

# TYLER

## REFRIGERATION

A division of  
Carrier Commercial Refrigeration, Inc.

### Low and Medium Temperature Narrow Depth Glass Door Display Merchandisers



**ALPINE**<sup>™</sup>  
SERIES

## INSTALLATION & SERVICE MANUAL (ISM)



For Model Numbers:

**A5FGN(T), A5FG(T)BB • A5NGN(T), A5NG(T)BB**

Manual Part no. 10000004

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found on page 32 of this manual.

Individual product ISM's are designed as supplements to Tyler's General Installation & Service Manual. Copies of current ISM's are available on the Tyler Refrigeration website in the Quick Reference section.

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## INTRODUCTION

Information contained in this manual pertains to both low-temperature and medium-temperature display merchandisers, including models:

A5FGN	A5FGNT	A5FGBB	A5FGTBB
A5FGNE	A5FGNTE	A5NGNE	A5NGNTE
A5NGN	A5NGNT	A5NGBB	A5NGTBB

The use of the name “merchandiser” and “case” are used interchangeably and have the same meaning. Also, the term “freezer” refers to the A5F series of frozen glass door merchandisers, while the term “cooler” represents the A5N medium temperature versions.

Tyler has made every effort to provide refrigeration equipment of the highest quality using state-of-the-art components. Merchandisers are built with the thickest insulation in the industry with a high-efficiency evaporator coil.

Potential case features include:

- Brushless D.C. electronic motors or PSC or shaded pole fan motors
- T8 fluorescent lamps
- LED lighting
- Standard-energy, low-energy or no-energy doors

These display cases were designed and tested using the following industry standards:

- ASHRAE Standard 72-2005 – Method of Testing Commercial Refrigerators and Freezers (ANSI Approved)
- ARI 1200- Performance Rating of Commercial Refrigerated Display Merchandisers and Storage Cabinets (ANSI Approved)
- UL 471- Commercial Refrigerators and Freezers (ANSI Approved) (equipment certified by ETL)
- NSF 7- Commercial Refrigerators and Freezers (ANSI Approved) (equipment certified by NSF)

ASHRAE 72-2005 specifies the test conditions for the equipment. It includes the ambient conditions of 75° F dry bulb and 55% RH. It also specifies the door opening requirements for the performance test. Doors are opened six times in one hour for 6 seconds. The door opening test period is for 8 hours during one 24-hour performance test. As an example a 5-door case will have 240 door openings during one 24-hour test.

Consult the factory if your store exceeds these test conditions.

### Delivery Inspection

These display cases were carefully tested in the factory, inspected and properly packed to ensure delivery in the best possible condition. The equipment should be uncrated and checked for damage immediately upon delivery. **DAMAGE MUST BE NOTED AT TIME OF DELIVERY AND ALL CLAIMS FOR DAMAGES MUST BE FILED WITH THE TRANSPORTATION COMPANY - NOT WITH TYLER.** The carrier will supply necessary report and claim forms.

### Packaging

Each case within a lineup is labeled to identify the lineup and joint. Labels use a number and letter designation (Figure 1). The number indicates the lineup. The letter indicates the case joint. Case joints begin with the letter A at the left most joint in the lineup, when looking at the front of the lineup. The joint for two cases has the same number-letter designation. Back-to-back cases have a unique designation. The leftmost joint in the lineup when looking at the front of the case is labeled 1-A. The joint on the back of the case is 1-A1.

Insulated dividers are factory installed to separate low and medium temperature cases. They are also used to join different case models. Factory installed “Plexi” glass dividers separate refrigeration circuits.

The first case in the lineup (with its right side labeled A) has a packet attached to the door handle that contains the manual, special instructions for installing ordered options, and touch up paint if the cases are custom painted. Every other case in the lineup has a packet attached to the door that contains the specific information for that case. The packing slip is taped to each case’s right hand door.

Bumpers and kickplates are shipped on top of the case. Shelves for the case are tie wrapped and blocked into the individual cases. Other accessories like, drain traps, drain pans, condensate evaporating pans, and hat channels are shipped in the case that require the parts.

Materials for joining cases include caulk, joining bolts, splices and T or J strips. These parts are supplied in cases that have a left-side insulated divider or no left end. The parts are bagged and taped to the coil covers. The T and J strips are tied to the shelves.

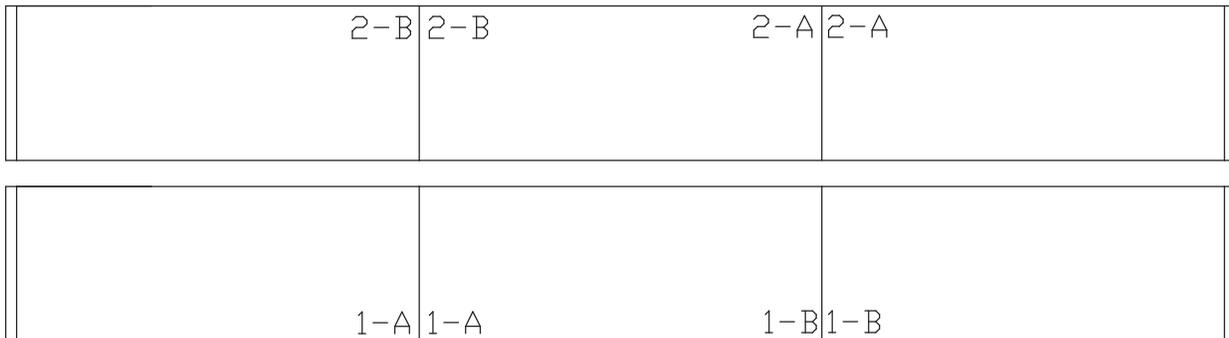
**Location**

These cases must not be installed in the direct rays of the sun or near a source of radiant heat.

Be certain that the floor under the installation is of sufficient strength to prevent sagging. Out of level conditions will result in reduced performance.

Wall merchandisers (those set with their backs to a wall)

and merchandisers set back-to-back should be positioned to allow a minimum of 2" - 4" of space behind the back of the unit(s). This will allow necessary air to circulate behind the display case(s). Higher humidity stores with minimal air circulation require a 4" gap.



FRONT OF LINEUP

CASE JOINT LABELS



FRONT OF LINEUP

BACK TO BACK CASE JOINT LABELS

**Figure 1: Case label information**

## INSTALLATION

### Leveling

Merchandisers must be installed perfectly level to allow efficient operation of the refrigeration coils and complete drainage of defrost water. Since a level area is seldom available, the following steps are recommended to insure a level installation.

1. Measure off and mark on floor the exact dimensions of the case lineup. (Check blueprints).
2. Snap a chalk line at the locations for the front and back positions of the base rails (Figure 2-A).
3. Mark locations of all joints (front and back).
4. Using a laser or transit, find the highest point along both base rail position lines. Using the high point as a reference, mark the difference directly on the floor to each joint (front and back)(Figure 2-B).
5. If you plan on using optional hat channels to raise the case height, place them under each pair of bases (Figure 3). Three and four door hat channels will be angled slightly to support the front and rear bases.
6. Place the required number of shims under each base or optional hat channel at each joint (front and back) to equal the highest point.

The A5FGN(T) and A5NGN(T) 2 through 5 door merchandisers have segmented bases mounted at the ends and under the center section of the case. Back-to-Back versions have full bases that run from front to back and are located at the ends and under the center sections of the case. The A5FGN(T)E and A5NGN(T)E crown-ends have segmented bases that run front-to-back.

7. Tape all shims in place (Figure 2-C).
8. Correctly orient the shims under the base or channel. Both corners of the base must be supported by shims to prevent the base from buckling (Figure 4).
9. Place additional support shims under all other bases or hat channels (Figures 5A, 5B & 5C).
10. If you've purchased seismic restraints, specific instructions for attaching those restraints are included in your document package. These instructions should be read and followed before the line up is assembled.

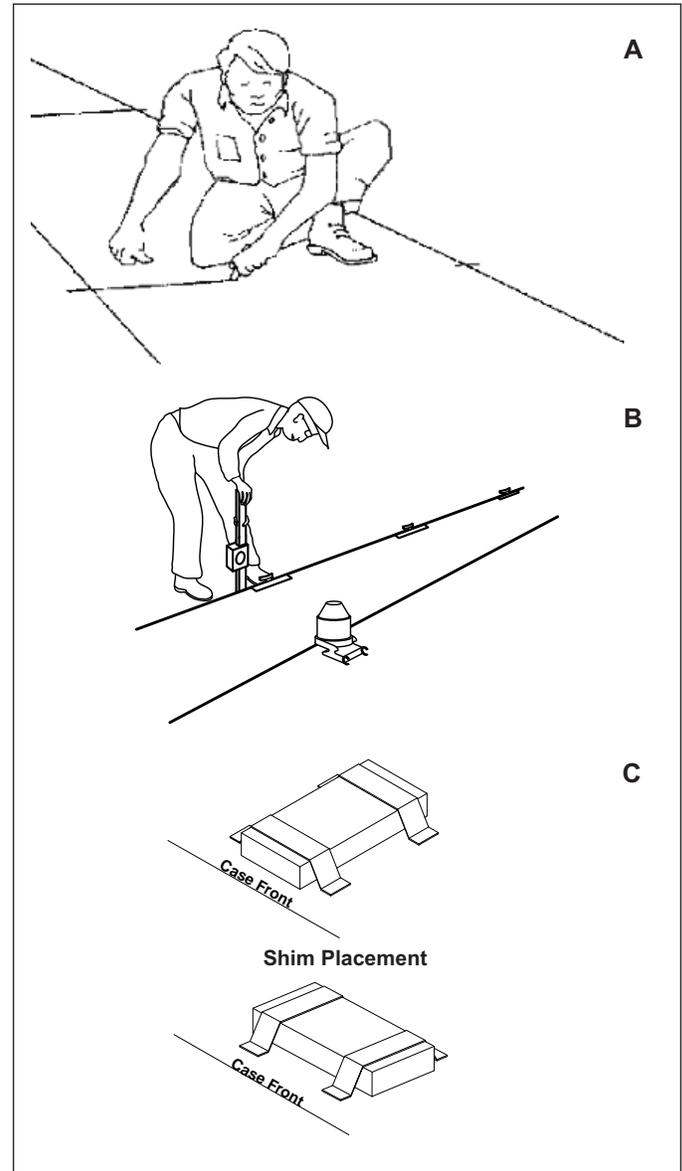


Figure 2: Leveling cases prior to joining

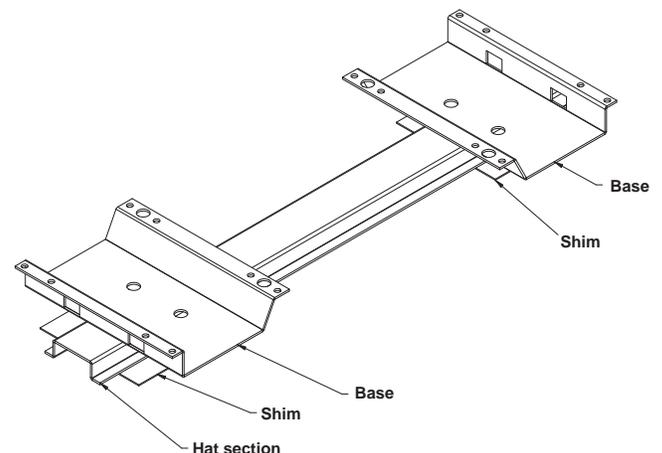
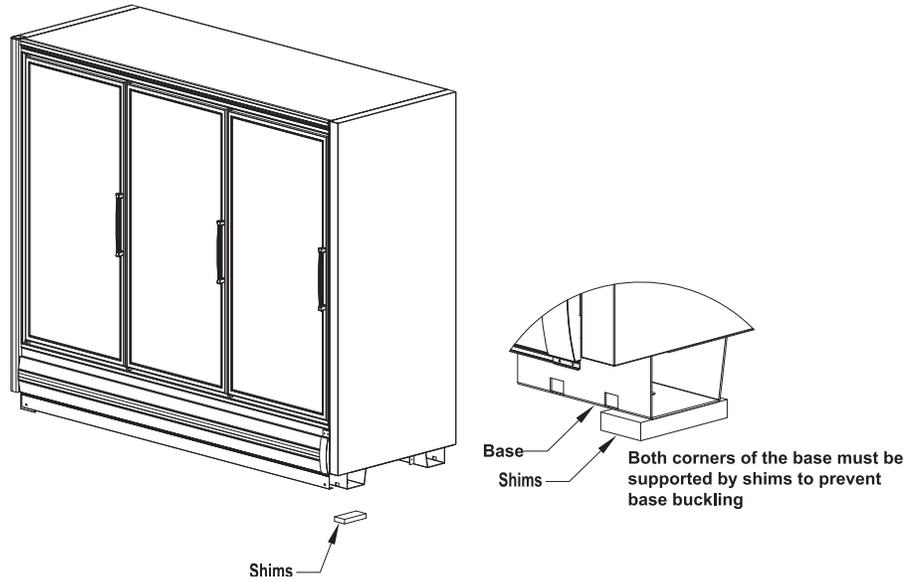
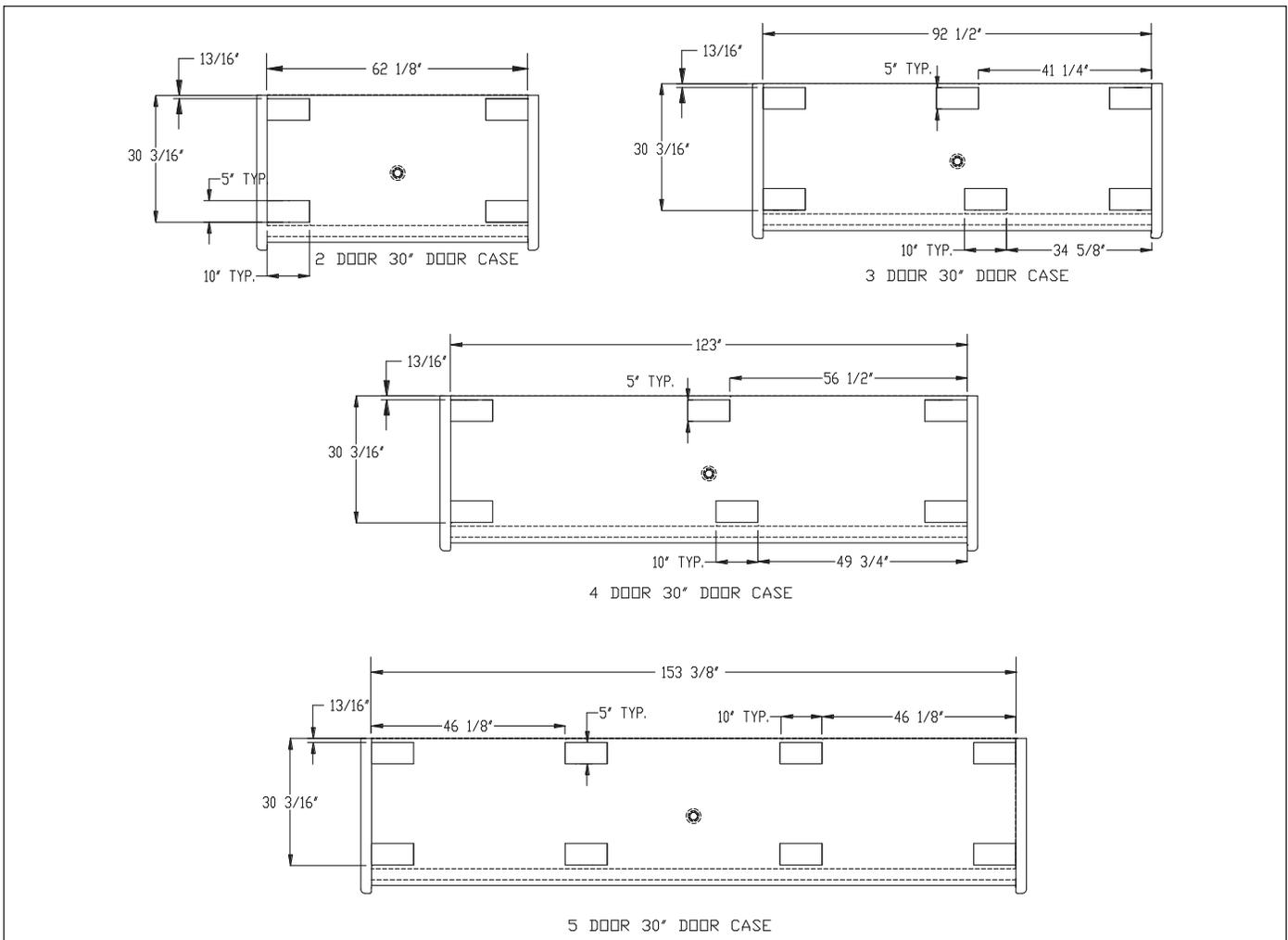


