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DATE: 04/11/88
REVISED: 03/06/89

KYSOR//WARREN

The Leading Edge of Technology

INSTALLATION & OPERATION MANUAL

MODEL:

L5,L5F,L5A,L5FA,I5F
FROZEN FOOD ICE CREAM
(AIR DEFROST)

THIS REFRIGERATOR CONFORMS TO THE COMMERCIAL REFRIGERATOR MANUFACTURERS ASSOCIATION HEALTH AND SANITATION STANDARD.

KYSOR//WARREN

DIVISION OF KYSOR INDUSTRIAL CORPORATION

1600 INDUSTRIAL BLVD., CONYERS, GEORGIA 30207 / 404•483•5600
5201 TRANSPORT BLVD., COLUMBUS, GEORGIA 31907

INSTALLATION AND OPERATING INSTRUCTIONS

FOR

L5, L5F, L5A, L5FA, I5F

APPLICATION:

The Kysor//Warren multi-shelf self-service frozen food cases are designed to merchandise packaged frozen products. These cases should be installed and operated according to the instructions 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 degree F dry bulb temperature and 55% relative humidity (64 degree F wet bulb temperature).

MODEL	DESCRIPTION
L5	Five Deck Frozen Food Merchandiser (Low Front) (Electric or Hot Gas Defrost)
L5F	Five Deck Frozen Food Merchandiser (High Front) (Electric or Hot Gas Defrost)
L5A	Five Deck Frozen Food Merchandiser (Low Front) (Air Defrost)
L5FA	Five Deck Frozen Food Merchandiser (High Front) (Air Defrost)
I5F	Five Deck Ice Cream Merchandiser (High Front) (Electric or Hot Gas Defrost)

Rev.: 10/10/85
10/05/87
04/11/88
03/06/89

GENERAL

These display refrigerators 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 shipped loose in case 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 days following delivery. A claim must be filed with the carrier by the consignee for damages.

LOCATION

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

If cases are to be located along an outside uninsulated wall, provisions should be made to ventilate or heat the dead air space between wall and case. If cases are located back to back, or if the end of the case is adjacent to a wall or another fixture, the same provision for ventilation is necessary. (Minimum of 3" clearance required between cases and wall or other cases.)

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 line-up and are in the proper sequence.

THESE REFRIGERATORS ARE LINE UP AT THE FACTORY AND ARE NUMBERED. INSURE THEY ARE LINED UP IN THE FIELD IN THE SAME SEQUENCE NUMBER.

WASTE OUTLET

The L5(F)(A) cases are equipped with a 1" M-NPT waste outlet connection which terminates in the center of the refrigerator below the insulated bottom. A water seal is provided and is shipped loose for field installation. Access to the drains are by removing the center deck pan and the case front panel.

INSTALLING DRIP PIPE

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

1. Never use a double water seal.

2. Never use a pipe smaller than the size pipe or water seal supplied with the equipment.

3. Always provide as much 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 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 TURNED OFF AND ALL ELECTRICAL IS OFF BEFORE WASHING YOUR REFRIGERATOR.

HONEYCOMB

The honeycomb material located in the discharge air nozzle is fragile and must be handled with care. The honeycomb should be inspected and cleaned after each six months of service.

Dirty or plugged honeycombs can easily be detected by use of a Dwyer #460 Air Meter.

AIR VELOCITIES

In order to measure case air velocities, a Dwyer 460 Air Meter should be used. All velocity readings should be taken approximately one hour after defrost.

Refrigerated Jet: 650 to 700 fpm
Guard Jet: 500 to 560 fpm
Ambient Jet: 450 to 500 fpm

BALLAST

Ballasts for lights are located in the canopy. The canopy panel is held in place with sheet metal screws and must be removed to service the ballasts.

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 or over the front edge of adjustable shelves. In doing so, you will seriously affect the performance which will result in higher product temperatures and increase operating costs.

DRAFTS

Drafts passing in front of the freezer must be eliminated or operation will be seriously affected. Do not allow air-conditioning grilles, electric fans, open doors or windows, etc. to create air currents past the cabinet in excess of 50 fpm.

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 panel is properly secured into position. This is an approved method by the Underwriters' Laboratories; however, wiring must be run in accordance with local and national electrical codes.

ELECTRICAL CONNECTIONS

All field connections are made in the electrical raceway.

Make sure that proper voltage is supplied to your refrigerator. Check refrigerator nameplate for the required voltage for fans, anti-sweat heaters, lights, and defrost heaters. ALL REFRIGERATORS MUST BE GROUNDED.

Fan motors 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 certain of the anti-sweat heaters.

On electric defrost models, the defrost heater amperages of all cases on defrost circuit should be added together, and if their rating exceeds 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 refrigerator 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.

Access to the fans in the refrigerated circuit is obtained by removing the deck pans in the lower display area. The guard circuit fans are accessible by removing the lower front panel. The ambient fans can be serviced from the exterior top of each cabinet.

ANTI-SWEAT HEATERS

These heaters are placed in the fixture to eliminate sweat forming on certain areas of fixture.

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 the condensing unit, estimate suction line loss at 2 PSIG.) Convert coil suction pressure to temperature. The difference between coil temperature and 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 1/4 turn between adjustments and allow 10 minutes or more between adjustments. Superheat should be set to 6-8 degree F.

REFRIGERATION LINES

The refrigeration lines are located under the center bottom deck pans in the refrigerated circuit. A refrigeration outlet is provided in the front right hand end of the cases. Make sure all refrigeration lines lie as close to the refrigerator bottom so as not to obstruct the air pattern or interfere with the fans.

When the refrigerant lines interconnecting several cases on the same system are routed in the guard air plenum, the suction lines must be insulated. See the section on "Recommended Piping Practices" for additional details on piping practices.

These 8' and 12' refrigerators 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 BOTTOM AND INSULATION. USE A HEAT SHIELD WHEN WELDING NEAR THE BOTTOM OF THE CASES.

REFRIGERANT

R-502 expansion valves are standard. If another 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 compressor.

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 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 SYSTEMS

Please read carefully before placing system into operation. After laying refrigerant lines, they should be blown out before making final connection at fixture or condensing unit. Use dry nitrogen to prevent any foreign matter 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.

