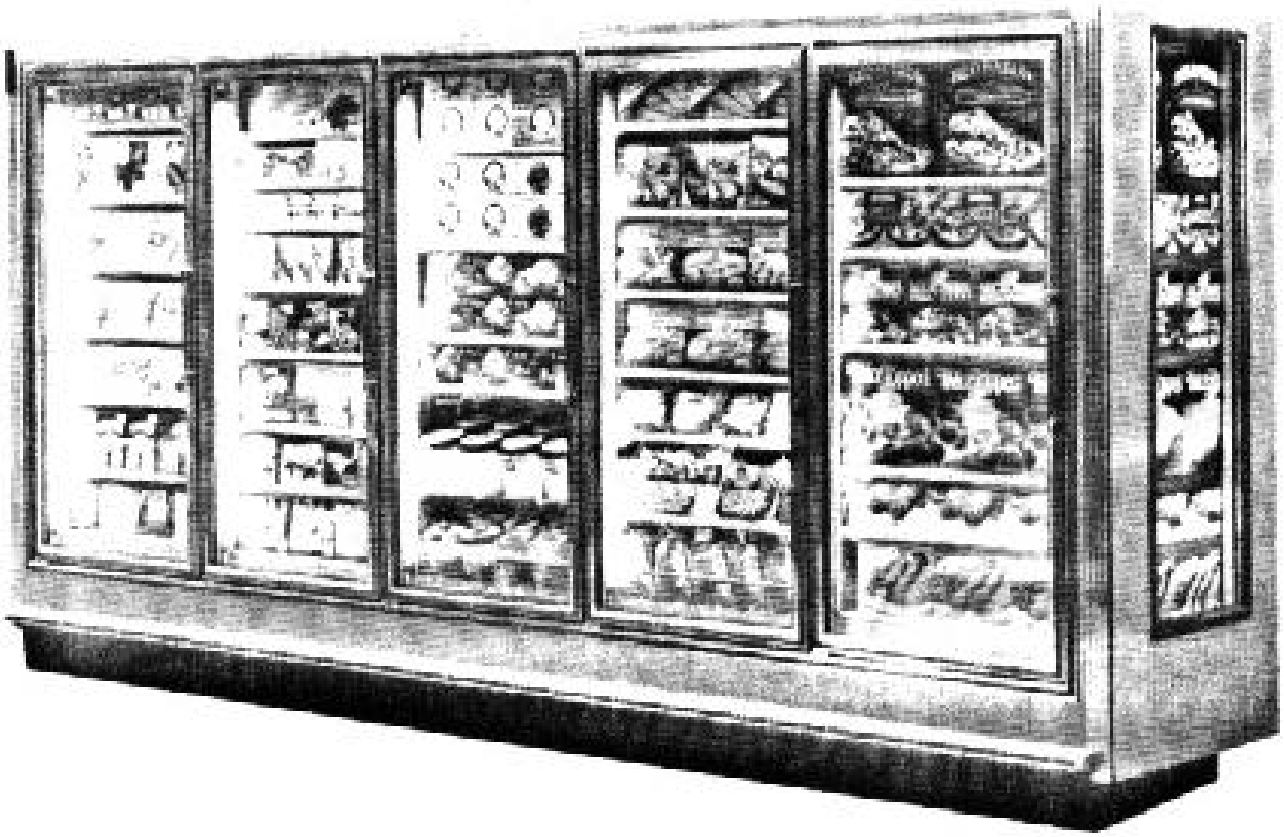
INSTALLATION AND OPERATING INSTRUCTIONS

FOR

REACH-IN FROZEN FOOD AND ICE CREAM FREEZERS

FREEZ-R-MART MODELS RI-DFR AND RI-DFR-KT



Retain this manual for future reference.

ZERO ZONE

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GENERAL INFORMATION

Introduction

The information contained in this manual pertains to Zero Zone DFR-KT 30" door and DFR 24" door freezers used for frozen food or ice cream merchandising. These display freezers are designed to operate in an air-conditioned store where the temperature is maintained at 75°F or lower and the relative humidity is at 55% or lower.

Inspection

These display freezers were carefully inspected and properly packed to ensure delivery in the best possible condition. The equipment should be uncrated and checked for damage before and after unloading immediately upon delivery. ALL CLAIMS FOR DAMAGES MUST BE FILED WITH THE TRANSPORTATION COMPANY — NOT WITH ZERO ZONE.

The carrier will supply necessary report and claim forms.

Location

The display freezer **must not** be located in the direct rays of the sun or near a source of radiant heat. The freezer must be located on a floor of sufficient strength.

***Note:** If the building floor sags, the automatic closing doors may sag and bind.*

Avoid totally enclosing the freezer. Allow back, top and end clearance for proper air circulation. Do not walk on the freezer or store dry goods on the top.

INSTALLATION

Joining Freezers

The Reach-In has been engineered for continuous display. This means that any number of Reach-In freezers can be joined together to create a display of any desired length. Reach-In freezers are built on permanent steel skids to promote easy installation.

To install Reach-Ins, perform the following steps. (See Figure 1.)

1. Set the first Reach-In into the desired position and level it. Check the gasketing around the open end of the Reach-In to see that it is intact. Fill in any torn areas with permagum. Run a heavy bead of caulk on top of the inner layer of gasketing.
2. Push the second Reach-In against the end of the first. Level the second Reach-In. Remove the left and right end coil covers (H) and the rectangular pocket hole covers (C), accessing the holes marked "A" in each freezer. (See Figure 1.) Carefully remove the insulation from the pocket holes and save it.

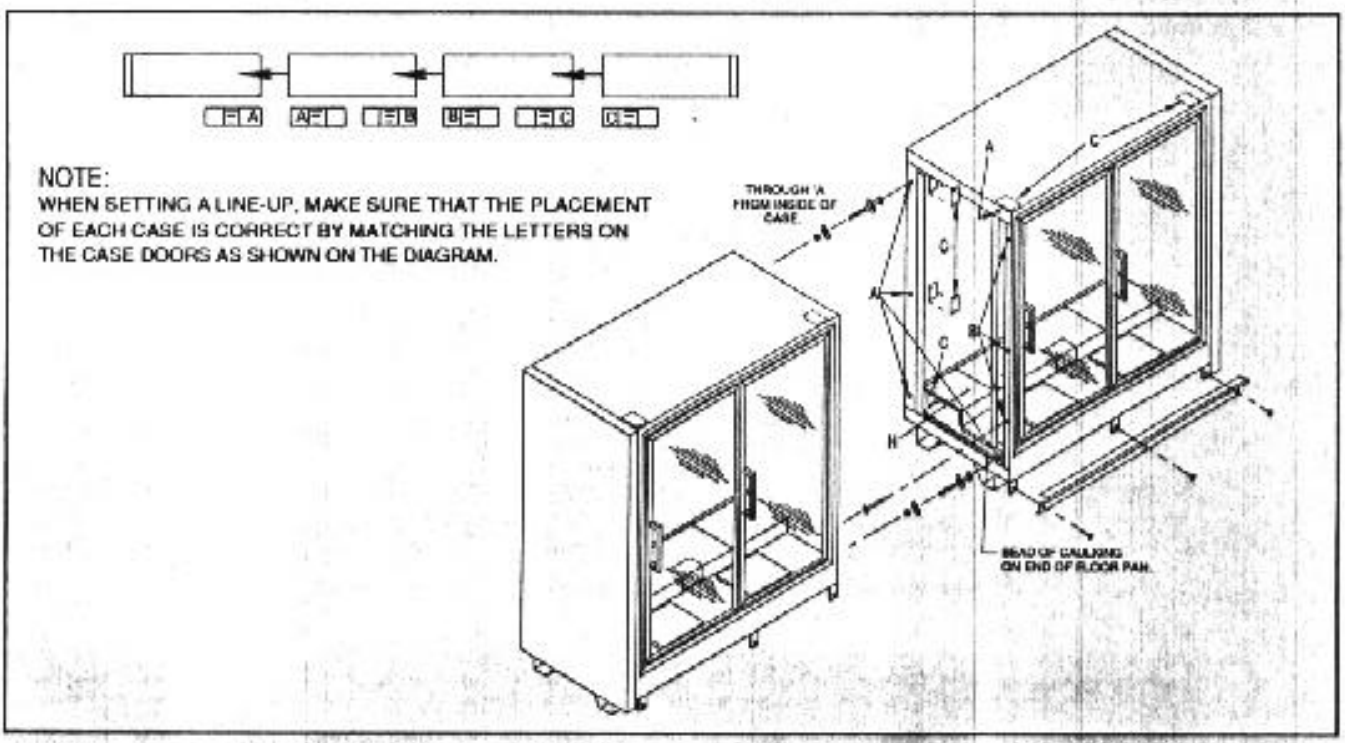

Figure 1. Joining Reach-In Freezers

3. Start the front joining bolts in the ceiling and floor pan holes at "A", but do not tighten them. Start the three joining bolts in the predrilled holes at "A", along the rear joint of the freezer, **but do not tighten them.**
4. Line up the joint at the front and top, and tighten the front bolts at "A". Snug up the three rear joint bolts at "A".

> **⚠ CAUTION ⚠**
>
> **NEVER USE THE JOINING BOLTS TO DRAW REACH-INS TOGETHER. THIS PRACTICE WILL RESULT IN DAMAGE TO THE FREEZERS.**

Push the Reach-Ins together with care as the bolts are being tightened.

5. Remove the gray plastic plugs from the door frame to expose the joining holes. Clamp the front joint with a Jorgensen wood clamp and install the three #14 x 3 inch long flat head wood screws through the predrilled holes (B) in the door frame. Replace the plastic plugs in the door frame after the screws have been installed.

To join more than two Reach-Ins at one time, use extension clamps of the Jorgensen pony type. Draw the cases together with the extension clamps. Check to be certain that the end gasket is intact. If any part of the gasket has been torn off, staple it back on or fill the torn area with additional gasket material. When installing the clamps, place one clamp at the bottom front of the freezer and one at the bottom rear. Then draw the freezers together uniformly. Move the clamps up, and draw top front and top rear of the joint together. After all bolts have been tightened, replace the insulation and the covers for the pocket holes.

Drain Line

The drain is located at the center of the freezer in the drain pan. It can be reached by removing the access plate located on the center of the coil cover. The 1" PVC drain outlet is located at the center front of the freezer.

Install a tee to the outlet pipe and a drain trap to the tee to prevent moist air from being drawn into the case. 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 a minimum of 1/4 inch per foot.

REFRIGERATION

General

Unless otherwise specified, the liquid and suction connections are made inside the case under the evaporator fan cover on the left side of the freezer. Refrigerant piping into the case is through the bottom. (See Figure 2.) After connections have been made, the refrigeration access hole in the bottom of the freezer must be sealed completely with aerosol-dispensed Urethane insulation or equivalent.

