



MULTI-DECK MERCHANDISER INSTALLATION & OPERATIONS MANUAL

BMD-RG MEAT/SEAFOOD

Table of Contents

Technical Reference	2-5	Pre-Power Checklist	12
General Information	6	Airflow & Defrost	13
Installation	7-8	Case Cleaning	14
Case Connections	9	Parts Ordering	15
Lighting & Power Supplies	10-11	Appendices	

To ensure proper functionality and optimum performance, it is STRONGLY recommended that Hillphoenix specialty cases be installed/serviced by qualified technicians who have experience working with commercial refrigerated display merchandisers and storage cabinets. For a list of Hillphoenix-authorized installation/service contractors, please visit our website at www.hillphoenix.com.





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R-744 (CO₂) NOTICE

For Systems Utilizing R-744 (CO₂) Refrigerant

For refrigeration units that utilize R-744 (CO₂), pressure relief and pressure-regulating relief valves may need to be installed based on the system capacity. The valves need to be located such that no stop valve is positioned between the relief valves and the parts or section of the system being protected.

When de-energizing refrigeration units containing R-744 (CO₂), venting of the R-744 (CO₂) refrigerant may occur through the pressure regulating relief valves. *These valves are located on the refrigeration system and not on the case model.* If venting does occur, the valve must not be defeated, capped, or altered by any means.

WARNING: Under no circumstances should any component be replaced or added without consulting Hillphoenix Field Service Engineering. Utilizing improper components may result in serious injury to persons or damage to the system.

Important

At Hillphoenix[®], the safety of our customers and employees, as well as the ongoing performance of our products, are top priorities. To that end, we include important warning messages in all Hillphoenix installation and operations handbooks, accompanied by an alert symbol paired with the word "DANGER", "WARNING", or "CAUTION".

All warning messages will inform you of the potential hazard; how to reduce the risk of case damage, personal injury or death; and what may happen if the instructions are not properly followed.

**DANGER**

Indicates an immediate threat of death or serious injury if all instructions are not followed carefully.

**WARNING**

Indicates a potential threat of death or serious injury if all instructions are not followed carefully.

**CAUTION**

Indicates that failure to properly follow instructions may result in case damage.

Revision History

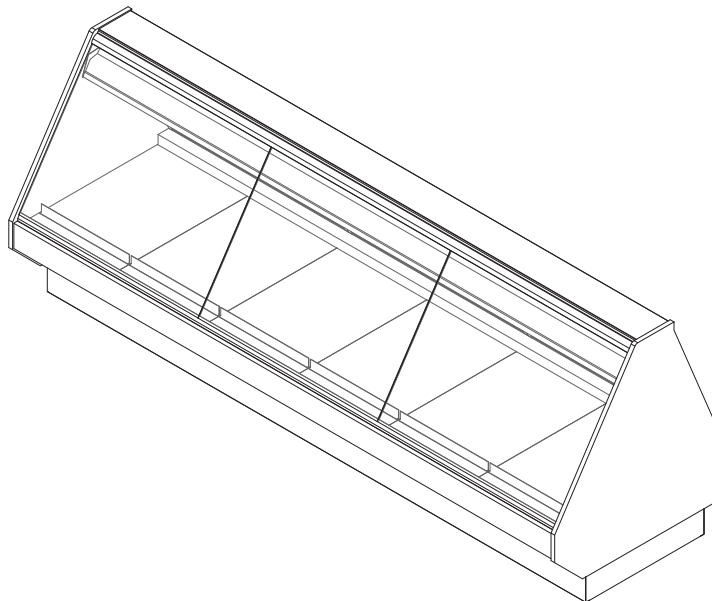
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BMD-RG

Service Multi-Deck Merchandiser w/ Flat Lift or Curved Glass
4', 6', 8', 10' & 12' (Meat/Seafood)

GENERAL NOTES:

- "---" Indicates that the feature is not an option on this case model and/or the data is not yet available at this time.
- Curved glass. (optional)



SHIPPING WEIGHT	
Case	Weight
BMD-RG	---



ENGINEERED FOR STORES WITH AMBIENT CONDITIONS NOT TO EXCEED 75° AND 55% RELATIVE HUMIDITY. DUE TO ENGINEERING IMPROVEMENTS SPECIFICATIONS MAY CHANGE WITHOUT NOTICE. ALL MEASUREMENTS ARE TAKEN PER ASHRAE-72-2005 SPECIFICATIONS. HILLPHOENIX REFRIGERATED DISPLAY CASES FOR SALE IN THE UNITED STATES MEET OR EXCEED DEPARTMENT OF ENERGY 2017 REQUIREMENTS. NUMBERS ARE BASED ON STANDARD CASE SIZES. CONSULT ENGINEERING.

BMD-RG

Rev. Date	Rev. #	Rev. Title
09-29-20	2	ENDVIEW UPDATE
07-28-20	1	NEW STANDARDS



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BMD-RG

Service Multi-Deck Merchandiser w/ Flat Lift or Curved Glass
4', 6', 8', 10' & 12' (Meat/Seafood)

ELECTRICAL DATA									
Case Length	Fans Per Case	High Efficiency Fans		Anti-Condensate Fans		Drain Heaters		Optional Defrost Heaters	
		120 Volts		120 Volts		120 Volts		208 Volts	
		Amps	Watts	Amps	Watts	Amps	Watts	Amps	Watts
4'	---	---	---	0.26	31.2	---	---	---	---
6'	---	---	---	0.52	62.4	---	---	---	---
8'	---	---	---	1.04	124.8	---	---	---	---
10'	---	---	---	1.04	124.8	---	---	---	---
12'	---	---	---	1.26	151.2	---	---	---	---

LIGHTING DATA						
Case Length	Lights Per Row	Light Length	Clearvoyant 4 LED Lighting (Per Light Row)			
			Standard Power (Cornice or Shelf)		High Power (Cornice)	
			120 Volts		120 Volts	
			Amps	Watts	Amps	Watts
4'	1	4'	0.05	5.9	0.12	14.9
6'	2	3'	0.08	9.4	0.20	23.8
8'	2	4'	0.10	11.8	0.24	29.8
10'	2	5'	0.12	15.0	0.30	37.0
12'	3	4'	0.15	17.7	0.36	44.7

GUIDELINES AND CONTROL SETTINGS (DX)					
BTUH/ft		Superheat Set Point @ Bulb (°F)	Evaporator (°F)	Discharge Air (°F)	Discharge Air Velocity (FPM)
Conventional	Parallel				
708	650	10	15	28	---

DEFROST CONTROLS							
Defrosts Per Day	Run-Off Time (Min)	Electric Defrost		Timed-Off Defrost		Hot Gas Defrost	
		Fail-Safe (Min)	Termination Temp (°F)	Fail-Safe (Min)	Termination Temp (°F)	Fail-Safe (Min)	Termination Temp (°F)
1	---	---	---	90	---	---	---

NOTES:

- "---" Indicates that the feature is not an option on this case model and/or the data is not yet available at this time.
- Listed discharge air velocity represents the average velocity at the peak of defrost.
- Units equipped with RH systems require 2 defrosts per day with a fail-safe of 120 minutes.
- Listed data is based on the factory recommended default fresh meat temperature settings.
- Shelves are not recommended for fresh meat applications.



