

HUSSmann®/CHINO

Installation
& Operation
Manual

REV. 1024

AB

UPRIGHT MEAT DISPLAY CASE



HUSSmann®

AB

UPRIGHT MEAT DISPLAY CASE

INSTALLATION & OPERATION GUIDE

General Instructions

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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.

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

HUSSMANN®/CHINO

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

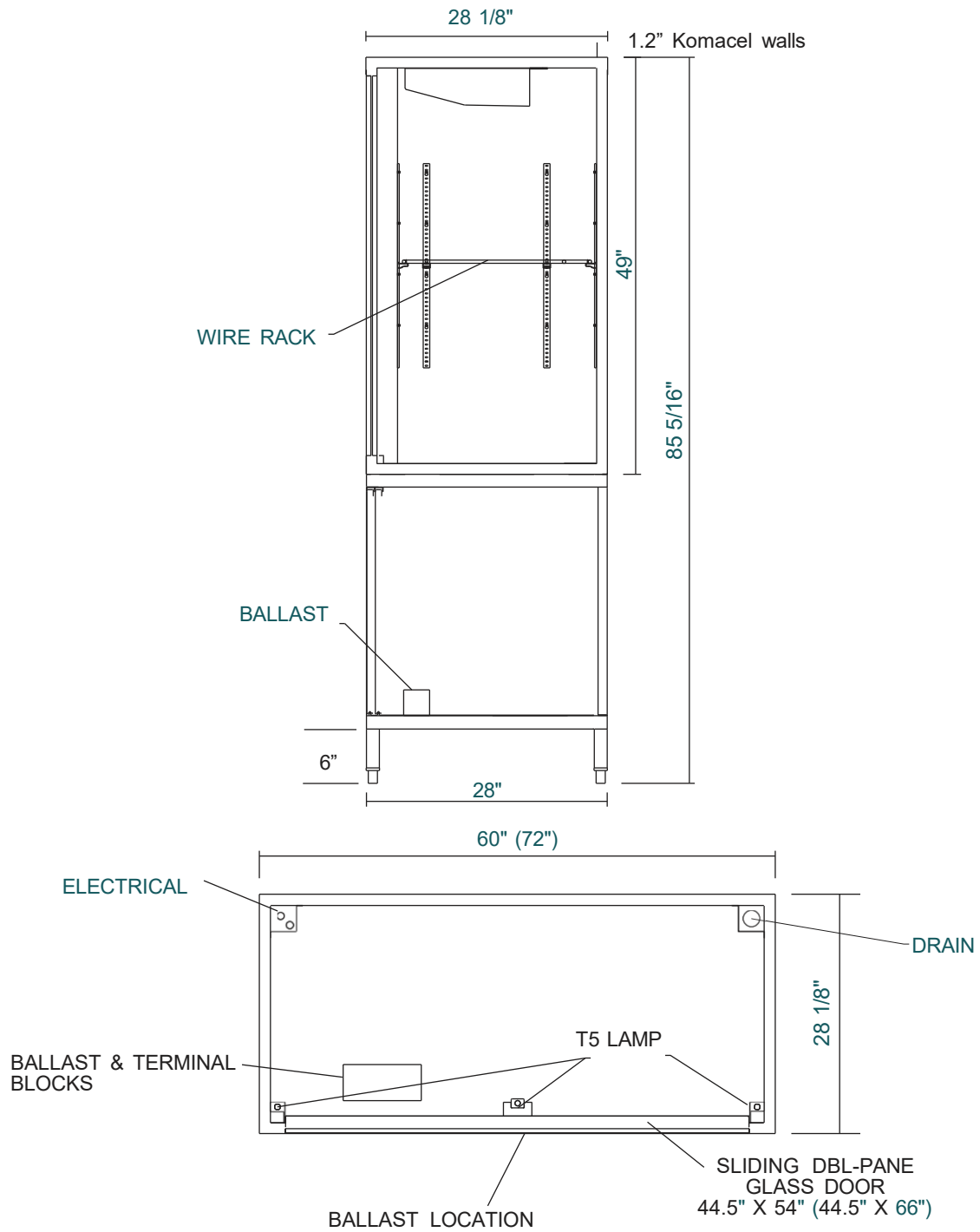
Important Information

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. Incorrect settings will result in short product life from dehydration, shrinkage and discoloration. Below are a few guidelines to ensure optimum performance and product life.

