONAL ELECTRICAL CODE STANDARDS.

##### **\*\*\*\*\* WARNING \*\*\*\*\***

INDIVIDUAL BREAKERS OR FUSES SHOULD BE PROVIDED FOR EACH COMPRESSOR MOTOR. GROUP FUSING, WHERE TWO OR MORE COMPRESSORS ARE INSTALLED ON ONE FUSE OR BREAKER IS **\*\*NOT RECOMMENDED\*\***. REFER TO THE NATIONAL ELECTRICAL CODE FOR APPROPRIATE LINE FUSE OR BREAKER SIZE.



REFRIGERATOR

COLD WALL EVAORATOR

EXP VALVE

SIGHT GLASS

FILTER

PRESSURE  
CONTROL

PERKINS ICE CREAM STATION  
SELF CONTAINED

CONDENSING UNIT

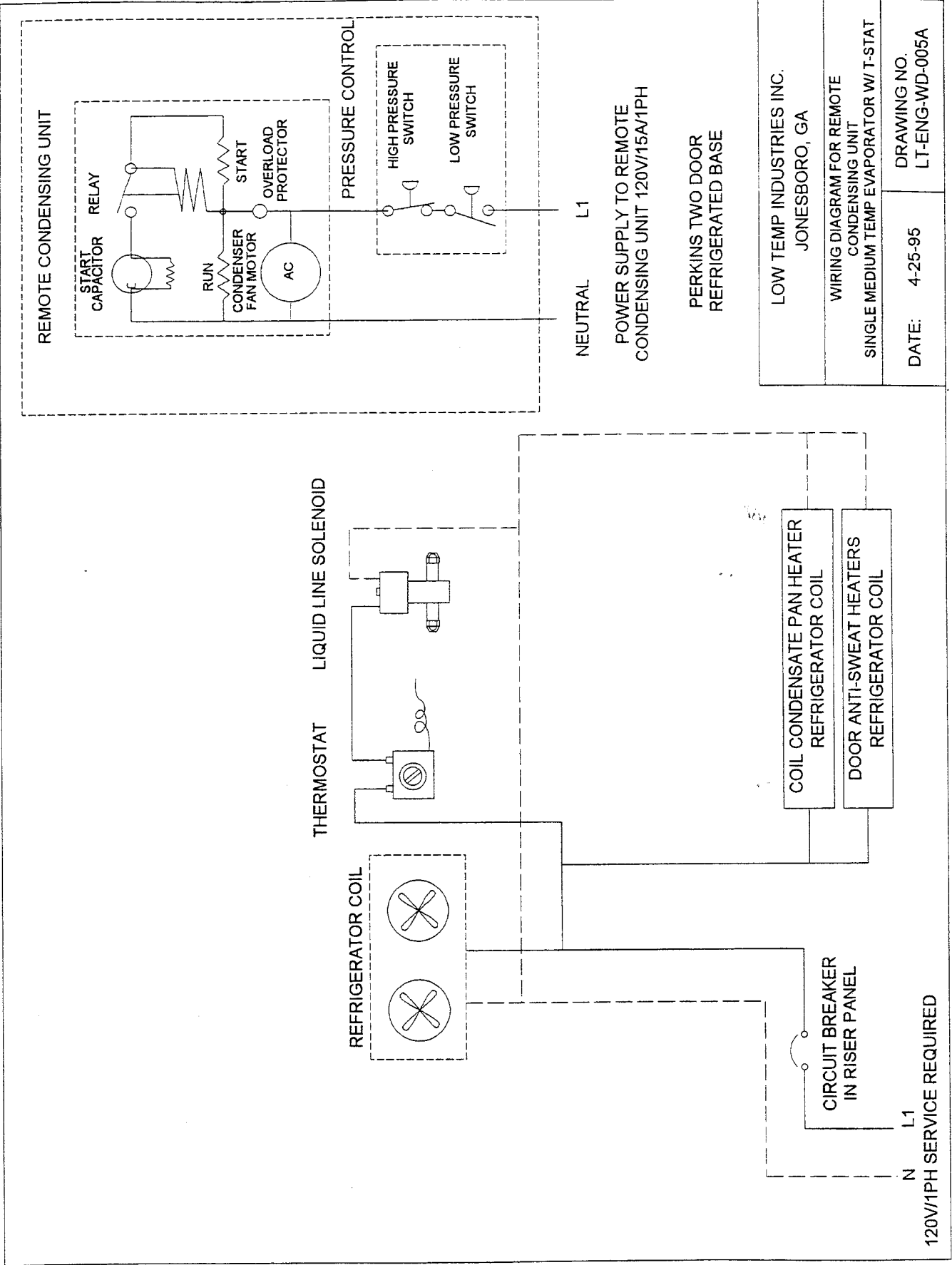
ACCUMULATOR

LOW TEMP INDUSTRIES INC.  
JONESBORO, GEORGIA

REFRIGERATION DIAGRAM  
SINGLE CIRCUIT COLD WALL

DATE: 9-5-95

DRAWING NO.  
LT-ENG-PD-001A



REFRIGERATOR  
UNIT COOLER COIL

LOCATED INSIDE COIL

EXP VALVE

T-STAT

SOLENOID

SIGHT GLASS  
FILTER

PRESSURE  
CONTROL

CONDENSING UNIT

PERKINS TWO DOOR  
REFRIGERATED BASE

LOW TEMP INDUSTRIES INC.  
JONESBORO, GEORGIA

REFRIGERATION DIAGRAM  
SINGLE KM COIL WITH T-STAT

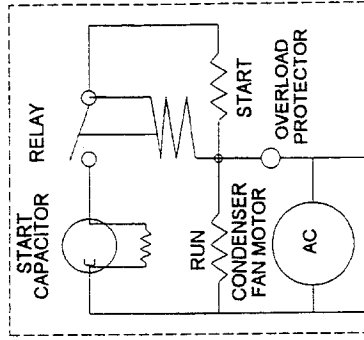
DATE: 4-26-95

DRAWING NO.  
LT-ENG-PD-003A

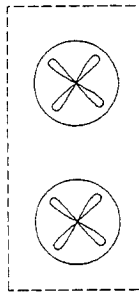
THIS DIAGRAM FOR TWO (2) COILS  
MOUNTED IN A COMMON BASE  
USING THE SAME CONDENSING UNIT