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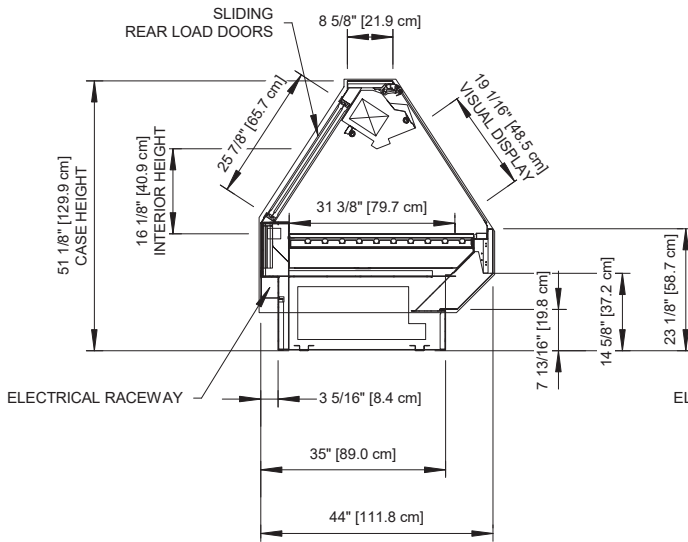
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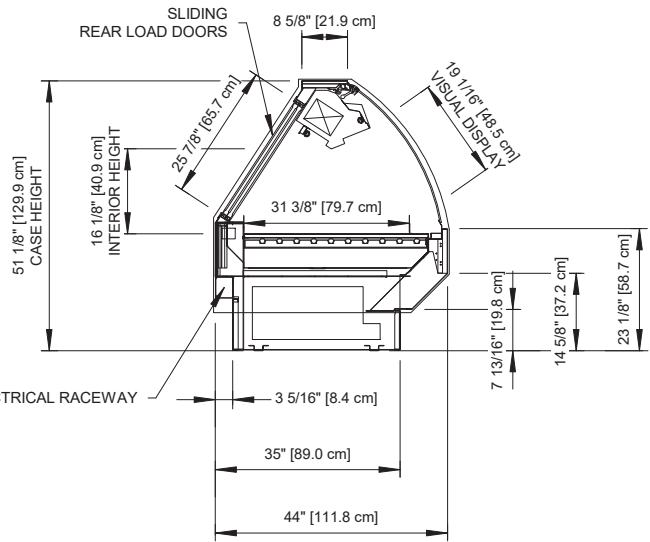


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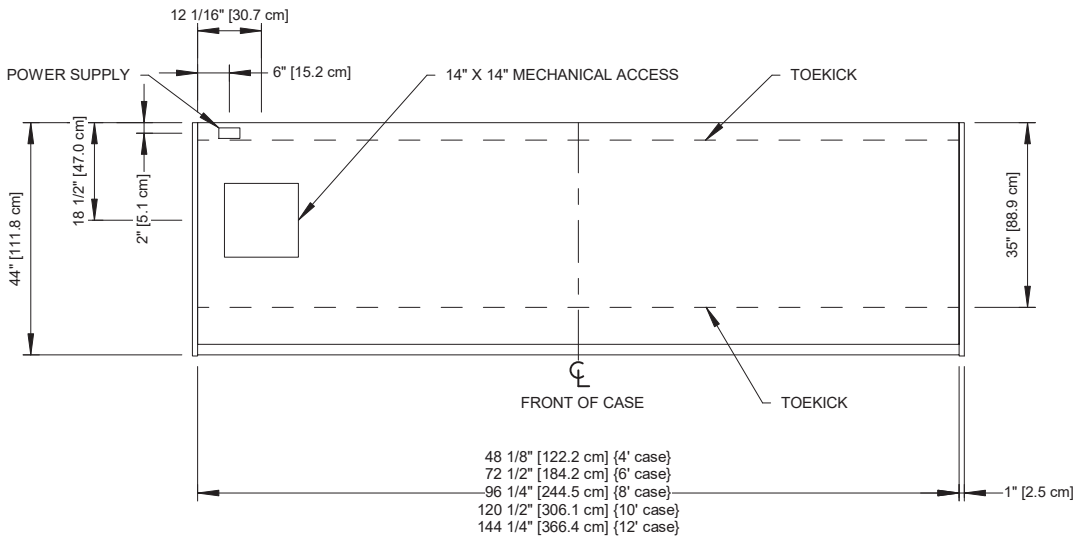
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FLAT GLASS



CURVED GLASS (OPTIONAL)



