

# HUSSMANN®

## ASC-L / ASCS-L

LIFT UP CURVED OR STRAIGHT GLASS, REFRIGERATED  
SERVICE GELATO AND ICE CREAM CASE



P/N IGSF-ASC-L/ASCS-L-0909

## General Instructions

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Keep this booklet with the case at all times for future reference.

## HUSSMANN®/CHINO

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### This Booklet Contains Information on:

**ASC-L/ASCS-L:** Lift-up curved or straight glass refrigerated service Gelato and Ice Cream Merchandiser

### Shipping Damage

All equipment should be thoroughly examined for shipping damage before and during unloading.

This equipment has been carefully inspected at our factory and the carrier has assumed responsibility for safe arrival. If damaged, either apparent or concealed, claim must be made to the carrier.

### Apparent Loss or Damage

If there is an *obvious loss or damage*, it must be noted on the freight bill or express receipt and signed by the carrier's agent; otherwise, carrier may refuse claim. The carrier will supply necessary claim forms.

### Concealed Loss or Damage

When loss or damage *is not apparent until after equipment is uncrated*, a claim for concealed damage is made. Make request in writing to carrier for inspection within 15 days, and retain all packaging. The carrier will supply inspection report and required claim forms.

### Shortages

Check your shipment for any possible shortages of material. If a shortage should exist and is found to be the responsibility of Hussmann Chino, *notify Hussmann Chino*. If such a shortage involves the carrier, *notify the carrier immediately*, and request an inspection. Hussmann Chino will acknowledge shortages within ten days from receipt of equipment.

### Hussmann Chino Product Control

The serial number and shipping date of all equipment has been recorded in Hussmann's files for warranty and replacement part purposes. All correspondence pertaining to warranty or parts ordering must include the serial number of each piece of equipment involved, in order to provide the customer with the correct parts.



This equipment is to be installed to comply with the applicable NEC, Federal, State, and Local Plumbing and Construction Code having jurisdiction.



## Installation (Cont'd)

### Leveling

**IMPORTANT! IT IS IMPERATIVE THAT CASES BE LEVELED FROM FRONT TO BACK AND SIDE TO SIDE PRIOR TO JOINING. A LEVEL CASE IS NECESSARY TO INSURE PROPER OPERATION, WATER DRAINAGE, GLASS ALIGNMENT, AND OPERATION OF THE HINGES SUPPORTING THE GLASS. LEVELING THE CASE CORRECTLY WILL SOLVE MOST HINGE OPERATION PROBLEMS.**

**NOTE:** A. To avoid removing concrete flooring, begin lineup leveling from the highest point of the store floor.

B. When wedges are involved in a lineup, set them first.

All cases were leveled and joined prior to shipment to insure the closest possible fit when cases are joined in the field. When joining, use a carpenter's level and shim legs accordingly. Case must be raised correctly, under legs where support is best, to prevent damage to case.

1. Check level of floor where cases are to be set. Determine the highest point of the floor; cases will be set off this point.
2. Set first case, and adjust legs over the highest part of the floor so that case is level. Prevent damage—case must be raised under leg or by use of 2x6 or 2x4 leg brace. Remove side and back leg braces after case is set.
3. Set second case as close as possible to the first case, and level case to the first using the instructions in step one.
4. Apply masking tape 1/8" in from end of case on inside and outside rear mullion on both cases to be joined.
5. Apply liberal bead of case joint sealant (butyl) to dotted area shown in (Fig. 2, #1) of first case. Apply heavy amount to cover entire shaded area.

**DO NOT USE PERMAGUM!**



**It is the contractor's responsibility to install case(s) according to local construction and health codes**

6. Slide second case up to first case snugly. Then level second case to the first case so glass front, bumper and top are flush.
7. To compress silicone at joint, use two Jurgenson wood clamps. Make sure case is level from front to back and side to side on inside bulkheads at joint.
8. Attach sections together via a 2 bolts located in the base of the case. Secure the overhead structure by bolting the bracket, located inside behind lights.



### CAUTION

Do not use cam locks to pull cases together.

9. Apply bead of silicone to top of bulkheads and slip on stainless steel bulkhead cap. Also apply silicone to seam between overhead light tubes.

### Joint Trim

After cases have been leveled and joined, and refrigeration, electrical, and wasted piping work completed, install the splashguards. Fasten along the top edge, or center, with #10 X 3/3" sheet metal screws.

**DO NOT SEAL JOINT TRIM TO FLOOR!**



### GLASS BREAKAGE MAY OCCUR!

Retighten glass along glass clamp after leveling and first time case is brought to full operating temperature!

## Installation (Cont'd)

### Bumper Installation Instructions



Step 1: Make sure the aluminum channel and end caps are installed.



Step 2: Use silicone lubricant to help the bumper slide into the channel.



Step 3: Starting on one end: while inserting the bumper, push it up against the end cap to prevent the bumper from shrinking after installation (when it gets cold).



Step 4: As you insert the bumper into the channel with one hand, pull the bumper toward you with the other to open the inside lips. Slowly apply pressure by rolling the bumper into the track.



---

## Installation (Cont'd)

### Boston Series 2000

**NOTE:** Flexible top: Over cut vinyl 1/8" for every 4' section for the flexible top to ensure a proper fit.

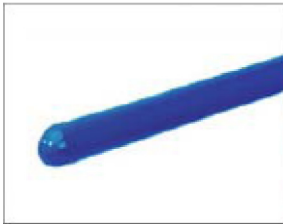
**NOTE:** Rigid Top: Do not over cut.



1. Attach the base and end/corner cap to the desired surface by inserting #8 pan head screws through the pre-slotted holes in both the end cap and the base. Insert screws through the two holes of end cap and tighten.



- 2a. **Flexible Top:** Butt end of the vinyl top against end/corner cap. While applying pressure, bend back vinyl top so that vinyl legs are positioned within the base grooves. Roll vinyl top over full length of base, then tap with rubber mallet to ensure vinyl is securely locked into the base.
- 2b. **Rigid Top:** Snap the Rigid Top over the Rigid Base.



3. If necessary wipe clean with any household cleaning product.

### Helpful Hints:

- For best results, before cutting, install a scrap piece of base into vinyl top to achieve a clean cut.
- Set the uncoiled flexible vinyl at room temperature 24 hours prior to installation.
- Lubricate the inside of the vinyl with soapy water or silicone before installing.
- Over cut the flexible vinyl and compression fit. Adding the additional materials will compensate for stretching which occurs during installation.

## Installation (Cont'd)

### Boston 2000 Eco Series



1. Attach the base and end/corner cap to the desired surface by inserting #8 pan head screws through the pre-slotted holes in both the end cap and the base. Insert screws through the two holes of end cap and tighten.



- 2a. **Flexible Top:** Butt end of the vinyl top against end/corner cap. While applying pressure, bend back vinyl top so that vinyl legs are positioned within the base grooves. Roll vinyl top over full length of base, then tap with rubber mallet to ensure vinyl is securely locked into the base.
- 2b. **Rigid Top:** Snap the Rigid Top over the Rigid Base.



3. If necessary wipe clean with any household cleaning product.

#### Helpful Hints:

- For best results, before cutting, install a scrap piece of base into vinyl top to achieve a clean cut.
- Set the uncoiled flexible vinyl at room temperature 24 hours prior to installation.
- Lubricate the inside of the vinyl with soapy water or silicone before installing.
- Over cut the flexible vinyl and compression fit. Adding the additional materials will compensate for stretching which occurs during installation.

## Installation (Cont'd)

### Boston 1000 Series

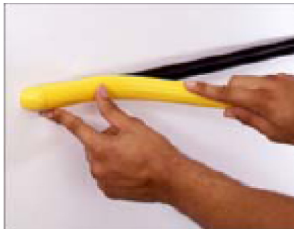
**NOTE:** Flexible top: Over cut vinyl 1/8" for every 4' section for the flexible top to ensure a proper fit.

**NOTE:** Rigid Top: Do not over cut.

#### Installation



1. Attach the base and end/corner cap to the desired surface by inserting #8 pan head screws through the pre-slotted holes in both the end cap and the base. Insert screws through the two holes of end cap and tighten.



- 2a. **Flexible Top:** Butt end of the vinyl top against end/corner cap. While applying pressure, bend back vinyl top so that vinyl legs are positioned within the base grooves. Roll vinyl top over full length of base, then tap with rubber mallet to ensure vinyl is securely locked into the base.

- 2b. **Rigid Top:** Snap the Rigid Top over the Rigid Base.



3. If necessary wipe clean with any household cleaning product.

#### Helpful Hints:

- For best results, before cutting, install a scrap piece of base into vinyl top to achieve a clean cut.
- Set the uncoiled flexible vinyl at room temperature 24 hours prior to installation.
- Lubricate the inside of the vinyl with soapy water or silicone before installing.
- Over cut the flexible vinyl and compression fit. Adding the additional materials will compensate for stretching which occurs during installation.



## Plumbing

### Waste Outlet and P-TRAP

The waste outlet is located off the center of the case on one side allowing drip piping to be run lengthwise under the fixture.

A 1-1/2" P-TRAPS and threaded adapters are supplied with each fixture. The P-TRAP must be installed to prevent air leakage and insect entrance into the fixture.

**NOTE:** PVC-DWV solvent cement is recommended. Follow the manufacturer's instructions.

### Installing Condensate Drain

Poorly or improperly installed condensate drains can seriously interfere with the operation of this refrigerator, and result in costly maintenance and product losses. Please follow the recommendations listed below when installing condensate drains to insure a proper installation:

1. Never use pipe for condensate drains smaller than the nominal diameter of the pipe or P-TRAP supplied with the case.
2. When connecting condensate drains, the P-TRAP must be used as part of the condensate drain to prevent air leakage or insect entrance. Store plumbing system floor drains should be at least 14" off the center of the case to allow use of the P-TRAP pipe section. Never use two water seals in series in any one line. Double P-TRAPS in series will cause a lock and prevent draining.

3. Always provide as much down hill slope ("fall") as possible; 1/8" per foot is the preferred minimum. PVC pipe, when used, must be supported to maintain the 1/8" pitch and to prevent warping.
4. Avoid long runs of condensate drains. Long runs make it impossible to provide the "fall" necessary for good drainage.
5. Provide a suitable air break between the flood rim of the floor drain and outlet of condensate drain. 1" is ideal.
6. Prevent condensate drains from freezing:
  - a. Do not install condensate drains in contact with non-insulated suction lines. Suction lines should be insulated with a non - absorbent insulation material such as Armstrong's Armaflex.
  - b. Where condensate drains are located in dead air spaces (between refrigerators or between a refrigerator and a wall), provide means to prevent freezing. The water seal should be insulated to prevent condensation.