LOCATED INSIDE ONE UNIT COOLER

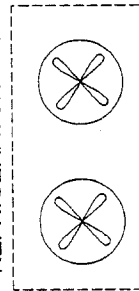
# CONDENSING UNIT



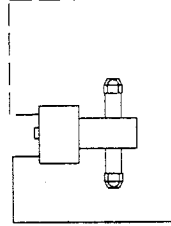
## REFRIGERATOR COIL



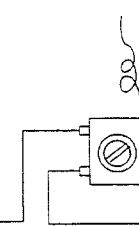
## REFRIGERATOR COIL



LIQUID LINE  
SOLENOID



THERMOSTAT



CONDENSING UNIT POWER  
120V/1PH SERVICE REQUIRED

N L1

PERKINS THREE DOOR  
REFRIGERATED BASE

COIL CONDENSATE PAN HEATER  
REFRIGERATOR COIL

DOOR ANTI-SWEAT HEATERS  
REFRIGERATOR COIL

COIL CONDENSATE PAN HEATER  
REFRIGERATOR COIL

DOOR ANTI-SWEAT HEATERS  
REFRIGERATOR COIL

CIRCUIT BREAKER  
IN RISER PANEL

N L1 UNIT COOLER POWER

120V/1PH SERVICE REQUIRED

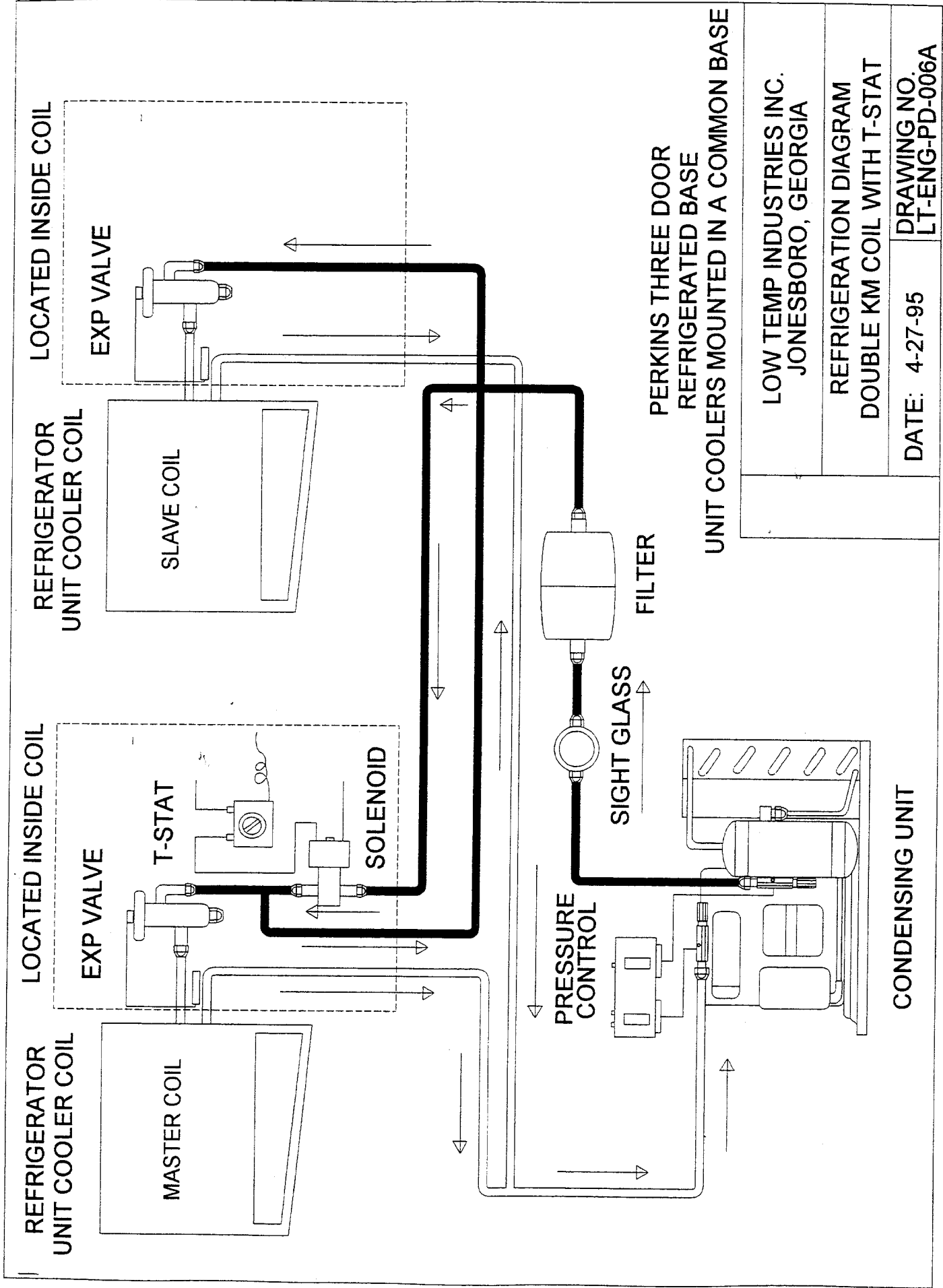
LOW TEMP INDUSTRIES INC.  
JONESBORO, GA

WIRING DIAGRAM FOR REMOTE  
CONDENSING UNIT  
DOUBLE MED TEMP COIL W/ T-STAT

DATE: 4-25-95

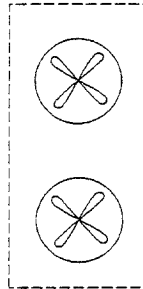
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LT-ENG-WD-006B



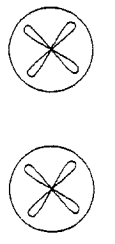


THIS DIAGRAM FOR THREE (3) COILS  
MOUNTED IN A COMMON BASE  
USING THE SAME CONDENSING UNIT

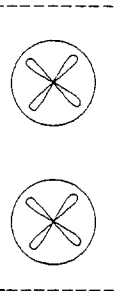
REFRIGERATOR COIL



REFRIGERATOR COIL

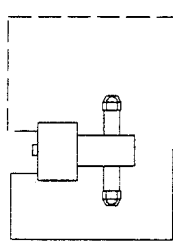


REFRIGERATOR COIL

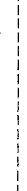


LOCATED INSIDE ONE UNIT COOLER

LIQUID LINE  
SOLENOID



THERMOSTAT



COIL CONDENSATE PAN HEATER  
REFRIGERATOR COIL

DOOR ANTI-SWEAT HEATERS  
REFRIGERATOR COIL

COIL CONDENSATE PAN HEATER  
REFRIGERATOR COIL

DOOR ANTI-SWEAT HEATERS  
REFRIGERATOR COIL

COIL CONDENSATE PAN HEATER  
REFRIGERATOR COIL

DOOR ANTI-SWEAT HEATERS  
REFRIGERATOR COIL

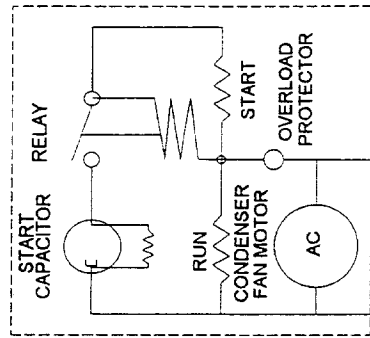
CIRCUIT BREAKER  
IN RISER PANEL

UNIT COOLER POWER

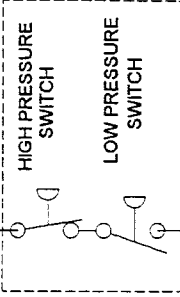
L1

120V/1PH SERVICE REQUIRED

CONDENSING UNIT



PRESSURE CONTROL



N L1

CONDENSING UNIT POWER  
120V/1PH SERVICE REQUIRED

PERKINS GRIDDLE STAND  
WITH EGG LOWERATOR SECTION

LOW TEMP INDUSTRIES INC.  
JONESBORO, GA

WIRING DIAGRAM FOR REMOTE  
CONDENSING UNIT  
TRIPLE MED TEMP COIL W/ T-STAT

DATE: 8-19-95

DRAWING NO.  
LT-ENG-WD-006C

REFRIGERATOR  
UNIT COOLER  
COIL

LOCATED  
INSIDE COIL  
EXP VALVE

LOCATED INSIDE COIL

EXP VALVE

MASTER  
COIL

T-STAT

SOLENOID

REFRIGERATOR  
UNIT COOLER COIL

SLAVE COIL

SLAVE COIL

PERKINS GRIDDLE STAND  
WITH EGG LOWERATOR SECTION  
UNIT COOLERS MOUNTED IN A COMMON BASE

PRESSURE  
CONTROL

SIGHT GLASS

FILTER

CONDENSING UNIT

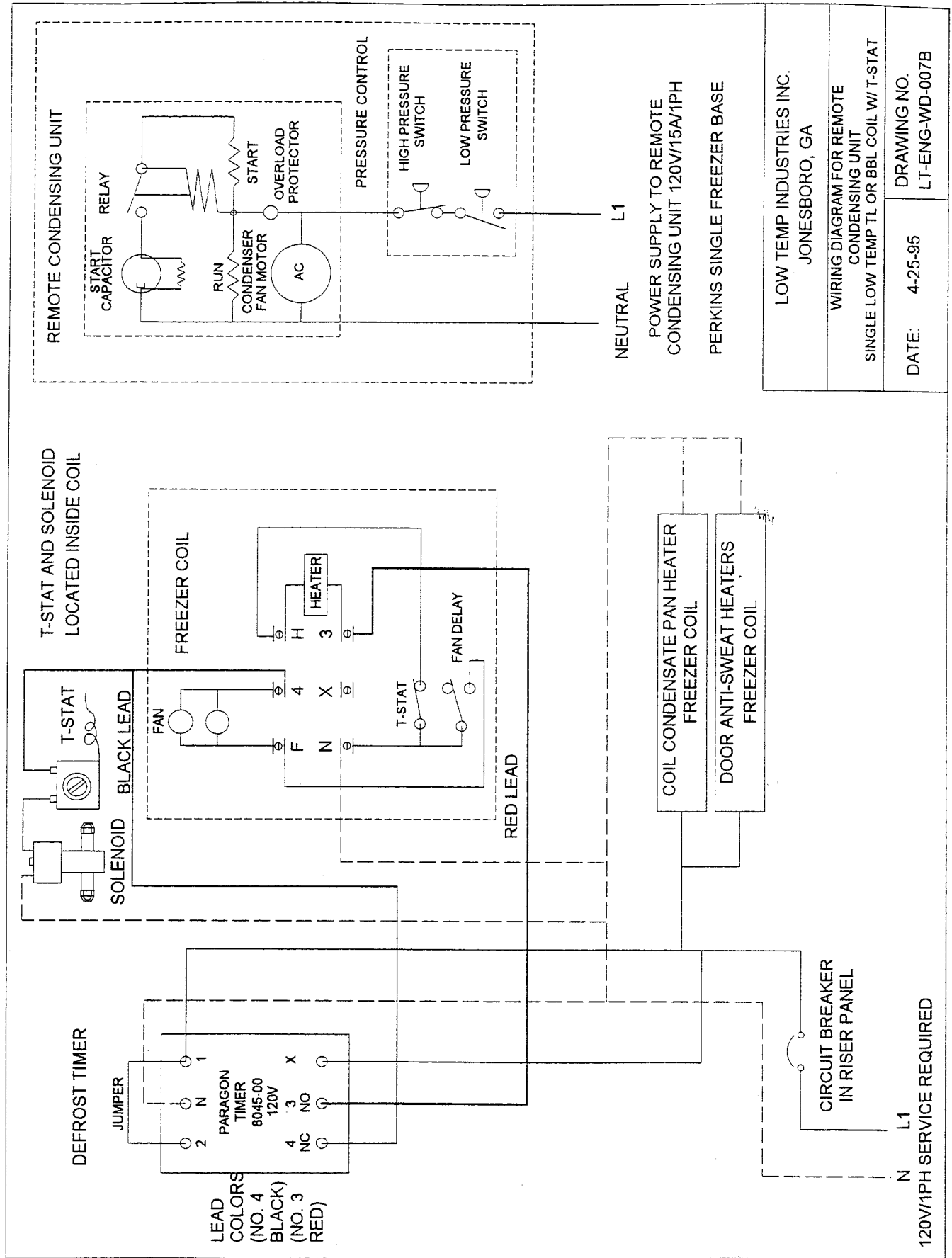
LOW TEMP INDUSTRIES INC.  
JONESBORO, GEORGIA