CONTROL DESCRIPTION

Air Defrost Models - L5(F)(A)

At a preset time, the defrost time clock stops the refrigeration to the case and energizes the defrost relay. This causes the rotation of the fan motors in the guard jet to reverse. The fans remain in this mode of operation until the coil temperature reaches 45 degree F. Each cabinet has a Therm-O-Disc (45 degree F) mounted on the top of the coil at the right hand end of the case. There is a removable panel for access.

When the Therm-O-Disc closes, the defrost is terminated. The case returns to the refrigeration mode, and the guard fans return to their original rotation.

Model	Defrost Period Frequency	Termination	Fail Safe Setting
L5(F)(A)	6	Therm-O-Disc (45 deg.F)	60 min.

Electric Defrost Models - L5(F)(A)

At a preset time, the defrost time clock stops the refrigeration to the case and energizes a defrost contactor located at the condensing unit. This action applies power to the defrost heaters in the case. All case fans run continuously in the same direction during defrost and refrigeration cycles. The defrost heaters remain energized until the defrost thermostat terminates the cycle. Each case is equipped with a Thermo Disc (55 degree F) for defrost termination. This control is mounted on top of the coil at the left hand end of the case. Also on the same location is a Thermal Safety Cut-Off (70 degree F) for each defrost heater. There is a removable panel for access.

Model	Defrost Period Frequency	Termination	Fail Safe Setting
L5(F)(A)	6	55 deg. F	30 min.

Hot Gas Defrost Models - L5(F)(A)

The L5(F)(A) cases for gas defrost are designed to be used on multi-compressor parallel compressor systems equipped for reverse cycle hot gas defrost. These cases are not intended for use on single compressor gas defrost units.

At a preset time, the defrost time clock stops the refrigeration to the case by de-energizing a valve in the suction line at the condensing unit and simultaneously opening a solenoid to feed discharge gas into the case suction line. All case fans run continuously, in the same direction, during defrost and refrigeration cycles. At the case, hot gas is diverted to the coil and the drain pan loop in a parallel manner. The condensed refrigerant then bypasses the expansion valve through a check valve and returns to the condensing unit. When the discharge air temperature reaches 60 degree F, the defrost is terminated and the case returns to the refrigeration cycle.

Each case is equipped with an adjustable thermostat for defrost termination. This control is located in the canopy at the left end with access from the top of the case. The sensing bulb is located in the refrigerated (inside) air stream with access through an opening in the upper back wall of the case.

Model	Defrost Period Frequency	Termination	Fail Safe Setting
L5(F)(A)	6	60 deg. F	30 min.

THERMOSTAT LOCATION

For convenience, the thermostat (if utilized) is located at the left end of the case in the canopy area. Adjustment access is from top of case. If the case is equipped with a defrost terminator, it will be located in the same area. Should the thermostat have to be replaced, remove the canopy for access.

Chart #1

Electrical Ratings

Model		Fan (Amps)	Anti-Cond 115V (Amps)	Lights (Amps)	Defrost Heater 208/60/3 (Amps)
L5	4	2.4	2.8	1.6	9.6*
L5A	4	2.1	2.8	1.6	Air
L5(F)	6	4.2	3.9	1.6	21.6*
L5(F)	8	4.8	5.6	2.1	13.6
L5(F)	12	7.2	8.6	4.2	20.4
L5(F)A	6	3.5	3.9	1.6	Air
L5(F)A	8	4.1	5.6	2.1	Air
L5(F)A	12	6.2	8.6	4.2	Air
L5(F)	8	4.8	5.6	2.1	Hot Gas
L5(F)	12	7.2	8.6	4.2	Hot Gas
I5F	8	4.8	6.0	2.1	17.6
I5F	12	7.2	9.3	4.2	26.3

*208/60/1

Chart #2

Recommended Control Settings

Model	Refrigerant & Application	LP Control Cut-Out	LP Control Cut-In	ERP Valve	Thermostat Disch. Air Temp. Cut-Out	Thermostat Disch. Air Temp. Cut-In
L5(F)(A)	R-502 Frozen Food	4 psig	10 psig	14-16	-5 dg.F	0 dg.F
I5F	R-502 Ice Cream	1 psig	8 psig	N/A	-22 dg.F	-16 dg.F

Note: Pressure control settings are for safety only. A thermostat should be used to control case temperature on single unit applications.

PARTS LIST

L5(F)(A)

Description	Part No.	Qty. 4	6	8	12
Temperature Control (Penn A19ABC-24)	8A11-027	1	1	1	1(Opt.)
Fan Motor	9A10-040	3	5	6	9
Fan Motor (Reversible) GE 5KPM51BL-190	9A10-039	1	2	2	3
Fan Blade (7",40dg.,CW)-Ref and Guard	9B10-044	3	5	6	9
Fan Blade (7",20dg.,CW)-Ambient	9B10-013	1	2	2	3
Fan Blade (7",31 dg.,CW)-Ref Jet "F" Model	9B10-042	-	3	4	6
Defrost Heater (2000W) Straight - FF	10K10-107	-	-	1	-
Defrost Heater (3000W) Straight - FF	10K10-098	-	-	-	1
Defrost Heater (2000W) Hairpin - FF	10K10-104	1	-	2	-
Defrost Heater (3000W) Hairpin - FF	10K10-106	-	-	-	2
Defrost Heater (4500W) Z-Type FF	10K10-114	-	1	-	-
Defrost Heater (2450W) Straight - IC	10K10-108	-	-	1	-
Defrost Heater (3675W) Straight - IC	10K10-100	-	-	-	1
Defrost Heater (2450W) Hairpin - IC	10K10-105	-	-	2	-
Defrost Heater (3675W) Hairpin - IC	10K10-099	-	-	-	2
Wireway Heater (60W, .5A)	10K12-053	-	-	1	-
Wireway Heater (90W, .8A)	10K12-054	-	-	-	1
Wireway Heater (30W, .3A)	10K12-058	1	-	-	-
Wireway Heater (45W, .4A)	10K12-060	-	1	-	-
Ballast Universal 490-S-LM-TC-P	10D10-027	1	1	-	-
Ballast GE 8G3732	10D10-036	-	-	1	2

PARTS LIST (CONT)