## Refrigeration

### Gelato/Soft Ice Cream

These display cases are designed to hold product at temperatures that will allow operators to scoop or dip gelato and soft ice cream into cones, containers or dishes. The temperatures will fall in the range of plus 4°F to plus 12°F depending on amount of sugar and butter fat in product. The temperature and condition of product must be checked after being in case the first four hours of operation. Because of the sensitive condition of these products, defrost is very critical. The fans do NOT run during defrost periods. The maximum time is 20 minutes for electric and 10 minutes for hot gas and Kool Gas. The fans are on a 2 minute delay after defrost to avoid adding heat to case.

If, because of ambient conditions, the defrost must be changed, amount of defrosts not time is necessary. i.e., 3 by 20 minutes instead of 2 x 40 minutes.

### Refrigerant Type

The standard refrigerant will be R-404 unless otherwise specified on the customer order. Check the serial plate on the case for information.

Piping for more than one case on a condensing unit is run underground with either common suction and liquid lines from the machine room or individual suction and liquid lines joined together in the machine room.

### Refrigeration Lines

<u>Liquid</u>	<u>Suction</u>
3/8" O.D.	5/8" O.D.

**NOTE:** The standard coil is piped at 5/8" (suction); however, the store tie-in may vary depending on the number of coils and the draw the case has. Depending on the case setup, the connecting point in the store may be 5/8", 7/8", or 1 1/8". Refer to the particular case you are hooking up.

Refrigerant lines should be sized as shown on the refrigeration legend furnished by the store.

Install **P-TRAPS** (oil traps) at the base of all suction line vertical risers.

**Pressure drop** can rob the system of capacity. To keep the pressure drop to a minimum, keep refrigerant line run as short as possible, using the minimum number of elbows. Where elbows are required, use long radius elbows only.

### Control Settings

See ASC-L/ASCS-L technical data sheet for the appropriate settings for your merchandiser. Maintain these parameters to achieve near constant product temperatures. Product temperature should be measured first thing in the morning, after having been refrigerated overnight. Defrost times should as directed in the ASC-L/ASCS-L technical data sheet. The number of defrosts per day should never change. The duration of the defrost cycle may be adjusted to meet conditions present at your location.

### Control Settings-Self Contained

On Self Contained cases all functions, defrost, fans, temperature are controlled by Pagon ERC-2 controller. See ASC-L/ASCS-L technical data sheet for proper temperature and defrost settings.

## Refrigeration (Cont'd)

### Access to TX Valves and Drain Lines

**Mechanical** - Remove product from end of case. Remove product racks. Remove refrigeration and drain access panels (labeled). TX valve (mechanical only) and drain are located under each access panel at end of the case.

**Electronic** - The Electronic Expansion valve master and slave cylinder(s) are located within the electrical access panel(s).

### Electronic Expansion Valve (Optional)

A wide variety of electronic expansion valves and case controllers can be utilized. Please refer to EEV and controller manufacturers information sheet. Sensors for electronic expansion valves will be installed on the coil inlet, coil outlet, and in the discharge air. (Some supermarkets require a 4th sensor in the return air). Case controllers will be located in the electrical raceway or under the case.

### Thermostatic Expansion Valve Location

This device is located on the same side as the refrigeration stub. An Alco balanced port expansion valve model is furnished as standard equipment, unless otherwise specified by customer.

### Expansion Valve Adjustment

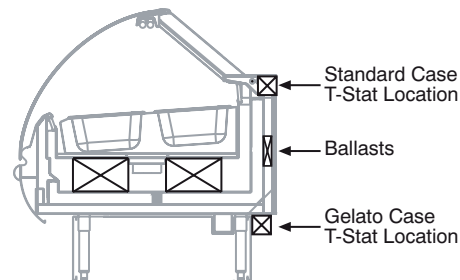
Expansion valves must be adjusted to fully feed the evaporator. Before attempting any adjustments, make sure the evaporator is either clear or very lightly covered with frost, and that the fixture is within 10°F of its expected operating temperature.

### Measuring the Operating Superheat

1. Determine the suction pressure with an accurate pressure gauge at the evaporator outlet.
2. From a refrigerant pressure temperature chart, determine the saturation temperature at the observed suction pressure.
3. Measure the temperature of the suction gas at the thermostatic remote bulb location.
4. Subtract the saturation temperature obtained in step No. 2 from the temperature measured in step No. 3.
5. The difference is superheat.
6. Set the superheat for 5°F - 7°F.

### T-STAT Location

Thermostats are located within the electrical raceway. The raceway location is dependent on the style of the front panel and whether the case is going to be pushed up against a wall. (See Diagram)



In all cases, the thermostat is located on the same side of the case. If you are looking at the case from the front, it is the right-hand side. If you are looking at the case from the back, it is the left-hand side.



**ATTENTION  
INSTALLER**

**It is the contractor's responsibility to install case(s) according to local construction and health codes**

### Piping

The refrigerant line outlets are located under the fixture at the left end when viewed from the back. Insulate suction lines to prevent condensation drippage.

## Refrigeration (Cont'd)

### Refrigeration Data

Note: This data is based on store temperature and humidity that does not exceed 75F and 55% R.H.

#### Frozen Food

Discharge Air (F) -10

Evaporator (F) -20

#### Ice Cream

Discharge Air (F) -20

Evaporator (F) -30

#### ASC-L 4' Frozen Pasta (Electric Defrost)

Discharge Air (F) 5

Evaporator (F) 0

Note: Not recommended to control temp by regulating coil temp allow T-STAT to cycle and control temp.

**Btu/hr/ft\***

#### Frozen Food

Parallel 650

Conventional 748

#### Ice Cream

Parallel 800

Conventional 920

#### ASC-L 4' Frozen Pasta (Electric Defrost)

Parallel 550

Conventional 633

\*For all refrigeration equipment other than Hussmann use conventional Btu values.

### Defrost Data

#### Electric Defrost Option

Frequency Hrs 24

#### OFFTIME

Temp Term °F 54

Failsafe Minutes 60

#### Kool-Gas™ Defrost Option

Frequency Hrs 24

#### OFFTIME

Temp Term °F 54

Failsafe Minutes 60

### Physical Data

Merchandiser Drip Pipe (in.) 1 ½\*

Merchandiser Liquid Line (in.) 3/8\*

Merchandiser Suction Line (in.) 5/8\*

#### Estimated Charge (lb)

4ft 1.7

6ft 2.5

8ft 3.5

10ft 4.2

12ft 5.0

\*Dependent on case length and refrigerant type.

### Glycol Requirements

GPM PSI

N/A N/A

N/A N/A

N/A N/A

## Paragon ERC 2 Electronic Controller for Self Contained Cases



The **ERC 2 Electronic Refrigeration Control** is a microprocessor-based electronic controller designed to control both the temperature and the defrost functions of a commercial refrigeration unit. It can be powered by 120, 208 or 240 VAC (50 or 60Hz). The control comes with four relay outputs: compressor, defrost, evaporator fan and alarm.

The ERC 2 includes a digital display module that provides readout of the temperature, time and built-in diagnostics. The display module can be mounted locally or remotely from the unit and it contains a touch keypad for simple programming. For defrost control, the unit uses a real time clock.

This control is NSF certified and it can be applied to many different commercial refrigeration applications like reach-ins, walk-ins, refrigerated cases or other different products where accurate control of refrigerated space and defrost cycles is required.

### Features / Benefits

**Multi-function Unit** Integrates defrost timer, temperature control, defrost termination switch, fan delay switch and digital thermometer.

**Display Module for Temperature Readout** Easy to read display that can be mounted with the unit or remotely. Temperature can be displayed in °F or °C.

**Two Temperature Sensors** For zone temperature and evaporator temperature.

**Choice of Defrost Methods** Off cycle, hot gas or electric heater with up to 8 defrosts per day and duration up to 4 hours.

**Four Relay Outputs** Compressor, defrost, evaporator fan and alarm.

**Adjustable Short Cycle Protection** Extra protection for the equipment.

**Non-volatile memory** The programmed parameters will remain in the memory.

**Capacitor Carry Over for the Clock** It maintains the correct time-of-day for up to 100 hours.

**Microprocessor-Based Electronics** High reliability and repeatability.

### Fcc Compliance\*

This device complies with CFR 47, Part 15, Class A FCC Requirements. Operation is subject to the following two conditions,

- (1) This device may not cause harmful interference and
- (2) This device must accept any interference received, including interference that may cause undesired operation.

### Canadian Compliance\*

This digital apparatus meets all of the Industry Canada, ICES-003, Class A requirements (Canadian Interference-Causing Equipment Regulations).

**\*Note:** These compliance apply to NEMA 1 enclosed models only. All modular units are the responsibility of the purchaser to obtain the compliance.

### Operation and Functions

The ERC 2 features a simple way to program and operate. Four buttons on the display module allow the user to scroll through the functions and set the desired parameters. A manual defrost button is used to initiate the defrost cycle at any time.

There are two different levels of security to access the programming features. The first one will allow the change on the time-of-day and the set point temperature (cut-off). The other level will allow access to the other parameters.

The programmable parameters are:

### Clock

- Clock: allows time-of-day programming and choice of display format (12 / 24 hours)

### General

- Display: the display can show time-of-day, zone temperature, evaporator temperature and it can also cycle between zone temperature and time-of day
- Temperature format: the control can use temperatures in °F or °C
- Fan enable during defrost: to control the fan operation during defrost (on or off)
- Minimum compressor off time: for short cycle protection, between 0 and 15 min
- Minimum compressor on time: between 0 and 15 min
- Alarm delay: a time delay can be configured for the alarm to operate (between 0 and 59 min)

## Paragon ERC 2 Electronic Controller for Self Contained Cases (Cont'd)

### Defrost

- Defrost type: it can be programmed for hot gas or electric heater defrost. An off cycle defrost type can be configured by selecting the electric defrost option and not connecting any device to the defrost relay
- Number of defrosts per day: between 1 and 8. There is also an option for 1 defrost every 48 hours
- Defrost cycle: a choice among defrost start time (real time clock), accumulated compressor run time or temperature initiation defrost
- Fan delay: amount of time that the fan will remain off after defrost is terminated (0 to 15 min)
- Pump down: amount of time the compressor remains on after defrost initiates (0 to 59 min)
- Drip time: amount of time the compressor is locked out after defrost is terminated (0 to 59 min)
- Defrost duration time: amount of time for the defrost duration. It also functions as a back-up for temperature termination.
- Defrost termination temperature: temperature that will cause the defrost to terminate (if reached before defrost duration time)
- Fan start temperature: temperature that will cause the fan to re-start after defrost