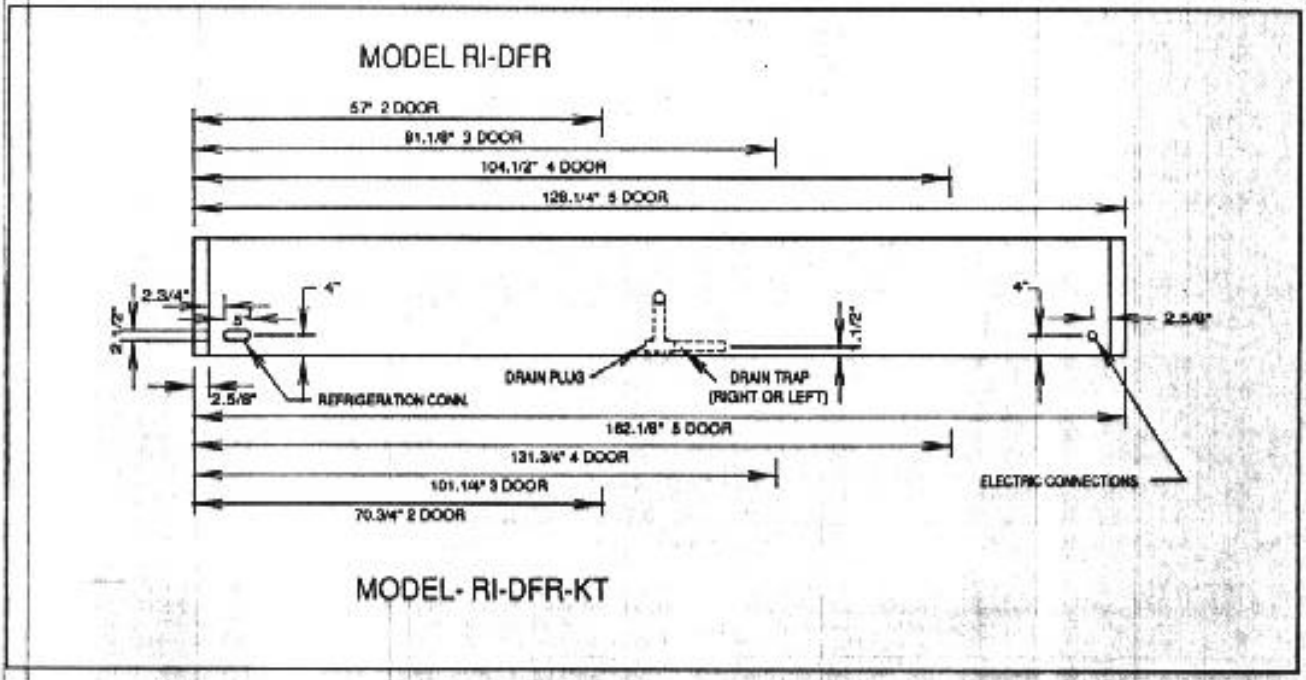

Figure 2. Drain, Refrigeration, and Electric Connection Location

Refrigerant Piping

Correct refrigeration line sizing and installation is essential for proper system operation. Tables 1 through 4 list R-502 line sizes for different combinations of frozen food and ice cream freezers. A P-trap must be installed at the bottom of all vertical suction risers.

When two or more freezer sections are connected to one compressor, the main liquid and suction line for the group should be run through the freezers under the fan housing and brought out through the refrigeration outlet of one freezer only. All freezer sections have refrigeration outlets, so be certain that all unused outlet openings are sealed. If this is not done, temperature loss, excessive frosting of coils, and frost or condensation under the freezer will result.

The compressor should be installed as close as possible to the freezers to reduce pressure drop. If the compressor is located above the freezer, use one size smaller tube for the suction tube **riser only** and install a shallow trap at the bottom of the riser. Use a flexible connection (vibration eliminator) between the suction line and compressor.

Tape the suction and liquid lines together to form an external heat exchanger. Insulate the tubing for at least 20 feet from the freezer outlet.

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 a good moisture indicating type of sight glass at the outlet end of the drier.

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Table 1. Line Sizes for DFR 24" Door Frozen Food Freezers

MODEL	BTU/HR @ -19 DEGREES F EVAPORATOR	COMPRESSOR HORSEPOWER R-502	RECOMMENDED LIQUID LINE SIZES EQUIVALENT LENGTH, FEET				RECOMMENDED SUCTION LINE SIZES EQUIVALENT LENGTH, FEET							
							50		100		150		200	
FROZEN FOOD TEMPERATURES 0 TO -5 DEGREES F.			50	100	150	200	H	V	H	V	H	V	H	V
RI-2-DFR	3600	1	1/4	3/8	3/8	3/8	7/8	7/8	7/8	7/8	7/8	7/8	7/8	7/8
RI-3-DFR	4800	1.1/2	1/4	3/8	3/8	3/8	7/8	7/8	7/8	7/8	7/8	7/8	7/8	7/8
RI-4-DFR	6100	1.1/2	1/4	3/8	3/8	3/8	7/8	7/8	7/8	7/8	7/8	7/8	7/8	7/8
RI-5-DFR	7400	2	1/4	3/8	3/8	3/8	7/8	7/8	7/8	7/8	7/8	7/8	7/8	7/8
RI-6-DFR	8400	2	1/4	3/8	3/8	3/8	7/8	7/8	7/8	7/8	7/8	7/8	7/8	7/8
RI-7-DFR	9700	3	1/4	3/8	3/8	3/8	7/8	7/8	7/8	7/8	7/8	7/8	7/8	7/8
RI-8-DFR	10900	3	1/4	3/8	3/8	3/8	7/8	7/8	7/8	7/8	7/8	7/8	7/8	7/8
RI-9-DFR	12200	3	3/8	1/2	1/2	1/2	1.1/8	1.1/8	1.1/8	1.1/8	1.1/8	1.1/8	1.1/8	1.1/8
RI-10-DFR	13500	3	3/8	1/2	1/2	1/2	1.1/8	1.1/8	1.1/8	1.1/8	1.1/8	1.1/8	1.1/8	1.1/8
RI-11-DFR	14700	3	3/8	1/2	1/2	1/2	1.1/8	1.1/8	1.1/8	1.1/8	1.1/8	1.1/8	1.1/8	1.1/8
RI-12-DFR	15900	5	3/8	1/2	1/2	1/2	1.1/8	1.1/8	1.1/8	1.1/8	1.1/8	1.1/8	1.1/8	1.1/8
RI-13-DFR	17200	5	3/8	1/2	1/2	1/2	1.1/8	1.1/8	1.1/8	1.1/8	1.1/8	1.1/8	1.1/8	1.1/8
RI-14-DFR	18500	5	1/2	1/2	1/2	1/2	1.1/8	1.1/8	1.3/8	1.1/8	1.3/8	1.1/8	1.5/8	1.1/8
RI-15-DFR	19700	5	1/2	1/2	1/2	1/2	1.1/8	1.1/8	1.3/8	1.1/8	1.3/8	1.1/8	1.5/8	1.1/8
RI-16-DFR	21000	5	1/2	1/2	1/2	1/2	1.1/8	1.1/8	1.3/8	1.1/8	1.3/8	1.1/8	1.5/8	1.1/8
RI-17-DFR	22200	5	1/2	1/2	1/2	1/2	1.1/8	1.1/8	1.3/8	1.1/8	1.3/8	1.1/8	1.5/8	1.1/8
RI-18-DFR	23100	5	1/2	1/2	1/2	1/2	1.1/8	1.1/8	1.3/8	1.1/8	1.3/8	1.1/8	1.5/8	1.1/8
RI-19-DFR	24400	7.1/2	1/2	5/8	5/8	5/8	1.1/8	1.1/8	1.3/8	1.3/8	1.3/8	1.3/8	1.5/8	1.3/8
RI-20-DFR	25600	7.1/2	1/2	5/8	5/8	5/8	1.1/8	1.1/8	1.3/8	1.3/8	1.3/8	1.3/8	1.5/8	1.3/8
RI-21-DFR	26800	7.1/2	1.2	5/8	5/8	5/8	1.1/8	1.1/8	1.3/8	1.3/8	1.3/8	1.3/8	1.5/8	1.3/8
RI-22-DFR	28000	7.1/2	1/2	5/8	5/8	5/8	1.1/8	1.1/8	1.3/8	1.3/8	1.3/8	1.3/8	1.5/8	1.3/8
RI-23-DFR	29000	7.1/2	1/2	5/8	5/8	5/8	1.1/8	1.1/8	1.3/8	1.3/8	1.3/8	1.3/8	1.5/8	1.3/8
RI-24-DFR	30100	7.1/2	1/2	5/8	5/8	5/8	1.1/8	1.1/8	1.3/8	1.3/8	1.3/8	1.3/8	1.5/8	1.3/8
RI-25-DFR	31400	7.1/2	1/2	5/8	5/8	5/8	1.1/8	1.1/8	1.3/8	1.3/8	1.3/8	1.3/8	1.5/8	1.3/8
RI-26-DFR	32500	7.1/2	1/2	5/8	5/8	5/8	1.1/8	1.1/8	1.3/8	1.3/8	1.3/8	1.3/8	1.5/8	1.3/8
RI-27-DFR	33800	7.1/2	1/2	5/8	5/8	5/8	1.1/8	1.1/8	1.3/8	1.3/8	1.3/8	1.3/8	1.5/8	1.3/8
RI-28-DFR	35000	7.1/2	1/2	5/8	5/8	5/8	1.1/8	1.1/8	1.3/8	1.3/8	1.3/8	1.3/8	1.5/8	1.3/8

How To Use This Table

The table shows the main line sizes to be used for various combinations of Reach-In freezers. Although the table shows the main line sizes, it can also be used to select the proper branch line sizes.

The table gives not only the individual BTU/HR and *approximate* compressor size, but also liquid and suction line sizes for runs from 50 feet in length to 200 feet. The suction line column has also been broken into horizontal and vertical runs.

