FORM NUMBER: L-2
DATE: 1/25/80
REVISED: 8/20/80

WARREN//SHERER

INSTALLATION & OPERATION MANUAL

MODEL:

L5(F;A), I5F
FROZEN FOOD ICE CREAM
(AIR DEFROST)

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

GENERAL INFORMATION

APPLICATION: These multiple shelf freezers were designed to merchandise frozen food L5, L5F, L5A, L5FA and ice cream I5F. These freezers have been designed for use in air conditioned stores where temperatures and humidity are maintained at or below 75° dry bulb and not higher than 64° wet bulb (55° relative humidity).

MODEL	DESCRIPTION	SERIAL NUMBER DESIGNATION
L5	Five deck frozen food merchandiser (low front) (electric or hot gas defrost)	748
L5F	Five deck frozen food merchandisers (high front) (electric or hot gas defrost)	750
L5A	Five deck frozen food merchandiser (low front) (air defrost)	749-B
L5FA	Five deck frozen food merchandiser (high front) (air defrost)	751-B
I5F	Five deck ice cream merchandisers (high front) (electric or hot gas defrost)	752

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.

NOTE: Your equipment, when delivered, will have a sticker attached advising what must be done to report any damage.

CLEANING CASE: To insure minimum maintenance costs, cabinet should be thoroughly emptied and washed out every 3 months. (Shut off power to cabinet before cleaning). A mild soap and water solution is recommended for enameled surfaces of the case. Do not use cleaner containing abrasive ingredients which will scratch or dull finish. The waste outlet should be flushed with a bucket of water following each cleaning. CAUTION: Do not overflow waste outlet. The two outer honeycombs should be inspected and cleaned as necessary every six months. Also see Page 2 (honeycomb). Refer to health and sanitation instructions at the rear of this manual for more cleaning information.

DRAFTS: Drafts passing in front of 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.

WASTE OUTLET:

LOCATION: A 1" MPT drain tee is located at the front toe space at the center of the cabinet.

WATER SEAL: A water seal is furnished with each cabinet, and should be installed as near the cabinet as practical. CAUTION: DO NOT allow a second water seal to be installed in series with the cabinet waste outlet furnished or cabinet will not drain properly.

DRIP PIPE: Drip pipe should have 1" in 4 ft. fall to insure rapid defrost water runoff.

CLEANING: Access to the waste outlet can be gained by removing the center bottom pans. The outlet is behind the fan panel and under the coil cover.

CHECK: Before putting cabinet in operation, check to be sure water will run completely from drain pan to floor waste outlet.

FANS: Access to the top fans in the refrigerated circuit is obtained by removing the display bottom pans. The bottom fans in the guard circuit are accessible by removing the front panel. Second guard jet fans are accessible on top exterior of each cabinet.

FAN MOTORS: Fan motors require no oiling or maintenance of any kind and run continuously. (See wiring diagrams)

FAN BLADES: Fan blades are color coded. Be sure to replace blades with same color coding.

ENDS: Freezers are shipped with ends installed CAUTION: Do no pry on bottom of ends when moving cases. This will damage ends and also break seal between ends and freezer.

SHELVES: Shelves are adjustable vertically in one inch increments as shown on end views of pages 13 and 14.

HONEYCOMB: The honeycomb material located in the discharge air nozzles is fragile and care must be exercised to avoid damaging it. The honeycombs should be inspected and cleaned as needed after each 6 months of service.

IMPORTANT: Personnel stocking these cabinets should be cautioned not to bump honeycomb when placing packages on the top shelf. Excessive accumulative damage to the honeycomb could result in faulty operation of the cabinet requiring replacement of the honeycomb.

Dirty or plugged honeycombs can easily be detected by using a Dwyer #460 Air Meter. Abnormally high readings for non-refrigerated honeycombs indicate that the honeycombs are dirty and should be cleaned. Generally refrigerated honeycombs will not require cleaning.

CAUTION: Before removing the guard duct honeycomb for cleaning, remove the three (3) plastic snap-on buttons located along the bottom edge of the nozzle. Buttons will damage honeycomb if they are not removed before honeycomb is removed. Honeycomb sections should not be interchanged from nozzle to nozzle or cabinet to cabinet, but must be replaced in the exact location that it was removed. (Refer to Health and Sanitation instructions at the rear of this manual for correct procedure to remove honeycomb).

AIR VELOCITIES: A "Dwyer" model #460 Air Meter must be used to measure the velocities as given below. Velocities are to be taken after the defrost cycle and once the cabinet is down to temperature.

REFRIGERATED JET:	760 F.P.M.	Low Front Cabinets
	720 F.P.M.	High Front Cabinets
FIRST GUARD JET:	560 F.P.M.	High & Low Front Cabinets
SECOND GUARD JET:	500 F.P.M.	High & Low Front Cabinets

LIGHT BALLASTS: Light ballasts for lights are located in the canopy. The canopy panel is held in place with sheet metal screws and must be removed to replace the ballast.

MERCHANDISE: Allow freezer to operate 4 to 5 hours before loading cabinet with merchandise. Merchandise should be kept in back of package stops and load line on all shelves. Package should be kept from covering return inlet in bottom compartment or operation will be impaired.
CAUTION: In its condition as shipped and after proper installation, this equipment is not inherently dangerous. However, it is designed for connection to high voltage outlets and should, therefore, be installed only by a licensed electrician and in accordance with the instructions contained in this manual. A failure to follow these instructions might create an electrical hazard. In addition be sure to seal around openings and not leave any exposed metal edges with sharp burrs, etc.

ASSEMBLING FREEZER

JOINING FREEZERS: Two or more cases may be joined to form a continous lineup. Plexiglass dividers are required between cabinets when operated on separate condensing units, or systems on different defrost periods. Instructions for joining two or more cabinets will be found in the joining kit box and also in this manual.

LEVELING: Freezers must be located on a firmly based floor and carefully leveled within plus or minus 1/16" as checked at return ducts, using blocks or shims, if necessary. Check to be sure water will drain satisfactorily from cabinet before cabinet is put into operation.

CLEARANCE: 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 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.)

CONTROLS

ITEM #	CONTROL	LOCATION	ADJUSTMENT
35	Temp. Control	L.H. end of cabinet canopy (on top)	-10° cut-out (FF)
	Hi-Low Pressure	On condensing unit	High 315 # (F502) Low 30 # (cut-in) 0 # (cut-out)
	Water Regulating Valve	On condensing unit	Adjust valve to maintain 200-225# for F502

ITEM #	CONTROL,	LOCATION	ADJUSTMENT
21	Expansion valve (F502) (FF)	R.H. end of cabinet in coil compartment	*Adjust to 8° superheat
24	Oil Pressure	At condensing unit	Non-adjustable
34	Defrost termination Thermo-Disc	11" from R.H. end (behind 4" plastic cover)	Non-adjustable (set @ 45° ± 3)
48	Defrost Relay	Behind removable lower fan panel	None

*NOTE: To adjust superheat, place thermocouple under expansion valve bulb. Read suction 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 the expansion valve is hunting).

Do not adjust 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.

TEMPERATURE CONTROL: The temperature control is located at the left hand end of canopy and is factory set at the approximate setting required for each cabinet. (Check control setting by thermometer even though control is set approximately.)

DEFROST CONTROLS (AIR DEFROST L5A MODELS)

If the cabinet is an L5A model which is an air defrost type, the defrost cycle is accomplished as follows:

1. At a preset time the time clock opens the condensing unit circuit and energizes the defrost relay which reverses the direction of the first guard fans.

2. The condensing unit remains off until the coil temperature reaches the 45° setting. The thermo-disc closes activating the solenoid in the time clock which returns the cabinet to the refrigeration cycle. The relay coil is also deactivated which returns the first guard fans to its original rotation.

3. The defrost timer is equipped with a fail-safe device which will terminate the defrost cycle in the event of a malfunction of the defrost termination control. A fail safe setting of 60 min. is recommended. The defrost time will vary from 21 min. with 55% R.H. ambient to 48 min. with 15% R.H. ambient. This is due to the lower humidity air having less BTU per lb. of dry air (Enthalpy). It is therefore recommended that a fail safe of 60 min. be used to prevent the defrost from being terminated before the coil is free of frost.

4. Each cabinet has a thermo-disc which closes at 45° which is mounted on top of the coil (11" from the right hand end.) The thermo-discs of all cabinets using the same condensing unit must be wired in series.

DEFROST CONTROLS (ELECTRIC DEFROST L5 MODELS)

1. At a preset time the time clock opens the condensing unit circuit and energizes the defrost heaters.

2. The condensing unit remains off until the coil temperature reaches the 45° thermo-disc setting. The thermo-disc closes, activating the time clock solenoid which terminates the defrost heat and returns the cabinet to the refrigeration cycle.

3. Set the fail safe for 30 min. for electric defrosts.

4. Same as 4 under air defrost.

5. Defrost circuits are brought out of the cabinet and are connected as per the electrical diagram in the back of this manual.

DEFROST PERIODS: Under normal design conditions, (75° -55% R.H.), we recommend 4 defrost periods per day. In some instances, it may be possible to maintain desired temperature with 2 or 3 defrost per day. This can be realized, generally by reducing the number of defrost periods necessary as the humidity is reduced, (the lower the humidity, the fewer number of defrost periods are needed). We recommend the fewest number of defrosts possible commensurate with the temperature desired in the case and the ambient temperature and humidity of the store. CAUTION: When the number of defrost cycles are lower than the normal number (4 to 6) the fail safe settings must be adjusted to a longer setting (maximum of 60 minutes). (NOTE: If more than 4 defrost per day are required, check store conditions.

OPERATING INSTRUCTIONS FOR DEFROST TIMER SETTING

1. Place defrost pins in outer (24 hour) dial at 6-hour intervals. (55% or higher RH)

2. To set fail-safe (inside dial), push down and rotate pointer to desired setting.

3. To set time of day, grasp knob at center of inner dial and rotate it counter-clockwise. This will rotate the outer dial. Line up correct time of day on the outer dial with the time pointer. Rotate inner dial only. CAUTION: Install and operate in vertical position only and be sure all pins are tightened securely. Use screwdriver to tighten pins.

REFRIGERATION

REFRIGERATION CONNECTIONS: 1-1/8" suction and 3/8" liquid refrigeration lines terminate under the center bottom pans in the refrigerated circuit. These size lines can be extended for a distance of no more than 6 feet when connecting to the main. IMPORTANT: Seal around line after connections are made. (It is recommended that NITROGEN flow through the lines when making all sweat connections.)
DEHYDRATION: 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.

SUCTION LINE INSULATION: Insulate suction lines with at least 3/4" insulation from insulation per manufacturers recommendation.

REFRIGERANT: This freezer is operated on condensing units using R-502 refrigerant. The cabinet is furnished with R-502 expansion valve located at right hand end of the cabinet.

ELECTRICAL

All electrical connections are made in the end to end wireway. To obtain access to this wireway the front lower panel must be removed.

115-VOLT CIRCUITS: (Single Phase)

Three (3) 115 volt circuits terminate in the wireway. One circuit each provided for the lights, anti-sweat heaters and fans. The lighting circuit can be connected to a main lighting panel so lights can be shut off during closed hours. The fan motor circuit must be connected to a panel where store personnel can not shut off except in emergency. Anti-sweat heaters are to remain on at all times. Some anti-sweat heaters can be cycled by controllers. (Refer to wiring of controller at the rear of this manual).

208 VOLT CIRCUITS (For Air Defrost Models)

Two wires must be brought from the time clock terminals 3 & N (8145-20) and connected to the coil in relay which will reverse the first guard fan motors during the defrost.

TEMPERATURE AND DEFROST CONTROL

Leads from the temperature control (used for cycling condensing units) and leads from defrost control (termination defrost) and also brought into the lower wireway and are identified with tags. These must be wired and set per these instructions.