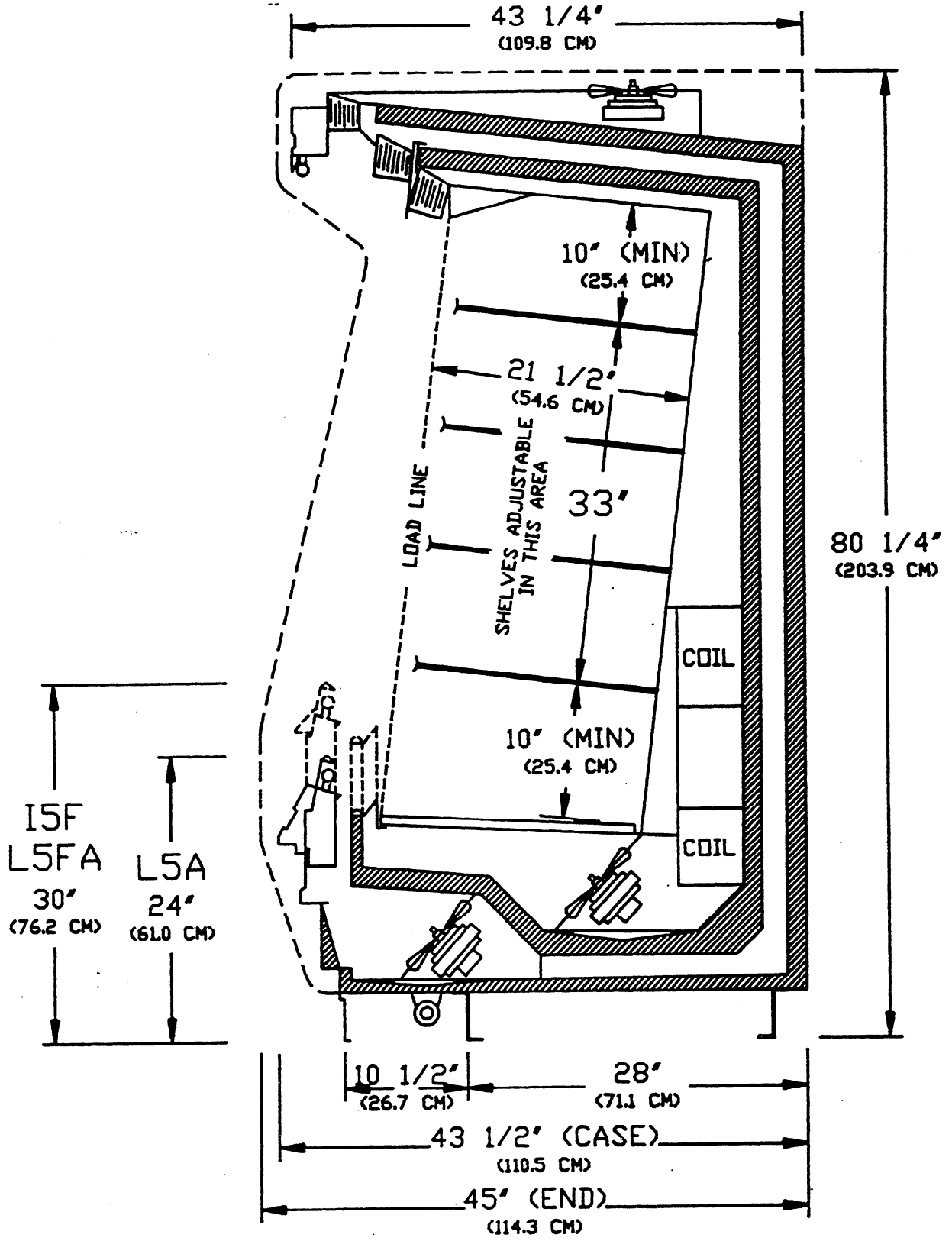
L5(F)(A)

Description	Part No.	Qty. 4	6	8	12
Bulb F96T12CWX HO	10A10-058	-	-	2	-
Bulb F72T12CWX HO	10A10-057	-	2	-	4
Bulb F48T12CWX HO	10A10-079	2	-	-	-
Lamp Shield	13A11-031	-	1	-	2
Lamp Shield	13A11-032	-	-	1	-
Lamp Shield	13A11-033	1	-	-	-
Expansion Valve (BFRE-A-ZP)	3A11-053	1	1	1	-
Expansion Valve (BFRE-C-ZP) - IC & 12' FF	3A20-037	-	-	1	1
Dial Thermometer	8D10-023	1	1	1	1
Rod Thermometer	8D10-026	1	1	1	1
Heat Exchanger	5C10-028	-	-	-	1
Heat Exchanger	5C10-029	-	-	1	-
Heat Exchanger	5C10-030	1	1	-	-
Lamp Holders	10B11-019	2	2	2	4
Lamp Holders	10B11-020	2	2	2	4
Defrost Relay (DPDT 12A 208V) - Air Defrost	8E11-054	1	1	1	1
Capacitor (2.5 MFD/370V)	10K14-057	1	-	-	-
Capacitor (5 MFD/370V)	10K14-059	-	1	1	-
Capacitor (7.5 MFD/370V)	10K14-058	-	-	-	1
Plastic Honeycomb	13A15-011	3	6	6	9
Second Jet Fan Guard	51U24-047	1	2	2	3

PARTS LIST (CONT)

L5(F)(A)

Description	Part No.	Qty. 4	6	8	12
Honeycomb LH Heater (2.2 OHM,157W,1.4A)	54U23-011	-	-	1	1
Honeycomb Center Heater (2.2 OHM,157W,1.4A)	54U23-011	-	-	-	1
Honeycomb RH Heater (2.2 OHM,157W,1.4A)	54U23-012	1	-	1	1
Honeycomb LH Heater (5 OHM,102W,.85A)	54U23-013	-	1	-	-
Honeycomb RH Heater (5 OHM,102W,.85A)	54U23-014	-	1	-	-
Nozzle Heater Assy (20 OHM,42W,.36A)	81C10-088	1	-	-	-
Nozzle Heater Assy (9 OHM,61W,.53A)	81C10-094	-	1	-	-
Nozzle Heater Assy (5 OHM,83W,.72A)	81C10-090	-	-	1	-
Nozzle Heater Assy (2.2 OHM,125W,1.1A)	81C11-083	-	-	-	1
Display Liner Top (32 OHM,26W,.23A)	54J10-011	1	-	-	-
Display Liner Top (16 OHM,34W,.30A)	54J11-027	-	1	-	-
Display Liner Top (9 OHM,40W,.38A)	81C10-093	-	-	1	-
Display Liner Top (3.3 OHM,84W,.73A)	81C11-085	-	-	-	1
Return Grill Heater (7 OHM,121W,1.05A)	81D10-022	-	-	1	-
Return Grill Heater (3 OHM,187W,1.62A)	81D11-027	-	-	-	1
Return Grill Heater (32 OHM,60W,.52A)	81D10-019	1	-	-	-
Return Grill Heater (16 OHM,82W,.68A)	81D10-023	-	1	-	-