Table 2. Line Sizes for DFR 24" Door Ice Cream Freezers

MODEL	BTU/HR @ -25 DEGREES F EVAPORATOR	COMPRESSOR HORSEPOWER R-502	RECOMMENDED LIQUID LINE SIZES EQUIVALENT LENGTH, FEET				RECOMMENDED SUCTION LINE SIZES EQUIVALENT LENGTH, FEET							
							50		100		150		200	
ICE CREAM TEMPERATURES -10 TO -15 DEGREES F.			50	100	150	200	H	V	H	V	H	V	H	V
RI-2-DFR	3900	1.1/2	1/4	3/8	3/8	3/8	7/8	7/8	7/8	7/8	7/8	7/8	7/8	7/8
RI-3-DFR	5300	1.1/2	1/4	3/8	3/8	3/8	7/8	7/8	7/8	7/8	7/8	7/8	7/8	7/8
RI-4-DFR	6700	2	1/4	3/8	3/8	3/8	7/8	7/8	7/8	7/8	7/8	7/8	7/8	7/8
RI-5-DFR	8200	2	1/4	3/8	3/8	3/8	7/8	7/8	7/8	7/8	7/8	7/8	7/8	7/8
RI-6-DFR	9300	3	1/4	3/8	3/8	3/8	7/8	7/8	7/8	7/8	7/8	7/8	7/8	7/8
RI-7-DFR	10700	3	1/4	3/8	3/8	3/8	7/8	7/8	7/8	7/8	7/8	7/8	7/8	7/8
RI-8-DFR	12000	3	3/8	1/2	1/2	1/2	1.1/8	1.1/8	1.1/8	1.1/8	1.1/8	1.1/8	1.1/8	1.1/8
RI-9-DFR	13400	5	3/8	1/2	1/2	1/2	1.1/8	1.1/8	1.1/8	1.1/8	1.1/8	1.1/8	1.1/8	1.1/8
RI-10-DFR	14800	5	3/8	1/2	1/2	1/2	1.1/8	1.1/8	1.1/8	1.1/8	1.1/8	1.1/8	1.1/8	1.1/8
RI-11-DFR	16200	5	3/8	1/2	1/2	1/2	1.1/8	1.1/8	1.1/8	1.1/8	1.1/8	1.1/8	1.1/8	1.1/8
RI-12-DFR	17500	5	3/8	1/2	1/2	1/2	1.1/8	1.1/8	1.1/8	1.1/8	1.1/8	1.1/8	1.1/8	1.1/8
RI-13-DFR	18900	5	1/2	1/2	1/2	1/2	1.1/8	1.1/8	1.3/8	1.1/8	1.3/8	1.1/8	1.5/8	1.1/8
RI-14-DFR	20900	5	1/2	1/2	1/2	1/2	1.1/8	1.1/8	1.3/8	1.1/8	1.3/8	1.1/8	1.5/8	1.1/8
RI-15-DFR	21700	7.1/2	1/2	1/2	1/2	1/2	1.1/8	1.1/8	1.3/8	1.1/8	1.3/8	1.1/8	1.5/8	1.1/8
RI-16-DFR	23100	7.1/2	1/2	1/2	1/2	1/2	1.1/8	1.1/8	1.3/8	1.1/8	1.3/8	1.1/8	1.5/8	1.1/8
RI-17-DFR	24400	7.1/2	1/2	5/8	5/8	5/8	1.1/8	1.1/8	1.3/8	1.3/8	1.3/8	1.3/8	1.5/8	1.3/8
RI-18-DFR	25400	7.1/2	1/2	5/8	5/8	5/8	1.1/8	1.1/8	1.3/8	1.3/8	1.3/8	1.3/8	1.5/8	1.3/8
RI-19-DFR	26800	7.1/2	1/2	5/8	5/8	5/8	1.1/8	1.1/8	1.3/8	1.3/8	1.3/8	1.3/8	1.5/8	1.3/8
RI-20-DFR	28200	7.1/2	1/2	5/8	5/8	5/8	1.1/8	1.1/8	1.3/8	1.3/8	1.3/8	1.3/8	1.5/8	1.3/8
RI-21-DFR	29500	7.1/2	1.2	5/8	5/8	5/8	1.1/8	1.1/8	1.3/8	1.3/8	1.3/8	1.3/8	1.5/8	1.3/8

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The table shows the main line sizes to be used for various combinations of Reach-In freezers. Although the table shows the main line sizes, it can also be used to select the proper branch line sizes.

The table gives not only the individual BTU/HR and *approximate* compressor size, but also liquid and suction line sizes for runs from 50 feet in length to 200 feet. The suction line column has also been broken into horizontal and vertical runs.

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WAUKESHA WISCONSIN

Table 3. Line Sizes for DFR-KT 30" Door Frozen Food Freezers

MODEL	BTU/HR @ -19 DEGREES F EVAPORATOR	COMPRESSOR HORSEPOWER R-502	RECOMMENDED LIQUID LINE SIZES EQUIVALENT LENGTH, FEET				RECOMMENDED SUCTION LINE SIZES EQUIVALENT LENGTH, FEET							
							50		100		150		200	
FROZEN FOOD TEMPERATURES 0 TO -5 DEGREES F.			50	100	150	200	H	V	H	V	H	V	H	V
RI-2-DFR-KT	4800	1.1/2	1/4	3/8	3/8	3/8	7/8	7/8	7/8	7/8	7/8	7/8	7/8	7/8
RI-3-DFR-KT	6100	1.1/2	3/8	3/8	3/8	3/8	7/8	7/8	7/8	7/8	7/8	7/8	7/8	7/8
RI-4-DFR-KT	7400	2	3/8	3/8	3/8	3/8	7/8	7/8	7/8	7/8	7/8	7/8	7/8	7/8
RI-5-DFR-KT	8800	2	3/8	3/8	3/8	3/8	7/8	7/8	7/8	7/8	7/8	7/8	7/8	7/8
RI-6-DFR-KT	10500	3	3/8	3/8	3/8	3/8	7/8	7/8	7/8	7/8	7/8	7/8	7/8	7/8
RI-7-DFR-KT	12200	3	3/8	1/2	1/2	1/2	1.1/8	1.1/8	1.1/8	1.1/8	1.1/8	1.1/8	1.1/8	1.1/8
RI-8-DFR-KT	13900	3	3/8	1/2	1/2	1/2	1.1/8	1.1/8	1.1/8	1.1/8	1.1/8	1.1/8	1.1/8	1.1/8
RI-9-DFR-KT	15700	5	3/8	1/2	1/2	1/2	1.1/8	1.1/8	1.1/8	1.1/8	1.1/8	1.1/8	1.1/8	1.1/8
RI-10-DFR-KT	17400	5	3/8	1/2	1/2	1/2	1.1/8	1.1/8	1.1/8	1.1/8	1.1/8	1.1/8	1.1/8	1.1/8
RI-11-DFR-KT	19100	5	1/2	1/2	1/2	1/2	1.1/8	1.1/8	1.3/8	1.1/8	1.3/8	1.1/8	1.5/8	1.1/8
RI-12-DFR-KT	20800	5	1/2	1/2	1/2	1/2	1.1/8	1.1/8	1.3/8	1.1/8	1.3/8	1.1/8	1.5/8	1.1/8
RI-13-DFR-KT	22500	5	1/2	1/2	1/2	1/2	1.1/8	1.1/8	1.3/8	1.1/8	1.3/8	1.1/8	1.5/8	1.1/8
RI-14-DFR-KT	24300	7.1/2	1/2	5/8	5/8	5/8	1.1/8	1.1/8	1.3/8	1.3/8	1.3/8	1.3/8	1.5/8	1.3/8
RI-15-DFR-KT	26000	7.1/2	1/2	5/8	5/8	5/8	1.1/8	1.1/8	1.3/8	1.3/8	1.3/8	1.3/8	1.5/8	1.3/8
RI-16-DFR-KT	27700	7.1/2	1/2	5/8	5/8	5/8	1.1/8	1.1/8	1.3/8	1.3/8	1.3/8	1.3/8	1.5/8	1.3/8
RI-17-DFR-KT	29400	7.1/2	1/2	5/8	5/8	5/8	1.1/8	1.1/8	1.3/8	1.3/8	1.3/8	1.3/8	1.5/8	1.3/8
RI-18-DFR-KT	31100	7.1/2	1/2	5/8	5/8	5/8	1.1/8	1.1/8	1.3/8	1.3/8	1.3/8	1.3/8	1.5/8	1.3/8
RI-19-DFR-KT	32800	7.1/2	1/2	5/8	5/8	5/8	1.1/8	1.1/8	1.3/8	1.3/8	1.3/8	1.3/8	1.5/8	1.3/8
RI-20-DFR-KT	34500	7.1/2	1/2	5/8	5/8	5/8	1.1/8	1.1/8	1.3/8	1.3/8	1.3/8	1.3/8	1.5/8	1.3/8
RI-21-DFR-KT	36200	7.1/2	1/2	5/8	5/8	5/8	1.3/8	1.3/8	1.5/8	1.3/8	1.5/8	1.5/8	2.1/8	1.5/8
RI-22-DFR-KT	37900	7.1/2	1/2	5/8	5/8	5/8	1.3/8	1.3/8	1.5/8	1.3/8	1.5/8	1.5/8	2.1/8	1.5/8
RI-23-DFR-KT	39500	7.1/2	1/2	5/8	5/8	5/8	1.3/8	1.3/8	1.5/8	1.3/8	1.5/8	1.5/8	2.1/8	1.5/8
RI-24-DFR-KT	41200	10	1/2	5/8	5/8	5/8	1.3/8	1.3/8	1.5/8	1.3/8	1.5/8	1.5/8	2.1/8	1.5/8
RI-25-DFR-KT	42900	10	1/2	5/8	5/8	5/8	1.3/8	1.3/8	1.5/8	1.3/8	1.5/8	1.5/8	2.1/8	1.5/8
RI-26-DFR-KT	44600	10	1/2	5/8	5/8	5/8	1.3/8	1.3/8	1.5/8	1.3/8	1.5/8	1.5/8	2.1/8	1.5/8
RI-27-DFR-KT	46300	5 & 7.1/2	1/2	5/8	5/8	5/8	1.3/8	1.3/8	1.5/8	1.3/8	1.5/8	1.5/8	2.1/8	1.5/8
RI-28-DFR-KT	48000	7.1/2 & 7.1/2	5/8	5/8	5/8	5/8	1.5/8	1.5/8	2.1/8	1.5/8	2.1/8	1.5/8	2.1/8	1.5/8
RI-29-DFR-KT	49800	7.1/2 & 7.1/2	5/8	5/8	5/8	5/8	1.5/8	1.5/8	2.1/8	1.5/8	2.1/8	1.5/8	2.1/8	1.5/8
RI-30-DFR-KT	51500	7.1/2 & 7.1/2	5/8	5/8	5/8	5/8	1.5/8	1.5/8	2.1/8	1.5/8	2.1/8	1.5/8	2.1/8	1.5/8

How To Use This Table

The table shows the main line sizes to be used for various combinations of Reach-In freezers. Although the table shows the main line sizes, it can also be used to select the proper branch line sizes.

The table gives not only the individual BTU/HR and *approximate* compressor size, but also liquid and suction line sizes for runs from 50 feet in length to 200 feet. The suction line column has also been broken into horizontal and vertical runs.