FROZEN FOOD ELECTRICAL REQUIREMENTS

	L5 - L5F		L5A - L5FA	
	WATTS	AMPS	WATTS	AMPS
-115/60/1				
Anti Sweat	510	4.7 (8')	510	4.7
Heaters	715	7.2 (12')	715	7.2
Fans	275	3.6 (8')	260	3.2
	410	5.4 (12')	375	4.8
Lights	270	2.6 (8')	270	2.6
	430	4.0 (12')	430	4.0
208/60/3				
Defrost	4900	13.6 (8')	--	--
Heaters	7350	20.4 (12')	--	--

ICE CREAM ELECTRICAL REQUIREMENTS (I5F)

	WATTS	AMPS.
Anti-Sweat Heaters	700	6.1 (8')
	1060	9.2 (12')
Fans	275	3.6 (8')
	410	5.4 (12')
Lights	270	2.4 (8')
	430	3.6 (12')
208/60/3	6000	16.6 (8')
Defrost Heaters	9000	24.9 (12')

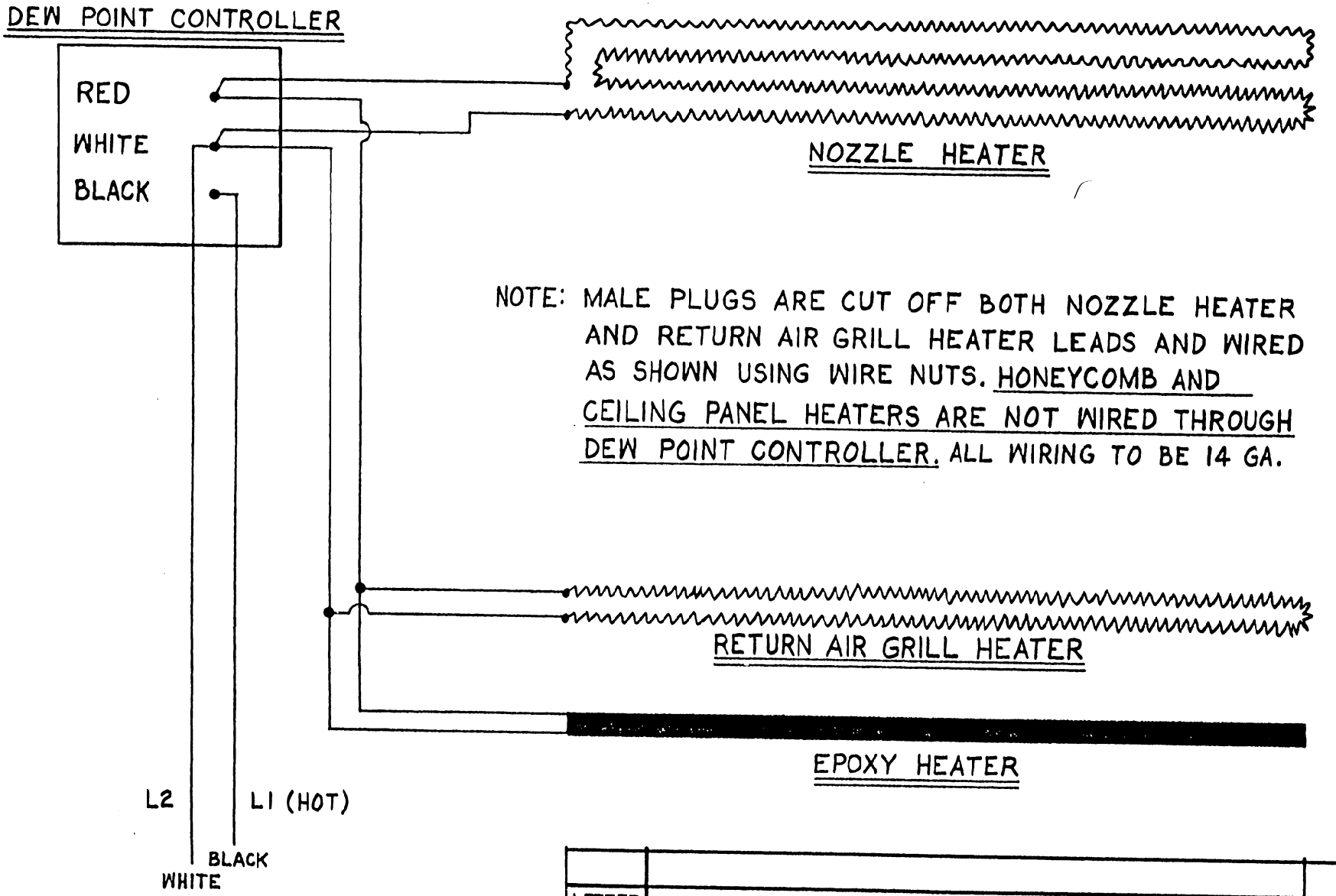
REPAIR PARTS FOR FROZEN FOOD & ICE CREAM MODELS WITH ELECTRIC DEFROST

ITEM NO.	PART NAME	PART #	DESCRIPTION
	CONTROLS		
34	Thermo-disc	3-014-02-0659	14T32-F45
35	Temperature Control (for cycling)	3-014-02-0804	PENN A19AAA-1
	DEFROST HEATERS (230 VOLT) L5 - L5F FROZEN FOOD		
8	Coil-Calrod	3-016-04-2305 Straight	(1) 2000 Watts (8 ft.)
		3-016-04-3204 Straight	(1) 3000 Watts (12 ft.)
		3-016-04-2404 Hairpin	(2) 2000 Watts (8 ft.)
		3-016-04-3105 Hairpin	(2) 3000 Watts (12 ft.)
	DEFROST HEATERS (230 VOLTS) I5F ICE CREAM		
8	Coil Calrod	3-016-04-2503 Straight	(1) 2450 Watts (8 ft.)
		3-016-04-3501 Straight	(1) 3675 Watts (12 ft.)
		3-016-04-2602 Hairpin	(2) 2450 Watts (8 ft.)
		3-016-04-3600 Hairpin	(2) 3675 Watts (12 ft.)
	REPAIR PARTS LIST FOR FROZEN FOOD & ICE CREAM MODELS L5 - L5F - L5A - L5FA - I5F		
	FANS		
*36	Motor (Morrill)	3-015-03-1606	*SPB-6EVI (ref.& 2nd guard duct)
36A	Motor	9A10-39	G.E. 5KPM51BL-19A Air Defrost only.
37	7" Refrigerated jet fan blades	3-015-01-1004	FV700CW-40S (color violet)
38	7" Second guard jet fan blades	3-015-01-0808	FV700CW-20S (color gold)
37	7" First guard jet fan blades	3-015-01-1004	FV700CW-40S (color violet)
	ANTI-SWEAT HEATERS (115 VOLTS)		
40	Nozzle	2-265-00-0055	83 Watts .72 amps. (8 ft.)
		2-265-00-0063	125 Watts 1.09 amps.(12 ft.)
12	Honeycomb LH Heater	1-216-00-0032	115 Watts 1.0 amps.
12	Honeycomb Center Heater	1-216-00-0032	115 Watts 1.0 amps.
13	Honeycomb RH heater	1-216-00-0032	115 Watts 1.0 amps.
15	Return grille heater	2-200-00-0095	121 Watts 1.05 amps. (8 ft.)
		2-200-00-0103	187 Watts 1.62 Amps. (12 ft.)
44	Return Duct Heater (Ice cream model only)	2-275-00-0376	98 Watts .85 amps. (12 ft.)
		2-275-00-0384	74 Watts .64 amps. (8 ft.)

* Substitute motors; Any G.E. or Redmond that is a unit bearing motor 115 volt, 6 watt output, and clockwise rotation.

ITEM NO.	PART NUMBER	PART #.	DESCRIPTION
46	Display Liner top Overlay Panel	2-240-00-0634	49 Watts .5 amps. (8 ft.)
		2-240-00-0642	88 Watts .8 amps. (12 ft.)
47	Wireway Heater	3-016-04-0101	60 Watts .5 amps. (8 ft.)
		3-016-04-0200	90 Watts .8 amps. (12 ft.)
	HONEYCOMB		
16	All Jets	3-019-05-0255	1/8" cell (Plastic)
	LIGHTS		
18	Ballast	3-016-01-4056	Univ. 480 XLHTCP or G. E. 8G3732
19	LAMPS	3-016-07-3805	F96/T12/CWX/HO 8 ft.
	General Electric, Sylvania, or Westinghouse	3-016-07-3201	F72/T12/CWX/HO 12 ft.
49	Lamp Shield	3-019-08-1151	TP472S w/end caps (12 ft.)
		3-019-08-1201	TP625S w/end cpas (8 ft.)
24	Oil Pressure Safety Switch	3-016-28-1309	PENN P45NCA-12
25	Thermometer	3-033-08-0502	Glass Stem
41	Second Jet Fan Guard	1-205-00-0050	Expanded Metal
30	Heat Exchanger	3-011-04-0502	B500XS (12 ft. F.F.)
		3-011-04-0403	B200XS (8 ft. F.F.)
		3-011-04-0502	B500XS (8 ft.& 12 ft. I.C.)
32	3" Plastic Plug Buttons (white)	3-025-11-0101	Refrigerated Comp't.
	4" Plastic Plug Buttons (white)	3-025-11-0200	Refrigerated Comp't.
33	Lamp Holders	3-016-06-1404	505x91 or 464
		3-016-06-1503	505x92 or 465
	RELAY AIR DEFROST MODEL		
48	Defrost Relay	8E11-38	Octal Base Relay
	Relay Base	8E11-37	Octal Relay Base
	Capacitor	10K14-59, 10K	370V. 5 MFD Capacitor (8')
		10K14-58	370V. 7.5MFD Capacitor (12')
	Alternate Defrost Relay	8E11-54	DPDT 208-240V coil
	ANTI-SWEAT HEATERS (115VOLT) ICE CREAM MODELS		
17	Honeycomb Heater	1-216-00-0016	83 Watt .72amps. (8ft.)
	(First Guard Duct)	1-216-00-0024	125 Watt 1.09 amps.(12ft.)

ITEM NO.	PART NAME	PART #	DESCRIPTION
	VALVES F.F.		
20	Expansion Valve (502)	3-009-01-1051	Sporlan GRE-1-ZP40 (8 ft.)
		3-009-01-1804	Sporlan GRE-1½ ZP40 (12 ft.)
	VALVES I.C.		
20	Expansion Valve (502)	3-009-01-1804	Sporlan GRE-1½ ZP40 (8 ft.)
		3-009-01-2703	Sprolan GRE-2 ZP40 (12 ft.)
**34	Hot Gas Defrost Models do not use the thermo-disc defrost termination, but a PENN. A19AAA-5 control.		



LETTER	REVISED	DATE	BY

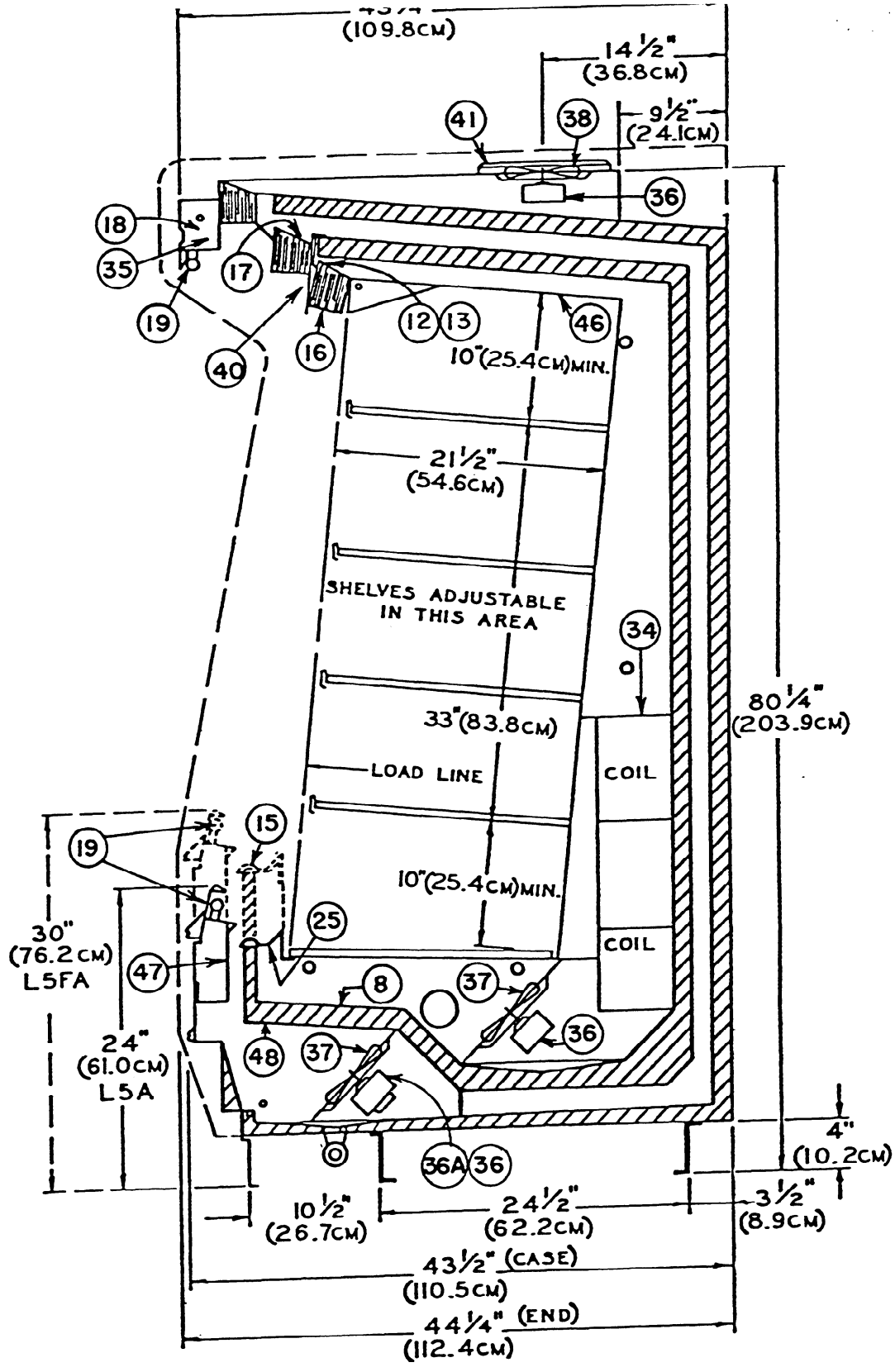
DATE 9-25-79
SCALE NONE
DRAWN D.E.W.
APPD. JPM