LETTER	REVISION	DATE	BY

DATE: 12 NOV 86
SCALE: 1"=1'-0"
DRAWN BY: JESSE
SHEET:

LAYOUT FOR

(I)L5(F)A
CROSS SECTION

KYSOR | WARREN // SHERER
DIVISION OF KYSOR INDUSTRIAL CORP.

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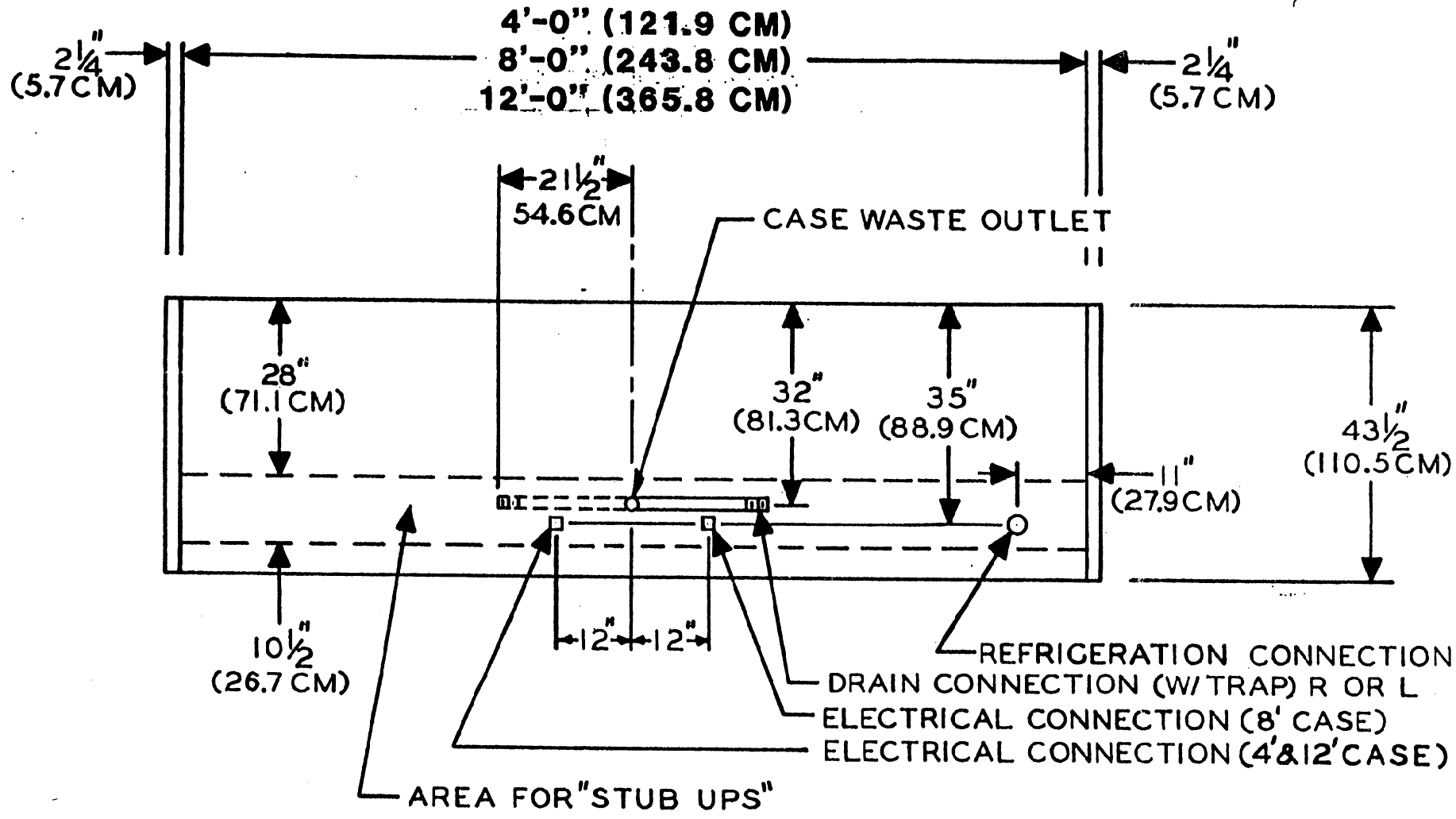


LETTER	REVISED	DATE	BY

DATE 2 FEB 82

SCALE 1/2" = 1'-0"

DRAWN JP

APPD.