Table 4. Line Sizes for DFR-KT 30" Door Ice Cream Freezers

MODEL	BTU/HR @ -25 DEGREES F EVAPORATOR	COMPRESSOR HORSEPOWER R-502	RECOMMENDED LIQUID LINE SIZES EQUIVALENT LENGTH, FEET				RECOMMENDED SUCTION LINE SIZES EQUIVALENT LENGTH, FEET							
							50		100		150		200	
ICE CREAM TEMPERATURES -10 TO -15 DEGREES F.			50	100	150	200	H	V	H	V	H	V	H	V
RI-2-DFR-KT	5300	1.1/2	1/4	3/8	3/8	3/8	7/8	7/8	7/8	7/8	7/8	7/8	7/8	7/8
RI-3-DFR-KT	6700	2	3/8	3/8	3/8	3/8	7/8	7/8	7/8	7/8	7/8	7/8	7/8	7/8
RI-4-DFR-KT	8200	2	3/8	3/8	3/8	3/8	7/8	7/8	7/8	7/8	7/8	7/8	7/8	7/8
RI-5-DFR-KT	9600	3	3/8	3/8	3/8	3/8	7/8	7/8	7/8	7/8	7/8	7/8	7/8	7/8
RI-6-DFR-KT	11600	3	3/8	3/8	3/8	3/8	7/8	7/8	7/8	7/8	7/8	7/8	7/8	7/8
RI-7-DFR-KT	13500	5	3/8	1/2	1/2	1/2	1.1/8	1.1/8	1.1/8	1.1/8	1.1/8	1.1/8	1.1/8	1.1/8
RI-8-DFR-KT	15300	5	3/8	1/2	1/2	1/2	1.1/8	1.1/8	1.1/8	1.1/8	1.1/8	1.1/8	1.1/8	1.1/8
RI-9-DFR-KT	17200	5	3/8	1/2	1/2	1/2	1.1/8	1.1/8	1.1/8	1.1/8	1.1/8	1.1/8	1.1/8	1.1/8
RI-10-DFR-KT	19100	5	1/2	1/2	1/2	1/2	1.1/8	1.1/8	1.3/8	1.1/8	1.3/8	1.1/8	1.1/8	1.1/8
RI-11-DFR-KT	21000	7.1/2	1/2	1/2	1/2	1/2	1.1/8	1.1/8	1.3/8	1.1/8	1.3/8	1.1/8	1.5/8	1.1/8
RI-12-DFR-KT	22900	7.1/2	1/2	1/2	1/2	1/2	1.1/8	1.1/8	1.3/8	1.1/8	1.3/8	1.1/8	1.5/8	1.1/8
RI-13-DFR-KT	24800	7.1/2	1/2	5/8	5/8	5/8	1.1/8	1.1/8	1.3/8	1.3/8	1.3/8	1.3/8	1.5/8	1.3/8
RI-14-DFR-KT	26700	7.1/2	1/2	5/8	5/8	5/8	1.1/8	1.1/8	1.3/8	1.3/8	1.3/8	1.3/8	1.5/8	1.3/8
RI-15-DFR-KT	28600	7.1/2	1/2	5/8	5/8	5/8	1.1/8	1.1/8	1.3/8	1.3/8	1.3/8	1.3/8	1.5/8	1.3/8
RI-16-DFR-KT	30400	7.1/2	1/2	5/8	5/8	5/8	1.1/8	1.1/8	1.3/8	1.3/8	1.3/8	1.3/8	1.5/8	1.3/8
RI-17-DFR-KT	32300	7.1/2	1/2	5/8	5/8	5/8	1.1/8	1.1/8	1.3/8	1.3/8	1.3/8	1.3/8	1.5/8	1.3/8
RI-18-DFR-KT	34200	7.1/2	1/2	5/8	5/8	5/8	1.1/8	1.1/8	1.3/8	1.3/8	1.3/8	1.3/8	1.5/8	1.3/8
RI-19-DFR-KT	36000	10	1/2	5/8	5/8	5/8	1.3/8	1.3/8	1.5/8	1.3/8	1.5/8	1.5/8	2.1/8	1.5/8
RI-20-DFR-KT	37900	10	1/2	5/8	5/8	5/8	1.3/8	1.3/8	1.5/8	1.3/8	1.5/8	1.5/8	2.1/8	1.5/8
RI-21-DFR-KT	39800	10	1/2	5/8	5/8	5/8	1.3/8	1.3/8	1.5/8	1.3/8	1.5/8	1.5/8	2.1/8	1.5/8

How To Use This Table

The table shows the main line sizes to be used for various combinations of Reach-In freezers. Although the table shows the main line sizes, it can also be used to select the proper branch line sizes.

The table gives not only the individual BTU/HR and *approximate* compressor size, but also liquid and suction line sizes for runs from 50 feet in length to 200 feet. The suction line column has also been broken into horizontal and vertical runs.

Temperature Control

A low pressure or temperature control can be used to control freezer temperature. The control should be selected with adequate contact capacity for the switching load.

	Frozen Food 0°F			Ice Cream -10°F		
	Pressure (psig)			Pressure (psig)		
	R-22	R-502	Temp.	R-22	R-502	Temp.
Cut In	24	31	0°F	17	23	-10°F
Cut Out	6	9	-8°F	3	7	-18°F

The settings are approximate due to variations in gauge accuracy, differences in compressor efficiency, and line pressure drop. After the freezer has been operating for 24 hours, it should be rechecked with the shelves fully loaded. The freezer works better when fully loaded, so it may be necessary to readjust the control setting. If the compressor short-cycles, the differential should be widened.

TEMPERATURE CONTROL ADJUSTMENT

When factory installed, the temperature control is located toward the left end of the freezer behind the black kick rail panel. The sensing bulb is located under the fan housing inside the cabinet. It should be wired in place of the low pressure (L.P.) control. (See applicable wiring diagrams.)

The movable indicator points to the temperature at which the compressor starts. The fixed indicator points to the temperature at which the compressor will stop. The difference between these two indicators is the differential. To set the control, proceed as follows:

1. Place a screwdriver in the slot and turn the dial so that the fixed indicator "B" points to the temperature at which the compressor is to stop. (See Figure 3.)
2. Turn the differential adjusting screw "C" until the movable indicator "D" points to the temperature at which the compressor is to start.

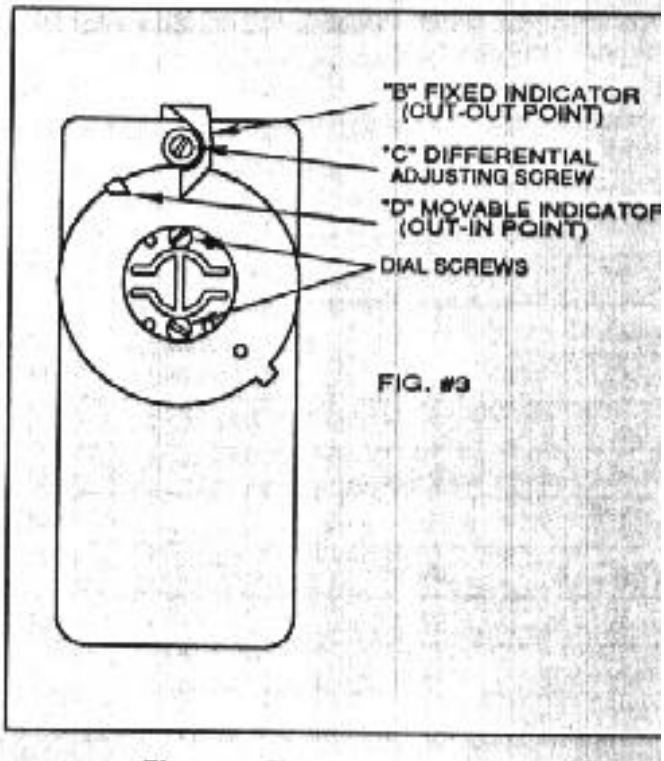

Figure 3. Temperature Control

Crankcase Pressure Regulating Valve (C.P.R.)

The crankcase pressure regulating valve regulates th flow of gas into the compressor. This valve is require if the compressor has insufficient starting torque accelerate to speed at high suction pressures.

Note: *Unless otherwise specified, the freezer is equippe with a "ZP" pressure limiting expansion valve. It will b necessary to replace it with a standard "Z" charg expansion valve before installing the crankcase pre sure regulating valve.*

When used, the C.P.R. valve should be located near th compressor, although it may be installed anywhere the suction line. Set the crankcase pressure regulatin valve to maintain the crankcase pressure recommende by the compressor manufacturer. If a time pressur clock is used for automatic defrosting of the coil, it important that the pressure line from the clock b connected to sense the evaporator pressure, not com pressor suction pressure.

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. Use nitrogen and refrigerant vapor to check for leaks. A Halide leak detector, Prest-O-Lite leak detector, or an electronic leak detector is recommended.

If the system is tight, evacuate with a high vacuum pump. Triple evacuation 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.

ELECTRICAL

(Check applicable wiring diagrams.)

External wiring should be sized according to the amperage rating stamped on the serial plate. All internal wiring has been done at the factory. The 115 volt leads terminate in the junction box located in the base at the bottom right of the freezer. The 115 volt, 60 Hz power source is connected to the color coded sets of leads. This power comes from the normally open contactor unless the freezer has a normally closed contactor. (See applicable wiring diagram.)

The 220 volt red leads for the defrost element terminate in the junction box located at the bottom right of the freezer. The power for the defrost element comes from the time clock. (See applicable wiring diagram).

The 115 volt power source to the freezer is ON at all times except during defrost. The 220 volt power source to the defrost elements is OFF at all times except during defrost. The time clock is in operation at all times.

Note: All wiring must comply with the National Electrical Code and all local codes.

DEFROSTING

General

Periodic defrosting to keep the coil free of excessive frost for top efficiency is accomplished automatically by a time clock used in conjunction with an automatic electric, hot gas, or reduced temperature gas injection defrost system.

Electric Defrost

When the pin in the 24 hour dial reaches the TIME arrow, the clock will trip and the defrost cycle will start. At that time the clock will stop the compressor, energize the 220 volt defrost heater and energize the normally closed 220 volt contactor that de-energizes the 115 volt fans, lights, and door heaters.

After the defrost period, the compressor will operate, lowering the coil temperature by removing heat from the coil and coil area. When the coil temperature reaches +5°F, the fan, light and door heater limit thermostats will close, starting the fans, lights and door heaters.

Gas Defrost

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.

Zero Zone freezers equipped for gas defrost consist of side port expansion valve, distributor and check valve for coil defrost, and a check valve and serpentine coil attached to the bottom of the pan to ensure pan and drain defrost.

