FORM NUMBER: 84-201-9
DATE: 9/24/84
REVISED:

WARREN//SHERER

INSTALLATION & OPERATION MANUAL

MODEL:

WIL

FROZEN FOOD ISLAND FREEZER

THIS REFRIGERATOR CONFORMS TO THE COMMERCIAL REFRIGERATOR MANUFACTURERS ASSOCIATION HEALTH AND SANITATION STANDARD.
CRS-SI-78

WARREN//SHERER
DIVISION OF KYSOR INDUSTRIAL CORPORATION

1600 ROCKDALE INDUSTRIAL BLVD., CONYERS, GEORGIA 30207/404•483•5600

NOTICE

ALL CLAIMS FOR SHORTAGES MUST BE MADE WITHIN TEN DAYS OF RECEIPT OF SHIPMENT

ANY SHORTAGES CLAIMED AFTER TEN DAYS WILL BE INVOICED AS ADDITIONAL PARTS.

WARREN/SHERER

INSTALLATION AND OPERATING INSTRUCTIONS

FOR

WIL "ELECTRIC AND HOT GAS DEFROST"

FROZEN FOOD MODELS

APPLICATION:

The Warren/Sherer Island Freezers were designed to merchandise frozen food. These freezers should be installed and operated according to the instructions contained in this manual to insure proper performance. They are designed for display of products in an air-conditioned store where temperature and humidity are maintained at a maximum of 75°F dry bulb temperature, 55% relative humidity.

MODEL	DESCRIPTION	SERIAL CODE DESIGNATION
WIL	Frozen Food Island Freezer With Electric or Hot Gas Defrost	792

9/24/84

GENERAL

These low temperature freezers may be installed individually or in a continuous line-up consisting of several 8-foot and 12-foot sections by using a joint trim kit. A plexiglass divider kit must be used between cases operating on different refrigeration systems. Divider will be factory installed if specified on order.

SHIPPING DAMAGE

All equipment should be examined for shipping damage before and during unloading. If there is any damage, the carrier should be notified immediately and an inspection requested. The delivery receipt "must" be noted that the equipment was received damaged. If damage is of a concealed nature you must contact the carrier immediately or no later than three (3) days following delivery. A claim must be filed with the carrier by the consignee for all damage.

LOCATION

This refrigerator must be located on firmly based floor and leveled within plus or minus 1/16". Use shims provided to level your refrigerator.

JOINING

Two or more fixtures of like models can be joined together to form a continuous line-up. Instructions for joining fixtures are included in the joint kit. Before lining up refrigerator, inspect refrigeration lines, electrical connections, and controls to insure refrigerators are in proper location in line-up and facing proper direction.

WASTE OUTLET

A 1" MPT waste outlet pipe terminates in the toe space in the center of the refrigerator at both sides. The waste outlet connection at the side opposite the electrical junction box is sealed with a 1" pipe cap. It is necessary for your protection to check this cap to make sure it is tight. This must be inspected prior to lining cases.

Before loading the fixture, be sure to check all access plates and make sure they are thoroughly sealed.

INSTALLING DRIP PIPE

Improperly installed drip pipes can seriously effect the operation of this equipment and result in increased maintenance cost. Listed below are some general rules for drip pipe installation.

1. Use the external water seal provided with the equipment. Never double seal a line.
2. Never use a pipe smaller than the size pipe or water seal supplied with the equipment.
3. Always provide as much as fall as possible in drip pipe. (1" fall for each 4' of drip pipe).
4. Avoid long runs in drip pipe which make it impossible to provide maximum fall in pipe.
5. Provide a drip space between drip pipe and floor drain or sewer connection.
6. Do not allow drip pipe to come in contact with uninsulated suction lines, which will cause the condensation from your refrigerator to freeze.

CLEANING

To insure minimum maintenance cost, cabinet should be thoroughly emptied and washed out every three (3) months. The exterior should be washed weekly. A mild soap and water solution is recommended for painted surfaces of the cabinet. Do not use cleaners containing abrasive materials which will scratch or dull finish. The waste outlet should be flushed with a bucket of water following each cleaning.

Caution: Never introduce water into the fixture faster than the waste outlet can carry it away.

BE SURE REFRIGERATION IS SHUT OFF AND ALL ELECTRICAL IS OFF BEFORE WASHING YOUR REFRIGERATOR.

LOADING

Merchandise should not be placed in the fixture until all controls have been adjusted and the refrigerator is at proper temperature.

At no time should the fixture be stocked beyond the load line located on the top of the back baffle and each end of the refrigerator.

For proper operation, you must not stock merchandise above the load lines. In doing so, you will seriously affect the performance, which will result in higher product temperatures and increase operating costs.

ELECTRICAL

All field installed wiring must comply with the NATIONAL ELECTRICAL CODE AND LOCAL CODES.

ELECTRICAL RACEWAY

An electrical raceway is provided with each refrigerator for running your fan, anti-sweat heaters, and defrost circuits from case to case without using conduit. This applies, of course, when the front bumper is properly secured into position. This is an approved method by the Underwriters' Laboratories; however, wiring must be in accordance with local and national electrical codes.

ELECTRICAL CONNECTIONS

All field connections are made at the main junction box.

