



MULTI-DECK MERCHANDISER INSTALLATION & OPERATIONS MANUAL

AGB-R MEAT/CHEESE

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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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LIABILITY NOTICE

For Cases with Shelf Lighting Systems

Hillphoenix does NOT design any of its shelf lighting systems or any of its display cases with shelf lighting systems for direct or indirect exposure to water or other liquids. The use of a misting system or water hose on a display case with a shelf lighting system, resulting in the direct or indirect exposure of the lighting system to water, can lead to a number of serious issues (including, without limitation, electrical failures, fire, electric shock, and mold) in turn resulting in personal injury, death, sickness, and/or serious property damage (including, without limitation, to the display itself, to the location where the display is situated [e.g., store] and to any surrounding property). DO NOT use misting systems, water hoses or other devices that spray liquids in Hillphoenix display cases with lighted shelves.

If a misting system or water hose is installed or used on a display case with a shelf lighting system, then Hillphoenix shall not be subject to any obligations or liabilities (whether arising out of breach of contract, warranty, tort [including negligence], strict liability or other theories of law) directly or indirectly resulting from, arising out of or related to such installation or use, including, without limitation, any personal injury, death or property damage resulting from an electrical failure, fire, electric shock, or mold.

P079211M, REVO

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.



Revision History

- new manual format_08/12
- parts list_09/12
- energy data and parts list_01/13
- endviews_03/13
- text update and airflow diagram_06/13
- energy data_07/13
- energy data_02/14
- endviews and energy data_09/14
- support diagram and parts list_02/15
- energy data and warranty_04/16
- DOE, CV4 energy data, endview/diagram updates, LED lighting, fan/coil content, Dixell operating instructions removal, wiring diagrams, UL cord/plug "same type" statement and warranty_10/19

ENERGY DATA

AGB REMOTE GRAVITY

Electrical Data

Model		Fans per Case	High Efficiency Fans		Anti-Condensate Fans		Drain Heaters		Optional Defrost Heaters		Humidification ²	
			120 Volts		120 Volts		120 Volts		208 Volts		120 Volts	
			Amps	Watts	Amps	Watts	Amps	Watts	Amps	Watts	Amps	Watts
AGB	4'	--- ¹	---	---	---	---	---	---	---	---	---	---
	6'	---	---	---	---	---	---	---	---	---	---	---
	8'	---	---	---	---	---	---	---	---	---	---	---

Lighting Data

Model		Lights per Row	Light Length (ft)	Clearvoyant 4 LED Lighting (Per Light Row)			
				Standard Power (Cornice or Shelf)		High Power (Cornice)	
				120 Volts		120 Volts	
				Amps	Watts	Amps	Watts
AGB	4'	1	4	0.05	5.9	---	---
	6'	1	4	0.05	5.9	---	---
	8'	1	4	0.05	5.9	---	---

Guidelines & Control Settings (DX)

Model		Conventional ⁴ BTUH/ft	Parallel ⁵ BTUH/ft	Superheat Set Point @ Bulb (°F)	Evaporator (°F)	Discharge Air (°F)	Discharge Air ⁷ Velocity (FPM)
AGB	Gravity Coil	1527	500	12	15	28	---
	Serpentine	255	50	8-10	33 ⁶	---	---
	RLS ³	255	200	8-10	---	28	---

Guidelines & Control Settings (Glycol)

Model		Conventional BTUH/ft	Parallel BTUH/ft	Supply Temp. (°F)	Flow Rate GPM/ft	Charge GAL/ft	Cut-In Temp (°F)	Cut-Out Temp (°F)
AGB	Gravity Coil	1527	500	20	0.8	0.5	---	---
	Serpentine	255	50	20	0.1	0.5	---	---
	RLS	255	200	20	0.1	0.5	28	26

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 efficiency requirements.
 Numbers are based on standard case sizes. Consult engineering.



AGB REMOTE GRAVITY

Defrost Controls

Model		Defrosts ^{9,10} 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)
AGB	Gravity Coil	4	0	---	---	90	47	---	---
	Serpentine ⁸	---	---	---	---	---	---	---	---
	RLS	6	0	---	---	20	47	---	---

1 NOTE: "---" indicates data not applicable.

2 Optional humidification system available to boost humidity. Humidity levels are determined by store aged beef programs.

3 RLS - Refrigerated Lower Storage.

4,5 Listed BTUH indicates unlighted shelves. Add the following for lighted shelves:

4' Shelf LED: 36 BTUH

4' Canopy LED: 72 BTUH

3' Shelf LED: 27 BTUH

3' Hi-Output LED: 54 BTUH

6 EPR valve is factory installed.

7 Average discharge air velocity at peak of defrost.

8 Defrost is tied to gravity coil.

9 DX units equipped with RH systems require 2 defrosts per day with a fail-safe of 120 minutes.

10 Glycol units equipped with RH systems require 3 defrosts per day with a fail-safe of 120 minutes.

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.

