HUSSMANN®/Chino

AB

UPRIGHT MEAT DISPLAY CASE

Installation & Operation Manual

REV. 0904

HUSSMANN®

AB

UPRIGHT MEAT DISPLAY CASE

P/N IGUP-AB-0904

INSTALLATION & OPERATION GUIDE

General Instructions

Table of Contents

THIS BOOKLET CONTAINS INFORMATION ON:

AB Upright Refrigerated Meat Display Case

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.

The Hussmann warranty is printed on the back of this guide.

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

HUSSMANN®/Chino

A publication of
Hussmann® Chino
13770 Ramona Avenue • Chino, California 91710
(909) 628-8942 FAX
(909) 590-4910
(800) 395-9229

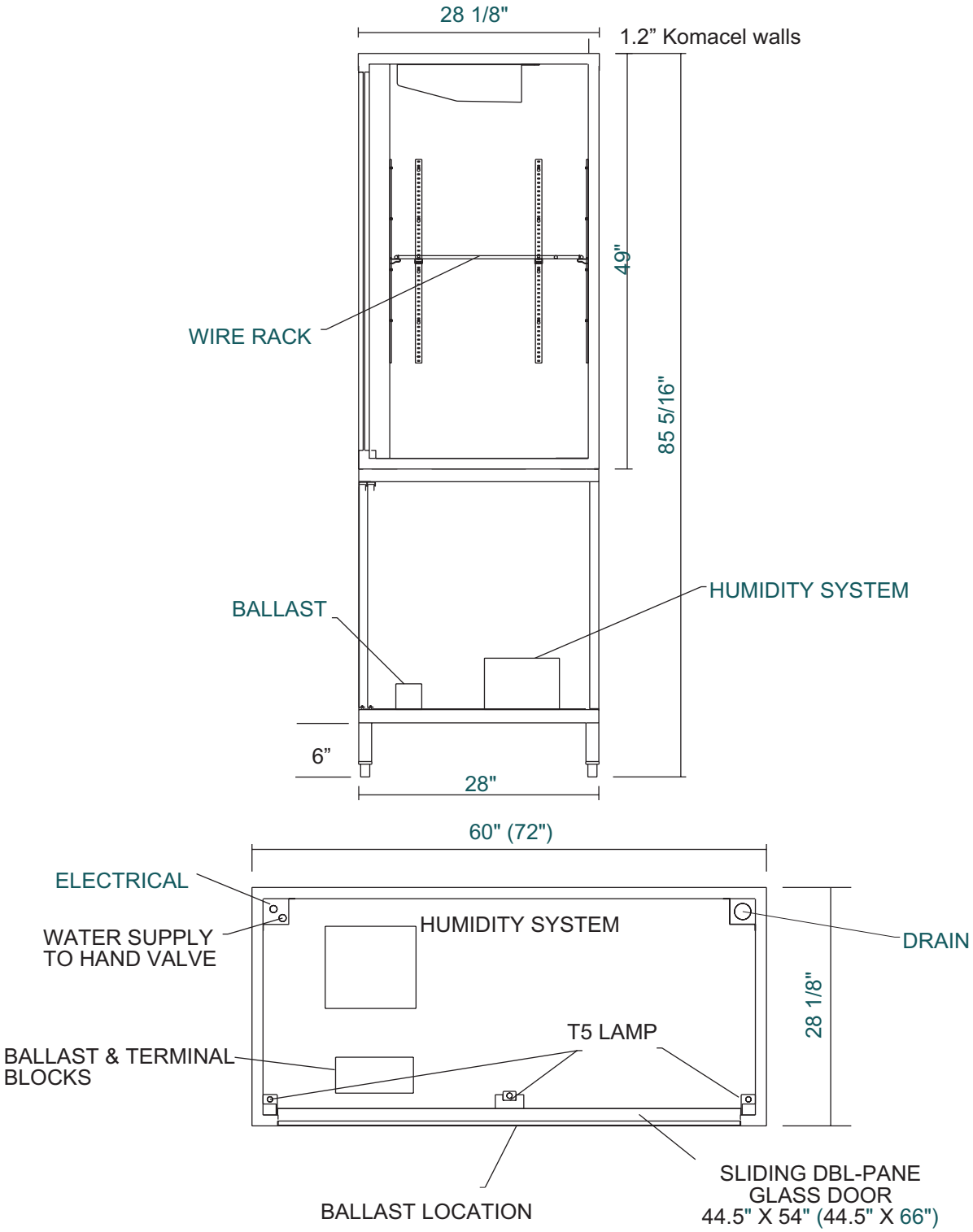
This equipment is to be installed to comply with the applicable NEC, Federal, State, and Local Plumbing and Construction Code having jurisdiction.

Important Information

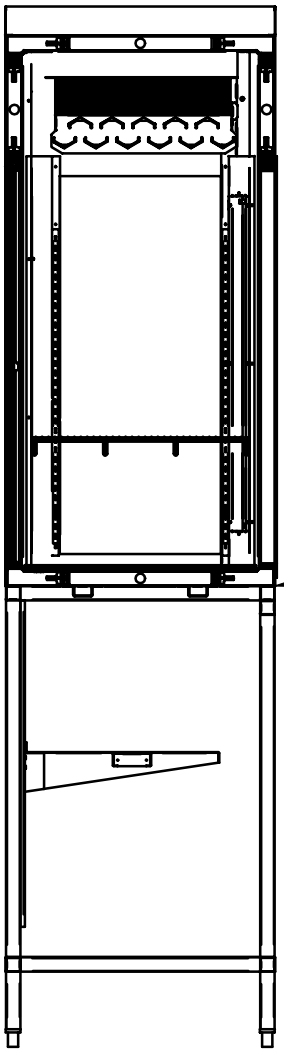
The AB Meat merchandisers are easy to work, attractive merchandising display cases capable of maintaining superb product quality, with the installation of the proper controlling devices. These should be set according to the manufacturer's specifications and combined with a properly maintained humidity system. Incorrect settings and failure to maintain the humidity system will result in short product life from dehydration, shrinkage and discoloration. Below are a few guidelines to ensure optimum performance and product life.