### Setpoint

- Setpoint temperature (cut-out): a setpoint temperature can be programmed to control the compressor operation. The range is -40 to 60 °F
- Cut-in differential: differential between the cut-out (setpoint) and the cut-in temperature. The range is 1 to 25 °F
- High and low temperature alarm setpoint: high and low alarms for the temperature can be set. The ranges are -40 to 60 °F for each of the alarms (high and low)

### Graphic Description / Dimensions

#### Display

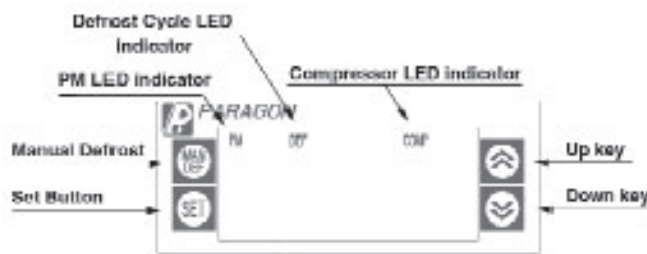


Fig. 1

### Relay Board Layout

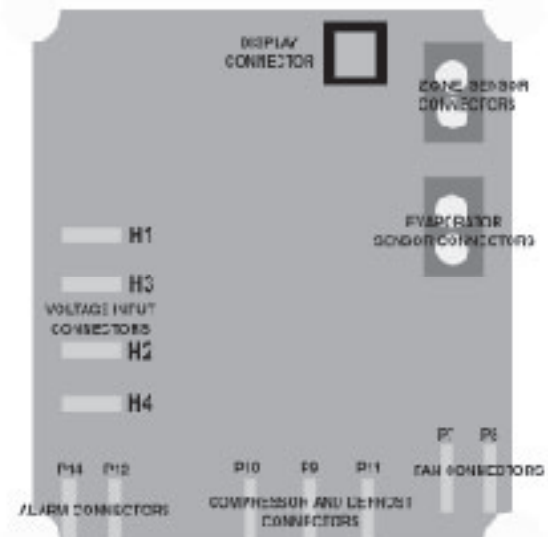


Fig. 2

### Control Wiring

- All wiring should conform to the National Electric Code and local regulations.
- Use copper conductors only.
- Electrical leads should not be taut; allow slack for temperature change and vibration.

The wiring diagrams for the ERC 2 are shown below:

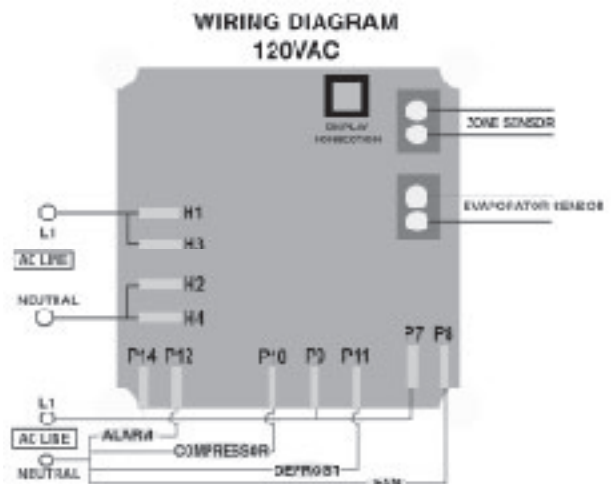


Fig. 7

208/240VAC

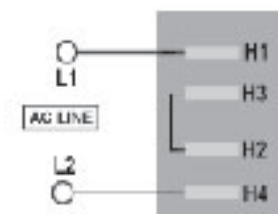


Fig. 8



## Paragon ERC 2 Electronic Controller for Self Contained Cases (Cont'd)

For 208-240 VAC, change the jumpers on the connectors located on the left side (from jumpers P3 to P4 and P5 to P6 for 120 VAC to a jumper from P4 to P5 for 208-240 VAC), just like this diagram shows. Neutral becomes L2 in 208-240 VAC

### Wiring Installation Procedure

1. Accessing the terminals
  - Open the metal case to access the control connectors. The cable can be disconnected from the display module while the control is being wired. Reconnect the cable before using the unit.
2. Connecting the sensors
  - Connect the evaporator sensor to the lower terminal block in the upper right corner.
  - Connect the zone sensor to the upper terminal block in the upper right corner.



Fig. 9 – Sensor Connectors

3. Connecting the refrigeration / defrost equipment
  - Connect the wires from the compressor (including the thermostat) to the correspondent terminal on the bottom side of the control (Fig. 10).
  - Connect the defrost device (heater or hot gas solenoid) to the terminal in the control (Fig. 10).
  - Connect the wire from L1 - 120 VAC or 208- 240 VAC line - to the terminal marked as “COM”.
  - Connect also the fan wires to the terminals marked as “FAN”.
  - Use the alarm quick connects to connect an alarm to the control, as shown in the picture.



Fig. 10 – Load / AC Input Connectors

4. Supplying Power to the Unit The power input must be connected to the terminals on the left side of the control (Fig. 10). Connect the 120 VAC L1 wire (or 208-240 VAC L1 wire) to the uppermost terminal and the 120 VAC neutral (or 208-240 VAC L2 wire) to the lowermost terminal. The terminals in the middle are used to change the voltage of the unit. Refer to the wiring diagram (Figs. 7 and 8) to see how to connect the jumpers for 120 VAC or 208-240 VAC.

For the models supplied with a metal case, connect the ground wire to the grounding lug on the bottom of the case.

5. Reconnecting the Display Module Reconnect the display module cable to the control.



Fig. 11 – Display Module Cable

### Programming

The ERC 2 control initially powers up displaying 12:00 AM otherwise it will show the last configured selection (time or temperature). If a power outage occurs during normal operation, the control will maintain the correct time-of-day using a capacitor (batteries are not required). The time will be maintained for up to 100 hours when the capacitor is fully charged.

To initiate a **Manual Defrost**, press and hold the MAN DEF key for 3 seconds.

There are two levels of programming in the ERC 2. The first level of security will enable the user to set two parameters: Time-of-day (**CLoC**) and Setpoint temperature (**SEt**). The other level allows access to the other parameters.

Three buttons are used for the programming: SET, UP and DOWN





Fig. 12





## Paragon ERC 2 Electronic Controller for Self Contained Cases (Cont'd)


To change time-of-day and setpoint temperature (First Level) follow these steps:

**Step 1**  Press and hold SET for 5 seconds. The display will show **CLoC**.



**Step 2**  Press SET again to change the time-of-day.

**Step 3**  or  Press **UP** or **DOWN** until the correct time-of-day is displayed.


**Step 4**  Press SET to accept the new time.

**Step 5**  Press **DOWN** to go to the next parameter-Setpoint Temperature - **SEt** (cut out).

**Step 6**  Press SET to change the setpoint temperature.

**Step 7**  or  Press **UP** or **DOWN** to go to the desired setpoint. The range is - 40 to 60°F or - 40 to 16°C.



**Step 8**  Press SET to accept the change.


**Step 9**  Press **DOWN** to exit the first level of programming.



**Note 1:** During programming, if no button is pushed during 30 seconds, the control will go back to the normal operating mode. This is valid for both programming levels.


**Note 2:** When changing the time, press and hold the MAN DEF button for 3 seconds to change the AM/PM mode.


**To change the other parameters (Second Level) follow these steps:**

**Step 1**  and  Press and hold SET and DOWN for 10 seconds. The display will show **dSPL**.

**Step 2**  Press SET to change the parameter.

**Step 3**  or  Press UP or DOWN to change the options, time or temperature for the current parameter.

**Step 4**  Press SET to accept the new value.

**Step 5**  Press DOWN to go to the next parameter, then go back to Step 2. After the last parameter is displayed (**ALHi**), the display will go back to the normal operating condition.

**Note:** To scroll down the parameters without changing them, press the DOWN button.

### List of Parameters

Here is a list of the parameters that can be changed in the Second Level of programming, as well as their options and ranges.

Parameter/Display Symbol Description Range / Options

Display Status	<b>dSPL</b> Information shown on the display during operation conditions <b>tdAy</b> – time-of-day <b>rSP°</b> – zone temperature (refrigerated space) <b>CyCL</b> – cycle between time and zone temperature <b>Epr°</b> – evaporator coil temperature
Clock Format	<b>CLHr</b> Format of the time (12 or 24 hours mode) <b>12Hr</b> – AM/PM format <b>24Hr</b> – 24 hour format
Temperature Format	<b>°dSP</b> Temperature degrees <b>°F</b> – degrees Fahrenheit <b>°C</b> – degrees Celsius
Defrost Type	<b>dFtP</b> Type of defrost used in the application <b>ELEC</b> – electric heater defrost / off cycle <b>HgAS</b> – hot gas–
Fan Status During Defrost	<b>EFAN</b> Enable or not the fan during defrost <b>no</b> – fan is turned off during defrost <b>yES</b> – fan remains on during defrost
Defrost Interval	<b>dFin</b> Type of defrost interval <b>TdAy</b> – time-of-day set-point <b>CPrn</b> – compressor run time <b>tdEF</b> –temperature initiated defrost
Minimum Compressor Off Time	<b>CoFF</b> Minimum time that the compressor will remain turned off Range: from 0 to 15 min