Make sure that proper voltage is supplied to your refrigerator. Check refrigerator nameplate for fan and anti-sweat volts and defrost volts. If a canopy is furnished, use a separate fused circuit. ALL REFRIGERATORS MUST BE GROUNDED.

Fan motors and waste outlet heaters must operate continuously and panel must be marked sufficiently to prevent the fan motors and anti-sweat heaters from being turned off accidentally. When refrigerators are multiplexed, add the total of these amperage values to determine wire size and circuit protection. Anti-condensate controllers can be used to control the display and return air rail heaters.

On electric defrost models, the defrost heater amperages should be added together, and if their rating exeeeds the defrost time clock or condensing unit breaker capacity, a defrost relay and circuit breaker must be employed and furnished by others. Make sure that proper wire size and branch circuit protection are employed for safe operation.

Chart #1 shows the electrical ratings for your refrigerator. This is the same information that appears on your refrigeration nameplate.

REFRIGERATION FAN MOTORS

The fan motors employed are permanently oiled for the life of the motor and require no periodic maintenance. They are wired according to the enclosed wiring diagram and MUST RUN CONTINUOUSLY.

ANTI-SWEAT HEATERS

These heaters are placed in the fixture to eliminate sweat and frost from forming on certain areas of fixture. The cross-section of fixture shows location of these heaters.

DEFROST HEATERS (Models with Electric Defrost)

A standard 208/230 volt heater is located under the deck pans. This heater is designed to give full heat coverage to the evaporator coils to insure proper defrosting of the refrigerator. The two black wires in raceway junction box must be connected to the timer or defrost relay in the unit control panel.

EXPANSION VALVE

The expansion valve furnished with your refrigerator has been sized for maximum coil efficiency. To adjust superheat, place a thermocouple under the expansion valve bulb. Read the suction line pressure as near coil as possible. (If at condensing unit, estimate suction line loss at 2 PSIG.) Convert coil suction pressure to temperature. The difference between coil temperature and the thermocouple temperature is superheat. (Use average superheat when expansion valve is hunting.) Do not set superheat until cases have pulled down to operating temperature and never open or close valve over 1/2 turn between adjustments and allow 10 minutes or more between adjustments. Superheat should be set to 6-8°F.

REFRIGERANT LINES

The liquid and suction lines are located in the left end of the refrigerator facing the electrical junction box. The suction line is 7/8" OD and the liquid line is 1/2" OD. The tubing faces back so that you can use an elbow and run in either direction, or if multiplexing you can use a tee. Make sure that all refrigerant lines lie as close to the refrigerator bottom as possible so as not to obstruct the air pattern of the refrigerator or block the shelf. Do not run suction lines of one system through cases on another system.

These 8-foot and 12-foot freezers have polyurethane foamed-in-place insulation. In opening a ferrule hole, simply heat a piece of copper tubing of the same size as the tubing to be employed and force it through the ferrule hole.

IMPORTANT - SEAL AROUND LINES AFTER CONNECTIONS ARE MADE. KEEP DIRECT FLAME FROM BOTTOM OF REFRIGERATOR, AS HEAT WILL DISINTEGRATE THE ALUMINUM BOTTOM AND INSULATION. USE A HEAT SHIELD WHEN WELDING NEAR THE BOTTOM OF THE CASES.

REFRIGERANT

R-502 expansion valves are standard. If other refrigerant is used, the order must specify the expansion valve to be supplied.

HEAT EXCHANGER

Heat exchangers are standard in these refrigerators. They aid to increase operating efficiency and reduce frosting and flood-back to compressors.

OPERATION

On single condensing unit systems, a thermostat should be used to control temperatures. The thermostat bulb should be mounted in the discharge air. On parallel units, temperature control can be provided by EPR valve, thermostat and liquid line solenoid or solid state low pressure controls on compressor unit. Chart #2 shows approximate settings for frozen food and dual temp merchandisers. Since many variables are present in each installation, such as store temperature, length of tubing runs, temperature desired in refrigerator, etc., Chart #2 is only a guide for the installer.

DEHYDRATION OF REFRIGERATION

Please read carefully before placing system into operation. After laying refrigerant lines, they should be blown out before making final connections at fixture or condensing unit. Use dry nitrogen to prevent any foreign matter from being left in the lines. Keep pressure below 250 pounds. To prevent scaling due to brazing, dry nitrogen should be allowed to flow through lines while brazing operations are taking place.

After the refrigeration system has been pressure-tested and proven leak-free, it is recommended that the system be dehydrated with a vacuum pump to 1000 microns for the first two evacuations and 500 microns on the third. The triple evacuation method requires evacuating the system three successive times and breaking each vacuum with dry refrigerant. Allow the pressure to rise above atmospheric pressure.

ELECTRIC DEFROST MODELS

On the electric and hot gas defrost models, the evaporator fans must run continuously to circulate air through the coils and baffles to remove frost that has accumulated. On electric defrost models, the defrost cycle is started by the time clock, which opens the control circuit on the refrigeration cycle and closes the defrost circuit, which engages the defrost heaters unitl the defrost termination control or the failsafe setting on the time clock terminates the defrost cycle and returns the case to refrigeration. Control settings for the defrost cycle are listed on Chart #2.