Figure 3: Typical hat channel locations

**Installation**



**Figure 4: Shims under bases and case**



**Figure 5A: Base Locations**

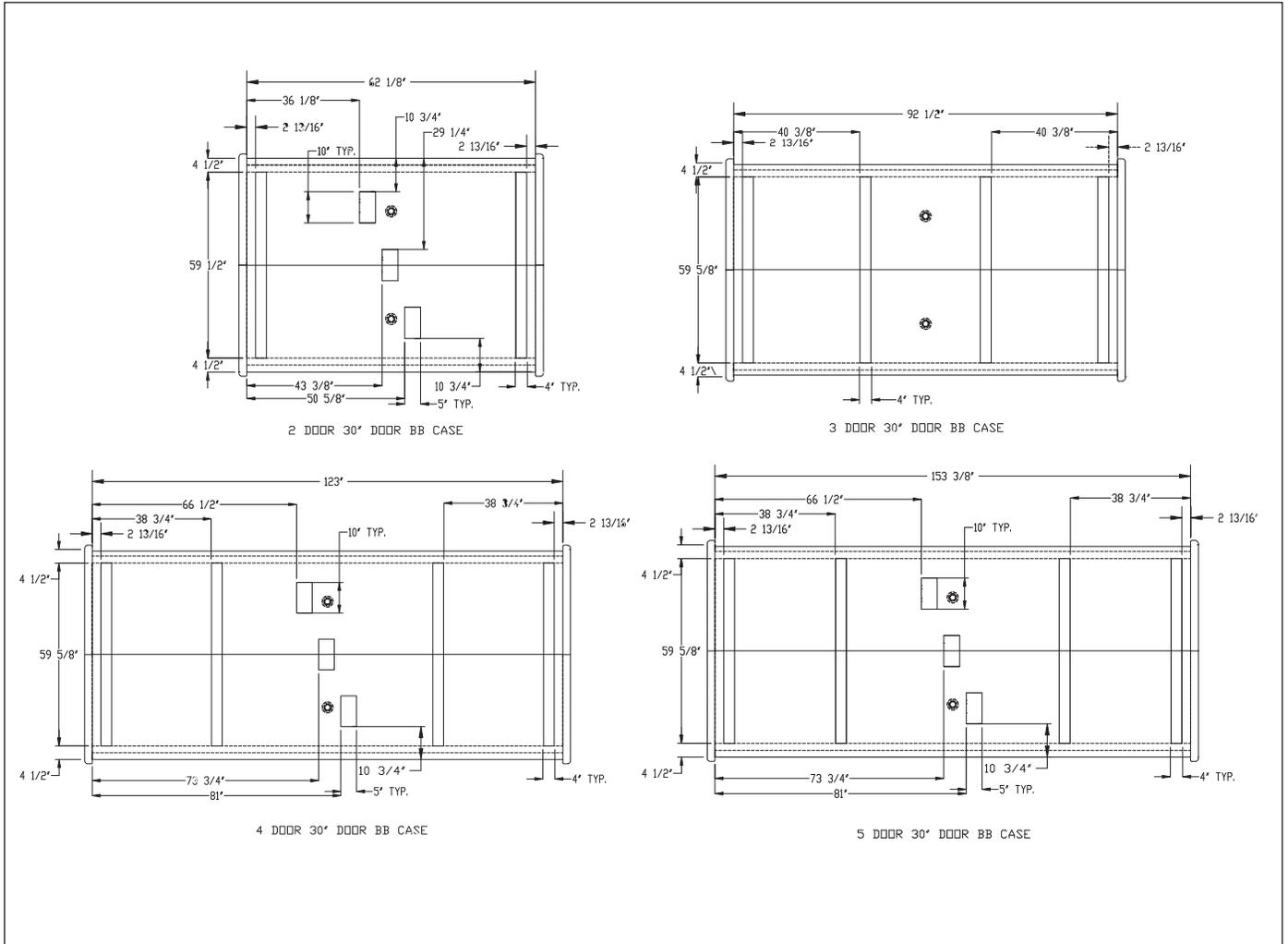


Figure 5B: Base Locations for 2-5 door back-to-backs

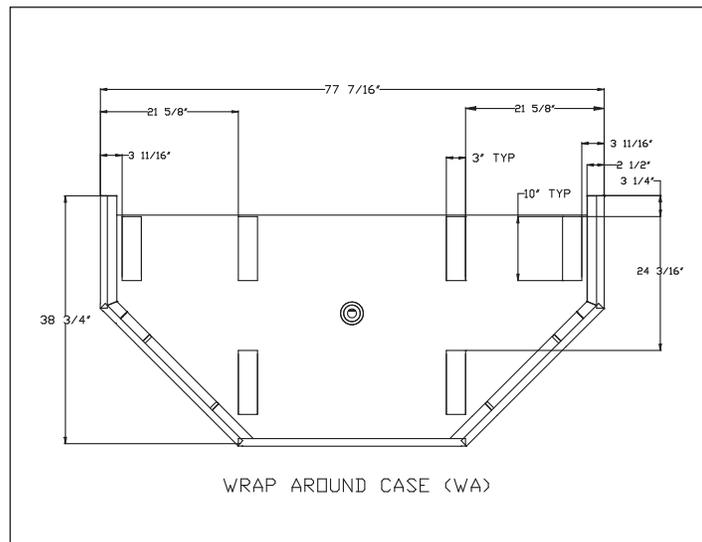


Figure 5C: Base Locations for end case

**Case Movement**

The back-to-back (BB) cases are shipped with wood planks that allow the use of pipe rollers. These wood planks should be removed after the case is moved to its final location (Figure 6).

All cases have steel protective support plates under the ends (not under insulated dividers). They are designed to protect the end from Johnson bar damage.

Use the following methods to move the cases.

Model	Fork lift from ends	Johnson bar	Furniture Dolly	Pipe Rollers	Safe (case) jacks
A5F(N)GN(T)	✓	✓	✓		✓
A5F(N)G(T)BB	✓	✓	✓	✓	✓
A5F(N)GN(T)E	✓*	✓			✓

\* Fork-lift from the rear

Care should be taken when moving the cases. The doors should be secured so they cannot open while the case is moved.

Only experienced certified fork truck drivers should use fork trucks to move the cases. The case should only be lifted off the floor as high as necessary for transport. The fork truck should be driven slowly avoiding any abrupt motions or bumps.

The following fork-lift dimensions must be maintained to avoid damaging the case when it is lifted:

**2-Door Merchandisers**

Forks must extend from 26" to no more than 30" under the case.

**3-Door Merchandisers**

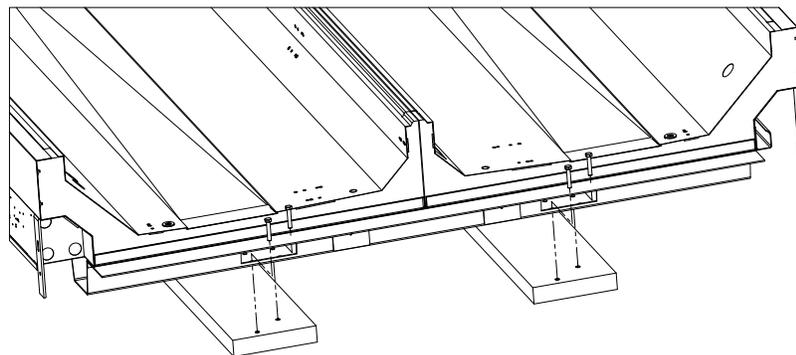
Use 48" long forks. Forks must extend from 39" to no more than 43" under the case.

**4 and 5 Door Merchandisers**

Use 48" long forks. Forks must extend from 44" to 47" under the case.

Fork blades wider than 4" will not fit into the bases.

For low shipping height applications such as the use of the optional Remote Condenser Unit (RCU), Tyler has optional expandable bases. As shipped, the base is 1-3/4" tall. It is attached with spacers that allow the base to slide away from the bottom of the case creating a gap that allows the use of a 1-1/2" thick fork-truck blade.



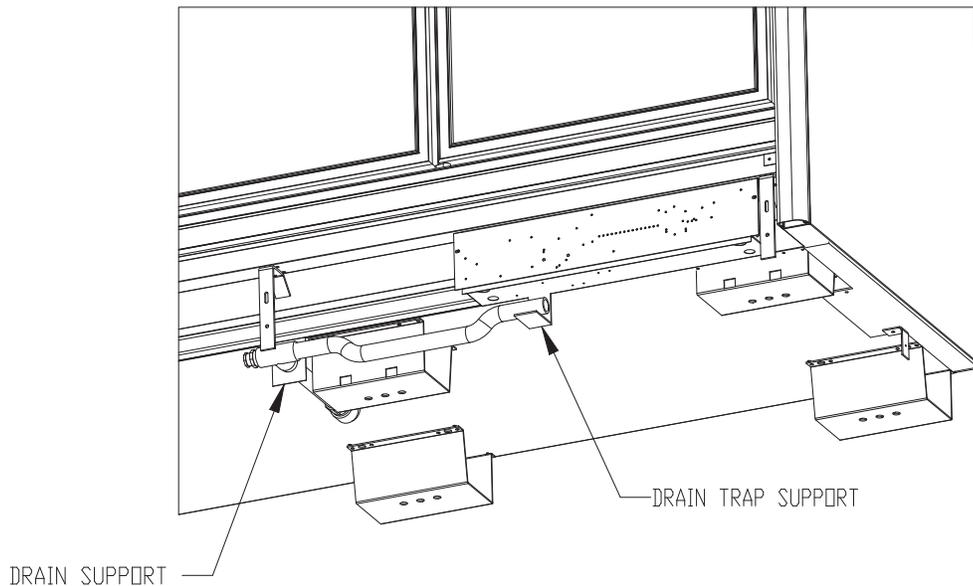
**Figure 6: Removing wood planks**

## **Drain Line**

The drain is located at the center of the case in the floor pan. The drain can be reached by removing the center coil covers and then removing a fan motor. The 1" PVC drain outlet is located at the center-front of the case behind the kickplate.

Install the tee to the outlet pipe and a drain trap to the tee. Plug the open end of the tee using the clean-out plug supplied with the drain trap kit. The drain line must be pitched away from the case. The tee, drain trap and plug are supplied with the case, and the factory installs a drain support at the front of the case. A trap support is supplied and is field mounted to the case (Figure 7).

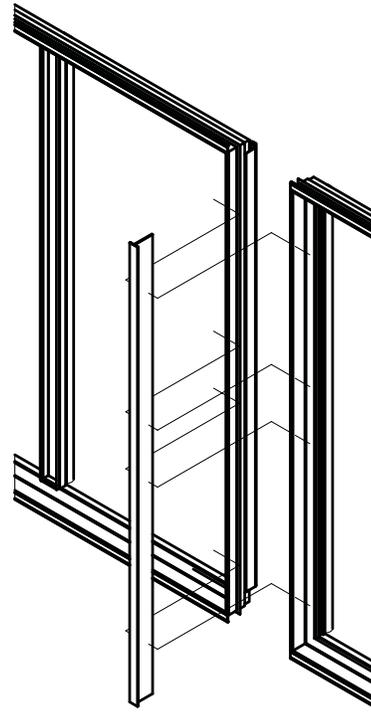
The drain trap must be level and should be primed with water after installation.



**Figure 7: Trap Support**

**Lineup Assembly**

1. Set the first case into the desired position and level it. Run a 1/4" to 3/8" diameter bead of Butyl caulk 1/2" in from both the inner and outer surfaces of the case end. (Figure 8).
2. Push the second case against the end of the first. Level the second case. Remove the left and right end-coil covers and the rectangular pocket hole covers, accessing the holes in the end frames of each case as shown. The bolt kit supplied with the cases includes diagrams of these locations. Install tee-strips between the door frames at case joints (See Figure 9). Use the special screws and nuts provided.
3. Start the joining bolts, but do not tighten them. Begin tightening the bolts at the top rear, working down the back of the case and up the front making sure that the front seams are flush.
4. For NSF case installation, the interior case seams need to be sealed using NSF approved caulk (not supplied) (Figure 10).
5. The end-panel protector support plates should be removed after the cases are set in their final position.