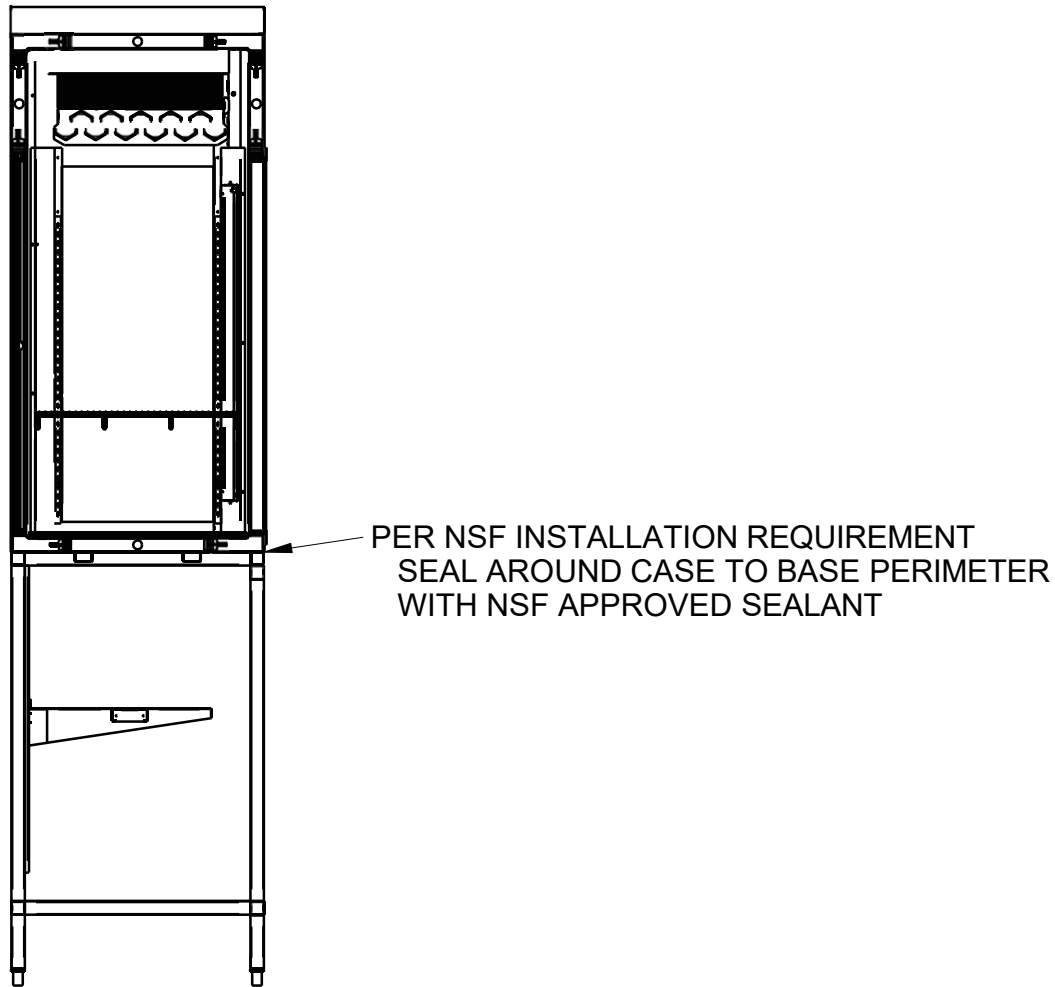
- Review the Case Specification in this book to verify thermostat setting. Do not set temperature too cold, **as this causes product dehydration.**
- Temperatures should be achieved by a T-STAT and suction solenoid at each case. Do not use EPR valves, liquid line solenoids or electronic control devices 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
- Work and rotate product - not to exceed a four (4) hour period.
- At night turn off case lights and cover product with **moistened cheese cloth 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. 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).**

NSF Compliant Sealing of The Case to The Floor

When the appliance is designed to be sealed to the floor or countertop the following procedure must be followed to establish proper sanitary operation. First, ensure the floor area is clean and free from debris. Begin by positioning the appliance in its designated installation spot, ensuring sufficient clearance on the back and sides according to the specified "Clearances" for proper ventilation. Next, level the appliance from front to back and side to side, as described in "Method for Leveling." Once level, outline the base of the appliance on the floor. Then, lift and support the front of the appliance. Apply a bead of NSF-approved sealant to the floor, positioned about 1/2 inch (13 mm) inside the front part of the outline. The bead should be substantial enough to cover the entire appliance surface when lowered onto it. Afterward, raise and support the rear of the appliance and apply the sealant to the floor along the remaining three sides. Finally, carefully lower the appliance and inspect it to ensure a complete seal around the entire perimeter and clean off any extra sealant as necessary. Once the appliance is sealed in accordance with these procedures, the result is intended to prevent liquid spillage on adjacent surfaces of the floor or countertop from passing under inaccessible portions of the equipment.

Cut and Plan Views

NSF Installation Requirement



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!

Installation of case

Mark floor where cases are to be located. Snap lines where base rails are positioned, not the front or back edges of the cases.

Leveling

Leveling is necessary to assure proper case alignment. Locate highest point of the floor on the chalk line as reference for determining height of shim-pack levelers. A laser transit is recommended for precision and requires just one person.

Once the base of the case has been positioned you can now move on to installing the top portion of the case, follow the next steps carefully to ensure proper fitment and operations of case.

**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.

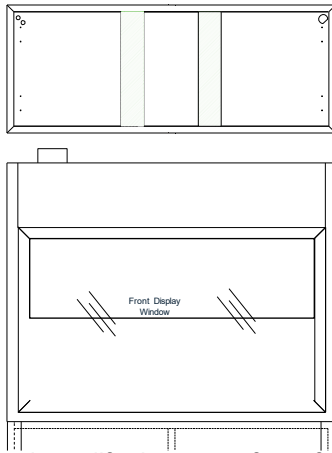
Before any work is completed or operation of the case remove the left hand light fixture in order to expose the refrigerant drop-ins. completing this before the display case is mounted on the base case will ease the process and the proper installation of the case.



Lift and Place Display

Using a forklift raise the display case using the lifting areas provided to properly raise the case with out damaging any protruding equipment.

Lifting Locations



Once case has been lifted remove foam from cutout area for piping to be placed through cutout location.



Place woden blocks spaced out equally on top of base to assist with the placement of the display on to the base. Lay supplied adhesive to the deck of the base before placing the Display case on top



Place coil drain through drop-in location at top and bottom of base case.