HOT GAS DEFROST MODELS

On hot gas defrost models, (parallel compressors operation only) hot gas is routed through the suction line and evaporator coil. It exits the coil through a by-pass around the expansion valve and heat exchanger to return to the liquid line where the "condensed" liquid is used to feed the other cases on the same parallel unit. The case fans continue to operate during defrost to warm up the drain pan and air ducts; however, at approximately 46°F, the fans reverse to direct warm air on the case bottom.

After the defrost has terminated, the fans will reverse to the proper direction when the coil temperature reaches approximately 25°F.

NOTE: On initial start-up, the case fans will run in the reverse direction until the coil reaches approximately 25°F. At that point, they will reverse and operate in the proper direction.

DUAL TEMPERATURE OPTION (Frozen Food/Medium Temp)

The standard dual temperature kit will include a 115 volt suction solenoid, EPR valve, and check valve and piping to by-pass the solenoid for hot gas defrost operation. A switch at the case, located behind a hole plug in the kickplate, will change the operation to medium temperature by closing the suction solenoid at the case. This will allow the fixture to operate on the EPR at the medium temperature setting. See Chart #2 for settings.

CHART #1

Model	Evaporator Fans and Continuous Operated Heaters 115 Volt		Anti-Cond. Amps 115 Volt (1)	Defrost Heater Amps 208 Volt / 1Ø (Electric Defrost)
	Ref. Cycle	Def. Cycle		
WIL 8	.9	.9	1.7	8.0
WIL 12	1.2	1.2	2.4	11.6

(1) Add .2 amps for each shopping end

CHART #2

REFRIGERANT	L P CONTROL CUT-OUT	CUT-IN	EPR VALVE	THERMOSTAT DISCHARGE AIR TEMPERATURE	
R-502	9 PSIG	16 PSIG	11-13 PSIG (2)	-10°	0°

Defrost Period

Number of Periods	Termination	Fail Safe Setting	
		Elect.	Hot Gas
One per day	Temperature 46°F Fixed Setting	60 min.	46 min.

Note: A defrost termination control is installed on the bottom pan of each case. These must be wired in series with the trip solenoid on the time clock.

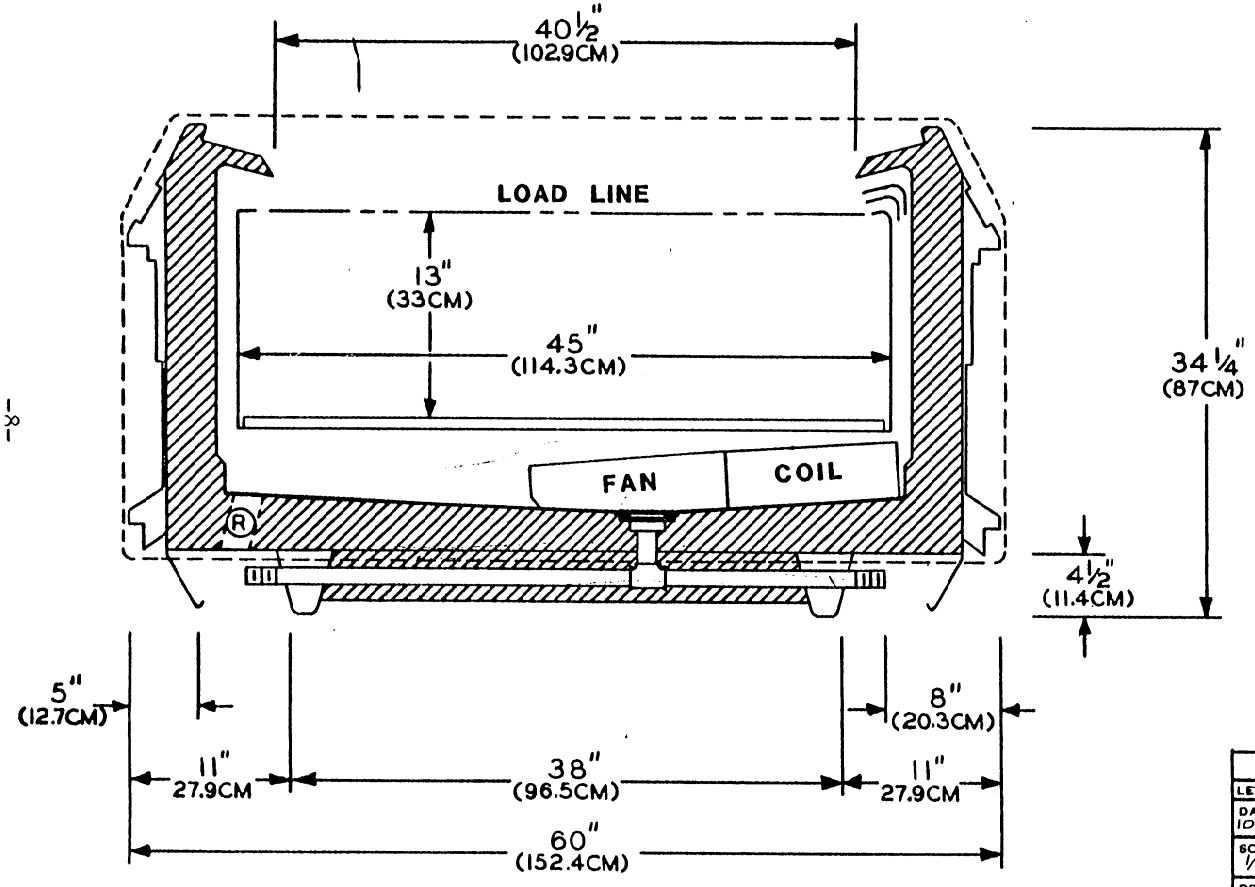
Dual temperature models have an additional defrost thermostat wired in series with this normal control to allow for medium temperature defrost control. The additional defrost control is tube mounted on the evaporator.