REFRIGERATION DIAGRAM

DOUBLE TA COIL & VA COIL WITH T-STAT

DATE: 8-18-95

DRAWING NO.  
LT-ENG-PD-006B



LOCATED INSIDE COIL

FREEZER  
UNIT COOLER COIL

ELECTRIC DEFROST  
PROVIDED IN COIL  
HEATER CONTROLLED BY  
PARAGON TIMER  
8045-00 / 120V

EXP VALVE

T-STAT

SOLENOID

SIGHT GLASS

FILTER

PRESSURE  
CONTROL

PERKINS SINGLE FREEZER BASE

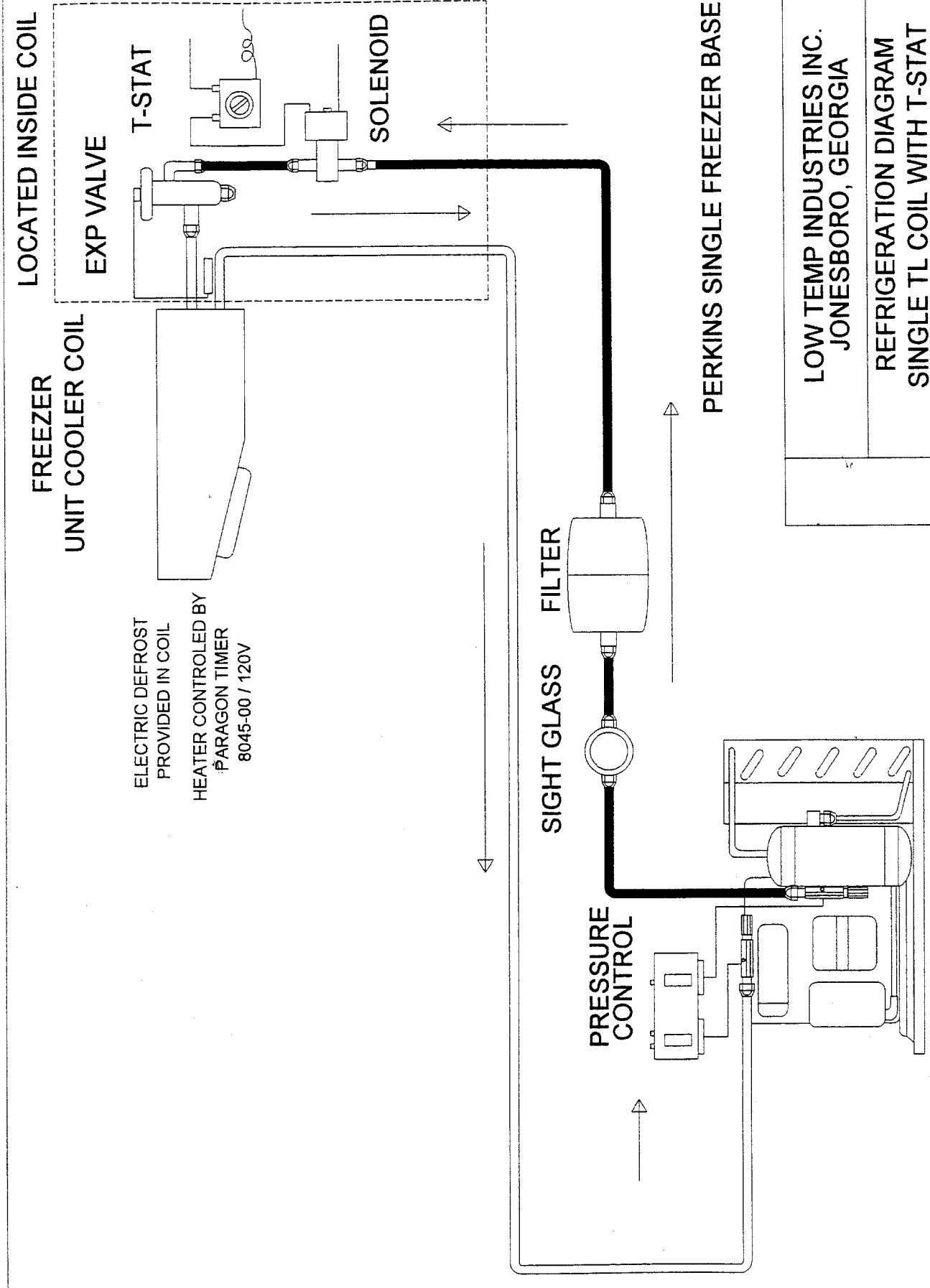
CONDENSING UNIT

LOW TEMP INDUSTRIES INC.  
JONESBORO, GEORGIA

REFRIGERATION DIAGRAM  
SINGLE TL COIL WITH T-STAT

DATE: 4-27-95

DRAWING NO.  
LT-ENG-PD-009B



## MULTIPLEX REFRIGERATED SYSTEMS INTRODUCTION

THE LOW TEMP INDUSTRIES MULTIPLEX REFRIGERATED SYSTEMS ARE TWO OR MORE SEPERATE COOLING SYSTEMS OPERATING AT DIFFERENT TEMPERATURES BUT OPERATING ON THE SAME CONDENSING UNIT. THIS COULD BE A REFRIGRATED BASE WITH A **Tempest-Aire** ®CONDIMENT RAIL, OR A REFRIGERATED BASE AND ICE CREAM FREEZER COMBINATION. IN ANY CASE THE SYSTEMS ARE DESIGNED TO OPERATE AS THEY ARE DESCRIBED IN THE EARILER SECTIONS. EACH SYSTEM IS CONTROLLED BY AN INDIVIDUAL THERMOSTAT AND WILL OPERATE AND ADJUST INDIEPENDENT OF THE OTHER SYSTEM.

HE PERFORMANCE OF THESE SYSTEMS DEPENDS UPON HOW THEY ARE USED. DOORS AND DRAWERS SHOULD BE KEPT CLOSED WHEN EVER NOT BEING ACCESSED. DOORS AND DRAWERS SHOULD BE CLOSED PROPERLY AND NOT SLAMMED OR KICKED CLOSED. GASKETS SHOULD BE CLEANED ON A REGULAR BASIS (SEE DETAIL ON GASKET CLEANING AND REPLACEMENT). EVAPORATOR UNIT COOLERS INTAKES AND DISCHARGES SHOULD BE KEPT CLEAN AND CLEAR OF ANY DEBRIS THAT MIGHT DISRUPT THE AIR FLOW. IF PROPERLY MAINTAINED THESE BASE UNITS WILL PROVIDE YEARS OF TROUBLE FREE SERVICE.

### OPERATING INSTRUCTIONS

#### START UP:

THE REFRIGERATION SYSTEM SUPPLIED WITH THESE SYSTEMS ARE OF THE HERMETIC TYPE. REFRIGERANT IS METERED BY EXPANSION VALVES WHICH ARE LOCATED IN THE EVAPORATOR UNIT COOLER. EACH REFRIGERATION SYSTEM HAS BEEN LEAK TESTED, CHARGED WITH REFRIGERANT AND OPERATED TO ENSURE THE PROPER OPERATION AND SETTING OF THE CONTROLS.

THE APPROPRIATE ELECTRICAL SERVICE FOR THIS UNIT IS 115 VAC, 60 HZ, SINGLE PHASE ENERGIZE THE UNIT BY (ATTACHING THE PLUG FOR MOBILE EQUIPMENT TO AN APPROPRIATE ELECTRICAL SUPPLY) OR (ENERGIZING THE PROPER BREAKER FOR PERMANENTLY WIRED EQUIPMENT) AND TURNING ON THE SERVICE SWITCH LOCATED AT THE END OF THE RAILS. AFTER APPROXIMATELY ONE (1) HOURS OF OPERATION THE UNIT WILL BE READY FOR USE.

NOTE! FOR REMOTE SYSTEMS THE POWER SUPPLY TO THE CONDENSING UNIT IS SEPARATE FROM THE POWER TO THE INDIVIDUAL RAILS. BE SURE THAT BOTH THE RAILS CIRCUIT AND THE CONDENSING UNIT CIRCUIT ARE ON.

#### OPERATION:

THE SYSTEM TEMPERATURE IS CONTROLLED BY A THERMOSTAT WHICH IS LOCATED IN THE EVAPORATOR UNIT COOLER. THERE IS AN EXPOSED CONTROL KNOB OR AN ACCESS HOLE FOR A SCREWDRIVER ADJUSTMENT LOCATED ON THE SIDE IF THE EVAPORATOR UNIT COOLER. THE THERMOSTAT CONTROLS A LIQUID LINE SOLENOID WHICH CONTROLS THE FLOW OF REFRIGERANT TO THE COOLING COILS. A LOW PRESSURE CONTROL (PHYSICALLY LOCATED IN THE FRONT OF THE COMPRESSOR COMPARTMENT) IS USED TO CYCLE OFF THE COMPRESSOR. THE LOW PRESSURE CONTROL IS SHOULD NOT BE ADJUSTED FROM THE FACTORY SETTINGS. ADJUSTMENT OF THIS CONTROL MAY CAUSE PERFORMANCE PROBLEMS WITH THE UNIT. THE TEMPERATURE IS DIRECTLY CONTROLLED BY THE THERMOSTAT.

