HUSSMANN®

BSM, GSM & GSS

Curved Glass Fresh Meat, Delicatessen and Seafood Merchandisers

(Modified for IMPACT)

NSF® Certified

Installation & Operation Manual

Vision Series

DRAFT P/N 415113
March 1999

CONTENTS

IMPORTANT
KEEP IN STORE FOR FUTURE REFERENCE
Quality that sets industry standards

This merchandiser conforms to the
Commercial Refrigerator Manufacturers Association
Health and Sanitation Standard
CRS-S1-96
and is NSF® certified.

HUSSMANN® 12999 St. Charles Rock Road • Bridgeton, MO 63044 USA • (314) 291-2000 • FAX (314) 298-4767

REPLACEMENT PARTS LIST

Item	Part Number	Description
1.	0363387	Fan Assembly BSM
2.	0368680	Fan Assembly GSM
3.	0355716	Ballast Electronic, 2 Lamp
	0355398	Ballast Electronic, 3 Lamp
4.	0355394	Fluorescent Lamp (Blower & Gravity Coil Models) F032T8 / 35K
4.	0355393	Fluorescent Lamp (Gravity Coil Models Only) F025T8 / 35K
5.	0250641	Receptacle Scale Stand
6.	0329058	Harness Wiring Fans 8 Ft
	0329059	Harness Wiring Fans 12 Ft
7.	0366753	Harness Lighted Shelf (female)*****
8.	0363346	Harness Convenience Receptacle 8 Ft
	0363347	Harness Convenience Receptacle 12 Ft
9.	0113625	Refrigeration Thermostat Penn #A19GD-21
10.	0135900	SPST Switch

***** Used with

0366752	Harness Lighted Shelf (male) located on shelf

MODEL DESCRIPTIONS

This instruction covers the merchandisers listed below. All models are available in either 8 ft or 12 ft lengths. Basic design features are listed to the right of each merchandiser.

BSM Refrigerated Double Curved Glass Delicatessen and Meat Merchandiser, blower coil, rear doors, 2 rows mezzanine shelves and hinged glass.

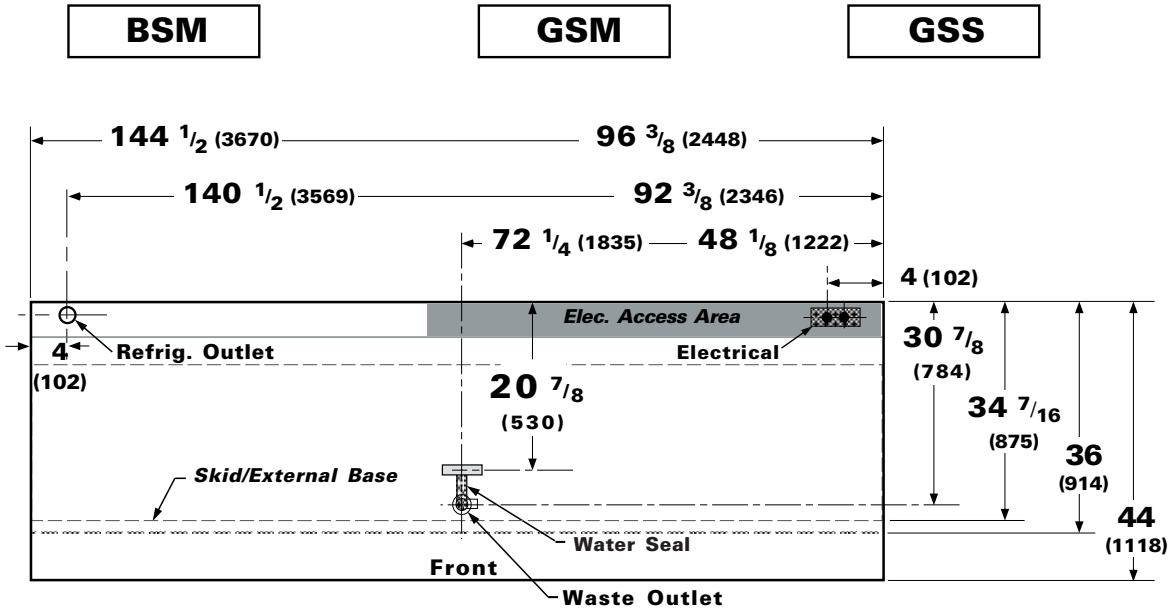
GSM Refrigerated Double Curved Glass Delicatessen and Meat Merchandiser, gravity coil, rear doors, 1 row mezzanine shelves and hinged glass.

GSS Refrigerated Double Curved Glass Seafood Merchandiser, gravity coil, rear doors and hinged glass.

APPLICATION

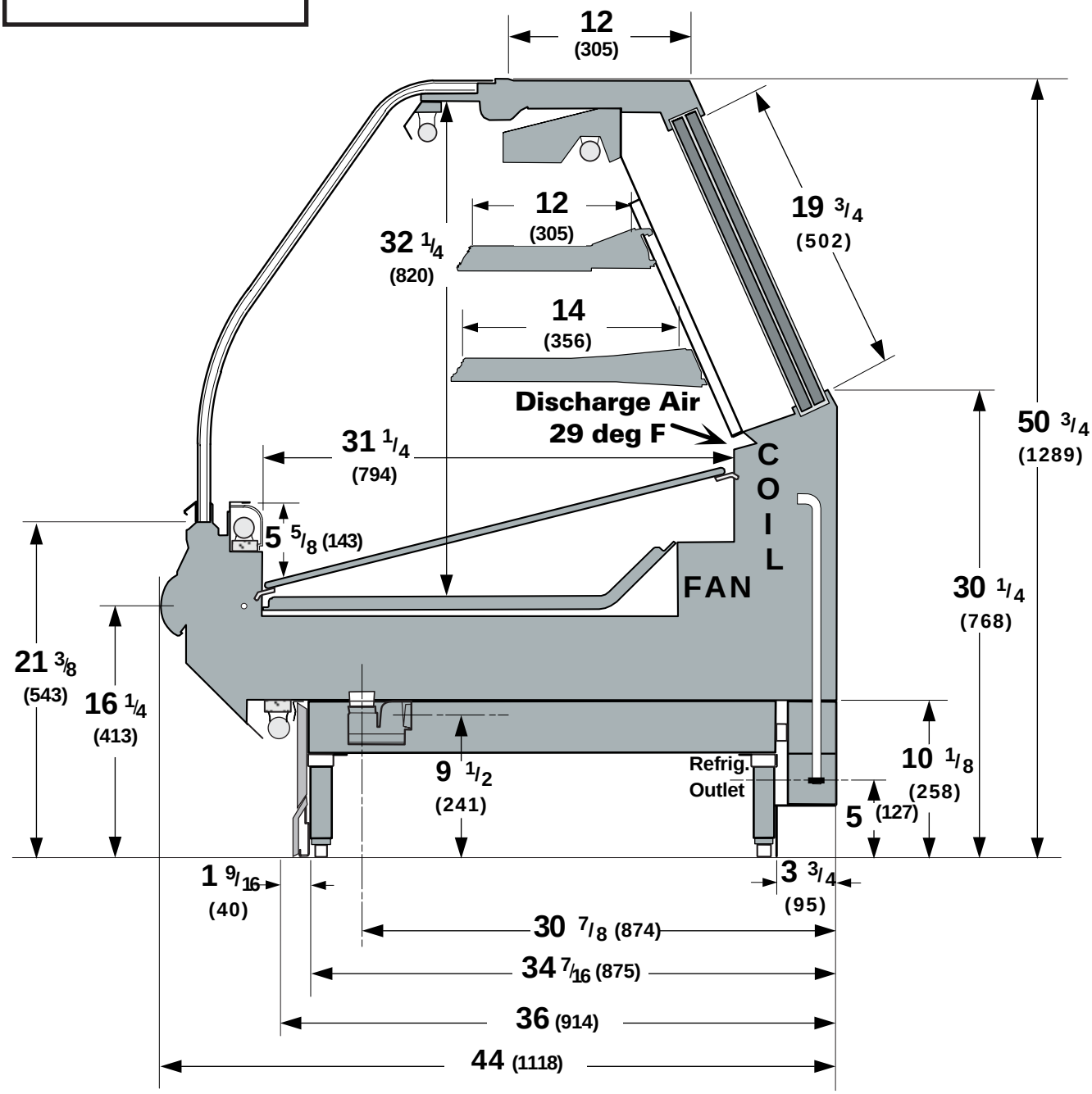
These merchandisers meet ANSI / National Sanitation Foundation (NSF®) Standard #7 requirements. These merchandisers are designed for displaying fresh meat, delicatessen and seafood products in air conditioned stores where temperature and humidity are maintained at or below 75 deg F dry bulb temperature and 55% relative humidity.

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 the life of the product.