Lower the Display case directly above from base of the case while ensuring the copper piping stays in line with the cutout to avoid damaging the case or the piping.



Ensure case is being lowered properly and no damage is being done



Check fitments to ensure proper alignment of cases if fitments do not align for any reason make adjustments with the forklift as needed



Use a set of shims to remove wooden blocks from under display case. a crowbar can also be used as a means of leverage. Two or more persons recommended for this step.



Once wooden blocks have been removed continue on to remove the shims by being nudged side to side until completely removed.



Ensure display case fits flush against the base case.



Predrill holes 1/4" deep in display case through rear skirt with drill locations using 9/64 drill bit supplied. fasten display case to base case using supplied screws



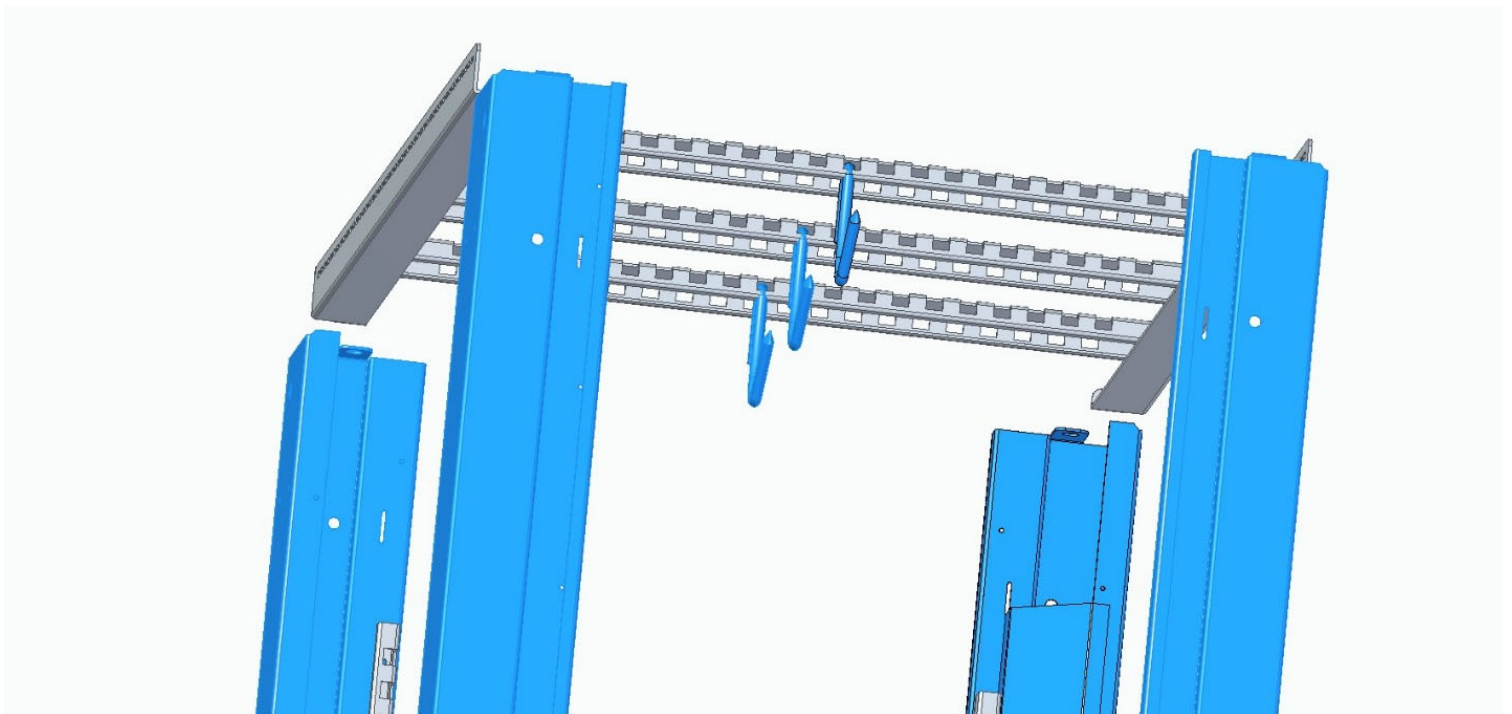
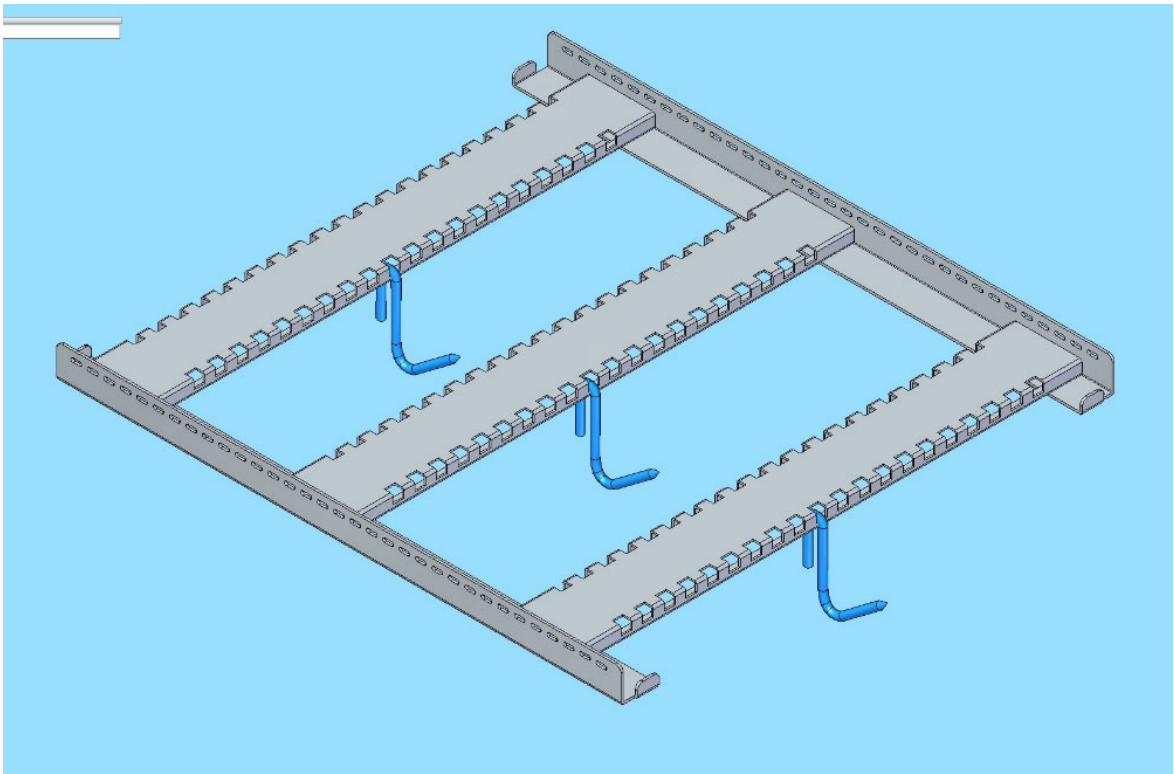
NOTE: DO NOT PENETRATE INTERIOR OF CASE DURING PREDRILLING OF 1/4" HOLES.