TITLE

PLAN VIEW

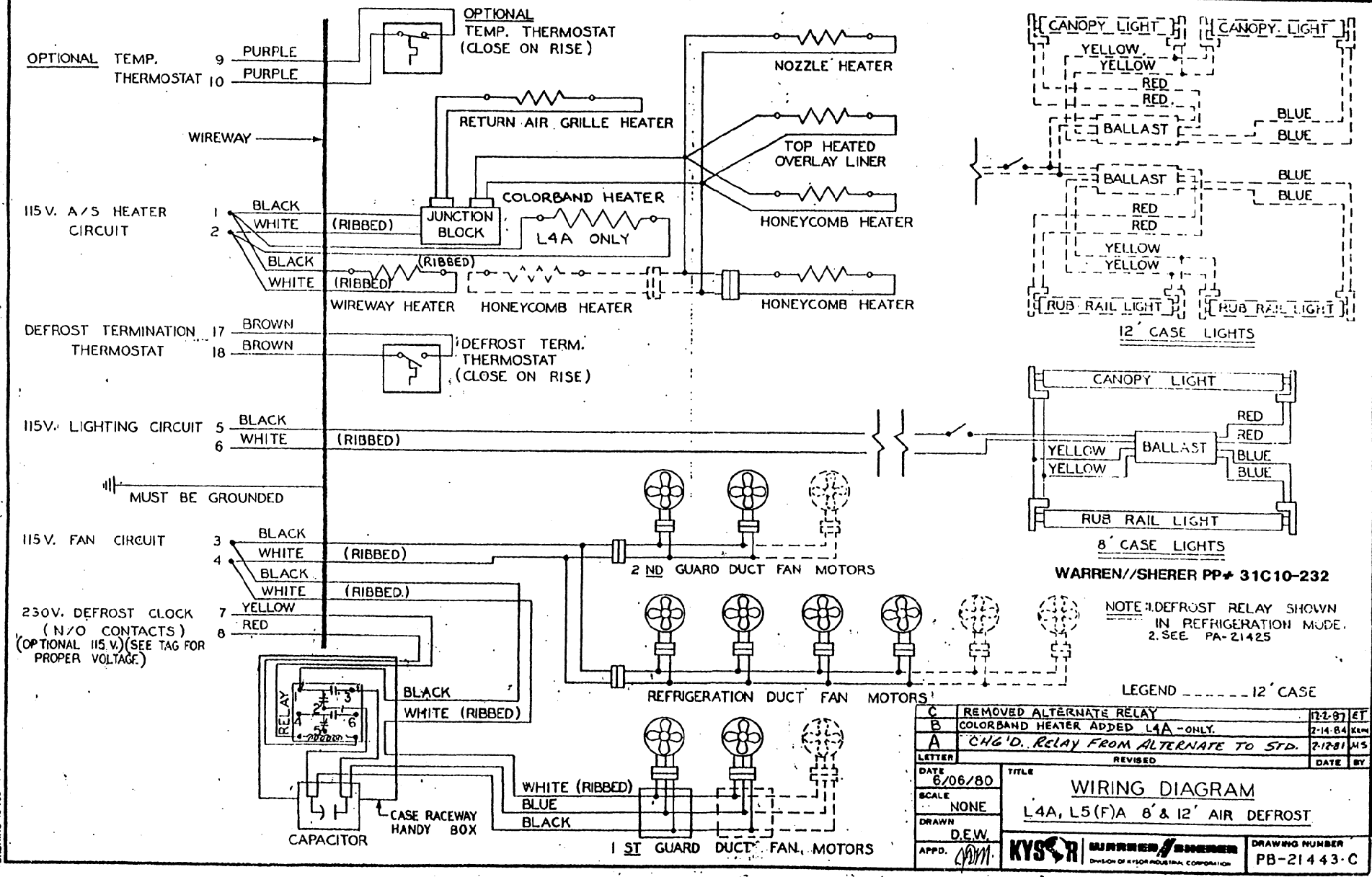
MODEL **(I)L5(F)A**

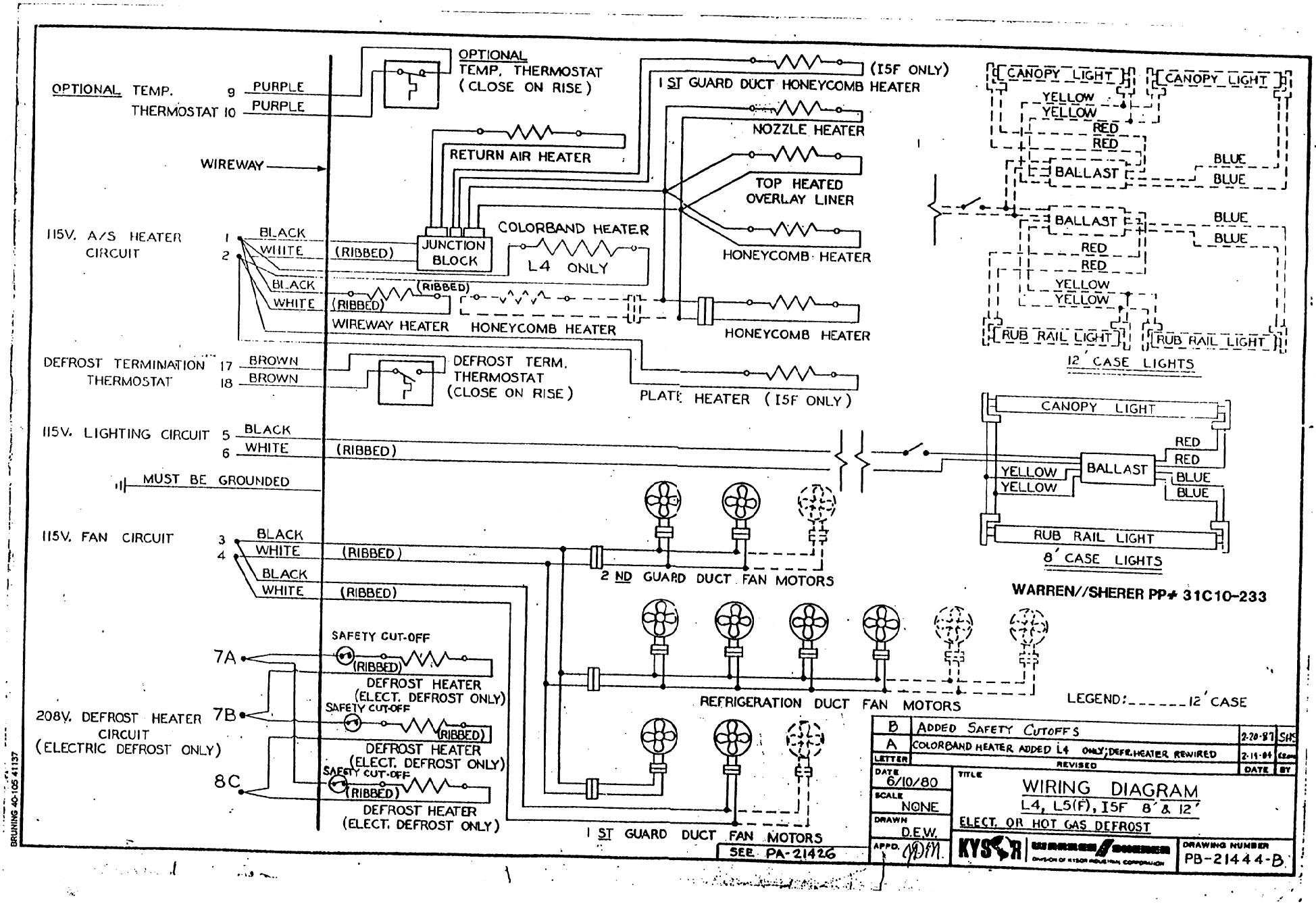
KYSOR | WARREN / SHERER

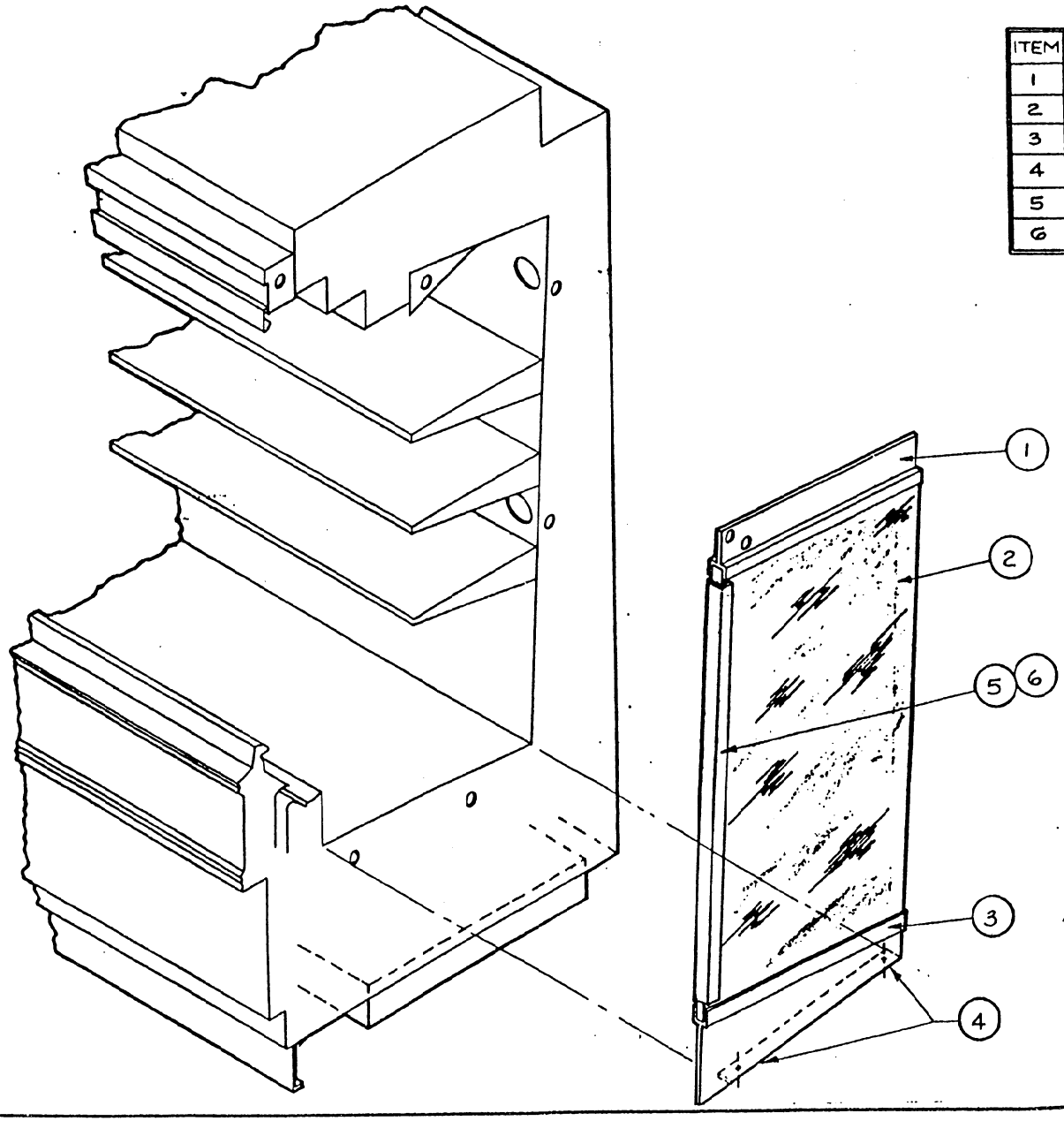
DIVISION OF KYSOR INDUSTRIAL CORPORATION

DRAWING NUMBER

SA-83-802


OPTIONAL TEMP. THERMOSTAT
9 PURPLE
10 PURPLE
OPTIONAL TEMP. THERMOSTAT (CLOSE ON RISE)
WIREWAY
NOZZLE HEATER
RETURN AIR GRILLE HEATER
TOP HEATED OVERLAY LINER
COLORBAND HEATER
HONEYCOMB HEATER
115 V. A/S HEATER CIRCUIT
1 BLACK
2 WHITE
(RIBBED)
JUNCTION BLOCK
L4A ONLY
BLACK
WHITE
(RIBBED)
WIREWAY HEATER
HONEYCOMB HEATER
HONEYCOMB HEATER
CANOPY LIGHT
CANOPY LIGHT
YELLOW
YELLOW
RED
RED
BLUE
BLUE
BALLAST
BALLAST
BLUE
BLUE
RED
RED
YELLOW
YELLOW
RUB RAIL LIGHT
RUB RAIL LIGHT
12' CASE LIGHTS
DEFROST TERMINATION THERMOSTAT
17 BROWN
18 BROWN
DEFROST TERM. THERMOSTAT (CLOSE ON RISE)
115V. LIGHTING CIRCUIT
5 BLACK
6 WHITE
(RIBBED)
CANOPY LIGHT
RED
