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.
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

• new manual format_05/21
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.
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.

### ELECTRICAL DATA

<table>
<thead>
<tr>
<th></th>
<th>Fans Per Case</th>
<th>High Efficiency Fans 120 Volts</th>
<th>Anti-Condensate Fans 120 Volts</th>
<th>Drain Heaters 120 Volts</th>
<th>Optional Defrost Heaters 208 Volts</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Amps</td>
<td>Watts</td>
<td>Amps</td>
<td>Watts</td>
</tr>
<tr>
<td>1 Tier</td>
<td>1</td>
<td>0.30</td>
<td>36.0</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>2 Tier</td>
<td>1</td>
<td>0.30</td>
<td>36.0</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>4 Tier</td>
<td>2</td>
<td>0.80</td>
<td>72.0</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>6 Tier</td>
<td>3</td>
<td>0.90</td>
<td>108.0</td>
<td>---</td>
<td>---</td>
</tr>
</tbody>
</table>

### LIGHTING DATA

<table>
<thead>
<tr>
<th>Lights Per Row</th>
<th>Light Length</th>
<th>Clearvoyant 4 LED Lighting (Per Light Row)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Standard Power (Cornice or Shelf) 120 Volts</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Amps</td>
</tr>
<tr>
<td>1 Tier</td>
<td></td>
<td>---</td>
</tr>
<tr>
<td>2 Tier</td>
<td></td>
<td>---</td>
</tr>
<tr>
<td>4 Tier</td>
<td></td>
<td>---</td>
</tr>
<tr>
<td>6 Tier</td>
<td></td>
<td>---</td>
</tr>
</tbody>
</table>

### GUIDELINES AND CONTROL SETTINGS (DX)

<table>
<thead>
<tr>
<th>BTUH/Tier</th>
<th>Superheat Set Point @ Bulb (°F)</th>
<th>Evaporator (°F)</th>
<th>Discharge Air (°F)</th>
<th>Discharge Air Velocity (FPM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1400</td>
<td>8 - 10</td>
<td>20</td>
<td>29</td>
<td>140</td>
</tr>
</tbody>
</table>

### DEFROST CONTROLS

<table>
<thead>
<tr>
<th>Defrosts Per Day</th>
<th>Run-Off Time (Min)</th>
<th>Electric Defrost Fail-Safe (Min)</th>
<th>Termination Temp (°F)</th>
<th>Timed-Off Defrost Fail-Safe (Min)</th>
<th>Termination Temp (°F)</th>
<th>Hot Gas Defrost Fail-Safe (Min)</th>
<th>Termination Temp (°F)</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>---</td>
<td>---</td>
<td>40</td>
<td>42</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
</tbody>
</table>

**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 measured from front facing.
- Discharge air velocity measured from deck perforations.

---

**TECHNICAL REFERENCE**

**OB-R**

Self-Service Open Multi-Deck Tiered Bulk Produce Merchandiser

1, 2, 4 & 6 Tier (Produce)

<table>
<thead>
<tr>
<th>Rev. Date</th>
<th>Rev. #</th>
<th>Rev. Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>05-27-21</td>
<td>2</td>
<td>END VIEW UPDATE</td>
</tr>
<tr>
<td>09-15-20</td>
<td>1</td>
<td>NEW STANDARDS</td>
</tr>
</tbody>
</table>
TECHNICAL REFERENCE

OB-R
Self-Service Open Multi-Deck Tiered Bulk Produce Merchandiser
1, 2, 4 & 6 Tier (Produce)

NOTES:
• Shown with optional wood cladding.

2017 DOE COMPLIANT

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.

OB-R

<table>
<thead>
<tr>
<th>Rev. Date</th>
<th>Rev. #</th>
<th>Rev. Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>05-27-21</td>
<td>2</td>
<td>END VIEW UPDATE</td>
</tr>
<tr>
<td>09-15-20</td>
<td>1</td>
<td>NEW STANDARDS</td>
</tr>
</tbody>
</table>
NOTES:
- Shown with optional wood cladding.