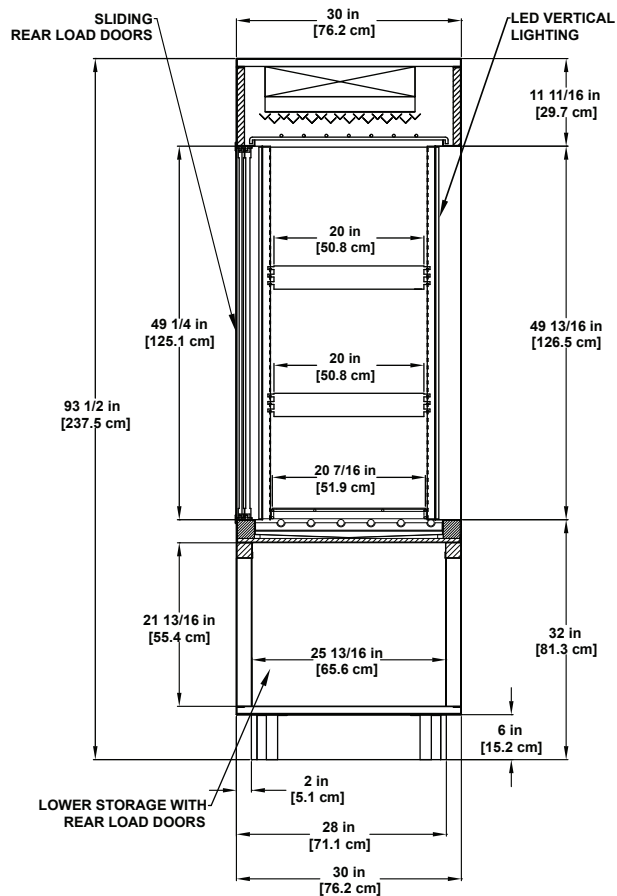
Hillphoenix refrigerated display cases for sale in the United States meet or exceed department of energy 2017 efficiency requirements.

Numbers are based on standard case sizes. Consult engineering.