RED
YELLOW
YELLOW
BALLAST
BLUE
BLUE
RUB RAIL LIGHT
8' CASE LIGHTS
MUST BE GROUNDED
115 V. FAN CIRCUIT
3 BLACK
4 WHITE
(RIBBED)
BLACK
WHITE
(RIBBED.)
2 ND GUARD DUCT FAN MOTORS
WARREN//SHERER PP# 31C10-232
230V. DEFROST CLOCK (N/O CONTACTS) (OPTIONAL 115 V.) (SEE TAG FOR PROPER VOLTAGE.)
7 YELLOW
8 RED
NOTE: 1. DEFROST RELAY SHOWN IN REFRIGERATION MODE.
2. SEE PA-21425
RELAY
BLACK
WHITE (RIBBED)
REFRIGERATION DUCT FAN MOTORS
LEGEND _____ 12' CASE
WHITE (RIBBED)
BLUE
BLACK
CAPACITOR
CASE RACEWAY HANDY BOX
1 ST GUARD DUCT FAN MOTORS
C REMOVED ALTERNATE RELAY 12-2-87 ET
B COLORBAND HEATER ADDED L4A-ONLY. 2-14-84 KLM
A CHG'D. RELAY FROM ALTERNATE TO STD. 7-17-81 MS
LETTER REVISED DATE BY
DATE 6/06/80
SCALE NONE
DRAWN D.E.W.
APPD.
TITLE
WIRING DIAGRAM
L4A, L5(F)A 8' & 12' AIR DEFROST
KYSOR WARREN/SHERER DIVISION OF KYSOR INDUSTRIAL CORPORATION
DRAWING NUMBER PB-21443-C
BRUNING 40-1105-41137