Liquid and suction line connections are made inside the case, through the refrigeration access hole located in the floor pan on the left side of the freezer.

Refrigerant Connection Sizes for Hot Gas Defrost		
Model	Suction O.D.	Liquid O.D.
2, 3 DFR; 2 DFR-KT	7/8"	3/8"
4 DFR; 3 DFR-KT	7/8"	1/2"
5 DFR; 4, 5 DFR-KT	1-1/8"	1/2"

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 bottom of the drain and into the evaporator. Condensed liquid leaves the evapo-

rator through the side port expansion valve distributor, through a check valve into the liquid line. Liquid condensed in the serpentine passes through a check valve into the liquid line. (See Figure 5.)

Refer to the defrost frequency and termination recommendations that follow.

Defrost Frequency and Termination

	Reduced Temp. Gas Defrost	Hot Gas	Electric
Frequency*	1	1	1
Time (Min.)	14-16	12-14	50
Temp. (°F) **	50-54	50-54	50-54
Fail Safe Time (Min.)	40	20	60
Drain Time (Min.)	0-3	0-3	0

* Refrigeration technician should recheck coil condition after one week of operation to be certain that the frequency and duration of defrost is adequate for the particular store and locality.

** Temp. termination thermostats should be wired in series for multiple evaporator installations.

Limit Thermostat

Each freezer has factory set limit thermostats attached to the return bends of the coil on the right end of the freezer to regulate the operation of the evaporator fans, freezer lights, and door heaters.

BECAUSE OF THE LIMIT THERMOSTATS, THE EVAPORATOR FANS, FREEZER LIGHTS, AND DOOR HEATERS WILL REMAIN OFF UNTIL THE COMPRESSOR IS OPERATING AND THE COIL TEMPERATURE IS BROUGHT BELOW THE THERMOSTAT CUT-IN SETTING (+5°F).

When the freezer first operates due to temperature fluctuations, the fans and lights may cycle off and on a few times until coil temperature is below +5°F.

To check the fan, light, and door heater circuit when the compressor is not operating, place a jumper wire across the thermostat leads. BE SURE TO REMOVE THE JUMPER WIRE BEFORE STARTING THE FREEZER. Removal of right side coil cover panel will be required to gain access to the electrical junction and limit thermostats.

USER INFORMATION

Cleaning

The freezer should be thoroughly cleaned before start-up and routinely thereafter to maintain a clean appearance. Use a mild detergent and warm water (never an abrasive cleaner) to wipe out the inside of the freezer. Wash down all glass doors with a good glass cleaner. The freezer will remain bright and sparkling with just a few minutes of cleaning each week.

Note: *Do not use high pressure water or steam to clean the interior. Remove any debris to prevent clogging of the drain tube.*

Shelf Location

The shelves are adjustable in 1/2 inch increments and may be located in any position for best display advantage due to the air discharge arrangement. It is suggested that the uppermost shelf be placed 11 inches down from the ceiling and the remaining shelves approximately 10-1/2 inches apart at the front of the freezer.

The rear of each shelf may be set lower than the front on each successive shelf so the shelf slants downward at the rear.

The 23" x 24" shelves (29-1/2" x 24" on the KT freezers) are used for the center sections of the freezer and the 25-1/4" x 24" shelves (32-1/8" x 24" on the KT) are for the end sections. (See Figure 4.) The shelves with one end bent upward should be placed at the bottom with the lip to the front. If desired, the bottom shelves can be placed in the center of the door opening and used for a dump basket display by placing side baffles along the side of the shelf.

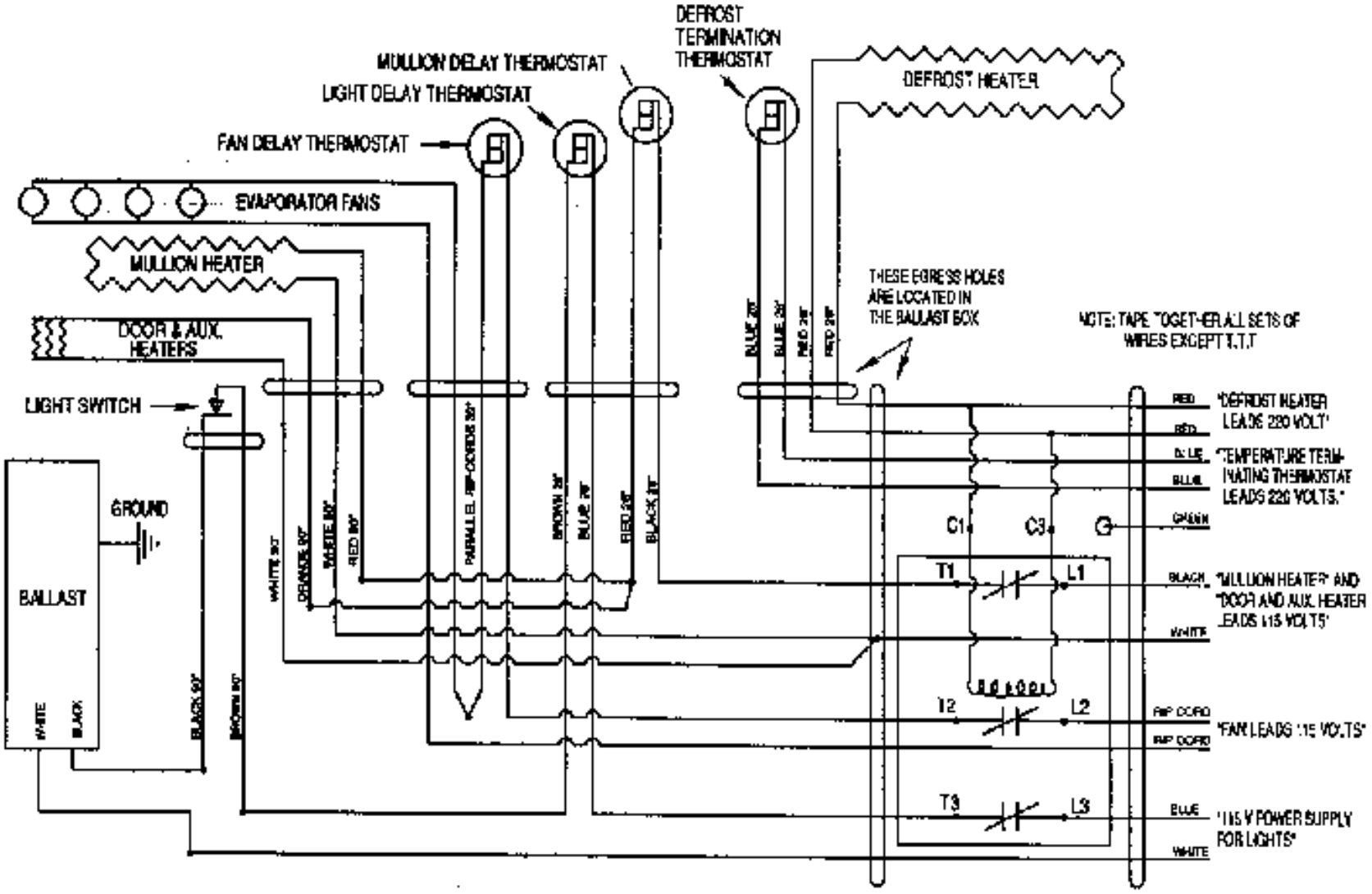

Figure 9. DFR Wiring Diagram — Electric Defrost.

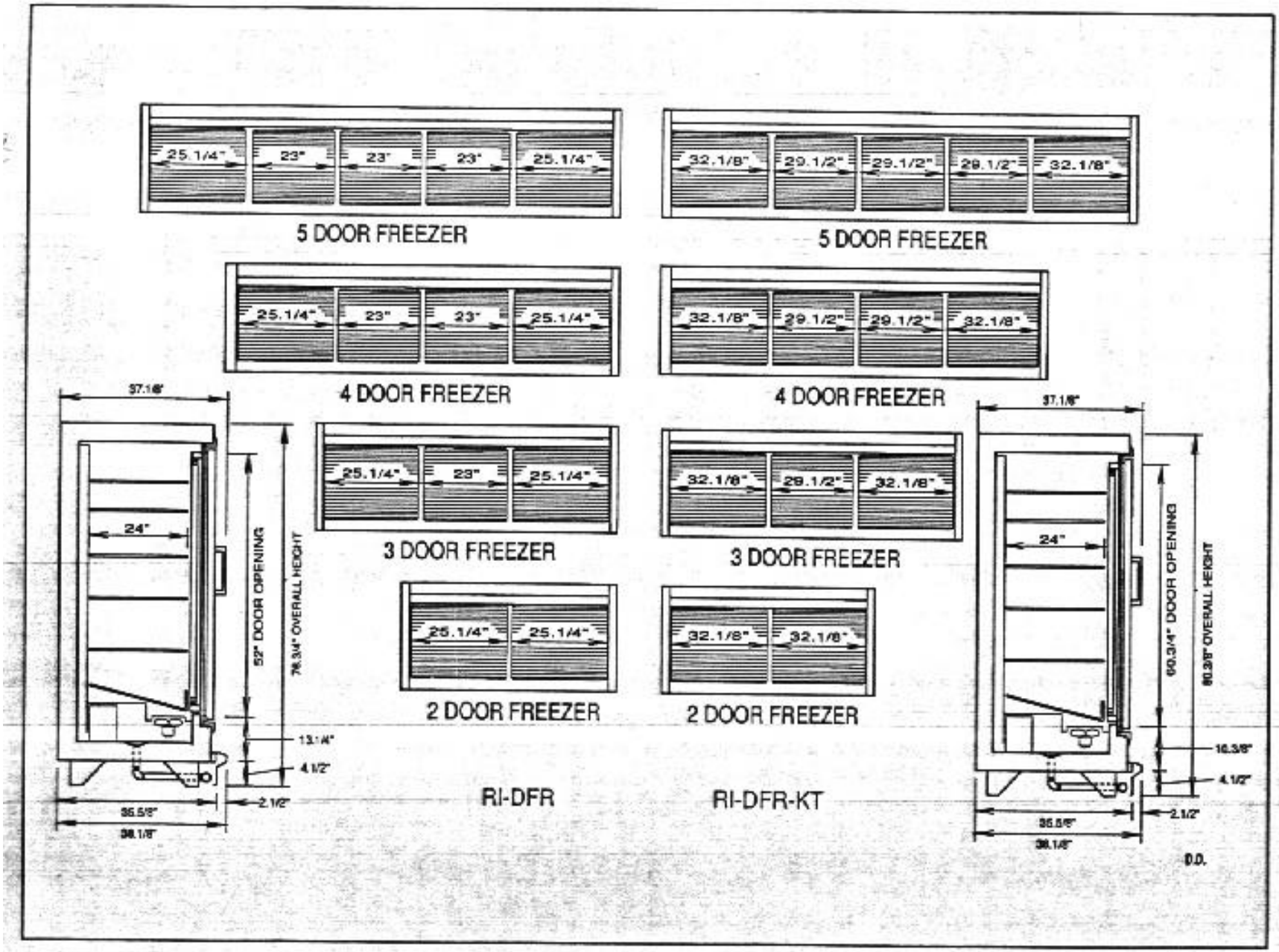

Figure 4. Shelf Placement

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Loading the Freezer

The freezer may be loaded with merchandise after it has been operating for at least 24 hours with correct case temperature and proper control operation. While loading the shelves, leave at least 1-1/2" between the top of the merchandise and the shelf immediately above it so the customer can reach to select the merchandise. This space also helps in maintaining proper air flow in the freezer.