THE THERMOSTAT THAT IS USED IN THE REFRIGERATED BASE SYSTEMS AND THE **Tempest-Aire** ®CONDIMENT RAIL SYSTEMS HAVE A CUT-OUT RANGE FROM 11 TO 26 DEGREES F. WITH A CONSTANT CUT-IN OF 37 DEGREE F. AND A NORMAL MID-RANGE SETTING OF 18 DEGREES F.. THIS CONSTANT CUT-IN OF 37 DEGREES F. INSURES THAT THE EVAPORATOR UNIT COOLER WILL DEFROST DURING THE OFF CYCLE, BUT WILL NOT AFFECT THE PRODUCT TEMPERATURE.

THE THERMOSTAT THAT IS USED IN THE ICE CREAM FREEZER SYSTEMS IS THE SAME AS THAT USED IN THR FREEZER BASE. IT HAS A CUT-OUT RANGE FROM -30.5 TO +12.5 DEGREES WITH AN 11 DEGREE DIFFERENTIAL AND A NORMAL MID-RANGE OFF SETTING OF -12 DEGREES F. AND AN NORMAL ON SETTING OF -1 DEGREES F.

THE REFRIGERATOR AND FREEZER DOORS AND DRAWERS SYSTEM BE KEPT CLOSED TO ENSURE A GOOD PRODUCT TEMPERATURE. THE SYSTEM USES THE COLD AIR GENERATED INSIDE THE CLOSED CHAMBER TO COOL THE PRODUCT. WHEN A DOORS AND DRAWERS ARE LEFT OUT THE SYSTEM PULLS WARM AIR IN AND GREATLY REDUCES THE SYSTEMS EFFICIENCY. GASKETS SHOULD BE CHECKED REGULARLY FOR WEAR AND KEPT CLEAN.

#### **CLEANING:**

THE INNER LINER OF THIS UNIT IS FABRICATED OF 304 STAINLESS STEEL. PLEASE SEE "HOW TO CLEAN STAINLESS STEEL" IN THIS MANUAL. NOTE THAT THIS IS A VERY BROAD SECTION ON CLEANING AND THE TYPE OF EQUIPMENT AND END USE SHOULD BE KEPT IN CONSIDERATION BEFORE SELECTING ANY SPECIAL CLEANERS.

SEE THE EARLIER SECTIONS ON HOW TO CLEAN THE *Tempest-Aire*® CONDIMENT RAIL SYSTEMS.

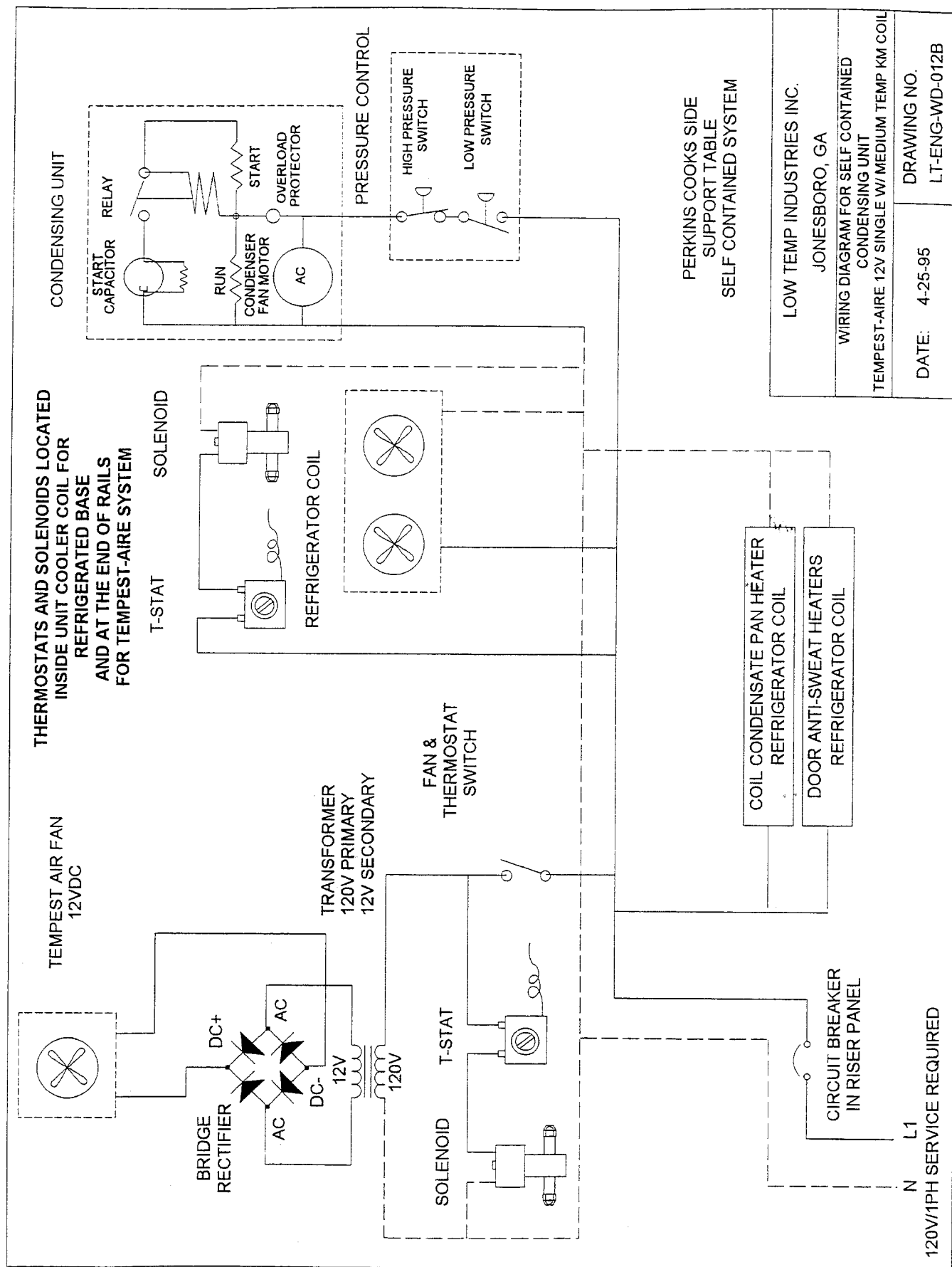
#### **ELECTRICAL SYSTEM:**

##### **\*\*\*\*\* WARNING \*\*\*\*\***

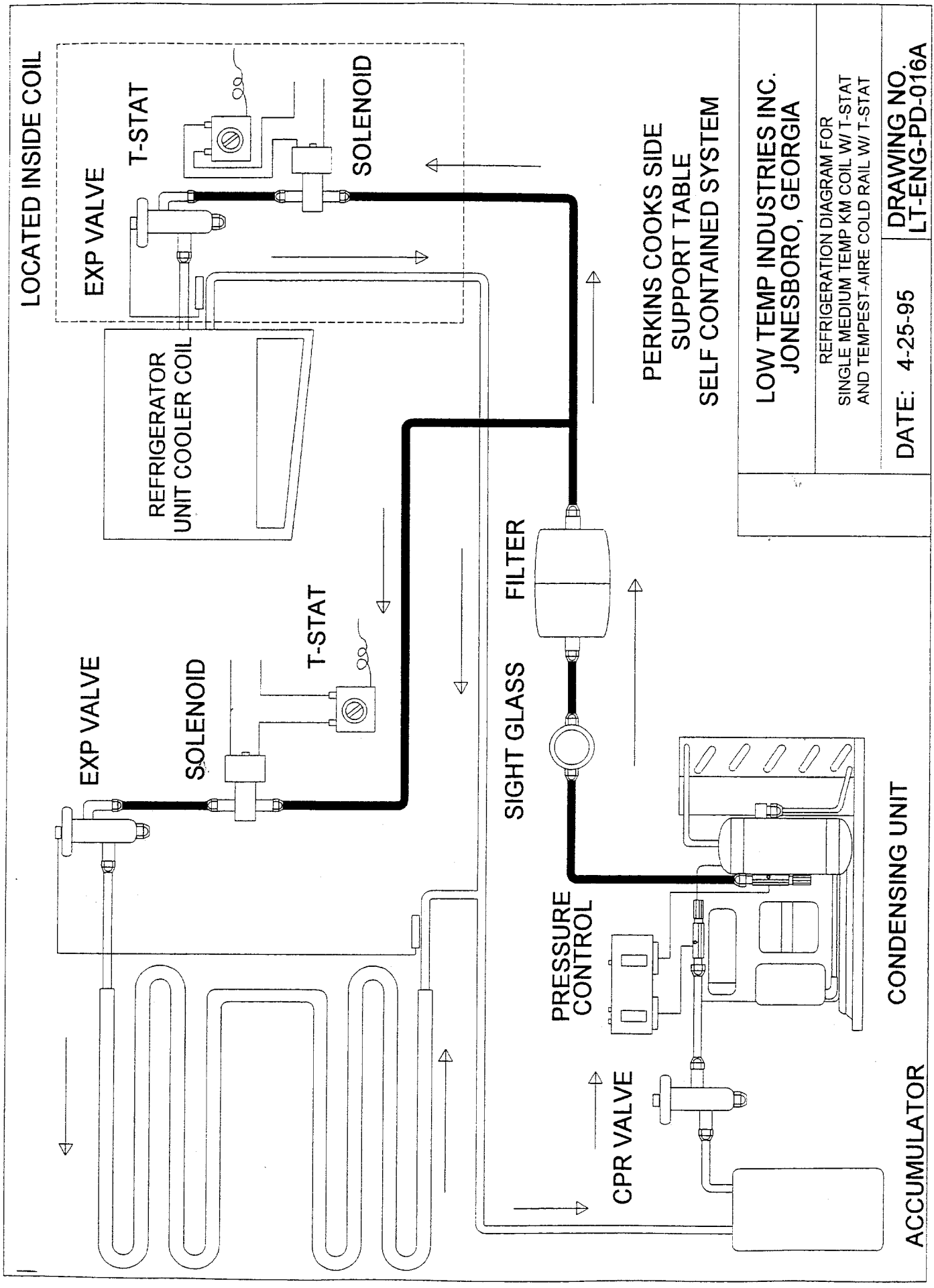
IN ORDER TO PREVENT ANY ELECTRICAL ACCIDENTS, THIS REFRIGERATION SYSTEM SHOULD BE INSTALLED AND SERVICED BY QUALIFIED MAINTENANCE PERSONNEL ONLY PER NATIONAL ELECTRICAL CODE STANDARDS.