Rev. Date Rev. # Rev. Title
05-27-21 2 END VIEW UPDATE
09-15-20 1 NEW STANDARDS
### TECHNICAL REFERENCE

**OB-R**

Self-Service Open Multi-Deck Tiered Bulk Produce Merchandiser

1, 2, 4 & 6 Tier (Produce)

---

**NOTES:**
- Shown with optional wood cladding.

---

**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.**

---

<table>
<thead>
<tr>
<th>Rev. Date</th>
<th>Rev. #</th>
<th>Rev. Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>05-27-21</td>
<td>2</td>
<td>END VIEW UPDATE</td>
</tr>
<tr>
<td>09-15-20</td>
<td>1</td>
<td>NEW STANDARDS</td>
</tr>
</tbody>
</table>
Self-Service Open Multi-Deck Tiered Bulk Produce Merchandiser

1, 2, 4 & 6 Tier (Produce)

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.

Rev. Date    Rev. #    Rev. Title
05-27-21    2        END VIEW UPDATE
09-15-20    1        NEW STANDARDS
TECHNICAL REFERENCE

OB-R
Self-Service Open Multi-Deck Tiered Bulk Produce Merchandiser
1, 2, 4 & 6 Tier (Produce)

NOTES:
• Shown with optional wood cladding.
TECHNICAL REFERENCE

OB-R
Self-Service Open Multi-Deck Tiered Bulk Produce Merchandiser
1, 2, 4 & 6 Tier (Produce)

11 3/8" [28.9 cm]
5" [12.7 cm]
17 1/8" [43.5 cm]
26 5/8" [67.6 cm]

OVERALL
69" [175.3 cm]

FRONT OF CASE
61 1/2" [156.2 cm]

TOEKICK
100 1/2" [255.3 cm]

OVERALL
108" [274.3 cm]

15" X 15" MECHANICAL ACCESS

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.

2017 DOE

END VIEW UPDATE

NEW STANDARDS

Rev. Date | Rev. # | Rev. Title
---|---|---
05-27-21 | 2 | END VIEW UPDATE
09-15-20 | 1 | NEW STANDARDS
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 OB-R produce application self-service single/multi-deck tiered bulk 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 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.)
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 supports 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.

   ![Horizontal supports](image1)

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.

   ![Seismic anchoring locations](image2)

**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
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.
**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 4-9 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 plumbing connections are compliant with local codes.

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

**PLUMBING**

The drain outlet or “P” trap (Fig. 3) 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. 3 "P" trap / drain outlet](image)

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.

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

**ELECTRICAL HOOKUPS & POWER SUPPLY ACCESS**

Electrical hookups are made through the power supply box (Fig. 4) that can be accessed by removing the marked compartment panel.

![Fig. 4 Clear view of the driver](image)

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.
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. 10)

☐ Have you checked the vertical plumb of the case? The horizontal level? (see pg. 11)

☐ Have you installed the toekick? (see pg. 12)

☐ Have you removed the shipping blocks from the refrigeration and plumbing lines? (see pg. 13)

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. 5-8). Overloading will cause malfunction and the loss of proper temperature levels. Note: The tier configuration will vary.

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

CAUTION

Use specific products for disinfection and cleaning: use soft, non-abrasive sponges and rags!

Fans and Pressure Plate
1. Disconnect power to the case and wait for fans to come to a complete stand-still.
2. To reach the fans and pressure plate first remove the base deck with help of the pre-drilled access lift supplied (Fig. 9 & 10). Note: It is recommended that more than one person lift the deck.
3. To access the underside of the fans first remove the screws on the top ends and front sill of the pressure plate cover (Fig. 11). Lift the pressure plate by use of the provided lift handles (Fig. 11). There are hinges shared between the pressure plate and coil covers. Note: It is recommended that more than one person lift the pressure plate. The topside of pressure plate will rest against the topside of the coil cover, exposing the underside of the pressure plate and fans.
4. Clean as necessary. Use a spray bottle filled with an approved mild detergent and warm water.
5. Be sure to move the pressure plate back to its original position after cleaning and/or inspection is complete.