**Figure 9: T-Strips**

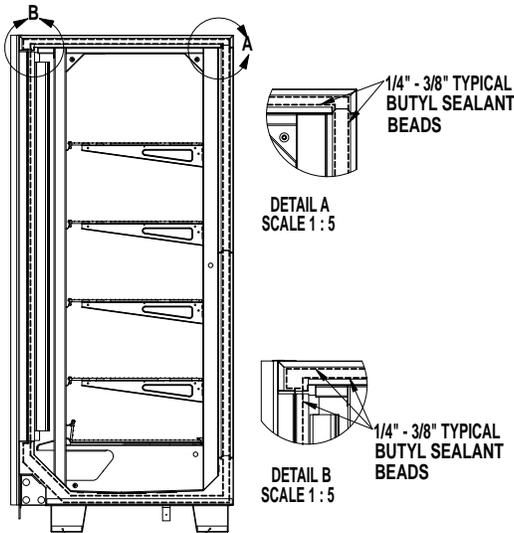
**DO NOT APPLY EXCESS AMOUNTS OF BUTYL SEALANT THAT WOULD CAUSE IT TO SQUEEZE ONTO END FRAME METAL AREAS.** Caulk-sealant used to join cases and complete the sealing requirements for NSF compliance should not come in contact with butyl sealant. Apply to clean, dry surfaces free of contaminants that adversely affect adhesion and could change color of sealant joint areas over time.

**Procedure for Joining Cases**

**These procedures are critical! Failure to follow these guidelines will result in a poorly functioning case. This is especially true of freezers.**

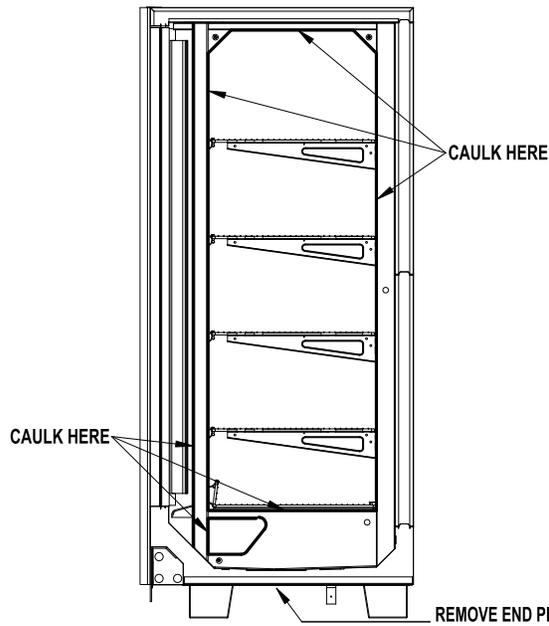
1. Apply two 1/4" to 3/8" wide beads of Butyl sealant, 1/2" in from the inside and outside edges of the foamed insulated ceiling, rear wall, base, and door frame to be joined. Apply to only one case joint to avoid excessive amounts of Butyl sealant that would squeeze out of the joint. Sealant is not applied to the structural steel end frames. After cases are joined, caulk the top and back exterior seams (if possible) at this time.

2. When joining ends of cases, caulk sealant should be applied in the same like manner for joints.



**If 4 shipping blocks are installed to inside of base ends, remove them to comply with NSF.**

**Figure 8: Caulking cases to be joined**



SURFACE TEMPERATURE SHOULD BE ABOVE 40°F  
AND FREE OF FROST.

1. Apply non-porous/non-absorbent good quality silicon caulk-sealant or (Manus Bond 75 -AM) after end panel is joined to case or when second case is joined with first case.
2. Apply solid caulk-sealant bead to areas shown to meet sealant requirements for NSF approved installations.
3. Apply small beads of sealant smoothly, but do not thin or feather excessively, because it may affect adhesion.

NOTE: Field caulk is applied continuously.

Figure does not show areas excluded for coolers

**Figure 10: Required sealing for NSF approved installations**

**Kickplate and Bumper**

A custom Tyler cart bumper is standard on all case models and is installed at the bottom front of the case. The assembly is adjustable to compensate for uneven floors.

**Installing the End Kickplate (Figure 11A)**

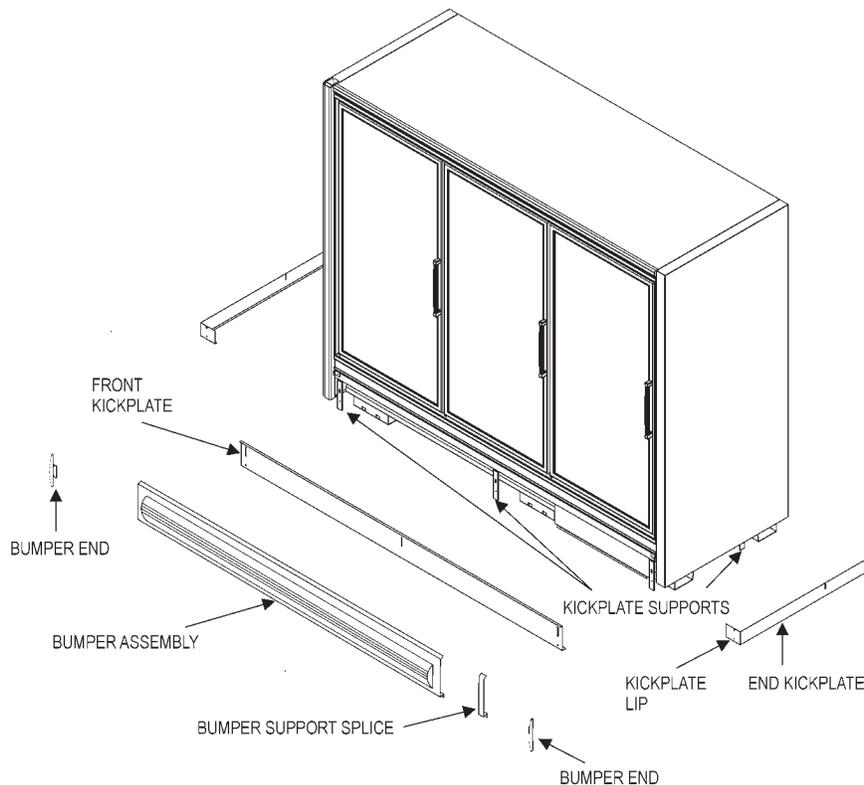
The end kickplate attaches to small brackets that are affixed to each side of the case. The kickplate can be adjusted vertically to match the height of the floor below it.

1. Attach a Tinnerman clip to the side kickplate support.
2. Place the end kickplate against the Tinnerman clip on the end kickplate support.
3. Install a black 3/4" screw through the end kickplate into the Tinnerman clip. A scratch-awl or similar tool can be used to line up the holes.
4. The front lip of the end kickplate lies behind the front kickplate and is attached with screws to the front kickplate and front-end kickplate supports.

**Installing the Front Kickplate & Bumper (Figures 11A & B)**

The front kickplate and bumper attaches using 1½" screws attached to support brackets located on the front of the case. The kickplate can be adjusted up and down to fit the height of the floor below it.

1. Starting from the left end of the lineup, attach a Tinnerman clip to each kickplate support. Locate them over the slot in the kickplate support.
2. Attach a kickplate splice to the right side of the front kickplate using the ¾" screw in the lower hole.
3. Lean the kickplate against the kickplate support.
4. Place the bumper assembly on the case by hanging the bumper support onto the bumper hanger. The kickplate should be located behind the bumper support.
5. Install the black 1½" screw through the bumper, front kickplate, kickplate splice, and into the Tinnerman clip. A scratch-awl or similar tool can be used to line up the holes.
6. Follow these steps to install the next bumper in the



**Figure 11A: Installing the bumper and kickplate**

lineup. A bumper support splice (provided) should be installed between the two cases. Center the splice over the gap using self-tapping screws (provided). Attach the upper portion of the splice using the predrilled holes in the splice. Then with two more screws, attach the lower half.

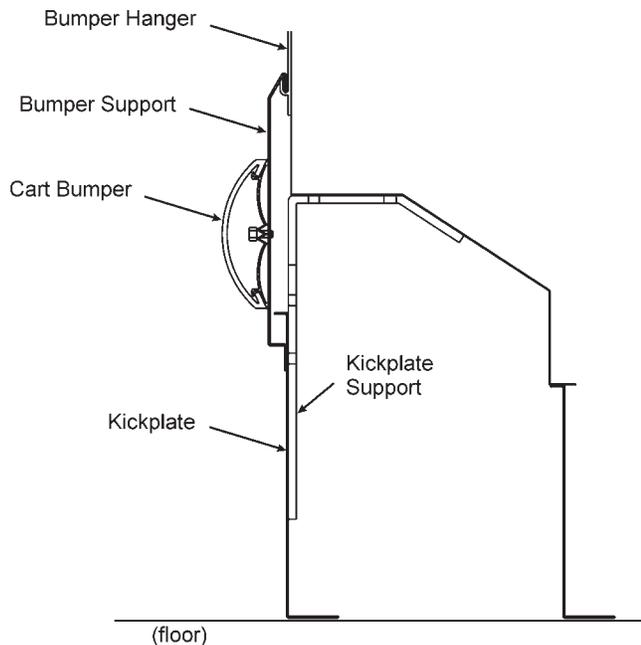


Figure 11B: Bumper and Kickplate Configuration

### Under-Case Return Airflow

To assemble the bumper for under case return airflow, a spacer (provided) must be inserted between the bumper support and kickplate (Figure 12). The spacer is held in place with the standard black assembly screw used to attach the bumper. One 3/8" spacer is required at each screw location (2 spacers on a 2-door, 3 spacers on a 3-door, etc.).

1. To ease installation, hook the bumper to the case and position the kickplate. Then pull the bottom edge of the bumper forward, hold the spacer in place, and then insert the assembly screw through the bumper, spacer, kickplate, bumper bracket and into the Tinnerman clip.
2. With the spacers in place, air will be allowed to flow between the bumper and kickplate and then underneath the case. The target airflow rate under the case should be 50 cfm/door.

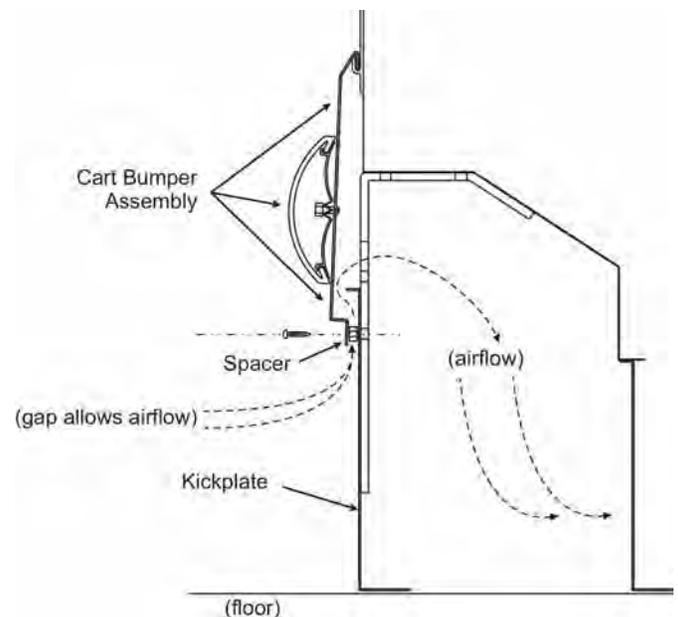


Figure 12: Bumper/Under-case air flow

## **REFRIGERATION**

### **General**

Unless otherwise specified, the liquid and suction connections are made inside the case under the evaporator fan/coil cover. Refrigerant piping may enter the case through the front left bottom, the left rear bottom of case or the left rear top of case. The copper pipe should not touch or rub on the edges of the sheet metal. After connections have been made, the refrigeration access hole in the case must be sealed completely with aerosol-dispensed Urethane insulation or equivalent (i.e.: Great Stuff). Penetrations made in sheet metal baffles should also be sealed (Figure 13).

### **Refrigerant Piping**

Correct refrigeration line sizing and installation is essential for proper system operation (see wiring diagrams on pages 16-18). A P-trap must be installed at the bottom of all vertical suction risers (Figure 14). Various risers are available as a factory installed option.

When two or more case sections are connected to one compressor, the main liquid and suction line for the group should be run through the cases and be brought out through the refrigeration outlet of one case only. The factory recommends one riser per circuit/system for hot gas defrost when using top back refrigeration exit. Circuit risers are available as a factory installed option. Insulate the tubing for at least 20 feet from the case outlet. On 30" wide door cases with suction lines over 1-3/8" diameter, a P-trap made with 45° elbows is required (Figure 14). A piping chase in front of the fan shroud allows the refrigerant lines to be run through the right or left end frame.

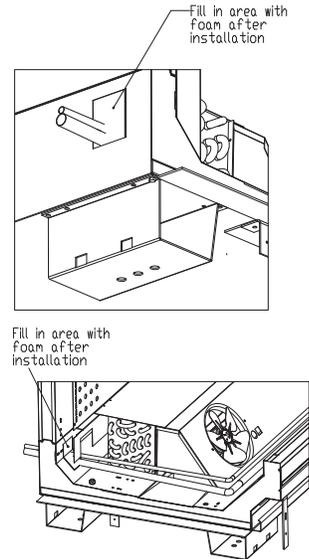
Piping should not be placed near the electric defrost heaters. The defrost heaters on the 30" door cases will grow one inch to the left of the coil when they reach operating temperature.

The compressor should be installed as close as possible to the cases to reduce pressure drop. Install a shallow trap at the bottom of the riser.

The suction and liquid lines may be taped together to form an external heat exchanger.

The best location for the liquid line drier is inside the freezing compartment. However, it may be installed near the compressor for easy maintenance. Install moisture indicating sight glass at the outlet end of the drier.