Attach uni-skirt to front and sides of case once all steps have been completed no drilling is necessary to attach, uni-skirt comes equipped with double-sided adhesive.

Once piping has been braized bolt left hand light fixture back in place.



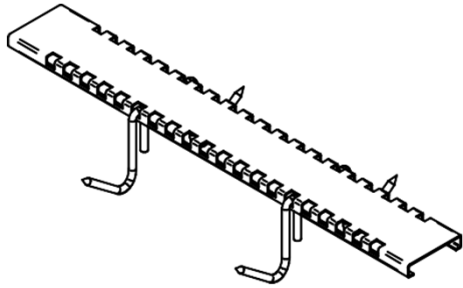
Meat Hanger Hooks and Wire Shelf Racks



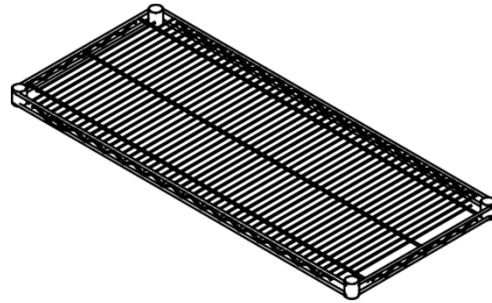
Install hooks as shown.

Meat Hanger Hooks and Wire Shelf Racks

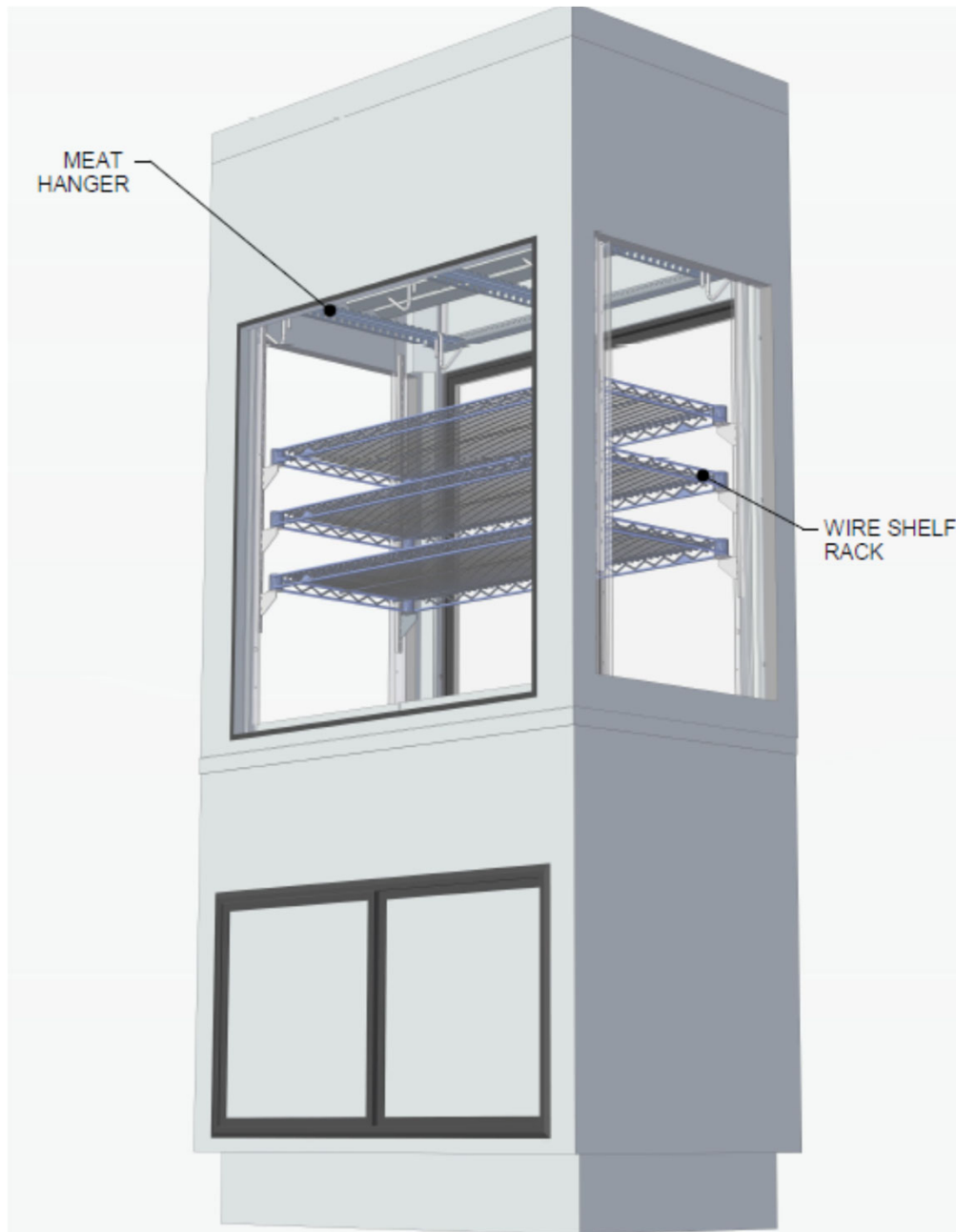
Install meat hangers and wire shelf racks as shown.