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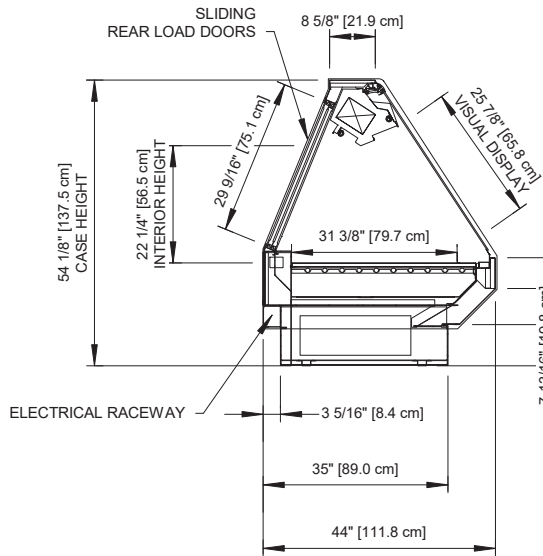
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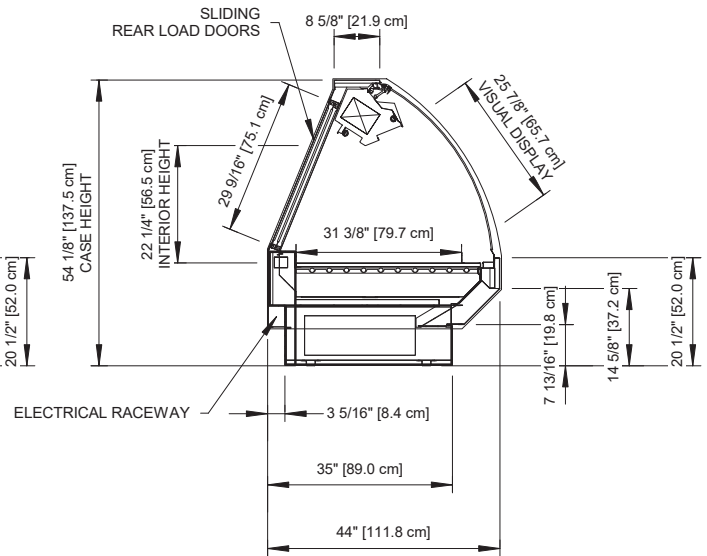
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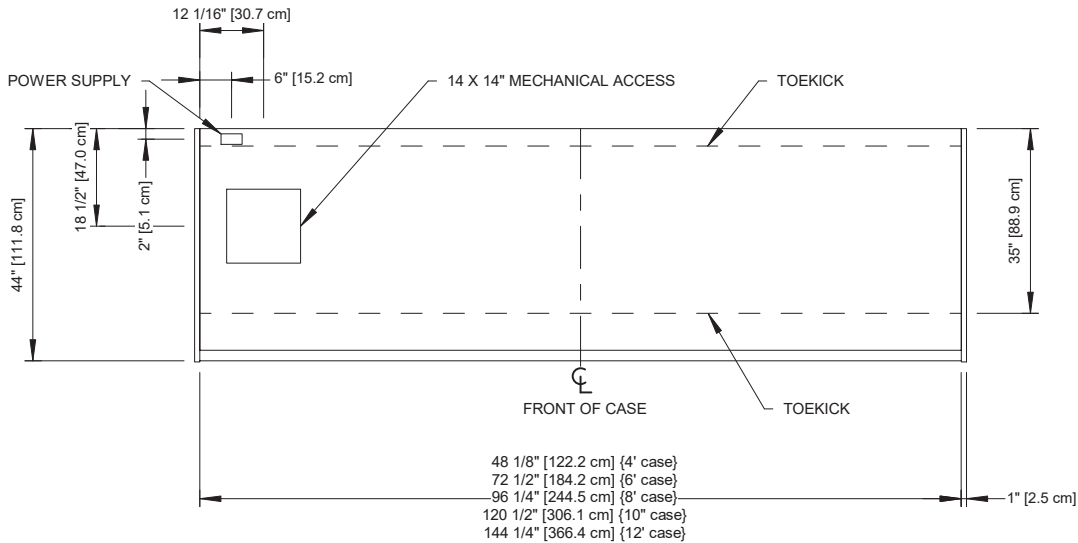
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CURVED GLASS (OPTIONAL)



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GENERAL INFORMATION

Thank you for choosing Hillphoenix for your food merchandising needs. This handbook contains important technical information and will assist you with the installation and operation of your new Hillphoenix specialty cases. By closely following the instructions, you can expect peak performance; attractive fit and finish; and long case life.

We are always interested in your suggestions for improvements (e.g. case design, technical documents, etc.). Please feel free to contact our Marketing Services group at the number listed below. Thank you for choosing Hillphoenix, and we wish you the very best in outstanding food merchandising.

CASE DESCRIPTION

This manual specifically covers the BMD-RG meat and seafood application service multi-deck merchandiser with curved or flat lift glass.

STORE CONDITIONS

Hillphoenix cases are designed to operate in an air-conditioned store that maintains a 75° F (24° C) store temperature and 55% (max) relative humidity (ASHRAE conditions). Case operation will be adversely affected by exposure to excessively high ambient temperatures and/or humidity.

REFRIGERATION SYSTEM OPERATION

Air-cooled condensing units require adequate ventilation for efficient performance. Machine-room temperatures must be maintained at a minimum of 65° F in winter and a maximum of 95° F in summer. Minimum condensing temperatures should be no less than 70° F.

SHIPPING CASES

Transportation companies assume all liability from the time a shipment is received by them until the time it is delivered to the consumer. Our liability ceases at the time of shipment.

RECEIVING CASES

Examine fixtures carefully and in the event of shipping damage and/or shortages, please contact the Service Parts Department at the number listed below.

CASE DAMAGE

Claims for obvious damage must be 1) noted on either the freight bill or the express receipt and 2) signed by the carrier's agent; otherwise, the carrier may refuse the claim. If damage

becomes apparent after the equipment is unpacked, retain all packing materials and submit a written request to the carrier for inspection within 14 days of receipt of the equipment.

Failure to follow this procedure will result in refusal by the carrier to honor any claims with a consequent loss to the consumer.

If a UPS shipment has been damaged, retain the damaged material, the carton and notify us at once. We will file a claim.

LOST/MISSING ITEMS

Equipment has been carefully inspected to insure the highest level of quality. Any claim for lost/missing items must be made to Hillphoenix within 48 hours of receipt of the equipment. When making a claim please use the number listed below.

SERVICE PARTS & TECHNICAL SUPPORT

For service parts questions regarding our cases, please contact our Service Parts Department at 1-844-HPX-PART (1-844-479-7278) or dfr-ia-parts@doverfoodretail.com

For technical questions regarding our cases, please contact our Technical Support Department at 1-833-280-5714.

CONTACTING THE FACTORY

If you need to contact Hillphoenix regarding a specific fixture, be certain that you have both the case model number and serial number. (This information can be found on the data tag, located at the top-left interior, rear exterior panel or interior rear lower storage of the case. *Location may vary based on case design.*)

Hillphoenix Specialty Products
703 Franklin Street, PO Box 478
Keosauqua, IA 52565
Website: www.hillphoenix.com

LOCATION

This refrigerated display case has been designed for displaying and storing perishable food product. It is engineered for air-conditioned stores with a maximum ambient of 75°F and 55% relative humidity.

When selecting the location for placement of this case, avoid the following conditions:

Excessive Air Movement

1. Doors
2. Air-conditioned vents
3. Other air sources

Excessive Heat

1. Windows
2. Sun
3. Flood lamps 8 feet or less from the product
4. Other heat sources

FLOOR PREP

1. Ask the general contractor if your current copy of the building dimensions are the most recently issued. Also, ask for the points of reference from which you should take dimensions to locate the cases.
2. Using chalk lines or a laser transit, mark the floor where the cases are to be located for the entire lineup. The lines should coincide with the outside edges of the case feet.
3. Move case as close as possible to its permanent location. Remove all crating and shipping braces above the shipping pallet. Loosen the plastic dust cover from the pallet, but leave cover over the case to protect it while removing the case from the pallet.
4. Shipping braces with a sled runner construction can either have metal brackets that can be removed with a screw gun, or wood blocks that can be removed with a J-bar.
Note: Shipping braces are normally located at each corner of the case. (Shipping braces used vary and are based on case design for best transport.)
5. Carefully, if horizontal supports, lift case up and off the pallet. Remove dust cover. Installation hardware ships in a marked packet located inside the case. Remove dust cover. Installation hardware ships in a marked packet located inside the case.
6. Leveling is necessary to ensure proper operation of the refrigeration system and drainage of the condensate. Locate the highest point on the positioning lines as a reference for determining the proper height of the shim-pack levelers. A laser transit is recommended for precision and requires just one person. Level adjustable feet by twisting, if applicable, or shim as necessary under horizontal sup-

ports as this will help ensure that the case is not settling over time.