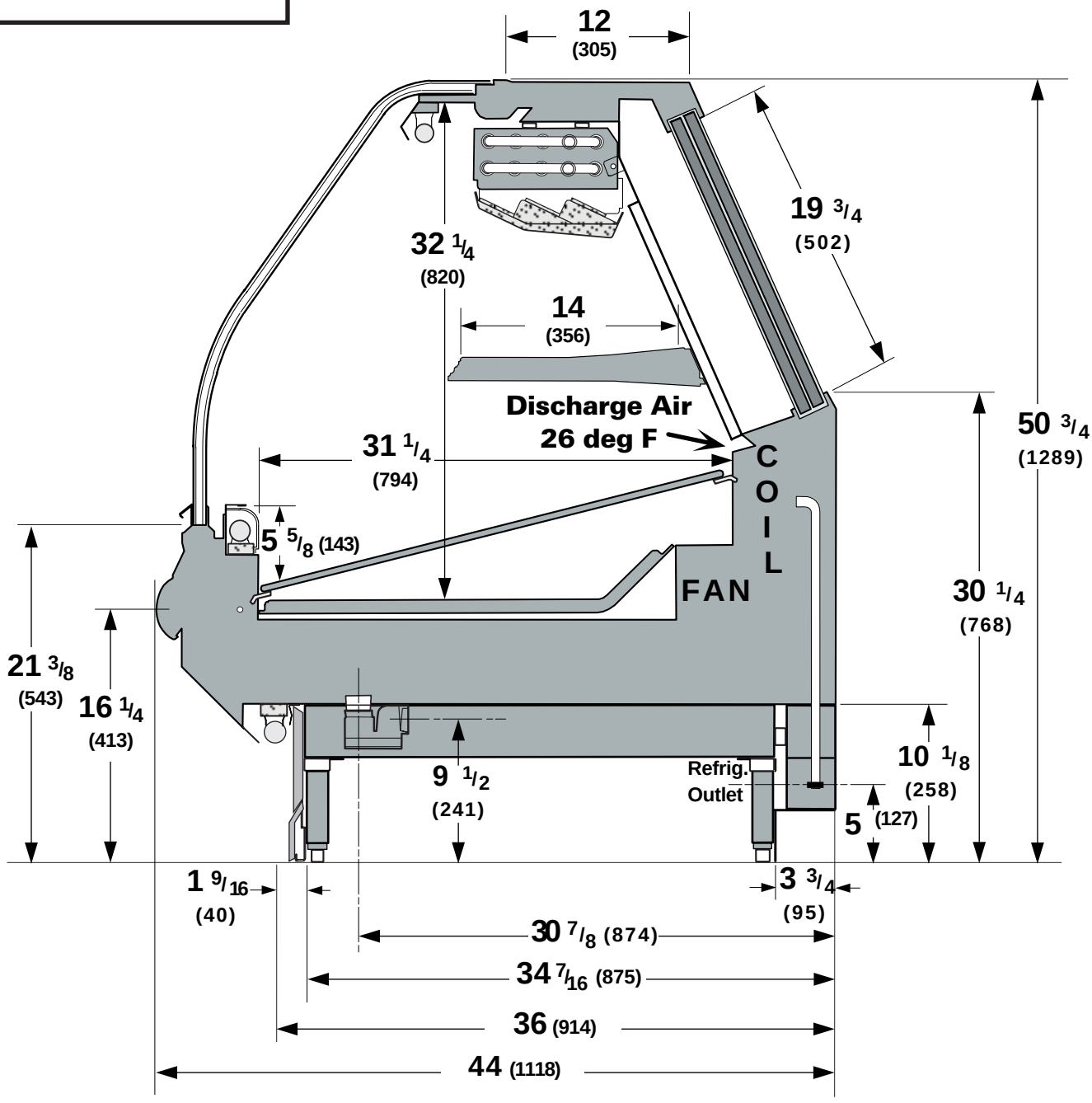
NOTE: All plan view and cross section measurements are given as inches (millimeters).

BSM



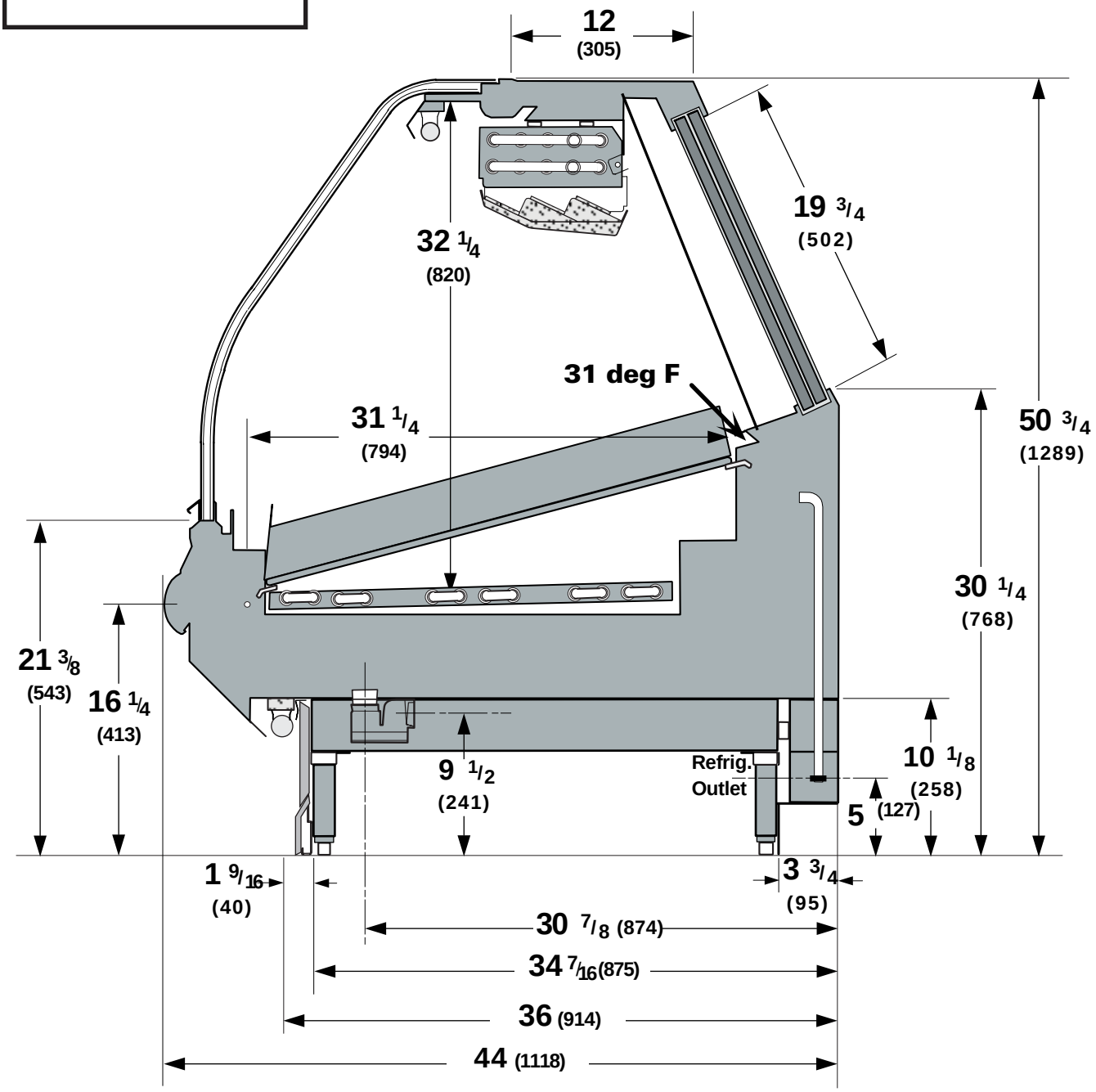
NOTE: All plan view and cross section measurements are given as inches (millimeters).

GSM



NOTE: All plan view and cross section measurements are given as inches (millimeters).

GSS



NOTE: All plan view and cross section measurements are given as inches (millimeters).

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 forms.

Concealed Loss Or Damage
When loss or damage is not apparent until after equipment is uncrated, a claim for concealed damage is made. Upon discovering damage, make request in writing to carrier for inspection within 15 days and retain all packing. The carrier will supply the inspection report and required claim forms.

SHIPPING BRACES

Move the fixture as close as possible to its permanent location and then remove all packaging and shipping braces. Check for damage before discarding packaging. Remove all separately packed accessories such as kits, and shelves.

EXTERIOR LOADING

Do NOT walk on top of merchandisers or damage to the merchandisers and serious personal injury could occur. *Merchandisers are not structurally designed to support any excessive external loading* such as the weight of a person.

LOCATION

Like other merchandisers, these are sensitive to air disturbances. Air currents passing around merchandisers will seriously impair their operation. Do NOT allow air conditioning, electric fans, open doors or windows, etc. to create air currents around the merchandisers.

IMPORTANT

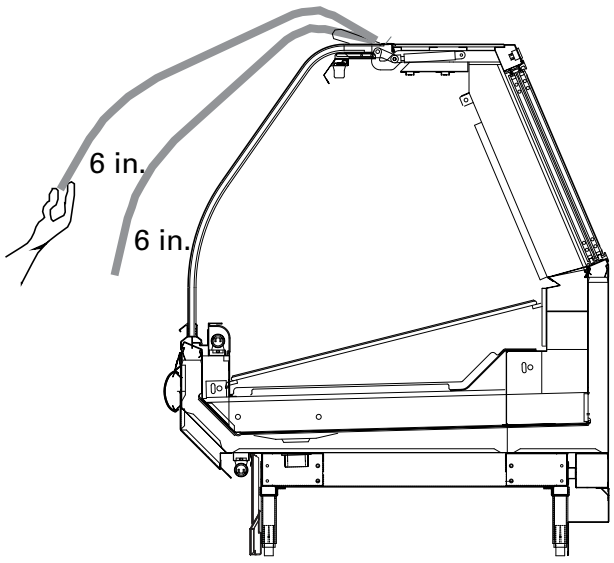
READ BEFORE RAISING FRONT GLASS

The top cylinders, which allow the raising and lowering of this glass, have been carefully installed and tested for the proper tension before shipment. However, during shipment and storage, the lubricant inside the cylinders may have settled. This settling can cause excessive or uneven tension on the glass to the point of breakage.

To avoid any damage, please do the following before completely raising the front glass.

1. Slowly raise and lower each glass section 6 times to a height of 6 in.
2. Increase the height to about 12 in. and raise and lower the glass 6 times.
3. Then raise the glass to the full extension and lower.

This should release any settled lubricant in the cylinders and prevent any stress on the front glass.



INSTALLING LEGS

1. Move merchandiser as close to its permanent position in line-up as possible. Do not slide merchandiser once legs are installed.

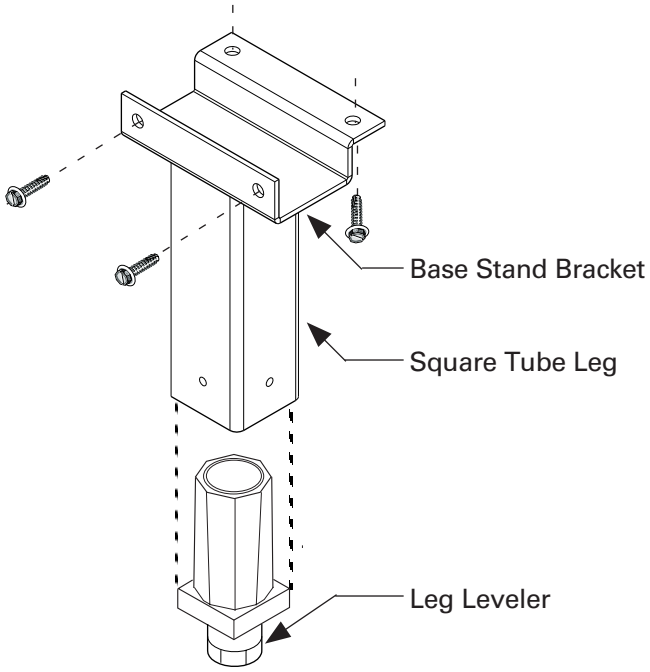
2. Remove merchandiser from wood rider. If installing more than one merchandiser, refer to Joint Kit instruction for gasket placement.