A low pressure or temperature control can be used to control case temperature. The control should be



**Figure 13: Penetration sealing**

selected with adequate contact capacity for the switching load. In rack systems, an evaporator pressure-regulating valve may be used to control the evaporating temperature.

The settings (See Figure 16) are approximate due to variations in gauge accuracy, differences in compressor efficiency, line pressure drop, and super heat settings. Before making adjustments for store or stocking conditions, make sure the super heat is set between 6°F and 10°F. Close coupled systems typically run at the higher end of this range to avoid flood back.

### **Temperature Control Adjustment**

When factory installed, the temperature control is located toward the right end of the case behind the black kick plate. The sensing bulb is located under the coil cover on the back side of the fan shroud. It can be wired in series with the low pressure (L.P.) control. It can also be used in a pump-down system by wiring it in series with the liquid solenoid valve. A thermostat is shown in Figure 15.

Discharge-air temperature probes for electronic case controllers may be installed in many different customer specified locations including, but not limited to, honeycomb, ceiling pocket cover, rear wall, and return air.

**Leak Check > Evacuation > Charging**

After all of the refrigeration piping and system components have been assembled, the entire system must be pressurized and checked for leaks.

When the system is leak free, evacuate with a deep vacuum pump. Triple evacuation to a minimum of 500 microns and nitrogen sweep is recommended. After the system has been thoroughly evacuated of all moisture and non-condensable gas, charge the system with the proper refrigerant, using “hi-side/low-side” charging techniques.

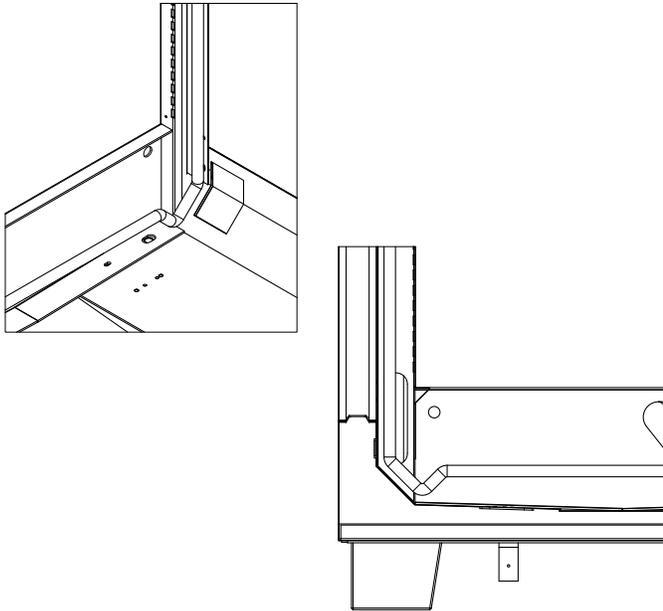


Figure 14: 45 degree elbow suction line

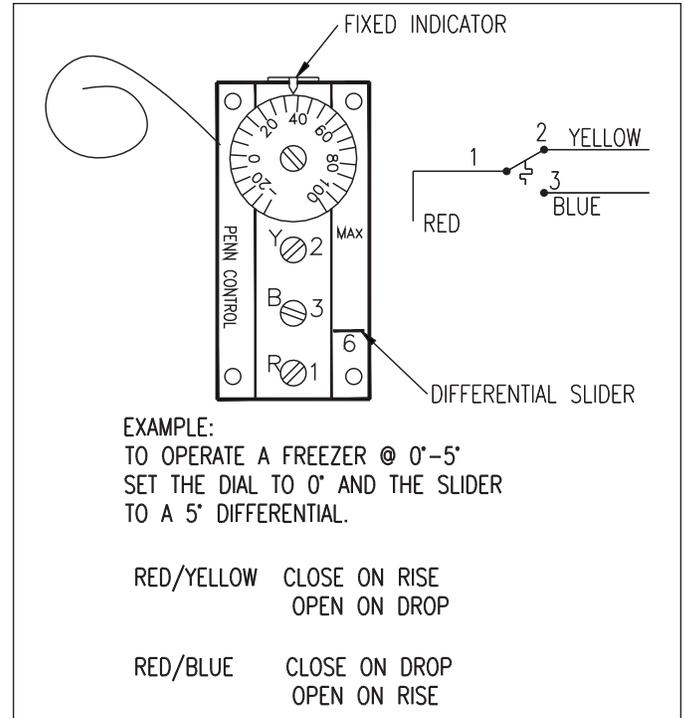


Figure 15: Temperature control

**Figure 16: Temperature Settings for R404a Refrigerant**

Application	Evaporator Temp (°F)	Condensing Unit		Discharge Air Temperature		Return Air Temperature	
		Cut-in (psig)	Cut-out (psig)	Cut-in (°F)	Cut-out (°F)	Cut-in (°F)	Cut-out (°F)
Frozen Food	-7	35	24	+3	-3	+6	0
Ice Cream	-16	27	16	-3	-12	-3	-9
Medium Temp.	+28						

Note: These set points may require optimization for your applications to prevent short-cycling or delayed cycling.

R-404a Line Sizing Tables for Tyler A5 Frozen Foods Merchandisers (-7° Evap. Temp.)

**Liquid Line Sizing - Electric Defrost\***

**Up to 50 equivalent feet**

90°F Liquid, 2°F Pressure Drop<sup>Δ</sup>

For rated Btuh:		
From	To	Liquid Line
0	7,300	1/4 <sup>†</sup>
7,310	15,000	5/16 <sup>†</sup>
15,010	27,300	3/8
27,310	64,600	1/2
64,610	122,000	5/8

**Up to 100 equivalent feet**

90°F Liquid, 2°F Pressure Drop<sup>Δ</sup>

For rated Btuh:		
From	To	Liquid Line
0	4,970	1/4 <sup>†</sup>
4,980	10,300	5/16 <sup>†</sup>
10,310	18,700	3/8
18,710	44,300	1/2
44,310	83,200	5/8

**Up to 150 equivalent feet**

90°F Liquid, 2°F Pressure Drop<sup>Δ</sup>

For rated Btuh:		
From	To	Liquid Line
0	3,960	1/4 <sup>†</sup>
3,970	8,150	5/16 <sup>†</sup>
8,160	14,900	3/8
14,910	35,500	1/2
35,510	66,700	5/8
66,710	111,000	7/8 <sup>†</sup>

**Up to 200 equivalent feet**

90°F Liquid, 2°F Pressure Drop<sup>Δ</sup>

For rated Btuh:		
From	To	Liquid Line
0	3,370	1/4 <sup>†</sup>
3,380	6,940	5/16 <sup>†</sup>
6,950	12,700	3/8
12,710	30,300	1/2
30,310	56,900	5/8
56,910	94,800	7/8 <sup>†</sup>

\* For hot gas defrost, use a liquid line one size larger than shown.

<sup>Δ</sup> For 1°F pressure drop, multiply rated Btuh by 1.45 before using the Liquid Line Sizing Table.

<sup>†</sup> Larger liquid line size may be used (such as 3/8), if preferred.

<sup>†</sup> 3/4 liquid line may be used to reduce cost.

**Liquid Correction Factors for Liquid Line Sizing Table - Use Maximum Liquid Temperature**

For maximum liquid temperatures other than 90°F, multiply rated BTU by liquid correction factor before using the Liquid Line Sizing Table.

Maximum Liquid Temperature:	40°F	50°F	60°F	70°F	80°F	90°F	100°F	110°F	120°F
Liquid Correction Factor:	0.96	0.95	0.95	0.95	0.97	1.00	1.05	1.12	1.21

**Suction Horizontal Line Sizing**

**Up to 50 equivalent feet**

90°F Liquid, 2°F Pressure Drop<sup>†</sup>

For rated Btuh:		
From	To	Horizontal
0	1,730	3/8 <sup>**</sup>
1,740	4,100	1/2 <sup>**</sup>
4,110	7,700	5/8 <sup>**</sup>
7,710	12,800	7/8 <sup>†</sup>
12,810	20,300	7/8
20,310	41,000	1-1/8
41,010	71,400	1-3/8
71,410	113,000	1-5/8

**Up to 100 equivalent feet**

90°F Liquid, 2°F Pressure Drop<sup>†</sup>

For rated Btuh:		
From	To	Horizontal
0	1,180	3/8 <sup>**</sup>
1,190	2,810	1/2 <sup>**</sup>
2,820	5,280	5/8 <sup>**</sup>
5,290	8,780	7/8 <sup>†</sup>
8,790	14,000	7/8
14,010	28,200	1-1/8
28,210	49,200	1-3/8
49,210	77,800	1-5/8

**Up to 150 equivalent feet**

90°F Liquid, 2°F Pressure Drop<sup>†</sup>

For rated Btuh:		
From	To	Horizontal
0	940	3/8 <sup>**</sup>
950	2,240	1/2 <sup>**</sup>
2,250	4,220	5/8 <sup>**</sup>
4,230	7,030	7/8 <sup>†</sup>
7,040	11,200	7/8
11,210	22,700	1-1/8
22,710	39,500	1-3/8
39,510	62,500	1-5/8
62,510	130,000	2-1/8

**Up to 200 equivalent feet**

90°F Liquid, 2°F Pressure Drop<sup>†</sup>

For rated Btuh:		
From	To	Horizontal
0	800	3/8 <sup>**</sup>
810	1,910	1/2 <sup>**</sup>
1,920	3,600	5/8 <sup>**</sup>
3,610	6,000	7/8 <sup>†</sup>
6,010	9,530	7/8
9,540	19,400	1-1/8
19,410	33,800	1-3/8
33,810	53,500	1-5/8
53,510	112,000	2-1/8

<sup>†</sup> For 1°F pressure drop, multiply rated BTU by 1.44 before using the Suction Horizontal Line Sizing Table.

<sup>\*\*</sup> Larger suction horizontal line size may be used, if preferred.

<sup>†</sup> 3/4 horizontal suction line may be used to reduce cost.

**Liquid Correction Factors for Suction Horizontal Line Sizing Table - Use Maximum Liquid Temperature**

For maximum liquid temperatures other than 90°F, multiply rated BTU by liquid correction factor before using the Liquid Line Sizing Table.

Maximum Liquid Temperature:	40°F	50°F	60°F	70°F	80°F	90°F	100°F	110°F	120°F
Liquid Correction Factor:	0.72	0.76	0.81	0.86	0.92	1.00	1.09	1.21	1.37

**Suction Vertical Riser Sizing**

**Maximum Allowable Riser Size For Adequate Oil Return\***

70°F Minimum Liquid Temperature, using 0.35 PSI Per 100 Feet (per 2006 ASHRAE Handbook - Refrigeration).

For rated Btuh:		
From	To	Vertical
1,360	2,550	1/2
2,560	4,270	5/8
4,280	6,790	5/8 <sup>†</sup>
6,800	13,900	7/8
13,910	24,300	1-1/8
24,310	38,400	1-3/8
38,410	80,000	1-5/8
80,010	142,000	2-1/8

It may be necessary to make adjustments to compensate for special situations which cause the actual Btuh to differ from the rated Btuh of the cases.

All liquid line and suction line sizes are inches, refrigeration O.D. Subject to change without notice.

\* If horizontal line size is smaller than specified vertical riser size, the smaller size may be used for both.

<sup>†</sup> 3/4 suction riser may be used to reduce pressure drop.

**Liquid Correction Factors for Suction Vertical Riser Sizing Table - Use Minimum Liquid Temperature**

Multiply rated BTU by liquid correction factor before using the Suction Vertical Riser Sizing Table.

Minimum Liquid Temperature:	40°F	50°F	60°F	70°F	80°F	90°F	100°F
Liquid Correction Factor:	0.84	0.88	0.94	1.00	1.07	1.16	1.27

**R-404a Line Sizing Tables for Tyler A5 Ice Cream Merchandisers (-16° Evap. Temp.)**

**Liquid Line Sizing - Electric Defrost\***

**Up to 50 equivalent feet**

90°F Liquid, 2°F Pressure Drop<sup>Δ</sup>

For rated Btuh:		
From	To	Liquid Line
0	7,090	1/4 <sup>†</sup>
7,100	14,600	5/16 <sup>†</sup>
14,610	26,500	3/8
26,510	62,800	1/2
62,810	117,000	5/8

**Up to 100 equivalent feet**

90°F Liquid, 2°F Pressure Drop<sup>Δ</sup>

For rated Btuh:		
From	To	Liquid Line
0	4,830	1/4 <sup>†</sup>
4,840	9,930	5/16 <sup>†</sup>
9,940	18,200	3/8
18,210	43,100	1/2
43,110	80,900	5/8

**Up to 150 equivalent feet**

90°F Liquid, 2°F Pressure Drop<sup>Δ</sup>

For rated Btuh:		
From	To	Liquid Line
0	3,850	1/4 <sup>†</sup>
3,860	7,930	5/16 <sup>†</sup>
7,940	14,500	3/8
14,510	34,500	1/2
34,510	64,800	5/8
64,810	108,000	7/8 <sup>†</sup>

**Up to 200 equivalent feet**

90°F Liquid, 2°F Pressure Drop<sup>Δ</sup>

For rated Btuh:		
From	To	Liquid Line
0	3,270	1/4 <sup>†</sup>
3,280	6,750	5/16 <sup>†</sup>
6,760	12,400	3/8
12,410	29,400	1/2
29,410	55,400	5/8
55,410	92,100	7/8 <sup>†</sup>

\* For hot gas defrost, use a liquid line one size larger than shown.

<sup>Δ</sup> For 1°F pressure drop, multiply rated Btuh by 1.45 before using the Liquid Line Sizing Table.

<sup>†</sup> Larger liquid line size may be used (such as 3/8), if preferred.

<sup>†</sup> 3/4 liquid line may be used to reduce cost.

**Liquid Correction Factors for Liquid Line Sizing Table - Use Maximum Liquid Temperature**

For maximum liquid temperatures other than 90°F, multiply rated BTU by liquid correction factor before using the Liquid Line Sizing Table.