7. Locate horizontal support positions along the chalk line (Fig. 1). Spot properly leveled shim packs at each support location.

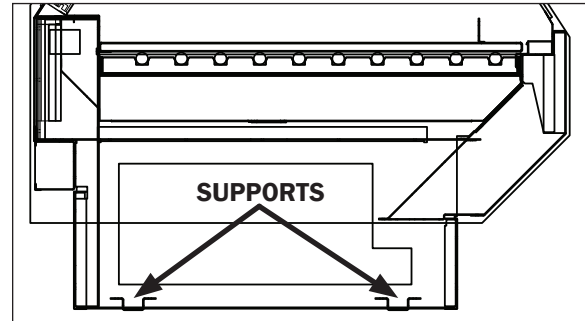


Fig. 1 Horizontal supports

8. If necessary, drill a hole in each end of every horizontal support (Fig. 2) and fasten to the floor with concrete anchors. **Note: The holes do not need to be in the exact locations specified here. Be sure that the anchors are close to the end of the horizontal supports and at each corner of the case.**

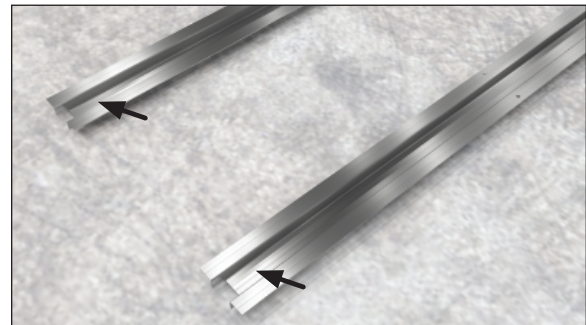


Fig. 2 Seismic anchoring locations

⚠ CAUTION

Locate the horizontal supports under unit before removing from pallet. Failure to do so will damage the finished metal if correct lift points are not identified prior to removal.

⚠ CAUTION

These cases are not designed for excessive external weight. Do not walk on top or inside of cases. Doing so may result in case damage and/or personal injury.

LINE-UP & INSTALLATION

Single Case

1. Move the case into position. Using a "J" bar, raise the end

CASE INSTALLATION

of the case (under cross support), and lower the horizontal support on to the shim packs. Repeat on the other end of the case.

WARNING

Be certain that your hands and feet are out of the way before lowering the case. Failure to do so may result in serious injury.

2. Once the case is properly placed on the shim packs, check the vertical plumb of the case by placing a bubble level on the rear wall. Add/remove shim packs as needed. For the horizontal level, repeat this process after placing the bubble level on the front sill.
3. Install the bumper, if applicable, into pre-attached bumper track and snap into place.
4. After sufficient time has passed to allow for bumper shrinkage, cut away the excess bumper for final fit and finish. Be certain to use an appropriate cutting tool (tubing- or PVC-cutter) to ensure a smooth cut.
5. Install case shelves and reconnect lights. Be aware that differing shelf configurations will affect energy consumption and case performance.
6. Install toekick back onto the base of case.

Multi-Case

1. Remove any shelves (discard the shelf clips) and/or loose items from the cases that may interfere with case joining. Keep all loose items as they will be used later in the installation process.
2. Follow the single-case installation instructions for the first case, excluding #6, then position the next case in the line-up approximately 3' away.
3. Move the second case to a position that is approximately 6" from the first case, then position case on the shim packs.
4. Push the cases tightly together, then lightly bolt them together through the holes provided (Fig. 3). Tighten all the joining bolts until all margins are equal. Be careful not to over tighten.
5. The stub-up location can be found under the tank on the customer left. See *technical reference on pages 4 and 5 for access locations*.
6. Apply case-to-case watershed (supplied) over the end frame seam (Fig. 4). The watershed prevents water from settling in the case joint.
7. Repeat steps 3-6 of this sequence for all remaining cases. Be certain to properly level all cases.
8. Properly align the front panels as needed, then install, if applicable, front panel trim (supplied).

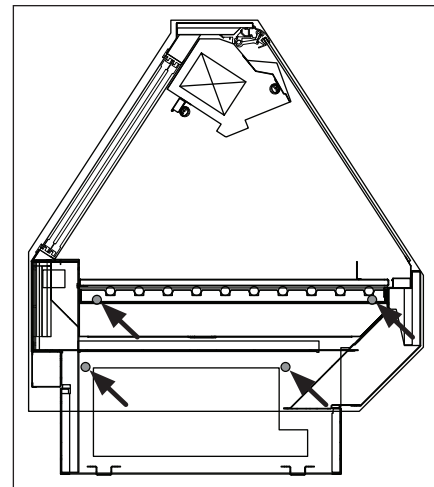


Fig. 3 Bolt locations

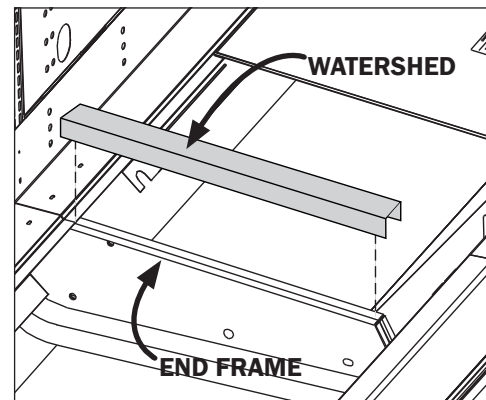


Fig. 4 Sealing the pipe chase

9. Install the bumper into pre-attached bumper track and snap into place.
10. After sufficient time has passed to allow for bumper shrinkage, cut away the excess bumper for final fit and finish. Be certain to use an appropriate cutting tool (tubing- or PVC-cutter) to ensure a smooth cut.
11. Install case shelves and reconnect lights. Be aware that differing shelf configurations will affect energy consumption and case performance.
12. Install toekick back onto the base of case.

CAUTION

Installation of 3rd-party materials may result in diminished case performance.

REFRIGERATION

Refrigeration connections will be made through the refrigeration stub up location on the customer left side of the case. Refrigeration lines may be headed together for all cases in a line-up, if necessary, by lines through the access holes with a high grade silicon to prevent recirculation. All lines must be correctly sized. See *technical reference on pages 4 and 5 for access locations*.

If it becomes necessary to penetrate the case bottom for any reason, make certain it is sealed afterward with canned-foam sealant and white RTV.

⚠ CAUTION

Be certain that all piping connections are compliant with local codes.

⚠ CAUTION

If any brazing is necessary, place wet rags around the area to avoid tank damage.