MEAT HANGER FRAME



WIRE SHELF RACK



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. The water seal is factory installed. Do not tighten the water seal where it connects to the drain fitting. Twisting the water seal "trap" can cause a water leak in the case's bottom liner. Do not use thread sealant between ABS drain fitting and water seal.

P-traps must be installed at the base of all refrigerated cases. The 1 1/2" P-TRAP and threaded adapter must be installed to prevent air leakage and insect entrance into the fixture.

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

WARNING!

Do NOT apply thread sealer to ABS 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 wrapping.
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.



PRECAUTION

THE DRAIN AND WATER SEAL ARE FACTORY INSTALLED. DO NOT USE THREAD SEALANT OR OVERTIGHTEN THESE PARTS. DO NOT TWIST WATER SEAL. DAMAGE TO THE DRAIN FITTING OR WATER SEAL MAY OCCUR

Refrigeration

Refrigerant Type

Check the serial plate on the case for information.

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.

Oil traps must be installed at the base of all suction line vertical risers on refrigerated cases.

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. Load master 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 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. A Sporlan balanced port expansion valve model is furnished as standard equipment, unless otherwise specified by customer.

Expansion Valve Adjustment

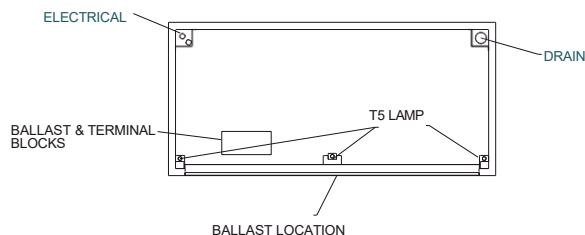
Expansion valves must be adjusted to fully feed the evaporator. Before attempting any adjustments, make sure the evaporator is either clear or very lightly covered with frost, and that the fixture is within 10°F of its expected operating temperature.

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.



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-SUITEMENT
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 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 LED Lights 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.

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.

LED Driver/Ballast Location

LED Drivers are located within the access panel that runs the length of the rear of the case. Refer to diagram on page 4.

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



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.**

User Information

Non-glare Glass

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.

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 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.

Maintenance

Electrical Precautions



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.

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.

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

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 steel's 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.

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

CAUTION

CLEANING PRECAUTIONS

When cleaning:

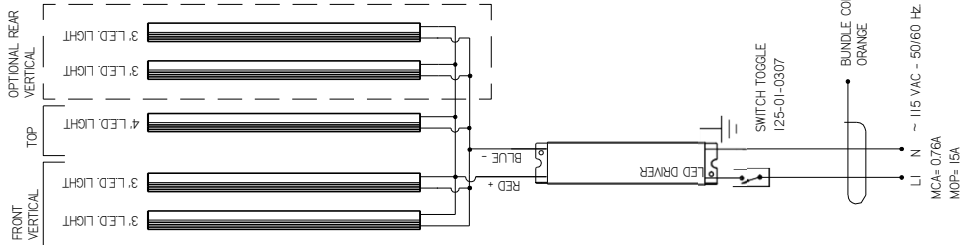
- Do not use high pressure water hoses
- Do not introduce water faster than waste outlet can drain
- NEVER INTRODUCE WATER ON SELF CONTAINED UNIT WITH AN EVAPORATOR PAN
- NEVER USE A CLEANING OR SANITIZING SOLUTION THAT HAS AN OIL BASE (these will dissolve the butyl sealants) or an AMMONIA BASE (this 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 CHLORANITED CLEANER ON ANY SURFACE
- DO NOT USE ABRASIVES OR STEEL WOOL SCOURING PADS (these will mar the finish)