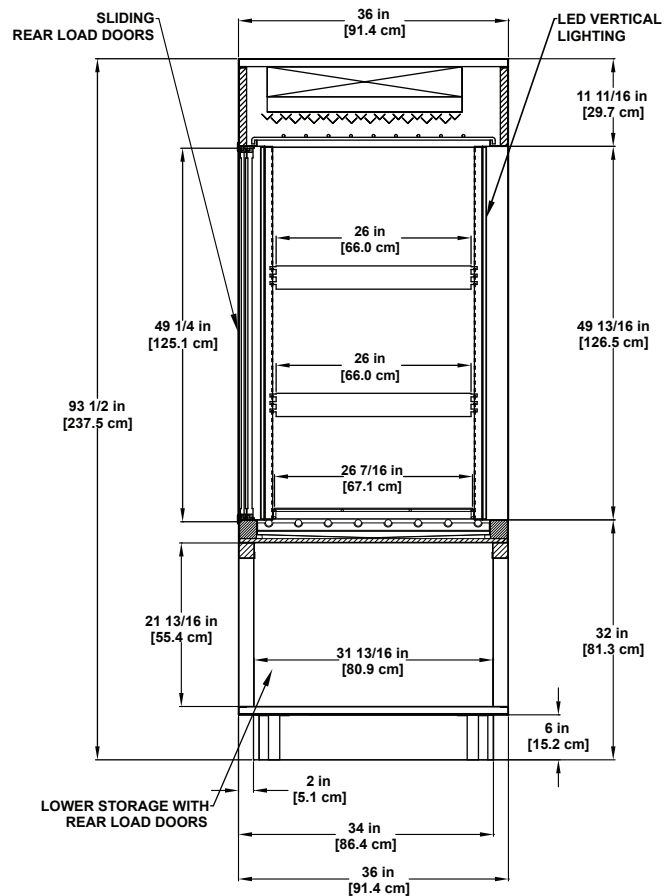


CASE DIMENSIONS

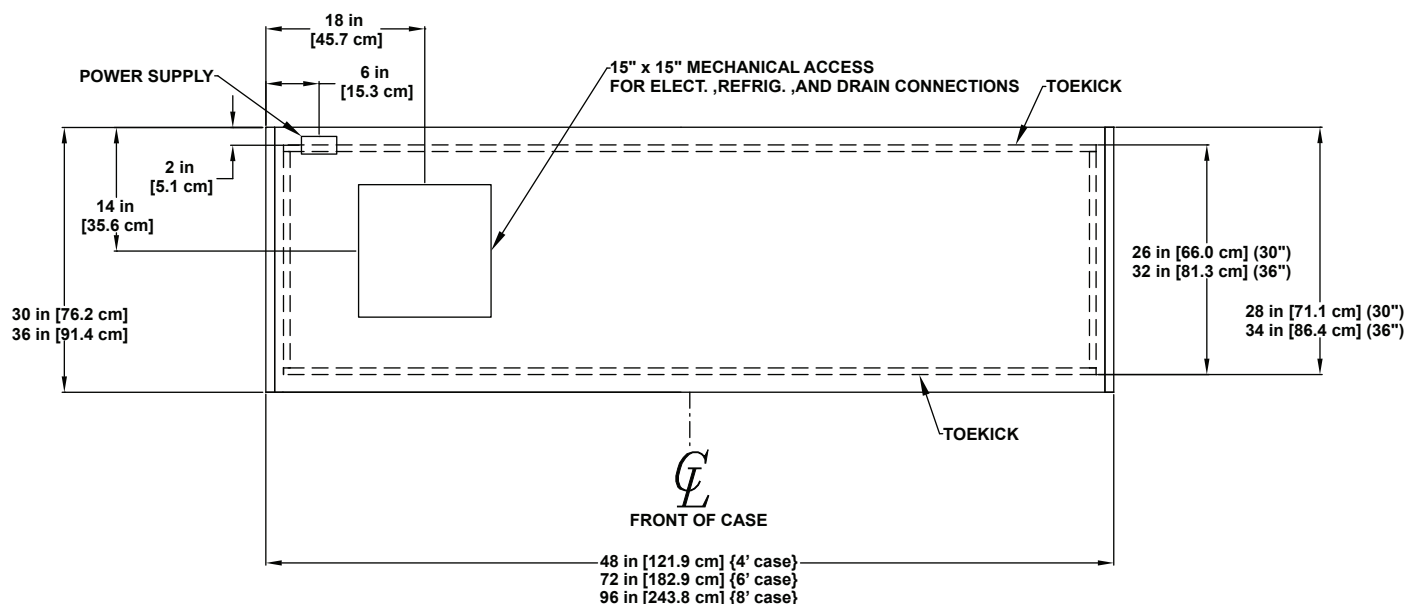
AGB REMOTE GRAVITY



30" PROFILE



36" PROFILE



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 AGB-R aged meat and cheese application, service multi-deck merchandiser.

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 & TECHNICAL SUPPORT

For service or technical questions regarding specialty cases, please contact our Specialty Products Division Service Department at 1-319-293-3777. For questions regarding our refrigeration systems or electrical distribution centers, please contact our Systems Division Customer Service Department at 1-770-388-0706.

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.*) When you have this information, call the number below and ask for a Service Parts Representative.

Hillphoenix Specialty Products
703 Franklin Street, PO Box 478
Keosauqua, IA 52565
Tel: (319) 293-3777/Fax: (319) 293-3776
Website: www.hillphoenix.com

CASE INSTALLATION

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. Carefully, lift case up and off the pallet. Remove dust cover. Installation hardware ships in a marked packet located inside the case.
4. 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 vertical supports as this will help ensure that the case is not settling over time.
5. Locate vertical support (Fig. 1) positions along the chalk line. Spot properly leveled shim packs at each support location.

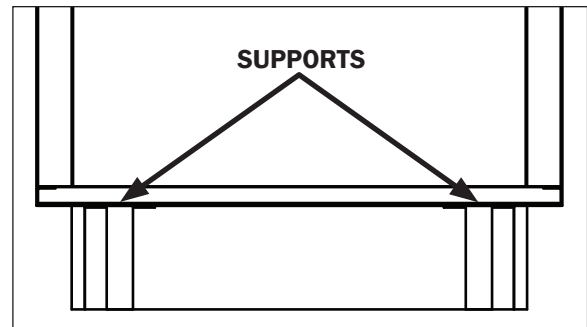


Fig. 1 Vertical supports



CAUTION

Locate the vertical 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, leaving a minimum of 2" between the wall and back of case. Using a "J" bar, raise the end of the case (under cross support), and lower the vertical support on to the shim packs. Repeat on the other end of the case.
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. Bolt the base brackets to the bottom outside-front and back of both line-up cases (Fig. 2). Repeat this with the domino brackets to the top of the cases ensuring that brackets are fastened to both cases securely (Fig. 3).
4. Properly align the front panels as needed, then install, if applicable, front panel trim (supplied).
5. Install the bumper, if applicable, into pre-attached bumper



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.

track and snap into place.