PLUMBING

The drain outlet or "P" trap (Fig. 5) is shipped loose with the case and made from a 1 1/2" PVC pipe. Care should be given to ensure that all connections are water-tight and sealed with the appropriate PVC or ABS cement.

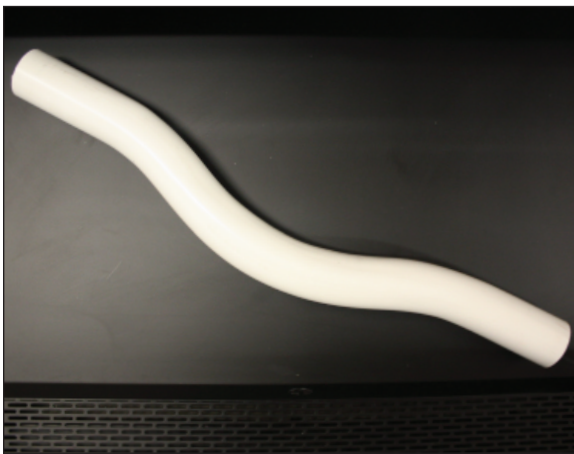


Fig. 5 "P" trap / drain outlet

Drain lines can be run left or right of the tee with the proper pitch to satisfy local drainage requirements. When connecting the PVC to the existing floor drains be sure to provide as much downhill slope as possible and avoid long runs of drain lines.

Do not install condensate drains in contact with non-insulated suction lines in order to prevent condensate from freezing. Install the 1 1/2" PVC trap, which is provided with the case. All drains must be trapped.

Before operating the case, be certain to remove the styrofoam shipping block that protects the plumbing lines during shipping.

⚠ CAUTION

Be certain that all plumbing connections are compliant with local codes.

⚠ CAUTION

Be sure to remove all styrofoam shipping blocks from piping and refrigerant lines. Failure to do so may result in case damage.

ELECTRICAL

Electrical hookups are made through the electrical raceway that can be accessed by removing the rear raceway panel.

For case-to-case wiring, run conduit between the power supply boxes or run wiring through the raceway. When connecting to the power supply on the case, field wiring should exit box from the side furthest away from case wiring to allow more room inside for wiring connections. Always check the data tag located on left end exterior panel or top interior of the case. The case must be grounded. *For more detailed electrical wiring information (see Appendix A1).*

⚠ CAUTION

Be certain that all electrical connections are compliant with local codes.

⚠ DANGER

CAUTION, RISK OF ELECTRIC SHOCK. If the cord or plug becomes damaged, replace only with a cord and plug of the same type.

GENERAL LIGHTING INFORMATION

Hillphoenix cases are equipped with LED luminaires and feature specially designed light reflectors in the cornice to improve the illumination of products. LED power supplies operate both the cornice and shelf lights and are located above the cornice reflectors.

The lighting system has an ON/OFF switch located in the raceway, power box or at the inside back of the case. Once a case has been properly positioned in the store and an electrician has connected the lighting circuit, the lights may be turned on to verify that they are connected and functioning properly.

To ensure peak performance, it is advisable to run the lighting systems only when the store climate control is on and case refrigeration is started. **Note: It is highly recommended that the ambient store temperature not exceed 80°F.**

DANGER

SHOCK HAZARD

Always disconnect power to case when cleaning, servicing or configuring components of the lighting system. Failure to do so may result in serious injury or death.

WARNING

Using improper DC power supplies may damage the luminaires, resulting in sub-standard operation and increased chances of safety issues/injury.

WARNING

Never replace a 24V DC power supply with a T8 or T5 ballast of any kind! Ballasts use alternating current (AC) instead of direct current (DC) and operate at a much higher voltage than is used by this LED system. Doing so will damage the LED system and increases the chance of safety issues/injury.

LED DRIVER/POWER SUPPLY ACCESS

To gain access to the LED driver or power supplies remove the raceway cover (Fig. 6). The power supply can be located at the customer left side of the case.

REPLACING LED LIGHTS

Once store power is connected and the light circuit is energized, the Clearvoyant LED system should operate without the

need for any significant maintenance for several years. Should a power supply need to be removed and/or replaced, turn off the power to the case before proceeding. Be certain to replace the power supply with genuine Hillphoenix parts or a comparable UL-listed Class-2 rated regulated 24V DC power supply with 100W output capacity.

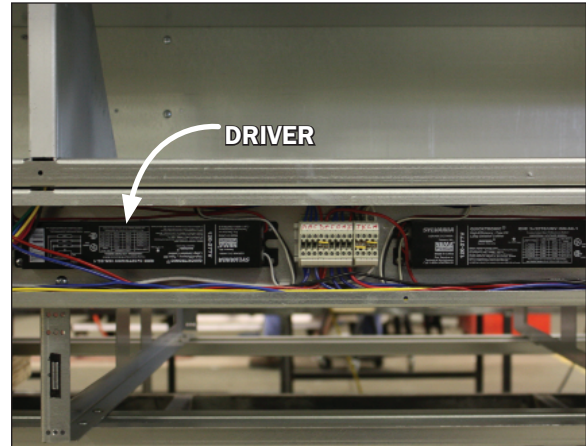


Fig. 6 Clear view of the drivers

LED LUMINAIRES

Removing LED luminaires:

1. Unplug the luminaire.
2. Remove the screws from the light clamps (Fig. 7) while keeping ahold of the light. Once the screws are removed the light rod will come away from the case with the clamps still holding to the light.

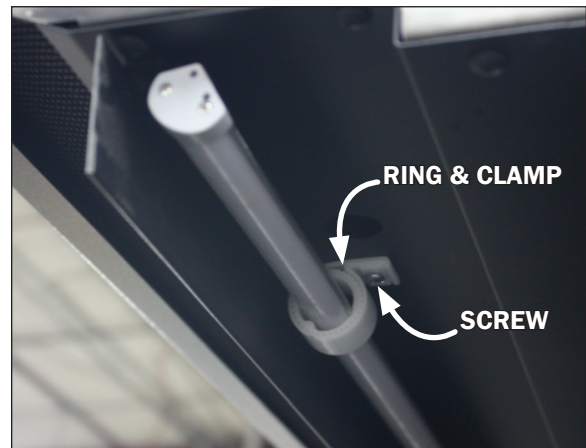


Fig. 7 LED light & ring/clamp

3. Remove the closed clamps and inner rings (Fig. 8) by unclipping the clamp ends located above the screw opening. This will release the grip around the inner ring (Fig. 9) and allow for the two pieces to be separated from one another.
4. Carefully remove the inner rings from around the light rod.

⚠ CAUTION

Too much tension on the inner clamp rings while removing them from an LED light rod may cause breakage. Use only enough tension for removal.