TITLE
WIRING DIAGRAM
DEW POINT CONTROLLER L4 & L5

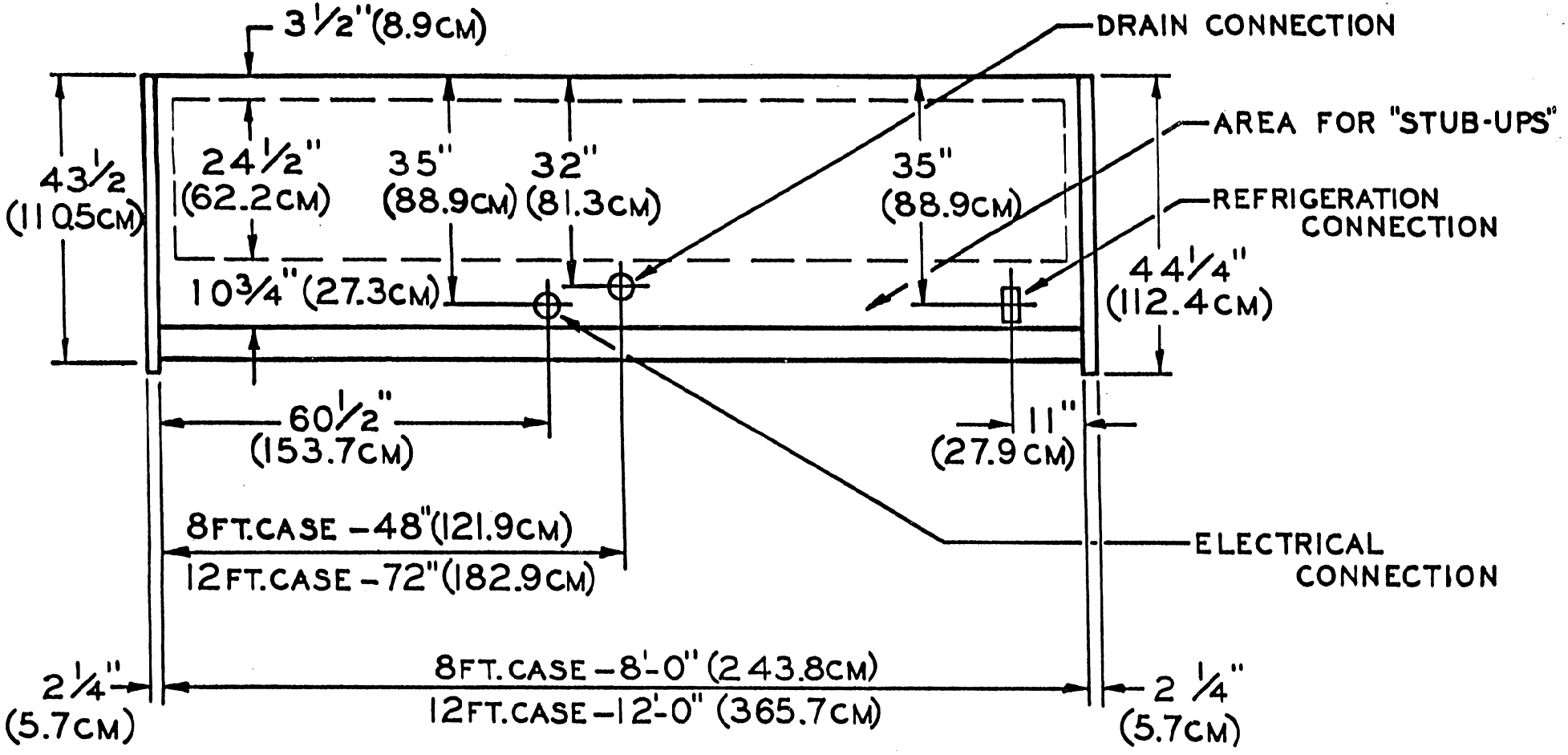
KYSOR | WARREN / SHERER
DIVISION OF KYSOR INDUSTRIAL CORPORATION

DRAWING NUMBER
0-164-00-0515

M79150
ECO # M79120



LETTER
DATE 2-2-78
SCALE 1/8" = 1"
DRAWN
APPD.
REVISED
DATE
TITLE
CROSS SECTION
MODEL L5(F)A
KYS
WARREN SHERER
DRAWING NUMBER
SB-78501



LETTER	REVISED	DATE	BY

DATE 2-2-78

SCALE 1/2" = 1'-0"

DRAWN

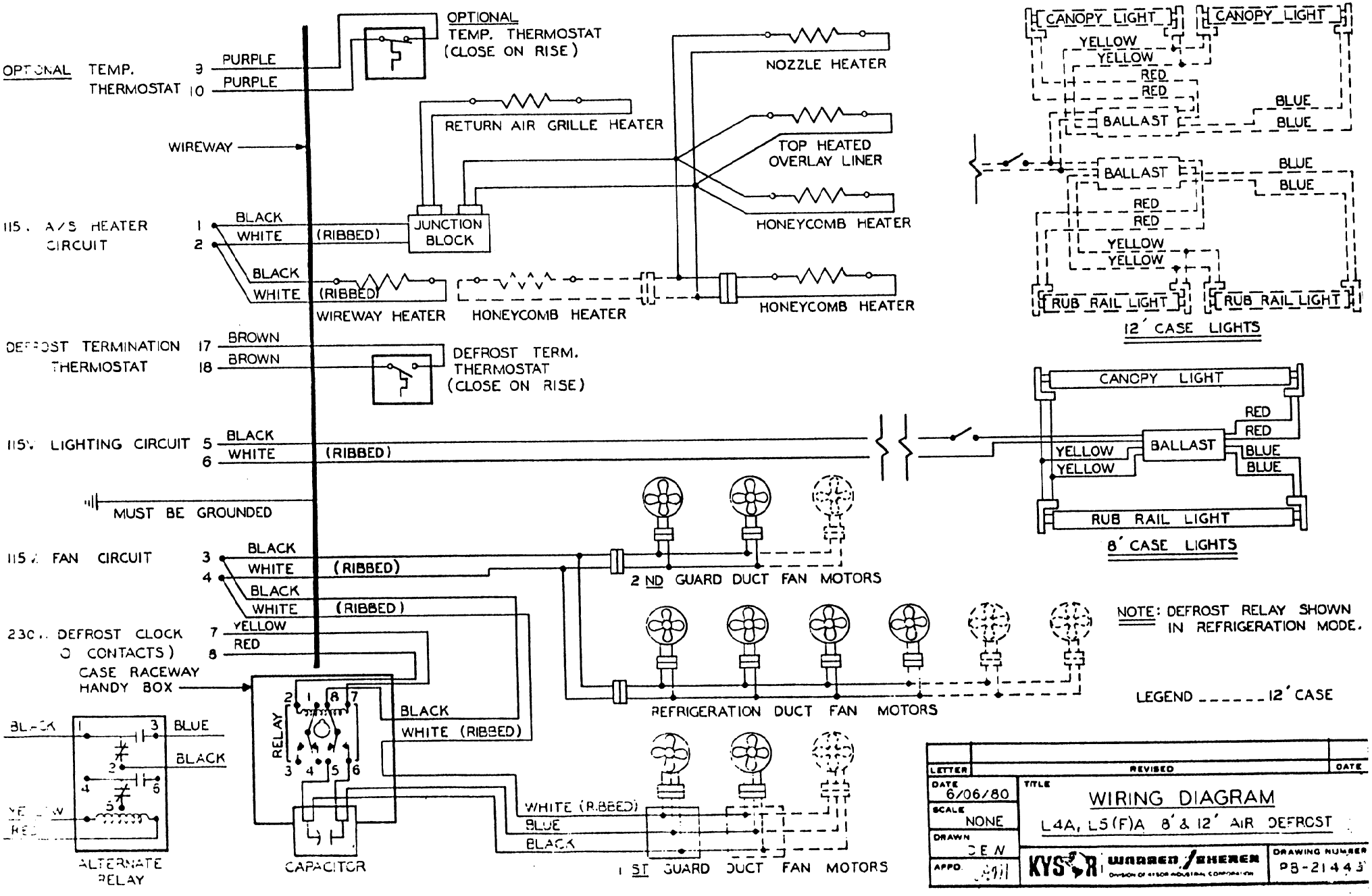
APPD.

TITLE

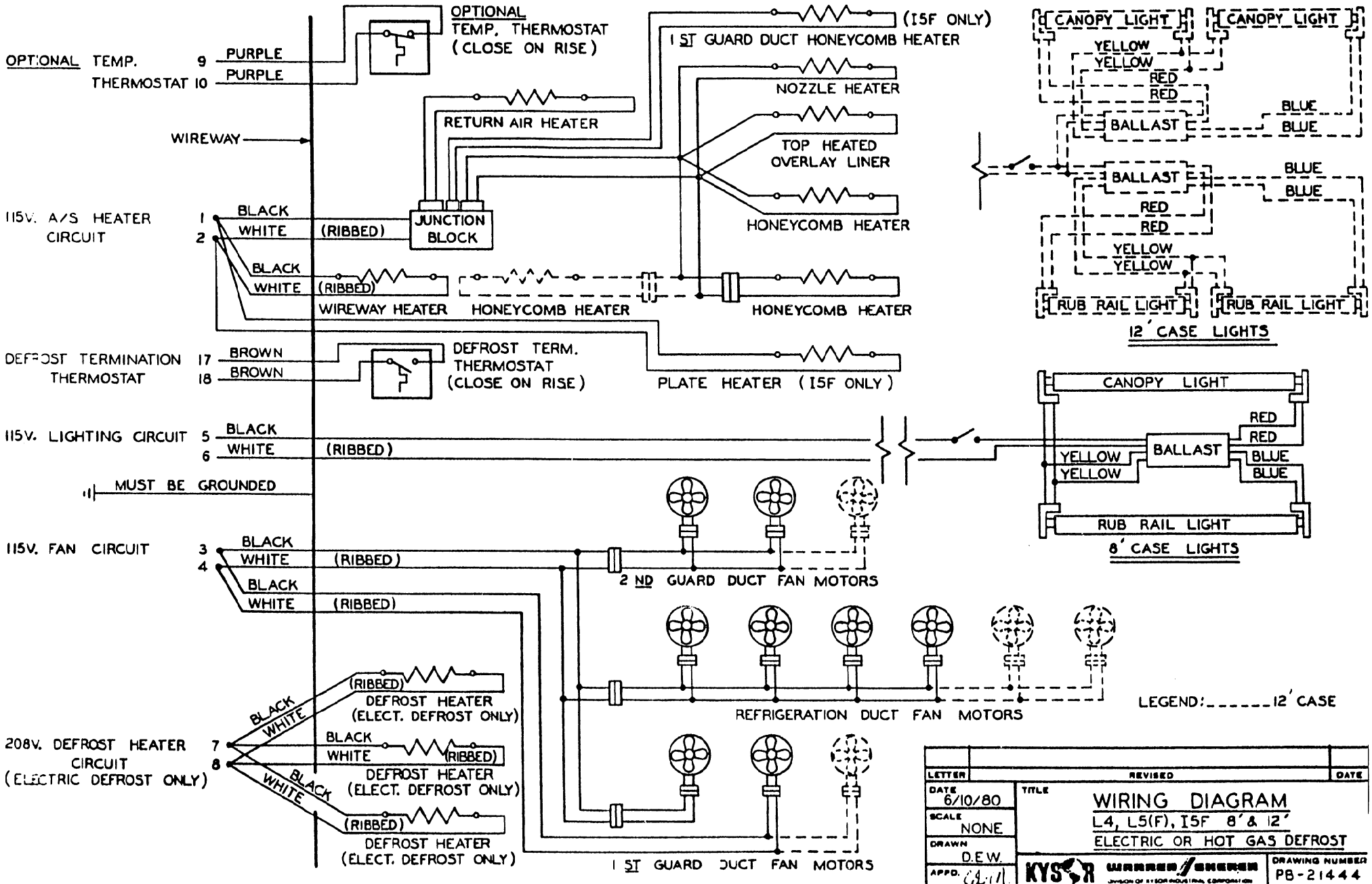
PLAN VIEW
MODEL L5(F)A

KYSOR | WARREN / SHERER
DIVISION OF KYSOR INDUSTRIAL CORPORATION

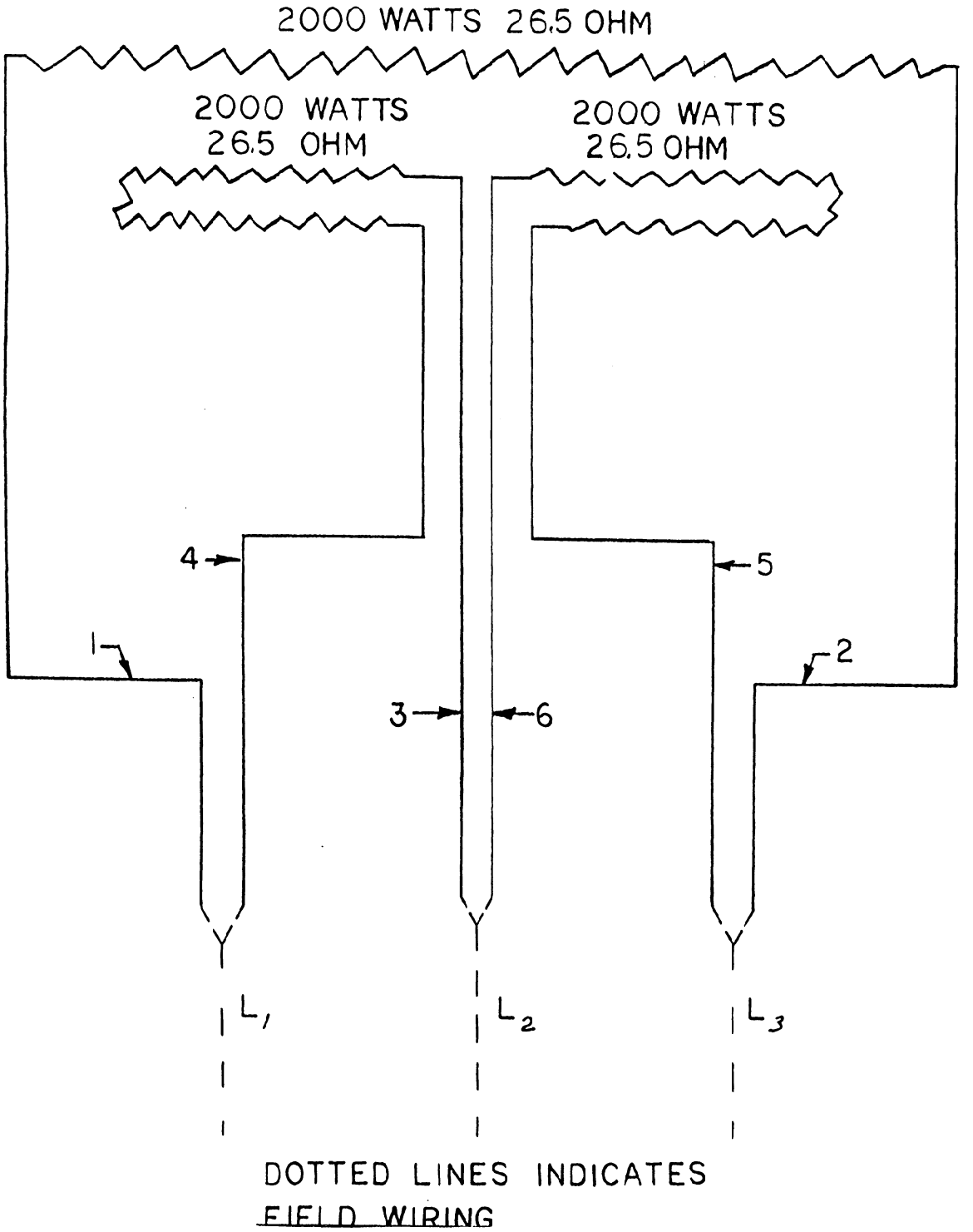
DRAWING NUMBER
SA-78507



LETTER	REVISED	DATE
DATE 6/06/80	TITLE WIRING DIAGRAM	
SCALE NONE	L4A, L5(F)A 8' & 12' AIR DEFROST	
DRAWN C E N	KYSOR WARREN / HENRER	DRAWING NUMBER PB-21443
APPD.		