For proper display, the products should be placed on edge and slanted to the back so the customer sees the face of the packages. Rotate inventory on a regular basis.

Do not load product so as to totally block discharge air holes in the back wall of the freezer.

Light Switch

The light switch is located inside the freezer in the upper right corner of the frame. Turn the light switch off during the initial freezer temperature pull-down to prevent the freezer lights from cycling off and on. Always turn the lights off when replacing bulbs.

SERVICE

Cart Bumper

The cart bumper must be removed to gain access to the drain connection, electrical connection, and refrigeration outlet sleeve. To remove the bumper, remove the 3 or 4 sheet metal screws located in the face of the black kick rail. Pull out the bottom of the black kick rail and lift upward to remove the complete bumper assembly.

Evaporator

The evaporator coil, located at the rear bottom of the freezer, is factory assembled with distributor, expansion valve, and heat exchanger. To inspect the coil, the coil cover can be raised by removing the sheet metal screws from the cover and back wall.

Expansion Valve

Unless otherwise specified, an externally equalized thermostatic expansion valve with pressure limiting ZP charge adjustable super-heat and thermal bulb is mounted to the evaporator coil. Under certain conditions, it may be necessary to adjust the super-heat setting for maximum coil effectiveness. To adjust the expansion valve, remove the right end coil cover from the top end of the coil. Remove the cap from the bottom of the valve. When looking up the valve stem, turn the valve stem counterclockwise to open the valve. Turn the valve stem clockwise to close the valve. Measure the suction line temperature at the expansion valve sensing bulb and compare it to the corrected suction temperature corresponding to the saturated pressure. Make sure that line pressure drop is taken into account.

Turn the valve stem only 1/4 turn at a time and allow sufficient time 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.

Electric Defrost Element

⚠ CAUTION ⚠

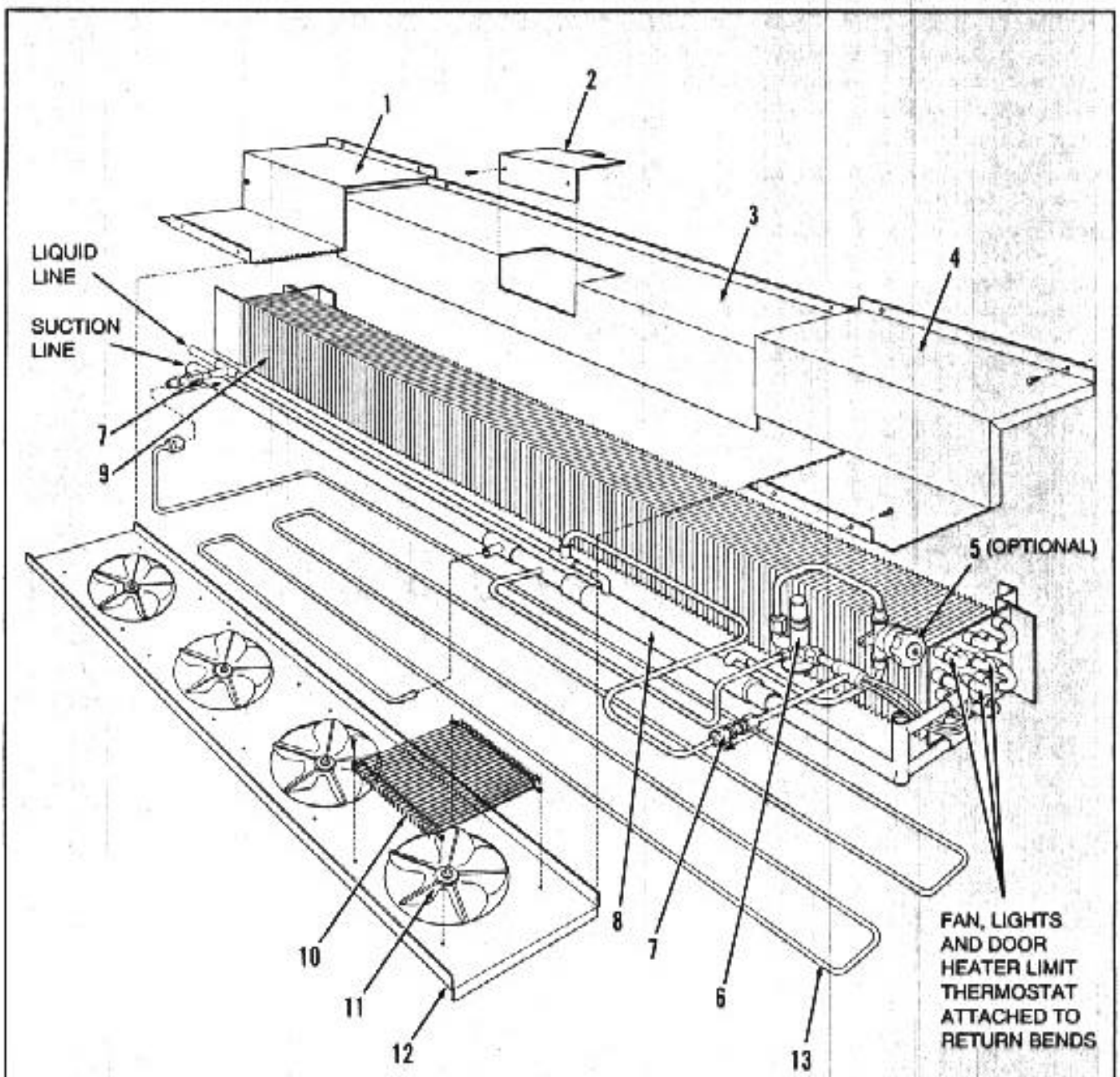
DISCONNECT POWER TO THE CASE BEFORE SERVICING HEATER.

The defrost element is located under the coil. The electric wire leads are connected in the right junction box below the right end coil cover at the front of the freezer. To remove the defrost element, remove the right, left, and center coil covers. Next remove the fan housing legs and air baffle assembly fastened to the rear edge of the fan housing with sheet metal screws. Turn the metal clips holding the heater pad from both ends of the coil end plates so they disengage the heater pad. Then slide out the complete heater pad assembly from under the coil and under the fan housing. Slowly lift the heater pad assembly between coil and fan housing, turning it on edge while lifting.

Evaporator Fans

Air is circulated throughout the freezer with shaft up, 115 volt low temperature fan motors. These motors must be operating at all times except during defrost. To service the fan:

1. Remove wire fan guard and mounting bracket screws.
2. Unplug fan from fan power supply plug located under fan housing. (See Figure 5.)



1. Left Coil Cover
2. Drain Access Cover
3. Coil Cover
4. Right Coil Cover
5. Hand Valve (Optional)
6. Expansion Valve
7. Check Valve (Hot Gas Defrost Only)
8. Heat Exchanger
9. Evaporator Coil
10. Fan Guard
11. Fan Blade-Fan Motor
12. Fan Housing
13. Serpentine Coil-Hot Gas Defrost (Heating Element (not shown) located under coil in case with electric defrost)

Figure 5. Freezer Component Location

Lights

High output 1500 milliamp bulbs are standard with these freezers. To ensure maximum component life, always replace with 1500 milliamp bulbs.

Use retainer clips and lamp shields.

***Note:** The use of 800 milliamp bulbs will result in bulb and ballast failure.*

To change a light bulb, turn off the light switch and remove the retainer clip located between the socket and end cap. Carefully force the lamp up into the spring-loaded lamp socket to allow the bulb to be removed from the bottom socket. (See Figure 6.) Remove the end caps and lamp shield.