OPTIONAL TEMP. THERMOSTAT
9 PURPLE
10 PURPLE
OPTIONAL TEMP. THERMOSTAT (CLOSE ON RISE)
WIREWAY
115V. A/S HEATER CIRCUIT
1 BLACK
2 WHITE
(RIBBED)
JUNCTION BLOCK
COLORBAND HEATER
L4 ONLY
BLACK
WHITE
(RIBBED)
WIREWAY HEATER
HONEYCOMB HEATER
RETURN AIR HEATER
1 ST GUARD DUCT HONEYCOMB HEATER
(I5F ONLY)
NOZZLE HEATER
TOP HEATED OVERLAY LINER
HONEYCOMB HEATER
HONEYCOMB HEATER
DEFROST TERMINATION THERMOSTAT
17 BROWN
18 BROWN
DEFROST TERM. THERMOSTAT (CLOSE ON RISE)
PLATE HEATER (I5F ONLY)
115V. LIGHTING CIRCUIT
5 BLACK
6 WHITE
(RIBBED)
MUST BE GROUNDED
115V. FAN CIRCUIT
3 BLACK
4 WHITE
(RIBBED)
BLACK
WHITE
(RIBBED)
2 ND GUARD DUCT FAN MOTORS
208V. DEFROST HEATER CIRCUIT (ELECTRIC DEFROST ONLY)
7A
SAFETY CUT-OFF
(RIBBED)
DEFROST HEATER (ELECT. DEFROST ONLY)
7B
SAFETY CUT-OFF
(RIBBED)
DEFROST HEATER (ELECT. DEFROST ONLY)
8C
SAFETY CUT-OFF
(RIBBED)
DEFROST HEATER (ELECT. DEFROST ONLY)
1 ST GUARD DUCT FAN MOTORS
SEE PA-21426
REFRIGERATION DUCT FAN MOTORS
CANOPY LIGHT
CANOPY LIGHT
YELLOW
YELLOW
RED
RED
BALLAST
BLUE
BLUE
BALLAST
BLUE
BLUE
RED
RED
YELLOW
YELLOW
RUB RAIL LIGHT
RUB RAIL LIGHT
12' CASE LIGHTS
CANOPY LIGHT
RED
RED
YELLOW
YELLOW
BALLAST
BLUE
BLUE
RUB RAIL LIGHT
8' CASE LIGHTS
WARREN//SHERER PP# 31C10-233
LEGEND: 12' CASE
B ADDED SAFETY CUTOFFS 2-20-87 SHS
A COLORBAND HEATER ADDED L4 ONLY; DEFR. HEATER REWIRED 2-11-86
LETTER REVISED DATE BY
DATE 6/10/80
SCALE NONE
DRAWN D.E.W.
APPD.
TITLE
WIRING DIAGRAM
L4, L5(F), I5F 8' & 12'
ELECT. OR HOT GAS DEFROST
KYSOR
DRAWING NUMBER
PB-21444-B
BRUNING 40-105 41137



ITEM	PART NO.	DESCRIPTION	QTY
1	54V11-523	RETAINER-DIVIDER TOP WELD ASSY.	1
2	73F11-170	PLEXIGLASS DIVIDER	1
3	54V11-519	RETAINER-DIVIDER BOTTOM WELD ASSY.	1
4	21B12-17	SCREW #10-16 x 1/2"	2
5	62G15-34	CHANNEL DIVIDER TRIM	1
6	29A10-37	SEALANT-CLEAR	1

1. LOCATE (ITEM 3), BOTTOM DIVIDER. ON END OF CASE AS SHOWN AND SECURE WITH (ITEM 4), #10-16 x 1/2" SCREW.
2. ALIGN (ITEM 1), TOP DIVIDER, BETWEEN CASES AND SLIDE (ITEM 2), PLEXIGLASS DIVIDER, IN TOP AND BOTTOM DIVIDER CHANNELS. TIGHTEN CASES TOGETHER.
3. APPLY (ITEM 6), SEALANT, TO (ITEM 5), CHANNEL TRIM, AND PLACE ON FRONT EDGE OF PLEXIGLASS.