6. 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.
7. Install case shelves and reconnect lights. Be aware that differing shelf configurations will affect energy consumption and case performance.
8. Snap toekick back onto the base of case.

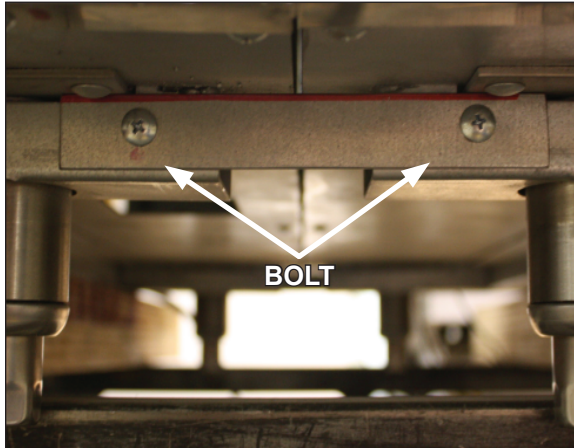


Fig. 2 Horizontal base bracket



Fig. 3 Domino bracket



CAUTION

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

CASE CONNECTIONS

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 *diagram on page 9 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. 4) 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. 4 "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 power supply box.

Bottom Piped - The power supply box can be accessed through the lower storage doors and will be mounted to the left interior panel.

Top Piped - The power supply box is mounted to the case top.

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).*

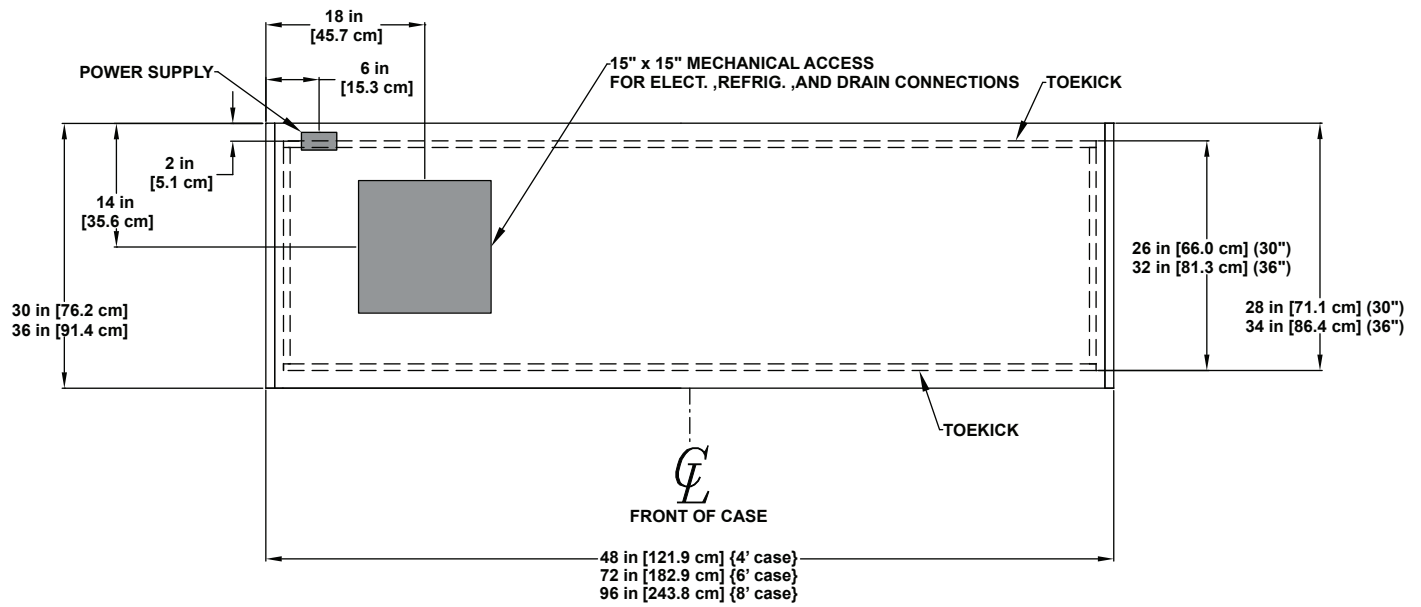
CAUTION

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.

MECHANICAL ACCESS LOCATIONS



LIGHTING & POWER SUPPLIES

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 look to the back of the interior lower storage. The power supply can be located here mounted to the interior back panel wall.

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.

LED LUMINAIRES

Removing LED luminaires:

1. Unplug the luminaire (Fig. 5).
2. Remove the screws from the light clamps (Fig. 6) 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.