CAUTION

Only lift the pressure plate and/or coil cover for a qualified inspector or a trained service provider. Failure to do so may result in damage to the refrigerant system.
CASE CLEANING

**DANGER**

When carrying out cleaning work or maintenance on the condensing unit it is essential to disconnect the machine and all its accessories from the main power.

**WARNING**

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

**CAUTION**

Do not pressure wash equipment as damage to electrical components may result.

**DANGER**

Be careful of the elements inside the condensate dissipator pan: this operates at high temperature.

**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.

**CAUTION**

Always be sure to move the pressure plate and screw the coil cover back to their original position after the cleaning and/or inspection is complete. Failure to do so may result in damage to the refrigerant system.

**UNSCHEDULED CASE MAINTENANCE**

Unscheduled maintenance concerns all those tasks that cannot normally be carried out by the routine user as specified. Such tasks require qualified personnel with specific technical skills (e.g. refrigeration system specialists, electricians etc.) and must be carried out at least once a year. See the scheduled maintenance table for a list of the main tasks. (Fig. 13).

If inspection reveals any rust, cracks and etc...it will be necessary to carry out repairs and/or replacement of parts so that the case meets code and the display case is in prime operating condition. To enhance safety, it is recommended that you always seek the advice of a specialized technician before carrying out any repair work.

**PARTS SUBJECT TO WEAR & SPARE PARTS**

Most spare parts carry clear, complete ID information. It is important that the refrigerated case parts be replaced by analogous parts of equivalent safety and quality: to order spare parts please contact Hillphoenix, stating the case model and serial number, found in this manual or on the case ID plate, and provide a description of the component and the desired quantity. Refer to the Parts section in the back of the manual for parts ordering and to identify parts that may need to be replaced.

---

Coil Inspection

1. Disconnect power to the case and wait for fans to come to a complete stand-still.

2. Remove the top two screws at both ends of the coil cover (Fig. 11), as well as the screws from the top ends and front sill of the pressure plate cover (Fig. 11). Be sure to save the removed screws for reassembly.

3. Carefully, without bending the sheet metal cover, with the use of the handles provided, gently slide the coil cover with the pressure plate assembly forward to expose the evaporator coil.

4. Clean as necessary. Use a spray bottle filled with an approved mild detergent and warm water. **This location should be accessed by qualified personnel only.**

5. Be sure to screw the coil cover back to its original position after cleaning and/or inspection is complete.
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-B3 ............................................................................................................. Dixell Operating Instructions
C1 .................................................................................................................. Sporlan Pressure-Temperature Chart
D1 .................................................................................................................. Parts List
1. CONTENTS

1. Contents
2. General warnings
3. General description
4. Regulation
5. Defrost
6. Front panel commands
7. Parameters
8. Digital inputs
9. Installation and mounting
10. Electrical connections
11. How to use the hot key
12. Alarm-signal
13. Technical data
14. Configuration
15. Default setting values

2. GENERAL WARNINGS

PLEASE READ BEFORE USING THIS MANUAL

1. This manual is part of the product and should be kept near the instrument for easy and quick reference.
2. The instrument shall not be used for purposes different from those described hereunder. It cannot be used as a safety device.
3. Check the application limits before proceeding.

SAFETY PRECAUTIONS

- Check the supply voltage is correct before connecting the instrument.
- Do not expose to water or moisture. Use the controller only within the operating limits avoiding sudden temperature changes with high atmospheric humidity to prevent formation of condensation.
- Warning: disconnect all electrical connections before any kind of maintenance.
- Fill the probe where it is not accessible by the End User. The instrument must not be opened.
- In case of failure or faulty operation send the instrument back to the distributor or to “Dixell S.p.A.” (see address) with a detailed description of the fault.
- Consider the maximum current which can be applied to each relay (see Technical Data).
- Ensure that the wires for probes, loads and the power supply are separated and far enough from each other without crossing or interlocking.
- In case of applications in industrial environments, the use of mains filters (our mod. FT1) in parallel with inductive loads could be useful.