Electrical Wiring Diagrams

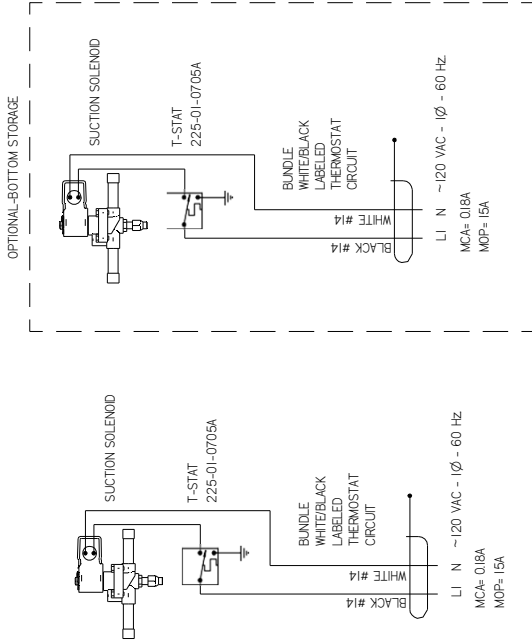
ABG	ABG-28-57-4-R, ABG-36-57-4-R	4'	3012828
	ABG-28-57-5-R, ABG-36-57-5-R	5'	3012830
	ABG-28-57-6-R, ABG-36-57-6-R	6'	3012831
	ABG-28-57-8-R, ABG-36-57-8-R	8'	3012834

CIRCUIT #1					
LOADING	120V				
	10.6				

REV	EN	DATE	REVISION HISTORY	REV BY	CHD BY	APPROB
1	EN	20100805	RELEASED TO PRODUCTION	EN	EN	EN



LIGHT CIRCUIT 33A 352W @ 120VAC



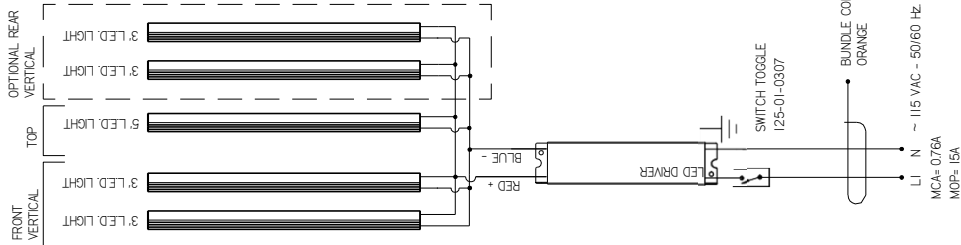
MATERIAL - N/A		DATE DRAWN - 8-5-16		ECN-CAP-00034957	
DRAWN BY - CRAIG BOOREY		DRAWN BY - CRAIG BOOREY		ECN-CAP-00034957	
REVIEWED BY - CRAIG BOOREY		REVIEWED BY - CRAIG BOOREY		ECN-CAP-00034957	
APPROVED BY - CRAIG BOOREY		APPROVED BY - CRAIG BOOREY		ECN-CAP-00034957	
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES		ECN-CAP-00034957	
TOLERANCES ARE		TOLERANCES ARE		ECN-CAP-00034957	
DECIMALS .XX ±.03 .XXX ±.01		DECIMALS .XX ±.03 .XXX ±.01		ECN-CAP-00034957	
ANGLES ± 2°		ANGLES ± 2°		ECN-CAP-00034957	
PROJECTION		PROJECTION		ECN-CAP-00034957	

HUSSEMAN		DIAGRAM-ABG-28-57		3012830	
-5-R		ABG-36-57-5-R		A	

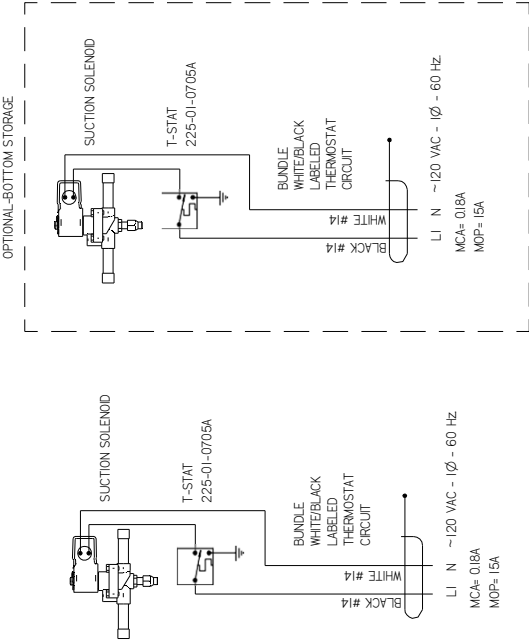
NOTES:
CASE MUST BE GROUNDED
WHEN PASSING WIRES THROUGH METAL HOLES A GROMMET MUST BE USED