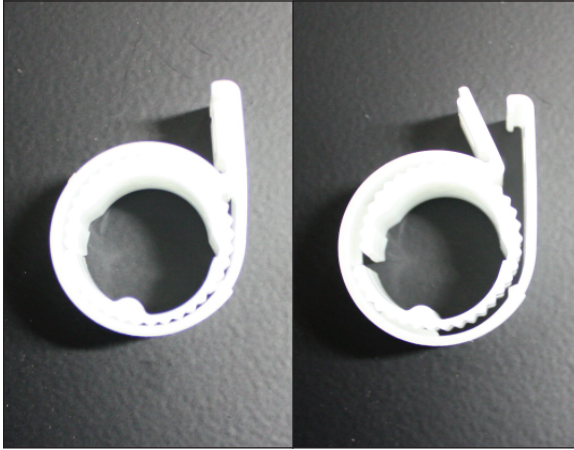


Fig. 8 Closed clamp

Fig. 9 Open clamp

Re-installing LED luminaires:

1. Place a ring (Fig. 10) around each end of the light rod and rotate until both edges of the rod line-up and snap ahold to the ridges in the ring.
2. Slide a clamp (Fig. 10) over each ring and close them tight around the rings by clipping together the clamp ends located above the screw opening.



Fig. 10 LED ring and clamp

3. Line-up the closed clamps (Fig. 8) and light rod with the existing screw holes on the case and re-attach.
4. Rotate the light rod into desired position after the clamps are firmly re-attached.

PRE-POWER CHECKLIST

Before powering-up the case, be certain that all of the steps listed below have been completed to ensure proper case functionality, safety and compliance with warranty terms.

- Have you thoroughly examined the case for shipping damage? (see pg. 6)**
- Have you checked the vertical plumb of the case? The horizontal level? (see pg. 7)**
- Have you applied the sealant to the end breakers of adjoining cases? (see pg. 8)**
- Have you sealed the case-to-case joints by applying caulk and acrylic tape to the end frame seam? (see pg. 8)**
- Have you installed the toekick? (see pg. 8)**
- Have you removed the shipping blocks from the refrigeration and plumbing lines? (see pg. 9)**

After powering-up the case, be certain that all of the steps listed below have been completed to ensure proper case functionality, safety and compliance with warranty terms.

- 1. Check all lights to ensure they are all functioning properly.**
- 2. Check case temperature and adjust controller as needed.**

AIRFLOW & PRODUCT LOAD

Hillphoenix cases provide maximum product capacity within the refrigerated air envelope. Please keep products within the appropriate load limit.

It is important that you do not overload the food product display so that it impinges on the airflow pattern (Fig. 11). Overloading will cause malfunction and the loss of proper temperature levels.

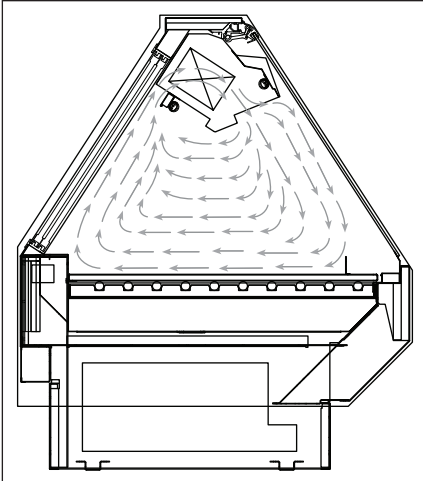


Fig. 11 Airflow Pattern

3. Finally, subtract the converted temperature reading from the actual temperature reading for superheat setting.

⚠ WARNING

Always keep product within the designated air curtain. Failure to do so may result in case malfunction and product losing proper temperature, resulting in sub-standard operation and increased chances of food contamination.

DEFROST & TEMPERATURE CONTROLS

Cases are equipped with either Hot Gas or Timed-Off defrost at the owner's option.

The hot gas defrost termination sensor bulb and probe are attached to the dump line which is in the front, left-hand side of the case.

DETERMINING SUPERHEAT

To identify proper superheat settings, complete the following:

1. Obtain suction pressure from access port; obtain suction line temperature from area near TXV bulb at the outlet of evaporator coil.
2. Using the suction pressure reading, convert pressure to temperature using temperature pressure chart (see *Appendix C1*).

CASE CLEANING

CASE CLEANING

A periodic cleaning schedule should be established to maintain proper sanitation, insure maximum operating efficiency, and avoid the corrosive action of food fluids on metal parts that are left on for long periods of time. We recommend cleaning once a week. Further suggestions for case cleaning include the following:

- To avoid shock hazard, be sure all electrical power is turned off before cleaning. In some installations, more than one disconnect switch may have to be turned off to completely de-energize the case.
- All surfaces pitch downward to a deep-drawn drain trough, funneling liquids to the center of the case where the waste outlet is located for easy access. Check the waste outlet to insure it is not clogged before starting the cleaning process and avoid introducing water faster than the case drain can carry it away.
- To clean the LED luminaires, shut off the lights in the case, then wipe the luminaires down with a soft, damp cloth. Avoid using harsh or abrasive cleaners as they may damage the lights. Be certain that the luminaires are completely dry before re-energizing.
- Clean from top to bottom when cleaning the display case to avoid cross contamination.
- If any potentially harmful cleaners are used, be certain to provide a temporary separator (e.g., cardboard, plastic wrap, etc.) between those cases that are being cleaned and those that may still contain product.
- Avoid spraying any cleaning liquids directly on the electrical connections.
- Allow cases to be turned off long enough to clean any frost or ice from coil and pans.
- Remove toekick and clean underneath the case with a broom and a long-handled mop. Use warm water and a disinfecting cleaning solution when cleaning underneath the cases.



DANGER

SHOCK HAZARD

Always disconnect power to case when servicing or cleaning. Failure to do so may result in serious injury or death.

Rear Load Doors

1. Remove the rear sliding doors on the back of the case and clean. To remove: push up and pull out (Fig. 12).
2. Use a spray bottle filled with an approved mild detergent and warm water.
3. Use a clean, disposable cloth (approved item) to thoroughly clean all areas of the case.
4. Wipe down doors with a clean, disposable cloth (approved item).
5. Place the cleaned doors on a clean sanitized surface until they are dry.



Fig. 12 Rear load door removal



Contact the Service Parts Department at:

1-844-HPX-PART (1-844-479-7278)

or

dfr-ia-parts@doverfoodretail.com

Provide the following information about the part you are ordering:

- **Model number and serial number*** of the case for which the part is intended.
- **Length of the part** (if applicable).
- **Color of part** (if painted) or color of polymer part.
- **Whether part is for left or right-hand application.**
- **Quantity**

***Data tag is located on the left end exterior panel or top interior of the case.**

If the parts are to be returned for credit, contact the Parts Department. Do not send parts without authorization.