Maximum Liquid Temperature:	40°F	50°F	60°F	70°F	80°F	90°F	100°F	110°F	120°F
Liquid Correction Factor:	0.95	0.94	0.94	0.95	0.97	1.00	1.05	1.12	1.23

**Suction Horizontal Line Sizing**

**Up to 50 equivalent feet**

90°F Liquid, 2°F Pressure Drop<sup>†</sup>

For rated Btuh:		
From	To	Horizontal
0	1,420	3/8 <sup>**</sup>
1,430	3,360	1/2 <sup>**</sup>
3,370	6,300	5/8 <sup>**</sup>
6,310	10,500	7/8 <sup>†</sup>
10,510	16,600	7/8
16,610	33,600	1-1/8
33,610	58,400	1-3/8
58,410	92,300	1-5/8

**Up to 100 equivalent feet**

90°F Liquid, 2°F Pressure Drop<sup>†</sup>

For rated Btuh:		
From	To	Horizontal
0	970	3/8 <sup>**</sup>
980	2,290	1/2 <sup>**</sup>
2,300	4,320	5/8 <sup>**</sup>
4,330	7,180	7/8 <sup>†</sup>
7,190	11,400	7/8
11,410	23,100	1-1/8
23,110	40,300	1-3/8
40,310	63,700	1-5/8
63,710	132,000	2-1/8

**Up to 150 equivalent feet**

90°F Liquid, 2°F Pressure Drop<sup>†</sup>

For rated Btuh:		
From	To	Horizontal
0	770	3/8 <sup>**</sup>
780	1,840	1/2 <sup>**</sup>
1,850	3,450	5/8 <sup>**</sup>
3,460	5,750	7/8 <sup>†</sup>
5,760	9,120	7/8
9,130	18,600	1-1/8
18,610	32,400	1-3/8
32,410	51,200	1-5/8
51,210	107,000	2-1/8

**Up to 200 equivalent feet**

90°F Liquid, 2°F Pressure Drop<sup>†</sup>

For rated Btuh:		
From	To	Horizontal
0	660	3/8 <sup>**</sup>
670	1,560	1/2 <sup>**</sup>
1,570	2,950	5/8 <sup>**</sup>
2,960	4,910	7/8 <sup>†</sup>
4,920	7,790	7/8
7,800	15,900	1-1/8
15,910	27,700	1-3/8
27,710	43,800	1-5/8
43,810	91,000	2-1/8

<sup>†</sup> For 1°F pressure drop, multiply rated BTU by 1.44 before using the Suction Horizontal Line Sizing Table.

<sup>\*\*</sup> Larger suction horizontal line size may be used, if preferred.

<sup>†</sup> 3/4 horizontal suction line may be used to reduce cost.

**Liquid Correction Factors for Suction Horizontal Line Sizing Table - Use Maximum Liquid Temperature**

For maximum liquid temperatures other than 90°F, multiply rated BTU by liquid correction factor before using the Liquid Line Sizing Table.

Maximum Liquid Temperature:	40°F	50°F	60°F	70°F	80°F	90°F	100°F	110°F	120°F
Liquid Correction Factor:	0.72	0.76	0.80	0.86	0.92	1.00	1.10	1.22	1.38

**Suction Vertical Riser Sizing**

**Maximum Allowable Riser Size For Adequate Oil Return\***

70°F Minimum Liquid Temperature, using 0.35 PSI Per 100 Feet (per 2006 ASHRAE Handbook - Refrigeration).

For rated Btuh:		
From	To	Vertical
1,210	2,280	1/2
2,290	3,810	5/8
3,820	6,050	5/8 <sup>†</sup>
6,060	12,400	7/8
12,410	21,600	1-1/8
21,610	34,300	1-3/8
34,310	71,300	1-5/8
71,310	127,000	2-1/8

It may be necessary to make adjustments to compensate for special situations which cause the actual Btuh to differ from the rated Btuh of the cases.

All liquid line and suction line sizes are inches, refrigeration O.D. Subject to change without notice.

\* If horizontal line size is smaller than specified vertical riser size, the smaller size may be used for both.

<sup>†</sup> 3/4 suction riser may be used to reduce pressure drop.

**Liquid Correction Factors for Suction Vertical Riser Sizing Table - Use Minimum Liquid Temperature**

Multiply rated BTU by liquid correction factor before using the Suction Vertical Riser Sizing Table.

Minimum Liquid Temperature:	40°F	50°F	60°F	70°F	80°F	90°F	100°F
Liquid Correction Factor:	0.83	0.88	0.94	1.00	1.08	1.17	1.28

R-404a Line Sizing Tables for Tyler A5 Medium Temp. Merchandisers (+28° Evap. Temp.)

**Liquid Line Sizing**

Up to 50 equivalent feet

90°F Liquid, 2°F Pressure Drop<sup>Δ</sup>

For rated Btuh:		
From	To	Liquid Line
0	2,750	3/16 <sup>+</sup>
2,760	8,050	1/4 <sup>+</sup>
8,060	16,600	5/16 <sup>+</sup>
16,610	30,100	3/8
30,110	71,200	1/2

Up to 100 equivalent feet

90°F Liquid, 2°F Pressure Drop<sup>Δ</sup>

For rated Btuh:		
From	To	Liquid Line
0	1,870	3/16 <sup>+</sup>
1,880	5,480	1/4 <sup>+</sup>
5,490	11,300	5/16 <sup>+</sup>
11,310	20,600	3/8
20,610	48,800	1/2
48,810	91,700	5/8

Up to 150 equivalent feet

90°F Liquid, 2°F Pressure Drop<sup>Δ</sup>

For rated Btuh:		
From	To	Liquid Line
0	1,480	3/16 <sup>+</sup>
1,490	4,360	1/4 <sup>+</sup>
4,370	8,990	5/16 <sup>+</sup>
9,000	16,500	3/8
16,510	39,100	1/2
39,110	73,500	5/8

Up to 200 equivalent feet

90°F Liquid, 2°F Pressure Drop<sup>Δ</sup>

For rated Btuh:		
From	To	Liquid Line
0	1,260	3/16 <sup>+</sup>
1,270	3,710	1/4 <sup>+</sup>
3,720	7,660	5/16 <sup>+</sup>
7,670	14,000	3/8
14,010	33,400	1/2
33,410	62,800	5/8

<sup>Δ</sup> For 1°F pressure drop, multiply rated Btuh by 1.45 before using the Liquid Line Sizing Table.

<sup>+</sup> Larger liquid line size may be used (such as 3/8), if preferred.

**Liquid Correction Factors for Liquid Line Sizing Table - Use Maximum Liquid Temperature**

For maximum liquid temperatures other than 90°F, multiply rated Btuh by liquid correction factor before using the Liquid Line Sizing Table

Maximum Liquid Temperature:	40°F	50°F	60°F	70°F	80°F	90°F	100°F	110°F	120°F
Liquid Correction Factor:	0.98	0.97	0.96	0.97	0.98	1.00	1.04	1.09	1.17

**Suction Horizontal Line Sizing**

Up to 50 equivalent feet

90°F Liquid, 2°F Pressure Drop<sup>†</sup>

For rated Btuh:		
From	To	Horizontal
0	1,970	5/16 <sup>**</sup>
1,980	3,580	3/8
3,590	8,460	1/2
8,470	15,900	5/8
15,910	26,300	7/8 <sup>†</sup>
26,310	41,600	7/8
41,610	84,000	1-1/8

Up to 100 equivalent feet

90°F Liquid, 2°F Pressure Drop<sup>†</sup>

For rated Btuh:		
From	To	Horizontal
0	1,350	5/16 <sup>**</sup>
1,360	2,450	3/8
2,460	5,810	1/2
5,820	10,900	5/8
10,910	18,100	7/8 <sup>†</sup>
18,110	28,700	7/8
28,710	58,000	1-1/8

Up to 150 equivalent feet

90°F Liquid, 2°F Pressure Drop<sup>†</sup>

For rated Btuh:		
From	To	Horizontal
0	1,080	5/16 <sup>**</sup>
1,090	1,960	3/8
1,970	4,650	1/2
4,660	8,740	5/8
8,750	14,600	7/8 <sup>†</sup>
14,610	23,100	7/8
23,110	46,700	1-1/8
46,710	81,300	1-3/8

Up to 200 equivalent feet

90°F Liquid, 2°F Pressure Drop<sup>†</sup>

For rated Btuh:		
From	To	Horizontal
0	920	5/16 <sup>**</sup>
930	1,670	3/8
1,680	3,970	1/2
3,980	7,470	5/8
7,480	12,500	7/8 <sup>†</sup>
12,510	19,700	7/8
19,710	40,000	1-1/8
40,010	69,600	1-3/8

<sup>†</sup> For 1°F pressure drop, multiply rated Btuh by 1.44 before using the Suction Horizontal Line Sizing Table.

<sup>\*\*</sup> Larger suction horizontal line size may be used, if preferred.

<sup>†</sup> 3/4 horizontal suction line may be used to reduce cost.

**Liquid Correction Factors for Suction Horizontal Line Sizing Table - Use Maximum Liquid Temperature**

For maximum liquid temperatures other than 90°F, multiply rated Btuh by liquid correction factor before using the Suction Horizontal Line Sizing Table

Maximum Liquid Temperature:	40°F	50°F	60°F	70°F	80°F	90°F	100°F	110°F	120°F
Liquid Correction Factor:	0.74	0.78	0.82	0.87	0.93	1.00	1.08	1.19	1.32

**Suction Vertical Riser Sizing**

Maximum Allowable Riser Size For Adequate Oil Return\*

70°F Minimum Liquid Temperature, using 0.35 PSI Per 100 Feet (per 2006 ASHRAE Handbook - Refrigeration)

For rated Btuh:		
From	To	Vertical
480	880	5/16
890	2,090	3/8
2,100	3,950	1/2
3,960	6,590	5/8
6,600	10,500	5/8 <sup>†</sup>
10,510	21,300	7/8
21,310	37,300	1-1/8
37,310	59,100	1-3/8

It may be necessary to make adjustments to compensate for special situations which cause the actual Btuh to differ from the rated Btuh of the cases.

All liquid line and suction line sizes are inches, refrigeration O.D. Subject to change without notice.

\* If horizontal line size is smaller than specified vertical riser size, the smaller size may be used for both.

<sup>†</sup> 3/4 suction riser may be used to reduce pressure drop.

**Liquid Correction Factors for Suction Vertical Riser Sizing Table - Use Minimum Liquid Temperature**

Multiply rated Btuh by liquid correction factor before using the Suction Vertical Riser Sizing Table

Minimum Liquid Temperature:	40°F	50°F	60°F	70°F	80°F	90°F	100°F
Liquid Correction Factor:	0.85	0.89	0.94	1.00	1.07	1.15	1.24

## ELECTRICAL

### CAUTION !

#### **DISCONNECT POWER TO THE CASE BEFORE SERVICING ELECTRICAL COMPONENTS TO AVOID PERSONAL INJURY AND DAMAGE TO THE UNIT.**

Figure 17 shows the typical wiring diagram for a freezer equipped with electric defrost, Figure 18 shows the typical wiring diagram for a freezer equipped with hot gas defrost, and Figure 19 shows a medium-temperature cooler with time-off defrosting. Each case ships with a wiring diagram located in the electric box that shows the exact wiring of the case.

There are many control options available for multiple case defrost systems. Wiring diagrams and instructions can be obtained by contacting the Tyler Refrigeration Service Department.

External wiring should be sized according to the amperage rating stamped on the serial plate. The serial plate is located on the ceiling inside the left-hand door. Typical electrical values are shown on specification sheets for each of these cases in the bag attached to the case or are available at the Tyler Refrigeration website ([www.carrier-tyler.com](http://www.carrier-tyler.com)). All internal wiring has been completed at the factory. Cases with standard wiring have their control wires terminated in the electrical compartment located behind the kickplate at the right end of the case. A terminal block has been used to simplify field connections. An electrical box is mounted on the top of the unit for cases equipped with the optional top mount electrical connections.

All wiring must comply with the National Electrical Code and all local codes. After installation of the equipment, correct operation of the electrical circuits and controls and defrost operation and termination should be verified. All operating voltages and amperages should be measured and recorded.

### **Optional Electrical Wiring**

#### **Master-Satellite Connection**

The “master-satellite” connection system allows one condensing unit to be connected to multiple cases. Figures 20 and 21 shows typical diagrams for this system.

All of the display case controls including the disconnect switch, time clock, temperature control, and defrost temperature control are installed behind the kick plate and pre-wired. The liquid line solenoid is pre-wired but

is not installed in the liquid line.

The power to operate each display case is connected at each cases’ disconnect switch. The power to operate the condensing unit is connected at the condensing unit. There are no interconnecting wires between the condensing unit and display case. There are interconnecting wires that need to be connected between the cases. The liquid line solenoid valve needs to be installed in the common liquid line before the liquid is distributed to the cases.