CIRCUIT #1					
LOADING	120V				
	107				

REV	EN	DATE	REVISION HISTORY	REV BY	CHK BY	APP BY
1	EN	20100805	RELEASED TO PRODUCTION	EN	EN	EN



LIGHT CIRCUIT 35A 375W @ 120VAC

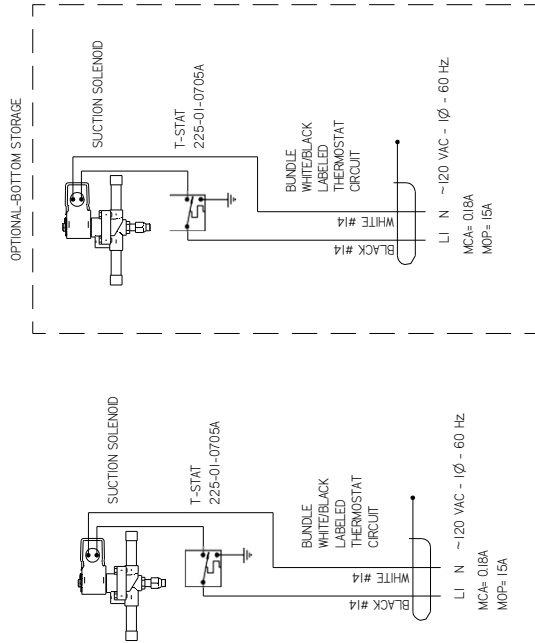
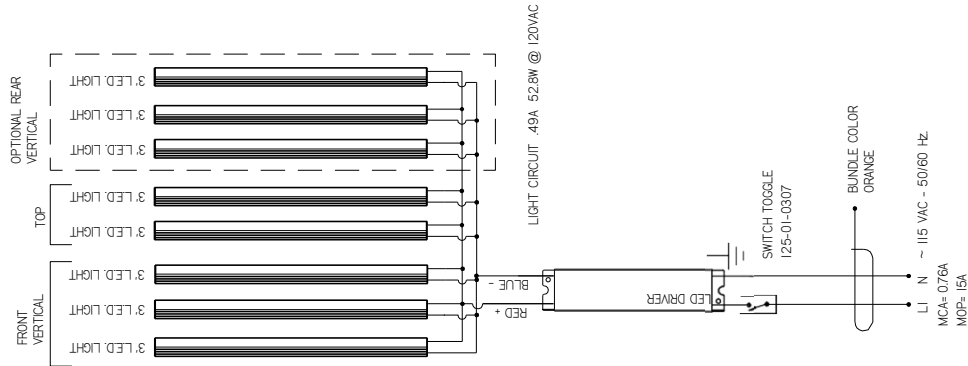


MATERIAL - N/A		DATE DRAWN - 8-5-16		ECN-CAP-00034951	
DRAWN BY - CRAIG BOOREY		REVIEWED BY - CRAIG BOOREY		SHEET 1 OF 1	
APPROVED BY - CRAIG BOOREY		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES		TOLERANCES ARE	
DECIMALS .XX ±0.3 .XXX ±0.10		ANGLES ± 2°		PROJECTION	
HUSSEMAN		DIAGRAM-ABG-28-57		ABG-36-57-6-R	
3012831		A		A	

NOTES:
CASE MUST BE GROUNDED
WHEN PASSING WIRES THROUGH METAL HOLES A GROMMET MUST BE USED

CIRCUIT #1
LOADING

120V			
10.8			



REVISION HISTORY			
REV	EN	DATE	REV BY / CHD BY / APPR BY
1	EN	20/06/2005	EN / GB
RELEASED TO PRODUCTION			GB

WATERAL - N/A

DATE DRAWN - 8-5-16

DRAWN BY - CRAIG BOOREY

REVIEWED BY - CRAIG BOOREY

APPROVED BY - CRAIG BOOREY

SHEET 1 OF 1

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES

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Spec Sheet

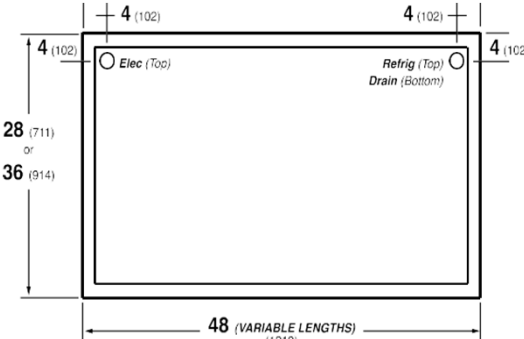



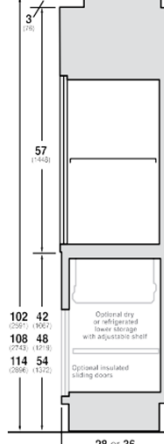
AB-AGED BEEF CASE
HUSSMANN - AB (CHINO)


DOE 2017
Energy Efficiency
Compliant

Hussmann refrigerated merchandisers configured for sale for use in the United States meet or surpass the requirements of the DOE 2017 energy efficiency standards.

REVISION DATE 01/09/2016







REFRIGERATION DATA:

CASE LENGTHS	CASE USAGE	CAPACITY TOP SECTION ***		TEMPERATURE (°F)			VELOCIT Y (FT/MIN)
		(BTU/HR/FT)					
		RATING CONDITION		EVAPORATOR		DISCHARGE AIR ** (°F)	
		NSF 7	AHRI	NSF 7	AHRI	NSF 7	
4', 5', 6', 8'	MEAT	320	280	20	24	22~25	50~75

CASE LENGTHS	EST. REFG. CHRGE. (R404A) (LBS)	20°F GLYCOL 6° RISE INLET TOP		20°F GLYCOL 6° RISE INLET OPTIONAL LOWER REFRIGERATED STORAGE	
		GPM	PSI	GPM	PSI
4'	0.9	0.5	0.1	0.5	0.1
5'	1.2	0.6	0.3	0.6	0.3
6'	1.5	0.7	0.6	0.7	0.6
8'	1.9	0.9	0.4	0.9	0.4