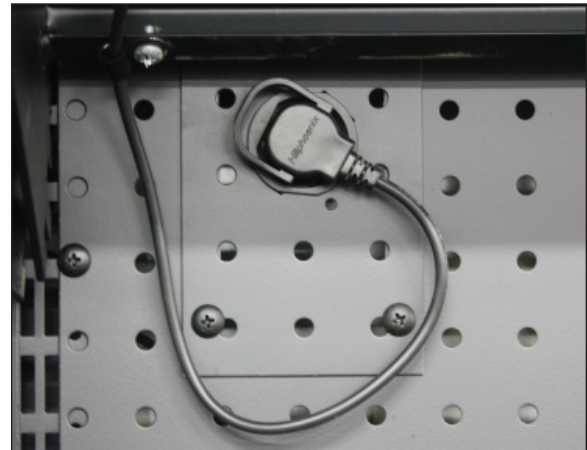


Fig. 5 LED light power cord

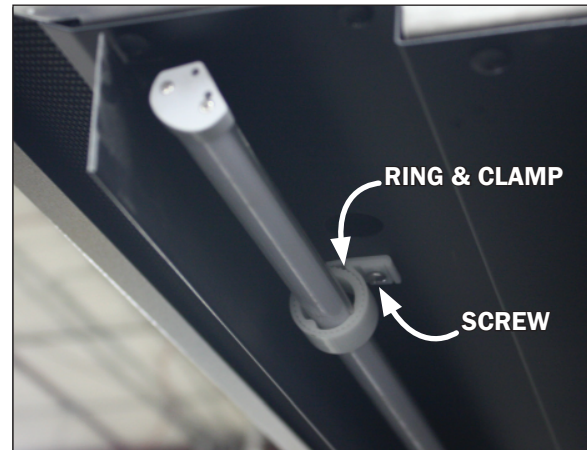
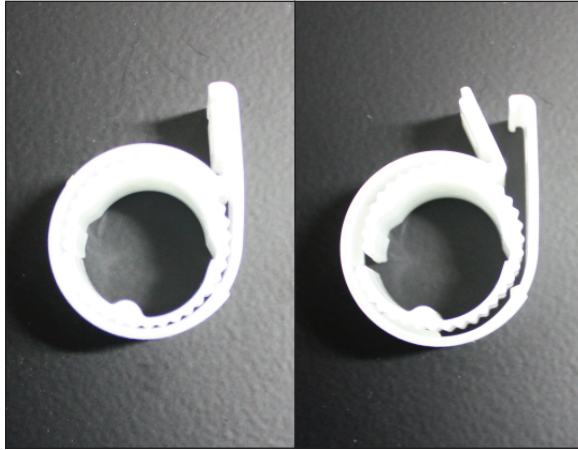


Fig. 6 LED light & ring/clamp

3. Remove the closed clamps and inner rings (Fig. 7) by unclipping the clamp ends located above the screw opening. This will release the grip around the inner ring (Fig. 8) 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. 7 Closed clamp****Fig. 8 Open clamp****Fig. 9 LED ring and clamp****Re-installing LED luminaires:**

1. Place a ring (Fig. 9) 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. 9) over each ring and close them tight around the rings by clipping together the clamp ends located above the screw opening.
3. Line-up the closed clamps (Fig. 7) 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. 5)**
- ☐ **Have you checked the vertical plumb of the case? The horizontal level? (see pg. 6)**
- ☐ **Have you installed the toekick? (see pg. 7)**
- ☐ **Have you removed the shipping blocks from the refrigeration and plumbing lines? (see pg. 8)**

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. 10). Overloading will cause malfunction and the loss of proper temperature levels, particularly when discharge and return air sections are covered.

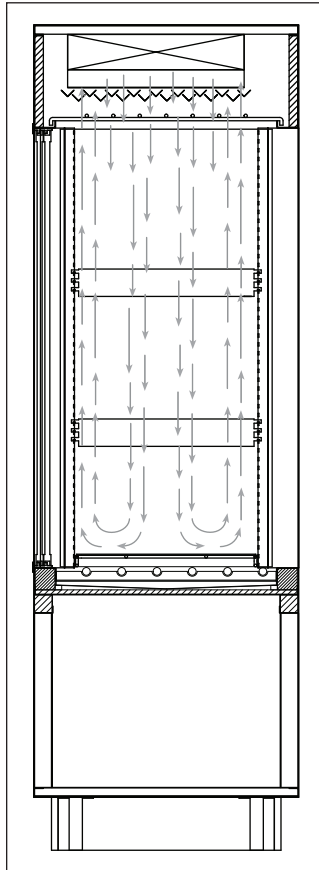


Fig. 10 Airflow pattern



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 Electric, 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.