SUPERSEDES DWG. 0-165-00-00068
REFERENCE DWG. 73F11-171

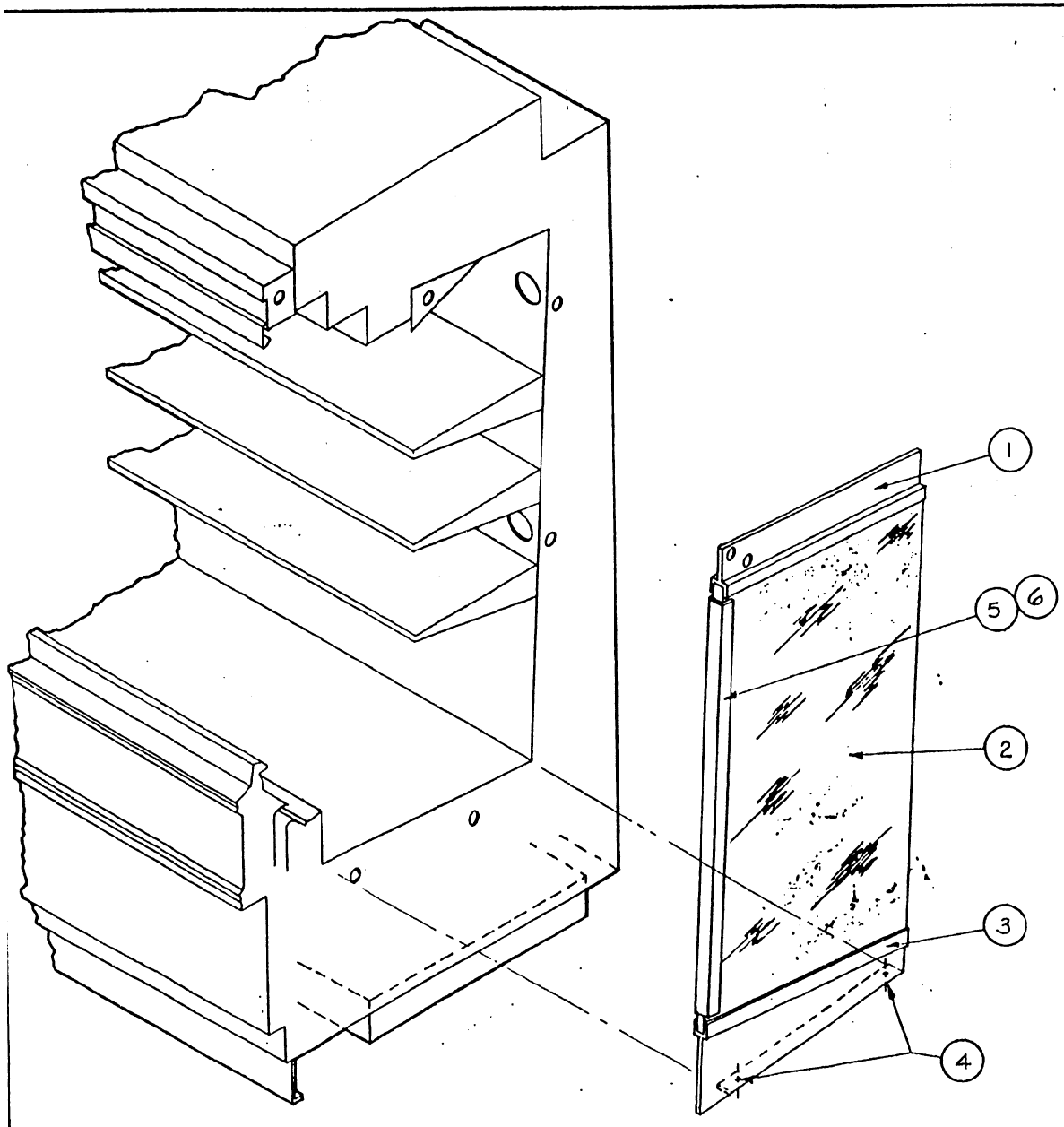
LETTER	REVISED	DATE
B	DELETE: 54V11-522; 54V11-520; ADD: 54V11-523(1); 54V11-519(1)	12-8-8
A	ITEM (4) WAS 3-028-09-0854 DESC. WAS: PLEXIGLASS DIVIDER KIT	2-3-86

DATE 2-27-85
SCALE NONE
DRAWN S. SHAW
APPD

TITLE
PLEXIGLASS DIVIDER ASS'Y.
L5F - L5FA

KYSOR | WARREN / SHERER
DIVISION OF KYSOR INDUSTRIAL CORPORATION

DRAWING NUMBER
PB-22194



ITEM	PART NO.	DESCRIPTION	QTY
1	54V11-523	RETAINER-DIVIDER TOP WELD ASSY.	1
2	73F11-168	PLEXIGLASS DIVIDER	1
3	54V11-518	RETAINER-DIVIDER BOTTOM WELD ASSY.	1
4	21B12-17	SCREW #10-16 x 1/2"	2
5	62G15-33	CHANNEL DIVIDER TRIM	1
6	29A10-37	SEALANT-CLEAR	1

1. LOCATE (ITEM 3), BOTTOM DIVIDER ON END OF CASE AS SHOWN AND SECURE WITH (ITEM 4), #10-16 x 1/2" SCREW.
2. ALIGN (ITEM 1), TOP DIVIDER, BETWEEN CASES AND SLIDE (ITEM 2), PLEXIGLASS DIVIDER, IN TOP AND BOTTOM DIVIDER CHANNELS. TIGHTEN CASES TOGETHER.
3. APPLY (ITEM 6), SEALANT, TO (ITEM 5), CHANNEL TRIM, AND PLACE ON FRONT EDGE OF PLEXIGLASS.

SUPERSEDES DWG. 0-165-00-0050
REFERENCE DWG. 73F11-169

LETTER	REVISED	DATE
B	DELETE: 54V11-522; 54V11-517; ADD: 54V11-523(1); 54V11-518(1)	12-8-87
A	ITEM 4 WAS 3-028-09-0854 DECAL WAS: PLEXIGLASS DIVIDER KIT	2-3-86

DATE 2-27-85
SCALE NONE
DRAWN S. SHAW
APPD

TITLE
PLEXIGLASS DIVIDER ASS'Y.
L5 - L5A

KYSOR | WARREN FRIGERER
DIVISION OF KYSOR INDUSTRIAL CORPORATION

DRAWING NUMBER
PB-22193

RECOMMENDED PIPING PRACTICES FOR KYSOR//WARREN CASES

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 proper 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 temperature cases to provide maximum of 65 Degree superheated gas back to the compressor and prevent condensation in exposed areas. Insulate suction lines on medium temperature cases with 1/2" thick insulation in exposed areas to prevent condensate droppage.

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

RECOMMENDED PIPING PRACTICES FOR WARREN/SHERER CASES (continued)

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

11. Provide expansion loops in suction lines on systems on hot gas defrost. See Engineering Bulletin #85-204-3 for detail.

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.

Revised: 7/25/80
7/25/85
3/14/89