##### **\*\*\*\*\* WARNING \*\*\*\*\***

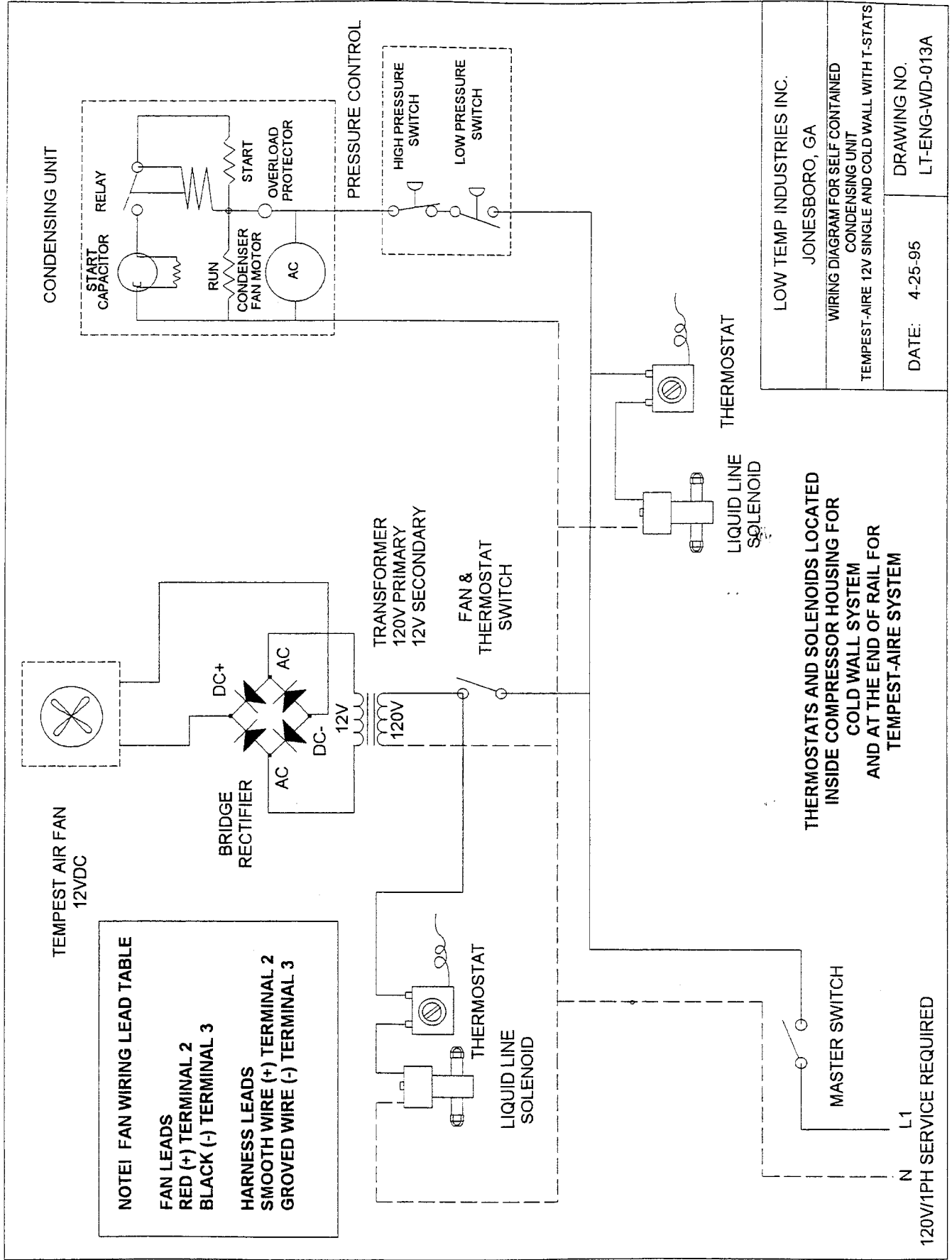
INDIVIDUAL BREAKERS OR FUSES SHOULD BE PROVIDED FOR EACH COMPRESSOR MOTOR. GROUP FUSING, WHERE TWO OR MORE COMPRESSORS ARE INSTALLED ON ONE FUSE OR BREAKER IS **\*\*NOT RECOMMENDED\*\***. REFER TO THE NATIONAL ELECTRICAL CODE FOR APPROPRIATE LINE FUSE OR BREAKER SIZE.



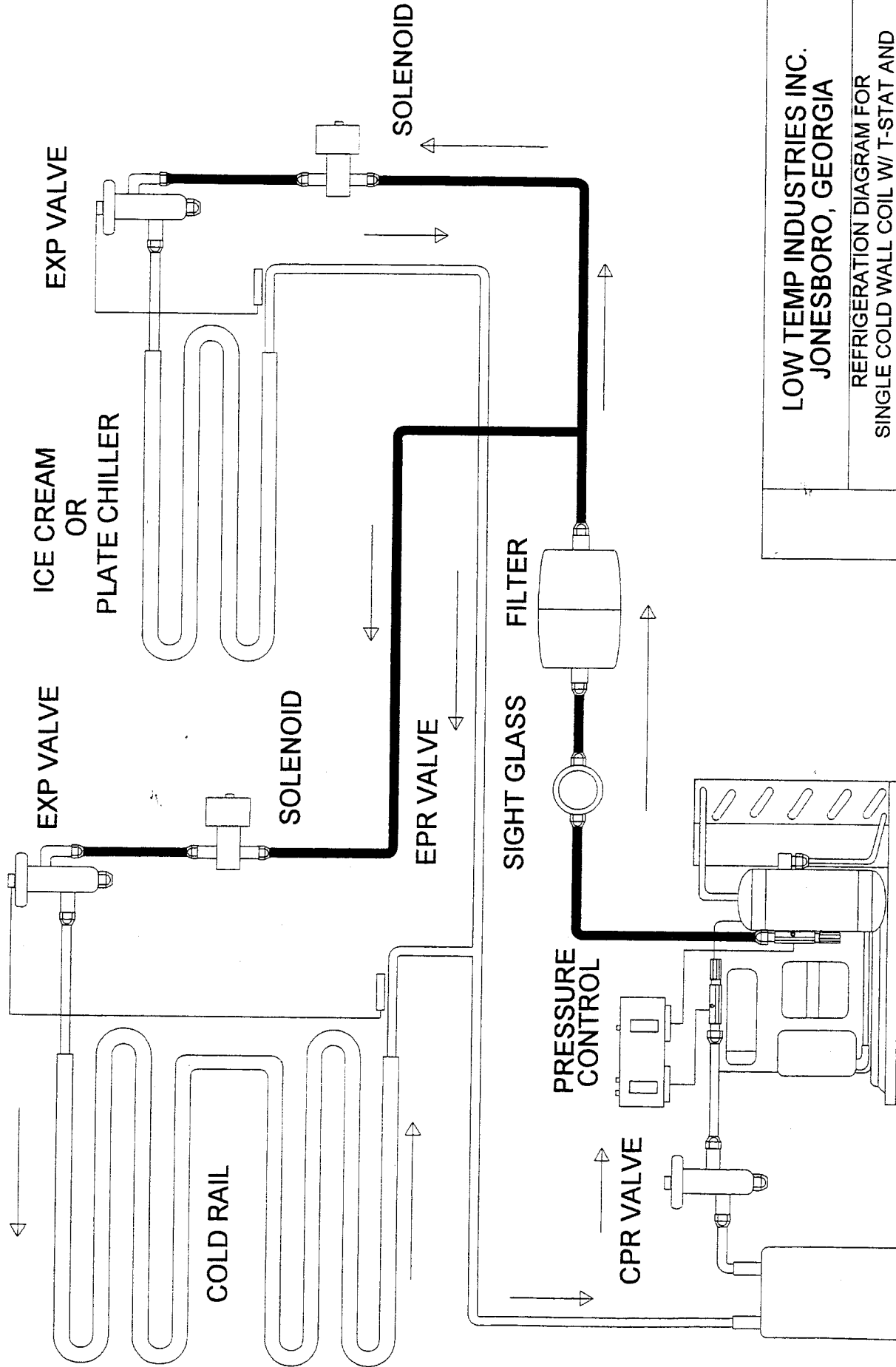




LOW TEMP INDUSTRIES INC. JONESBORO, GEORGIA	
REFRIGERATION DIAGRAM FOR SINGLE MEDIUM TEMP KM COIL W/ T-STAT AND TEMPEST-AIRE COLD RAIL W/ T-STAT	
DATE: 4-25-95	DRAWING NO. LT-ENG-PD-016A