3. Raise merchandiser approximately 12 in. from floor and block with timbers or other sturdy support.

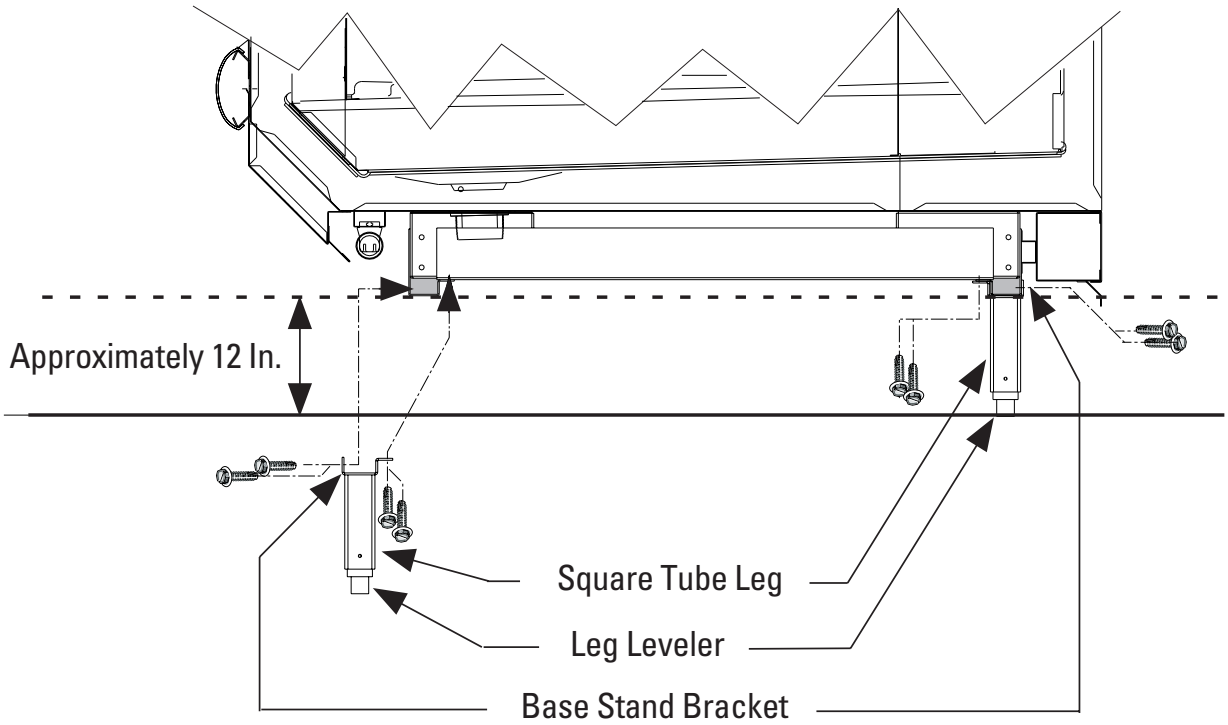
4. Insert leg levelers completely into square tube legs. Attach leg assembly to skid rail with four 10-16 x 3/4 in. washer-head sheet metal screws per bracket.

5. After all legs are installed, remove supporting blocks and lower merchandiser into line-up. Do not slide merchandiser once legs are installed

NOTE: Lower front panels will be easier to install if leg levelers are at mid-point or higher.



Adjustable Leg Assembly



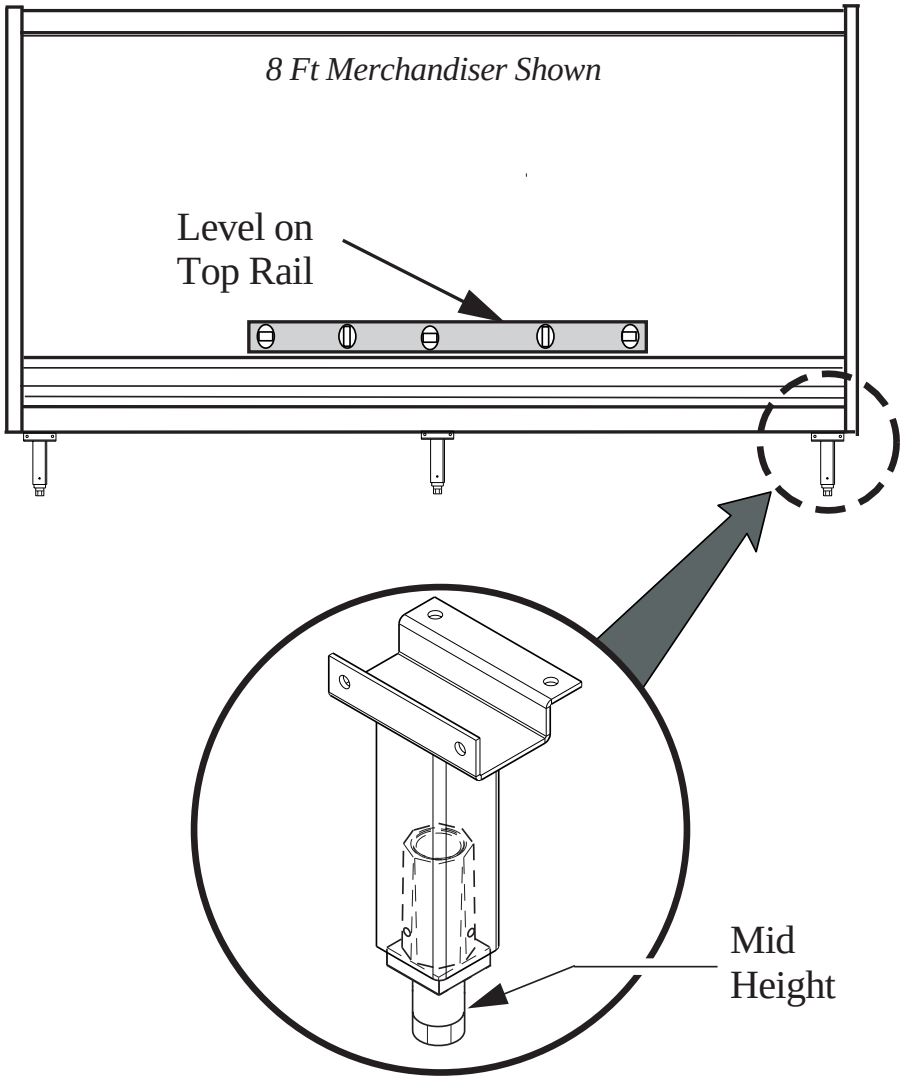
LEVELING

Merchandisers must be installed level to ensure proper operation of the refrigeration system and to ensure proper drainage of defrost water.

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

Set a long level (4 ft or more) on the top rail of the merchandiser. Use an open-end wrench to turn leg levelers until the merchandiser is level from end to end and from front to back. Check all 6 legs on 8 ft merchandisers, or 8 legs on 12 ft merchandisers.

Merchandisers are joined after the lineup is level. Instructions are packed with the joint kit.



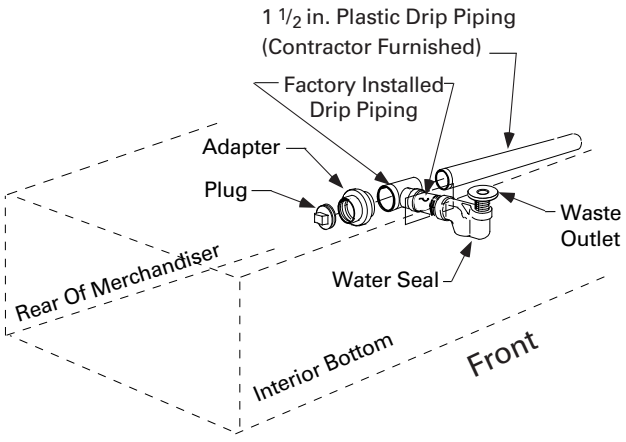
ANCHORING

Merchandisers on legs cannot be anchored.

WASTE OUTLET

The waste outlet is located at the center of each merchandiser allowing drip piping to be run under the fixture lengthwise. A 1 1/2 in. water seal is supplied with each fixture. The water seal must be installed to prevent air leakage and insect entrance into the fixture. A tee and plug have been shipped to allow field installation to determine direction of drain.

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



INSTALLING DRIP PIPING

Poorly or improperly installed drip pipes can seriously interfere with the operation of these merchandisers, and result in costly maintenance and product losses. Please follow the recommendations listed below when installing drip pipes to ensure proper installation.

1. Never use drip piping smaller than the nominal diameter of the pipe or water seal supplied with the merchandiser.

2. When connecting drip piping, the "water seal" must be used as part of the drip piping to prevent air leakage or insect entrance. Never use two water seals in series in any one drip pipe. *Double water seals in series will cause an air lock and prevent draining.*

3. Pitch the drip piping in the direction of flow. There should be a minimum pitch of 1/8 in. per foot.

4. Avoid long runs of drip piping. Long runs make it impossible to provide the pitch necessary for good drainage.

5. Provide a suitable air break between flood rim of the floor drain and outlet of drip pipe.

6. Prevent drip pipes from freezing:
   A. Do NOT install drip pipes in contact with uninsulated suction lines. Suction lines should be insulated with a non-absorbent insulation material.

   B. Where drip pipes are located in dead air spaces, such as between merchandisers or between a merchandiser and a store wall, provide means to prevent freezing.

Note: To prevent condensation problems, the water seal should be insulated.

INSTALLING SPLASH GUARD AND LOWER FRONT PANEL

Make certain that the end assemblies, end splash guards and end panels have been installed according to the End Kit instruction.

The splash guard is shipped inside each case. ***After*** merchandisers have been leveled and joined, and all drip piping, electrical and refrigeration work has been completed, install the splash guards.