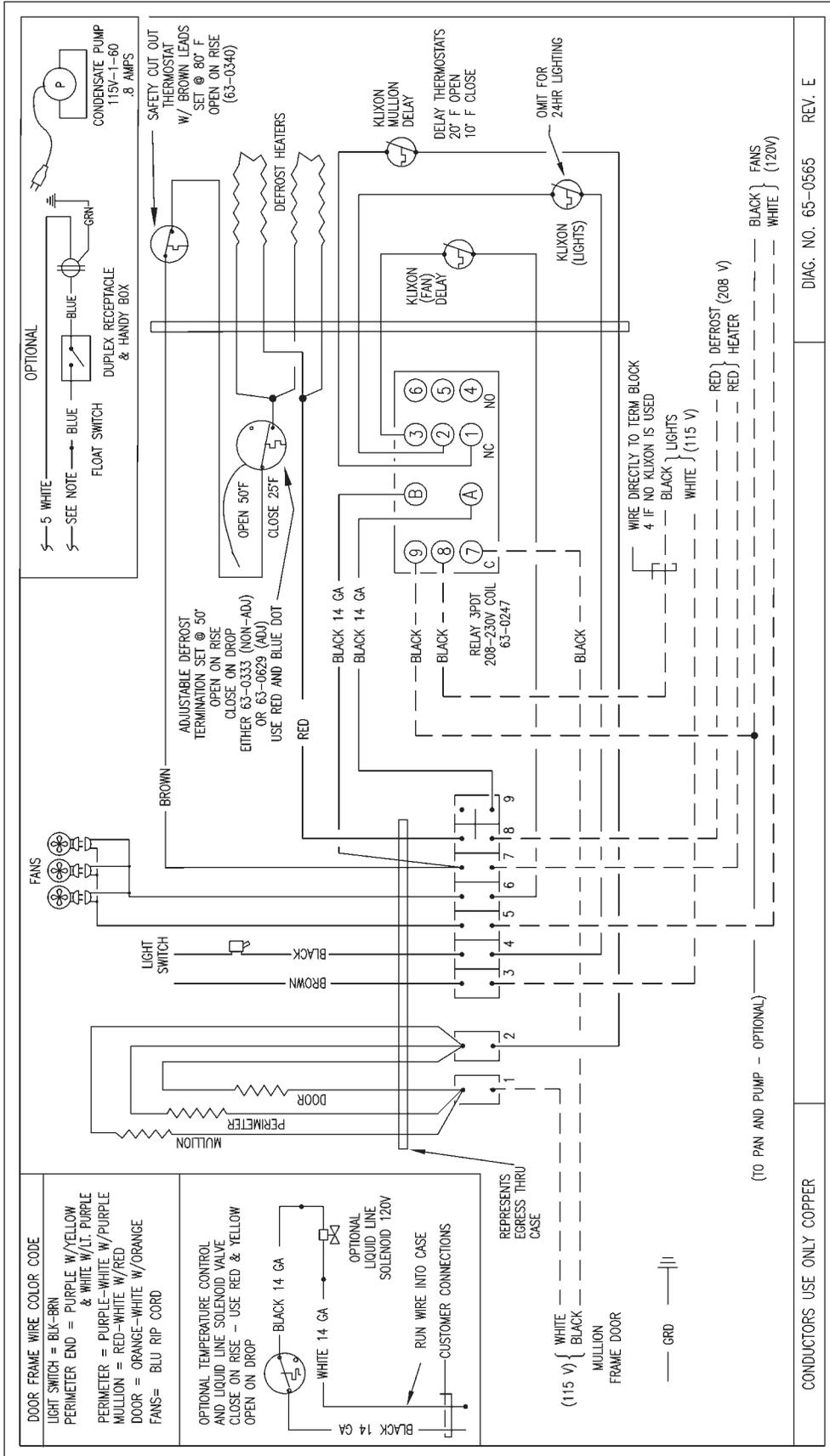
The controls operate the system as a pump down defrost. When the display case begins defrost, the liquid line solenoid valve, fans and anti-sweat heaters are de-energized. The defrost heaters are energized. The compressor continues to run and pumps down the coil.

The master case contains the time clock. Interconnecting case wiring allows the master case to control the satellite cases. When defrost is initiated in the master case, it sends an electrical signal to each satellite case to energize the defrost relay and initiate a defrost in all of the cases. A second set of interconnecting wires are connected in series between each of the cases. Each case defrost heater is de-energized when the coil reaches the defrost termination temperature. An additional signal is relayed to the next case indicating that the termination temperature has been reached. When all of the cases have reached termination temperature, the defrost termination circuit is complete and the defrost is terminated.

The liquid line solenoid is energized at the end of the defrost cycle and the defrost heaters are de-energized. The suction line pressure rises and the compressor starts. When the evaporator reaches operating temperature, the delay thermostat (klixons) will close, energizing the fans and anti-sweat door heaters.

# Wiring Diagram

## Figure 17: Electric Defrost A5FGN(T), A5FG(T)BB

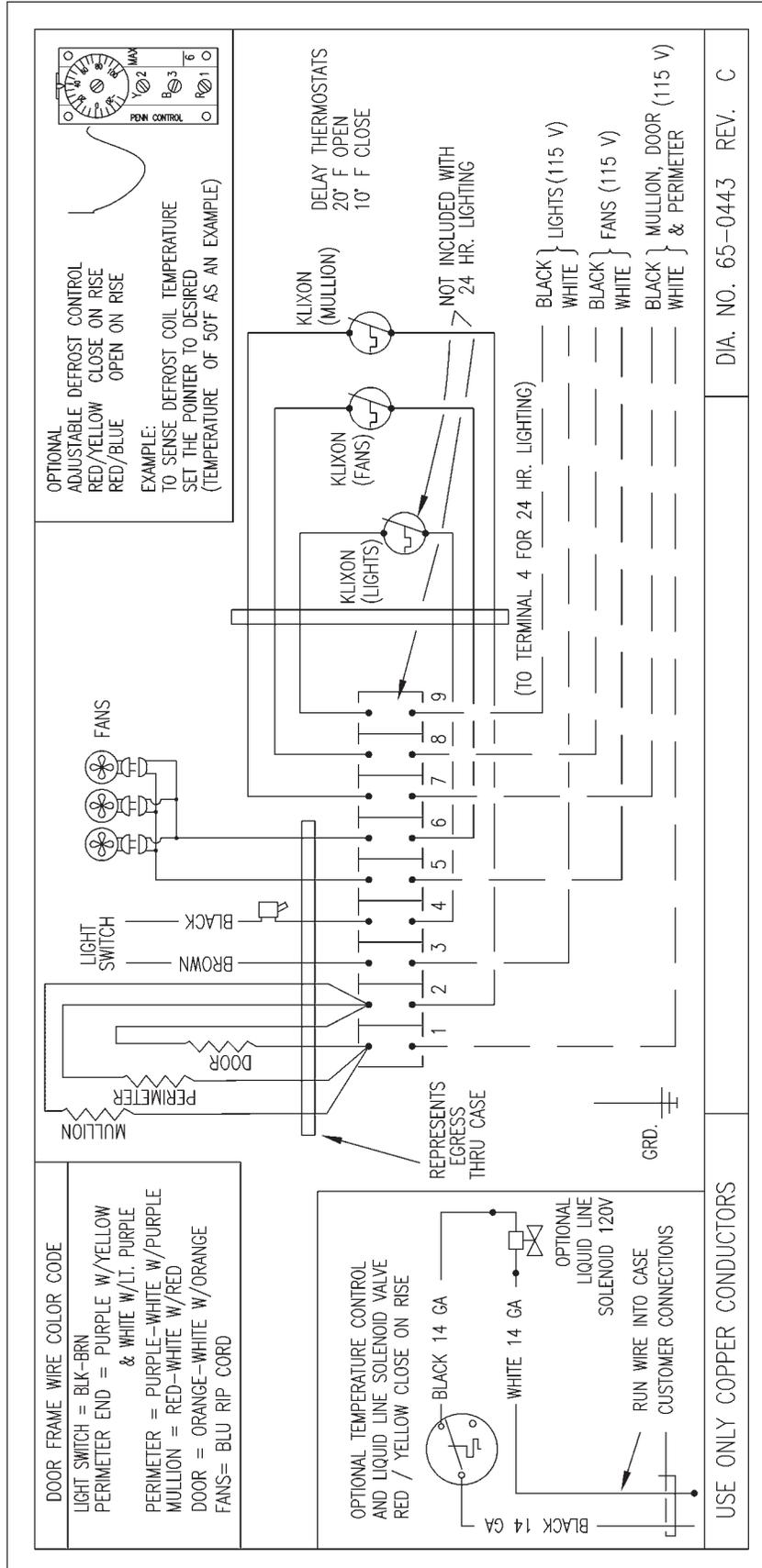


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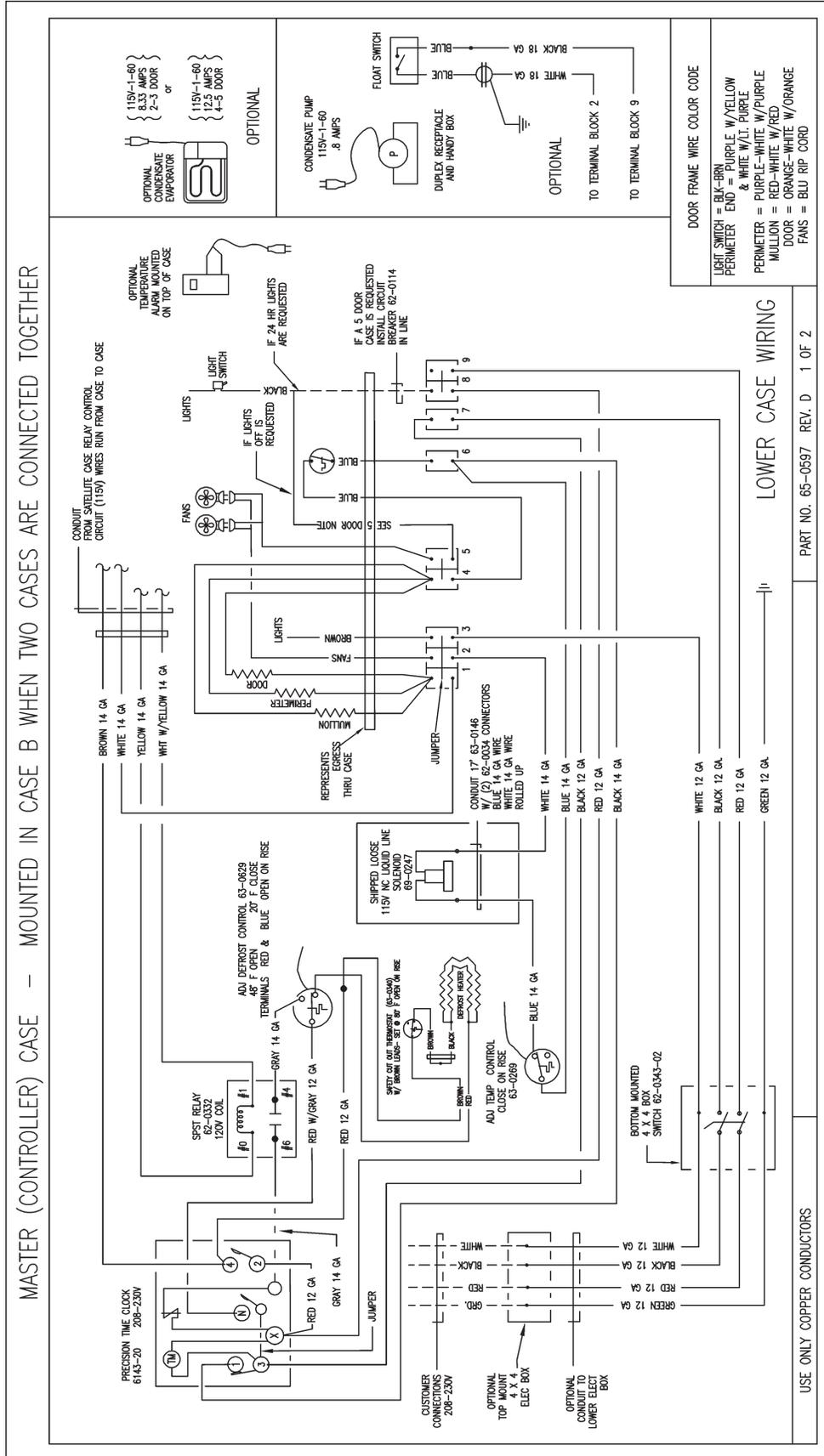
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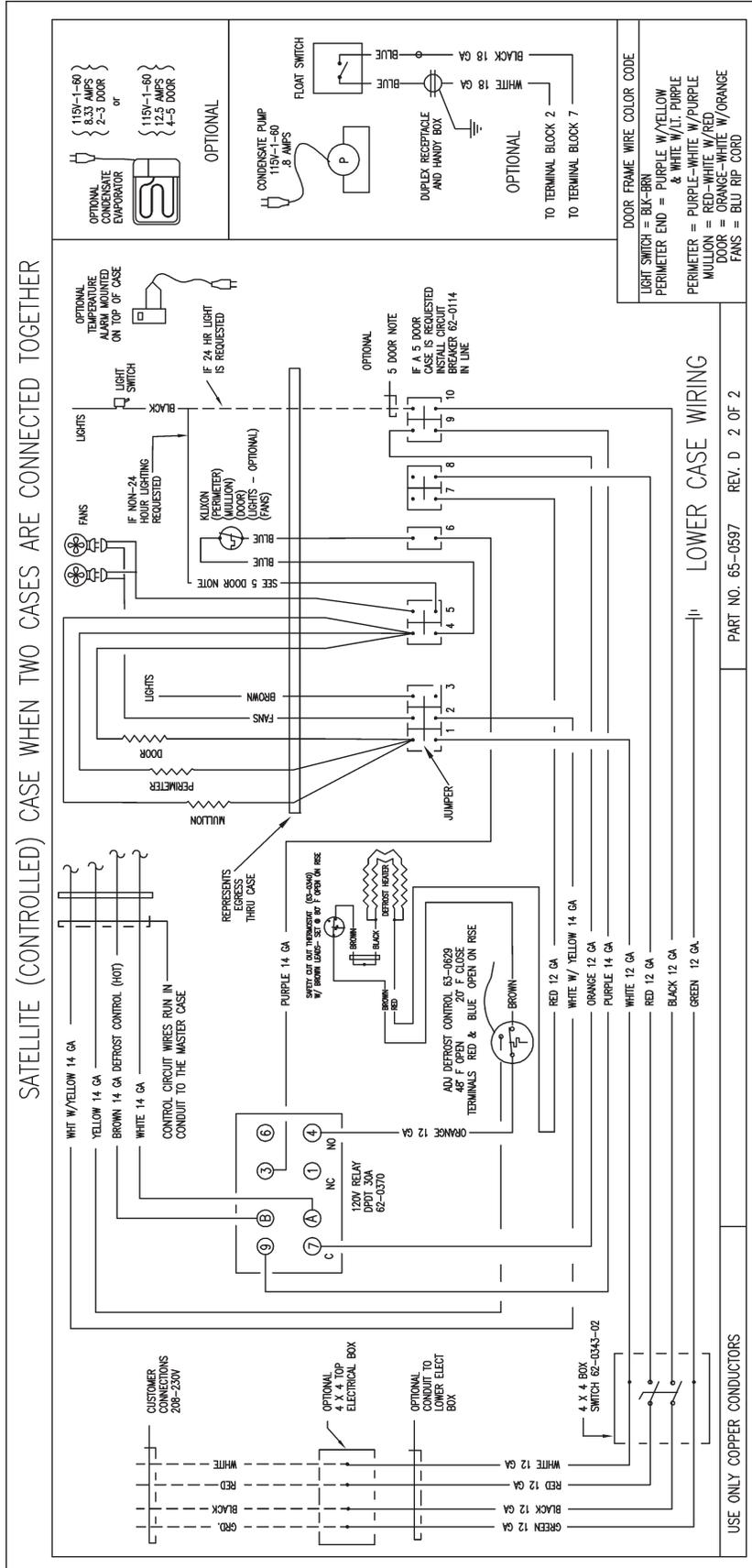
Figure 18: Hot Gas Defrost A5FGN(T), A5FG(T)BB







**Master / Satellite Wiring Diagrams (low-temp)**  
**Figure 21: Satellite (Controlled)**



## DEFROSTING

### General

Periodic defrosting to keep the coil free of frost is accomplished automatically by a time clock only in medium-temperature coolers, or used in conjunction with an electric or hot gas defrost in low-temperature freezers.