LOW TEMP INDUSTRIES INC. JONESBORO, GA	
WIRING DIAGRAM FOR SELF CONTAINED CONDENSING UNIT	
TEMPEST-AIRE 12V SINGLE AND COLD WALL WITH T-STATS	
DATE: 4-25-95	DRAWING NO. LT-ENG-WD-013A



LOW TEMP INDUSTRIES INC.  
JONESBORO, GEORGIA

REFRIGERATION DIAGRAM FOR  
SINGLE COLD WALL COIL W/ T-STAT AND  
TEMPEST-AIRE COLD RAIL W/ T-STAT

DATE: 09-21-95

DRAWING NO.  
LT-ENG-PD-017A

CONDENSING UNIT

ACCUMULATOR

**PREVENTATIVE MAINTENANCE OF**  
**LOW TEMP INDUSTRIES**  
**REFRIGERATED EQUIPMENT**

*To insure that your equipment will continue to operate properly, please follow these simple steps:*

- #1 On all self contained systems make sure that the **FILTER** in the louvered panel is always kept clean of dust and dirt. Failure to do this will cause compressor to overheat and may cause compressor failure, and will also **VOID ANY FACTORY WARRANTY** on compressor.
- #2 To insure proper operation of these units, periodically check the evaporator unit coolers to ensure that the air intakes and the discharge areas are kept clean and clear. If the air fan intakes or discharge become blocked with wrappings or debris this will cause the coils located inside the unit coolers to freeze and the temperature in the unit will rise.
- #3 On freezer bases to insure proper operation the defrost timers must be set properly. The factory recommends three (3) twenty (20) minute defrost cycles. These should be set for low peak periods. During defrost cycle the temperature indicating device will rise above the freezing point. This is normal for this system. The product temperature will not be adversely affected because this system will recover to the proper operational temperature within 15 to 30 minutes. If these defrost cycles are not set properly this unit will not perform properly. An additional defrost cycle may be required if you are in a HIGH humidity environment.
- #4 **Tempest-Aire** ®CONDIMENT RAILS. Factory recommends that these units be defrosted at least once a day. Also, refer to step #1.
- #5 **Tempest-Aire** ®CONDIMENT RAILS. When cleaning these units is important to remove the power to the circulation fan and remove it from the unit. If the fan unit becomes wet, dry the fan assembly before applying power.

For more cleaning information on these models, see the section on "CLEANING" in this manual.

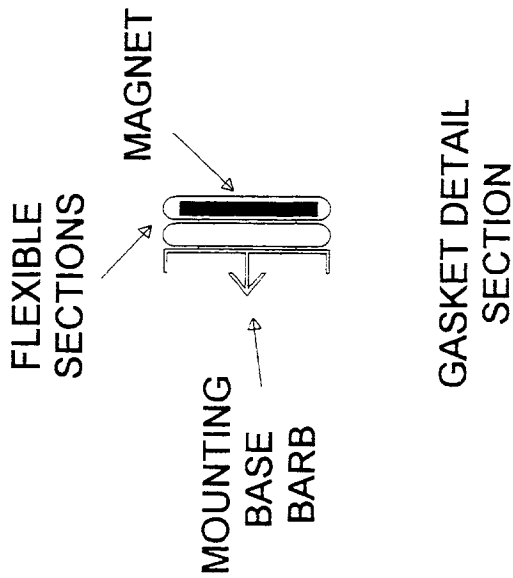
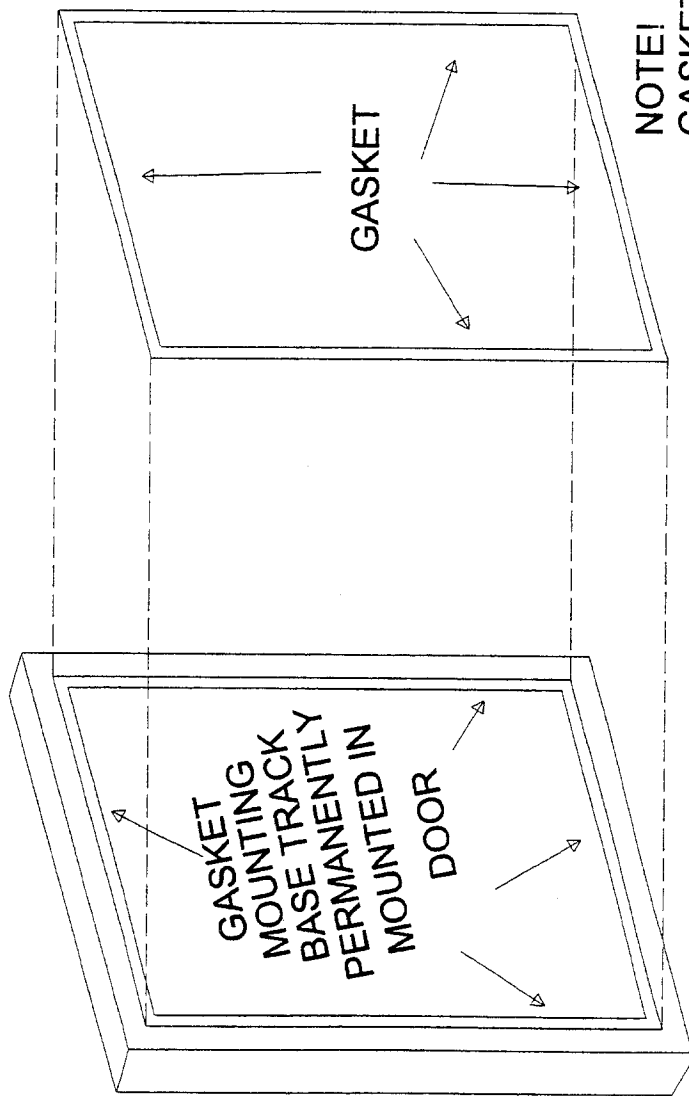
## REFRIGERATION SERVICE CHART

<u>COMPLAINT</u>	<u>PROBLEM</u>	<u>SOLUTION</u>
A. COMPRESSOR WILL NOT START	1. LINE DISCONNECT SWITCH OPEN 2. FUSE REMOVED OR BLOWN 3. CONTROL STUCK IN OPEN POSITION 4. CONTROL OFF DUE TO COLD LOCATION	1. CLOSE START OR DISCONNECT SWITCH 2. REPLACE FUSE 3. REPAIR OR REPLACE CONTROL 4. RELOCATE CONTROL
B. COMPRESSOR WILL NOT START, HUMS BUT TRIPS OVERLOAD PROTECTOR	1. LOW VOLTAGE TO UNIT 2. STARTING CAPACITOR DEFECTIVE 3. RELAY FAILING TO CLOSE 4. COMPRESSOR MOTOR HAS A WINDING OPEN OR SHORTED 5. INTERNAL MECHANICAL TROUBLE IN COMPRESSOR	1. CALL POWER SUPPLIER 2. REPLACE CAPACITOR 3. REPLACE RELAY 4. REPLACE COMPRESSOR 5. REPLACE COMPRESSOR
C. COMPRESSOR STARTS BUT DOES NOT SWITCH OFF OF START WINDING	1. LOW VOLTAGE TO UNIT 2. RELAY FAILING TO OPEN 3. RUN CAPACITOR DEFECTIVE 4. EXCESSIVELY HIGH DISCHARGE 5. COMPRESSOR MOTOR HAS A WINDING OPEN OR SHORTED 6. INTERNAL MECHANICAL TROUBLE IN COMPRESSOR (TIGHT)	1. CALL POWER SUPPLIER 2. REPLACE RELAY 3. REPLACE CAPACITOR 4. CHECK DISCHARGE SHUT OVERCHARGE OR INSUFFICIENT COOLING CONDENSER. 5. REPLACE COMPRESSOR 6. REPLACE COMPRESSOR
D. COMPRESSOR STARTS AND RUNS, BUT SHORT CYCLES ON OVERLOAD PROTECTOR	1. LOW VOLTAGE TO UNIT 2. OVERLOAD PROTECTOR DEFECTIVE 3. RUN CAPACITOR DEFECTIVE 4. EXCESSIVE DISCHARGE PRESSURE 5. COMPRESSOR TOO HOT, RETURN GAS HOT 6. COMPRESSOR MOTOR HAS A WINDING SHORTED	1. CALL POWER SUPPLIER 2. CHECK CURRENT, REPLACE PROTECTOR 3. REPLACE CAPACITOR 4. CHECK VENTILATION, RESTRICTIONS IN COOLING MEDIUM, RESTRICTIONS IN REFRIGERANT SYSTEM 5. CHECK REFRIGERANT CHARGE (FIX LEAK IF NECESSARY) 6. REPLACE COMPRESSOR
E. UNITS RUNS OK, BUT SHORT CYCLES ON	1. OVERLOAD PROTECTOR 2. THERMOSTAT 3. HIGH PRESSURE CUT OUT DUE TO: A. INSUFFICIENT AIR B. OVERCHARGE C. AIR IN SYSTEM 4. LOW PRESSURE CUT-OUT DUE TO:	1. SEE D-2 ABOVE 2. DIFFERENTIAL SET TOO CLOSE, WIDEN 3A. CHECK AIR SUPPLY TO CONDENSER 3B. REDUCE REFRIGERANT CHARGE 3C. PURGE