- Review the Case Specification in this book to verify thermostat setting. Do not set temperature too cold, **as this causes product dehydration.**
- Temperatures should be achieved by a t-stat and suction solenoid at each case. Do not use EPR valves, liquid line solenoids or electronic control devices of any kind. **These controls allow temperature swings causing product dehydration and excessive energy consumption.**
- Defrost cycles should be set according to the Case Specifications in this book
- Clean humidity system a minimum of every 90 days **for proper system operation.**
- Work and rotate product – not to exceed a four (4) hour period.
- At night turn off case lights and cover product with **moistened cheesecloth or fabric towels.**
- Keep meat holding box at 32°.
- Keep meat prep room refrigerated at 55°.
- Meat bloom box (if applicable) should be at 36°.
- Meat must enter the case at 40° or below. **Product deterioration is very rapid above 40°.**
- Maintain sanitary conditions throughout the meat holding, prep and working areas.
- Do not display product directly within the air discharge.
- **Turn and rotate the meat. The blood which gives the pink color works down in time which causes surface discoloration and dehydration. When turned before this condition occurs the other side is kept in good color (bloom) condition. The meat can even be turned (3) three and (4) four times.**
- **It is not required at night to remove the product from the case. Turn the lights off at night and cover the product. We recommend you use a moistened cheesecloth or towels. This helps slow down the product dehydration process by taking the moisture from the cloth and not from the product. This is an old method that meat shops have used for many years. It works and helps to gain extended product life.**
- **Cold coils remove heat and moisture from the case and deposit it as frost on the coil. Thus a defrost is required to remove this frost. Our humidity system adds moisture to the case and helps slow down the dehydration process. The only other moisture in the case is in the product. A single level of meat in a case will dry out much faster than a fully loaded case with three to four levels of meat.**
- **The colder the case, the faster the product loses its moisture and shelf life. It is very important to maintain a constant even product temperature (see Case Specifications).**

Cut & Plan Views



NSF Installation Requirement



PER NSF INSTALLATION REQUIREMENT
SEAL AROUND CASE TO BASE PERIMETER
WITH NSF APPROVED SEALANT

Installation

LOCATION

The refrigerated merchandisers have been designed for use only in air conditioned stores where temperature and humidity are maintained at or below 75°F and 55% relative humidity. DO NOT allow air conditioning, electric fans, ovens, open doors or windows (etc.) to create air currents around the merchandiser, as this will impair its correct operation.

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.

UNCRATING THE STAND

Place the fixture as close to its permanent position as possible. Remove the top of the crate. Detach the walls from each other and remove from the skid. Unbolt the case from the skid. The fixture can now be lifted off the crate skid. **Lift only at base of stand!**

EXTERIOR LOADING

These models have **not** been structurally designed to support excessive external loading. **Do not walk on their tops**; This could cause serious personal injury and damage to the fixture.

DO NOT SEAL JOINT TRIM TO FLOOR!

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 P-trap must be installed to prevent air leakage and insect entrance into the fixture. (P-traps are not supplied with these cases.)

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 nonabsorbent 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.

GENERAL INFORMATION

The Service Case Humidification system is an automatic moisture maintenance system designed to raise humidity levels in any new or existing service case counter or refrigerated floral display. It delivers a damp fog into the service case or floral display at selected intervals by using a combination of air and water.

The system consists of a humidification nozzle assembly, water filtration/regulator unit, remote timer, and air compressor unit (see attached diagram).

PLEASE READ ALL INSTRUCTIONS BEFORE BEGINNING INSTALLATION

1. Installation of Regulator Assembly and water hookup Procedure -
   a. Tie into the water supply line under or near the service case or floral display by using either a compression or sweat "Tee" fitting with a 1/2" FPT. (In cases of new store construction, the appropriate 1/2" FPT fitting may already be stubbed up under the case).
   b. Screw the provided 1/4" x 1/2" MPT gray plastic push-in filing into the 1/2" FPT water fitting.
   c. To connect tubing for water, push one end of the 1/4" black poly tubing into the plastic push-in fitting at the Tee". Measure and cut tubing to length and insert the opposite end of tubing into the 1/4" push-in fitting on the Regulator Assembly marked "CITY WATER".
   d. Connect another length of black poly tubing to the push-in fitting (or plastic push-in "Tee" for SCH-2) labeled 'WATER" on the Regulator Assembly. Measure and cut this piece of tubing to length and connect the opposite end to the push-in elbow fitting on the back of the nozzle assembly. It may be necessary to drill access holes through the bottom of the case for the tubing lines - if so, ensure these holes are sealed with silicon or similar substance.

TECHNICAL PROCEDURES ARE NOW COMPLETE

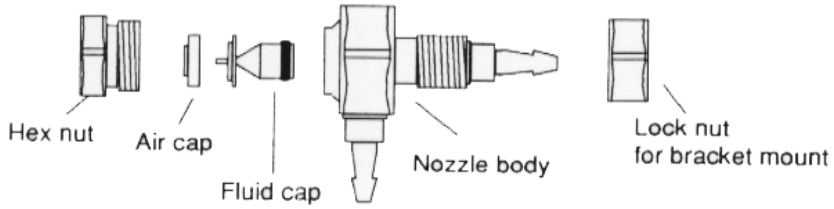
2. **Start-up, Testing and Adjustment Procedures**
   a. Turn water on. Pressure gauge on Regulator Assemblies should read approximately 1-4 psi.
   b. Set Timer at each station for a 60 second "On Time" and 1 minute "Off Time" cycle. (SEE ATTACHED CONTROLLER SETTING INSTRUCTIONS!) This setting, is for testing, on] and will allow enough time for the water to 1111 the line and reach the nozzle.
   c. Plug in the Controller to the 115V outlet. Compressor and solenoid valves will activate and plumes from nozzles will independently appear shortly thereafter.
   d. If humidity plume is too light or too heavy. Adjust the Regulator accordingly. Adjust water pressure by lifting up the yellow locking cap on the top of the Regulator and turn clockwise (to increase pressure) or counter- clockwise (to decrease pressure). Make Regulator adjustments ONLY when system is running. Push down on cap to relock the regulator on the desired pressure.
   e. A desired setting would be a pressure that provides a solid constant plume from the nozzle(s), but shuts off cleanly when the cycle ends. If the nozzle(s) continue to emit a stream of water or drip at shut-off, the pressure should be decreased.
   f. On completion of testing/adjustment, reset Controller to recommended "On/Off' settings as per Owner's Guide which is included in the packing carton.
   g. Carry out training on tip cleaning and Timer settings with department manager and/or staff.