HUMIDIFICATION SYSTEMS

The starting point for proper humidity levels in the AGB display case are typically around 75% RH when stocked with product. The RH will vary during defrost or cycling. A humidification system is recommended to ensure consistent performance in all store ambient. Several factors to consider are listed below and adjustments may need to be made to the setting for particular configurations to maintain humidity levels within a case.

- 1. 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.
- 2. Desired Case Temperature** - Hillphoenix recommends a set point of 33°-36°F. If the meat is too cold the meat may freeze and the aging process will slow or stop. If the meat is too warm it will spoil.
- 3. Dry Aging Process** - Dry aged beef is typically stored for 14-21 days in a humidity and temperature controlled environment. The product moisture content, desired shrink and approximate time spent in the aging process all are factors related to the amount of humidity the product releases into the case environment.

All set points and parameters are starting point and must be adjusted to meet ambient conditions and desired product temperatures.

If store conditions are very dry, an optional humidification system is recommended.

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 B1).
3. Finally, subtract the converted temperature reading from the actual temperature reading for superheat setting.

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.



WARNING

Exercise extreme caution when working in a case with the coil cover removed. The coil contains many sharp edges that can result in severe cuts to the hands and arms.

Rear Load & Lower Storage Doors

1. Remove the rear sliding doors on the back of the case and clean. To remove: push up and pull out (Fig. 11).
Note: The same applies for optional lower storage doors (RRS/DRS and RLS/DLS).



Fig. 11 Rear load door removal

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.



**THIS DOCUMENT CONTAINS IMPORTANT INFORMATION ABOUT
CLEANING YOUR ULTRAVISION® ANTI-REFLECTIVE GLASS!
PLEASE READ AND FOLLOW THESE INSTRUCTIONS TO
PREVENT DAMAGE TO THE ANTI-REFLECTIVE COATINGS.**

SOVIS ULTRAVISION® tempered glass specialized Anti-Reflective coatings on each surface of the glass. These coatings reduce the glare from lighting so that the products on display are more visible to your customers.

While the Anti-Reflective coatings are durable, they are susceptible to scratching if abrasive materials are used for cleaning. Once the glass surfaces are scratched, it is impossible to restore the original finish. Special care must be taken to prevent damage when cleaning the glass. SOVIS recommends the following products for routine cleaning of ULTRAVISION® Anti-Reflective glass:

Cleaning Cloths – two products are recommended...

- **Scotch-Brite® High Performance Cloth** – manufactured by 3M® and available in most grocery stores under the name *Scotch-Brite® Microfiber Cleaning Cloth* in a 12" x 14" size. This cloth is washable and may be reused as long as it remains clean.
- **Spontex® Microfibre Cleaning Cloth** – distributed by Spontex® and available in most grocery stores under the same name in a 15.75" x 12" size. This cloth is washable and may be reused as long as it remains clean.

Cleaning Fluid – for more difficult cleaning jobs, these products are recommended...

- **Windex®** - standard product only (extra-strength or specialty products may not be suitable)
- **Glass-Plus®** - standard product only (extra-strength or specialty products may not be suitable)
- **Exceed® Multi-Surface & Glass Cleaner** – from Kay Chemical Company, Greensboro, NC
- **Warm Water**

Note: equivalent store-brand glass cleaning products are normally acceptable substitutes to the brand name products listed above.

The cleaning cloths named above will normally remove dust, grease, oil, and fingerprints without the need for cleaning fluids. A light spray of the cleaning fluids listed above will reduce the time required for cleaning. These materials have been tested and proven to clean ULTRAVISION® glass without scratching or damaging the Anti-Reflective coatings. If you need assistance with obtaining these materials, please contact your display case supplier.

Under no circumstances should the following types of materials be used for cleaning glass with ULTRAVISION® Anti-Reflective coatings.

- Coarse Paper Towels
- Scouring Pads or Powders
- Steel Wool or Steel Fiber Materials
- Blades
- Acidic or highly Alkaline detergents
- Fluorine based detergents



CAUTION

Do not use these materials for cleaning glass.





Contact the Service Parts Department at:

319-293-3777

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.