(2) Setting indicated is for low temp operation with EPR at condensing unit. For dual temp operation, the EPR located in the case should be set at approximately 41 psig for medium temp operation.

PARTS LIST

WIL

Description	8	12	Part No.
Evaporator Fan Motor	2	3	9A10-39
Evaporator Fan Blade	2	3	9B10-45
Expansion Valve	1	1	3A10-27
Defrost Term. Thermostats			
Electric	1	1	8A10-71
Hot Gas	1	1	8A10-71
	1	1	8A11-26
Dual Temp (Additional)	1	1	8A11-26
Temp. Control (Optional)	1	1	8A11-27
Rev. Fan Relay (Hot Gas)	1	1	8E11-55
Rev. Fan Control (Hot Gas)	1	1	8A11-26
Waste Outlet Heater	1	1	10K12-28
Display Rail	2		10K12-10
		2	10K12-11
Defrost Heaters (Elec.)	1		10K10-84
		1	10K10-85
Capacitor	1		10K14-59
		1	10K14-58



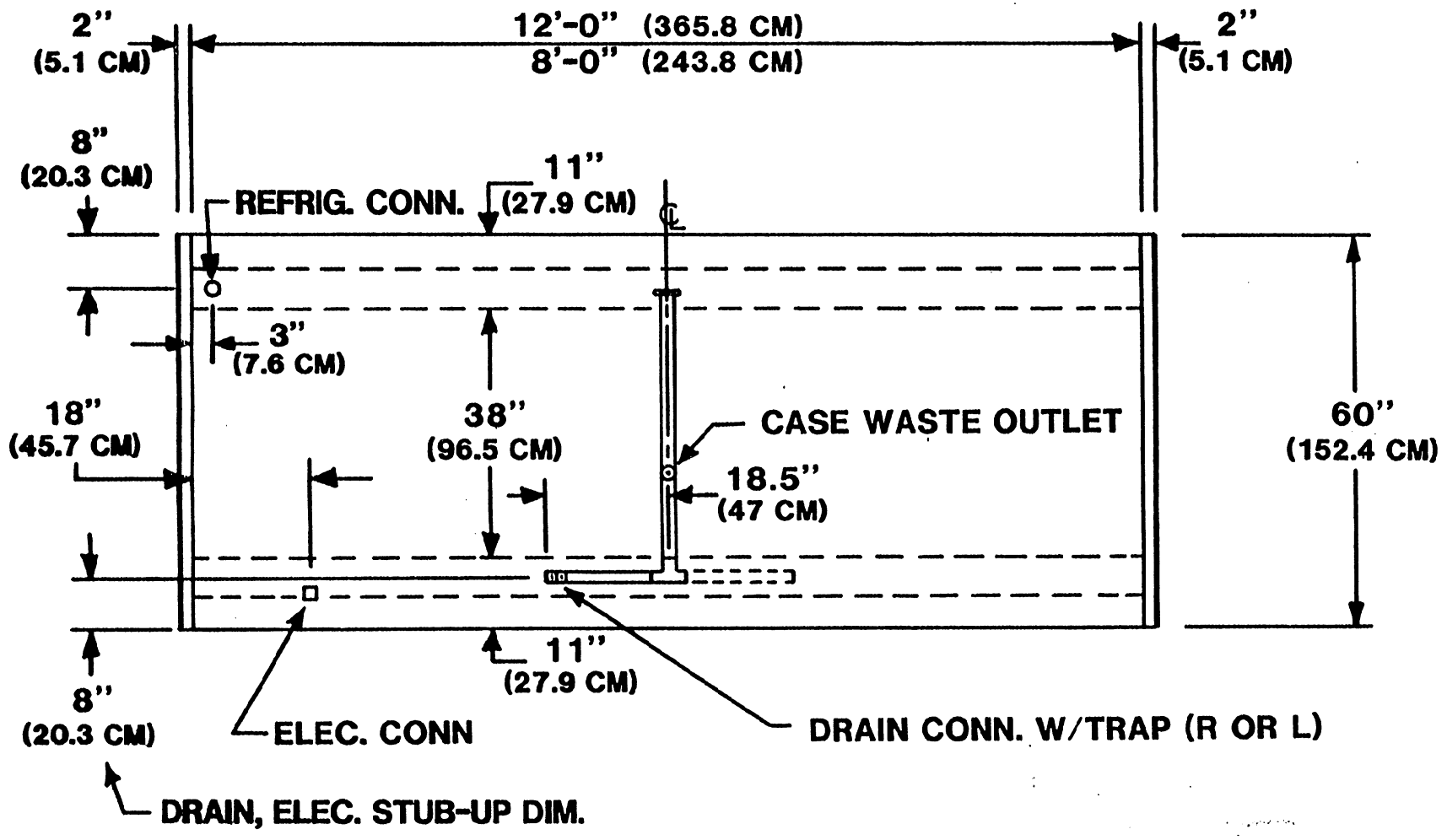
LETTER	REVISED	DATE	BY

DATE: 10 OCT 84
SCALE: 1/8" = 1"
DRAWN: JP
APPD.