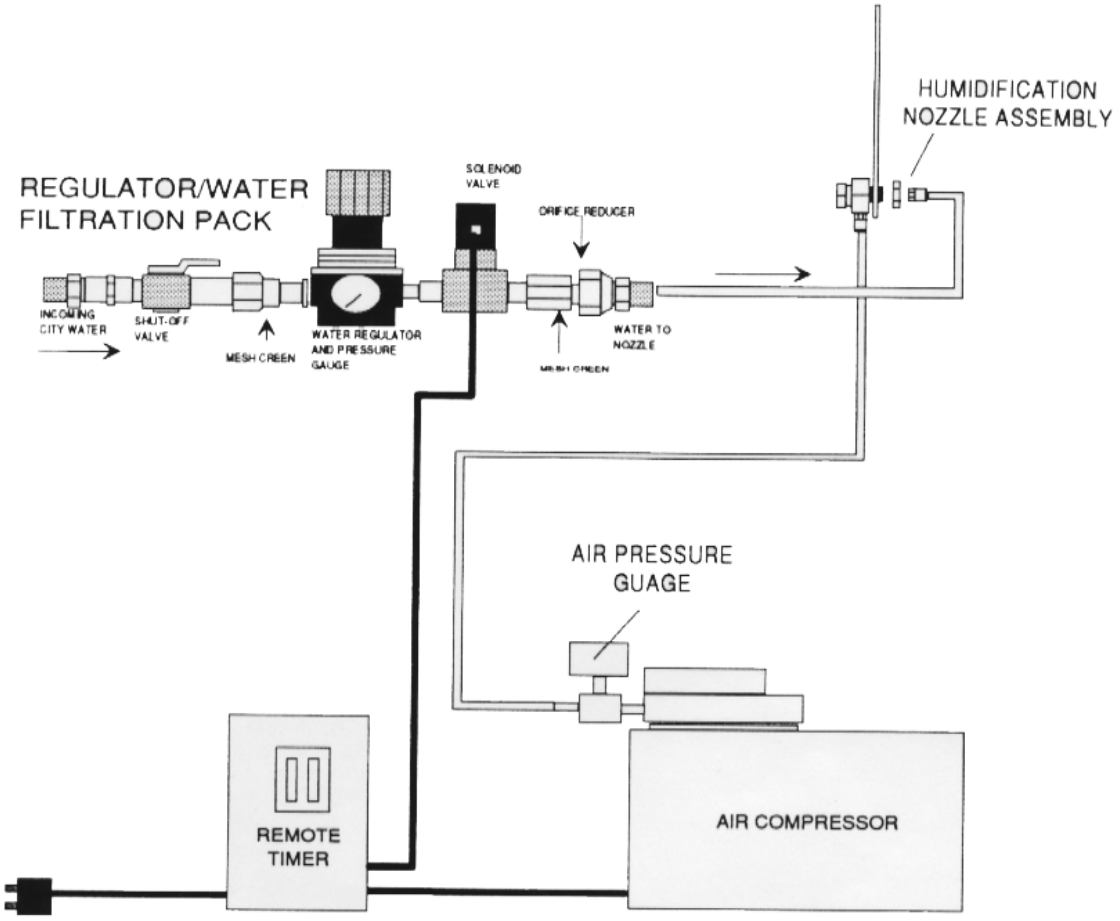
3. **Warranty Conditions** -

The SCH system carries a 1 year limited Parts Only warranty. Fractal Inc. will replace component parts that are found to be defective through normal operation or workmanship during manufacture.

   b. Performance problems that are directly related to poor water quality are not the responsibility of the manufacturer.

THE MANUFACTURER WILL NOT BE RESPONSIBLE FOR EQUIPMENT PERFORMANCE PROBLEMS (DURING OR AFTER INSTALLATION). IF INSTALLATION, ADJUSTMENT, AND TRAINING IS NOT CARRIED OUT IN ACCORDANCE WITH THESE INSTRUCTIONS. INSTALLING CONTRACTORS SHOULD BE AWARE THAT 24 HOUR SERVICE ASSISTANCE IS AVAILABLE BY CALLING THE ABOVE TELEPHONE NUMBERS.





PROPRIETARY

SERVICE CASE HUMIDIFICATION SYSTEM

DATE	4/26/94
DRAWN BY	TMF
CHECKED BY	JA
PAGE	

FRACTAL, INC.
The Leader In Perishable Control
9375 SW Commerce Circle, Suite #9
Wilsonville OR USA 97070
(503) 682-9515
1-800-338-MIST

Recommended operation times: You should adjust your humidification time for your stores needs~ This is because each service case and floral display differs in temperature, humidity, case style and volume. See chart below for sample timings,

APPLICATION	OFF ***TIME***	***ON TIME***
Seafood	5 min	30 sec
Meat	5 min	30 sec.
Deli	10 min.	30 sec.
Floral	10 min.	60 sec

Humidification nozzle assembly:

The humidification nozzle assembly is typically located at one end of the service case aimed towards the opposite end. The humidification nozzle is specially designed to precisely mix air and water providing the desired humidity level.

System maintenance and cleaning: (See also attached Cleaning Instructions) It is recommended that you clean the humidification nozzle (tip) periodically, especially in areas with water that contain a high content of solids. Unscrew the hex nut and remove the air and fluid caps from the main nozzle body, Soak the caps in a hot water and Efferdent@ solution for approximately 20 minutes, rinse and replace.

Remote timer operation; (See also cdtached Timer Setting Instructions) The remote timer has two dials used for setting times.The dial labeled "T ON" represents the amount of time the operating cycle is to remain on. Each number equals one minute,The dial labeled "T OFF" represents the delay between operating cycles. Each number equals one minute. Example: If you want two minutes of mist every ten minutes, set the dial labeled "T ON" at 2 and set the dial labeled "T OFF" of 10.

Troubleshooting:

See attached drawings and helpful tips, however should any further assistance be required, please call Fractal Inc, Service Dept. at **1-800-338 6478**.

CONTROLLER SETTINGS

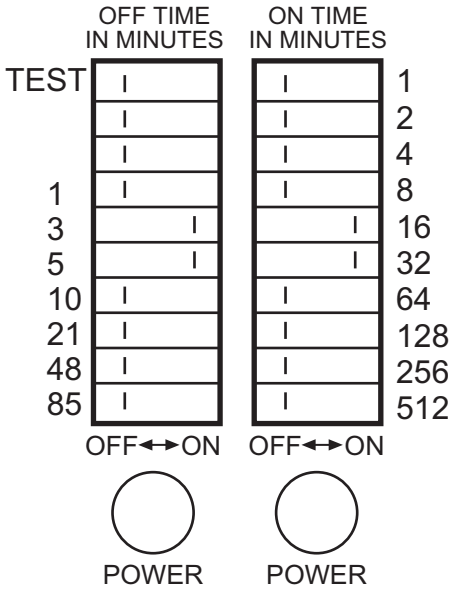
FOR SERVICE CASE HUMIDIFICATION SYSTEM MODELS SCH1/SCH2 - SINGLE STATION

The SCH controller should be installed using the suggested factory settings for the mist
"OnTime" and "Off Time" as outlined in the Owner's Guide. However, it is up to the department manager's discretion to adjust these settings to best suit each application. The left column of switches controls "Off Time" in minutes and the right column of switches controls "On Time" time in seconds.

1. **To adjust mist "ON TIME":** Set the desired length of Mist by sliding the appropriate numbered switch to the right, or "On" position.
2. **To adjust mist "OFF TIME": Set** the desired interval of Mist by sliding the appropriate numbered switch to the right, or "On" position.