## Paragon ERC 2 Electronic Controller for Self Contained Cases (Cont'd)

Minimum Compressor On Time	<b>Con</b> Minimum time that the compressor will remain turned on Range: from 0 to 15 min	Fan Cut-In Temperature	<b>FAn°</b> Temperature in the evaporator that will turn the fan on after defrost Range: from – 40 to 60°F or— 40 to 23°C
Alarm Delay	<b>ALrd</b> Time delay before the alarm goes off after the temperature fall off the two alarm setpoints Range: from 0 to 59 min	Low Temperature Alarm	<b>ALLo</b> Low temperature setpoint that will make the alarm go off and the error message appear on the display Range: from – 40 to 83°F or – 40 to 23°C
Compressor Run Time	<b>CPrn</b> Time the compressor will run between defrosts	High Temperature Alarm	<b>ALHi</b> High temperature setpoint that will make the alarm go off and the error message appear on the display Range: from – 40 to 83°F or –40 to 23°C
Number of Defrosts	<b>nodF</b> Number of defrosts per day from 0 to 8 (0 means 1 defrost every 48 hours)	<b>Important Note:</b>	To change from degrees <b>C</b> to <b>F</b> or vice-versa, the user must reprogram all the parameters that are related to the temperature. The unit does not convert the parameters automatically from degrees <b>F</b> to <b>C</b> or vice-versa.
Defrost Start Time	<b>dEF1-8</b> Start time of each defrost		
Defrost Duration	<b>dEFd</b> Defrost duration time (back-up for defrost termination temperature) Range: from 0 min to 4 hours		
Fan Delay <b>FAnd</b>	Delay time for the fan after defrost (back-up for fan cut-in temperature) Range: from 0 to 15 min		
Pump Down	<b>Pudn</b> Pump down duration Range: from 0 to 59 min	<b>Example 1 - To adjust the time-of-day</b>	
Drip Time <b>driP</b>	Drip time duration Range: from 0 to 59 min	<ul style="list-style-type: none"><li>- Press and hold SET for 5 seconds</li><li>- Press SET again</li><li>- Press UP or DOWN until the correct time appears on the display</li><li>- Press SET to accept the new time</li><li>- Press DOWN twice to exit the programming mode</li></ul>	
Setpoint Differential	<b>diF°</b> Cut-in temperature differential Note: cut-in is cut-out plus differential Range: from 1 to 25°	<b>Example 2 - To set one defrost a day, at 11:59 PM</b>	
Temperature Initiated	Defrost <b>tdEF</b> Temperature that will initiate a defrost cycle Range: from – 40 to 40°F or– 40 to 4°C	<ul style="list-style-type: none"><li>- Press and hold SET and DOWN for 10 seconds</li><li>- Press DOWN five times to get to go to the Defrost Interval (dFIn)</li><li>- Press SET to change the parameter</li><li>- Press DOWN until tdAy appears on the display</li><li>- Press SET to accept the option</li><li>- Press DOWN seven times to go to the Number of Defrosts (noDF)</li><li>- Press SET to change it</li><li>- Press UP or DOWN until 1 appears on the display</li><li>- Press SET to accept the change</li><li>- Press DOWN to go to Defrost Start Time (dEF1)</li><li>- Press SET to change the time</li><li>- Press UP or DOWN until the 11:59 PM appears on the display</li></ul>	
Defrost Termination	Temperature <b>dEF°</b> Temperature in the evaporator that will terminate the defrost cycle Range: from 0 to 75°F or –18 to 25°C		

## Paragon ERC 2 Electronic Controller for Self Contained Cases (Cont'd)

### Error Codes

Display	Control Status
<b>Er 1</b>	ERC Fault – software or hardware failure
<b>Er 2</b>	ERC Communication Fault – indicates that there is a problem with the display module cable
<b>Er 3</b>	Zone Sensor Fault – indicates an open or shorted temperature sensor
<b>Er 4</b>	Evaporator Sensor Fault – indicates an open or shorted evaporator sensor
<b>Er 5</b>	ERC Fault – software or hardware failure
<b>Er 6</b>	Low Temperature Alarm – indicates that the temperature has dropped below the low alarm setpoint
<b>Er 7</b>	High Temperature Alarm – indicates that the temperature has gone above the high alarm setpoint

If the zone temperature sensor fails, the control will use the cycle times it recorded for the last three cycles to control the equipment (based on time). Therefore the food will be preserved in case of failure.

If the evaporator sensor fails the control will terminate the defrost cycle based on time.

For Error Codes 1, 2 and 5 cut the power to the unit and correct the problem to reset the display.

For Codes 3 and 4, press the UP or DOWN button on the display to reset the error message. If the display still shows the message, the sensor must be replaced.

**The Error Codes 6 and 7 will be automatically reset once the temperature is back within the two setpoints.**

### Technical Specifications

**Input Power:** 120 / 208-240 VAC 50/60 Hz (+10,-15%)

**Power Consumption:** 5VA @ 120/240VAC

**Zone Temperature Sensor:** NTC thermistor. Range – 40 to 199°F

**Evaporator Coil Sensor:** NTC thermistor. Range – 40 to 199°F

**Ambient Operating Conditions:** – 40 to 122°F; 0 to 95% RH (non condensing)

**Display Module Dimensions:** 2.75"W x 1.10"H x 1.38"D

**Case Dimensions:** 4.40"W x 7.28"H x 3.80"D

**Shipping Weight:** 2.7 lbs.

**Agency Approvals:** c-UR-us Recognized Component (equivalent to UL and CSA certifications) NSF International Certified

### Output Relay Ratings:

#### COMPRESSOR: SPST NO

	120 VAC	208 VAC	240 VAC
Horsepower Rating (hp)	1	1.5	2
FLA / LRA	16/96	12/72	12/72
Pilot Duty	470	470	470

#### DEFROST: SPST NC

	120 VAC	208 VAC	240 VAC
Resistive Amps	16	16	16
Horsepower Rating (hp)	1/2	3/4	1
Pilot Duty (VA)	470	470	470

#### EVAPORATOR FAN: SPST NC

	120 VAC	208 VAC	240 VAC
Resistive Amps	16	16	16
Horsepower Rating (hp)	1/2	3/4	1
FLA / LRA	10/59	8/48	8/48
Pilot Duty (VA)	470	470	470

#### ALARM: SPST NO

	120 VAC	208 VAC	240 VAC
Resistive Amps	5	5	5
Pilot Duty (VA)	240	240	240

Ä **PARAGON**

Commercial Refrigeration Controls

Ranco North America,

8115 US Route 42N,

Plain City, OH 43064

Telephone: 614 873 9000

Facsimile: 614 873 9332

An Invensys Company,

Part # 7515008-001 September 99

## Electrical

### Wiring Color Code

STANDARD CASE WIRE COLOR CODE CODIGO DE COLORES DE LOS ALAMBRES PARA LAS VITRINAS ESTANDAR CODE COULEUR POUR FILS DE BOITIER NORMALISE		
COLOR DESCRIPTION	DESCRIPCION	DESCRIPTION
GROUND	TIERRA MASA	MASSE
ANTI-SWEAT	ANTICONDENSACION	ANTI-SUINTEMENT
LIGHTS	LUCES	ECLAIRAGE
RECEPTACLES	ENCHUFES	PRISE DE COURANT
T-STAT/SOLENOID 230VAC	TERMOSTATO/SOLENOIDE (230VAC)	SOUPAPE A SOLENOID (230 VAC)
T-STAT/SOLENOID 115VAC	TERMOSTATO/SOLENOIDE (115VAC)	SOUPAPE A SOLENOID (115 VAC)
T-STAT/SOLENOID 24VAC	TERMOSTATO/SOLENOIDE (24VAC)	SOUPAPE A SOLENOID (24 VAC)
FAN MOTORS	VENTILADORES	VENTILATEUR
BLUE CONDENSING UNIT	UNIDAD DE CONDENSACION	UNITE DE CONDENSATION

**USE COPPER CONDUCTORS ONLY**  
**UTILISEZ LES CONDUCTEURS DE CUIVRE SEULEMENT**  
**UTILICE LOS CONDUCTORES DE COBRE SOLAMENTE**  
 430-01-0338 R101003

### CASE MUST BE GROUNDED

**NOTE:** Refer to label affixed to case to determine the actual configuration as checked in the "TYPE INSTALLED" boxes.

### Electrical Circuit Identification

Standard lighting for all refrigerated models will be full length fluorescent lamps located within the case at the top.

The switch controlling the lights, the plug provided for digital scale, and the thermometer are located at the rear of the case mullion.

### Electrical Service Receptacles (When Applicable)

The receptacles located on the exterior of the merchandiser are intended for scales and lighted displays. They are not intended nor suitable for large motors or other external appliances.



**DANGER**

**BEFORE SERVICING  
ALWAYS DISCONNECT ELECTRICAL  
POWER AT THE MAIN DISCONNECT  
WHEN SERVICING OR REPLACING ANY  
ELECTRICAL COMPONENT.**

**This includes (but not limited to) Fans, Heaters  
Thermostats, and Lights.**

### Field Wiring and Serial Plate Amperage

Field Wiring must be sized for component amperes printed on the serial plate. Actual ampere draw may be less than specified. Field wiring from the refrigeration control panel to the merchandisers is required for refrigeration thermostats. Case amperes are listed on the wiring diagram, but always check the serial plate.

### Ballast Location

Ballasts are located on the right rear panel.

### ASHRAE Color Code

**NOTE:** All other manufacturers have no standard sensor codes.

Case Control Systems SENSOR COLOR			
Manufacturer ® >	EIL	CPC	
Location			
Coil Inlet	Color	Blue	Blue
	Part#	225-01-1755	225-01-3255
Coil Outlet	Color	Red	Red
	Part#	225-01-1757	225-01-3123
Discharge Air	Color	Green	Green
	Part#	225-01-1756	225-01-3260
Return Air	Color	Purple	Green
	Part#	225-01-1758	225-01-3260
Defrost Term.	Color	White	Orange
	Part#	225-01-0650	225-01-3254
Liquid Line	Color	White	Blue
	Part#	225-01-0650	225-01-3255

## User Information

### Stocking

Improper temperature and lighting will cause serious product loss. Discoloration, dehydration and spoilage can be controlled with proper use of the equipment and handling of product. Product temperature should always be maintained at a constant and proper temperature. This means that from the time the product is received, through storage, preparation and display, the temperature of the product must be controlled to maximize life of the product. Hussmann cases were not designed to “heat up” or “cool down” product - but rather to maintain an item's proper temperature for maximum shelf life. To achieve the protection required always:

1. Minimize processing time to avoid damaging temperature rise to the product. Product should be at proper temperature.
2. Keep the air in and around the case area free of foreign gasses and fumes or food will rapidly deteriorate.
3. Maintain the display merchandisers temperature controls as outlined in the refrigerator section of this manual.
4. Do not place any product into these refrigerators until all controls have been adjusted and they are operating at the proper temperature. Allow merchandiser to operate a minimum of 6 hours before stocking with any product.
5. When stocking, never allow the product to extend beyond the recommended load limit. **Air discharge and return air flow must be unobstructed at all times to provide proper refrigeration.**
6. There are vents located at the base of the front of the glass, just above the front rail. These vents supply a continuous, gentle flow of air across the front glass which inhibits condensation. **Do not place any signs or other restrictive objects on the front of the refrigerator that will block these vents.**
7. Keep the service doors closed (when applicable). Refrigeration performance will be seriously affected if left open for a prolonged period of time.
8. Avoid the use of supplemental flood or spot lighting. Display light intensity has been designed for maximum visibility and product life at the factory. The use of higher output fluorescent lamps (H.O. and V.H.O.), will shorten the shelf life of the product.
9. In the Gelato Pan configuration, all holes must be filled (if only an empty pan) to prevent air flow disruption.

### Case Cleaning

Long life and satisfactory performance of any equipment are dependent upon the care given to it. To insure long life, proper sanitation and minimum maintenance costs, the refrigerator should be thoroughly cleaned frequently. It is essential to establish and regulate cleaning procedures. This will minimize bacteria causing discoloration which leads to degraded product appearance and significantly shortening product shelf life.

**SHUT OFF FAN DURING CLEANING PROCESS.** It can be unplugged within the case, or shut off case at the source. The interior bottom may be cleaned with any domestic soap or detergent based cleaners.