APPENDIX

A1	Wiring Information
B1	Sporlan Pressure-Temperature Chart
C1	Parts List

A1: WIRING DIAGRAM

TBD

B1: SPORLAN PRESSURE-TEMPERATURE CHART



Vacuum-Inches of Mercury
Bold Italic Figures

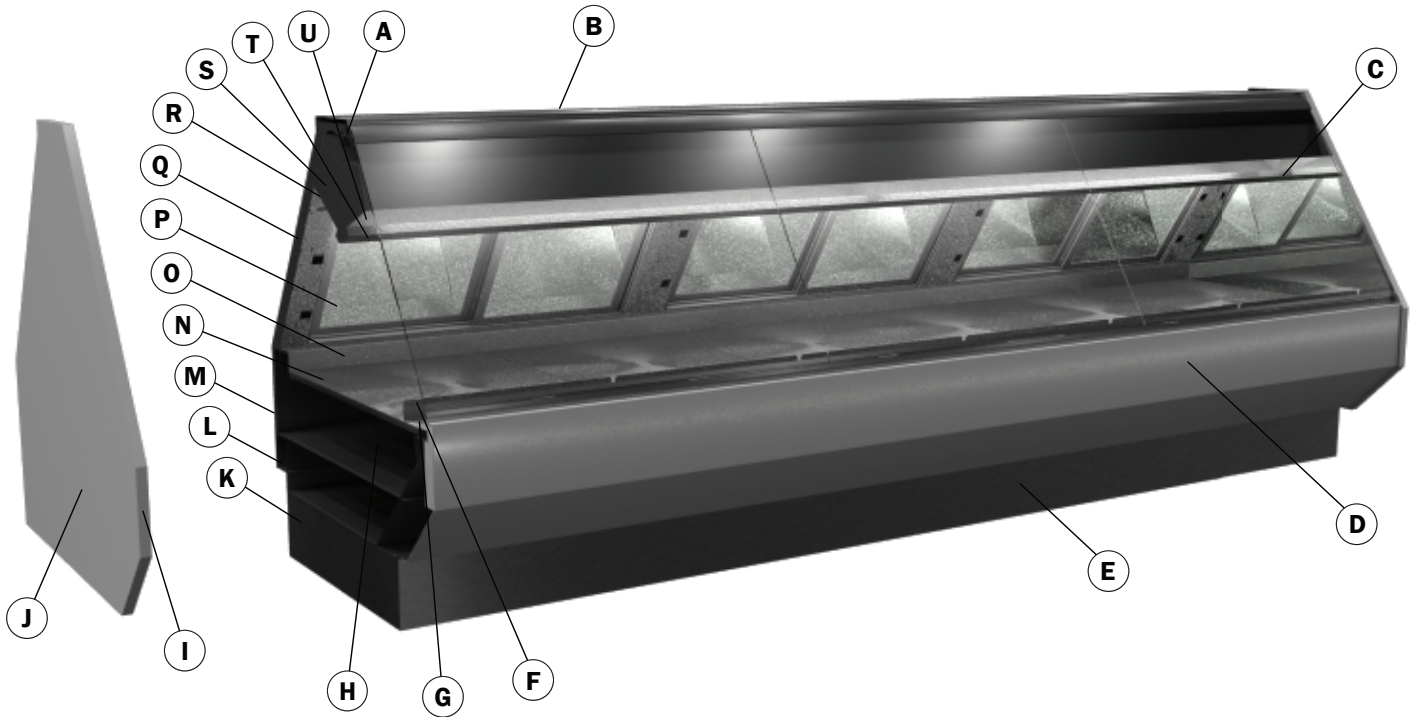
TEMPERATURE PRESSURE CHART - at sea level

Pressure-Pounds Per
Square Inch Gauge

TEMPERATURE (°F)	REFRIGERANT (SPORLAN CODE)			TEMPERATURE			REFRIGERANT (SPORLAN CODE)			TEMPERATURE						
	134a (J)	404A (S)	507 (P)	(°F)	(°C)	134a (J)	404A (S)	507 (P)	(°F)	(°C)	134a (J)	404A (S)	507 (P)			
-60	51.1	21.8	7.3	18.6	79.9	13.1	45.4	48.1	25.6	357.4	5.6	37.0	88.8	92.8	61.6	569.3
-55	48.3	20.3	3.9	16.6	91.1	13.8	46.6	49.3	26.5	363.4	43	38.0	90.6	94.6	63.1	577.6
-50	45.6	18.7	0.1	14.3	103.4	14.4	47.8	50.5	27.5	369.5	44	39.0	92.4	96.5	64.7	586.0
-45	42.8	16.9	2.0	11.7	116.6	15.0	49.0	51.8	28.4	375.6	45	40.1	94.2	98.3	66.3	594.5
-40	40.0	14.8	4.3	8.8	131.0	15.7	50.2	53.0	29.4	381.8	46	41.1	96.0	100.2	67.9	603.1
-35	37.2	12.5	6.8	8.1	146.5	16.4	51.5	54.3	30.4	388.0	47	42.2	97.9	102.1	69.5	611.7
-30	34.4	9.8	9.6	11.0	163.1	17.0	52.7	55.6	31.4	394.3	48	43.2	99.8	104.1	71.1	620.5
-25	31.7	6.9	12.7	14.1	181.0	17.7	54.0	56.9	32.4	400.7	49	44.3	101.7	106.0	72.8	629.3
-20	28.9	3.7	16.0	17.6	200.2	18.4	55.3	58.3	33.5	407.2	50	45.4	103.6	108.0	74.5	638.3
-18	27.8	2.3	17.4	19.1	208.3	19.1	56.6	59.6	34.6	413.8	55	51.2	115.3	118.3	83.4	684.4
-16	26.7	0.8	18.9	20.6	216.5	19.9	58.0	61.0	35.7	420.4	60	57.4	126.0	129.2	92.9	733.1
-14	25.6	0.4	20.4	22.2	225.0	20.6	59.3	62.4	36.8	427.1	65	64.0	137.3	140.7	103.2	784.2
-12	24.4	1.1	22.0	23.8	233.8	21.3	60.7	63.8	37.9	433.8	70	71.1	149.3	153.0	114.2	838.1
-10	23.3	1.9	23.6	25.5	242.7	22.1	62.1	65.3	39.0	440.7	75	78.7	162.0	165.9	125.9	894.9
-8	22.2	2.8	25.3	27.3	251.9	22.9	63.5	66.7	40.2	447.6	80	86.7	175.4	179.6	138.4	954.9
-6	21.1	3.6	27.0	29.1	261.3	23.7	64.9	68.2	41.4	454.6	85	95.2	189.5	194.1	151.8	1018
-4	20.0	4.6	28.8	30.9	271.0	24.5	66.4	69.7	42.6	461.7	90	104.3	204.5	209.3	166.1	**
-2	18.9	5.5	30.7	32.8	280.9	25.3	67.8	71.2	43.8	468.8	95	113.9	220.2	225.4	181.2	**
0	17.8	6.5	32.6	34.8	291.0	26.1	69.3	72.7	45.0	476.1	100	124.2	236.8	242.3	197.3	**
1	17.2	7.0	33.6	35.8	296.2	26.9	70.8	74.3	46.3	483.4	105	135.0	254.2	260.1	214.4	**
2	16.7	7.5	34.6	36.9	301.5	27.8	72.4	75.9	47.6	490.8	110	146.4	272.5	278.8	232.5	**
3	16.1	8.0	35.6	37.9	306.8	28.6	73.9	77.5	48.9	498.3	115	158.4	291.8	298.5	251.6	**
4	15.6	8.5	36.6	39.0	312.1	29.5	75.5	79.1	50.2	505.8	120	171.2	312.1	319.2	271.9	**
5	15.0	9.1	37.7	40.1	317.6	30.4	77.1	80.7	51.6	513.4	125	184.6	333.3	340.9	293.3	**
6	14.4	9.6	38.7	41.1	323.1	31.3	78.7	82.4	52.9	521.2	130	198.7	355.6	363.8	315.8	**
7	13.9	10.2	39.8	42.3	328.6	32.2	80.3	84.1	54.3	529.0	135	213.6	379.1	387.8	339.6	**
8	13.3	10.8	40.9	43.4	334.2	33.1	82.0	85.8	55.7	536.9	140	229.2	403.7	413.0	364.7	**
9	12.8	11.3	42.0	44.5	339.9	34.1	83.7	87.5	57.2	544.8	145	245.7	429.6	439.5	391.0	**
10	12.2	11.9	43.1	45.7	345.7	35.0	85.4	89.2	58.6	552.9	150	262.9	456.8	467.4	418.7	**
11	11.7	12.5	44.3	46.9	351.5	36.0	87.1	91.0	60.1	561.0	155	281.0	485.5	497.0	447.8	**