LETTER	REVISED	DATE
DATE 6/10/80	TITLE: WIRING DIAGRAM L4, L5(F), I5F 8' & 12' ELECTRIC OR HOT GAS DEFROST	
SCALE NONE		
DRAWN D.E.W.		
APPD.	KYSOR WARREN ENGINEER	DRAWING NUMBER PB-21444

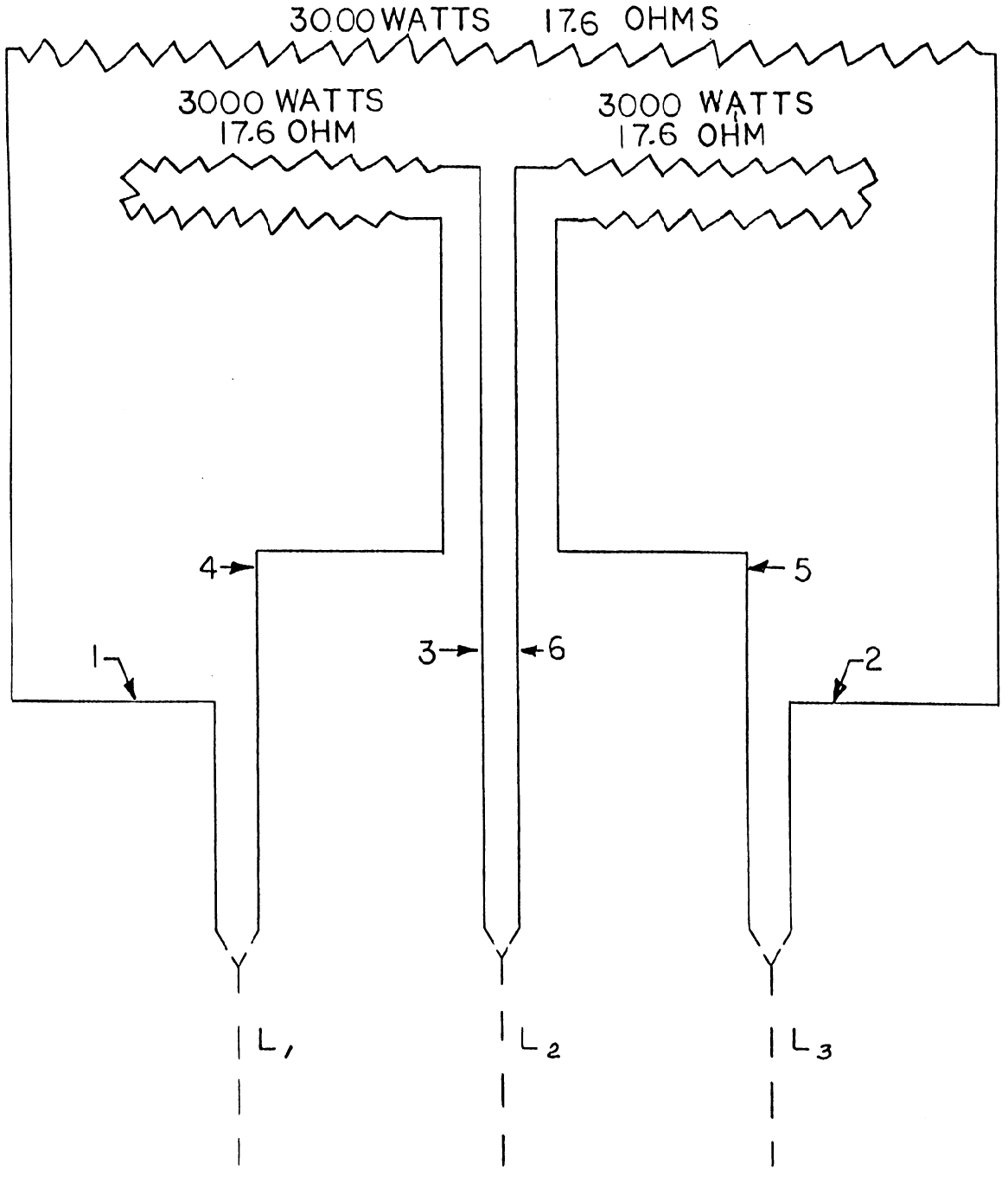


DOTTED LINES INDICATES
FIELD WIRING

3 PHASE
DEFROST HEATER CIRCUIT

LINE	208 VOLT	220 VOLT
L_1	13.6 AMP	14.4 AMP
L_2	13.6 AMP	144 AMP
L_3	13.6 AMP	14.4 AMP

L58

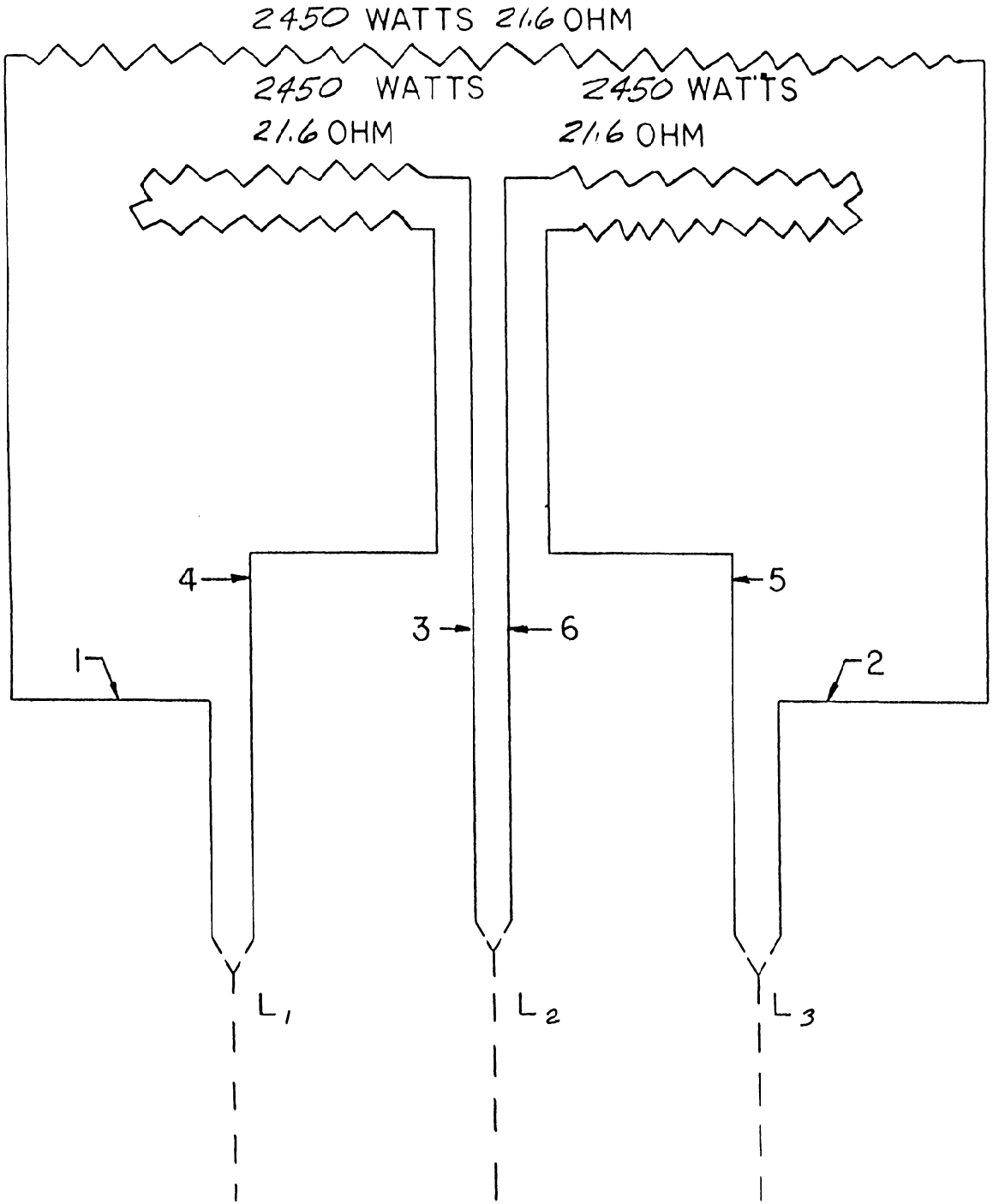


DOTTED LINES INDICATE
FIELD WIRING

3 PHASE
DEFROST HEATER CIRCUIT

LINE	208 VOLT	220 VOLT
L_1	20.4 AMP.	21.6 AMP
L_2	20.4 AMP	21.6 AMP
L_3	20.4 AMP	21.6 AMP

L5F12

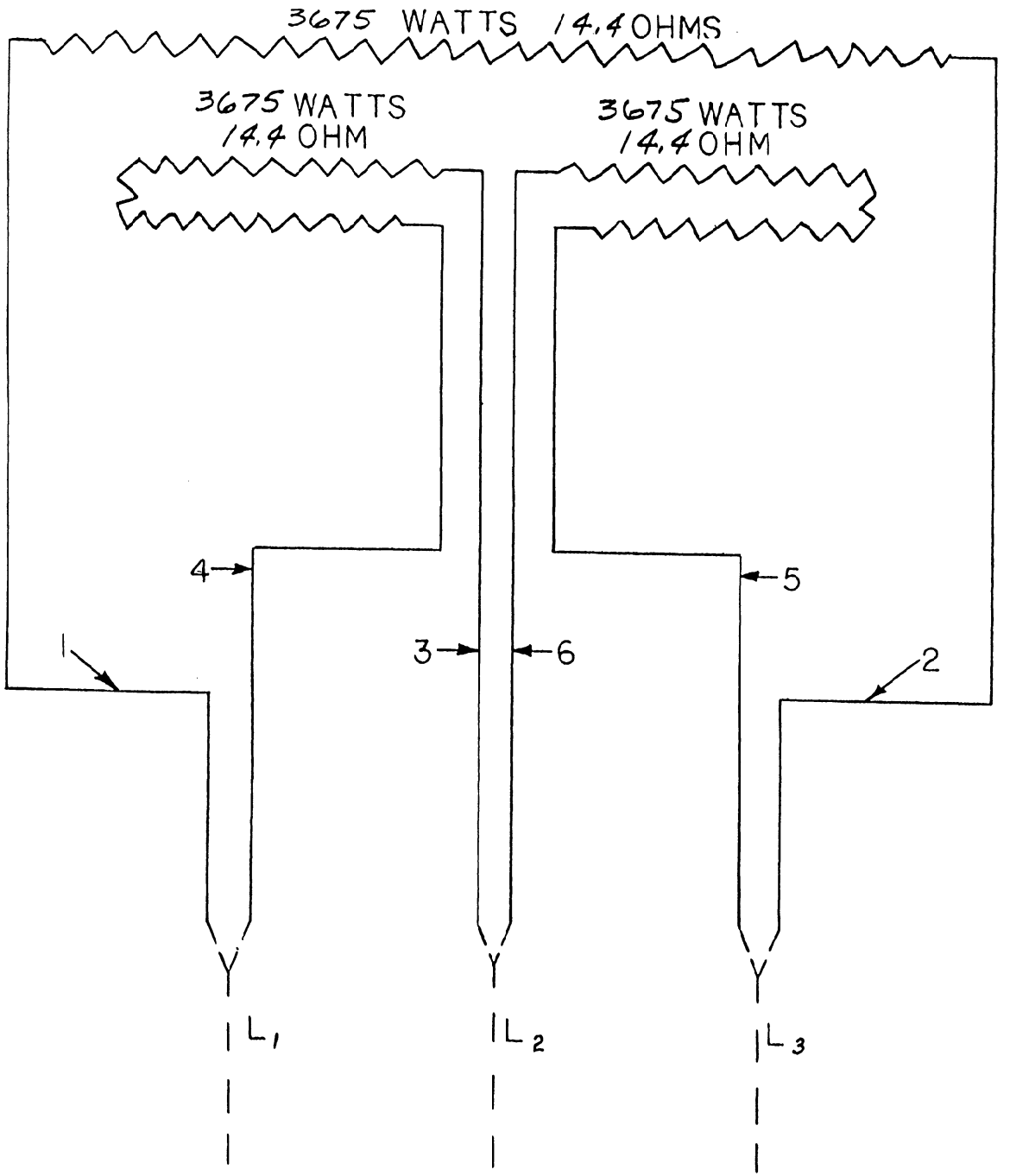


DOTTED LINES INDICATES
FIELD WIRING

3 PHASE
DEFROST HEATER CIRCUIT

LINE	208 VOLT	220 VOLT
L_1	16.6 AMP	17.6 AMP
L_2	16.6 AMP	17.6 AMP
L_3	16.6 AMP	17.6 AMP

15 F8



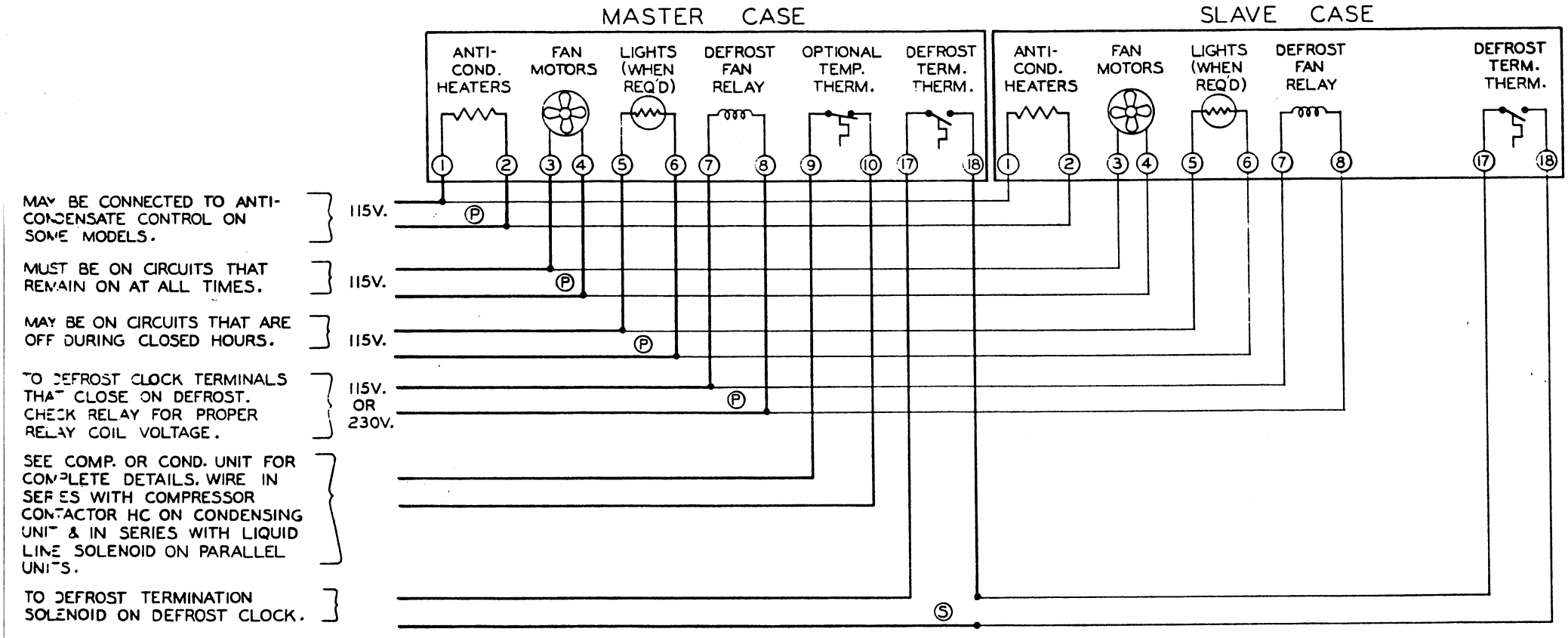
DOTTED LINES INDICATE FIELD WIRING

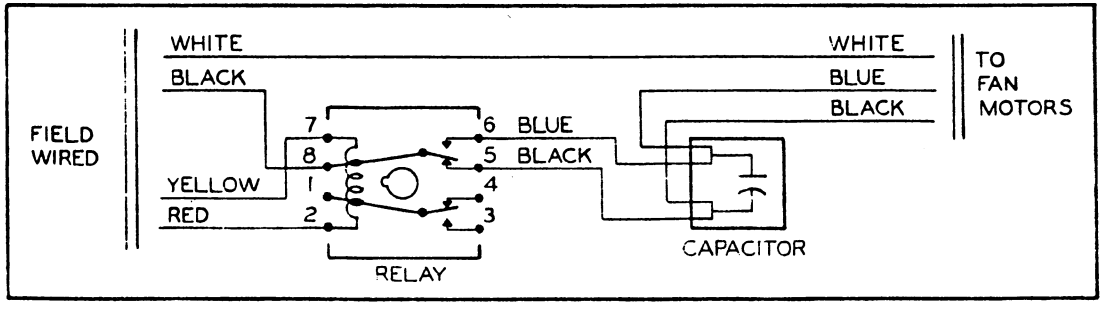
3 PHASE

DEFROST HEATER CIRCUIT

LINE	208 VOLT	220 VOLT
L_1	24.9 AMP	26.3 AMP
L_2	24.9 AMP	26.3 AMP
L_3	24.9 AMP	26.3 AMP

15F12





TYPICAL RELAY / CAPACITOR ASSEMBLY

(DEFROST RELAY SHOWN IN REFRIGRATION MODE)

NOTES: 1) OPTIONAL TEMPERATURE THERMOSTAT IS CLOSE ON RISE. ONE CONTROL REQUIRED PER LINE-UP.
2) DEFROST TERMINATION THERMOSTAT IS CLOSE ON RISE. ONE CONTROL PER CASE AND THEY MUST BE WIRED IN SERIES.

LEGEND - Ⓟ THESE LEADS ARE WIRED IN PARALLEL.
Ⓢ THESE LEADS ARE WIRED IN SERIES.

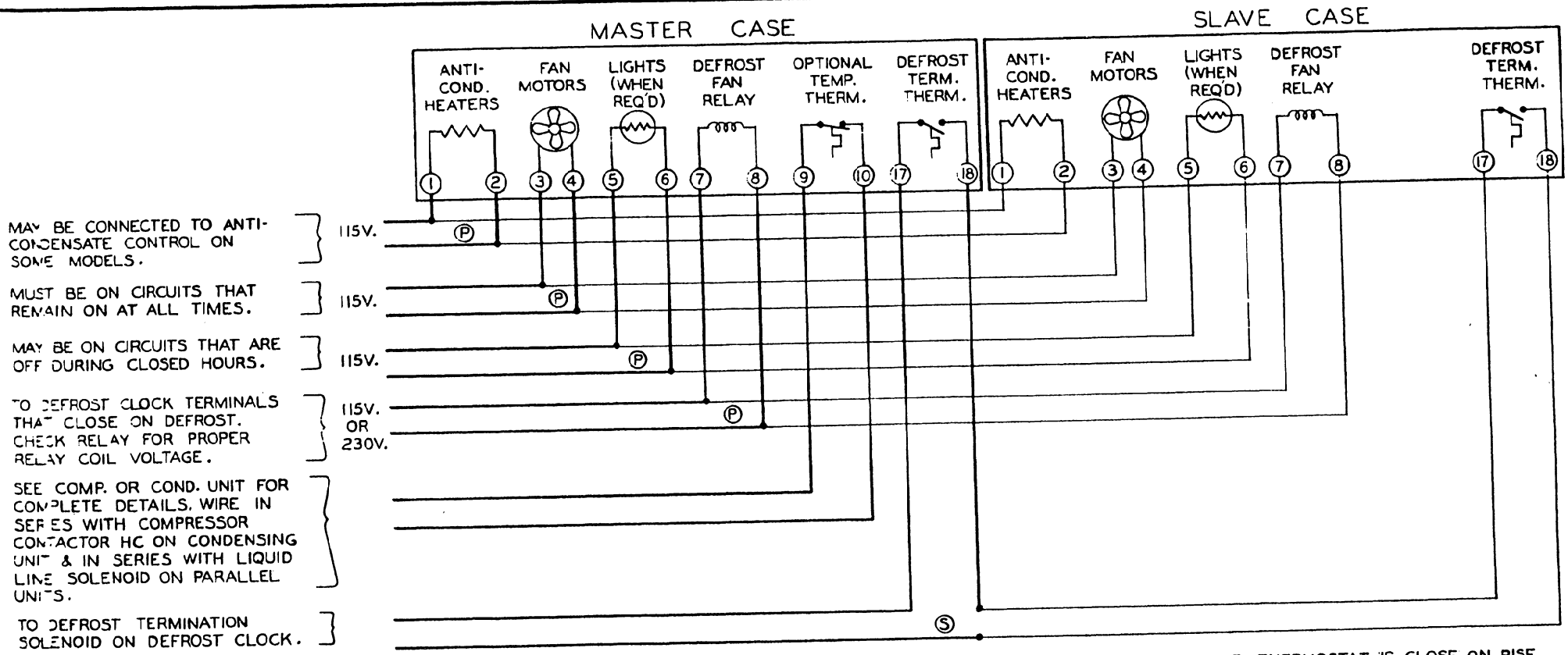
LETTER	REVISED	DATE

DATE 6/12/80
SCALE NONE
DRAWN DEW
APPD.

TITLE
TYPICAL AIR DEFROST FIELD WIRING
(FAN RELAY MOUNTED ON CASE)

KYSOR WARREN // SHERER
DIVISION OF KYSOR INDUSTRIAL CORPORATION

DRAWING NUM PB-21



NOTES: 1) OPTIONAL TEMPERATURE THERMOSTAT IS CLOSE ON RISE. ONE CONTROL REQUIRED PER LINE-UP.
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LEGEND - Ⓟ THESE LEADS ARE WIRED IN PARALLEL.
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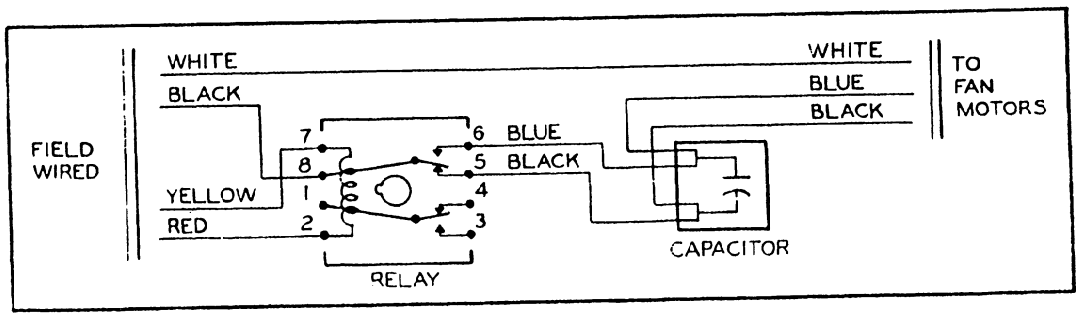
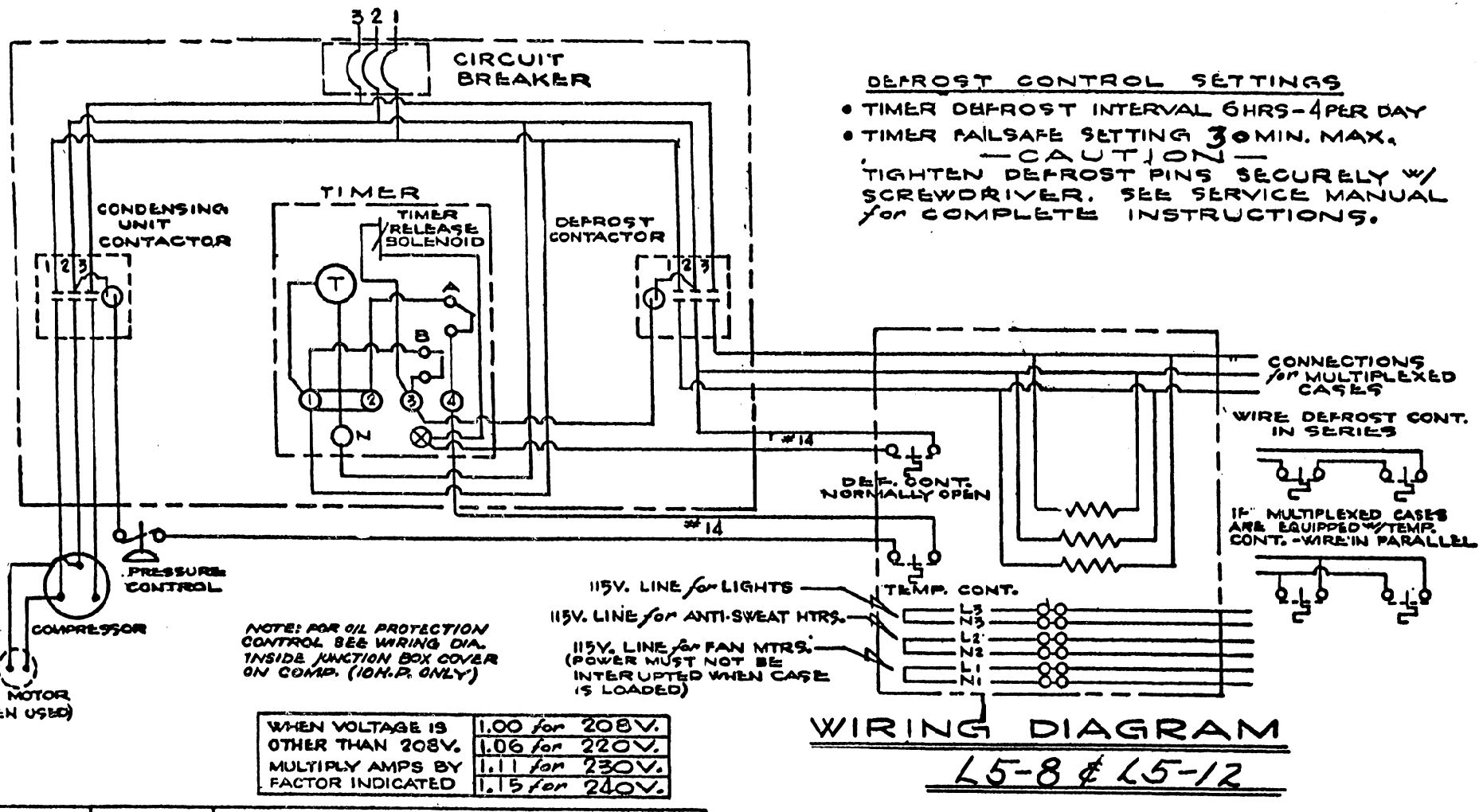


TYPICAL RELAY / CAPACITOR ASSEMBLY
(DEFROST RELAY SHOWN IN REFRIGRATION MODE)

LETTER	REVISED	DATE
DATE 6/12/80	TITLE TYPICAL AIR DEFROST FIELD WIRIN (FAN RELAY MOUNTED ON CASE)	
SCALE NONE		
DRAWN DEW		
APPD	KYSOR WARREN // SHERER DIVISION OF KYSOR INDUSTRIAL CORPORATION	DRAWING NUMBER PB-21449



DEFROST CONTROL SETTINGS

- TIMER DEFROST INTERVAL 6HRS-4 PER DAY
- TIMER FAILSAFE SETTING 30 MIN. MAX.

—CAUTION—

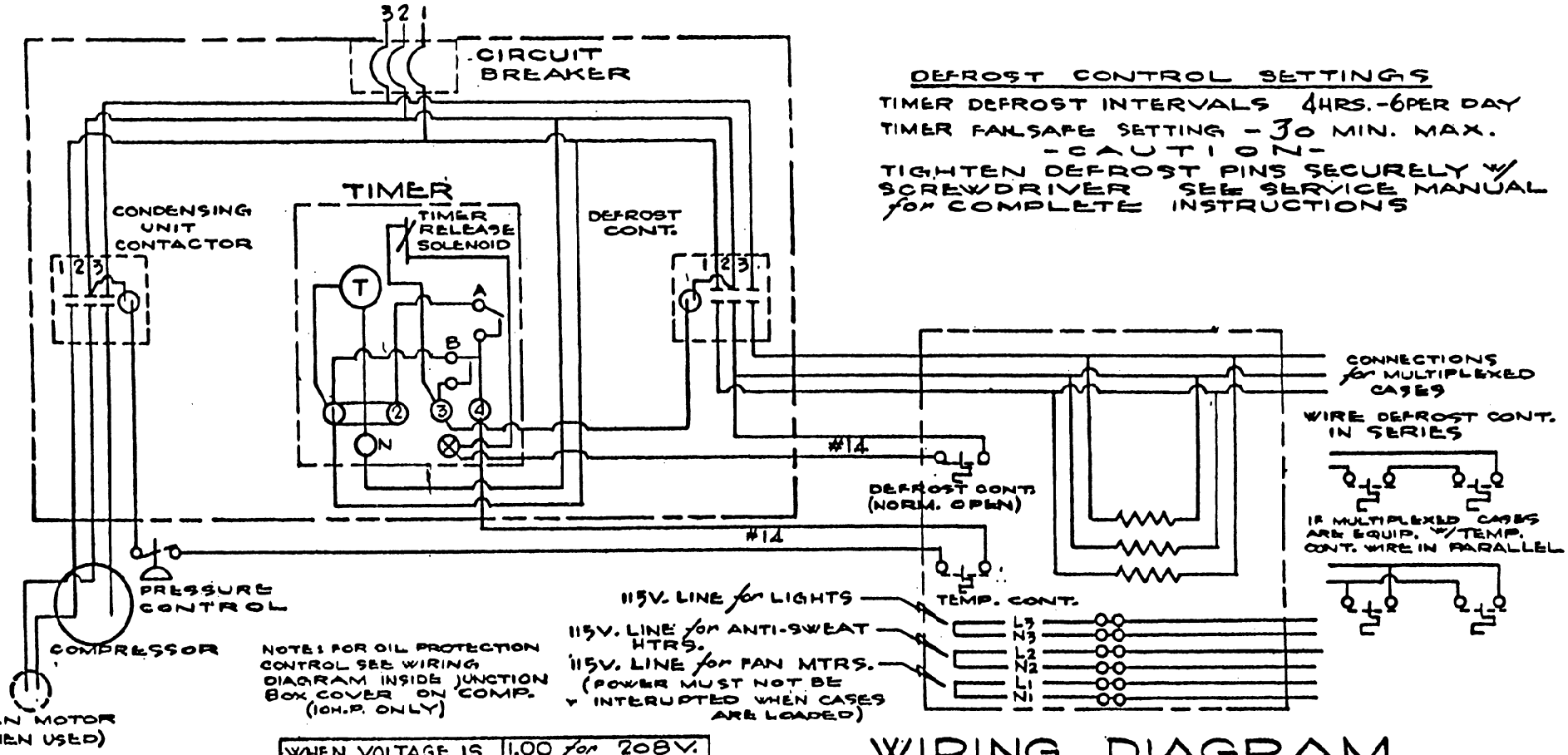
TIGHTEN DEFROST PINS SECURELY W/ SCREWDRIVER. SEE SERVICE MANUAL for COMPLETE INSTRUCTIONS.

WIRING DIAGRAM

L5-8 & L5-12

WHEN VOLTAGE IS OTHER THAN 208V. MULTIPLY AMPS BY FACTOR INDICATED	
	1.00 for 208V.
	1.06 for 220V.
	1.11 for 230V.
	1.15 for 240V.

LENGTH of CASES	WATTS @ 230V.	DEFROST CIRCUIT 208V. 3 ø 60CYCLE				
		AMPS LINE 1	AMPS LINE 2	AMPS LINE 3	CONTACTOR	WIRE # & SIZE
8	7350	16.6	16.6	16.6	NONE REQ'D	12
12	11025	24.9	24.9	24.9	" "	10
16	14700	33.2	33.2	33.2	" "	10
20	18375	41.5	41.5	41.5	" "	10
24 (2-12)	22050	49.8	49.8	49.8	75A-3P	6
24 (3-8)	22050	49.8	49.8	49.8	" "	6
28 (1-8 / 1-12)	25725	58.1	58.1	58.1	" "	6
32 (1-12)	29400	66.4	66.4	66.4	" "	4
36 (3-12)	33075	74.7	74.7	74.7	90A-3P	4



DEFROST CONTROL SETTINGS

TIMER DEFROST INTERVALS 4HRS.-6PER DAY

TIMER FAILSAFE SETTING - 30 MIN. MAX.

-CAUTION-

TIGHTEN DEFROST PINS SECURELY W/ SCREWDRIVER SEE SERVICE MANUAL for COMPLETE INSTRUCTIONS

WIRING DIAGRAM

I5F-8 & I5F-12

WHEN VOLTAGE IS OTHER THAN 208V. MULTIPLY AMPS BY FACTOR INDICATED	
1.00	for 208V.
1.06	for 220V.
1.11	for 230V.
1.15	for 240V.

LENGTH of CASES	WATTS @ 230V.	DEFROST CIRCUIT 208V. 3 ø 60 CYCLE				
		AMPS LINE 1	AMPS LINE 2	AMPS LINE 3	CONTACTOR	WIRE # SIZE
8	9900	22.5	22.5	22.5	NONE REQ'D.	10
12	14850	33.6	33.6	33.6	" "	8
16	19800	45.0	45.0	45.0	75A-3P	6
20	24750	56.1	56.1	56.1	" "	4

SYM.	REQ'D.	PART NUMBER	DESCRIPTION
A	1	2-355-00-0817	TRIM-CONNECTOR CANOPY
B	1	2-355-00-1179	TRIM-COLOR BAND UPPER CONNECTOR
C	1	3-038-06-1317	CASTING-JOINT TRIM (#16F10-57)
D	1	2-355-00-1161	TRIM-LOWER FRONT TOP CONNECTOR
E	1	2-355-00-1187	TRIM-LOWER FRONT BOTTOM CONNECTOR
F	1	3-027-03-1107	BOLT 3/8-16 X 4" HEX. HD. STL.
G	4	3-027-03-0703	BOLT 3/8-16x2-3/4 HEX. HD. STL.
H	2	3-027-03-0109	BOLT 3/8-16 X 1" HEX. HD. STL.
J	12	3-026-04-0802	FLAT WASHER PLT'D. 1/8 X 13/32 X 1 3/8
K	2	3-026-04-0406	FLAT WASHER PLT'D. 3/8
L	7	3-026-01-0607	NUT 3/8-16 HEX.
M	2	3-028-09-0409	SCREW # 6-A X 3/4 TRUSS HEAD
N	2	3-028-05-0106	SCREW # 10-24 X 1/2 TRUSS HEAD
P	8	3-028-07-0310	SCREW # 8-A X 1/2 OVAL HD. N.P.
R	12	3-028-09-0853	SCREW # 10-A X 1/2 TRUSS HEAD
S	3 Tubes	4-017-05-0107	CAULKING COMPOUND
T	1	2-355-00-1443	TRIM, BASE COVER CONNECTOR

1. Remove case from crate skids and set in final location, remove shipping supports. Note: Avoid dropping nuts and washers into case as they will plug drain.

2. Check floor for level, how much shimming is required and how service outlets are located. Decide whichcase to be installed first, move others out of the way.

3. Position remaining cases and level, using metal shims furnished. Level per enclosed instructions. Caulk end of joining case, move into position and adjust to obtain good alignment.

4. Remove (2) round plastic plug buttons at each end of display back panel.

5. Install 3/8- 16 X 4" long hex bolt, washers and nut in alignment-pull up lugs at the front of base and tighten. Use pry bar to assist tightening of bolt and getting cases tight and in straight line.

6. Install 3/8x2-3/4 long hex bolts, washers and nuts in the holes accessible from display area, front, lower back, center and upper back. Install 3/8- 16 X 1" long hex bolts, washers and nuts in upper front and canopy joining holes.

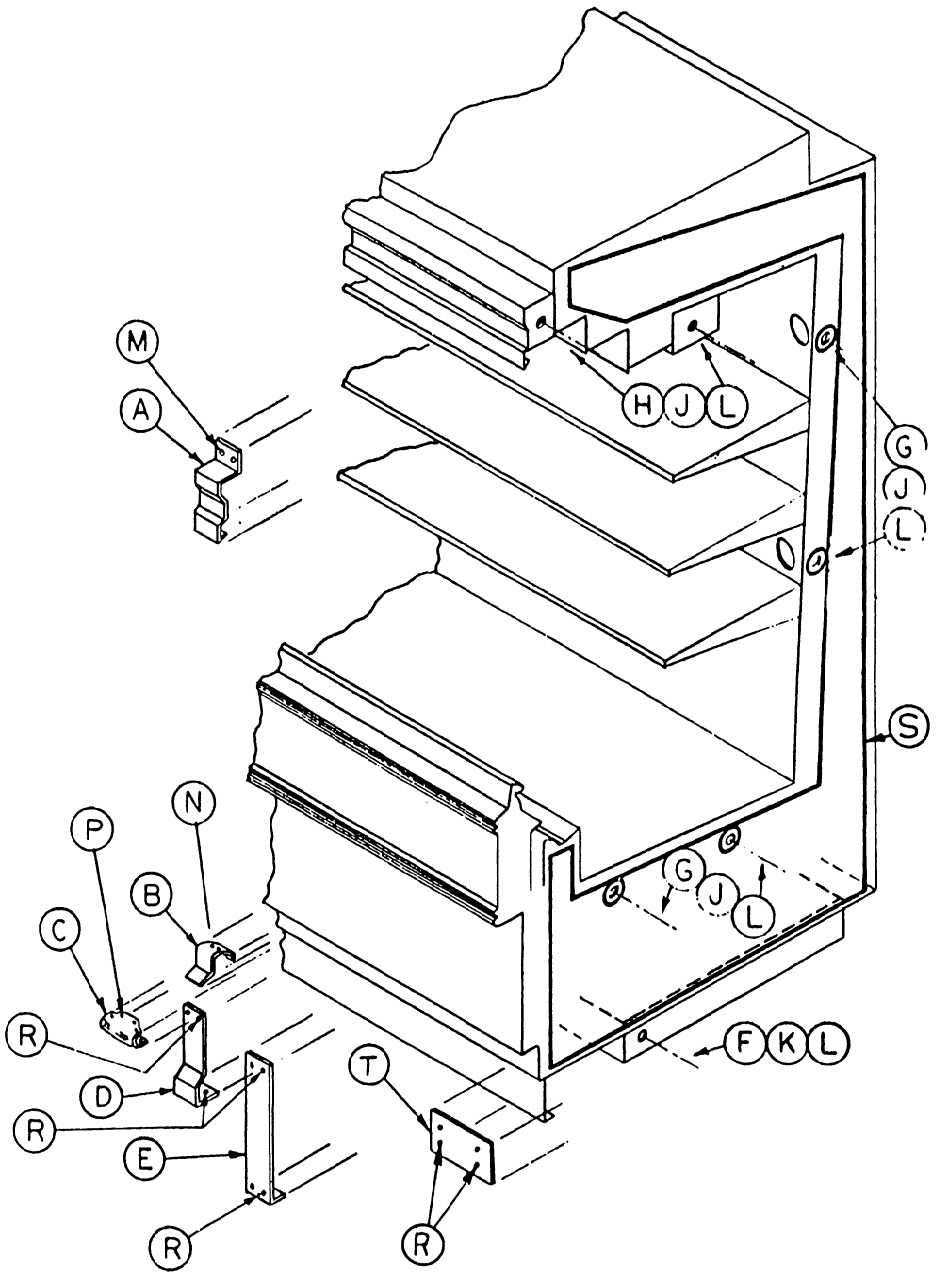
7. Check alignment and adjust if necessary. Tighten all joining bolt firmly.

8. Install color band trim (sym.B) first,using #10-24 X 1/2 long truss head bolts in threaded fasteners provided in case. Adjust trim for best fit and tighten screws.