TITLE
CROSS SECTION
MODEL WIL

KYSOR | WARREN // ENERGY
DIVISION OF KYSOR INDUSTRIAL CORPORATION

DRAWING NUMBER
SB-84-950



LETTER	REVISED	DATE	BY

DATE 10 OCT 84

SCALE 1/2" = 1'-0"

DRAWN JP

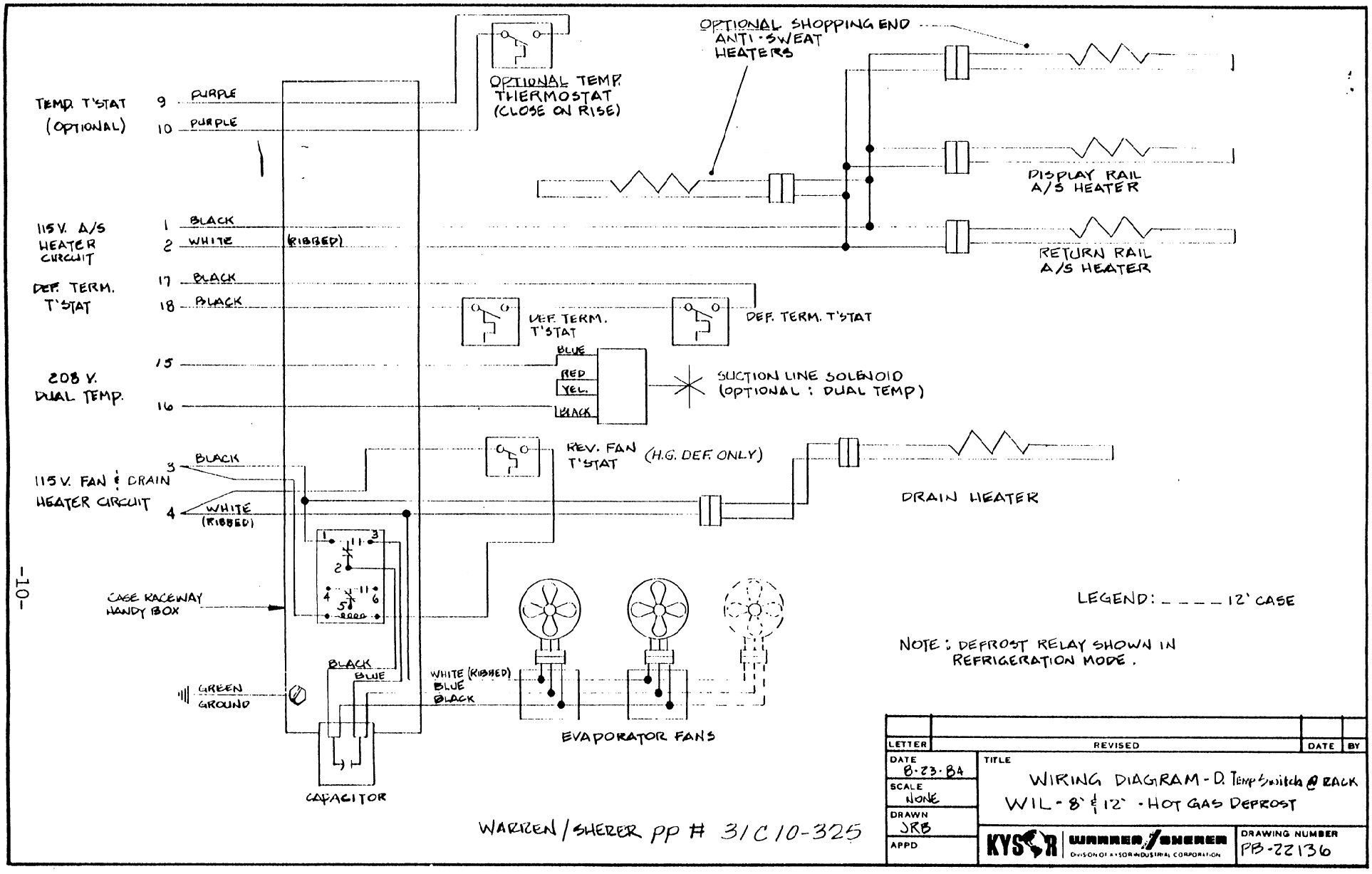
APPD.