3. GENERAL DESCRIPTION

The XR03CX, in 32x74x55mm short format, is microprocessor based controller suitable for applications on normal temperature refrigerating units. It provides two relay output: one for compressor and the other one for alarm signalling or as auxiliary output. It provides an NTC probe input and a digital input for alarm signalling, switching the auxiliary output or for start defrost. The instrument is fully configurable through special parameters that can be easily programmed through the keyboard or the by HOTKEY.

The XR04CX, in 32x74x55mm short format, is microprocessor based controller suitable for applications on normal or low temperature refrigerating units. It provides two relay output: one for compressor and the other for defrost. It provides two NTC probe inputs, one for room temperature and other one to control defrost termination. The instrument is fully configurable through special parameters that can be easily programmed through the keyboard or by HOTKEY.

4. REGULATION

The regulation is performed according to the temperature measured by the thermostat probe with a positive differential from the set point if the temperature increases and reaches set point plus differential the compressor is started and then turned off when the temperature reaches the set point value again.

In case of fault in the thermostat probe the start and stop of the compressor are timed through parameters "C" and "Cn".

5. DEFROST

XR03CX

Defrost is performed through a simple stop of the compressor. Parameter "id" controls the interval between defrost cycles, while its length is controlled by parameter "Md".

XR04CX

Two defrost modes are available through the "id" parameter:
- tdHEL: defrost through electrical heater (compressor OFF)
- tihm: hot gas defrost (compressor ON)

Other parameters are used to control the interval between defrost cycles (id, ), its maximum length (Md) and two defrost modes: timed or controlled by the evaporator’s probe. At the end of defrost dripping time is started, its length is set in the parameter. With "Md" the dripping time is disabled.

6. FRONT PANEL COMMANDS

SET

To display target set point; in programming mode it selects a parameter or confirm an operation

TO START A MANUAL DEFROST

Push the DEF key for more than 2 seconds and a manual defrost will start

KEYS COMBINATION

- To lock or unlock the keyboard
- To enter in programming mode
- To return to room temperature display

HOW TO CHANGE A PARAMETER VALUE

To change the parameter’s value operate as follows:
1. Enter the Programming mode by pressing the SET+ keys for 3s (°C) or °F LED starts blinking.
2. Select the required parameter. Press the SET- key to display its value
3. Use + or - to change its value.
4. Press SET+ to store the new value and move to the following parameter.
5. To exit: Press SET+ or wait 15s without pressing a key.

NOTE: the set value is stored even when the procedure is exited by waiting the time-out to expire.

7. PARAMETERS

REGULATION

- KEEP T/L pull the L2 message is displayed. If a key is pressed more than 3s the "OF" message will be displayed.

TO UNLOCK THE KEYBOARD

Keep pressed together for more than 3s the and key till the "on" message will be displayed.
B2: DIXEL Operating Instructions

<table>
<thead>
<tr>
<th>dxEL</th>
<th>Operating Manual</th>
</tr>
</thead>
</table>

Hy

Differential: (0.1°C to 25°C) Intervention differential for set point. Compressor Cut In is SET POINT + differential (Hy). Compressor Cut Out is when the temperature reaches the set point.

LS

Minimum SET POINT: (5°C SET - 5°F SET - SET = LS). Set the minimum value for set point.

US


ot

First probe calibration: 0° to 9.9°C, allows to adjust offset of the first probe.

P2

Evaporator probe presence: n = not present; y = the defrost stops by temperature. (Only XR04CX).

eE

Second probe calibration: 0° to 9.9°C, allows to adjust offset of the second probe. (Only XR04CX).

od

Outputs activation time at start up: (0÷99)min This function is enabled at the start up of the instrument and inhibits any output activation for the period of time set in the parameter.

Ac

Anti-short cycle delay: (0÷50) min minimum interval between the compressor stop and the following restart.

Cy

Compressor ON time with faulty probe: (0÷99) min during which the compressor is active in case of faulty thermometer probe. With Cylind compressor is always OFF.

Cn

Compressor OFF time with faulty probe: (0÷99) min during which the compressor is OFF in case of faulty thermometer probe. With Comp compressor is always active.

Kd

Kind of Action (Only XR03CX): cl= cooling action; h= heating action.

DISPLAY

CF

Measurement unit: °C (°C) °C Celsius; °F= