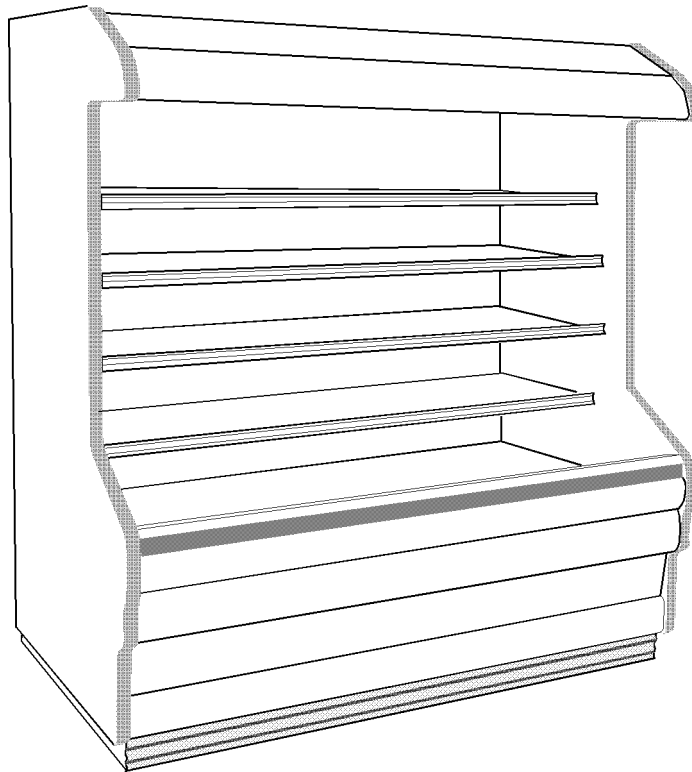


# TYLER



## Installation & Service Manual



### L6FA

**MULTI-SHELF FROZEN FOOD MERCHANDISER**  
**Low Temperature Self Serve Display Cases**

This manual has been designed to be used in conjunction with the General Installation & Service Manual.

**Save the Instructions in Both Manuals for Future Reference!!**

This merchandiser conforms to the Commercial Refrigeration Manufacturers Association Health and Sanitation standard CRS-S1-96.

PRINTED IN U.S.A.	Specifications subject to change without notice.	REPLACES EDITION	7/99	ISSUE DATE	1/00	PART NO.	9027522	REV. D
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The following Low Temperature, Multi-Shelf Frozen Food Merchandiser models are covered in this manual:

<b>MODEL</b>	<b>DESCRIPTION</b>
L6FA	6', 8' & 12' MULTI-SHELF FROZEN FOOD MERCHANDISER

**SPECIFICATIONS**

**L6FA Multi-Shelf Frozen Food Merchandiser Specification Sheets**

<b>MODEL</b>	L6FA*	L6FA	L6FA
<b>USAGE</b>	FROZEN	MEAT	DAIRY
<b>BTUH/FT</b>	1742	1637	1555
<b>SUCTION°</b>	-20F	+15F	+25F
<b>ENTER AIR°</b>	-10F	+24F	+35F

\*NOTE: L6F6A FROZEN FOOD CASE HAS 2317 BTUH/FT WHEN USED AS A STAND ALONE CASE.

NOTE: COMPRESSOR SIZING SHOULD ALLOW FOR SUCTION LINE PRESSURE DROP.

THE ABOVE RATINGS ARE FOR COMPRESSOR SELECTION ONLY. FOR ENERGY CALCULATION DATA REFER TO THE ENERGY SECTION. FOR COMPRESSOR SIZING INFORMATION REFER TO THE "GOLD" SECTION & FOR LINE SIZING INFORMATION REFER TO THE "BUFF" SECTION OF THE TYLER SPECIFICATION GUIDE.

208 VOLT DEFROST (AMPS)									
FT	6	8	12	16	20	24	28	32	36
3 PH	11.2 DF-3-30	15.0 DF-3-30	23.0 DF-3-30	15/15 DF-3-30 -30	15/23 DF-3-30 -30	23/23 DF-3-30 -30	15/15/23 DF-3-30 -30-30	15/23/23 DF-3-30 -30-30	23/23/23 DF-3-30 -30-30
CASE-TO-CASE SUCTION LINE SUB-FEED BRANCH LINE SIZING									
R404A	7/8"	1 1/8"	1 1/8"	1 3/8"	1 3/8"	1 5/8"	1 5/8"	1 5/8"	2 1/8"

DEFROST CONTROL				BACKUP PRESSURE SETTINGS**		EPR SETTINGS***	
PER DAY	MODE	TIME	TERM.	CUT IN	CUT OUT	R22	R404A
2-3	ELECT	40 MIN.	55F	15# @ R404A	5# @ R404A	---	17#
3-4	HOT GAS	22-25 MIN.	60F*	15# @ R404A	5# @ R404A	---	17#

\* If an Electronic Sensor is used for termination, it should be set at 70°F termination temperature.

\*\* Used with Thermostat or EPR Control.

\*\*\* Set EPR to give this pressure at the case.

**CASE CIRCUITS:** In addition to the 208V Defrost Circuit, there is the 120V Case Fan Circuit plus the 120V Case Anti-Sweat Heater Circuit. Shelf or Canopy lights require a separate 120V circuit which can be switched at the back room for convenience in controlling the lights.

**ELECTRICAL DEFROST:** Requires a 3 Phase 208V supply for the defrost heaters, controlled by the defrost clock and breaker(s) at the machine panel, a 3 pole contactor, and defrost limit switch in each case. Setting of the switch is 52F.

**GAS DEFROST:** Uses a limit thermostat, along with a primary fan klixon which cycles the primary fans OFF above 60F.

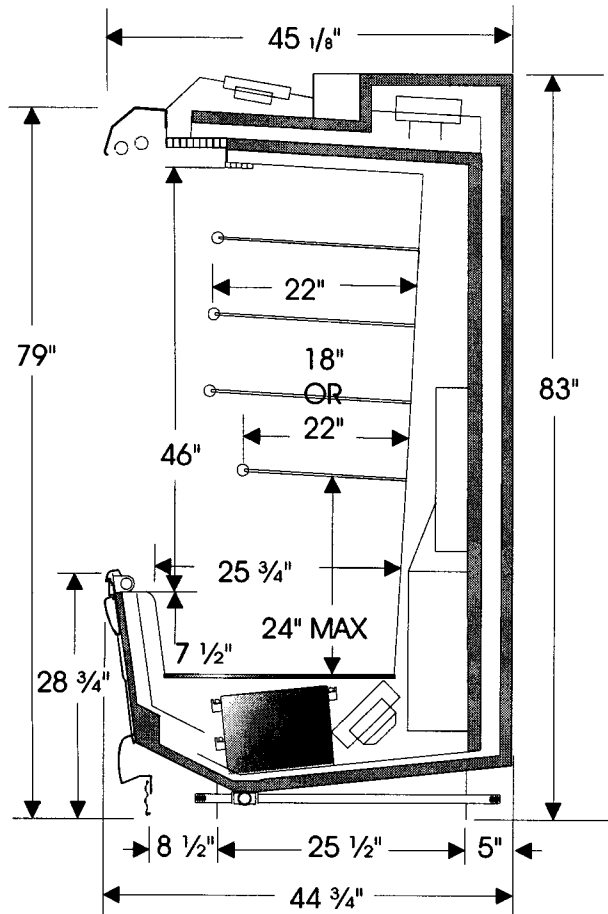
**Ambient Air Band:** This case has a third air band which directs ambient air in front of the Air Screens to provide an extra barrier to warm air infiltration.

**Pressure Control Settings:** W/O Thermostat & Solenoid, 13# Cut-In, 7# Cut-Out. (With Thermostat & Solenoid, 19# Cut-In, 0# Cut-Out - OPTIONAL)

**CASE BTUH REQUIREMENTS** are calculated to produce approximately the indicated entering air temperature with absolute maximum operating ambient limits of **75F & 55RH**.

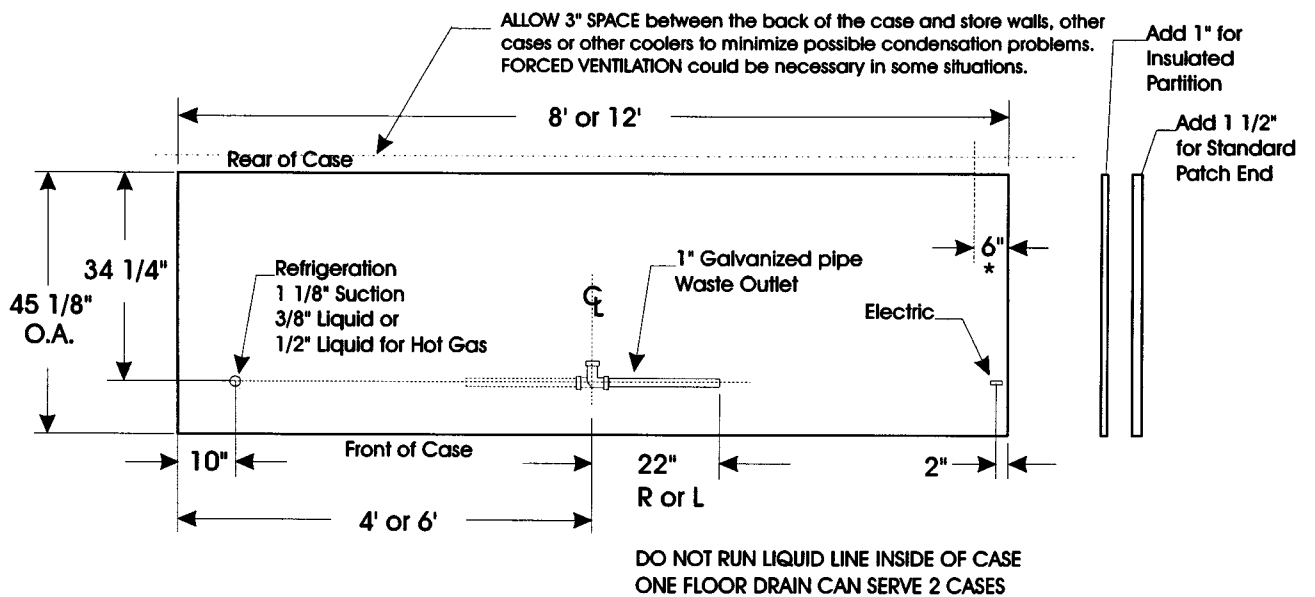
The information contained herein is based on technical data and tests which we believe to be reliable and is intended for use by persons having technical skill, at their own discretion and risk. Since conditions of use are outside Tyler's control, we can assume no liability for results obtained or damages incurred through the applications of the data presented. SPECIFICATIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE.

L6FA Multi-Shelf Frozen Food Merchandiser



120 VOLT ELECTRICAL DATA (AMPS)			
FT	STD. FANS	ECM FANS	ANTI-SWT
6	3.2	1.3	1.5
8	3.8	1.9	2.4
12	5.0	2.5	3.5

120 VOLT LIGHTING (AMPS) T-8/ ELECTRONIC BALLASTS		
FT	STD. LIGHTS (2 ROW CANOPY, 1 ROW NOSE)	OPTIONAL 800 MA LIGHTS (2 ROW CANOPY, 1 ROW NOSE)
6	1.6	3.4
8	1.8	3.7
12	2.6	6.3

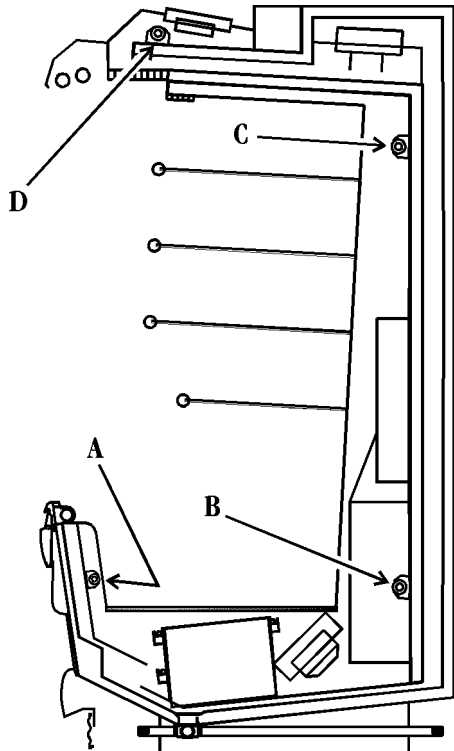


\* 208 Volt circuit is required at the top of this case for the defrost contactor

## INSTALLATION PROCEDURES

### Carpentry Procedures

#### Case Pull-Up Locations



All L6FA models have four pull-ups at each end of the case. Pull-ups A, B, C and D are located as shown and should be installed and tightened starting with A and finishing with D.

See "General I&S Manual" for line-up assembly instructions.

### Electrical Procedures

#### Electrical Considerations

##### CAUTION

Make sure all electrical connections at components and terminal blocks are tight. This will prevent burning of electrical terminals and/or premature component failure.

##### NOTE

- Lower raceway cover will be shipped loose. See the "General I&S Manual" for raceway cover installation and removal instructions.
- Since 208V defrost wiring enters the rear of the case through the outer air band, the exterior and interior access holes must be caulked to maintain air band separation.

#### Case Fan Circuit

This circuit has three sets of fans (primary, secondary and ambient) that are supplied by an uninterrupted, protected 120V circuit. The case fan circuit is not cycled, except when equipped for gas defrost. On gas defrost cases the primary fans are controlled by a 60/30 klixon.

##### NOTE

With gas defrost, the primary fans will not restart until the coil temperature reaches 30°F at the fan delay thermostat.

#### Fluorescent Lamp Circuit

The standard case lighting system is T-8 electronic lamps. The standard lighting is 2-row of horizontal canopy lights and 1-row of nose lights.

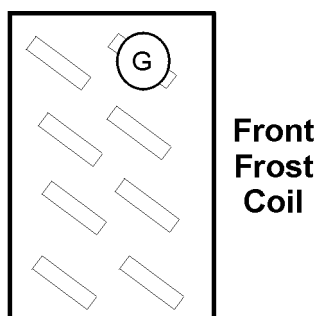
## Defrost Information

See "General I&S Manual" for operational descriptions for each type of defrost control.

### Defrost Control Chart

Defrost Type	Defrosts Per Day	Defrost Duration (Min)	Term. Temp.
Electric	2-3	35	55°F
Gas	3-4	22-25	60°F*

\*Use 70°F with electronic defrost sensor.



G = Gas Defrost (Fan Delay)

The diagram shows the location for each defrost type that uses a klixon.

### NOTE

- The termination thermostat (55/35 Settings) for electric defrost is located in the right hand end of the upper electrical raceway.
- The termination thermostat for gas defrost is located next to the rear coil bypass check valve.

### CAUTION

If electronic sensors are used in place of the klixons, the sensors must be located in the same location as the klixons for that defrost type. Any other locations will effect the refrigeration efficiency of the case.

### L6FA Optional Hot Gas Defrost Operation Requirements.

When reverse cycle gas defrosting option is used, it should only be applied to multiple compressor systems (Parallel racks). A maximum of not more than 25% of the load on a

given rack should defrost at one time because the defrosting cases become a condenser during the defrost period and the other refrigerated cases must provide enough heat load to keep a compressor operating. Do not defrost more than 24 feet of the L6FA at one time to limit the amount of refrigerant used in that circuit during the defrost.

**Insulated partitions must be used between cases in the same lineup that have different defrost times.**

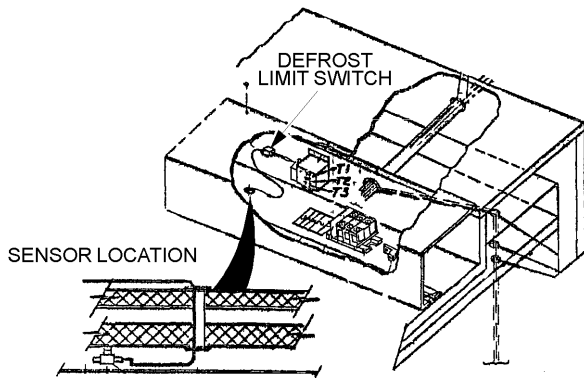
Defrosts are initiated by a multi-circuit defrost clock or an electronic defrost controller. At the beginning of gas defrost the refrigeration is stopped and the gas is diverted in a reverse direction through the suction line to the display case. The refrigeration should be set to remain off for the complete failsafe time plus a 5 minute drain off or clear time period. This type of defrost operation allows the problem areas in the case to completely clear without subjecting the refrigerated product to excessive warm up.

A defrost termination "klixon type" open on rise thermostat is mounted (on the left hand side) next to the rear coil check valve that bypasses defrost refrigerant flow around the expansion valve. The defrost termination device along with the mechanical or electronic defrost control should be set up to **cycle or pulse the hot gas valve during the defrost time period.** If you use a mechanical clock, you should wire it in parallel with the hot gas valve. If the return liquid temperature rises to 70°F, the hot gas valve should be closed until the return liquid temperature cools to 40°F and then the hot gas valve will reopen and provide additional heat. This cycling will continue until the total defrost time has elapsed. Note that the "klixon type" thermostat has a time lag associated with it's operation so its actual setting is 60°F, but **if an electronic sensor is used for termination, it should be set at 70°F termination temperature**

because it is faster reacting. Also, if used with an electronic controller, cycle the hot gas valve when the lowest sensor temperature (minimum) has reached 70°F.

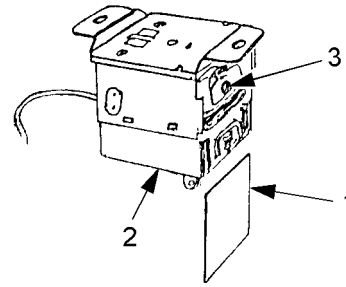
In addition the primary air band fans on the L6FA are cycled off during the defrost cycle with a limit "klixon type" thermostat that is mounted to a coil return bend on the right hand end of the case. It will cycle the primary fans off at 60°F and on at 30°F. This helps minimize the product temperature warmup during the defrost. All other fans, both secondary and ambient airband, continue to run during defrost.

**Electric Defrost Limit Switch**



The Defrost Limit Switch is located in the top raceway with its sensing bulb in the primary air band. The limit switch is factory preset for 52°F. If defrost is too long, the thermostat is set too high.

**Adjusting the Defrost Limit Switch**



Remove the fiberboard (1) from the end of the control (2) . Turn the brass adjustment screw (3) clockwise to raise, or counterclockwise to lower the termination temperature. One turn changes temperature setting approximately 5°F.

**WIRING DIAGRAMS**

**ELECTRICIAN NOTE - OVERCURRENT PROTECTION**

120V circuits should be protected by 15 or 20 Amp devices per the requirements noted on the cabinet nameplate or the National Electrical Code, Canadian Electrical Code - Part 1, Section 28. 208V defrost circuits employ No. 10 AWG field wire leads for field connections. On remote cases intended for end to end line-ups, bonding for ground may rely upon the pull-up bolts.

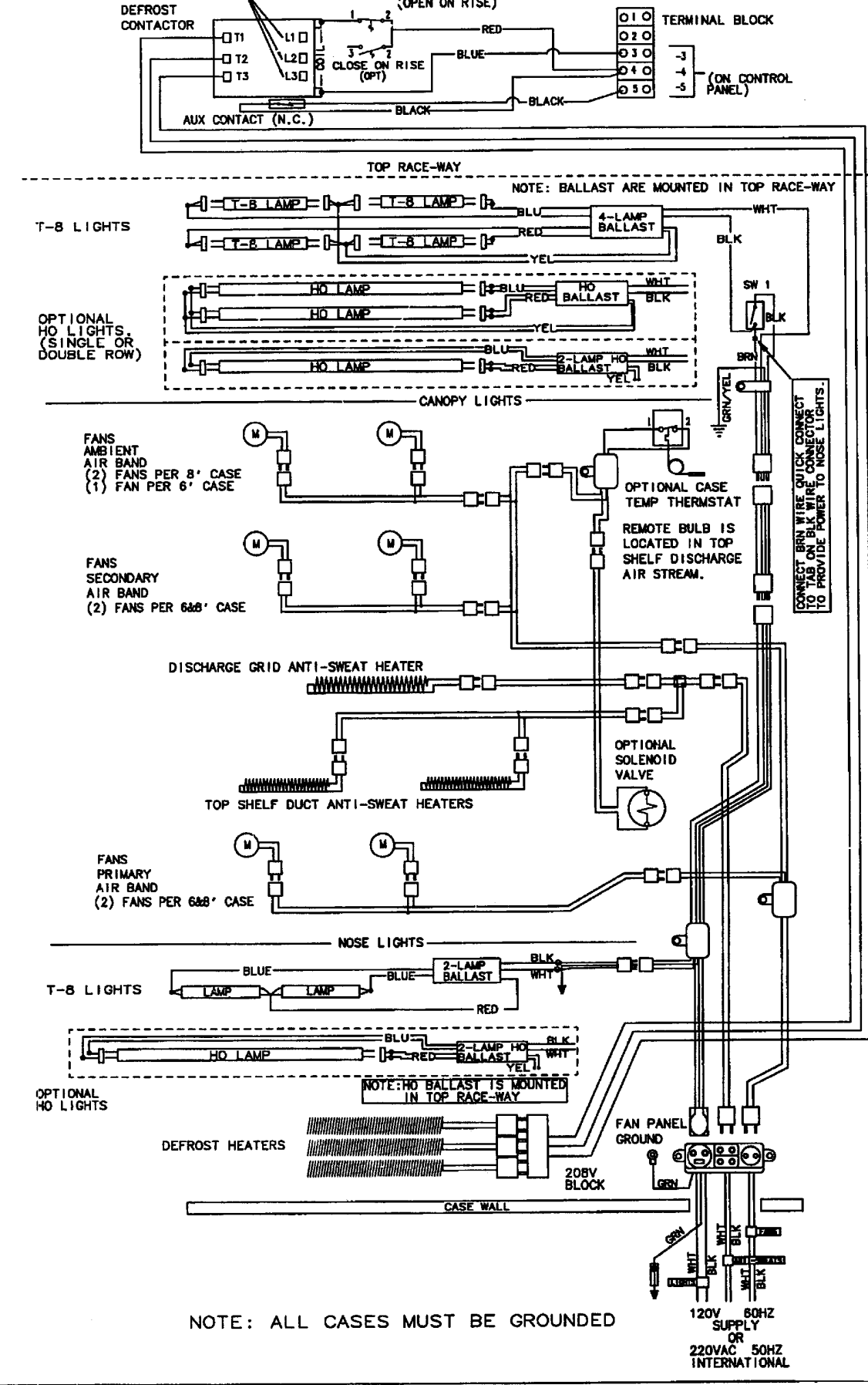
The following wiring diagrams on pages 9 thru 12 will cover the L6FA case circuits with electric defrost and gas defrost. The canopy lighting circuit is covered in the case circuit diagrams.



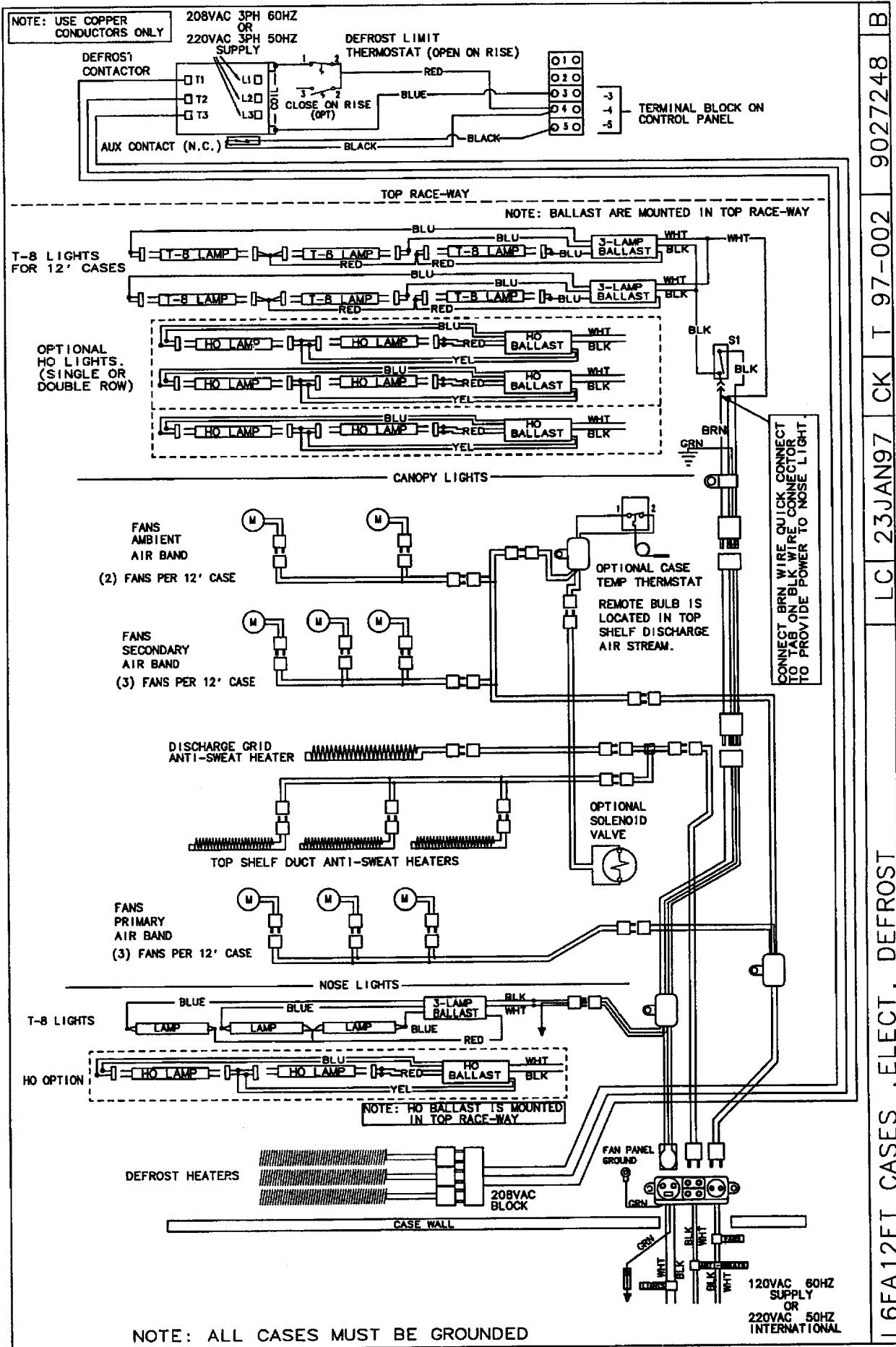
NOTE: USE COPPER CONDUCTORS ONLY

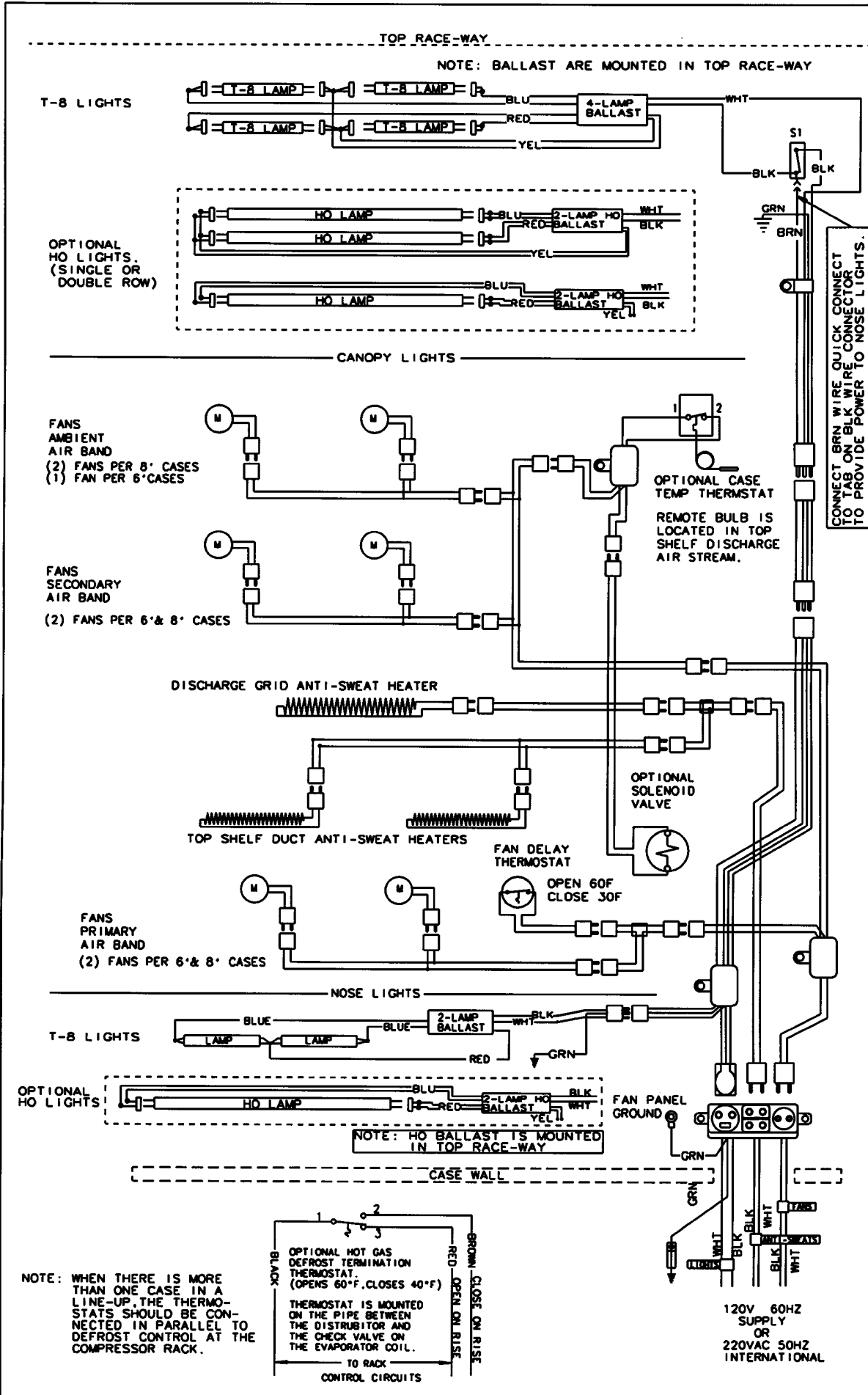
208VAC 3PH 60HZ OR 220VAC 3PH 50HZ SUPPLY

DEFROST LIMIT THERMOSTAT (OPEN ON RISE)



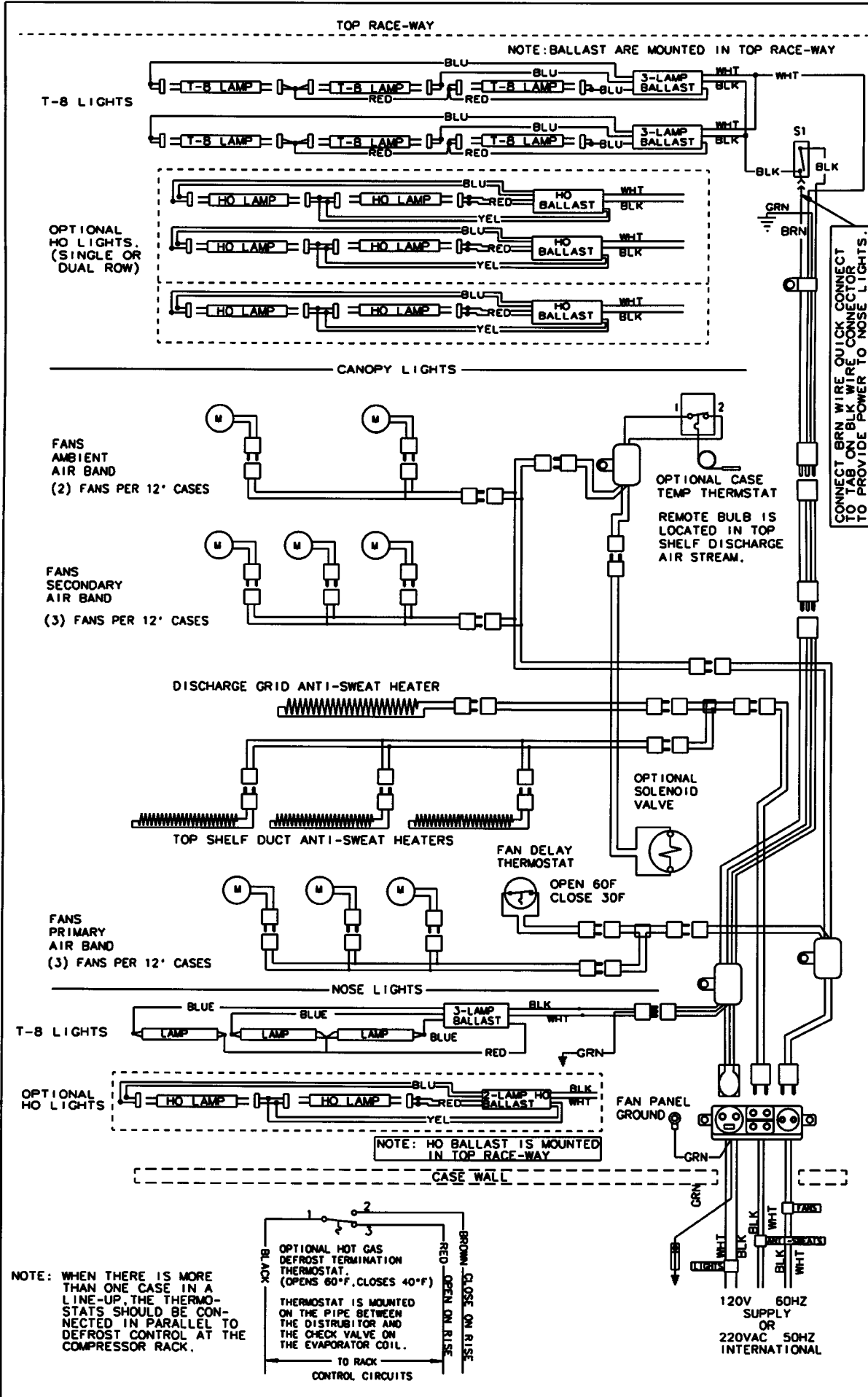
LC 23JAN97 CK T 97-002 9027247 B  
 L6FA 6&8FT CASES, ELECT. DEFROST





B  
 9027300  
 CK  
 17JUL98  
 LC  
 DEFROST  
 HOT-GAS  
 CASES, 8FT & 6L6FA

NOTE: ALL CASES MUST BE GROUNDED



9027301 B

LC 17JUL98 CK

NOTE: ALL CASES MUST BE GROUNDED

L6FA12FT CASES, HOT-GAS DEFROST

## GENERAL INFORMATION

### Night Curtains and Strip "Doors"

Night curtains and strip "doors" are available from several sources. They promote energy savings by partially closing off the front of the case. **TYLER does not promote these products**, but accepts that they are used by some.

Night curtains are to be pulled down each night. They considerably cut the refrigeration load during the night by cycling the compressor more frequently. If gas or electric defrost occurs when the curtains are down, a surplus of moisture laden air will be trapped in the refrigerated area, and deposit on product. For this reason, defrosts must be scheduled to occur when the case is open.

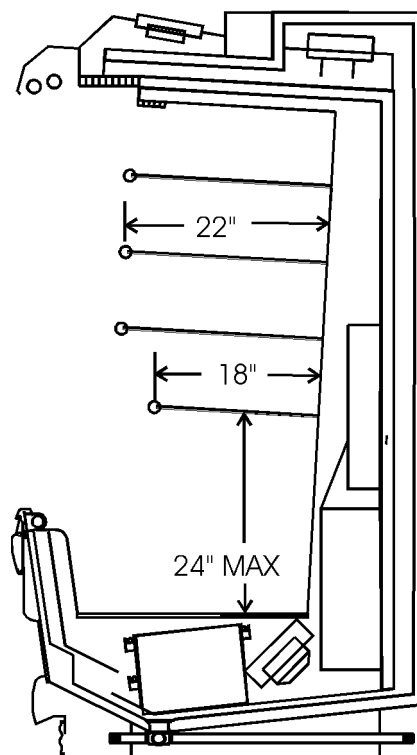
Plastic strip "doors" are permanently hung over the face of the case. The ambient air band is disconnected and plugged during installation. The refrigeration load reduction alters the system drastically. The compressor and suction line become oversized and the need for defrost time and frequency are reduced. Follow the suppliers recommendations for best results.

### Case Shelving Information

#### Case Shelving Limitations

Low temperature multi-shelf cases are particularly sensitive to air pattern changes. These changes occur if shelves are not installed or used properly.

Four full rows of shelving must be used in this case. The bottom row of shelving must be no more than 24" above the bottom tray. Shelving can consist of four rows of 22" wide shelves or three rows of 22" wide shelves and one bottom row of 18" wide shelves. **Do not use any other shelving combinations.**



#### Shelf Loading

Observe all the LOAD LINE stickers when stocking the shelves with product.

- Do not let the product spill over or go beyond these lines.
- Do not let the product cover up or block any of the air ducts.

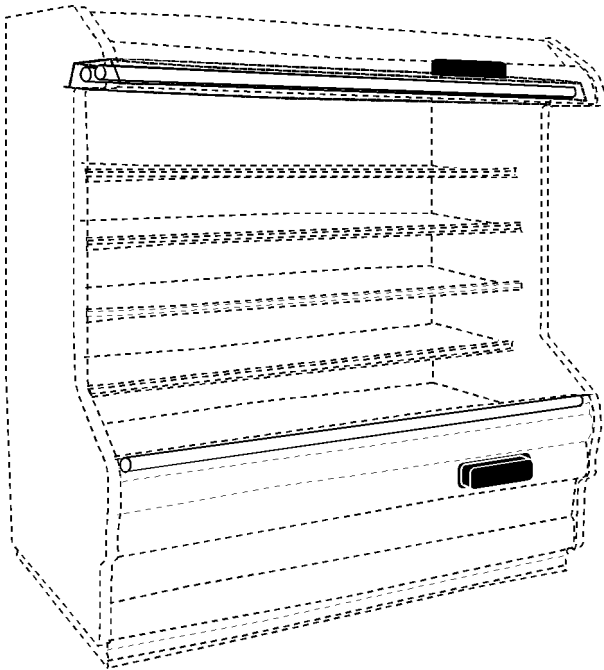
#### **CAUTION**

**Use of large signage can interfere with the proper air movement in the case. Improper air movement will alter the case temperature and could cause product loss.**

### SERVICE INSTRUCTIONS

See "General I&S Manual" for T-8 and 800MA T-12 lamp, canopy ballast, fan blade and motor, and color band and bumper replacement instructions.

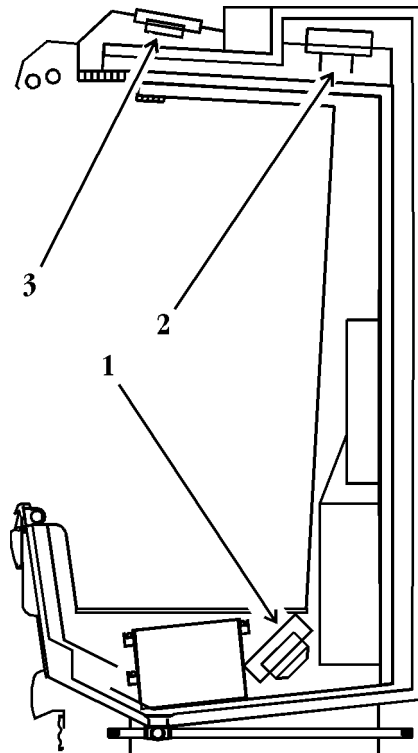
### Ballast and Lighting Locations



The canopy light ballasts are located under the canopy on the top of the canopy light channel. The nose light ballasts are under the upper front cladding. The canopy light(s) are under the canopy light channel in the top of the case. The nose light(s) are behind the bumper retainer/hand rail.

### Fan Locations

Fan assemblies are located in three locations in the L6FA. The primary fans (1) are located under the bottom trays and behind the primary condensing coil. The secondary fans (2) are located on the top rear of the case in the secondary air band. The ambient fans (3) are located on the top front of the case in the ambient air band. The ambient fans are under the filters.



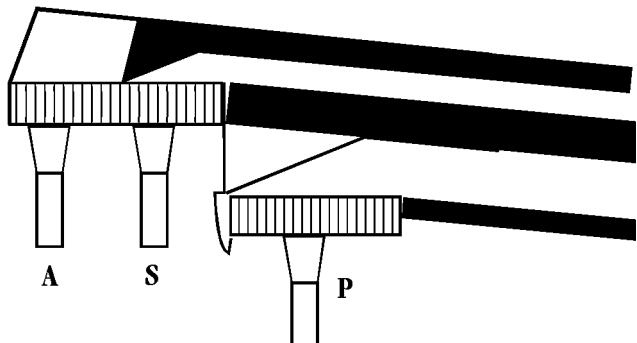
### Checking Air Velocities

**NOTE**

- Be sure area above the case is clear!
- Conditioned air must circulate above the case for the ambient air band intake!
- Do not block top ambient air band filter!

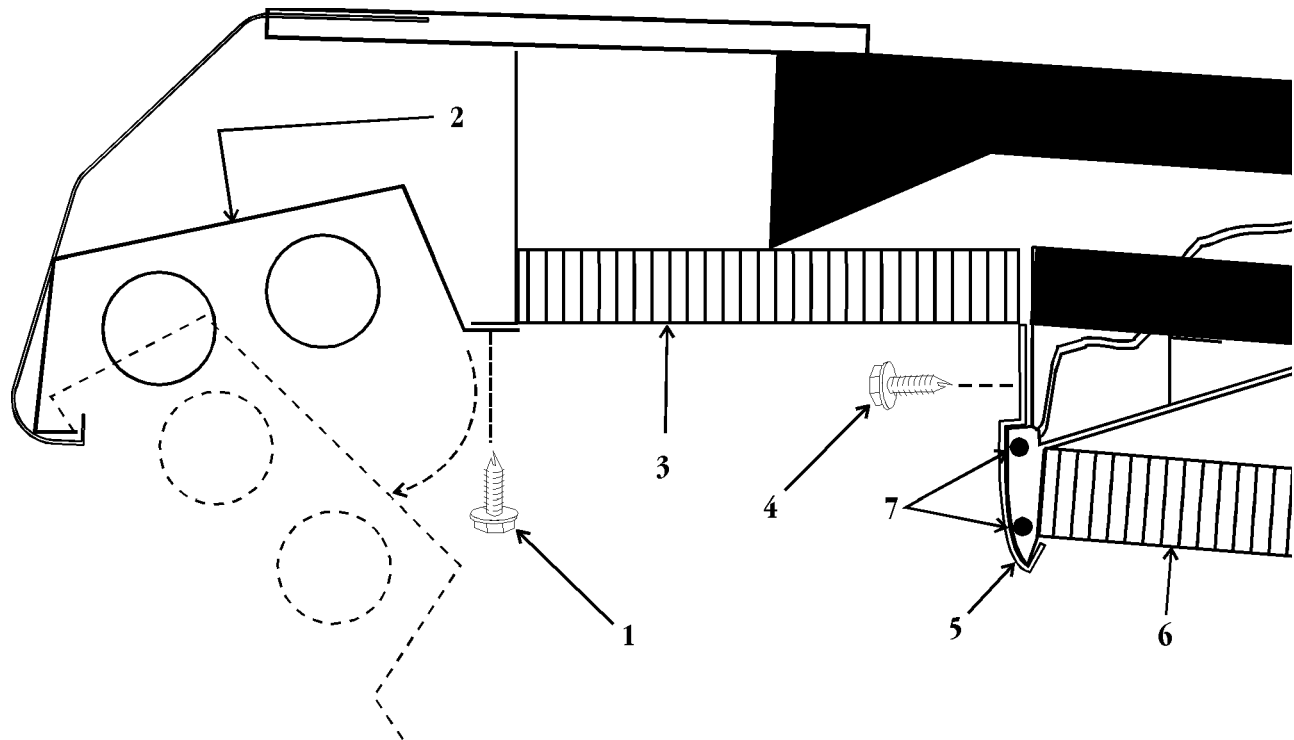
Check air velocities with an Anlor, Jr. Model 8100 Velometer with airscoop modification. Further information on the Velometer can be obtained from the TYLER Service Department.

L6FA case air velocities should be as fol-



lows:

<b>Ambient Air</b> -	400 fpm
<b>Secondary Air</b> -	500 fpm
<b>Primary Air</b> -	620 fpm (before defrost)
	720 fpm (after defrost)



### Cleaning Honeycomb

The inner honeycomb (primary) should not require cleaning. The outer honeycomb (ambient/secondary) will require cleaning. How often will depend on the amount of dust and lint in the store air.

Need for cleaning can be determined by comparing clean honeycomb air velocities with what velocities are being produced when they are checked.

#### Ambient/Secondary Honeycomb Cleaning

1. Remove screws (1), lower light channel (2) and remove outer honeycomb (3).
2. Clean outer honeycomb (3) away from the case with high pressure air or water.
3. Replace the outer honeycomb (3) and secure the light channel (2).

### Anti-Sweat Heater Replacement

#### WARNING

**Always shut off electricity to the entire case before replacing an anti-sweat heater. Electrical power to wire ends could cause personal injury and/or death.**

#### NOTE

**Anti-sweat heater wires will be still be attached. Tag and cut wires to remove front molding.**

1. Remove the screws (4) and front molding (5) and inner honeycomb (6) from the interior top of the case.
2. Tag and cut defective anti-sweat wire (7) and remove aluminum tape and wire from front molding (5). Discard aluminum tape.
3. Install new anti-sweat wire (7) in grooves in front molding (5) and cover with new aluminum tape.

- Splice the anti-sweat heater wire (7) to wire leads from the case.

### **CAUTION**

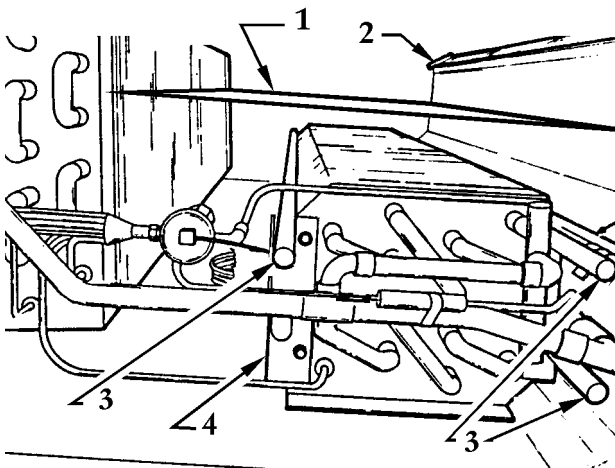
**Make sure wire leads do not get pinched by the front molding during installation. Pinched wires could short out the anti-sweat heater wire.**

- Install inner honeycomb (6) and front molding (5) and secure with screws (4).
- Restore electrical power to the case.

## **Defrost Heater Replacement**

### **WARNING**

**Always shut off electricity to the entire case before replacing a defrost heater. Automatic cycling of fans or electrical power to wire ends could cause personal injury and/or death.**

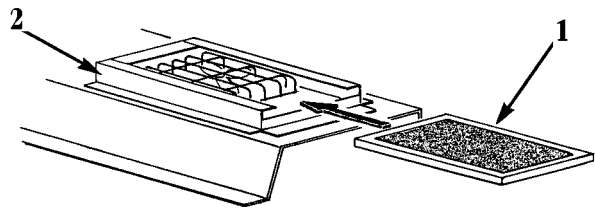


- Remove bottom trays (1) from case (2).
- Disconnect defective defrost heater (3) and remove from the defrost heater support (4) and case (2).
- Install new defrost heater (3) in reverse order.
- Restore electrical power to the case.

## **Ambient Air Filter Replacement**

Ambient air filters are located on top front of the case above each ambient fan. Replace all ambient air filters at initial start-up. Routinely inspect and replace all ambient air filters.

- To remove and inspect the air filter, slide



out ambient air filter (1) from air filter retainer (2). Inspect the ambient air filter.

- To replace the air filter, slide new ambient air filter (1) in the air filter retainer (2). Use 10' X 24" X 1" fiberglass air filters.

### **NOTE**

**Do not clean and/or reuse old filters. Poor ambient air flow will result.**

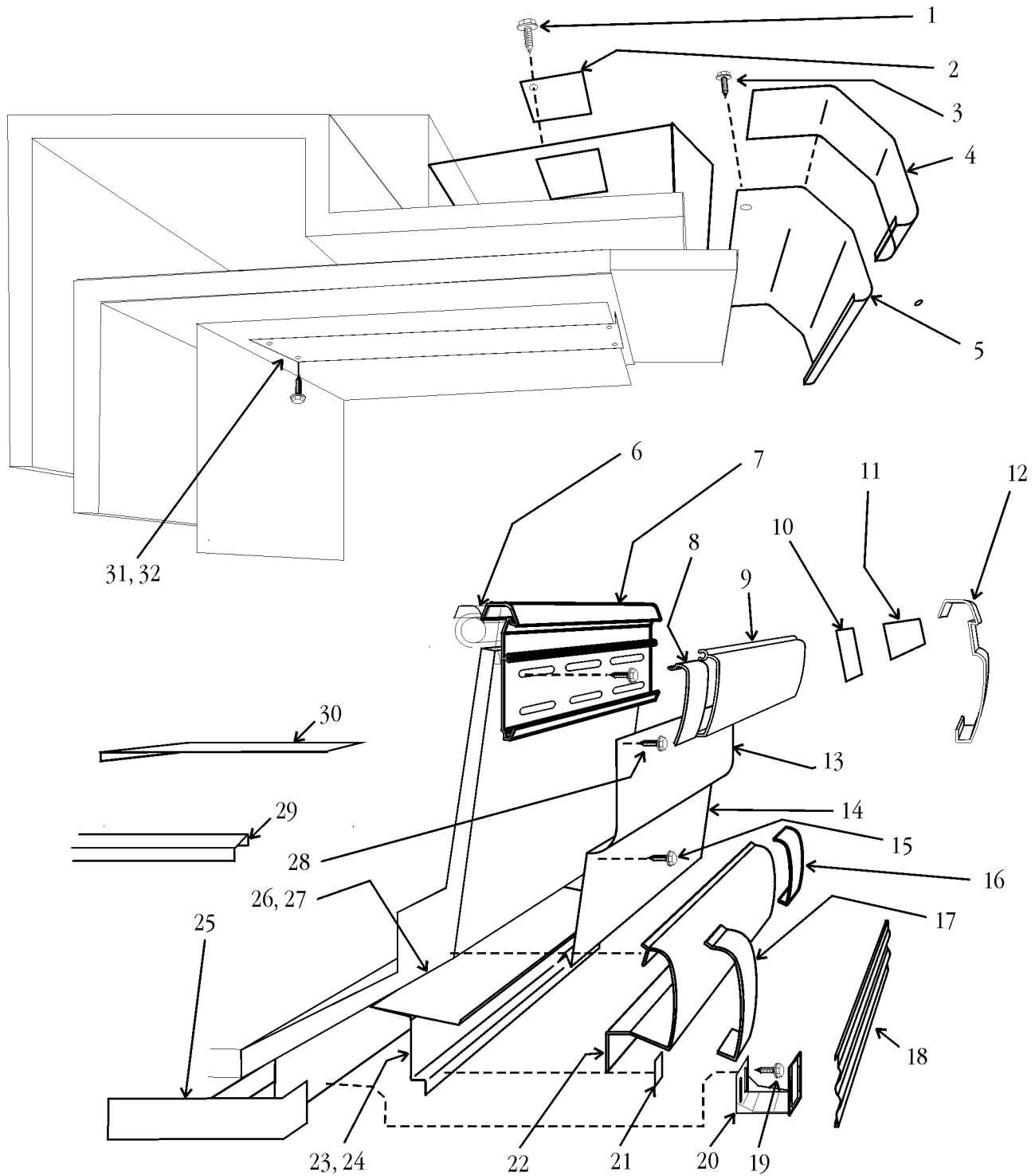


## PARTS INFORMATION

### Cladding and Trim Parts List

<u>Item</u>	<u>Description</u>	<u>6'</u>	<u>8'</u>	<u>12'</u>
1	Screw (per cover)	5183536 (3)	5183536 (3)	5183536 (3)
2	Pull-Up Angle Cover	5611559 (2)	5611559 (2)	5611559 (2)
3	Screw	5183536 (8)	5183536 (8)	5183536 (8)
4	Canopy Backer, Painted	9025983 (4)	9025983 (6)	9025983 (8)
5	Canopy Hood, Painted	9025222	9025223	9025224
6	Hand Rail Backer	9025316	9025316	9025316
7	Hand Rail/Bumper Retainer	-----	color per order	-----
8	Bumper Backer	-----	color per order	-----
9	Bumper	-----	color per order	-----
10	Color Band Backer, Painted	9040223	9040223	9040223
11	Color Band, Painted	9023795	9023798	9023800
12	Bumper End Trim	-----	color per order	-----
13	Upper Front Cladding, Painted	9025643	9025473	9025474
14	Lower Front Cladding, Painted	9025644	9025475	9025476
15	Screw	5183536 (4)	5183536(4)	5183536 (6)
16	Raceway Cover Backer	-----	color per order	-----
17	Raceway Cover End Trim	-----	color per order	-----
18	Kickplate	-----	color per order	-----
	Kickplate Backer	9041790	9041790	9041790
19	Shoulder Screw	9025833 (6)	9025833 (8)	9025833 (8)
20	Kickplate Support Assy.	9042341 (3)	9042341 (4)	9042341 (4)
21	Raceway Cover Retainer	9023841 (3)	9023841 (4)	9023841 (5)
	Screw	5183536 (9)	5183536 (12)	5183536 (15)
22	Raceway Cover	-----	color per order	-----
23	Raceway Support	9041326 (4)	9041326 (6)	9041326 (8)
24	Screw	5183536 (8)	5183536 (12)	5183536 (16)
25	LH End Close-off, Painted	9022463	9022463	9022463
	RH End Close-off, Painted	9022464	9022464	9022464
26	Raceway	9300242	9300243	9300244
27	Screw, Shoulder	9025833 (12)	9025833 (18)	9025833 (24)
28	Screws	5205439 (4)	5205439 (5)	5205439 (6)

<u>Item</u>	<u>Description</u>	<u>6'</u>	<u>8'</u>	<u>12'</u>
29	Horizontal End Trim	5190028	5190028	5190028
30	Tray Joint Trim	5187950	5187950	5187950
31	Top Shelf Duct Joint	5629694	5629694	5629694
32	Screw	5205439 (4)	5205439 (4)	5205439 (4)



**Operational Parts List**

Case Usage	Domestic			Export	
	115 Volt 60 Hertz			220 Volt 50 Hertz	
Case Size	6'	8'	12'	8'	12'
Fan Motors (ambient)	5125532 5 Watt	5125532 5 Watt	5125532 5 Watt	5202538 5 Watt	5202538 5 Watt
(secondary)	5125532 5 Watt	5125532 5 Watt	5125532 5 Watt	5202538 5 Watt	5202538 5 Watt
(primary)	5146520 23 Watt	5146520 23 Watt	5146520 23 Watt	5223696 18.3 Watt	5223696 18.3 Watt
Fan Motor Brackets (ambient)	5120098	5213132	5120098	5213132	5120098
(secondary)	5120098	5120098	5120098	5120098	5120098
(primary)	5205112	5205112	5205112	5205112	5205112
Fan Blades					
(amb.)(7.75" 22° 5B)	9040680	----	----	----	9040680
(amb.)(6" 27° 5B)	----	9023762	----	----	----
(amb.)(7.75" 20° 5B)	----	----	9023760	----	----
(amb.)(6" 30° 5B)	----	----	----	9023766	----
(sec.)(7.75" 15° 5B)	9301932	9301932	9301932	----	----
(sec.)(7.75" 18° 5B)	----	----	----	9023761	9023761
(prim.)(8.75" 25° 5B)	5984399	5984399	----	5984399	----
(prim.)(8.75" 30° 5B)	----	----	9407319	----	9407319
Fan Guard (ambient)	5063030	5063030	5063030	5063030	5063030
T-8 Electronic Ballast (canopy)	5966635	5966635	5991030	9028439	9028438
(nose)	5991029	5991029	5991030	9028437	9028438
Opt. 800MA Ballast (can./2-row)	5049140	5204769	5049140	5204859	5204859
T-8 Lampholder	5232279	5232279	5232279	5232279	5232279
800MA Lampholder (telescoping)	5614628	5614628	5614628	5614628	5614628
(stationary)	5614629	5614629	5614629	5614629	5614629
Light Switch	5100565	5100565	5100565	5100565	5100565
Electric Defrost Heater (3/case)	5216523	5199301	5199302	5199301	5199302
Special Contactor for Defrost w/Aux. Pilot Circuit - 3 Pole 40A	5109383& 5638229	5109383& 5638229	5109383& 5638229	5109383& 5638229	5109383& 5638229
Electric Def. Termination T'stat	5058480	5058480	5058480	5058480	5058480
Anti-Sweat Heater Wire					
(between sec./prim. air bands)	5216522	5088067	5088068	5088691	5088692
(in primary air band)	5216522	5124216	5124217	5124216	5124217

For information on operational parts not listed above contact the TYLER Service Parts Department.