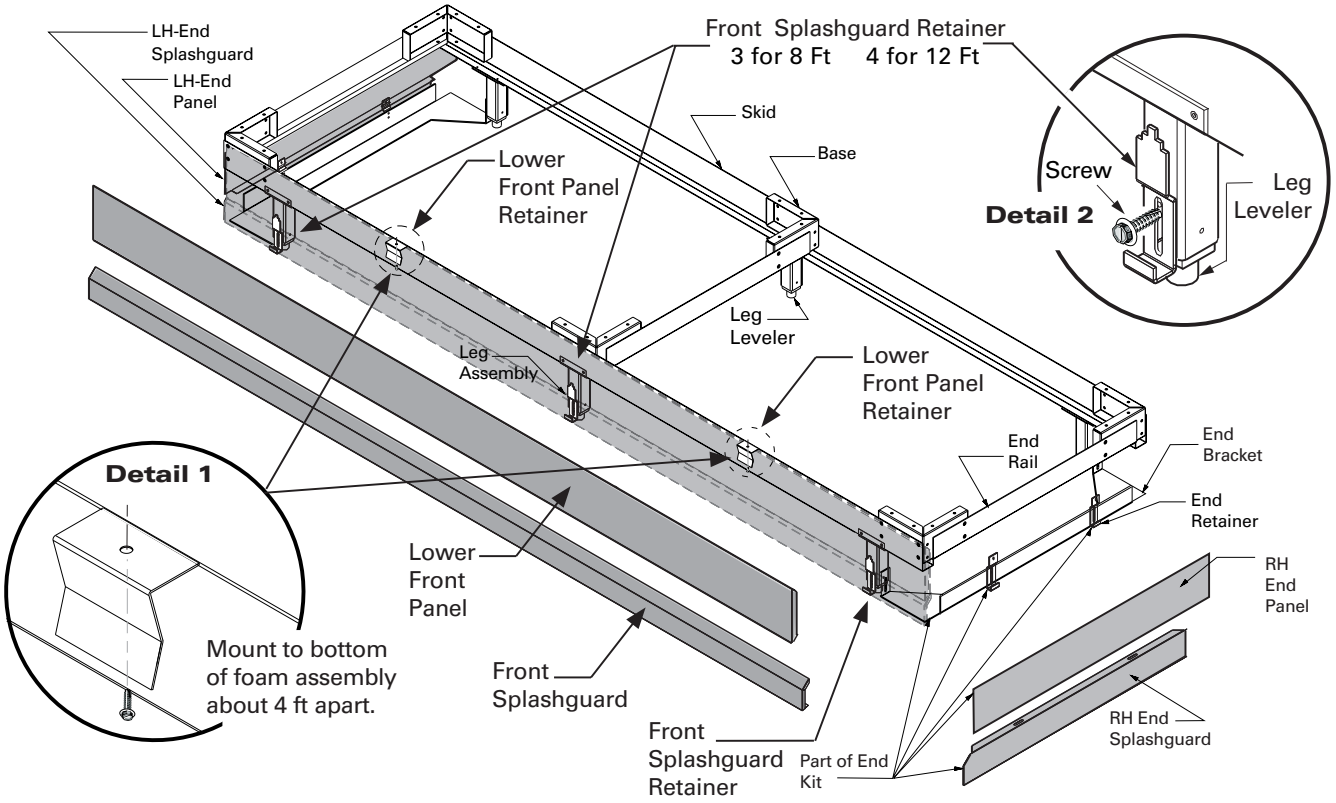
1. Use one #8 x 1/2 in. Phillips head AB point sheet metal screw to attach one lower front panel retainer centered in each 4 ft section of the front (Detail 1).

2. At front of merchandiser, with small hole in square tube leg as a guide, use a 1/8 in. (4 mm) drill bit to drill a hole through each leg and into leg leveler. Attach a splash guard retainer to each leg with a #8 x 1/2 in. Phillips head AB point sheet metal screw (Detail 2).

3. To install the front splash guard, begin at the left end. Align slots in splash guard with retainer, then push splash guard down to seat firmly on retainer.

4. Position top of lower front panel up behind retainers (Step 1), and align slots in bottom of panel with tops of splash guard retainers. Lower panel onto splash guard retainers, seating firmly.

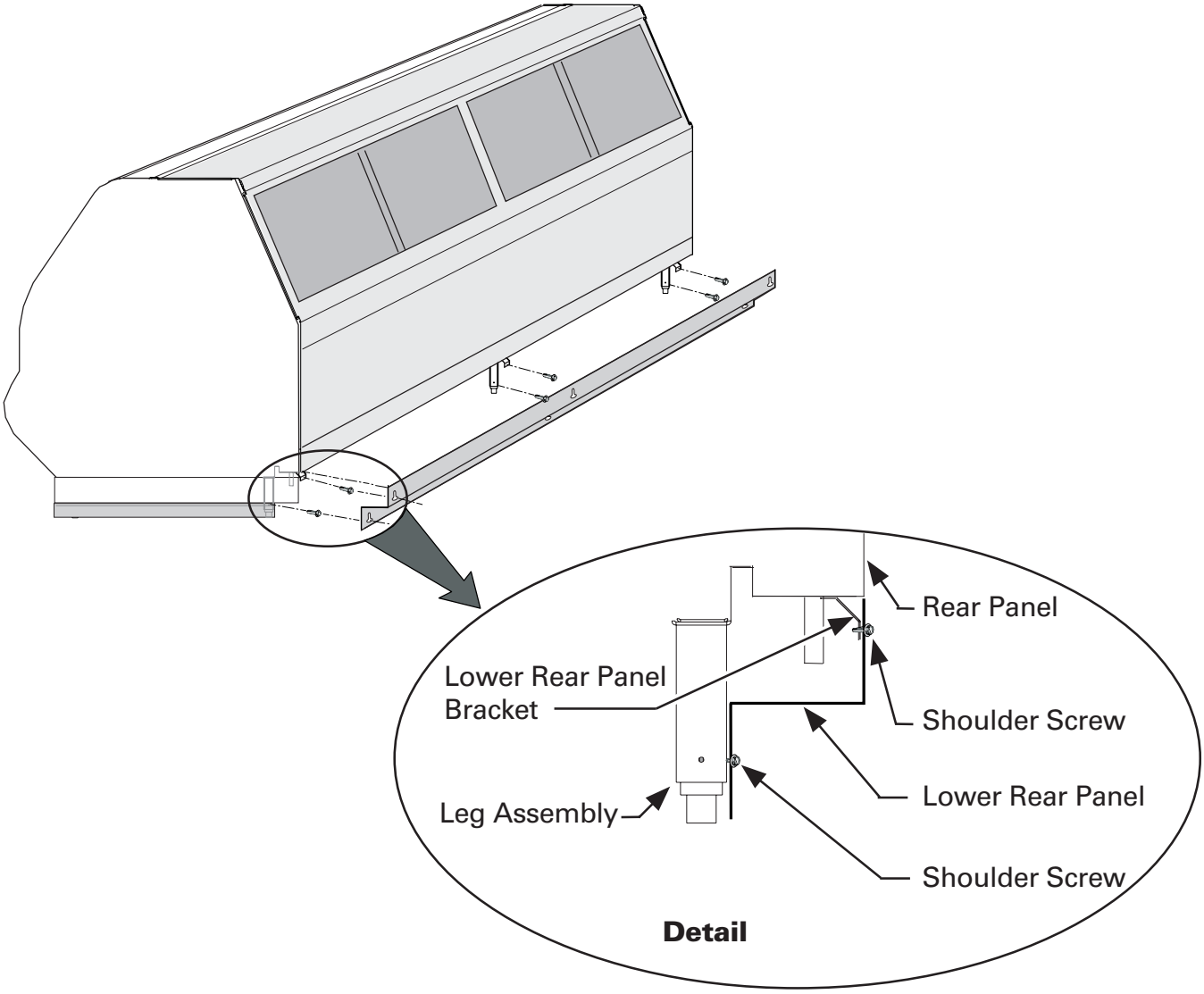
Do not use additional fasteners or sealant to hold splash guards or panels in place. Splash guards and panels must be removable for cleaning.



INSTALLING LOWER REAR PANEL

When properly installed, the lower rear panel can be removed and replaced without using tools.

1. At rear of merchandiser, with small hole in square tube leg as a guide, use a 1/8 in. (4 mm) drill bit to drill a hole through each leg and leg leveler. Drive a shoulder screw into each hole. Leave space between screw head and leg to slide panel when installed.
2. Drive one shoulder screw into each lower rear panel bracket. Leave enough space between bracket and screw head to slide panel when installed.
3. Position keyhole slots in lower rear panel over shoulder screws in brackets and on legs. Slide panel down toward floor. Top of lower rear panel should butt against bottom of rear panel.



REFRIGERATION

REFRIGERANT

The correct type of refrigerant will be stamped on each merchandiser's serial plate located at the rear, on the exterior surface of the merchandiser.

REFRIGERANT PIPING

Connection Sizes

Liquid Line	3/8 in. OD
Suction Line	1/2 in. OD

Connection Location

The refrigerant line connections are 4 inches from the left end, as viewed when facing the front of the merchandiser.

Before making connections, wrap tubing with a wet rag to protect the factory piping seal.

Line Sizing

Refrigerant lines should be sized as shown on the refrigeration legend that is furnished for the store or according to ASHRAE guidelines. If the legend is not available, refer to the appropriate Hussmann application manual and the *Hussmann Line Sizing* document to size branch line piping of Hussmann equipment.

Oil Traps

P-traps (oil traps) must be installed at the base of all suction line vertical risers.

Pressure Drop

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

Insulation

The suction and liquid lines should be clamped or taped together and insulated for a minimum of 30 ft from the merchandiser. Additional insulation for the balance of the liquid and suction lines is recommended wherever condensation drippage is objectionable.

NOTE: OFFTIME defrost is the **ONLY** type of defrost recommended for these merchandisers.

CONTROL SETTINGS

Conventional Single Compressor

Measure discharge air temperature at the center of the moire openings found below and in front of the bottom sliding door track as shown on each cross-section.

Refrigeration temperature must be controlled by both an EPR valve (primary control) and a 3–5 deg F differential thermostat (secondary control) responding to evaporator discharge air temperature. The thermostat will control the compressor motor contactor, or the liquid line solenoid at the merchandiser.

The EPR valve must be set to provide the case design discharge air temperature. Adjust the refrigeration thermostat to control the discharge air temperature sightly below the discharge air temperature setting to protect product during reduced load periods (lights off, lower ambient).

NOTE: The thermostat may be ordered factory installed. The thermostat body is located behind the rear closure 14 inches from left-hand end. It is fastened to the exterior foam bottom. The bulb is located in the rear left flue area behind the rear shelf support.

Defrost is Off Time. Indoor condenser units may use pressure or time termination. Outdoor condenser units use time termination. On outdoor units, the defrost timer controls a liquid line solenoid that begins a defrost pump down 4 minutes before defrost.

Refrigeration Data

Merchandiser	GSM	BSM	GSS
Discharge Air (deg F)	26	29*	31
Evaporator (deg F)	21	21	21
Fan Cycling CI/CO	NA	NA	NA

* The discharge air temperature for these cases is taken from the top discharge grille.