### Defrost Settings and Controls

#### Off-Cycle Defrost

Medium temperature coolers are typically defrosted by using an “off-cycle defrost”. During an off-cycle defrost, refrigeration to the cases is halted, but the evaporator fans continue to run. Frost is melted by the warmth of the display case’s internal air. Typically, anti-sweat heaters and display lights operate during defrost. Defrost may be terminated by time (30 minutes) or upon reaching a coil temperature of 43°F.

#### Electric Defrost

Frequency: One electric defrost per day is recommended.

Time of day: Nighttime defrosting is preferred to avoid periods of shopping or stocking.

Duration: Electric defrost does not require any drip time because Tyler provides a built-in fan delay thermostat.

Electric defrost for low-temp and off-cycle for medium-temp Fail-safe Times:

	Ice Cream	Frozen Food	Med. Temp
A5FGN(BB)	1/day at 45 mins	1/day at 45 mins	
A5FGNT(BB)	1/day at 55 mins	1/day at 55 mins	
A5NGNT(BB)			3/day at 30 mins

At ASHRAE test conditions and 208 volt defrost heater operation, the typical observed A5FGN 30" door defrost durations are 28 minutes for ice cream and 19 minutes for frozen food. At the same conditions, the typical observed A5FGNT 30" door defrost durations are 39 minutes for ice cream and 26 minutes for frozen food. A5FGN(T)E Crown End defrost durations are 43 minutes.

**Preferred Termination: For optimal performance, Tyler recommends a temperature-terminated defrost, using a defrost termination thermostat or probe sensing the coil temperature.**

A5FGN and A5FGNT door case has the probe located at the right hand side of the coil in the center of the bottom row of tubes.

The A5FGNE and A5FGNTE case has the probe located at the right hand side of the coil in the top row of tubes.

Tyler provides a defrost termination thermostat as standard unless a control system defrost probe is requested. The defrost termination temperature is 50°F.

Temperature termination based on coil temperature allows the length of defrost to vary depending on how much frost is on the coil and the defrost heater voltage. Coil frost is a function of shopping patterns, stocking habits, general door maintenance and ambient temperature and humidity. More frost requires a longer defrost. A lower defrost heater voltage extends the defrost period.

Alternate Termination: If it is not possible to terminate the defrost cycle based on a defrost termination thermostat or probe sensing the temperature at the coil, and the only available temperature probe is sensing the discharge air temperature, then the termination temperature should be set to 65°F, zero minutes drip time.

Tyler electric defrost freezers are delivered with the defrost thermostat open-on-rise contacts wired-in series with the defrost heaters. Unless the installer rewires the defrost thermostat, the defrost heater is de-energized when defrosting is complete.

Tyler electric defrost freezers are also equipped with a high-limit, snap-disc thermostat that de-energizes the defrost heater if the coil temperature exceeds 80°F to provide a secondary safety termination.

#### Hot Gas Defrost

Frequency: One hot gas defrost per day is recommended.

Time of day: Nighttime defrosting is preferred to avoid periods of shopping or stocking.

Duration: Hot gas defrost requires a 5 minute drip time.

Hot Gas Defrost Fail-safe Times:

	Ice Cream	Frozen Food
Hot Gas	1/day at 30 mins 5 min. drip	1/day at 30 mins 5 min. drip
Reduced Temperature Gas	1/day at 40 mins 5 min. drip	1/day at 40 mins 5 min. drip

**Preferred Termination: For optimal performance, Tyler recommends a temperature-terminated defrost, using a defrost termination thermostat or probe attached to the dump line.**

At ASHRAE test conditions, termination ranges from 12-22 minutes.

Defrost termination thermostats are optional on hot gas or reduced-temperature gas applications. If the cases are so equipped, the defrost termination is 65°F.

### **Electric Defrost Operation**

The compressor stops when the defrost is initiated in a non-pump-down system. On pump-down systems, the liquid line solenoid will be de-energized when the defrost is initiated. The clock will energize the 208/230 volt defrost heater, and energize the normally closed 208/230 volt contactor or relay. This de-energizes the 115-volt fans, lights and anti-sweat heaters. If you don't have a light circuit limit thermostat, the lights will not de-energize.

After the defrost period, the compressor will operate. When the coil temperature reaches +5°F, the fan, light and anti-sweat heater limit thermostats (Klixons) will close, starting the fans, lights and anti-sweat heaters (Figure 22).

### **Gas Defrost Operation**

Several types of gas defrost methods in conjunction with time actuated, time or temperature terminated defrost timers can be used to defrost the evaporator.

The refrigeration system designer and installer are responsible for correct line sizing for effective gas defrost and liquid return from the freezers. Sizing and component selection depend on the type of defrost, size, and location of high side refrigeration system.

Tyler freezers equipped for gas defrost consist of a side port distributor and a TXV check valve for coil defrost, and a suction line check valve to bypass hot gas to the serpentine coil. The serpentine coil is attached to the bottom of the pan to ensure pan and drain defrost.

The timer starts the gas defrost cycle by energizing a solenoid, reversing valve, or directional valve. The gas is injected from the source into the suction line of the evaporator to be defrosted. The gas flows into the serpentine coil attached to the floor of the case and then into the evaporator. Condensed liquid leaves the evaporator through the side port distributor, through a check valve into the liquid line. (Figure 23).

### **General Notes**

- The refrigeration technician should recheck coil condition after one week of retail operations to be certain that the frequency and duration of defrost is adequate for the particular store and locality. For example, if defrost voltage is below 200 volts, additional fail-safe time may be required.
- When using time terminated defrost, defrost termination thermostat should be wired in series with the defrost heater.
- Defrost termination thermostats may be wired in series for multiple evaporator installations.
- Defrost termination thermostats may be used as a digital input for electronic controllers.

### **Limit Thermostat**

Each freezer has factory set limit thermostats (Klixons) attached to the return bends of the coil on the right end of the freezer to regulate the operation of the evaporator fans and anti-sweat door heaters. A limit thermostat is optional for the light circuit. When a limit thermostat is provided in the lighting circuit, the lights will be off during defrost.

**IMPORTANT! OPERATION OF THE LIMIT THERMOSTATS CAUSES THE EVAPORATOR FANS, FREEZER LIGHTS, AND ANTI-SWEAT DOOR HEATERS TO REMAIN OFF UNTIL THE COMPRESSOR IS OPERATING AND THE COIL TEMPERATURE IS BROUGHT BELOW THE THERMOSTAT CUT-IN SETTING (+5°F ). SUPERHEAT MUST BE SET CORRECTLY BY THE INSTALLING CONTRACTOR FOR PROPER THERMOSTAT OPERATION.**

When the freezer first operates, the fans and lights may cycle off and on a few times until coil temperature is below +5°F. The superheat must be set for proper operation.

The 30" door models have a high limit thermostat installed on the coil return bend, wired in series with the defrost heaters. This thermostat opens when the temperature reaches 80°F.

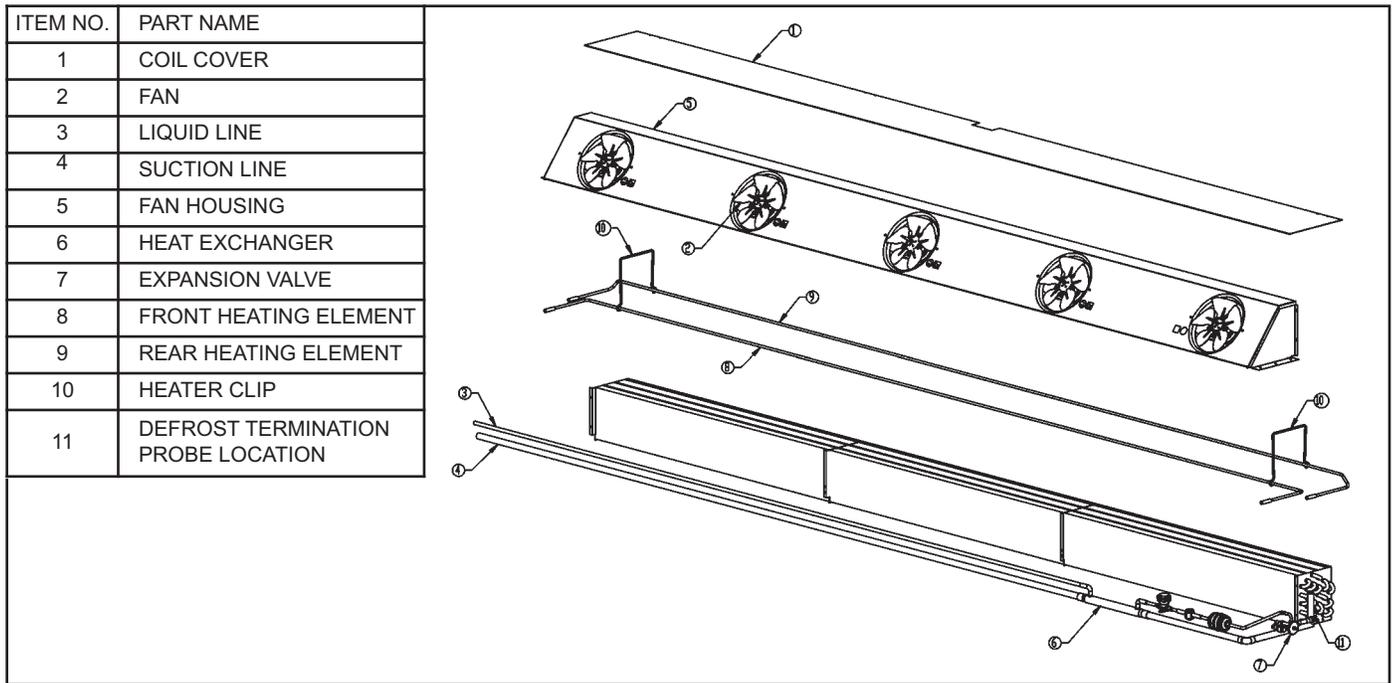


Figure 22: Coil Parts Breakdown, Electric Defrost

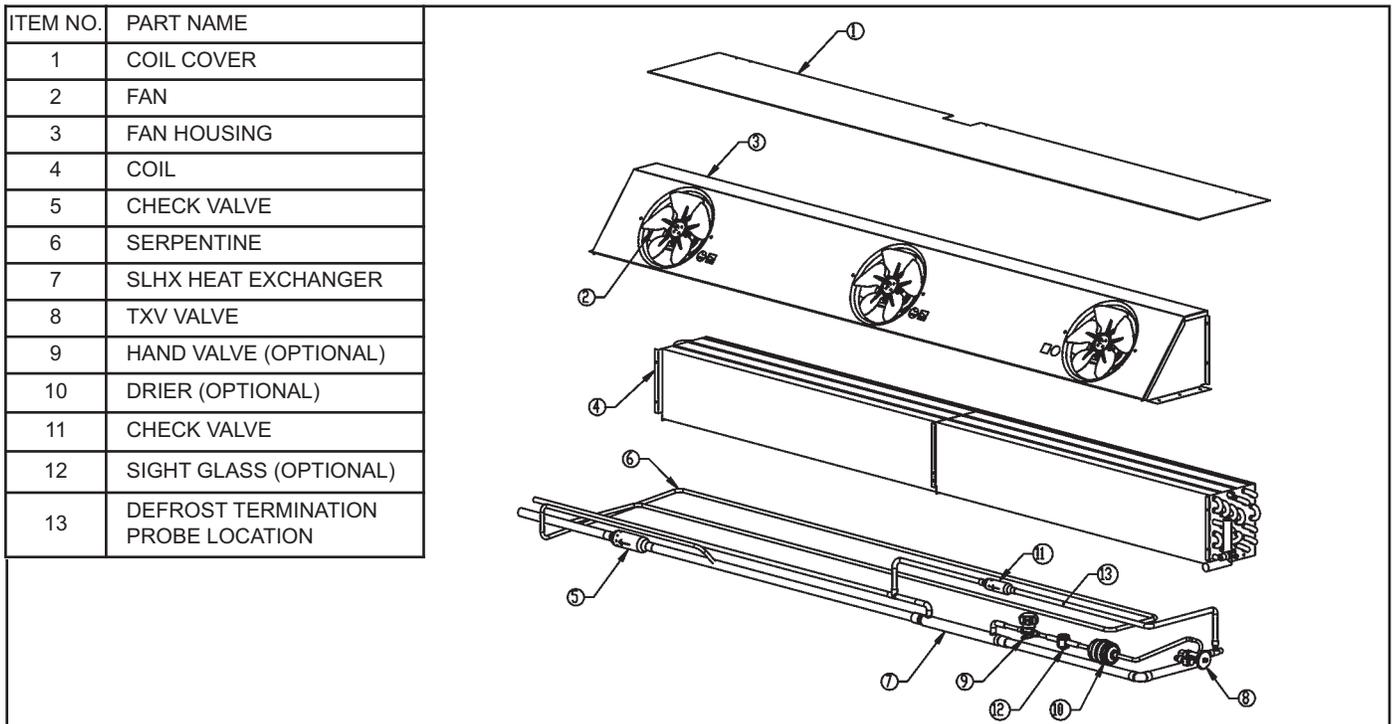


Figure 23: Coil Parts Breakdown, Hot Gas Defrost

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## **USER INFORMATION & SERVICE**

### **User Information**

#### **Cleaning**

Cases should be thoroughly cleaned before start-up and routinely thereafter to maintain a clean appearance. Use mild detergent and warm water (never an abrasive cleaner) to wipe out the inside of the case. Wash down all glass doors with glass cleaner. Do not use any products containing silicon on anti-fog glass coatings. Clean interior glass reduces fogging and increases visibility. The case will remain bright and sparkling with just a few minutes of cleaning each week. Internal components can be cleaned after removal of access panels. The case drain should be regularly cleared of debris and price tags.

Do not use high-pressure water or steam to clean the interior.