The use of hoses and sage machines to clean the inside of the cases is recommended and is an excellent way to clean the coil fins and hard to reach corners of the interior of the cases. Be sure to observe the warnings below when cleaning the case.

Sanitizing solutions will not harm the interior bottom, however, these solutions should always be used according to the manufacturer's directions and should not contain Ammonia.

*Soap and hot water are not enough to kill this bacteria. A sanitizing solution must be included with each cleaning process to eliminate this bacteria.*

1. Allow cases to come to room temperature
2. Scrub thoroughly, cleaning all surfaces, with soap and hot water.
3. Rinse with hot water, but do not flood.
4. Apply the sanitizing solution according to the manufacturer's directions.
5. Rinse thoroughly.
6. Dry completely before resuming operation.

### Stainless Steel Cleaning and Care

There are three basic things, which can break down your stainless steel's passivity layer and allow corrosion.

#### 1. Mechanical Abrasion

Mechanical Abrasion means those things that will scratch the steels surface. Steel Pads, wire Brushes, and Scrapers are prime examples.

#### 2. Water

Water comes out of our tap in varying degrees of hardness. Depending on what part of the country you live in, you may have hard or soft water. Hard water may leave spots. Also, when heated, hard water leaves deposits behind that if left to sit, will break down the passive layer and rust your stainless steel. Other deposits from food preparation and service must be properly removed.

#### 3. Chlorides

Chlorides are found nearly everywhere. They are in water, food and table salt. One of the worst perpetrators of chlorides can come from household and industrial cleaners.



## User Information (Cont'd)

Don't Despair! Here are a few steps that can help prevent stainless steel rust.

### 1. Use the Proper Tools

When cleaning your stainless steel products, take care to use non-abrasive tools. Soft Clothes and plastic scouring pads will NOT harm the steel's passive layer. Stainless steel pads can also be used but the scrubbing motion must be in the same direction of the manufacturer's polishing marks.

### 2. Clean With the Polish Lines

Some stainless steels come with visible polishing lines or "grain". When visible lines are present, you should ALWAYS scrub in a motion that is parallel to them. When the grain cannot be seen, play it safe and use a soft cloth or plastic scouring pad.

### 3. Use Alkaline, Alkaline Chlorinated or Non-chloride Containing Cleaners

While many traditional cleaners are loaded with chlorides, the industry is providing an ever increasing choice of non-chloride cleaners. If you are not sure of your cleaner's chloride content contact your cleaner supplier. If they tell you that your present cleaner contains chlorides, ask for an alternative. Also, avoid cleaners containing quaternary salts as they also can attack stainless steel & cause pitting and rusting.

### 4. Treat your Water

Though this is not always practical, softening hard water can do much to reduce deposits. There are certain filters that can be installed to remove distasteful and corrosive elements. Salts in a properly maintained water softener are your friends. If you are not sure of the proper water treatment, call a treatment specialist.

### 5. Keep your Food Equipment Clean

Use alkaline, alkaline chlorinated or non-chlorinated cleaners at recommended strength. Clean frequently to avoid build-up of hard, stubborn stains. If you boil water in your stainless steel equipment, remember the single most likely cause of damage is chlorides in the water. Heating cleaners that contain chlorides has a similar effect.

### 6. RINSE, RINSE, RINSE

If chlorinated cleaners are used you must rinse, rinse, rinse and wipe dry immediately. The sooner you wipe off standing water, especially when it contains cleaning agents, the better. After wiping the equipment down, allow it to air dry for the oxygen helps maintain the stainless steel's passivity film.

### 7. Never Use Hydrochloric Acid (Muriatic Acid) on Stainless Steel

### 8. Regularly Restore/Passivate Stainless Steel

## Cleaning Glass and Mirrors

Only use a soft cloth and mild glass cleaning for cleaning any glass or mirrored components. Be sure to rinse and/or dry completely.

**Never use hot water on cold glass surfaces! It may shatter and cause serious injury!** Allow glass surfaces to warm first.

## CAUTION

### CLEANING PRECAUTIONS

When cleaning:

- Do not use high pressure water hoses
- Do not introduce water faster than waste outlet can drain
- NEVER INTRODUCE WATER ON SELF CONTAINED UNIT WITH AN EVAPORATOR PAN
- NEVER USE A CLEANING OR SANITIZING SOLUTION THAT HAS AN OIL BASE (these will dissolve the butyl sealants) or an AMMONIA BASE (this will corrode the copper components of the case)
- TO PRESERVE THE ATTRACTIVE FINISH:
- DO USE WATER AND A MILD DETERGENT FOR THE EXTERIOR ONLY
- DO NOT USE A CHLORINATED CLEANER ON ANY SURFACE
- DO NOT USE ABRASIVES OR STEEL WOOL SCOURING PADS (these will mar the finish)

## Non-Glare Glass Cleaning

The high optical clarity of this glass is possible due to special coatings on the glass surface itself. To preserve this coating and the optical clarity, keep the glass clean.

Water is the only solution recommended to be used to clean the non-glare glass. The damage to the glass from improper, caustic solutions is irreparable.

In addition to cleaning the glass with the recommended product, there are precautions that should be taken when working and cleaning the inside of the case.

- When cleaning the inside of the cases, we recommend that the glass be fully opened and covered to prevent solutions from splashing onto the glass and ruining the coating on the inside.

## Plexiglass and Acrylic Care

Improper cleaning not only accelerates the cleaning cycle but also degrades the quality of this surface. Normal daily buffing motions can generate static cling attracting dust to the surface. Incorrect cleaning agents or cleaning cloths can cause micro scratching of the surface, causing the plastic to haze over time.

## Cleaning

Hussmann recommends using a clean damp chamois, or a paper towel marked as dust and abrasive free with **210® Plastic Cleaner and Polish** available by calling Sumner Labs at **1-800-542-8656**. Hard, rough cloths or paper towels will scratch the acrylic and should not be used.



## User Information (Cont'd)

### Antistatic Coatings

The **210®** has proven to be very effective in not only cleaning and polishing the Plexiglass surface, but also providing antistatic and anti-fog capabilities. This product also seals pores and provides a protective coating.

## Maintenance



**DANGER**

**BEFORE SERVICING  
ALWAYS DISCONNECT ELECTRICAL  
POWER AT THE MAIN DISCONNECT  
WHEN SERVICING OR REPLACING ANY  
ELECTRICAL COMPONENT.  
This includes (but not limited to) Fans, Heaters  
Thermostats, and Lights.**

### Replacing Fluorescent Lamps

Fluorescent lamps are furnished with a shatterproof protective coating. The same type of lamp with protective coating must be used if replaced.

**HUSSmann®**

ENCAPSULITE

SHATTERPROOF COATING - SA 10645



Complies with FDA USDA  
& OSHA Regulations

NSF

for replacement call:  
**1-800-395-9229**

→ Turn switch off then on after replacing bulb ←

### T-5 Bulbs

Please note: T-5 lights must be turned off and on after bulb replacement.

### Evaporator Fans

The evaporator fans are located at the center front of these merchandisers directly beneath the display pans. *Should fans or blades need servicing, always replace fan blades with the raised embossed side of the blade TOWARD THE MOTOR.*

### Copper Coils

The copper coils used in Hussmann merchandisers may be repaired in the field. Materials are available from local refrigeration wholesalers.

Hussmann recommends using #15 Sil-Fos for repairs.

### Tips and Troubleshooting

**Before calling for service, check the following:**

1. Check electrical power supply to the equipment for connection.
2. Check fixture loading. Overstocking case will affect its proper operation.
3. If frost is collecting on fixture and/or product, check that Humidity Control is working properly, and that no outside doors or windows are open - allowing moisture to enter store.



**IMPORTANT  
INFORMATION**

### FOR PROMPT SERVICE

**When contacting the factory,  
be sure to have the Case Model and Serial  
Number handy. This information is on a plate  
located on the case itself.**

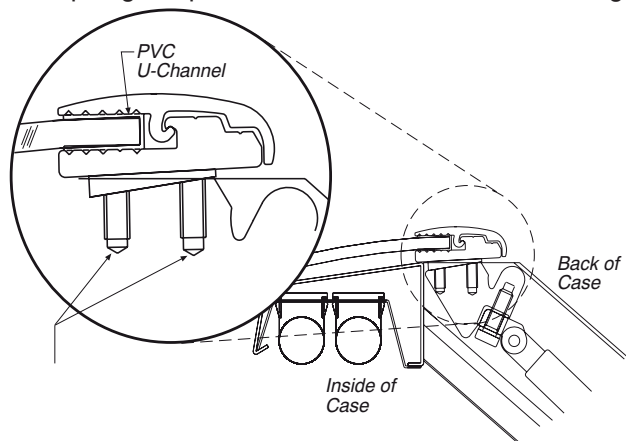
## Glass Adjustment and Replacement

### Glass Replacement and Adjustment Instructions

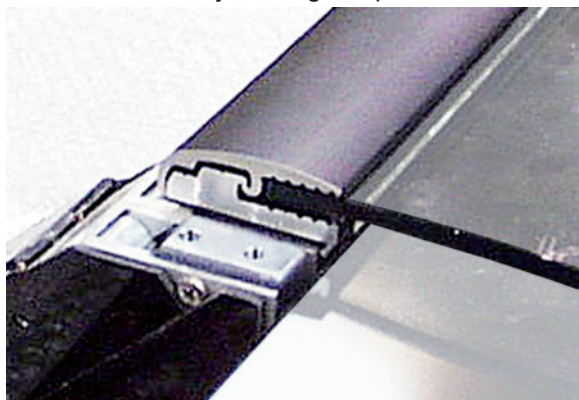
In order to replace or adjust the glass, the glass must be placed in the raised position. The underside of the clamp is exposed, revealing the tightening screws. By turning these screws counterclockwise 1/4 turn each, the glass will be loosened for either removal or adjustment.

**Note:** Do not overtighten the screws since damage may occur.

1. Open glass panel. Relieve the tension on the hinge.



2. Loosen all the set screws along the bottom inside edge of the glass panel.
3. Remove or re-adjust the glass panel.



*Close-up of the clam-shell located on top of the ASC case.*

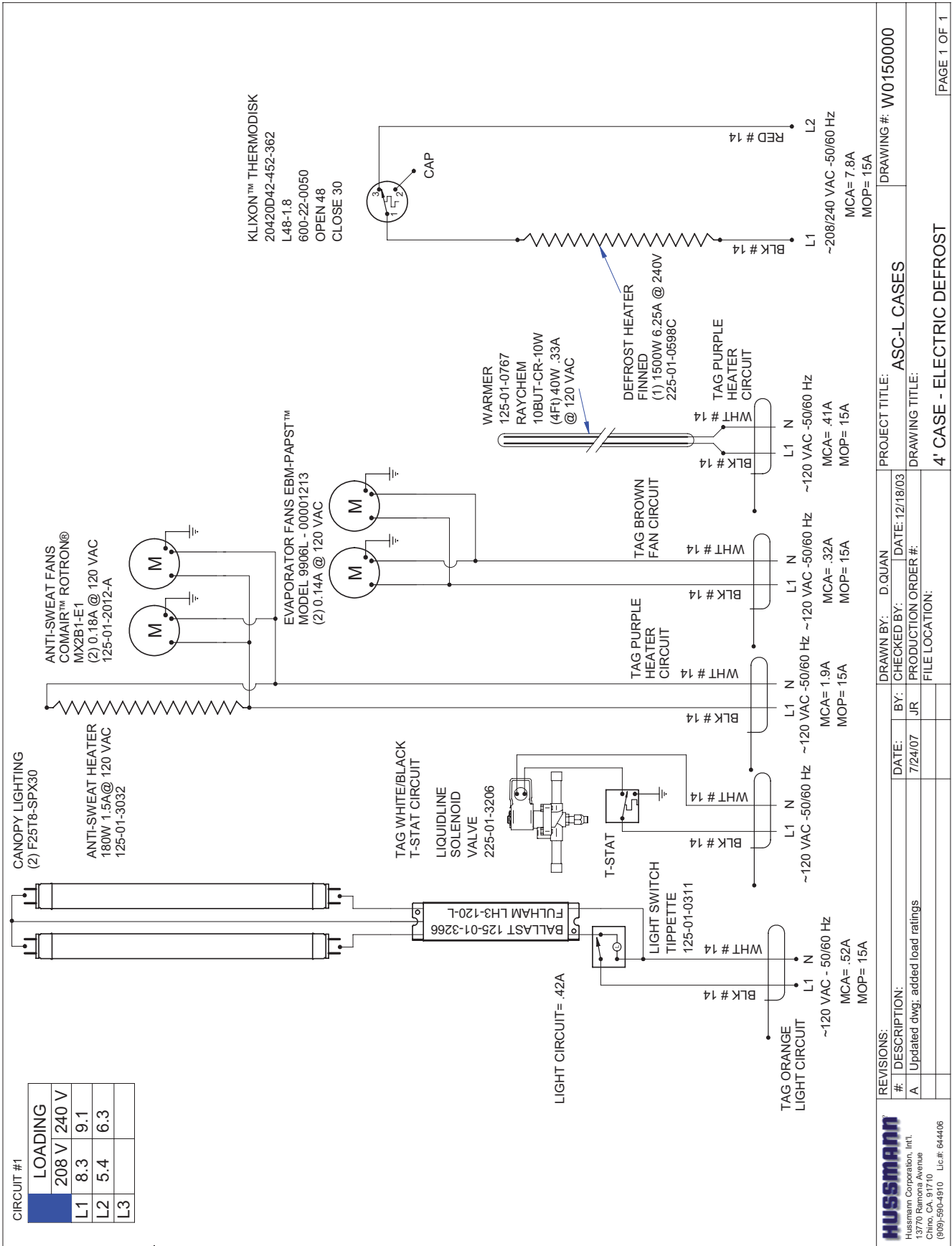


*Close-up of the glass in the upright position located on top of the ASC case.*

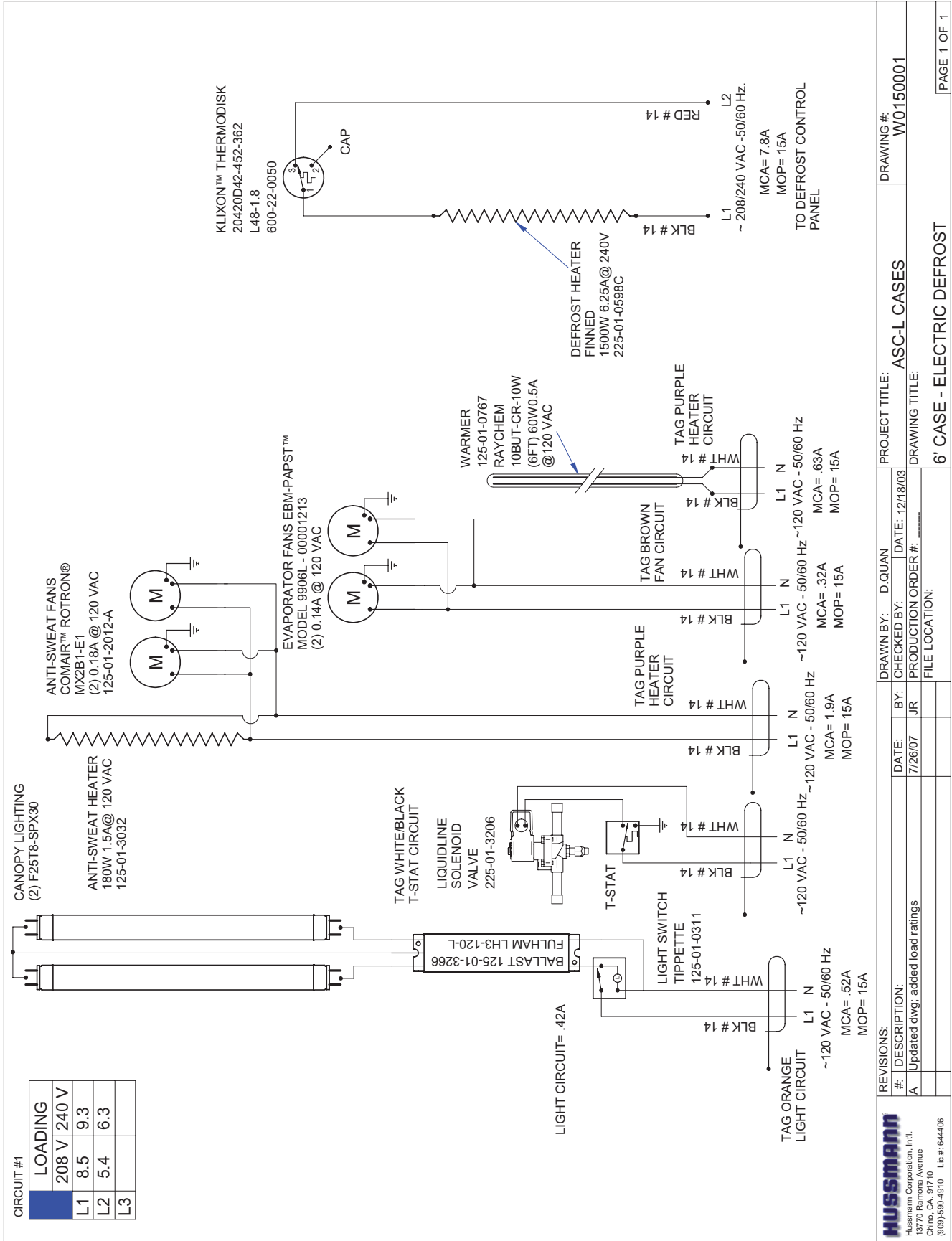
## Electrical Wiring Diagrams

<b>ASC-L</b>	<b>ASC-L</b>	4'	W0150000
	Electric Defrost	6'	W0150001
		12'	W0150004
	<b>ASC-L</b>	4'	W0150010
		8'	W0150012
		12'	W0150014

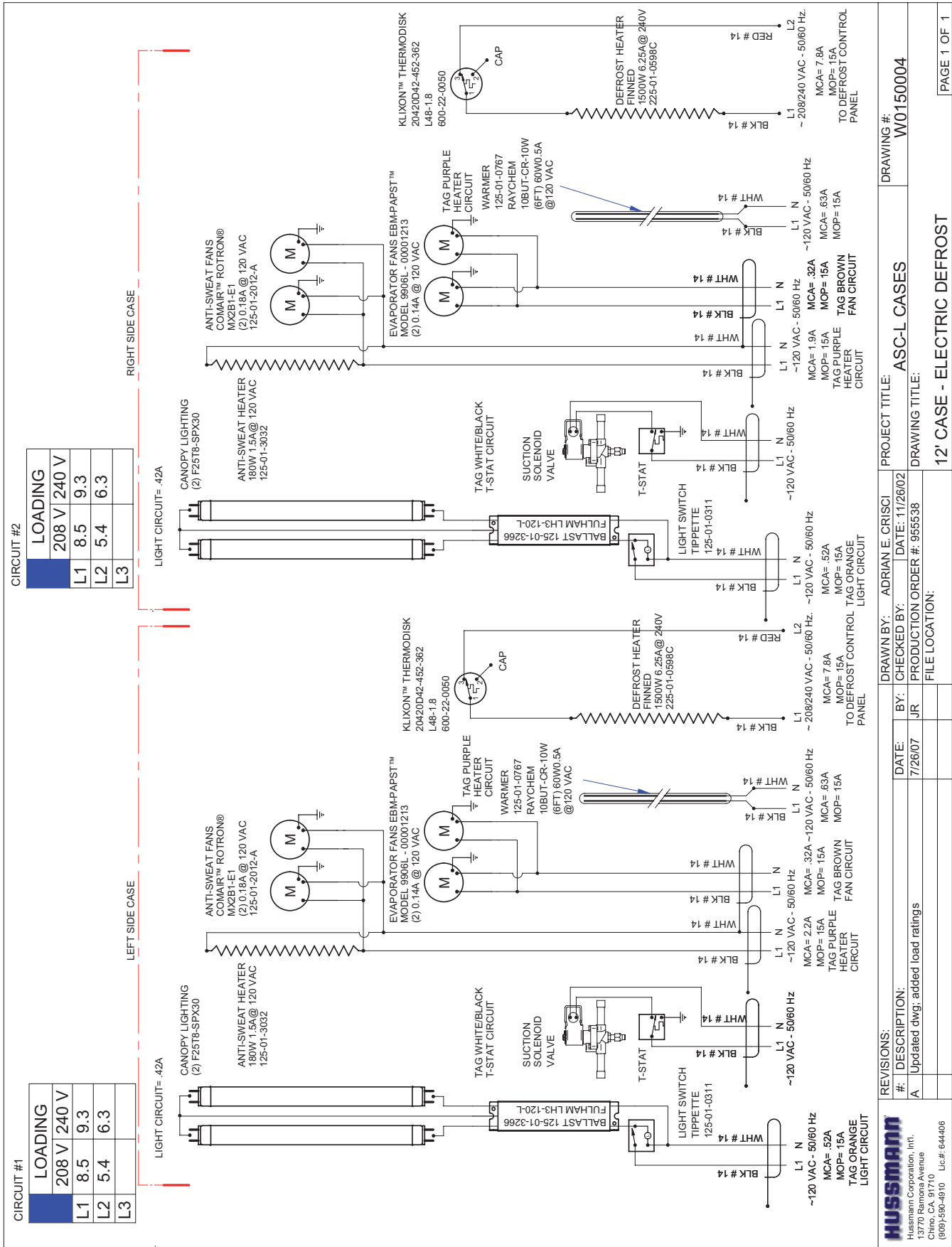
Wiring Diagrams



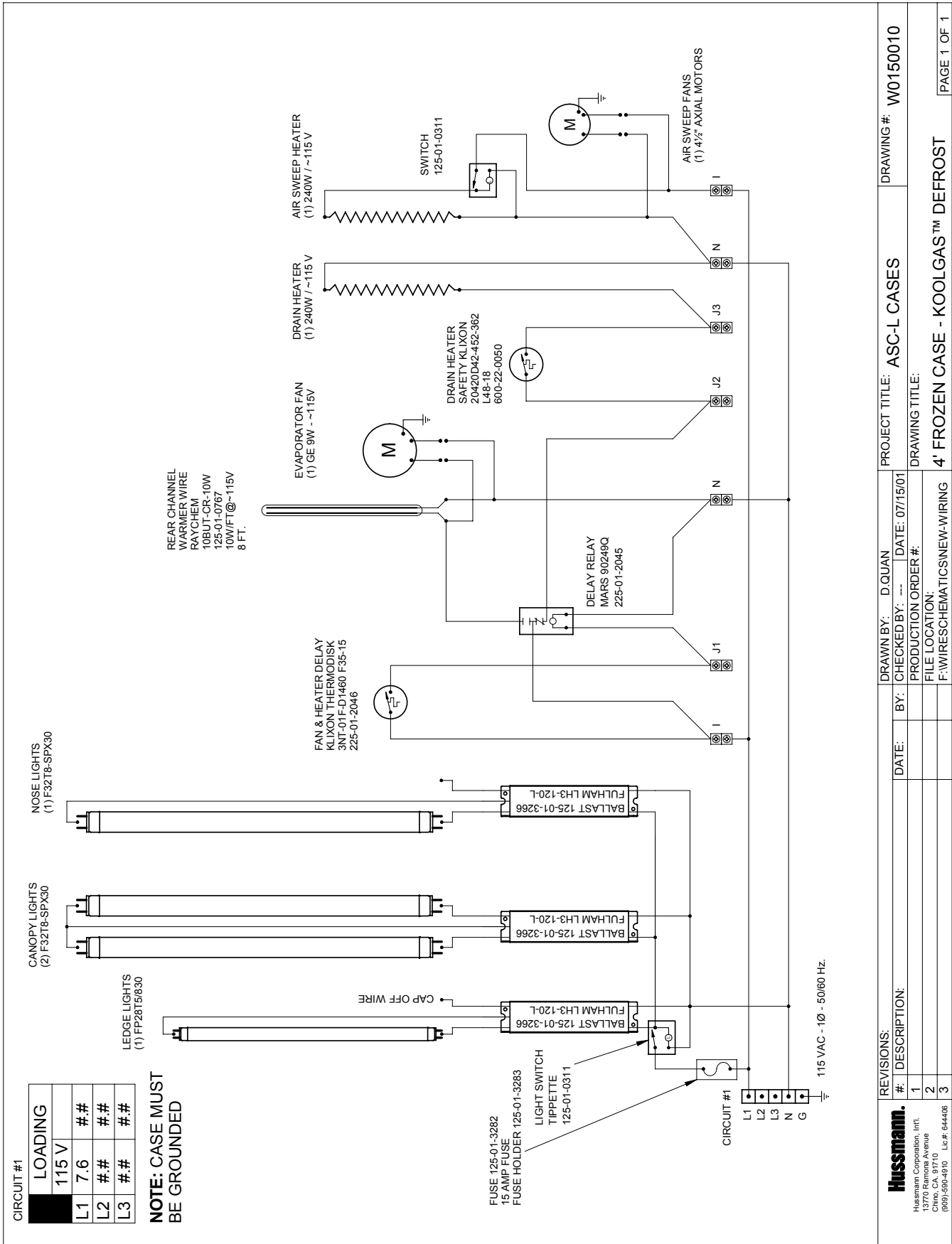
## Wiring Diagrams (Cont'd)



Wiring Diagrams (Cont'd)

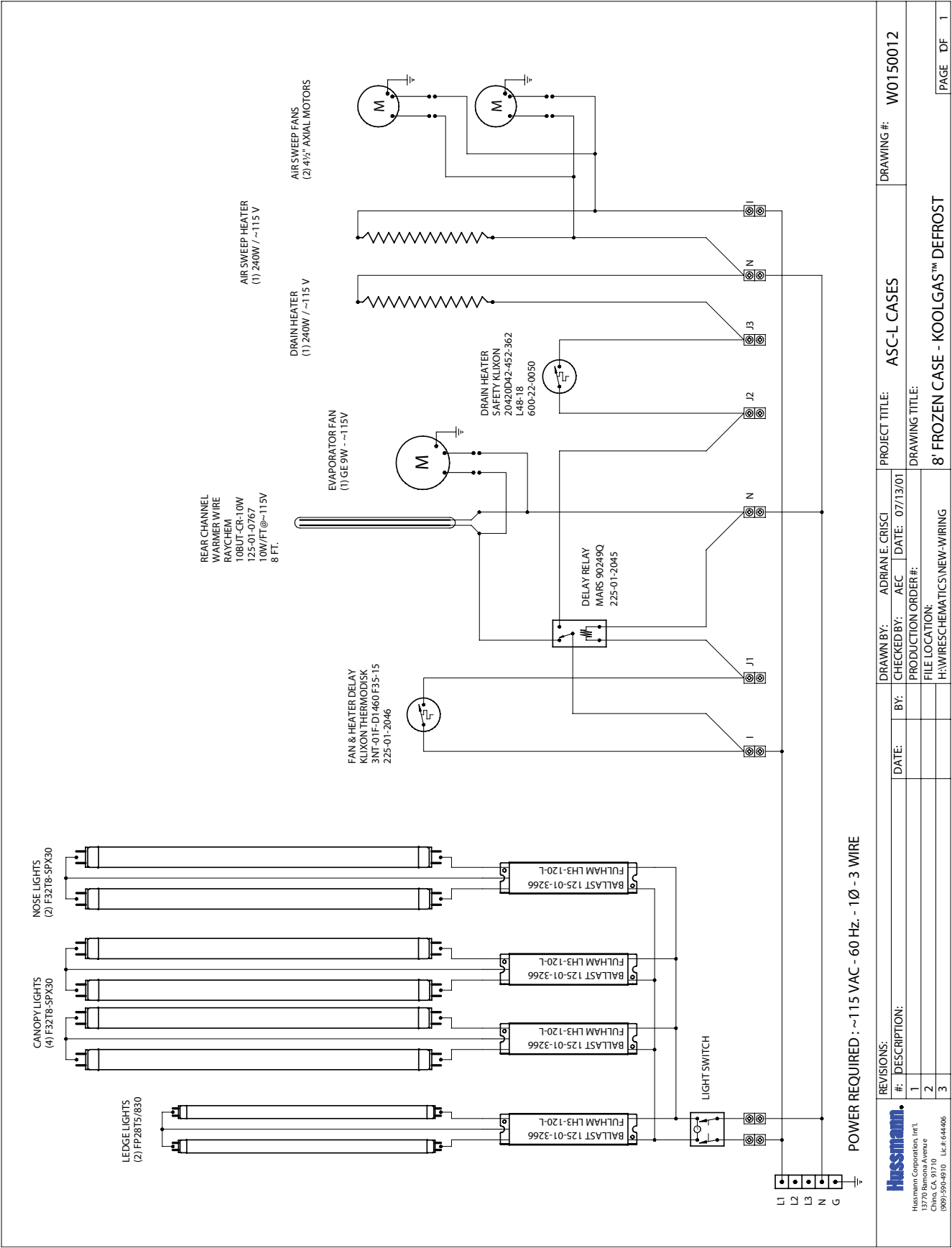


## Wiring Diagrams (Cont'd)





Wiring Diagrams (Cont'd)

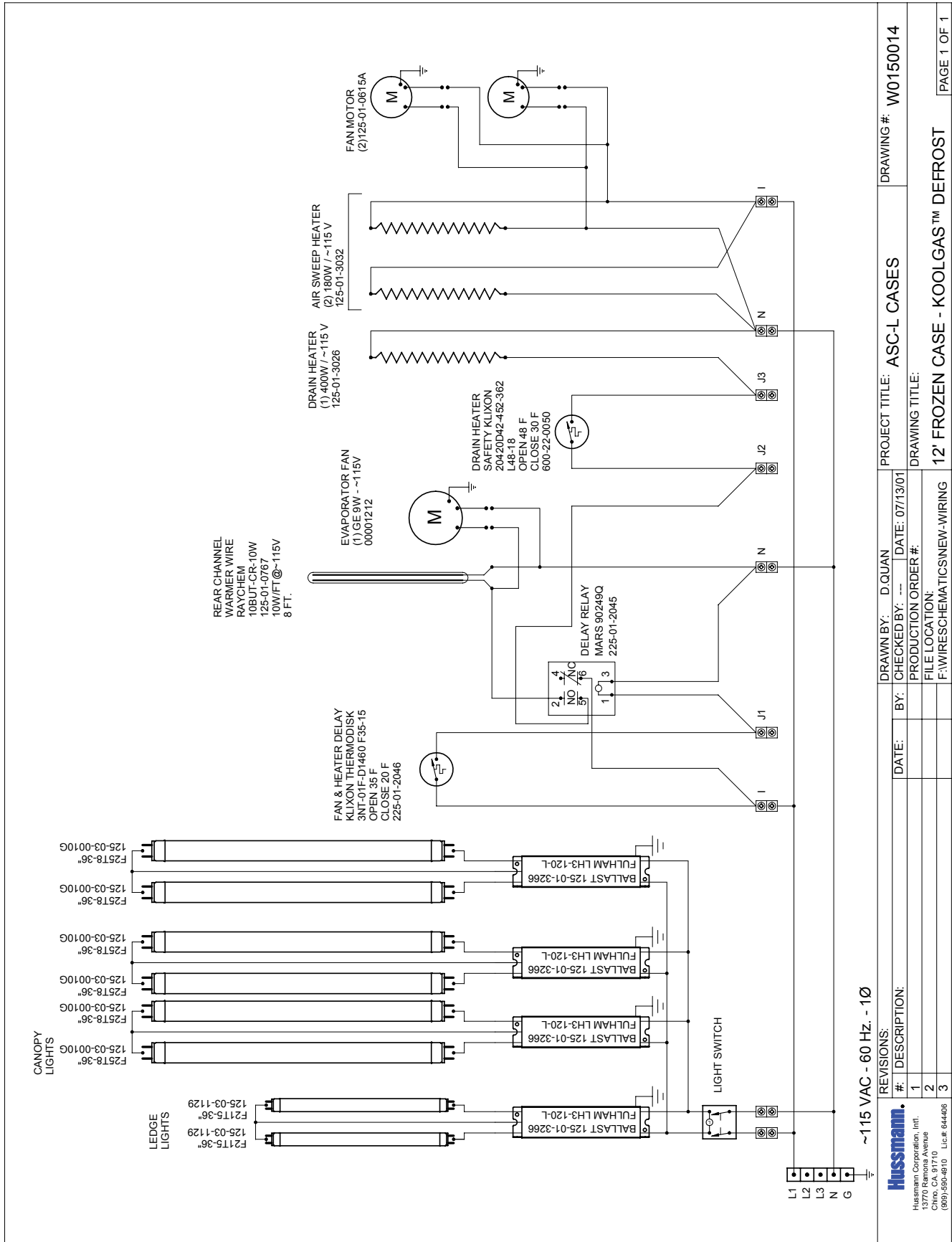


POWER REQUIRED : ~115 VAC - 60 Hz - 1Ø - 3 WIRE

REVISIONS:			DRAWN BY: ADRIAN E. CRISCI		PROJECT TITLE: ASC-L CASES		DRAWING #: W0150012	
#:	DESCRIPTION:	DATE:	BY:	CHECKED BY: AEC	DATE:	07/13/01	DRAWING TITLE: 8' FROZEN CASE - KOOLGAS™ DEFROST	
1							PAGE	DF 1
2								
3								

**Hussmann**  
Hussmann Corporation, Inc.  
13770 Ramona Avenue  
Chino, CA 91710  
(909) 590-4910 Lic # 644406

## Wiring Diagrams (Cont'd)

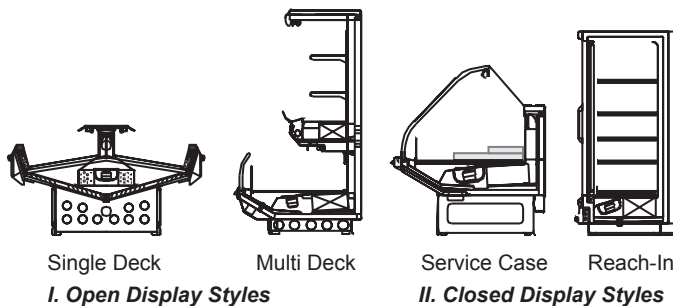


## Appendices

### Appendix A. - Temperature Guidelines

The refrigerators should be operated according to the manufacturer's published engineering specifications for entering air temperatures for specific equipment applications. Table 1 shows the typical temperature of the air entering the food zone one hour before the start of defrost and one hour after defrost for various categories of refrigerators. Refer to Appendix C for Field Evaluation Guidelines.

Table 1	
Type of Refrigerator	Typical Entering Air Temperature
<b>I. OPEN DISPLAY</b>	
A. Non frozen:	
1) Meat	28°F
2) Dairy/Deli	32°F
3) Produce	
a. Processed	36°F
b. Unprocessed	45°F
B. Frozen	0°F
C. Ice Cream	-5°F
<b>II. CLOSED DISPLAY</b>	
A. Non frozen:	
1) Meat	34°F
2) Dairy/Deli	34°F
3) Produce	
a. Processed	36°F
b. Unprocessed	45°F
B. Frozen	0°F
C. Ice Cream	-5°F



### Appendix B. - Application Recommendations

- 1.0 Temperature performance is critical for controlling bacteria growth. Therefore, the following recommendations are included in the standard. They are based on confirmed field experience over many years.
- 1.1 The installer is responsible for following the installation instructions and recommendations provided by Hussmann for the installation of each individual type refrigerator.
- 1.2 Refrigeration piping should be sized according to the equipment manufacturer's recommendations and installed in accordance with normal refrigeration practices. Refrigeration piping should be insulated according to Hussmann's recommendations.

- 1.3 A clogged waste outlet blocks refrigeration. The installer is responsible for the proper installation of the system which dispenses condensate waste through an air gap into the building indirect waste system.
- 1.4 The installer should perform a complete start-up evaluation prior to the loading of food into the refrigerator, which includes such items as:
  - a) Initial temperature performance, Coils should be properly fed with a refrigerant according to manufacturer's recommendations.
  - b) Observation of outside influences such as drafts, radiant heating from the ceiling and from lamps. Such influence should be properly corrected or compensated for.
  - c) At the same time, checks should be made of the store dry-bulb and wet-bulb temperatures to ascertain that they are within the limits prescribed by Hussmann.
  - d) Complete start-up procedures should include checking through a defrost to make certain of its adequate frequency and length without substantially exceeding the actual needs. This should include checking the electrical or refrigerant circuits to make sure that defrosts are correctly programmed for all the refrigerators connected to each refrigeration system.
  - e) Recording instruments should be used to check performance.

### Appendix C. - Field Recommendations

**Recommendations for field evaluating the performance of retail food refrigerators and hot cases**

- 1.0 The most consistent indicator of display refrigerator performance is temperature of the air entering the product zone (see Appendix A). In practical use, the precise determination of return air temperature is extremely difficult. Readings of return air temperatures will be variable and results will be inconsistent. The product temperature alone is not an indicator of refrigerator performance.

**NOTE:** Public Health will use the temperature of the product in determining if the refrigerator will be allowed to display potentially hazardous food. For the purpose of this evaluation, product temperature above the FDA Food Code 1993 temperature for potentially hazardous food will be the first indication that an evaluation should be performed. It is expected that all refrigerators will keep food at the FDA Food Code 1993 temperature for potentially hazardous food.

## Appendices (Cont'd)

- 1.1 The following recommendations are made for the purpose of arriving at easily taken and understood data which, coupled with other observations, may be used to determine whether a display refrigerator is working as intended:
- a) **INSTRUMENT** - A stainless steel stem-type thermometer is recommended and it should have a dial a minimum of 1 inch internal diameter. A test thermometer scaled only in Celsius or dually scaled in Celsius and Fahrenheit shall be accurate to 1°C (1.8°F). Temperature measuring devices that are scaled only in Fahrenheit shall be accurate to 2°F. The thermometer should be checked for proper calibration. (It should read 32°F when the stem is immersed in an ice water bath).
  - b) **LOCATION** - The probe or sensing element of the thermometer should be located in the airstream where the air first enters the display or storage area, and not more than 1 inch away from the surface and in the center of the discharge opening.
  - c) **READING** - It should first be determined that the refrigerator is refrigerating and has operated at least one hour since the end of the last defrost period. The thermometer reading should be made only after it has been allowed to stabilize, i.e., maintain a constant reading.
  - d) **OTHER OBSERVATIONS** - Other observations should be made which may indicate operating problems, such as unsatisfactory product, feel/appearance.
  - e) **CONCLUSIONS** - In the absence of any apparent undesirable conditions, the refrigerator should be judged to be operating properly. If it is determined that such condition is undesirable, i.e., the product is above proper temperature, checks should be made for the following:
    1. Has the refrigerator been loaded with warm product?
    2. Is the product loaded beyond the "Safe Load Line" markers?
    3. Are the return air ducts blocked?
    4. Are the entering air ducts blocked?
    5. Is a dumped display causing turbulent air flow and mixing with room air?
    6. Are spotlights or other high intensity lighting directed onto the product?
    7. Are there unusual draft conditions (from heating/air-conditioning ducts, open doors, etc.)?
    8. Is there exposure to direct sunlight?
    9. Are display signs blocking or diverting airflow?
    10. Are the coils of the refrigerator iced up?
    11. Is the store ambient over 75°F, 55% RH as set forth in ASHRAE Standard 72 and ASHRAE Standard 117?
    12. Are the shelf positions, number, and size other than recommended by Hussmann?
    13. Is there an improper application or control system?
    14. Is the evaporator fan motor/blade inoperative?
    15. Is the defrost time excessive?
    16. Is the defrost termination, thermostat (if used) set too high?
    17. Are the refrigerant controls incorrectly adjusted?
    18. Is the air entering the condenser above design conditions? Are the condenser fins clear of dirt, dust, etc.?
    19. Is there a shortage of refrigerant?
    20. Has the equipment been modified to use replacements for CFC-12, CFC-502 or other refrigerant? If so, have the modifications been made in accordance with the recommendations of the equipment manufacturer? Is the refrigerator charged with the proper refrigerant and lubricant? Does the system use the recommended compressor?

### Appendix D. - Recommendations to User

- 1.0 Hussmann Corporation provides instructions and recommendations for proper periodic cleaning. The user will be responsible for such cleaning, including the cleaning of low temperature equipment within the compartment and the cooling coil area(s). Cleaning practices, particularly with respect to proper refrigerator unloading and warm-up, must be in accordance with applicable recommendations.

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**Appendices (Cont'd)**

- 1.1 Cleaning of non frozen food equipment should include a weekly cleaning of the food compartment as a minimum to prevent bacteria growth from accumulating. Actual use and products may dictate more frequent cleaning. Circumstances of use and equipment design must also dictate the frequency of cleaning the display areas. Weekly washing down of the storage compartment is also recommended, especially for equipment subject to drippage of milk or other liquids, or the collection of vegetable, meat, crumbs, etc. or other debris or litter. Daily cleaning of the external areas surrounding the storage or display compartments with detergent and water will keep the equipment presentable and prevent grime buildup.
- 1.2 Load levels as defined by the manufacturer must be observed.
- 1.3 The best preservation is achieved by following these rules:
  - a) Buy quality products.
  - b) Receive perishables from transit equipment at the ideal temperature for the particular product.
  - c) Expedite perishables to the store's storage equipment to avoid unnecessary warm-up and prolonged temperature recovery. Food store refrigerators are not food chillers nor can they reclaim quality lost through previous mishandling.
  - d) Care must be taken when cross merchandising products to ensure that potentially hazardous vegetable products are not placed in non refrigerated areas.
  - e) Display and storage equipment doors should be kept closed during periods of inactivity.
  - f) Minimize the transfer time of perishables from storage to display.
  - g) Keep meat under refrigeration in meat cutting and processing area except for the few moments it is being handled in processing. When a cut or tray of meat is not to be worked on immediately, the procedure should call for returning it to refrigeration.
  - h) Keep tools clean and sanitized. Since mechanical equipment is used for fresh meat processing, all such equipment should be cleaned at least daily and each time a different kind of meat product comes in contact with the tool or equipment.
  - i) Make sure that all refrigeration equipment is installed and adjusted in strict accordance with the manufacturer's recommendations.
  - j) See that all storage and refrigeration equipment is kept in proper working order by routine maintenance.

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## Service Record

Last service date:      By:

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