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

A1: WIRING DIAGRAM

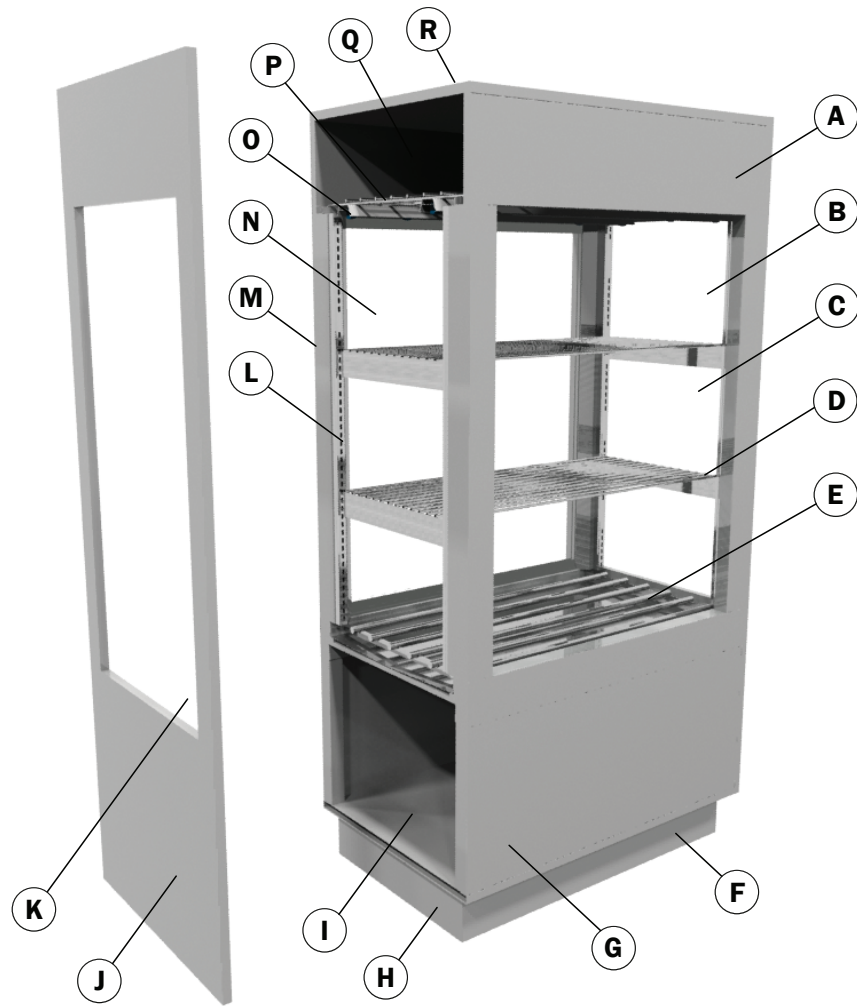
TBD

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		REFRIGERANT (SPORLAN CODE)				TEMPERATURE		REFRIGERANT (SPORLAN CODE)				TEMPERATURE		REFRIGERANT (SPORLAN CODE)						
(°F)	(°C)	134a (J)	404A (S)	507 (P)	717 (A)	744 - CO ₂	(°F)	(°C)	134a (J)	404A (S)	507 (P)	717 (A)	744 - CO ₂	(°F)	(°C)	134a (J)	404A (S)	507 (P)	717 (A)	744 - CO ₂
-60	-51.1	21.8	7.3	5.8	18.6	79.9	12	-11.1	13.1	45.4	48.1	25.6	357.4	42	5.6	37.0	88.8	92.8	61.6	569.3
-55	-48.3	20.3	3.9	2.2	16.6	91.1	13	-10.6	13.8	46.6	49.3	26.5	363.4	43	6.1	38.0	90.6	94.6	63.1	577.6
-50	-45.6	18.7	0.1	0.9	14.3	103.4	14	-10.0	14.4	47.8	50.5	27.5	369.5	44	6.7	39.0	92.4	96.5	64.7	586.0
-45	-42.8	16.9	2.0	3.0	11.7	116.6	15	-9.4	15.0	49.0	51.8	28.4	375.6	45	7.2	40.1	94.2	98.3	66.3	594.5
-40	-40.0	14.8	4.3	5.4	8.8	131.0	16	-8.9	15.7	50.2	53.0	29.4	381.8	46	7.8	41.1	96.0	100.2	67.9	603.1
-35	-37.2	12.5	6.8	8.1	5.4	146.5	17	-8.3	16.4	51.5	54.3	30.4	388.0	47	8.3	42.2	97.9	102.1	69.5	611.7
-30	-34.4	9.8	9.6	11.0	1.6	163.1	18	-7.8	17.0	52.7	55.6	31.4	394.3	48	8.9	43.2	99.8	104.1	71.1	620.5
-25	-31.7	6.9	12.7	14.1	1.3	181.0	19	-7.2	17.7	54.0	56.9	32.4	400.7	49	9.4	44.3	101.7	106.0	72.8	629.3
-20	-28.9	3.7	16.0	17.6	3.6	200.2	20	-6.7	18.4	55.3	58.3	33.5	407.2	50	10.0	45.4	103.6	108.0	74.5	638.3
-18	-27.8	2.3	17.4	19.1	4.6	208.3	21	-6.1	19.1	56.6	59.6	34.6	413.8	55	12.8	51.2	115.3	118.3	83.4	684.4
-16	-26.7	0.8	18.9	20.6	5.6	216.5	22	-5.6	19.9	58.0	61.0	35.7	420.4	60	15.6	57.4	126.0	129.2	92.9	733.1
-14	-25.6	0.4	20.4	22.2	6.7	225.0	23	-5.0	20.6	59.3	62.4	36.8	427.1	65	18.3	64.0	137.3	140.7	103.2	784.2
-12	-24.4	1.1	22.0	23.8	7.8	233.8	24	-4.4	21.3	60.7	63.8	37.9	433.8	70	21.1	71.1	149.3	153.0	114.2	838.1
-10	-23.3	1.9	23.6	25.5	9.0	242.7	25	-3.9	22.1	62.1	65.3	39.0	440.7	75	23.9	78.7	162.0	165.9	125.9	894.9
-8	-22.2	2.8	25.3	27.3	10.3	251.9	26	-3.3	22.9	63.5	66.7	40.2	447.6	80	26.7	86.7	175.4	179.6	138.4	954.9
-6	-21.1	3.6	27.0	29.1	11.5	261.3	27	-2.8	23.7	64.9	68.2	41.4	454.6	85	29.4	95.2	189.5	194.1	151.8	1018
-4	-20.0	4.6	28.8	30.9	12.9	271.0	28	-2.2	24.5	66.4	69.7	42.6	461.7	90	32.2	104.3	204.5	209.3	166.1	**