## REFRIGERANT SERVICE CHART (CONT.)

<u>COMPLAINT</u>	<u>PROBLEM</u>	<u>SOLUTION</u>
	A. UNDERCHARGED	4A. FIX LEAK AND ADD REFRIGERANT
	B. EXPANSION VALVE OUT OF ADJUSTMENT.	4B. RE-ADJUST VALVE
	C. RESTRICTION IN EXPANSION VALVE.	4C. REPLACE VALVE
F. UNIT OPERATES LONG OR CONTINUOUSLY	1. SHORTAGE OF REFRIGERANT	1. FIX LEAK, ADD CHARGE
	2. CONTROL CONTACTS STUCK OR FROZEN CLOSED.	2. CLEAN CONTACTS, OR REPLACE CONTROL.
	3. REFRIGERANT OR AIR CONDITIONED SPACE HAS EXCESSIVE LOAD OR POOR INSULATION	3. DETERMINE FAULT AND CORRECT CORRECT.
	4. EVAPORATOR COIL ICED	4. DEFROST
	5. RESTRICTION IN REFRIGERANT SYSTEM	5. DETERMINE LOCATION AND REMOVE
	6. DIRTY CONDENSER	6. CLEAN CONDENSER
	7. FILTER DIRTY	7. CLEAN OR REPLACE
G. START CAPACITOR OPEN	1. RELAY CONTACTS NOT OPENING PROPERLY	1. CLEAN CONTACTS, OR REPLACE IF NECESSARY
	2. PROLONGED OPERATION ON START CYCLE DUE TO: A. LOW VOLTAGE TO UNIT B. IMPROPER RELAY	2A. CALL POWER SUPPLIER 2B. REPLACE
	3. EXCESSIVE SHORT CYCLE	3. DETERMINE REASON FOR SHORT CYCLE (SEE E. AND CORRECT)
H. RUN CAPACITOR OPEN, SHORTED OR BLOWN	1. IMPROPER CAPACITOR	1. DETERMINE CORRECT SIZE AND REPLACE
	2. EXCESSIVELY HIGH LINE VOLTAGE (100% OF RATED-MAX)	2. CALL POWER SUPPLIER
I. SPACE TEMPERATURE TOO HIGH	1. CONTROL SETTING TOO HIGH	1. RESET (CONTROL)
	2. INADEQUATE AIR CIRCULATION	2. IMPROVE AIR MOVEMENT
J. SUCTION LINE FROSTED OR SWEATING	1. EXPANSION VALVE STUCK	1. CLEAN VALVE OF FOREIGN PARTICLES REPLACE IF NECESSARY
	2. EVAPORATOR FAN NOT RUNNING	2. DETERMINE REASON AND CORRECT
	3. OVERCHARGE OF REFRIGERANT	3. CORRECT CHARGE

LOW TEMP INDUSTRIES  
JONESBORO, GEORGIA



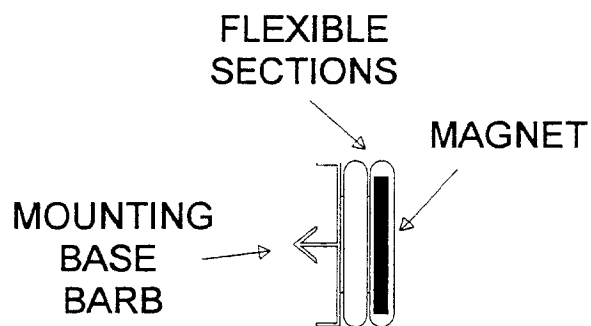
NOTE! WHEN ORDERING GASKETS:  
GASKETS ARE MEASURED FROM THE  
CENTER LINE OF THE MOUNTING BASE  
TRACK. THE DOOR IS APPROXIMATELY  
2-1/2" LARGER THAN THE GASKET

#### GASKET REPLACEMENT PROCEDURE:

TO REMOVE THE EXISTING GASKET, OPEN THE REFRIGERATOR DOOR AND PULL THE GASKET OUT OF THE MOUNTING BASE TRACK.

TO INSTALL NEW GASKET, ALIGN THE MOUNTING BASE BARB WITH THE BASE TRACK AND PRESS INTO THE BASE TRACK. THE MOUNTING BASE BARB SHOULD SNAP INTO MOUNTING BASE TRACK.

LOW TEMP INDUSTRIES  
JONESBORO, GEORGIA



GASKET DETAIL  
SECTION

REFRIGERATOR DOOR GASKET CARE AND CLEANING:

THE REFRIGERATOR DOOR GASKET IS A KEY COMPONENT IN MAINTAINING GOOD PERFORMANCE IN YOUR REFRIGERATION SYSTEM AND MAINTAINING GOOD PRODUCT TEMPERATURE.

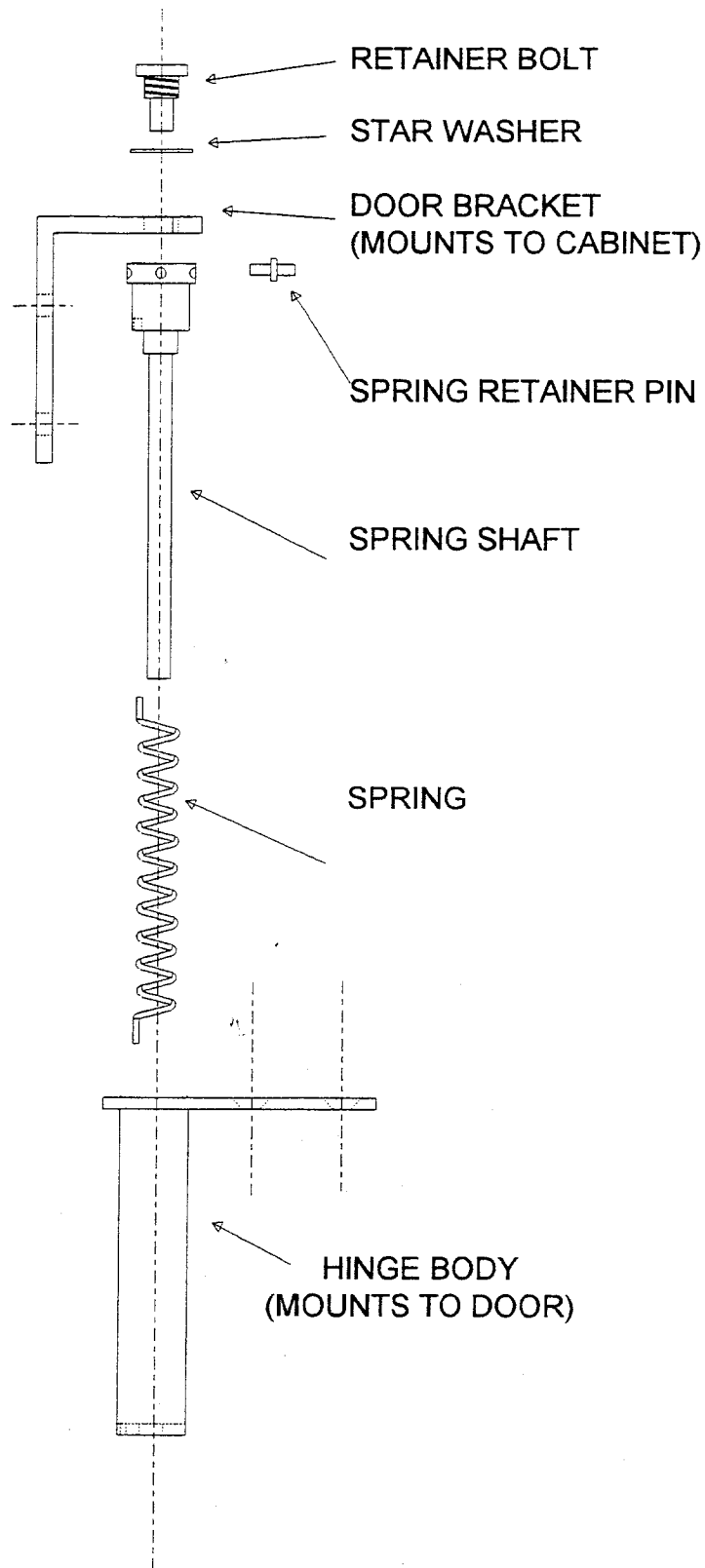
GASKETS SHOULD BE CLEANED DAILY.

USING A DAMP CLOTH CLEAN THE AREA BETWEEN THE FLEXIBLE SECTIONS OF ANY DEBRIS OF DIRT, DEBRIS LEFT IN THESE AREAS WILL ACT LIKE A KNIFE AND TEAR THE GASKET.

ONCE THE GASKET HAS BEEN CLEANED, COAT THE GASKET WITH A LIGHT LAYER OF VEGETABLE OIL. THIS WILL HELP KEEP THE GASKETS FLEXIBLE.