TITLE

PLAN VIEW
MODEL WIL

KYSOR | WARREN / SHERER
DIVISION OF KYSOR INDUSTRIAL CORPORATION

DRAWING NUMBER
SA-84-951



WARREN/SHERER PP # 31C10-325

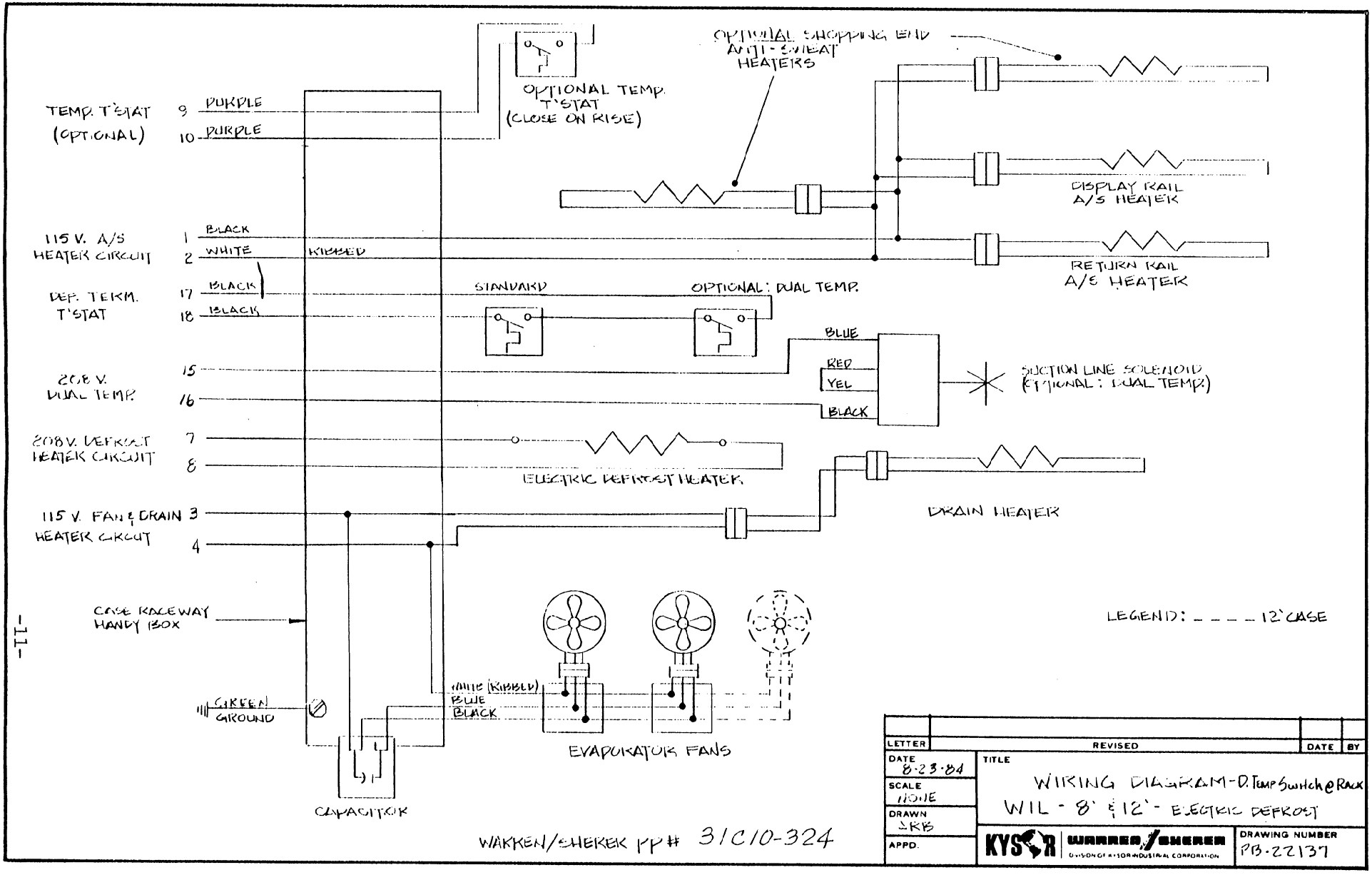
LETTER	REVISED	DATE	BY

DATE 8-23-84
SCALE NONE
DRAWN JRB
APPD

TITLE
WIRING DIAGRAM - D. Temp Switch @ RACK
WIL - 8' & 12' - HOT GAS DEFROST

KYSOR | WARREN/SHERER DIVISION OF KYSOR INDUSTRIAL CORPORATION

DRAWING NUMBER PB-22136



WARREN/SHEREK PP# 31C10-324

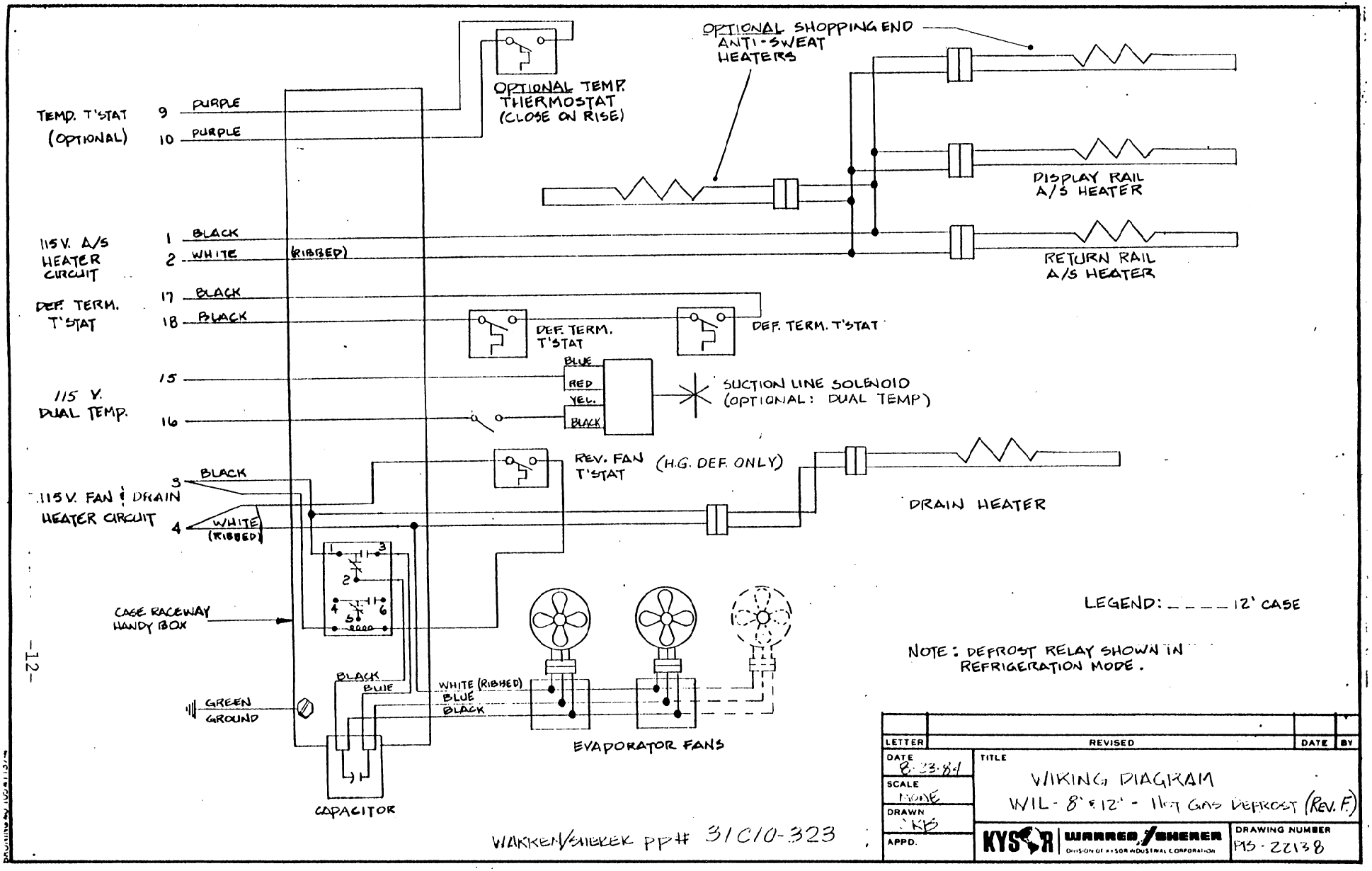
LETTER	REVISED	DATE	BY

DATE 8-23-84
SCALE NONE
DRAWN SRB
APPD.

TITLE
WIRING DIAGRAM-D. Temp Switch @ Rack
WIL - 8' & 12' - ELECTRIC DEFROST

KYSOR | WARREN/SHEREK | DIVISION OF KYSOR INDUSTRIAL CORPORATION

DRAWING NUMBER PB-22137



LEGEND: _ _ _ _ 12' CASE

NOTE: DEFROST RELAY SHOWN IN REFRIGERATION MODE.