-2	-18.9	5.5	30.7	32.8	14.3	280.9	29	-1.7	25.3	67.8	71.2	43.8	468.8	95	35.0	113.9	220.2	225.4	181.2	**
0	-17.8	6.5	32.6	34.8	15.7	291.0	30	-1.1	26.1	69.3	72.7	45.0	476.1	100	37.8	124.2	236.8	242.3	197.3	**
1	-17.2	7.0	33.6	35.8	16.4	296.2	31	-0.6	26.9	70.8	74.3	46.3	483.4	105	40.6	135.0	254.2	260.1	214.4	**
2	-16.7	7.5	34.6	36.9	17.2	301.5	32	0.0	27.8	72.4	75.9	47.6	490.8	110	43.3	146.4	272.5	278.8	232.5	**
3	-16.1	8.0	35.6	37.9	18.0	306.8	33	0.6	28.6	73.9	77.5	48.9	498.3	115	46.1	158.4	291.8	298.5	251.6	**
4	-15.6	8.5	36.6	39.0	18.8	312.1	34	1.1	29.5	75.5	79.1	50.2	505.8	120	48.9	171.2	312.1	319.2	271.9	**
5	-15.0	9.1	37.7	40.1	19.6	317.6	35	1.7	30.4	77.1	80.7	51.6	513.4	125	51.7	184.6	333.3	340.9	293.3	**
6	-14.4	9.6	38.7	41.1	20.4	323.1	36	2.2	31.3	78.7	82.4	52.9	521.2	130	54.4	198.7	355.6	363.8	315.8	**
7	-13.9	10.2	39.8	42.3	21.2	328.6	37	2.8	32.2	80.3	84.1	54.3	529.0	135	57.2	213.6	379.1	387.8	339.6	**
8	-13.3	10.8	40.9	43.4	22.1	334.2	38	3.3	33.1	82.0	85.8	55.7	536.9	140	60.0	229.2	403.7	413.0	364.7	**
9	-12.8	11.3	42.0	44.5	22.9	339.9	39	3.9	34.1	83.7	87.5	57.2	544.8	145	62.8	245.7	429.6	439.5	391.0	**
10	-12.2	11.9	43.1	45.7	23.8	345.7	40	4.4	35.0	85.4	89.2	58.6	552.9	150	65.6	262.9	456.8	467.4	418.7	**
11	-11.7	12.5	44.3	46.9	24.7	351.5	41	5.0	36.0	87.1	91.0	60.1	561.0	155	68.3	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

C1: PARTS LIST



A	Cornice
B	Fixed Front Glass
C	Adjustable Shelf Bracket
D	Stainless Steel Wire Shelf
E	Bottom Deck SS Wire Riser
F	Front Toekick
G	Outside Front
H	End Toekick
I	Dry or Refrigerated Lower Storage
J	End Panel
K	Fixed End Glass
L	Shelf Standard
M	Outside Back
N	Rear Load Doors
O	Light Guard
P	Upper-Interior Wire Grid
Q	Gravity Coil Location
R	Case Top



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®

A  **DOVER**™ COMPANY

Tel: 319-293-3777

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

Due to our commitment to continuous improvement, all specifications are subject to change without notice.

Hillphoenix is a Sustaining Member of the American Society of Quality.

Visit our website at www.hillphoenix.com