#### **Shelf Location**

The shelves are adjustable in 1" increments and may be located in any position for the best display advantage. Be sure shelf clips or brackets are completely seated before installing the shelf. The shelf brackets (for wire shelves only) are stamped with "R" for Right and "L" for left for proper orientation when installing shelves.

#### **Shelves**

Tyler manufactures many different styles of shelves, baskets and product stops. The shelves and baskets are placed on the shelf brackets. Some of the baskets may be reversed and used as a typical shelf.

#### **Loading the Case**

The case may be loaded with merchandise after it has been operated for at least 24 hours with correct case temperature and proper control operation. While loading the shelves, leave an air space between the top of the merchandise and the shelf above it so the customer can remove the merchandise. The air space allows an air curtain on top of the product. Product should not extend beyond the front of the shelves or block the return air grill.

The typical Cantilever shelf load is 170 lbs. with a maximum load of 235 lbs. Note some deflection may occur under higher loads.

#### **Light Switch**

A light switch is located inside the right-hand door. Turn the light switch off during the initial case temperature pull

down to prevent the case lights from cycling off and on. Always turn the light switch off when replacing lamps.

#### **Case Thermometer**

Cases are typically shipped with 2 thermometers. One thermometer is factory mounted in the discharge air stream. The second thermometer is shipped loose and should be installed in the warmest product location. Specific instructions are packaged with the shipped loose thermometer.

#### **Service**

Cart bumpers must be removed to gain access to drain clean-outs and electrical connections. Disassemble the bumper and kickplate by removing the 2 or 3 metal screws located in the kickplate. The bumper assembly can be lifted up and removed from the case. The kickplate can be removed, exposing the electric tray cover and drain (Figure 11A).

#### **Evaporator**

The evaporator coil, located at the bottom-rear of the case is factory assembled with the distributor, expansion valve, and other refrigeration components. To inspect the coil, remove the center or left-of-center coil cover. A small inspection port is located at the rear of the case. To inspect the entire coil, remove the remaining coil covers and raise the evaporator cover.

#### **Expansion Valve**

A superheat-adjustable externally equalized thermostatic expansion valve, with a removable strainer and pressure limiting charge, is mounted to the evaporator coil - unless otherwise specified. The valve is not preset. Adjust the superheat setting for maximum coil effectiveness. Typical superheat settings are between 6°F and 10°F. Close coupled systems should use the higher superheat setting to minimize the chance of liquid flood back.

To adjust the expansion valve, remove the right end coil cover. Remove the cap from the bottom of the valve. When looking at the valve stem end, turn the valve stem counterclockwise to decrease superheat. Turn the valve stem clockwise to increase superheat. Measure the suction line temperature at the expansion valve-sensing bulb and compare it to the suction temperature corresponding to the saturated pressure. Make sure that line pressure drop is taken into account. (con't on p.30)

**Case Lineup Combinations and Length Chart**

Doors in Lineup	2 Door Case	3 Door Case	4 Door Case	5 Door Case	Total length w/o ends (in.)	Total length w/o ends (ft. & in.)
2	1				62.13	5 ft 2-1/8 in
3		1			92.50	7 ft 8-1/2 in
4			1		123.00	10 ft 3 in
5				1	153.38	12 ft 9-3/8 in
6		2			185.00	15 ft 5 in
7		1	1		215.50	17 ft 11-1/2 in
8			2		246.00	20 ft 6 in
9			1	1	276.38	23 ft 3/8 in
10				2	306.75	25 ft 6-3/4 in
11		1	2		338.50	28 ft 2-1/2 in
12			3		369.00	30 ft 9 in
13			2	1	399.38	33 ft 3-3/8 in
14			1	2	429.75	35 ft 9-3/4 in
15				3	460.13	38 ft 4-1/8 in
16			4		492.00	41 ft
17			3	1	522.38	43 ft 6-3/8 in
18			2	2	552.75	46 ft 3/4 in
19			1	3	583.13	48 ft 7-1/8 in
20				4	613.50	51 ft 1-1/2 in
21			4	1	645.38	53 ft 9-3/8 in
22			3	2	675.75	56 ft 3-3/4 in
23			2	3	706.13	58 ft 10-1/8 in
24			1	4	736.50	61 ft 4-1/2 in
25				5	766.88	63 ft 10-7/8 in
26			4	2	798.75	66 ft 6-3/4 in
27			3	3	829.13	69 ft 1-1/8 in
28			2	4	859.50	71 ft 7-1/2 in
29			1	5	889.88	74 ft 1-7/8 in
30				6	920.25	76 ft 8-1/4 in
31			4	3	952.13	79 ft 4-1/8 in
32			3	4	982.50	81 ft 10-1/2 in
33			2	5	1,012.88	84 ft 4-7/8 in
34			1	6	1,043.25	86 ft 11-1/4 in
35				7	1,073.63	89 ft 5-5/8 in
36			4	4	1,105.50	92 ft 1-1/2 in
37			3	5	1,135.88	94 ft 7-7/8 in
38			2	6	1,166.25	97 ft 2-1/4 in
39			1	7	1,196.63	99 ft 8-5/8 in
40				8	1,227.00	102 ft 3 in

Turn the valve stem only 1/4 turn at a time and allow sufficient time (20 to 30 minutes) for the valve to settle before making any further adjustments. Replace the valve stem cap after the valve super-heat has been adjusted. **BE CERTAIN THE VALVE STEM CAP IS WIPED DRY FIRST.**

**! CAUTION !**

**DISCONNECT POWER TO THE CASE BEFORE SERVICING ELECTRICAL COMPONENTS TO AVOID PERSONAL INJURY AND DAMAGE TO THE UNIT.**

### **Defrost Heater Element**

On 30" door cases one heater is located on the front of the coil and one on the rear of the coil. On wraparound cases, the heater element is located under the coil. The electric wire leads are connected in the junction box behind the front kick rail.

### **Heater Element Removal**

Defrost heaters for the electric defrost cases are located on the front and rear face of the coil. The front heater is located approximately 1" off the floor and the rear heater is approximately 2" off the floor. The heater is secured to the coil by a number of stainless steel heater retaining clips. Heaters are fastened to the floor on the right hand side of the coil. Remove fasteners holding the heater to the floor.

The front heater can be removed by pulling the retaining clip away from the coil and sliding the heater out from under the clip.

The rear heater can be removed by raising the heater retaining clip. Raise each clip about 2 inches above the coil working from right to left on the coil. Repeat this process until the retaining clips are free of the coil. The heater will slide up with the retaining clip.

To remove the defrost element for the A5FGN(T)E Crown End, remove the coil covers. Lift the inner coil cover upward and tip the fan housing forward. This will expose the coil. Remove both fan housing end brackets and center coil supports, then slide out the complete heater pan assembly from under the coil. Slowly lift the heater pan assembly between the coil and fan housing, turning it on edge while lifting. Heaters are installed in the reverse order of how they were removed.

### **Evaporator Fans**

Air is circulated throughout the case with 115-volt low temperature fan motors. These motors must be

operating at all times except during defrosting (low-temperature only). Fan motors should be replaced with motors having the same characteristics including type, physical size, wattage and RPM.

### **Air-Curtain Velocities**

Air-curtain velocity for freezers and coolers are affected by stocking levels, coil frost loads, temperature and fan condition. The measurement method also affects the reading. Tyler recommends using an Anor Velometer Jr., set to the 0-to-800 fpm range. Air velocity should be measured at the back edge of the discharge air honeycomb, at the center of the middle door in the case (other doors have slightly lower velocity). A typical velocity reading is 425 feet per minute (FPM) in a fully-packed freezer (395 FPM for medium-temperature coolers), after the freezer/cooler has defrosted and is pulled down to operating temperature. A typical velocity reading for tall cases is 400 FPM for freezers, and 370 FPM for coolers under the same conditions. Air-curtain velocity in a partially packed freezer is significantly lower because more air exits the back wall duct holes.

### **Fan Removal**

1. Turn off power to fans. Remove coil cover.
2. Unplug fan from fan power supply plug located on the front face of the fan housing.
3. Remove the fan blade nut and fan blade.
4. Remove the two mounting bolts and remove the fan assembly from the fan housing.
5. Remove the three fan motor mounting screws from the back of the fan motor.
6. Reverse steps 1 - 5 to install.

### **Ballasts for A5F(N)GN(T)E Crown Ends**

Most Tyler case ballasts are located in the door mullion. Ballasts for the Crown Ends are located behind the kickplate.

### **Fluorescent Lighting**

T8 lighting systems use a lens to direct light output evenly across the shelves. Turn off power before servicing the lamps. The lens must be removed to access the lamp. The lens must be replaced after servicing for proper operation. Detailed information is contained in the door instruction booklet.

## Front Edge Trim Replacement

The metal front edge trim is designed as a removable protective piece that can help protect the end panel from receiving direct damage. In the event of damage, the edge trim can be removed and a replacement piece reinstalled. The following procedure demonstrates how to replace the edge trim:



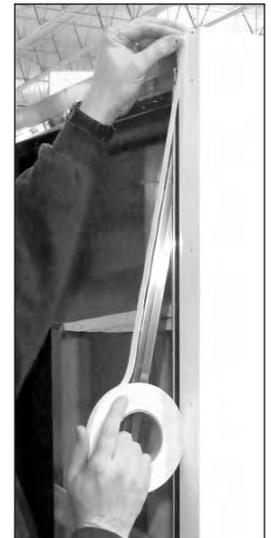
**A.** Back-out and retain the frame screws that secure the “J”-strip that covers the inside edge of the trim piece. If the door hinges on the side of the edge trim that needs replaced, it will be in the way of the frame screws, and will need to be removed first in order to access the screws.

**B.** Use a razor blade to score and remove the clear silicone bead and then remove the J-strip. Remove excess silicone from the J-strip as needed. **NOTE:** Take proper precautions when using a sharp razor blade.



**C.** The edge trim piece is secured to the front with a commercial grade double-sided tape (not supplied by Tyler). To remove the damaged trim, start at the top with a blade or screwdriver and tap out to separate the trim from the end panel. Continue downward by gently prying the piece from the panel until removed. Remove any loose debris or tape and then apply strips of double-sided tape to the front of the end panel and remove the backing from the tape. Make sure the entire surface is covered.

**C**



**D.** Seat the new replacement edge trim piece by laying the top fold of the edge trim into place first, keeping the trim at an angle away from the panel. Then work the piece into place by pressing both downward and inward, applying even pressure to the trim as you work your way down to ensure a proper seal with the tape.



**E.** Reinstall the J-strip with the screws and apply a new bead of clear silicone to seal the J-strip to the edge trim.

## REVISION LOG

This log sheet is intended to track both major and minor revisions to this manual, and to describe what the nature of the revision is. Revision identification is located in the lower right corner of the cover page.

Major revisions are lettered alphabetically, dated accordingly, and require reprinting for inclusion with the product at shipment. Minor revisions are denoted after the major revision with a “period” followed by a sequential number, and do not require a printed update. All manuals with any revision changes will be available in electronic PDF format on the Tyler Refrigeration website.

Content changes that determine the type of revisions are decided on a case-by-case basis by Tyler internal management.

DATE	REVISION TYPE		DESCRIPTION	RESULTS
	MAJOR	MINOR		
Feb 2009	n/a	n/a	First Edition Printing	

# TYLER

## REFRIGERATION

A division of  
Carrier Commercial Refrigeration, Inc.

### *One Year Equipment Warranty*

TYLER REFRIGERATION, a division of Carrier Commercial Refrigeration, Inc. hereinafter referred to as "TYLER", warrants to the original purchaser of the Equipment with the Model and Serial Number shown above, that said Equipment, including all parts thereof, is free from defects in material and workmanship. TYLER'S sole obligation under this warranty shall be limited to repairing or exchanging any part or parts, f.o.b. factory, which may prove defective within one year from date of original installation (not to exceed one year and ninety days from date of shipment from the factory) and which TYLER'S examination discloses to be thus defective. All defective parts must be returned to the Tyler factory of origin within thirty (30) days under the terms of this warranty. As to products or parts not manufactured by Tyler, the warranty, if any, of the respective manufacturer of any items of new equipment and parts is incorporated into this warranty by reference.

THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, AND DOES NOT INCLUDE ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. TYLER SHALL NOT BE LIABLE FOR ANY CONSEQUENTIAL, INCIDENTAL OR SPECIAL DAMAGES, INCLUDING, BUT NOT LIMITED TO, LOSS OF FOOD PRODUCTS, LOSS OF PROFITS, LOSS OF REFRIGERANT, OR INJURY TO PERSON OR PROPERTY CAUSED BY DEFECTIVE EQUIPMENT, MATERIAL OR PARTS. TYLER'S SOLE LIABILITY SHALL BE LIMITED TO THE REPAIR OR REPLACEMENT OF ANY DEFECTIVE PART OR PARTS AS ABOVE STATED AND SHALL NOT INCLUDE LABOR OR OTHER EXPENSES INCURRED IN THE REMOVAL AND/OR INSTALLATION OF DEFECTIVE PARTS OR EQUIPMENT.

TYLER neither assumes, nor authorizes any person to assume for it, any other obligation or liability in connection with said equipment or any part thereof.

IN ADDITION TO THE FOREGOING, THIS WARRANTY SHALL NOT APPLY:

1. To the Condensing Unit used with said Equipment unless same was furnished by TYLER.
2. When this Equipment or any part thereof is subjected to accident, alteration, abuse, misuse, tampering, operation on low or improper voltages, or is put to a use other than normally recommended by TYLER.
3. To any product or part which shall have been repaired, altered or assembled in any way by other than TYLER, TYLER'S supplier or TYLER'S installation contractor which, in the sole judgment of TYLER affects the performance, stability or purpose for which it was manufactured.
4. When this Equipment or any part thereof is damaged by transportation, fire, flood, act of God or when the original model and serial number plate has been altered, defaced or removed.
5. When operation of this equipment is impaired due to improper drain installation.
6. To any product or parts sold on an "AS IS" basis.
7. Toward payment of any removal or installation charges of warranted parts.
8. When this Warranty Certificate has been altered in any way.
9. This Warranty is made to the original purchaser only and is not transferable.

This One-Year Warranty shall apply only within the boundaries of the continental United States and Canada and such other areas as are covered by specific agreement between the authorized Distributor and TYLER.

Model: \_\_\_\_\_ Serial Number: \_\_\_\_\_



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