Defrost Data

Frequency (hr)	24	12	24
Electric			
Temp Term (deg F)	NA	NA	NA
Fail-safe (min)	NA	NA	NA
Gas			
Duration (min)	NA	NA	NA
Offtime			
Duration (min)	60	60	60
Offtime w/Pressure Termination (deg F)	48	48	48
Fail-safe (min)	60	60	60
When Thermostat Controls Temperature			
Low Pressure Backup Control CI/CO (deg F)	14/4	14/4	14/4

Parallel Compressor Rack

Measure discharge air temperature at the center of the moire openings found below and in front of the bottom sliding door track as shown on each cross-section.

Refrigeration temperature must be controlled by both an EPR valve (primary control) and a 3–5 deg F differential thermostat (secondary control) responding to evaporator discharge air temperature. The thermostat will be wired to a continuous “ON” circuit and will control a liquid line solenoid at the merchandiser.

The EPR valve must be set to provide the case design discharge air temperature. Adjust the refrigeration thermostat to control the discharge air temperature sightly below the discharge air temperature setting to protect product during reduced load periods (lights off, lower ambient).

NOTE: The thermostat may be ordered factory installed. The thermostat body is located behind the rear closure 14 inches from left-hand end. It is fastened to the exterior foam bottom. The bulb is located in the rear left flue area behind the rear shelf support.

Defrost is Off Time and is time terminated. To isolate the evaporator during defrost, a suction stop valve must be used.

Refrigeration Data

Merchandiser	GSM	BSM	GSS
Discharge Air (deg F)	26	29*	31
Evaporator (deg F)	21	21	21
Fan Cycling CI/CO	NA	NA	NA

* The discharge air temperature for these cases is taken from the top discharge grille.

Defrost Data

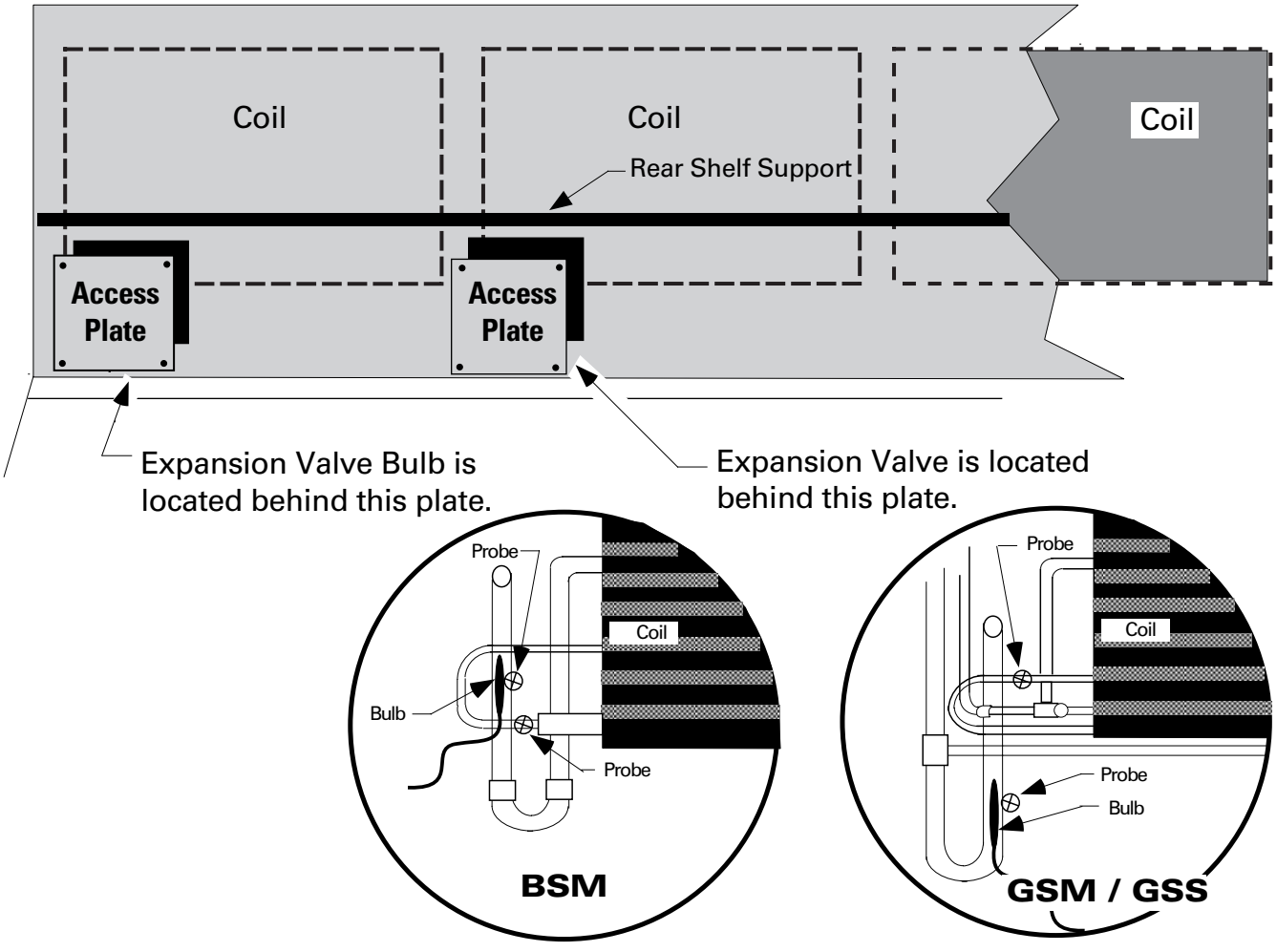
Frequency (hr)	24	12	24
Electric			
Temp Term (deg F)	NA	NA	NA
Fail-safe (minutes)	NA	NA	NA
Gas			
Duration (minutes)	NA	NA	NA
Offtime			
Duration (minutes)	60	60	60

EXPANSION VALVE ADJUSTMENT

Expansion valves must be adjusted to fully feed the evaporator. During valve adjustment, the evaporator must be clear or only lightly covered with frost. The fixture must be within 10 deg F of its operating temperature.

Attach two sensing probes (either thermocouple or thermistor) to the evaporator—one under the clamp holding the expansion valve bulb and the other securely taped to the evaporator inlet line.

Some "hunting" of the expansion valve is normal. The valve should be adjusted so that during the hunting THE GREATEST DIFFERENCE BETWEEN THE TWO PROBES IS 3–5 DEG F. With this adjustment, during a portion of the hunting the temperature difference between the probes will be less than 3 deg F (at times as low as 0 deg F). Make adjustments of no more than 1/4 turn for Balanced Port TEV and 1/2 turn for "G" Body TEV at a time. Wait for at least 15 minutes before rechecking the probe temperature and making further adjustments.



CONNECTIONS

All wiring must be in compliance with NEC and local codes. All electrical connections are to be made in the electrical raceway as shown below.

IDENTIFICATION OF WIRING

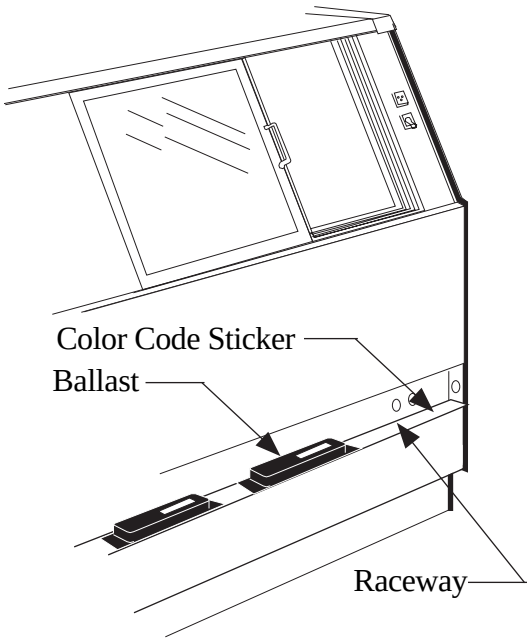
Leads for all electrical circuits are identified by colored plastic bands. These bands correspond to the *Wiring Color Code* located inside the merchandiser's raceway.

WIRING COLOR CODE

Leads for all electrical circuits are identified by a colored plastic band: neutral wire for each circuit has either White insulation or a White plastic sleeve in addition to the color band.

PINK .....REFRIG. THERMOSTAT LOW TEMP.	ORANGE OR
LIGHT BLUE..REFRIG. THERMOSTAT NORM TEMP.	TAN .....LIGHTS
DARK BLUE ..DEFROST TERM. THERMOSTAT	MAROON...RECEPTACLES
PURPLE.....ANTI-SWEAT HEATERS	YELLOW....DEFROST HEATERS, 120V
BROWN .....FAN MOTORS	RED*.....DEFROST HEATERS, 208V
GREEN* .....GROUND	*EITHER COLORED SLEEVE OR COLORED INSULATION

ELECTRICIAN NOTE: CASE MUST BE GROUNDED



FIELD WIRING

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 control panel to the merchandisers is required for refrigeration thermostats. *Most component amperes are listed below.* ***Always check the serial plate.***

Electrical Data

120V 1 PH 60 Hz				
Model	Fans	Lights– full complement of lighted shelves		Receptacles
		Standard	Option	
	(1)	(2)	(3)	(4)
BSM				
8 ft	0.8	2.85	3.42	15.0
12 ft	1.3	3.75	4.50	15.0
GSM				
8 ft	0.2	2.28	2.85	15.0
12 ft	0.3	3.00	3.75	15.0
GSS				
8 ft	NA	1.14	1.71	15.0
12 ft	NA	1.50	2.25	15.0

(1) Fans should be on a separate circuit from the lights to avoid turning fans off with the store lights.

Each column applies to light configurations listed at right. These values must be used regardless of whether lighted shelves are installed or not.

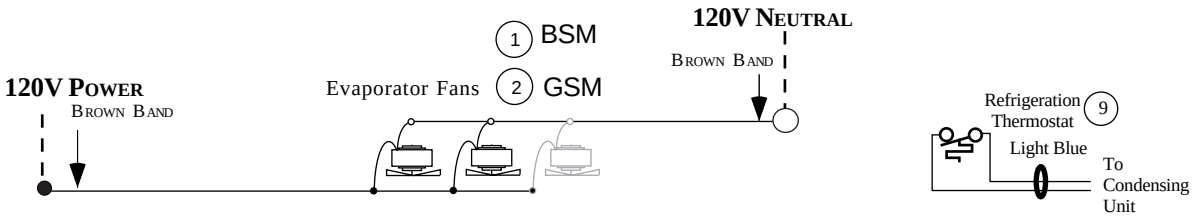
Merchandisers are equipped with T-8 fluorescent lamps and electronic ballasts.