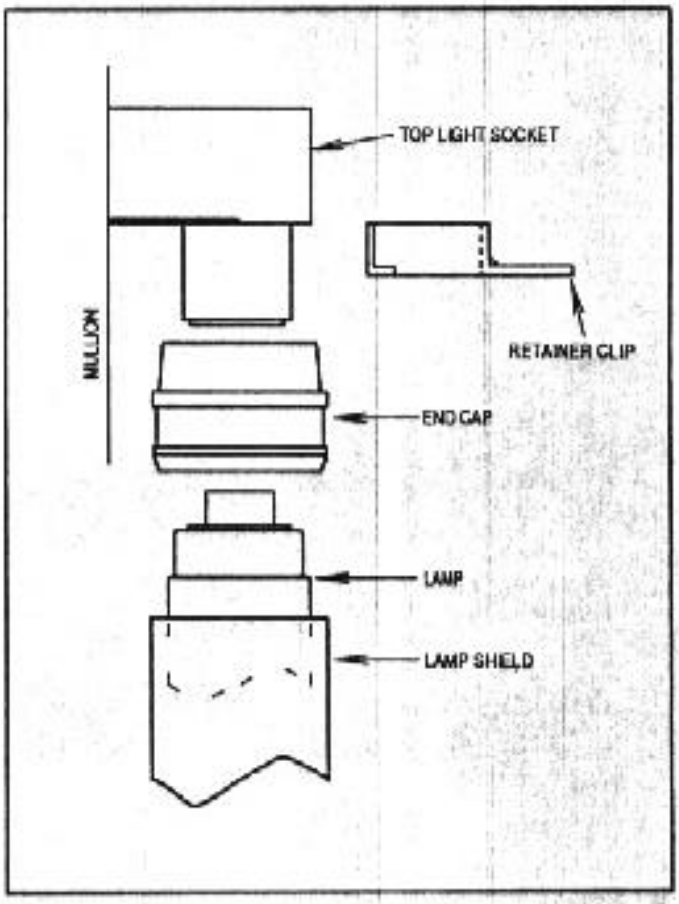


Figure 6. Removing Lamp

SPECIFICATIONS

NO. OF DOORS	FREEZER COMBINATIONS	24" WIDE DOORS MODEL	TOTAL LENGTH W/ ENDS	30" WIDE DOORS MODEL	TOTAL LENGTH W/ ENDS
2	(1) 2-DR	RI-2-DFR	4'- 9"	RI-2-DFR-KT	5'-10 3/4"
3	(1) 3-DR	RI-3-DFR	6'- 9 1/8"	RI-3-DFR-KT	8'- 5 1/4"
4	(1) 4-DR	RI-4-DFR	8'- 8 1/2"	RI-4-DFR-KT	10'-11 3/4"
5	(1) 5-DR	RI-5-DFR	10'- 6 1/4"	RI-5-DFR-KT	13'- 6 1/4"
6	(2) 3-DR	RI-6-DFR	13'- 0 1/2"	RI-6-DFR-KT	16'- 5 1/4"
7	(1) 3-DR & (1) 4-DR	RI-7-DFR	15'- 0"	RI-7-DFR-KT	18'-11 3/4"
8	(2) 4-DR	RI-8-DFR	17'- 0 1/4"	RI-8-DFR-KT	21'- 6 1/4"
9	(1) 4-DR & (1) 5-DR	RI-9-DFR	19'- 0"	RI-9-DFR-KT	24'- 0 3/4"
10	(2) 5-DR	RI-10-DFR	20'-11 3/4"	RI-10-DFR-KT	26'- 7"
11	(1) 3-DR & (2) 4-DR	RI-11-DFR	23'- 4"	RI-11-DFR-KT	29'- 6 1/4"
12	(3) 4-DR	RI-12-DFR	25'- 3 3/4"	RI-12-DFR-KT	32'- 1"
13	(2) 4-DR & (1) 5-DR	RI-13-DFR	27'- 3 1/2"	RI-13-DFR-KT	34'- 7"
14	(1) 4-DR & (2) 5-DR	RI-14-DFR	29'- 3 1/4"	RI-14-DFR-KT	37'- 1 3/4"
15	(3) 5-DR	RI-15-DFR	31'- 3"	RI-15-DFR-KT	39'- 8 1/4"
16	(4) 4-DR	RI-16-DFR	33'- 7 1/4"	RI-16-DFR-KT	42'- 7 1/4"
17	(3) 4-DR & (1) 5-DR	RI-17-DFR	35'- 7"	RI-17-DFR-KT	45'- 1 3/4"
18	(2) 4-DR & (2) 5-DR	RI-18-DFR	37'- 6 3/4"	RI-18-DFR-KT	47'- 8 1/4"
19	(1) 4-DR & (3) 5-DR	RI-19-DFR	39'- 6 1/2"	RI-19-DFR-KT	50'- 2 3/4"
20	(4) 5-DR	RI-20-DFR	41'- 6 1/4"	RI-20-DFR-KT	52'- 9 1/4"
21	(4) 4-DR & (1) 5-DR	RI-21-DFR	43'-10 1/2"	RI-21-DFR-KT	55'- 8 1/4"
22	(3) 4-DR & (2) 5-DR	RI-22-DFR	45'-10 1/4"	RI-22-DFR-KT	58'- 2 3/4"
23	(2) 4-DR & (3) 5-DR	RI-23-DFR	47'-10"	RI-23-DFR-KT	60'- 9 1/4"
24	(1) 4-DR & (4) 5-DR	RI-24-DFR	49'- 9 3/4"	RI-24-DFR-KT	63'- 8 1/4"
25	(5) 5-DR	RI-25-DFR	51'- 9 1/2"	RI-25-DFR-KT	65'-10 1/4"
26	(4) 4-DR & (2) 5-DR	RI-26-DFR	54'-10 3/4"	RI-26-DFR-KT	68'- 9 1/4"
27	(3) 4-DR & (3) 5-DR	RI-27-DFR	56'- 1 1/2"	RI-27-DFR-KT	71'- 3 3/4"
28	(2) 4-DR & (4) 5-DR	RI-28-DFR	58'- 1 1/4"	RI-28-DFR-KT	73'- 9 3/4"
29	(1) 4-DR & (5) 5-DR			RI-29-DFR-KT	76'- 4 1/8"
30	(6) 5-DR			RI-30-DFR-KT	78'-10 1/2"

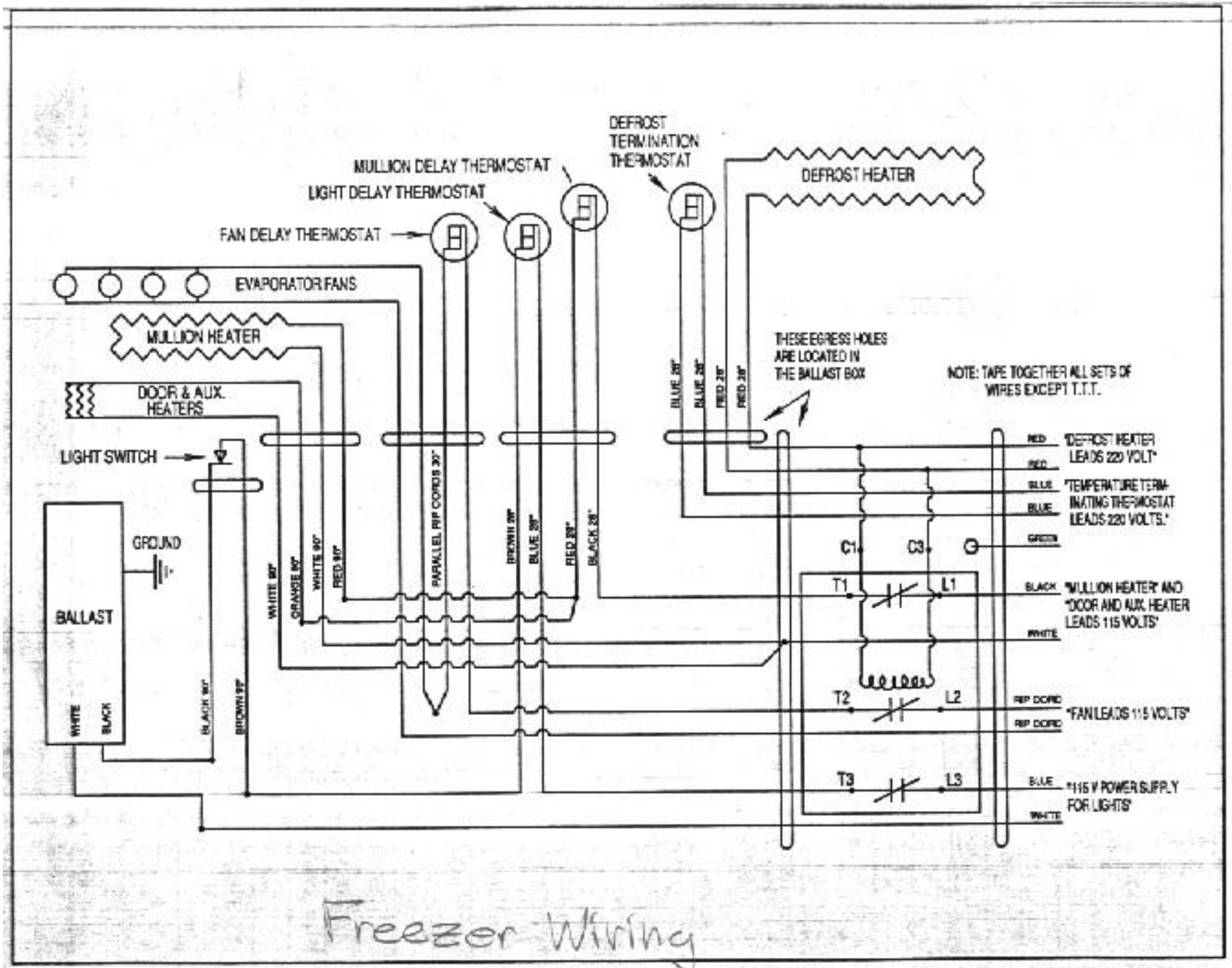


Figure 7. Wiring Diagram — Electric Defrost

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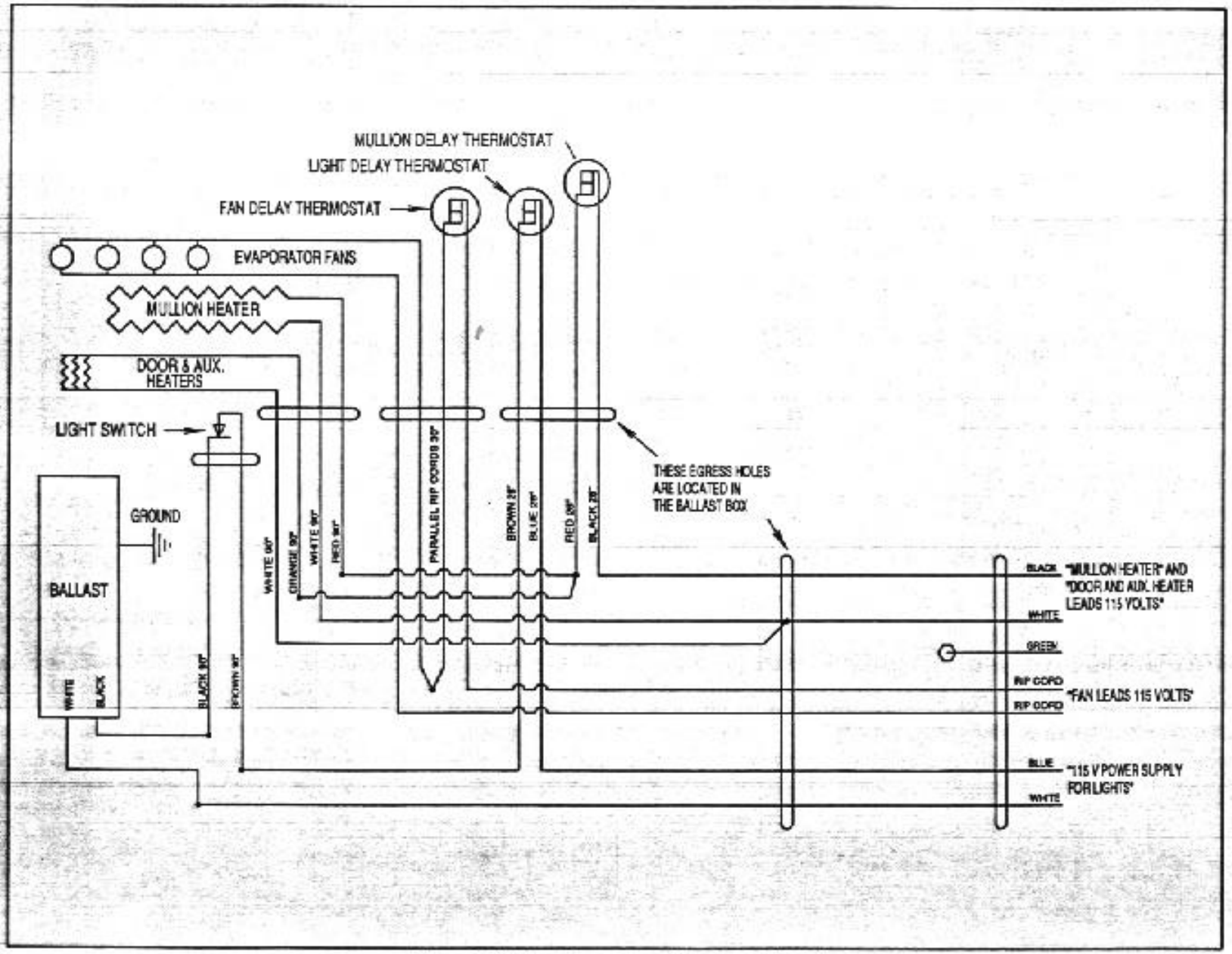