WARREN/SHERER PP# 31C10-323

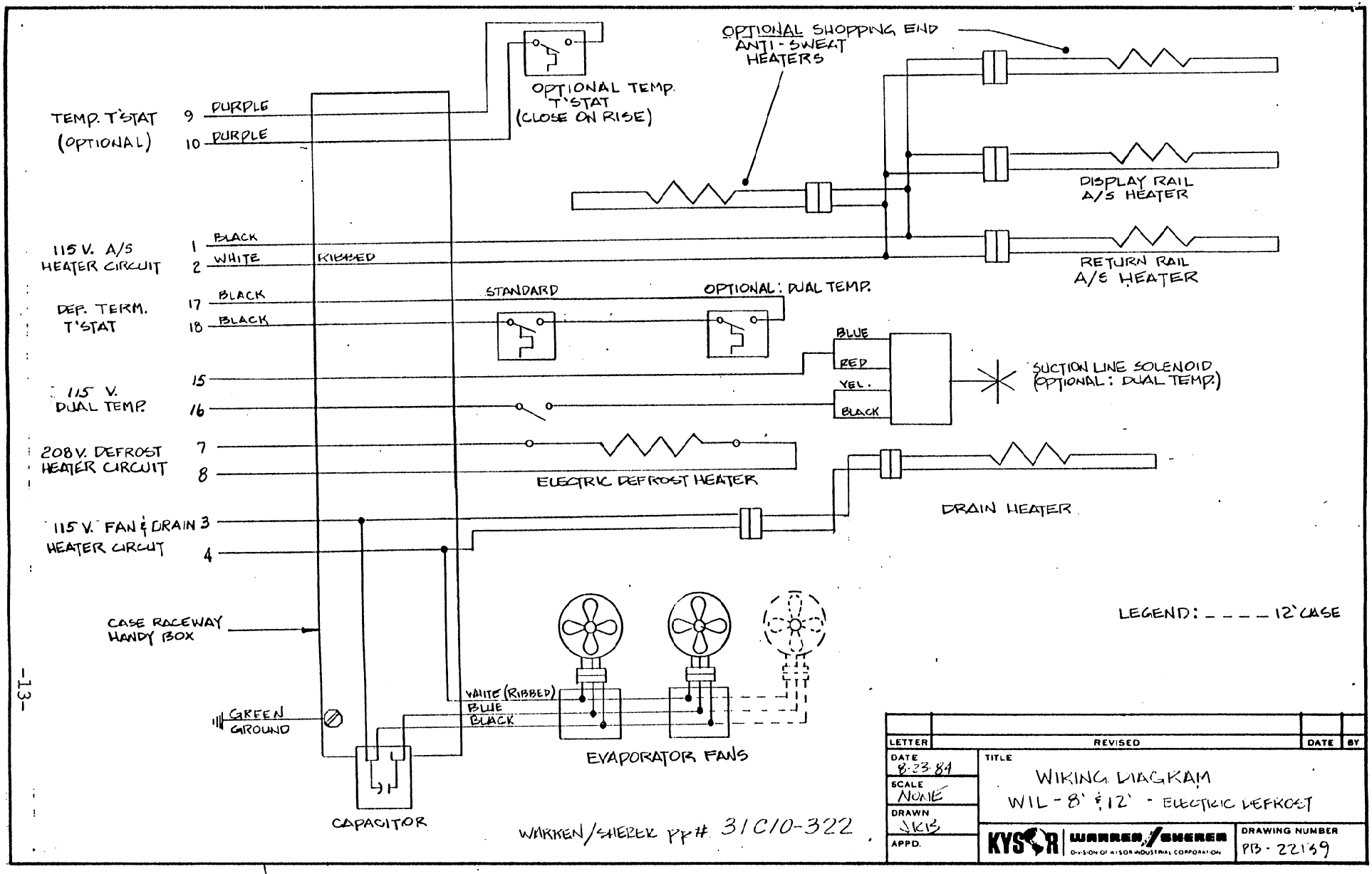
LETTER	REVISED	DATE	BY

DATE 8-23-84
SCALE NONE
DRAWN KB
APPD.

TITLE
WIRING DIAGRAM
WIL-8' & 12' - HOT GAS DEFROST (REV. F)

KYSOR | WARREN/SHERER DIVISION OF KYSOR INDUSTRIAL CORPORATION

DRAWING NUMBER P15-22138



WARREN/SHERER pp# 31C10-322

LETTER	REVISED	DATE	BY

DATE 8-23-84
SCALE NONE
DRAWN JKB
APPD.

TITLE
WIRING DIAGRAM
WIL-8' & 12' - ELECTRIC DEFROST

KYSOR | WARREN/SHERER DIVISION OF KYSOR INDUSTRIAL CORPORATION

DRAWING NUMBER PB-22139

1. Proper size refrigeration lines are essential to good refrigeration performance. Suction lines are more critical than liquid or discharge lines. Oversized suction lines may prevent good oil return to the compressor. Undersized lines can rob refrigeration capacity and increase operating cost. Consult the technical manual or legend sheet for proper line sizes.

2. Refrigeration lines in cases in line-ups can be reduced. However, the lines should be no smaller than the main trunk lines in at least 1/3 of the cases and no smaller than one size above the case lines to the last case. Reductions should not exceed one line size per case. It is preferred to bring the main trunk lines in at the center of line-up. Liquid lines on systems on hot gas defrost must be increased one line size above the main trunk line for the entire line-up. Individual feed lines should be at the bottom of the liquid header.

3. Do not run refrigeration lines from one system through cases on another system.

4. Use dry nitrogen in lines during the brazing to prevent scaling and oxidation.

5. Insulate suction lines from the cases to the compressor with 3/4" wall thickness Armaflex or equal on low temp cases to provide maximum of 65° sub-cooled gas back to the compressor and prevent condensation in exposed areas. Insulate suction lines on medium temp cases with 1/2" thick insulation in exposed areas to prevent condensate drippage.

6. Suction and liquid lines should never be taped or soldered together. Adequate heat exchanger is provided in the case.

7. Refrigeration lines should never be placed in the ground unless they are protected against moisture and electrolysis attack.

8. Always slope suction lines down toward the compressor, 1/2" each 10'. Do not leave dips in the line that would trap oil.

9. Provide "P" traps at the bottom of suction line risors, 4' or longer. Use a double "P" trap for each 20' of risors. "P" traps should be the same size as the horizontal line. Consult the technical manual or legend sheet for proper size risors.

10. Use long radius ells and avoid 45° ells.

11. Provide expansion loops in suction lines on systems on hot gas defrost. An expansion loop is required for each 100' of straight run.

12. Strap and support tubing to prevent excessive line vibration and noise.

13. Brazing of copper to copper should be with a minimum of 10% silver. Copper to brass or copper to steel should be with 45% silver.

14. Avoid the use of "bull head" tees in suction lines. An example is where suction gas enters both ends of the tee and exits the center. This can cause a substantial increase in pressure drop in the suction lines.

15. When connecting more than one suction line to a main trunk line, connect each branch line with an inverted trap.