9. Install casting (sym.C) over joint as shown and fasten using #8A X 1/2" long oval head N.P.screws.

10. Install lower trim top and bottom (sym.D & E) over joints as shown and fasten using #10A X 1/2 Truss head screws.

11. Install canopy trim (sym A) which is shaped to fit the canopy and the recessed area in canopy. Locate over the joint and fasten with #6A x 3/4 long truss head screws.

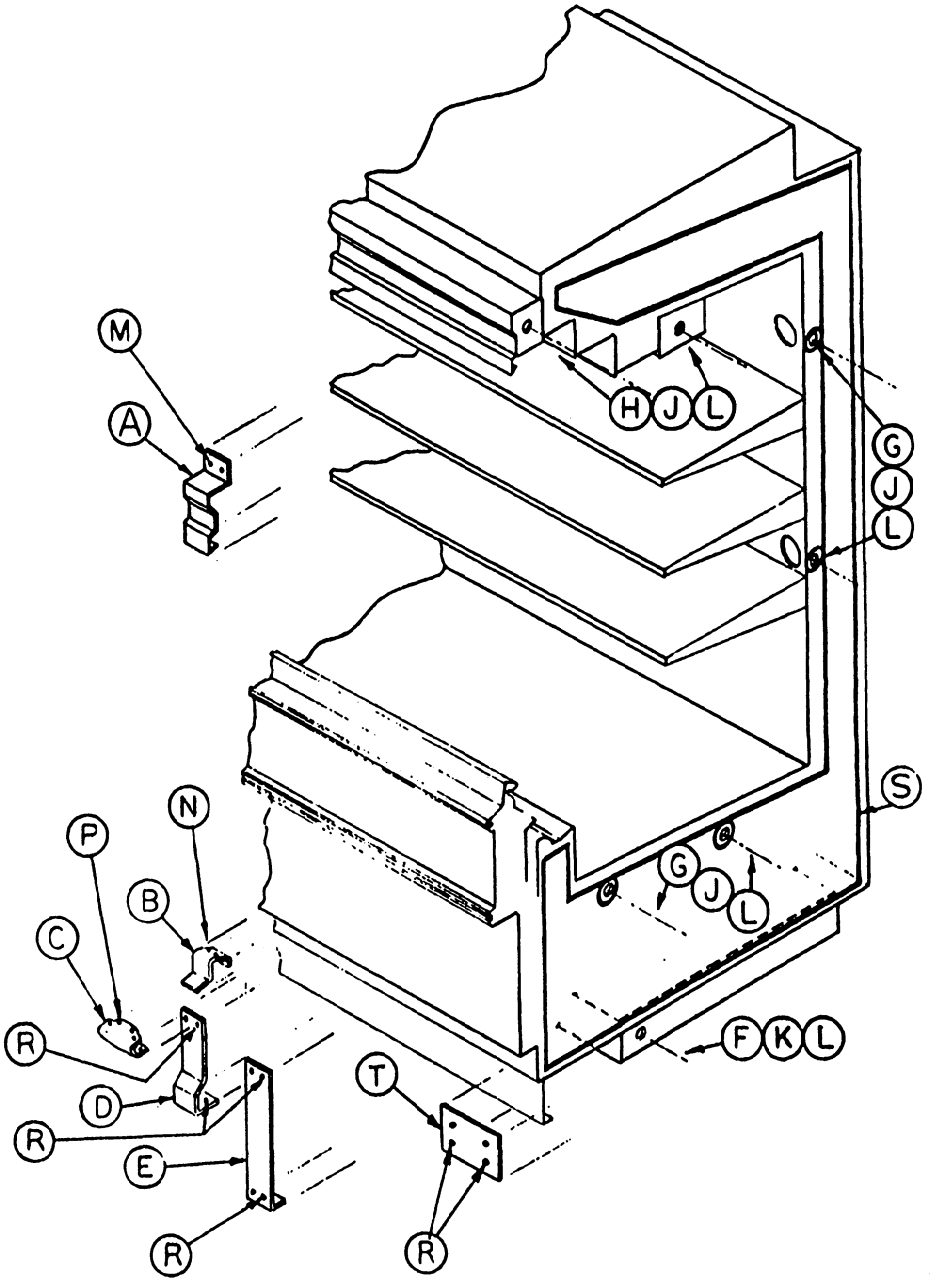


Rev. 77124
M79010

0-355-00-0035 JOINT KIT FOR MODELS L5 - L5A

KYSOR | Warren-Sherer
DIVISION OF KYSOR INDUSTRIAL CORP.
West Industrial Road, Marshall, Michigan 49068

SYM.	REQ'D.	PART NUMBER	DESCRIPTION
A	1	2-355-00-0817	TRIM-CONNECTOR CANOPY
B	1	2-355-00-1179	TRIM-COLOR BAND UPPER CONNECTOR
C	1	3-038-06-1317	CASTING-JOINT TRIM (#16F10-57)
D	1	2-355-00-1161	TRIM-LOWER FRONT TOP CONNECTOR
E	1	2-355-00-1153	TRIM-LOWER FRONT BOTTOM CONNECTOR
F	1	3-027-03-1107	BOLT 3/8 - 16 X 4" HEX. HD. STL.
G	4	3-027-03-0703	BOLT 3/8-16x2-3/4" HEX. HD. STL.
H	2	3-027-03-0109	BOLT 3/8 - 16 X 1" HEX. HD. STL.
J	12	3-026-04-0302	FLAT WASHER PLT'D. 1/8 X 13/32 X 1 3/8
K	2	3-026-04-0406	FLAT WASHER PLT'D. 3/8
L	7	3-026-01-0607	NUT 3/8 - 16 HEX
M	2	3-028-09-0409	SCREW #6-A X 3/4 TRUSS HEAD
N	2	3-028-05-0106	SCREW # 10- 24 X 1/2 TRUSS HEAD
P	8	3-028-07-0310	SCREW # 8-A X 1/2 OVAL HD. N.P.
R	12	3-028-09-0853	SCREW # 10-A X 1/2 TRUSS HEAD
S	3 Tubes	4-017-05-0107	CAULKING COMPOUND
T	1	2-355-00-1443	TRIM, BASE COVER CONNECTOR



1. Remove case from crate skids and set in final location, remove shipping supports. Note: Avoid dropping nuts and washers into case as they will plug drain.

2. Check floor for level, how much shimming is required and how service outlets are located. Decide which case to be installed first, move others out of the way.

3. Position remaining cases and level, using metal shims furnished. Level per enclosed instructions. Caulk end of joining case, move into position and adjust to obtain good alignment.

4. Remove (2) round plastic plug buttons at each end of display back panel.

5. Install 3/8- 16 X 4" long hex. bolt, washers and nut in alignment-pull up lugs at the front of base and tighten. Use pry bar to assist tightening of bolt and getting cases tight and in straight line.

6. Install 3/8-16x2-3/4" long hex bolts, washers and nuts in the holes accessible from display area, front, lower back, center and upper back. Install 3/8 - 16 x 1" long hex bolts, washers and nuts in upper front and canopy joining holes.

7. Check alignment and adjust if necessary. Tighten all joining bolt firmly.

8. Install color band trim (sym.B) first,using # 10- 24 X 1/2 long truss head bolts in threaded fasteners provided in case. Adjust trim for best fit and tighten screws.

9. Install casting (sym.C) over joint as shown and fasten using #8A X 1/2" long oval head N.P. screws.

10. Install lower trim top and bottom (sym.D & E) over joints as shown and fasten using #10A x 1/2 truss head screws.

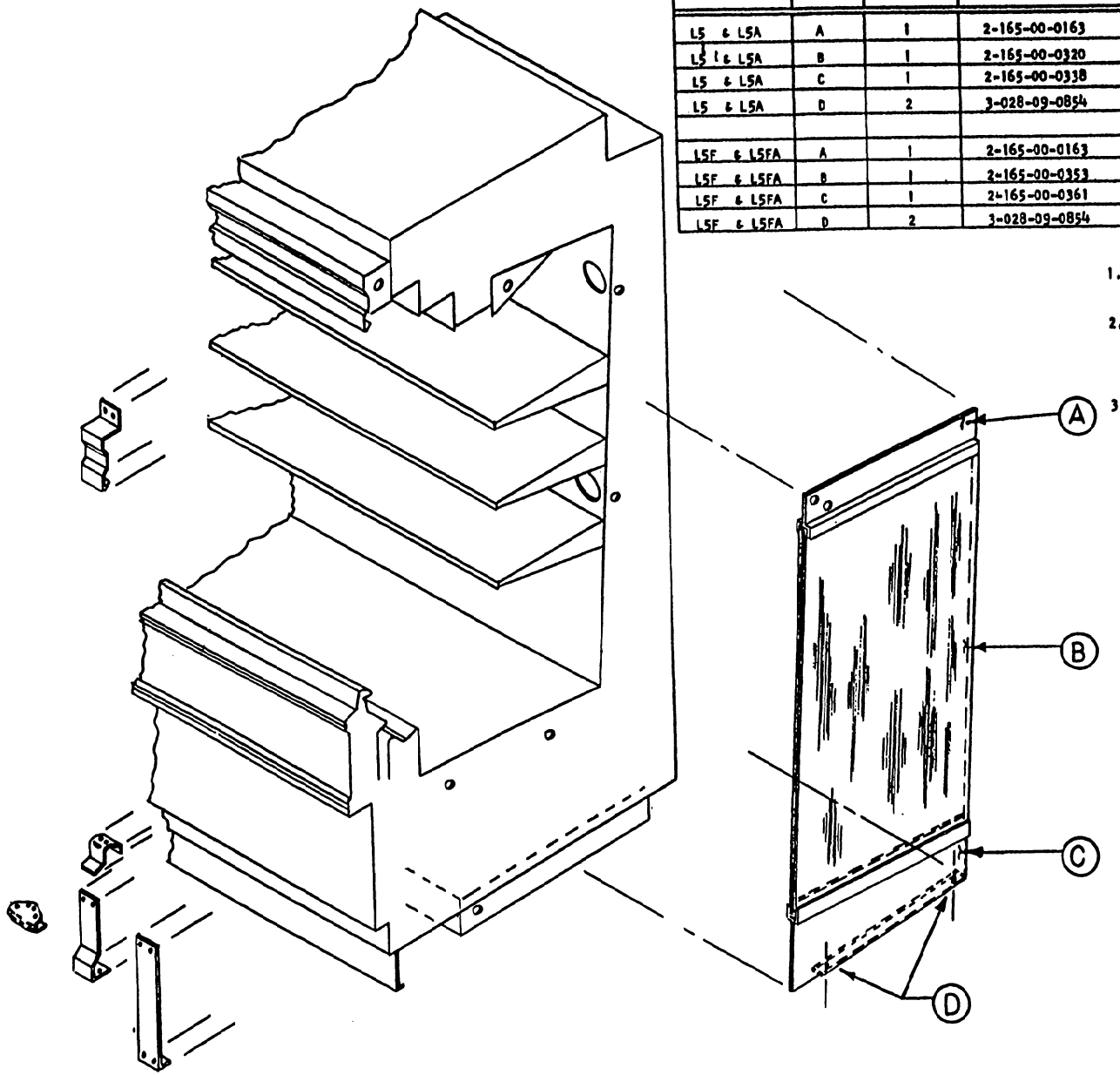
11. Install canopy trim (sym.A) which is shaped to fit the canopy and the recessed area in canopy. Locate over the joint and fasten with # 6A X 3/4 long truss head screws.

Rev. 77124
M79010

0-355-00-0027 JOINT KIT FOR MODELS L4-L4A - L5F - L5FA

KYSOR | Warren-Sherer
DIVISION OF KYSOR INDUSTRIAL CORPORATION
West Industrial Road, Marshall, Michigan 49068

MODEL	SYM.	REQ'D	PART NUMBER	DESCRIPTION
L5 & L5A	A	1	2-165-00-0163	DIVIDER-TOP RETAINER OUTSIDE
L5 & L5A	B	1	2-165-00-0320	DIVIDER-PLEXIGLAS
L5 & L5A	C	1	2-165-00-0338	DIVIDER-BOTTOM RETAINER OUTSIDE
L5 & L5A	D	2	3-028-09-0854	SCREW # 10-A x 1/2 TRUSS HEAD
L5F & L5FA	A	1	2-165-00-0163	DIVIDER-TOP RETAINER OUTSIDE
L5F & L5FA	B	1	2-165-00-0353	DIVIDER- PLEXIGLAS
L5F & L5FA	C	1	2-165-00-0361	DIVIDER-BOTTOM RETAINER OUTSIDE
L5F & L5FA	D	2	3-028-09-0854	SCREW # 10 A x 1/2 TRUSS HEAD



1. Locate bottom divider (sym.C) in position as shown and fasten in place using 2 screws (sym.D)
2. Place top divider (sym.A) in position between cases then slide plexiglass (sym.B) in grooves provided in metal dividers. Then tighten cases together.
3. Other parts shown are part of joint kit. See joint kit section in manual for part numbers.