Figure 8. Wiring Diagram — Hot Gas Defrost

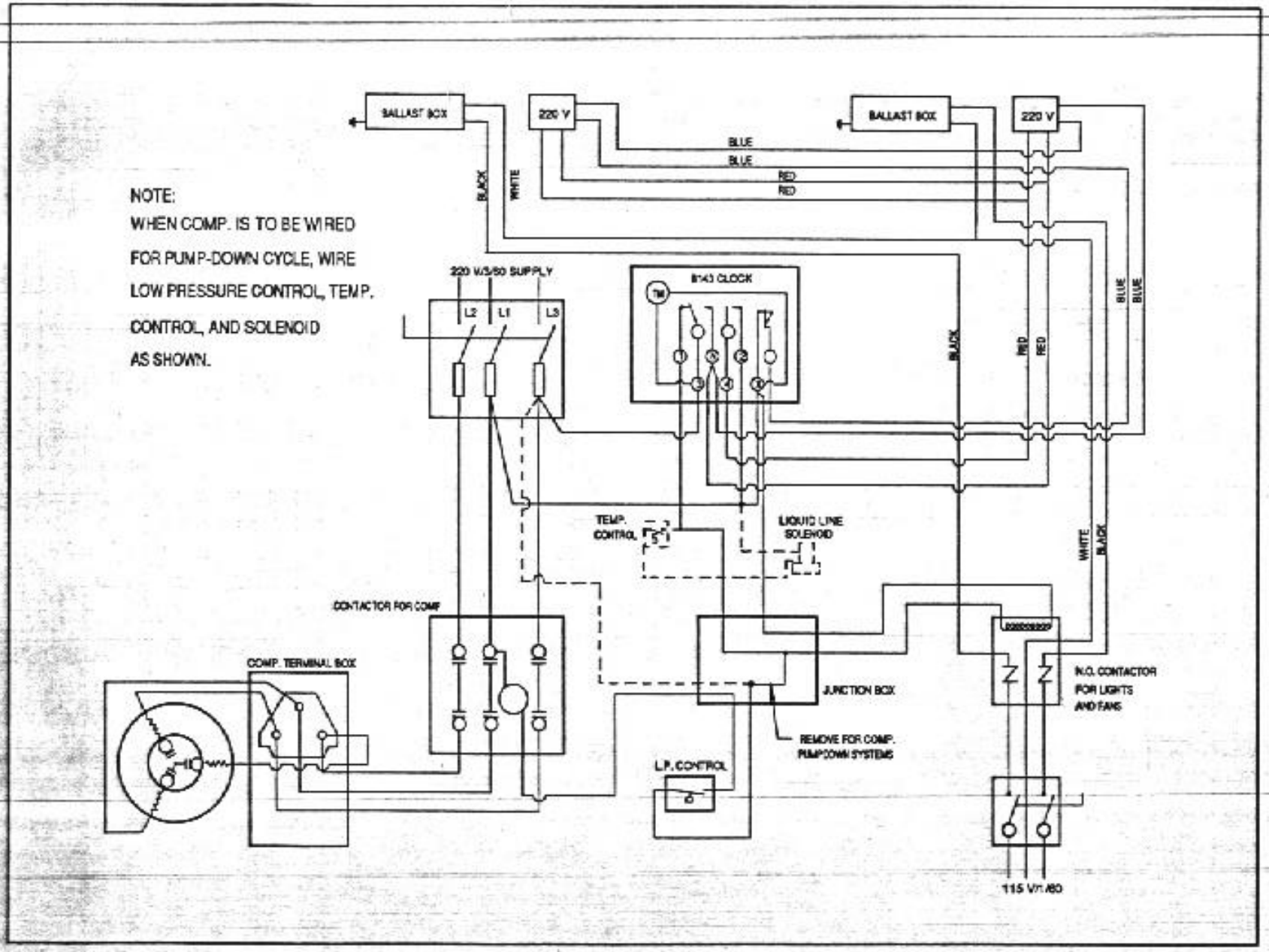

Figure 9. Wiring Diagram — Time Temperature Defrost

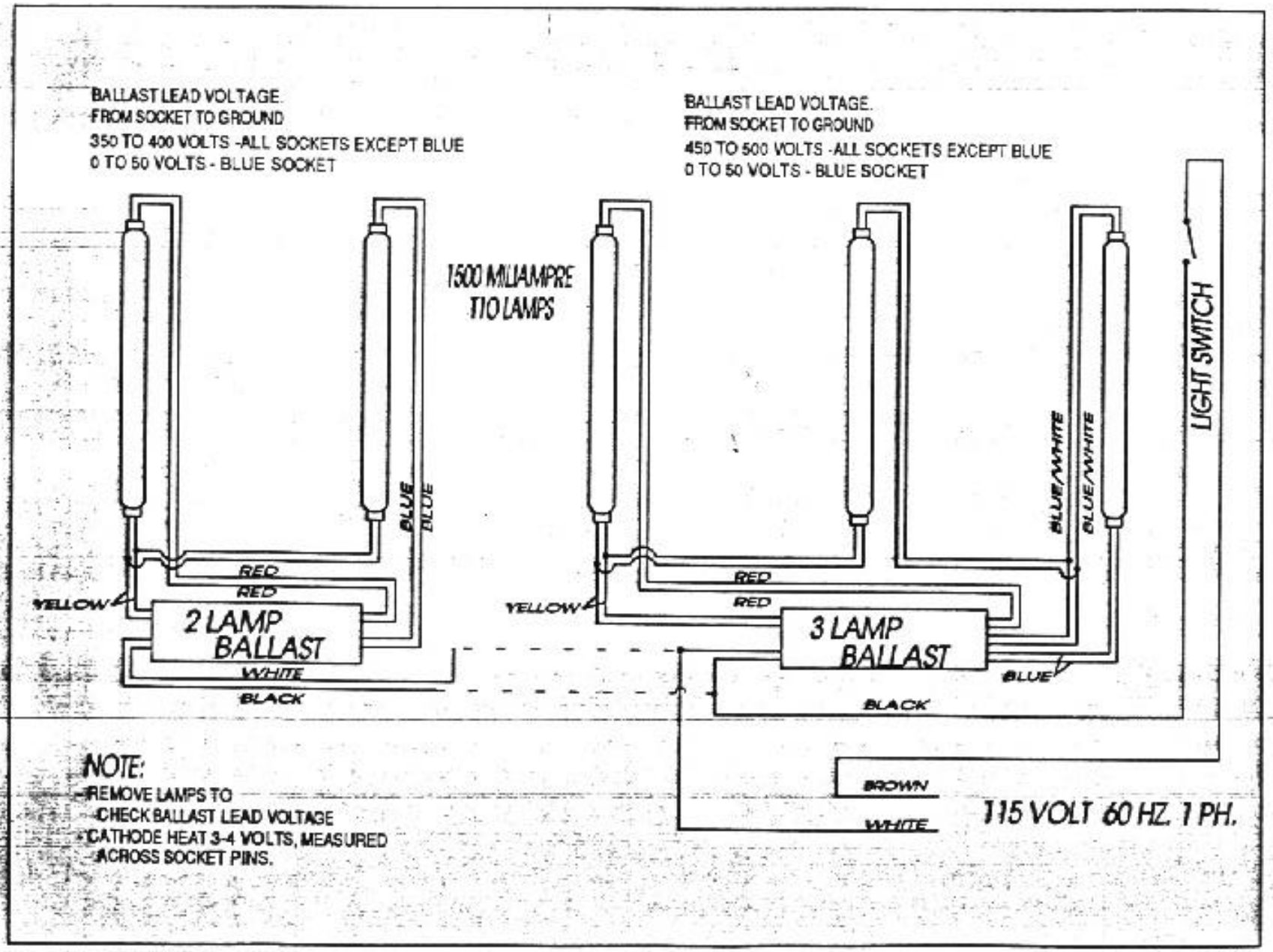

Figure 10. Wiring Diagram — 2 and 3 Lamp Ballast

ZERO ZONE
WAUKESHA WISCONSIN

PARTS LIST

RI-DFR and RI-DFR-KT

Part No.	Description
	Ballasts
63-0033	2 Lamp Low Temp — 48"
63-0036	2 Lamp Low Temp — 60"
63-0037	3 Lamp Low Temp — 48" or 60"
	Defrost Heater Elements
60-0001	1200 Watt (2 DFR)
60-0003	1400 Watt (2 DFR-KT)
60-0004	1750 Watt (3 DFR)
60-0005	2200 Watt (4 DFR/3 DFR-KT)
60-0006	2750 Watt (5 DFR/4 DFR-KT)
60-0007	3500 Watt (5 DFR-KT)
	Lamps
63-0047	F48T10CW (DFR 48" Low Temp)
63-0049	F60T10CW (DFR-KT 60" Low Temp)
63-0057	F60T10 SP-30 (DFR-KT 60" Low Temp)
	Lamp Assemblies (Lamp, Jacket & 2 Terminals)
63-0048	F48T10J/CW (DFR 48" Low Temp)
63-0049	F60T10J/CW (DFR-KT 60" Low Temp)
63-0058	F60T10J/SP-30 (DFR-KT 60" Low Temp)
63-0045	Lamp End Grommets (2)
75-0119	Top Lampholders
75-0120	Bottom Lampholders
	Lamp Jackets
63-0042	DFR — 48"
63-0043	DFR-KT — 60"
	Defrost Terminations
63-0028	Klixon T.T.T.
63-0101	White Rogers #101
63-0027	Klixon (Fan, Light, or Heater Delay)
63-0020	Normally Closed Contactor: ACC230
63-0001	Fan Motor
63-0002	Fan Motor (Low Energy)
41-0077	Motor Mounting Bracket
63-0006	Fan Blade
55-CLIP	Shelf Clip
63-0106	Temperature Control — White Rogers #106