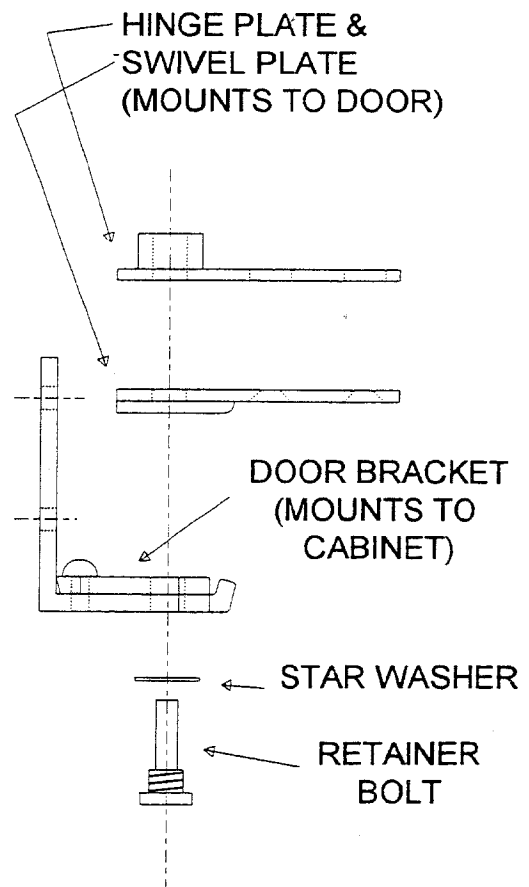


8-95



TOP HINGE ASSEMBLY

LOW TEMP INDUSTRIES JONESBORO, GEORGIA
REFRIGERATOR DOOR HINGE DRAWING
NOTE! SPECIFY LEFT HAND OR RIGHT HAND WHEN ORDERING



BOTTOM HINGE ASSEMBLY

**REPLACEMENT PARTS LIST**  
**FOR ALL REFRIGERATION SYSTEMS**

**NOTE! CHECK YOUR UNIT FOR SPECIFIC COMPONENTS USED**

**(THESE SYSTEMS USE R-22 OR R-502 REFRIGERANT)**

ITEM NO.	DESCRIPTION	STOCK NO.	MFG. NO.	MANUFACTURER
1	CONDENSING UNIT(R-22)	311931	MSYH-0025-IAA	COPELAND
1A	CONDENSING UNIT(R-22)	311932	MSYH-0033-IAA	COPELAND
1B	CONDENSING UNIT (R-502)	311933	MSYL-0027-IAA	COPELAND
1C	CONDENSING UNIT (R-502)	311934	MSYL-0035-IAA	COPELAND
2	PRESSURE CONTROL	280610	012-4834-000	RANCO
3	FILTER / DRIER	282300	C-052-T-HH	SPORLAN
4	SIGHT GLASS	282400	SA-12FM	SPORLAN
5	(OLD MEDIUM TEMP) EXPANSION VALVE(R-22)	282570	FV-1/4-C	SPORLAN
5A	(OLD MEDIUM TEMP) EXPANSION VALVE (R-502)	282571	FR-1/8-C	SPORLAN
5B	(OLD LOW TEMP) EXPANSION VALVE(R-502)	282572	FR-1/8-Z	SPORLAN
5C	(NEW MEDIUM TEMP) EXPANSION VALVE(R-22)	282573	Q-O(1/4T)-VC-5'	SPORLAN
5C	(NEW MEDIUM TEMP) EXPANSION VALVE(R-502)	282574	Q-O(1/8T)-RC-5'	SPORLAN
5D	(NEW LOW TEMP) EXPANSION VALVE(R502)	282575	Q-O(1/8T)RZ-5'	SPORLAN
6	UNIT COOLER (MED. TEMP)	312000	KMK-13A	BOHN
6A	UNIT COOLER (MED. TEMP)	312100	KMK-17A	BOHN
6B	UNIT COOLER (MED. TEMP)	312020	MDF-27-13	RUSSELL
6C	UNIT COOLER (MED. TEMP)	312220	TA-0100C	BOHN
6D	UNIT COOLER (MED. TEMP)	312250	TA-0130C	BOHN
6E	UNIT COOLER (MED. TEMP)	312260	VA-0120C	BOHN
6F	UNIT COOLER (MED. TEMP)	312300	BBM-11A	BOHN
6G	UNIT COOLER (MED. TEMP)	312310	BBM-16A	BOHN

# REPLACEMENT PARTS LIST FOR ALL REFRIGERATION SYSTEMS

ITEM NO.	DESCRIPTION	STOCK NO.	MFG. NO.	MANUFACTURER
7	UNIT COOLER (LOW TEMP)	312011	KLK-11A	BOHN
7A	UNIT COOLER (LOW TEMP)	312110	KLK-15A	BOHN
7B	UNIT COOLER (LOW TEMP)	312210	TL-09AF	BOHN
7C	UNIT COOLER (LOW TEMP)	312212	TL-012AF	BOHN
8	ACCUMULATOR	281700	3616	REFRIG. RESEARCH
9	DEFROST TIMER	356700	8045-00/120	PARAGON
10	CRANKCASE PRESS. REG.	281800	CRO-4	SAPORLAN
11	ANTI-CONDENSATE PAN	500010	T12-5000	COMPONENT HARDWARE
12	THERMOMETER (BACK MT. BEZEL W/ 6" CAPILARY)	500010	10-6812-01-4	COOPER
12A	THERMOMETER (FRONT MT. BEZEL W/ 72" CAPILARY)	500031	65356X	CLIFTON
13	TOGGLE SWITCH	335910	TA205-PWB	CARLING
14	AXIAL FAN (120V USED IN COMPRESSOR COMPARTMENTS)	312400	028021	CON-AIR ROTRON
15	LIQUID LINE SOLENOID	281600	A3F1/120	SPORLAN
16	THERMOSTAT (REF.) (REFRIGERATOR BASE & COLD RAILS)	280810	A12-700	RANCO
17	THERMOSTAT (FREEZER)	281010	A30-308	RANCO
	<b>Tempest-Aire ®</b>			
18	AXIAL FAN	312390	MC12A3	CON-AIR ROTRON

NOTE! DOOR AND DRAWER GASKETS ARE AVAILABLE ONLY THROUGH LOW TEMP INDUSTRIES.

			GASKET SIZE	DOOR SIZE
19	DOOR GASKET	493340	22" X 23"	25-1/2" X 24-1/2"
20	DOOR GASKET	493450	20-5/8" X 21-7/8"	24-3/8" X 23-1/8"
21	DRAWER GASKET	493394	30-1/2" X 8-3/4"	32" X 10-1/4"
22	DRAWER GASKET	493393	17-1/2" X 8-3/4"	19" X 10-1/4"
23	DOOR HINGE TOP L.H.	158110	1522 L00004	KASON
23A	DOOR HINGE BTM. L.H.	158120	1521L 00004	KASON
24	DOOR HINGE TOP R.H.	158130	1522 R00008	KASON
24A	DOOR HINGE BTM. R.H.	158140	1521 R00008	KASON

# WARRANTY

ALL LOW TEMP INDUSTRIES FOOD SERVICE EQUIPMENT IS FULLY WARRANTED BY THE MANUFACTURER AGAINST DEFECTS IN MATERIALS OR WORKMANSHIP FOR A PERIOD OF ONE (1) YEAR FROM THE DATE OF PURCHASE BY THE ORIGINAL USER AND ONLY TO THE ORIGINAL PURCHASER PROVIDED IT IS INSTALLED AND OPERATED IN ACCORDANCE WITH THE INSTRUCTIONS SUPPLIED WITH THE UNIT. ALSO, IT MUST NOT BE MISUSED, ALTERED OR NEGLECTED AND USED ONLY ON CIRCUITS AND VOLTAGES REQUIRED FOR THAT UNIT.

OUR OBLIGATION UNDER THIS WARRANTY SHALL BE LIMITED TO ONE OF THE FOLLOWING PROCEDURES. SELECTION OF A PROCEDURE SHALL BE AT THE SOLE DISCRETION OF LOW TEMP INDUSTRIES INC.

- A. REPLACEMENT OF DEFECTIVE PARTS, SHIPPED F.O.B. FACTORY, IN EXCHANGE FOR THE RETURNED DEFECTIVE PART, SHIPPED PREPAID FREIGHT.
- B. FREE REPLACEMENT OF DEFECTIVE PART, SHIPPED F.O.B. FACTORY.
- C. DEFECTIVE PART SHIPPED PREPAID FREIGHT TO FACTORY, REPAIRED AND RETURNED, SHIPPED F.O.B. . FACTORY.
- D. ALL **LABOR COSTS** SHALL BE COVERED FOR A PERIOD OF **90 DAYS** FROM THE DATE OF PURCHASE.

LOW TEMP INDUSTRIES INC. SHALL NOT BE RESPONSIBLE FOR ANY DAMAGE CAUSED BY FIRE, FLOOD, WINDSTORM, OR ANY OTHER ACT OF GOD; WAR, WHETHER DECLARED OR UNDECLARED NOR SHALL WE BE RESPONSIBLE FOR THE LOSS OF FOOD OR OTHER PRODUCTS DUE TO POWER OR MECHANICAL FAILURE. THIS WARRANTY SHALL NOT COVER ANY DAMAGE CAUSED DURING SHIPMENT WHICH SHOULD BE REPORTED TO THE DELIVERING CARRIER.

**LOW TEMP MANUFACTURING COMPANY**

**A DIVISION OF LOW TEMP INDUSTRIES INC.**

**9192 TARA BOULEVARD**

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