PLEXIGLAS DIVIDER KIT

0-165-00-0050 FOR MODELS L5-L5A

0-165-00-0068 FOR MODELS L5F & L5FA

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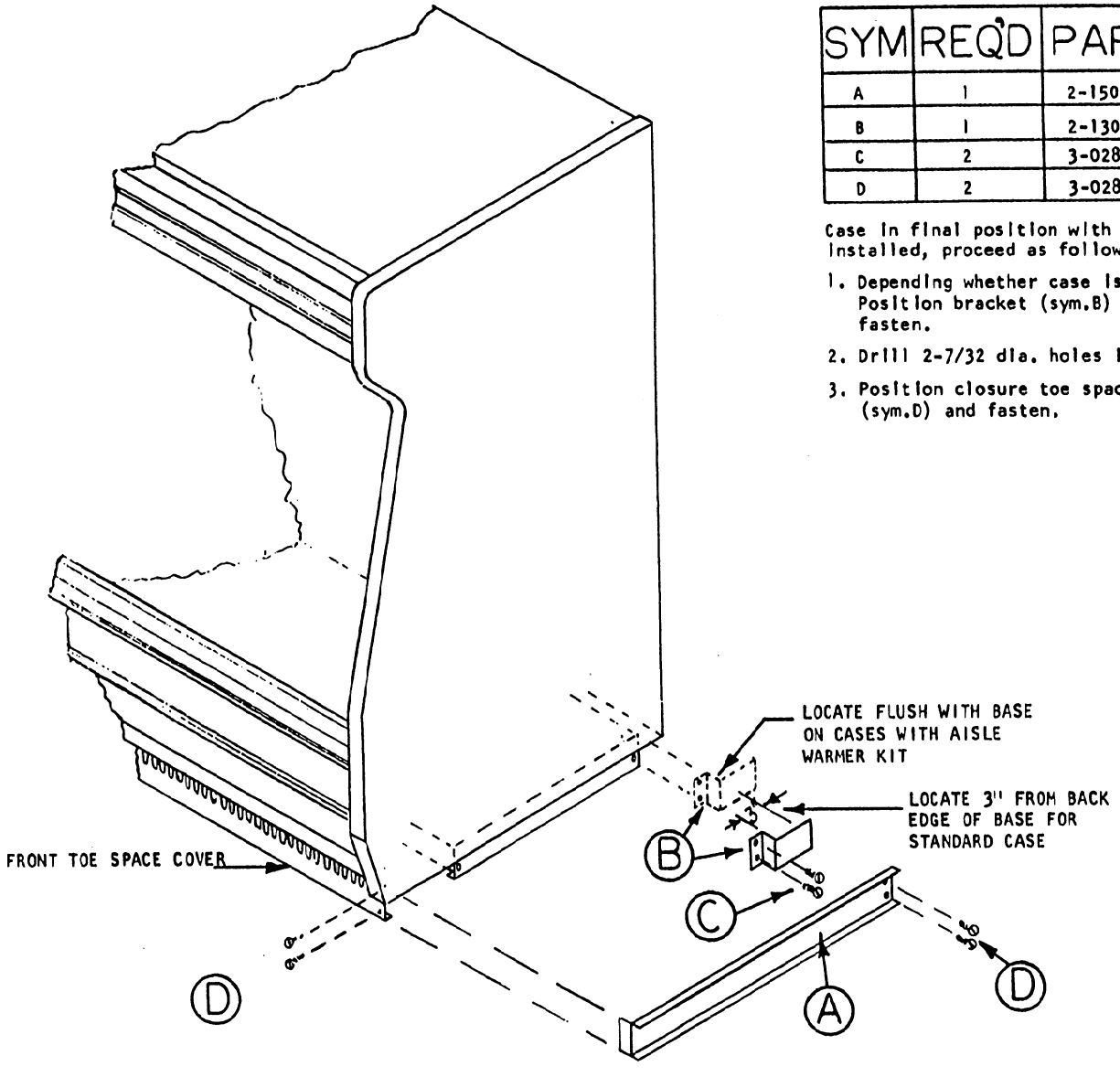
Marshall, Michigan 49068



SYM	REQ'D	PART NUMBER	DESCRIPTION
A	1	2-150-00-0467	CLOSURE-TOP SPACE END
B	1	2-130-00-2500	BRACKET-END KICK RAIL CLOSURE
C	2	3-028-06-0105	SCREWS BINDERHEAD 1/2 X 10-24 S.S.
D	2	3-028-06-0303	SCREWS BINDERHEAD 3/4 X 10 S.S.

Case in final position with refrigeration, electrical, drain lines and front toe space cover installed, proceed as follow.

1. Depending whether case is standard or has aisle warmer kit. Position bracket (sym.B) and drill 2-5/32 dia. holes for # 1/2 x 10-24 screws (sym.C) and fasten.
2. Drill 2-7/32 dia. holes in front toe space cover 1/2" in from end.
3. Position closure toe space end (sym.A) and drill 4 1/8 dia. holes for # 3/4 X 10 SS screws (sym.D) and fasten.

0-170-00-0012 END TOE SPACE COVER
FOR MODELS L4A, L5A OR L5FA

KYSOR Warren-Sherer
DIVISION OF KYSOR INDUSTRIAL CORPORATION
West Industrial Road, Marshall, Michigan 49068

IMPORTANT,

HEALTH AND SANITATION STANDARD FOR RETAIL FOOD STORE REFRIGERATION

L5(A) and L5F(A) frozen food and ice cream models were designed and built in compliance with CRMA Health and Sanitation Standard CRS-S1-67.

Since sanitation must necessarily be a joint effort of manufacturer, installer and user, recommendations and instructions for both installer and user are listed below. Beyond furnishing practical recommendations, the manufacturer cannot be responsible for unsanitary installation or usage.

INSTALLER'S RESPONSIBILITIES (See Section VII of Standard)

Display cases must be carefully leveled to insure that drains in case can function properly. Shims and other leveling means user must provide a firm support for the case to insure that case will remain level for its useful life.

Manufacturer furnishes a line type drain trap that must be connected to the drain fitting on each cabinet. The trap must be located within 3 ft. of the cabinet and discharge must not be directly connected to sewer line but rather discharge into drain sump. CAUTION: Do not reduce drain line size smaller than what is provided at case. Drain sump is cast aluminum.

Cases must be installed a minimum distance of 3 inches from wall so as to permit adequate ventilation. If cases are installed back to back, a forced ventilating system must be incorporated. A suitable kit can be purchased from manufactuer.

Installing ends and/or joining cases must be according to instructions furnished by manufacturer. Special care must be exercised to insure that joints are sealed properly, especially in lower areas of joint.

Toe space cover panel is adjustable and should be installed to make a sanitary joint with floor. If floor is irregular or an unusual amount of shimming was necessary to level cases so that range of adjustment on panel furnished is exceeded, installer must provide and install additional materials as required or advise owner of condition so he can arrange to have corrections made.

The open space between wall and end of case must be neatly closed with hardboard or other material acceptable to owner so as to prevent the accumulation of debris back of case.

Space between wall and top of case must be covered with a suitable screen or grille to guard from debris finding its way into this space.

Since proper temperatures are most important for sanitation, installer must make sure cases are performing properly before he permits owner to load cases with product. Temperature of air discharging from honeycomb must be zero degrees or lower except during defrost cycle.

OWNER RESPONSIBILITIES (SEE SECTIONS VIII AND IX)

GENERAL: To insure minimum maintenance cost of operating your cabinet and to meet all local sanitary codes, this cabinet should be thoroughly emptied and washed out every three (3) months. CAUTION: Do not use high pressure hose when cleaning any case. Check the drain outlet to insure it is not clogged before starting to clean and do not introduce water into case faster than the drain can carry it away.

PAINTED SURFACE: A mild soap and water solution is recommended for enameled surface. Do not use cleaners containing abrasive ingredients which will scratch or dull finish.

HONEYCOMB: (Air Discharge) The honeycomb material located in the discharge air nozzles are fragile and care must be exercised to avoid damaging it. The honeycomb should be inspected and cleaned as needed after each six months of service. See page #2 for further instruction on detecting if honeycomb is dirty or plugged.

REMOVAL OF HONEYCOMB: 2nd guard honeycomb must be removed before attempting to remove first guard: Don't attempt to remove plastic extrusion in 1st guard duct as it is sealed in place at the factory. Before removing the 1st guard duct honeycomb remove the three (3) plastic snap-on buttons located along the bottom edge of the nozzle. See (page 32, fig. #1, item B). Buttons will damage honeycomb if they are not removed before the honeycomb is removed. To remove refrigerated and 2nd guard honeycombs, remove stainless steel clips at points "A" and "C" fig. #1. Then remove honeycomb retainers. (white plastic-wedge type). Points "D" and "F" fig. #1. New honeycomb can be removed and cleaned with compressed air or warm water. Be sure to remove all water from honeycomb cells before reinstalling same. See page 2 for further instructions on removal of honeycomb.

DRAIN LOCATION: Center of cabinet below interior botton. (Botton is sectional)

CLEANING OF RETURN AIR: Remove all tags and other foreign materials from return air grille. (See fig. #2)

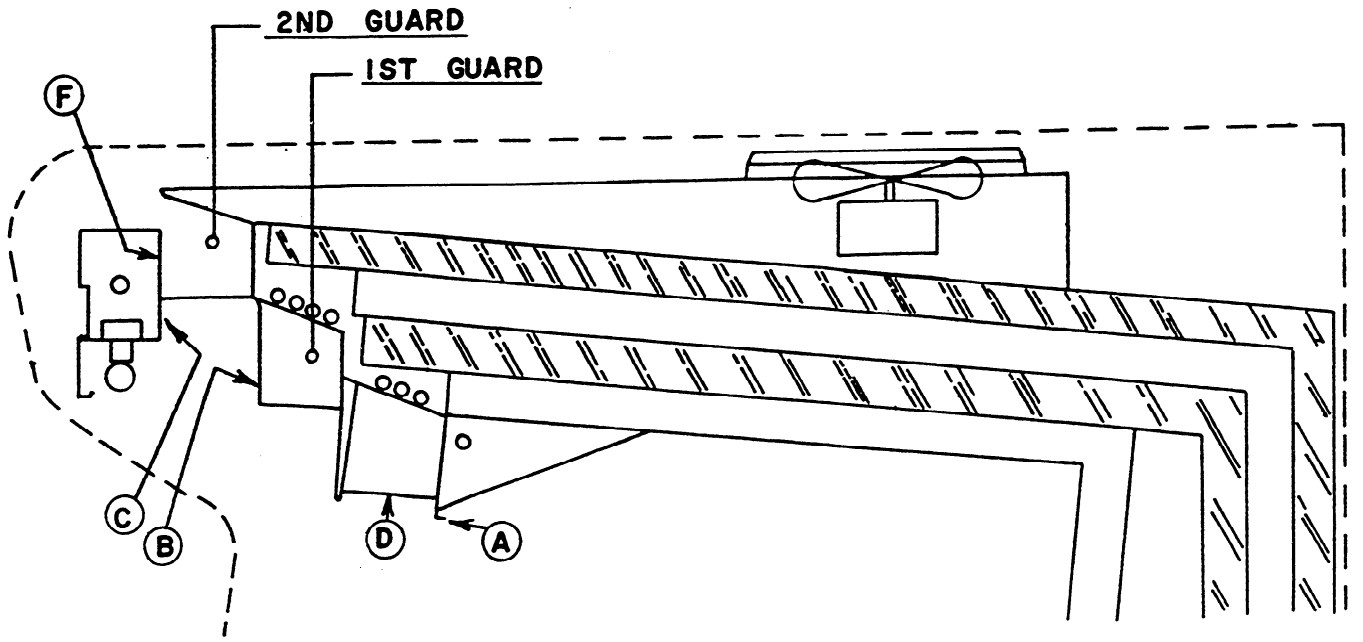


FIG. 1

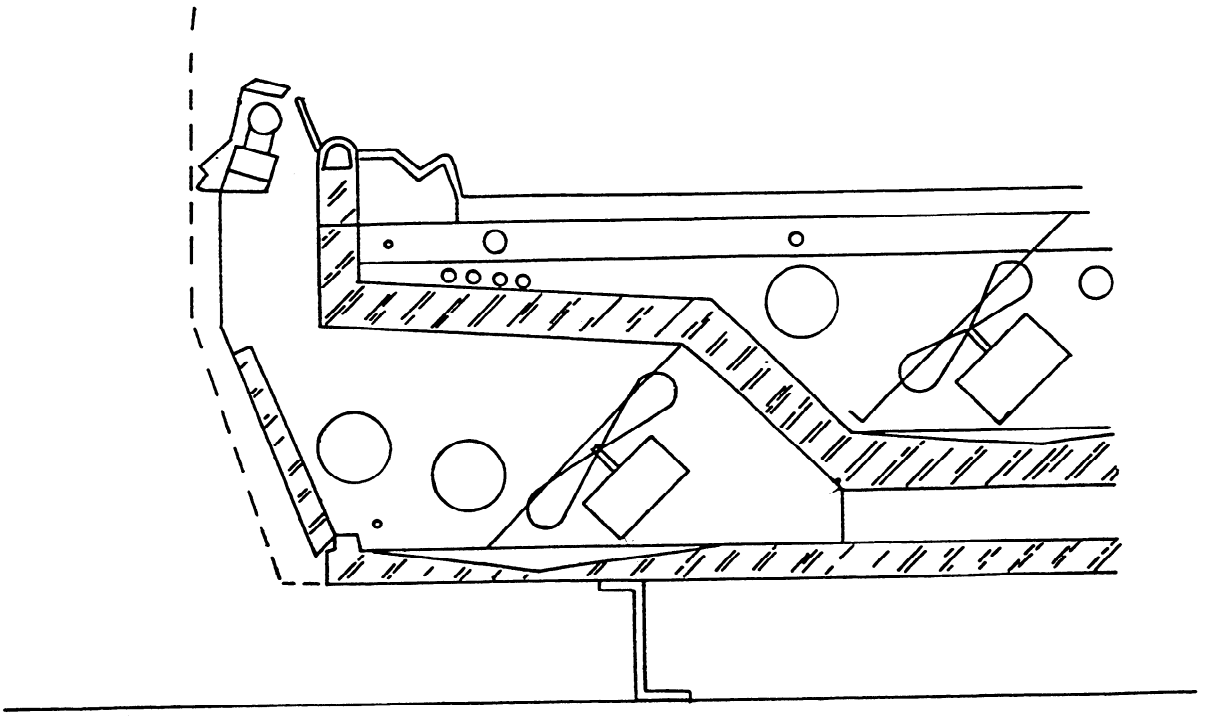


FIG. 2

RECOMMENDED PIPING PRACTICES FOR WARREN/SHERER CASES 7/25/80

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.