To determine subcooling for R-404A use BUBBLE POINT values (Temperatures above 50°F — Gray Background); to determine superheat for R-404A, use DEW POINT values (Temperatures 50°F and below).
** = exceeds critical temperature
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C1: PARTS LIST



A	Lift Glass Hardware
B	Case Top
C	Front Lift Glass
D	Die Board
E	Front Toekick
F	Air Return
G	Product Stop
H	Insulated Drain Pan
I	End Panel Trim
J	End Panel
K	End Toekick
L	Electrical Raceway
M	Outside Back
N	Bottom Deck
O	Inside Back
P	Sliding Rear Load Doors
Q	Strut
R	Gravity Coil Air Return
S	Gravity Coil
T	Gravity Coil Drain Trough
U	Gravity Coil Air Discharge



Hill PHOENIX, Inc.
Hereinafter Referred To As Manufacturer

LIMITED WARRANTY

GENERAL WARRANTY

Manufacturer's products are warranted to be free from defects in materials and workmanship under normal use and maintenance for fourteen months from date of shipment from manufacturer (the "Base Warranty Period"). In the event of a qualifying warranty claim, a new or rebuilt part to replace any defective part will be provided without charge. The replacement part is covered under this warranty for the remainder of the applicable Base Warranty Period. In order to be eligible for warranty coverage, customer must: (i) notify Manufacturer promptly upon discovery of a warrant defect, and (ii) comply with the warranty claim procedures provided by Manufacturer from time to time.

This equipment warranty does not include labor or other costs incurred for diagnosing, repairing, removing, installing, shipping, servicing, or handling of either defective parts or replacement parts.

The warranty shall not apply:

1. To any unit or any part thereof which has been subject to accident, alteration, negligence, misuse or abuse, or which has not been operated in accordance with the manufacturer's recommendations, or in conditions outside of Manufacturer's specifications, or if the serial number of the unit has been altered, defaced, or removed.
2. When the unit, or any part thereof, is damaged by fire, flood, or other act of God.
3. To products that are impaired or damaged due to improper installation.
4. When installation and startup forms are not properly completed or returned within two weeks after startup.
5. If the defective part is not returned to the Manufacturer.
6. To service, maintenance or wear and tear parts (such as lights, starters and ballasts)

MODIFICATIONS TO GENERAL WARRANTY

The following sets forth certain modifications to the General Warranty for specific products of Manufacturer:

DISPLAY CASE AND SPECIALTY PRODUCTS CLEARVOYANT® LED LIGHTING

The warranty period for Clearvoyant LED lighting components within the Clearvoyant lighting system is five years from date of shipment.

REMEDY LIMITATION/DAMAGES EXCLUSION

THE REMEDY OF REPAIR OR PROVISION OF A REPLACEMENT PART WITHOUT CHARGE SHALL BE THE EXCLUSIVE REMEDY FOR ANY WARRANTY CLAIM HEREUNDER. WITHOUT LIMITING THE FOREGOING, MANUFACTURER SHALL NOT BE LIABLE UNDER ANY CIRCUMSTANCES FOR INCIDENTAL, INDIRECT OR CONSEQUENTIAL DAMAGES, INCLUDING LOSS OF PROFIT, LABOR COST, LOSS OF REFRIGERANT OR FOOD PRODUCTS.

EXCLUSIVE WARRANTY

THE FOREGOING WARRANTY IS THE EXCLUSIVE WARRANTY WITH RESPECT TO THE PRODUCTS. ALL OTHER WARRANTIES, WHETHER EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION, THE WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, ARE HEREBY DISCLAIMED AND EXCLUDED. NO IMPLIED WARRANTY SHALL BE DEEMED CREATED BY COURSE OF DEALING OR USAGE OF TRADE. NO OTHER PERSON IS AUTHORIZED TO EXPAND OR CREATE ANY OBLIGATION GREATER THAN OR MORE EXPANSIVE THAN THE WARRANTY PROVIDED HEREIN.

Submit warranty claims to:

Hillphoenix Refrigeration & Power

Systems Division
2016 Gees Mill Road
Conyers, GA 30013
Warranty / Service
Phone: 1-833-280-5714

Hillphoenix Display Case Division

1925 Ruffin Mill Road
Colonial Heights, VA 23834
Warranty / Service
Phone: 1-833-280-5714

Hillphoenix Specialty Products Division

703 Franklin Street
Keosauqua, IA 52565
Warranty / Service
Phone: 1-833-280-5714

Warning **Maintenance & Case Care**

When cleaning cases the following must be performed PRIOR to cleaning:

To avoid electrical shock, be sure all electric power is turned off before cleaning. In some installations, more than one switch may have to be turned off to completely de-energize the case.

Do not spray cleaning solution or water directly on fan motors or any electrical connections.

All lighting receptacles must be dried off prior to insertion and re-energizing the lighting circuit.

Please refer to the Use and Maintenance section of this installation manual.

Hillphoenix[®]

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Hillphoenix Specialty Products
1-319-293-3777

703 Franklin Street, PO Box 478, Keosauqua, IA 52565

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