(2) **BSM** standard lighting electrical values include two rows of interior canopy lamps, one row of interior rail lamps and two rows of shelving.
GSM standard lighting electrical values include two rows of interior canopy lamps, one row of interior rail lamps and one row of shelving.
GSS standard lighting electrical values include two rows of interior canopy lamps.

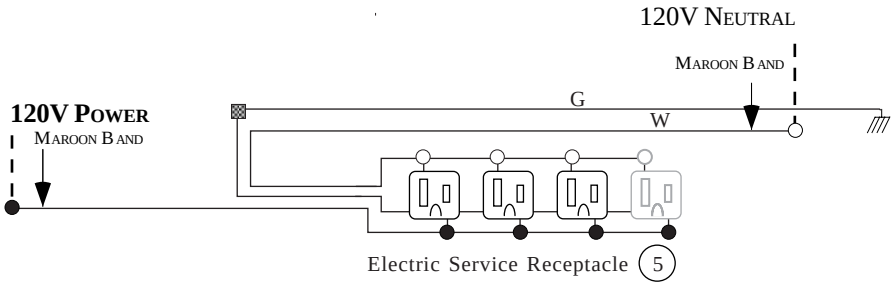
(3) Optional lighting includes all of standard lighting plus one row of exterior front lamps.

(4) The receptacles located on the rear of the merchandiser are intended for small lighted displays and scales, NOT for large motors or other high wattage appliances.

Fan Circuits Offtime Defrost (standard)



Receptacles (standard)



WARNING

All components must have mechanical ground, and the merchandiser must be grounded.

Notes:
Check Store Legend for Specifics.
Grayed Components in 12 Ft Models Only. Broken Line Indicates Field Wiring.

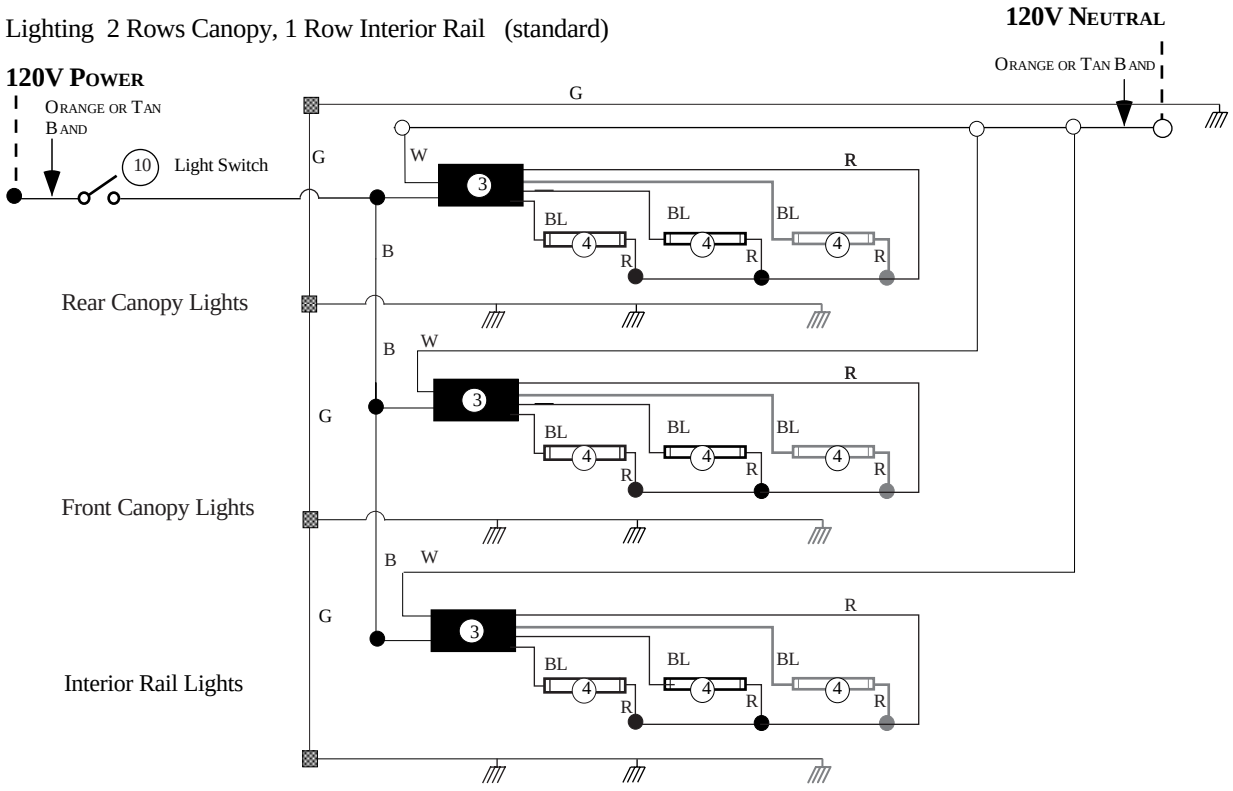
CIRCLED NUMBERS = PARTS LIST ITEM NUMBERS

● = **120V POWER** ○ = **120V NEUTRAL**

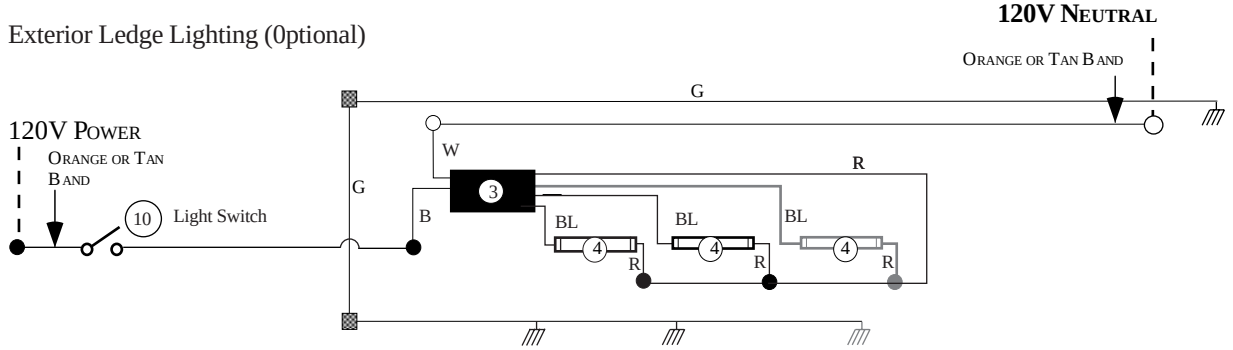
Light Circuits
BSM and GSM

CIRCLED NUMBERS = PARTS LIST ITEM NUMBERS

Lighting 2 Rows Canopy, 1 Row Interior Rail (standard)



Exterior Ledge Lighting (0ptional)



WARNING

All components must have mechanical ground, and the merchandiser must be grounded.

Notes:

Schematic shows both standard and optional components. Not all components will be on each merchandiser. Check store legend for specifics.

Grayed components in 12 ft models only

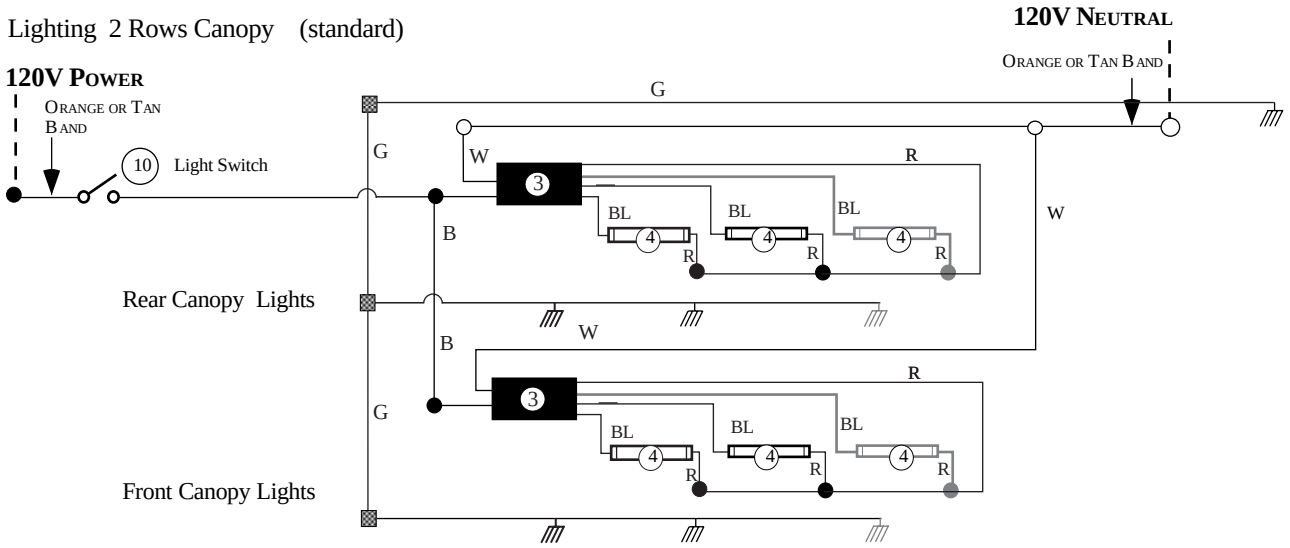
R = Red BL = Blue B = Black G = Green W = White

● = **120V POWER** ○ = **120V NEUTRAL** ▩ = **GROUND**

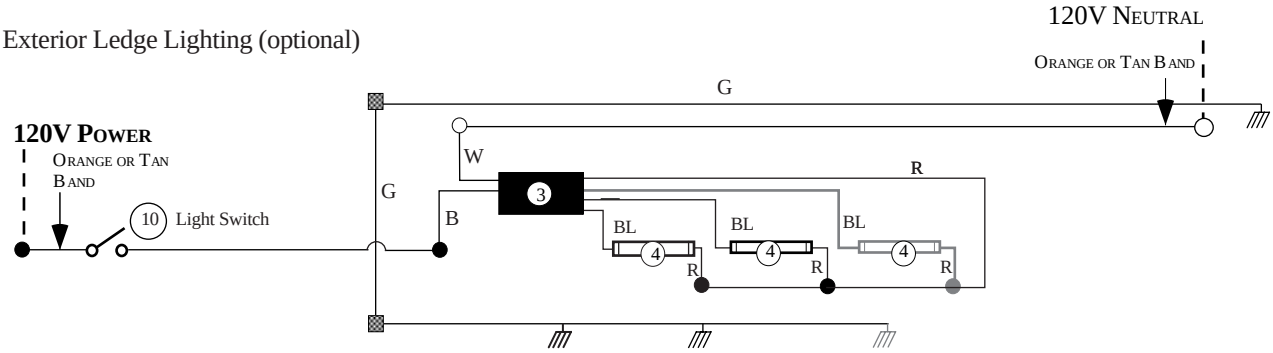
Light Circuits
GSS

CIRCLED NUMBERS = PARTS LIST ITEM NUMBERS

Lighting 2 Rows Canopy (standard)



Exterior Ledge Lighting (optional)



WARNING

All components must have mechanical ground, and the merchandiser must be grounded.

Notes:

Schematic shows both standard and optional components. Not all components will be on each merchandiser. Check store legend for specifics.

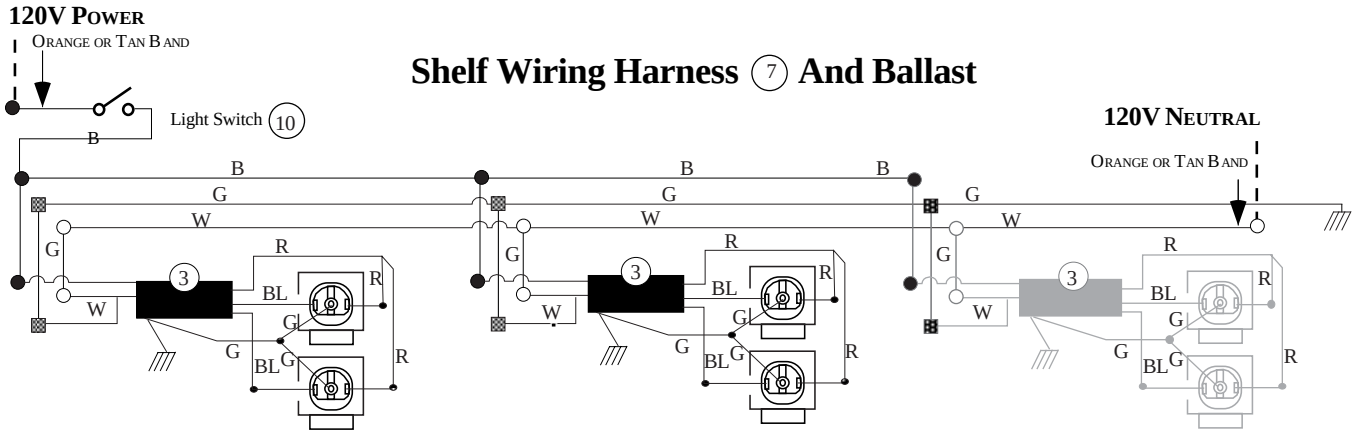
Grayed components in 12 ft models only

R = RED BL = BLUE B = BLACK G = GREEN W = WHITE

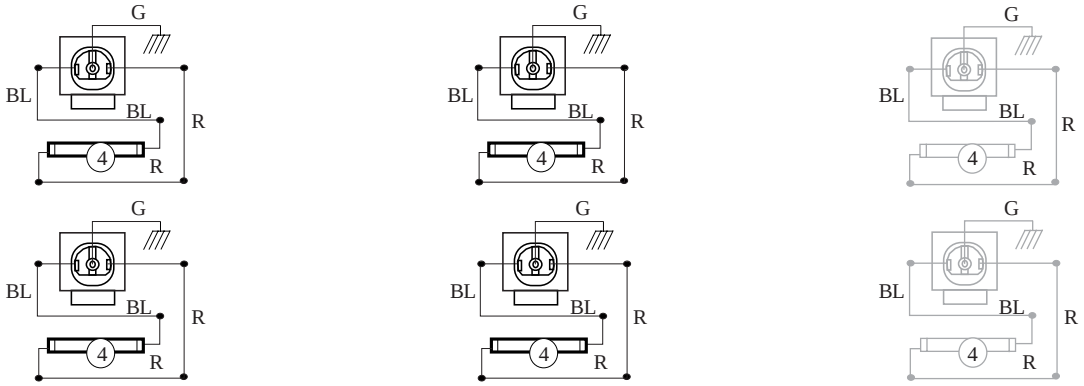
● = **120V POWER** ○ = **120V NEUTRAL** ▩ = **GROUND**

Optional Shelf Light Circuits - BSM and GSM

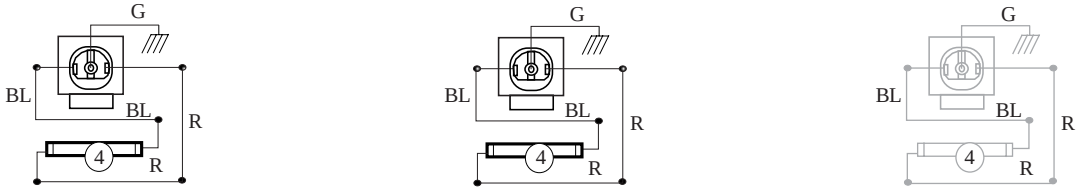
CIRCLED NUMBERS = PARTS LIST ITEM NUMBERS



Optional Shelf Lighting › BSM



Optional Shelf Lighting › GSM



WARNING

All components must have mechanical ground, and the merchandiser must be grounded.

Notes:

Schematic shows both standard and optional components. Not all components will be on each merchandiser. Check store legend for specifics.

Grayed components in 12 ft models only.

R = Red BL = Blue B = Black G = Green W = White

● = 120V POWER ○ = 120V NEUTRAL ▩ = GROUND

Ballast Locations - BSM, GSM and GSS

Not all merchandisers will have all the ballasts shown.

Raceway at Rear of Case

Top Front	Top Rear	Interior Frt rail	Mezzanine top shelf	Mezzanine Bottom shelf	Exterior Ledge

Ballast Layout for 8 ft and 12 ft Merchandisers
(Viewed from rear of case)

WARNING

Do not ingest ice used in GSS merchandisers. **Once ice has been used to display fresh fish or seafood, it is not fit for human consumption. Dispose of used ice and melt water through approved sanitary sewer systems.**

CARE AND CLEANING

NEVER USE
ABRASIVE CLEANSERS, SCOURING PADS,
OR ABRASIVE WIPE CLOTH.

The merchandisers feature designs that promote quick and complete cleaning. The front glass is easily raised out of the way.

Front Glass
Soap and water or a non-abrasive glass cleaning agent may be used to clean the front glass.

Exterior Surfaces
The exterior surfaces must be cleaned with mild detergent and warm water to protect their finish.

Interior Surfaces
The interior surfaces may be cleaned with most domestic detergents, ammonia based cleaners and sanitizing solutions.

CAUTION: SHUT FAN OFF DURING CLEANING PROCESS.

The fan plenum is hinged and can be raised out of the way. Releasing plenum latch at center allows the fan plenum and cover to pivot upward to expose the coil area.

Do NOT:

- Spray water directly on evaporator fans.
- Use mineral oil based solutions. these will dissolve the butyl sealants in the merchandisers.
- Use steam or high water pressure hoses to wash the interior. These will destroy the merchandiser's seals.
- Flood. Never introduce water faster than the waste outlet can remove it.
- After cleaning make sure plenum latch is secured.

DO:

- DISCONNECT POWER TO MERCHANDISER.
- Remove the product and all loose debris to avoid clogging the waste outlet.
- Thoroughly clean all surfaces with soap and hot water. Rinse with hot water.
- Apply the sanitizing solution according to the manufacturer's directions.
- Allow the merchandisers to dry before resuming operation.
- When cleaning lighted shelves, wipe down with a damp sponge or cloth so that water does not enter the light channel. Do not use a hose or submerge shelves in water.

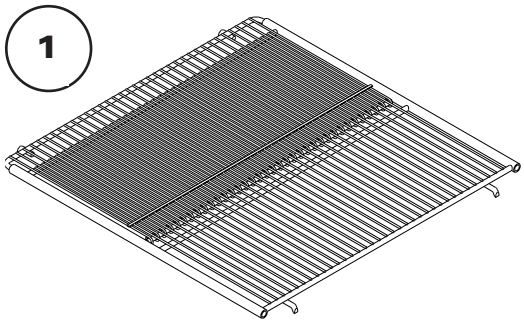
WARNING

Do NOT use HOT water on COLD glass surfaces. This can cause the glass to shatter and could result in personal injury. Allow glass fronts, ends and service doors to warm before applying hot water.

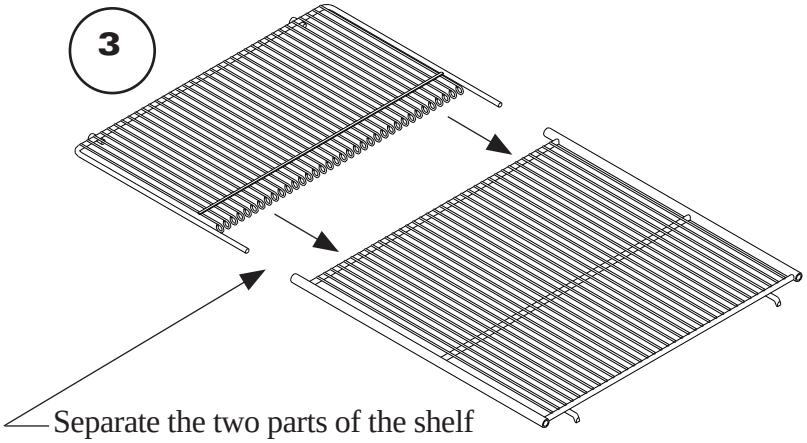
CLEANING TELESCOPING SHELF

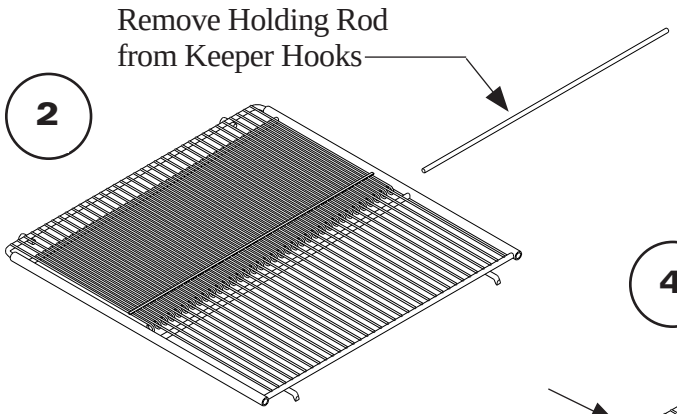
A 20-in. nylon brush is shipped with each merchandiser. This brush is used when cleaning the telescoping shelf.

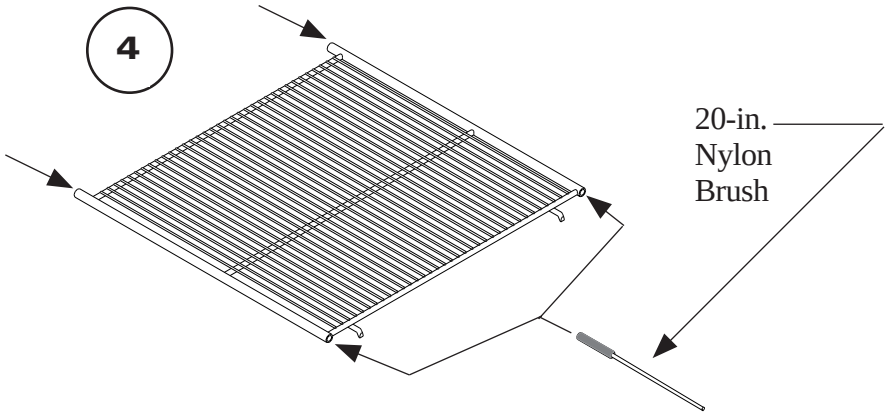
1. Remove telescoping shelf assembly from merchandiser.
2. Remove holding rod from keeper hooks.
3. Separate the two halves of the shelf.
4. Use the brush to clean the insides of both hollowed tubes from both ends.
5. Rinse.
6. Re-assemble shelf. Re-install in merchandiser.



Fully Assembled Shelf







Clean hollowed tubes from both ends.

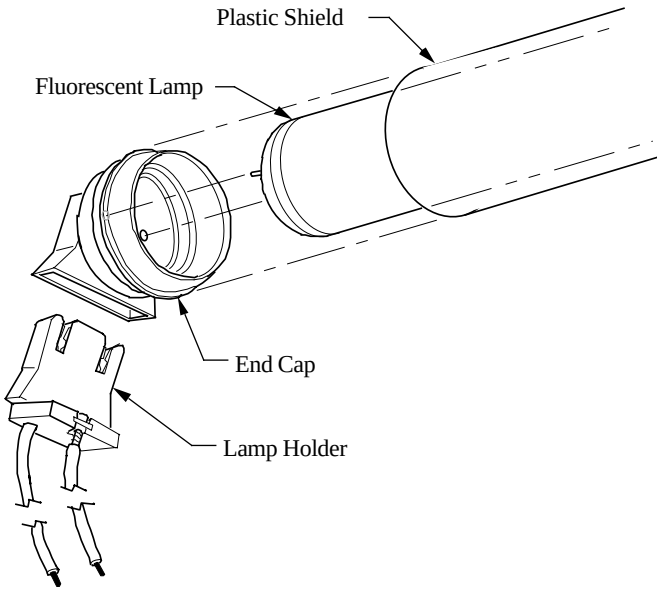
REPLACING SHELF LAMPS

Fluorescent lamps are furnished with moisture resistant lamp holders, shields and end caps. Whenever a fluorescent lamp is replaced, be certain to reinstall the lamp shields and end caps.

1. Turn light switch to OFF prior to replacing or installing any lighting components.

2. Remove lamp by simply pushing the lamp away from the lamp holder.

3. To install a lamp, align the end caps over the lamp holders and press gently. A slight snap will be felt as the lamp is seated.



SHELVES

Mezzanine Shelves
Display shelves can be installed at two different positions as desired. (Does not apply to GSS.)

Bottom Wire Shelves
These shelves are adjustable up and down to change display angle.

NOTE: When changing shelf positions, it is helpful to open the front curved glass and do the work from the front.

STOCKING

Product should not be placed in merchandisers until all refrigeration controls have been adjusted and merchandisers are at proper operating temperature. **Air discharge and return air flue must be unobstructed at all times to provide proper refrigeration.**

ELECTRICAL SERVICE RECEPTACLES

The receptacles located on the exterior back of the merchandisers are intended for scales and lighted displays. They are NOT intended or suitable for large motors that are found in meat and delicatessen departments.

REPAIRING ALUMINUM COIL

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

Hussmann recommends the following solders and technique:

WARNING

Always disconnect the electrical power at the main disconnect when servicing or replacing any electrical component. This includes, but is not limited to such items as fans, heaters, thermostats and lights.

Solders

Aladdin Welding Products Inc.
P.O. Box 7188
1300 Burton St.
Grand Rapids, MI 49507
(616) 243-2531

X-Ergon
1570 E. Northgate
P.O. Box 2102
Irving, TX 75062
(800) 527-9916

NOTE:

Hussmann aluminum melts at . . . . 1125 deg F
Aladdin 3-in-1 rod at . . . . . 732 deg F
X-Ergon Acid core at . . . . . 455 deg F
Factory Solder at aluminum
to copper transitions . . . . . 855 deg F

Technique

1. Locate leak.
2. **Remove all pressure.**
3. Brush area UNDER HEAT.
4. Use **Prestolite torch only, No. 6 tip**.
5. Maintain separate set of stainless steel brushes and USE ONLY ON ALUMINUM.
6. Tin surface around area.
7. Brush tinned surface UNDER HEAT, thoroughly filling the open pores around leak.
8. Repair leak. Let aluminum melt solder, NOT the torch.
9. Don't repair for looks. Go for thickness.
10. Perform a leak check.
11. Wash with water.
12. Cover with a good flexible sealant.

WARNING

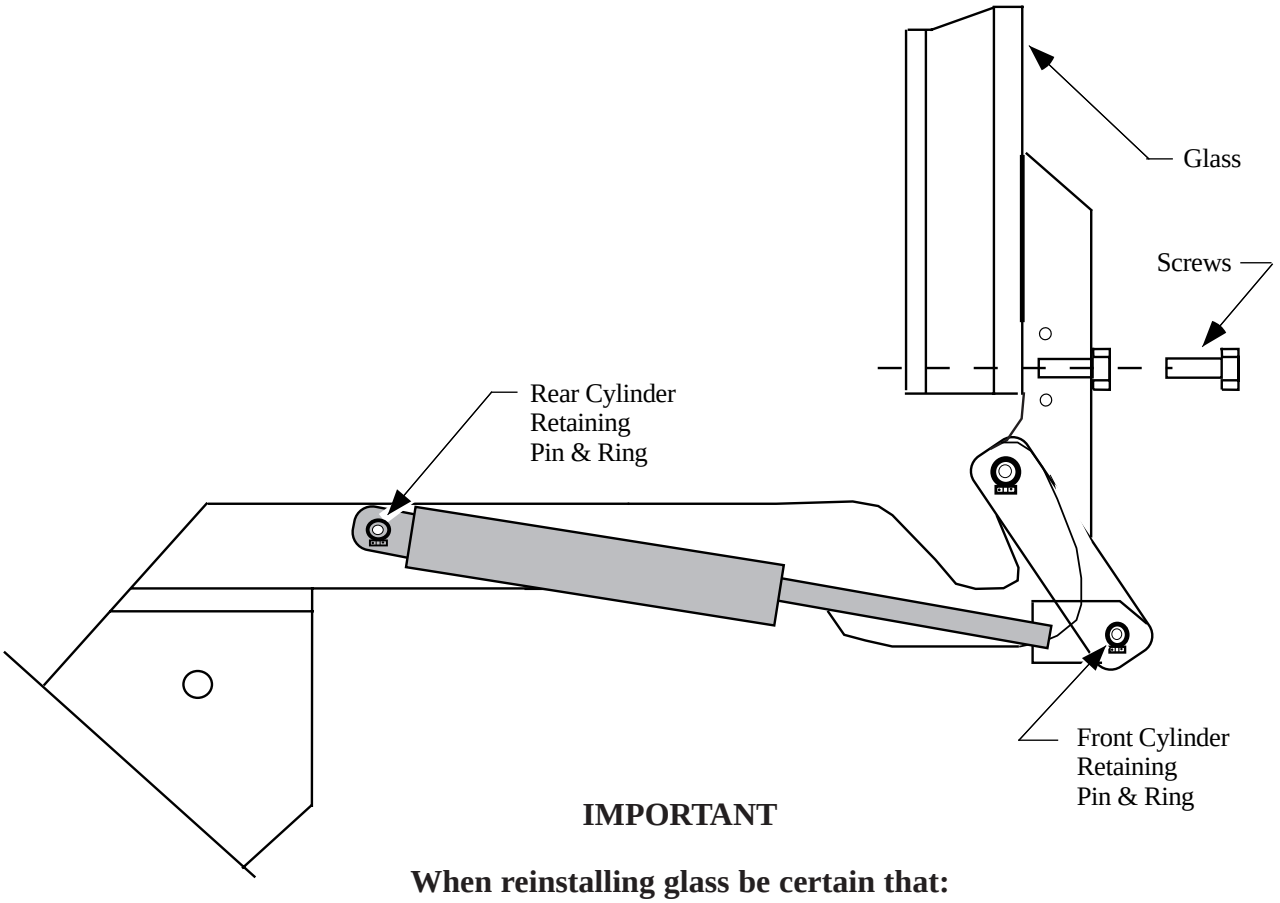
Once the cylinder is released, the front glass will have no support to maintain it in a raised position. Support the front glass at all times until cylinder is replaced or the glass is lowered.

CYLINDER REMOVAL

1. Remove front retaining ring and retaining pin.
2. Cylinder will then be swinging loose.
3. Remove rear retaining ring and remove cylinder.

GLASS REMOVAL
(Requires more than one person)

1. Open glass to its full extension.
2. Locate 4 hex head screws and washers (2 at each end) and remove.
3. Remove Glass.



IMPORTANT

When reinstalling glass be certain that:
Gasket is on glass evenly and
Glass is fully bottomed in retainer.

HUSSMANN®

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 from 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-Gloversville 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 (Atlanta, Bridgeton, Brantford, Chino) and self-contained display cases (Bridgeton, Brantford, Chino, Denver), 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. 63044-2483 August 15, 1998