NOTES:

1. To delete previous settings, slide switches back to the left or "Off" position.
2. Numbers can be combined for total time "On" or "Off" by sliding more than one switch to the "On" position. Power light should be illuminated at all times when power is connected.
4. "On Cycle" light will illuminate only during Misting cycle.
5. For manual operation or for testing, slide switch marked "Test" to the "On" position and slide all other switches to the *"Off"* position.



WARNING: Controller must be properly grounded to ensure proper operation. Electrical power must be disconnected prior to hook-up or service. Follow all applicable local electrical codes.

FOR SERVICE:

Call your local Authorized Service Agency or contact:

FRACTAL INC.
9375 SW Commerce Circle #9
Wilsonville, OR 97070
(503) 682-9515
(800) 338-MIST (6478)

MODELS "SCH & SCHMS" - EMITTER NOZZLE CLEANING INSTRUCTIONS

If the nozzle appears plugged or seems to sputter, it may be that some particles or mineral buildup has occurred in the fluid body of orifice. Follow these simple instructions to solve the problem. Also, depending on the quality of the local water supply, regular cleaning should be carried out as a matter of course.

Step 1: Unplug the controller

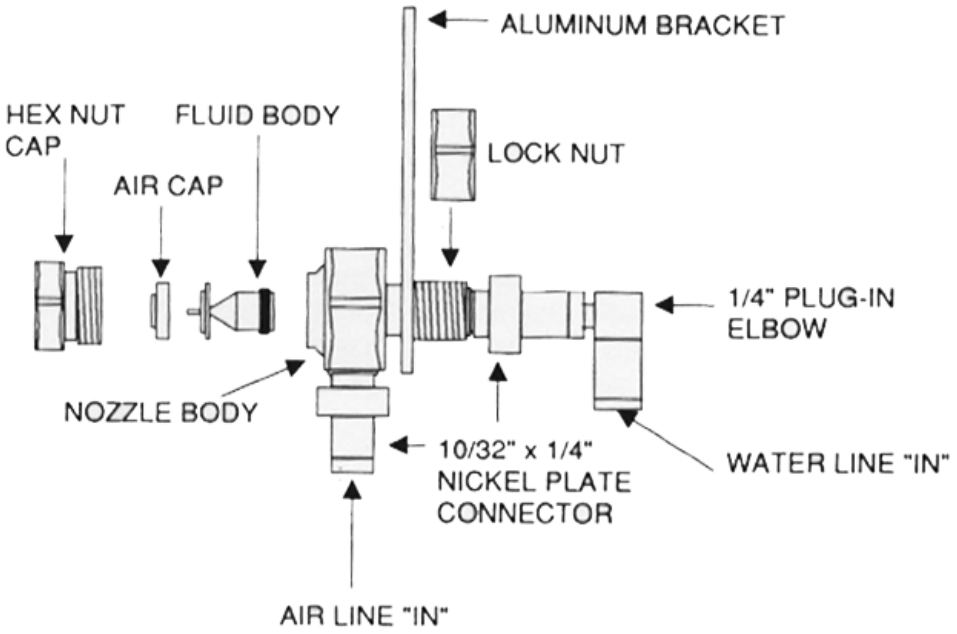
Step 2: Bracing the nozzle body with one hand, carefully loosen the hex nut Cap on the front of the emitter nozzle, and remove (be careful not to lose the Air Cap when you remove the Hex Nut).

Step 3. Remove the fluid Body from the nozzle body and look through it towards a light. If you cannot see daylight, simply rinse under a hot water and blow through the orifice until the blockage is cleared. For more severe mineral deposits, soak the Fluid Body in an Efferdent solution for approximately 15 minutes, rinsing afterwards. Do Not insert needles or similar sharp points into the orifice as this will enlarge the size and affect spray performance.

Step 4: Replace the Fluid Body back into the main body (black "O" ring end in first).

Step 5 Making sure the Air Cap is sitting flush inside, screw on the Hex Nut and tighten

Step 6: Plug in controller



TROUBLE SHOOTING GUIDE

Problem	Possible Cause / Remedy
Compressor not running	• Loss of power to controller. Check 110V supply and in-store breaker. • Loss of power to compressor. Check for loose wires on controller module.
No Humidity Plume	• Water turned off. Check main water supply to regulator unit. • Water tubing contacting ice/ frozen product. Thaw and insulate. • Solenoid valve not opening. Check 11OV power from controller. • Water pressure too low. Adjust regulator while system is running. • Tubing lines blocked or kinked. Check and repair. • Air pressure escaping. Check air line for leaks (air pressure should be 25 PSI). • No water getting to nozzle. Remove and clean orifice reducing plate in regulator assembly.
Too much / Too Little Moisture	• Adjust controller settings. Shorten "Mist On" time or increase "Mist Off" time. • Adjust water pressure.

MAJOR SYSTEM COMPONENTS

PART #	DESCRIPTION
10263	Air Compressor
10578	1/8" 110V Mini Solenoid Valve
10762	Timer Module (Pin plug-in)
10264	8 Pin Base
10193	110V Relay
10024	1/4" Brass Shutoff Valve
10904/l/4/15lbs	Pressure Gauge
10716	Water Regulator
SCHNOZSA	Nozzle Sub-Assembly
SCHBRKTSA	Bracket Mounted nozzzle Sub-Assemblr
SCHVSA	Valve / Regulator Sub-Asembly (Water filtration Pack)
SCHTSA	Complete Timer Sub assembly

Refrigeration

REFRIGERANT TYPE

The standard refrigerant will be R-22 unless otherwise specified on the customer order. Check the serial plate on the case for information.

REFRIGERATION LINES

LIQUID	SUCTION
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 the "Case Specs" section of this guidebook 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. For all multiplexing, defrost should be time terminated. Loadmaster valves are not recommended. Defrost times should as directed in the Case Specifications section of this guide. 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.

ACCESS TO TX VALVES & 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. A Sporlan balanced port expansion valve model is furnished as standard equipment, unless otherwise specified by customer.

EXPANSION VALVE ADJUSTMENT

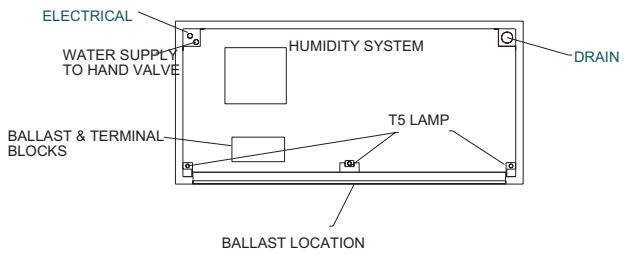
Expansion valves must be adjusted to fully feed the evaporator. Before attempting any adjustments, make sure the evaporator is either clear or very lightly covered with frost, and that the fixture is within 10°F of its expected operating temperature.

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.
3. The difference is superheat.
5. Set the superheat for 5°F - 7°F.

T-STAT LOCATION

T-Stats are located within the electrical raceway. Refer to diagram below.



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	Descripcion
	GROUND	TIERRA MASA	MASSE
	ANTI-SWEAT	ANTICONDENSCION	ANTI-SUINTEMENT
	LIGHTS	LUCES	ECLAIRAGE
	RECEPTACLES	ENCHUFER	RECEPTACLE
	T-STAT/SOLENOID 230 V	THERMOSTATO / SOLENOID (230 VAC)	SOUPAPE A SOLENOID (230 V)
	T-STAT/SOLENOID 115 V	THERMOSTATO / SOLENOID (115 VAC)	SOUPAPE A SOLENOID (115 V)
	FAN MOTORS	VENTILADORES	VENTILATEUR
			430-01-0338 r9908

CASE MUST BE GROUNDED

NOTE: Refer to label illustrated above that is affixed to case to determine the actual configuration as checked in the "TYPE INSTALLED" boxes.

ELECTRICAL CIRCUIT IDENTIFICATION

Standard lighting for all 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 receptacle that is provided on the exterior back of these models is intended for computerized scales with a fifteen amp maximum load, not for large motors or other high wattage appliances. It should be wired to a dedicated circuit.

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 & 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. Most component amperes are listed in the "Case Specs" section, but always check the serial plate.

BALLAST LOCATION

Ballasts are located within the access panel that runs the length of the rear of the case. Refer to diagram on page 6.

WIRING & SERIAL PLATE AMPERAGE

Field Wiring must be sized for component amperes stamped on the serial plate. Actual ampere draw may be less than specified. Field wiring from the refrigeration con trol panel to the merchandisers is required for refrigeration thermostats. Most component amperes are listed in the "Case Specs" section, but always check the serial plate.

ASHRAE COLOR CODE

NOTE: All other manufacturers have no standard sensor codes.

Case Control Systems	SENSOR	COLOR	
Manufacturer ® >		EIL	CP
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

NON-GLARE GLASS

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

Windex® or Glass Plus® are the only solutions recommended to be used to clean the non-glare glass. The damage to the glass from improper, caustic solutions is irrepairable.

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.

User Information, Cont'd

Maintenance

ELECTRICAL PRECAUTIONS

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.

This lamp has been treated to resist breakage and must be replaced with a similarly treated lamp in order to maintain compliance with NSF Standards. NSF CODE 4.28.1
Contact HUSSMANN Chino for replacement
1-800-395-9229 x 2131

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 & 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.

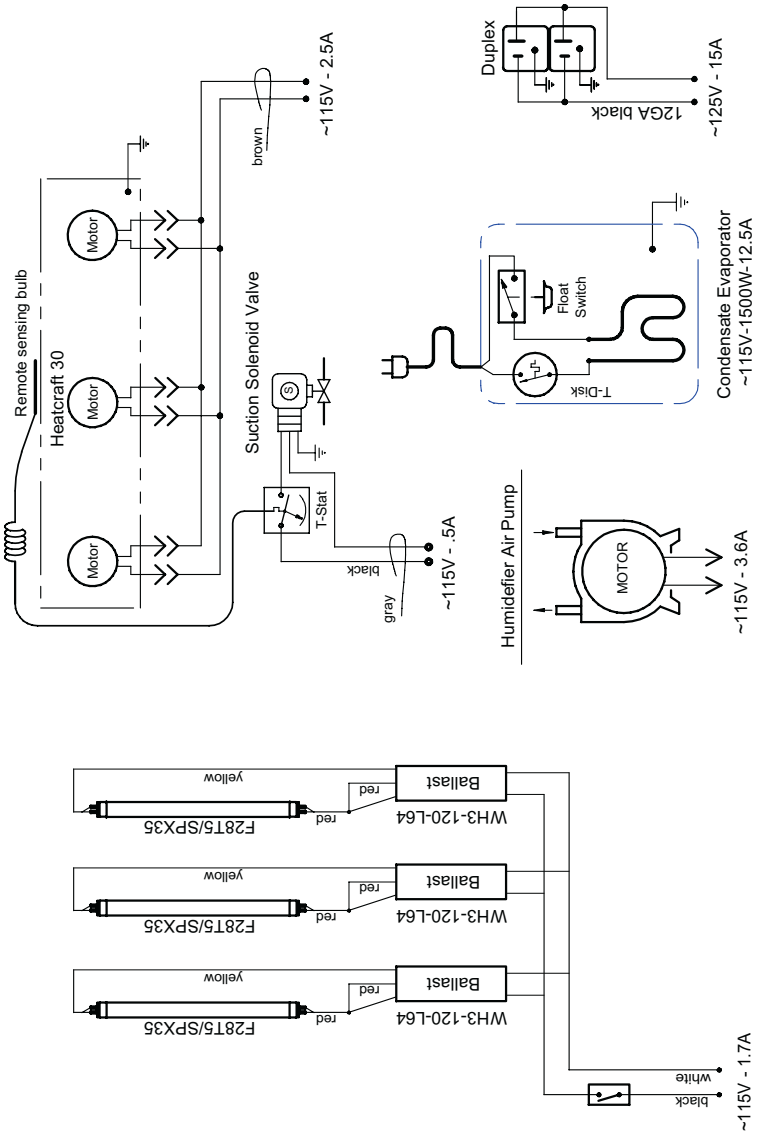
IMPORTANT INFORMATION

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.

Electrical and Refrigeration Specifications

MODEL NUMBER / CASE LENGTH	BTU REQ'D PER FT.	TEMPERATURE EVAP TMP	TEMPERATURE AVG PROD TMP	TEMPERATURE DISC TMP	DISCHG. AIR VELOC @FPM	T-STAT/ CUT IN SETTINGS	TYPE OF COIL	FAN SIZE & NUMBER OF MOTORS	DEFROST FREQ. & DURATION	115 V. ELECTRICAL CIRCUITS E E FANS (OPTIONAL)	STD. FANS	WARMERS	LIGHTS	Humidity System
AB														
Blower Coil													Humidity	System
5'	990	25	34	26	200	35	Forced Air	4" C-frame (3)	36 min. (4)	-	2.5	-	.58	3.6
6'	990	25	34	26	200	35	Forced Air	4" C-frame (5)	36 min. (4)	-	3.5	-	.58	3.6
Gravity Coil													Humidity	System (opt.)
5' & 6'	360	25	35	25	-	35	Gravity	-	90 (1)	-	-	-	.58	3.6

Electrical Schematics



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No.	Description:	Date:	By:
1	Revised case lenght	07/11	AEC

Drawn By: Boris Kasrel
Checked By: BJK Date: 06.27.00
Assembly: 06.27.00
File Location: H:\WireSchematics\NewWiring...\

Project Title: Aged Beef Display Case
Drawing Title: AB-5' Remote Wiring Diagram

Drawing No.: W0050001

Sheet 1 of 1

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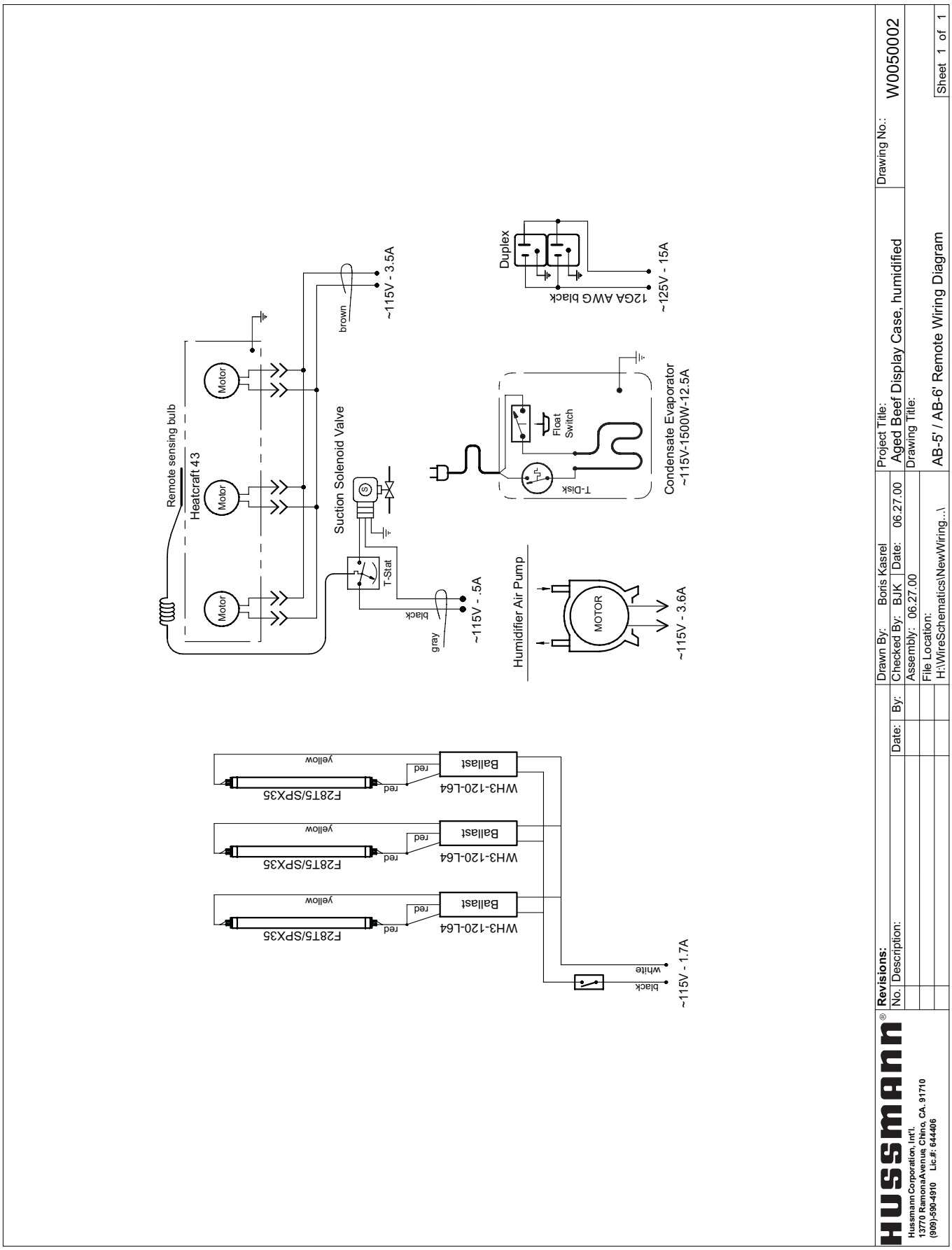

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No.	Description:	Date:	By:	Checked By: BJK Date: 06.27.00	Aged Beef Display Case, humidified	
				Assembly: 06.27.00	Drawing Title:	
				File Location: H:\WireSchematics\NewWiring...\	AB-5' / AB-6' Remote Wiring Diagram	Sheet 1 of 1

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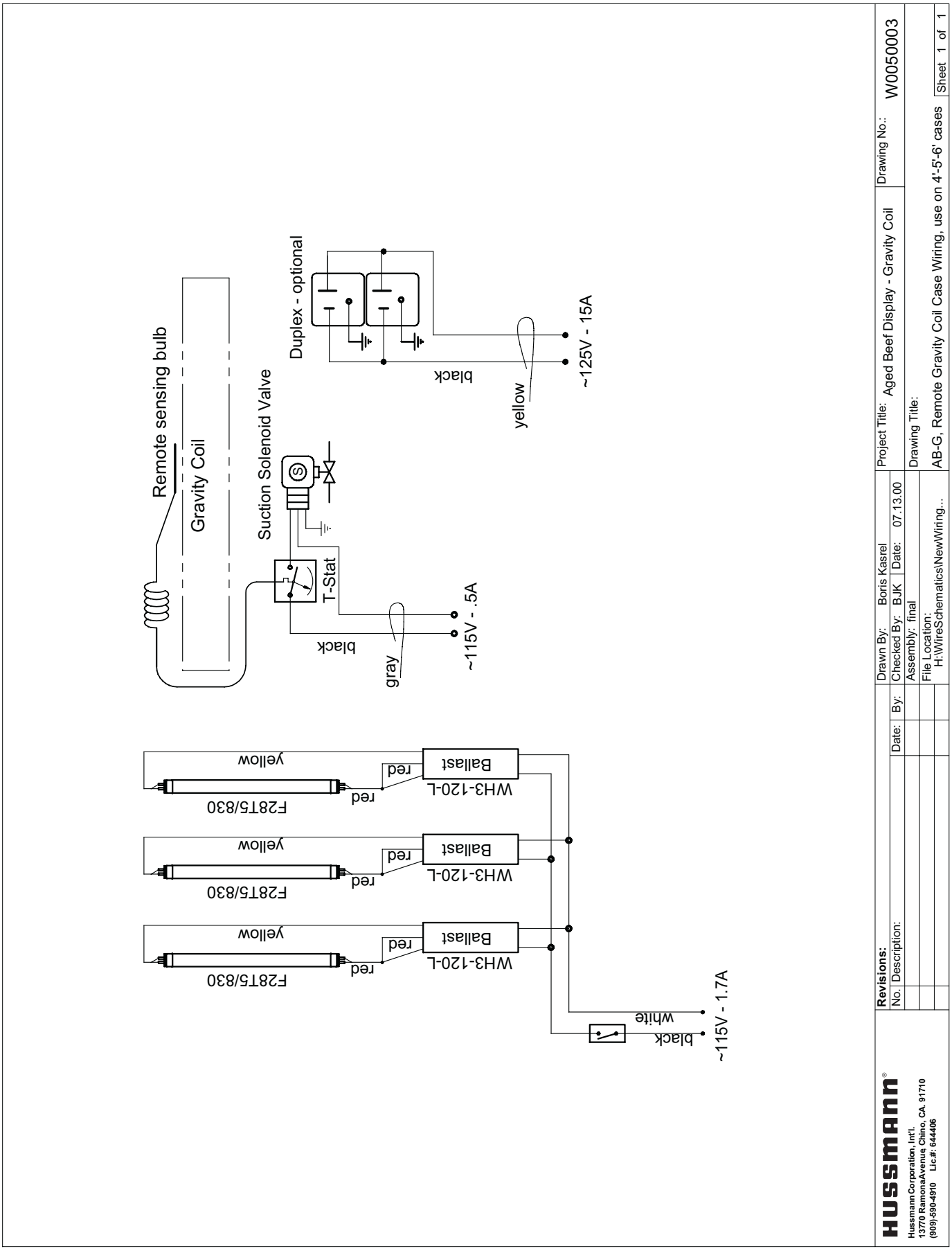

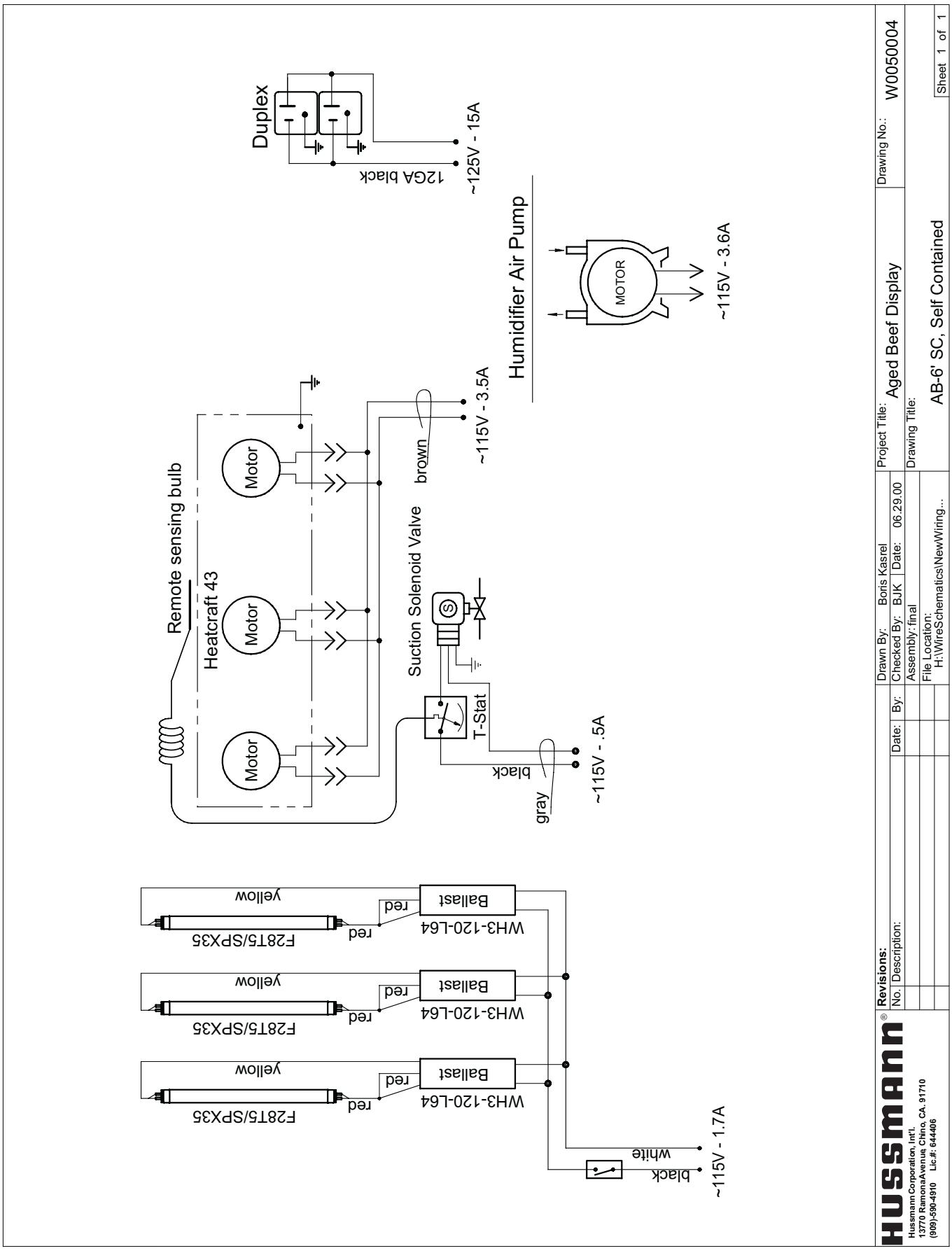

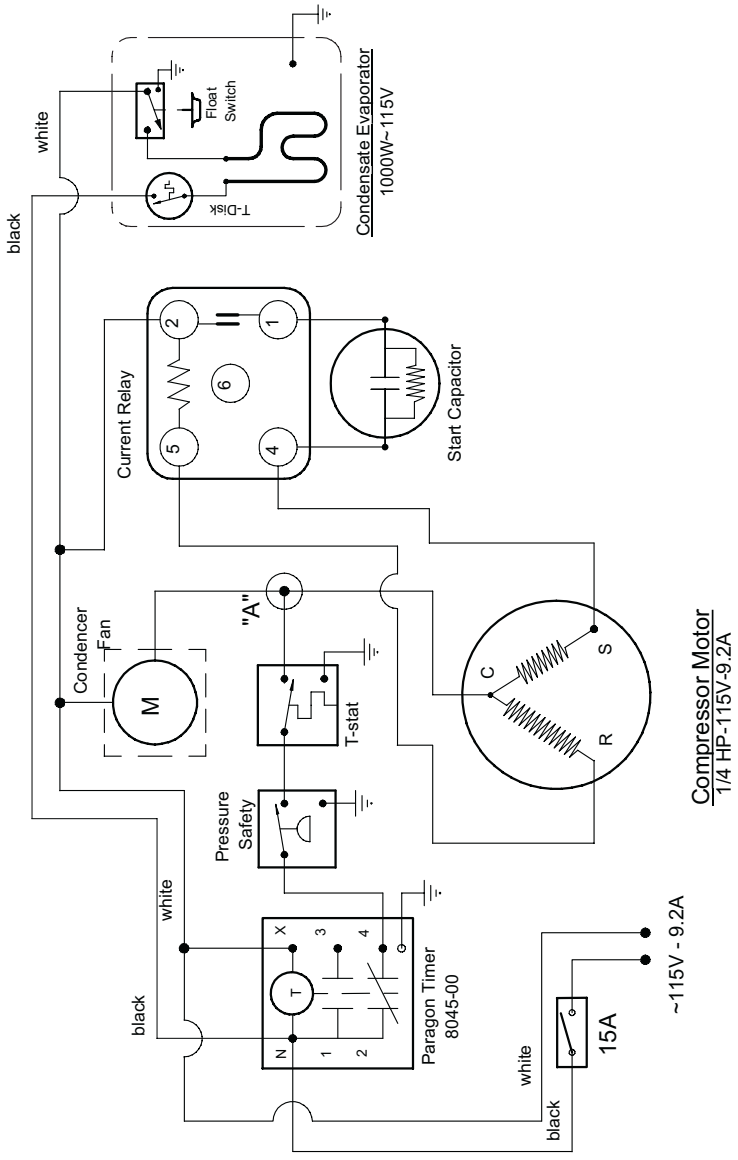

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Revisions:			
No.	Description:	Date:	By:

Drawn By:	Boris Kasrel		
Checked By:	BJK	Date:	06.29.00
Assembly: final			
File Location:	H:\WireSchematics\NewWiring...		

Project Title: Aged Beef Display

Drawing No.: W0050004

Drawing Title: AB-6' SC, Self Contained

Sheet 2 of 2

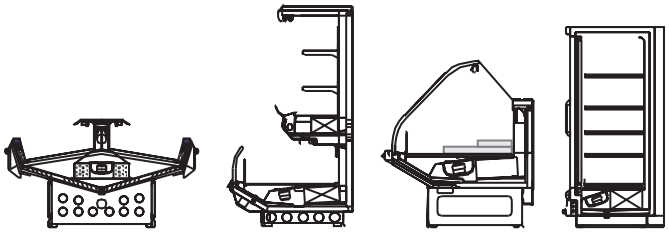
Appendices

Appendix A. – Temperature Guidelines Refrigerated

The refrigerators should be operated according to the manufacturer's published engineering specifications for entering air temperatures for specific equipment applications. Table I 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 I

TYPE OF REFRIGERATOR	TYPICAL ENTERING AIR TEMPERATURE
I. OPEN DISPLAY	
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
II. CLOSED DISPLAY	
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



Single Deck *Multi Deck* *Service Case* *Reach-In*

I. Open Display Styles ***II. Closed Display Styles***

Appendix B. – Application Recommendations Refrigerated

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 the manufacturer 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 the manufacturer'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 the manufacturer.

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 - Refrigerated

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 (Refrigerated see Diagram 1, 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.

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 determined 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 the manufacturer?
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?

Appendix D. – Recommendations To User - Refrigerated

1.0 The manufacturer should provide 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.

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.

Appendices, Cont'd

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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Limited Warranty

This warranty is made to the original user at the original installation site and is not transferable.

Hussmann merchandisers are warranted to be free from defect in material and workmanship under normal use and service for a period of one (1) year from the date of original installation (not to exceed fifteen (15) months from the date of shipment for the factory). **Hussmann Impact Modular Coils are warranted for a total of five (5) years based upon the above criteria**. Hussmann's obligation under this warranty shall be limited to repairing or exchanging any part or parts, without charge F.O.B. factory or nearest authorized parts depot within said period and which is proven to the satisfaction of the original manufacturing plant warranty group to be thus defective.

Hussmann covers the entire case or refrigeration product and all its components (except for lamps, driers, fuses, and other maintenance type replacement parts) for the one (1) year warranty period.

Additionally, Hussmann warrants for a total period of three (3) years all sealed, multi-glass assemblies except those used in sliding doors on closed meat display cases. If within three (3) years from the date of installation (not to exceed thirty-nine (39) months from the date of shipment from factory), it shall be proven to the satisfaction of the originating factory warranty group that there is impaired visibility through the multi-glass assemblies thereof caused by moisture between the glasses, the multi-glass assembly will be replaced free of charge, F.O.B. factory. This additional warranty excludes accident, misuse, or glass breakage.

On Hussmann manufactured self-contained display cases, Hussmann agrees to repair or exchange, at its option, the original motor/compressor unit only with a motor/compressor of like or of similar design and capacity if it is shown to the satisfaction of Hussmann that the motor/compressor is inoperative due to defects in factory workmanship or material under normal use and service as outlined in Hussmann's "Installation Instructions" which are shipped inside new Hussmann equipment. Hussmann's sole obligation under this warranty shall be limited to a period not to exceed five years from date of factory shipment.

On Hussmann refrigeration systems, an additional (4) year extended warranty for the motor/compressor assembly is available, but must be purchased prior to shipment to be in effect. Hussmann reserves the right to inspect the job site, installation and reason for failure.

The motor/compressor warranties listed above do not include replacement or repair of controls, relays, capacitors, overload protectors, valve plates, oil pumps, gaskets or any external part on the motor/compressor replaceable in the field, or any other part of the refrigeration system or self-contained display case.

THE WARRANTIES TO REPAIR OR REPLACE ABOVE RECITED ARE THE ONLY WARRANTIES, EXPRESS, IMPLIED OR STATUTORY, MADE BY HUSSMANN WITH RESPECT TO THE ABOVE MENTIONED EQUIPMENT, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS, AND HUSSMANN NEITHER ASSUMES NOR AUTHORIZES ANY PERSON TO ASSUME FOR IT, ANY OTHER OBLIGATION OR LIABILITY IN CONNECTION WITH THE SALE OF SAID EQUIPMENT OR ANY PART THEREOF.

THIS WARRANTY SHALL NOT APPLY TO LOSS OF FOOD OR CONTENTS OF THE EQUIPMENT DUE TO FAILURE FOR ANY REASON. HUSSMANN SHALL NOT BE LIABLE:

- For payment of labor for any removal or installation of warranted parts;
- For any repair or replacements made without the written consent of Hussmann, or when the equipment is installed or operated in a manner contrary to the printed instructions covering installation and service which accompanied such equipment;
- For any damages, delays, or losses, direct or consequential which may arise in connection with such equipment or part thereof;
- For damages caused by fire, flood, strikes, acts of God or circumstances beyond its control;
- When the equipment is subject to negligence, abuse, misuse or when the serial number of the equipment has been removed, defaced, or altered;
- When the equipment is operated on low or improper voltages
- When the equipment is put to a use other than normally recommended by Hussmann (i.e. deli case used for fresh meat);
- When operation of this equipment is impaired due to improper drain installation;
- For payment of refrigerant loss for any reason;
- For costs related to shipping or handling of replacement parts.

Hussmann Corporation, Corporate Headquarters: Bridgeton, Missouri, U.S.A. 63044 August 1, 1998

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