1) BTU'S INCLUDE CANOPY LIGHT AND TWO FRONT MULLION LIGHTS
 2) ADD 60 BTU'S FOR OPTIONAL LED REAR MULLION LIGHTS
 3) ADD 210 BTU'S/FT FOR LOWER STORAGE WITH GRAVITY COIL
 4) ADD 40 BTU/HR/FT FOR OPTIONAL 36" CASE DEPTH
 5) AHRI 1200 RATING POINT FOR ENERGY CONSUMPTION COMPARISON ONLY
 6) USE DEW POINT FOR HIGH GLIDE REFRIGERANTS. CARE SHOULD BE TAKEN TO USE THE DEW POINT IN P/T TABLES FOR MEASURING AND ADJUSTING SUPERHEAT. ADJUST EVAPORATOR PRESSURE AS NEEDED TO MAINTAIN THE DISCHARGE AIR TEMPERATURE SHOWN.
 7) RATING CONDITION IS NSF TYPE I, 75°F/55% RH

REFRIGERATION DATA CONTINUED:

ELEC. THERMOSTAT / AIR SENSOR SETTINGS			DEFROST TYPE	TIME (MIN)	DEFROST FREQUENC Y (#/DAY)	TERM. TEMP (°F) COIL ONLY	DRIP TIME	DEFROST WATER (LBS/DAY/FT)
USAGE	CUT IN (°F)	CUT OUT (°F)						
MEAT	26	23	OFF TIME	40	4	45	N/A	2.8

END PANEL WIDTH KEY

# OF END PNLS	END PNL WIDTH (IN.)	TOTAL ADDED LENGTH (IN.)
1	1.125	1.125
2	1.125	2.25

ELECTRICAL DATA:

STANDARD FANS, HEATERS, LED LIGHTS (115 VOLT)

CASE LENGT H	EVAPORATOR FANS				LED CANOPY/FRONT LIGHTS		OPTIONAL LED REAR MULLION LIGHTS		MAX. LED LOAD (W/ ALL OPTIONS)		ANTI-SWEAT HEATERS (ON FAN CIRCUIT)		CONVENIENCE OUTLETS (OPTIONAL)			
	# OF EVAP FANS	BLAD E DIA. (IN.)	BLADE PITCH (°)	AMPS	WATTS	AMPS	WATTS	AMPS	WATTS	AMPS	WATTS	AMPS	WATTS	# OUTLETS	VOLTS	AMPS
4'	N/A	N/A	N/A	N/A	N/A	0.2	23	0.1	15	0.3	39	N/A	N/A	N/A	N/A	N/A
5'	N/A	N/A	N/A	N/A	N/A	0.2	26	0.1	15	0.4	41	N/A	N/A	N/A	N/A	N/A
6'	N/A	N/A	N/A	N/A	N/A	0.2	28	0.1	15	0.4	44	N/A	N/A	N/A	N/A	N/A
8'	N/A	N/A	N/A	N/A	N/A	0.3	31	0.1	15	0.4	46	N/A	N/A	N/A	N/A	N/A

OPTIONAL HIGH OUTPUT LED LIGHTS (115 VOLT)

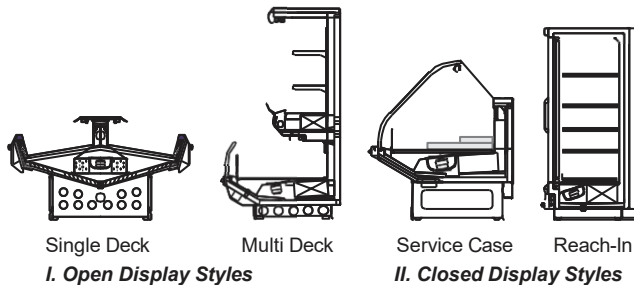
CASE LENGT H	CANOPY/FRONT LIGHTS H.O. LED		OPTIONAL REAR LIGHTS		MAX. H.O. LED LOAD	
	AMPS	WATTS	AMPS	WATTS	AMPS	WATTS
4'	0.3	39	0.2	26	0.6	65
5'	N/A	N/A	N/A	N/A	N/A	N/A
6'	0.4	41	0.2	26	0.6	67
8'	0.5	52	0.2	26	0.7	78

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 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	
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



Appendix B. - Application Recommendations - Refrigerated

1. 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.
2. The installer is responsible for following the installation instructions and recommendations provided by the manufacturer for the installation of each individual type refrigerator.
3. 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

3. according to the manufacturer's recommendations.
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.
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 I, 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. 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 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. 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.
 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.

Appendices (Cont'd)

2. Load levels as defined by the manufacturer must be observed.
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.



This warning does not mean that Hussmann products will cause cancer or reproductive harm, or is in violation of any product-safety standards or requirements. As clarified by the California State government, Proposition 65 can be considered more of a ‘right to know’ law than a pure product safety law. When used as designed, Hussmann believes that our products are not harmful. We provide the Proposition 65 warning to stay in compliance with California State law. It is your responsibility to provide accurate Proposition 65 warning labels to your customers when necessary. For more information on Proposition 65, please visit the California State government website.

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They can be found on a small metal plate on the unit. Please note them below for future reference.

MODEL:

SERIAL NUMBER: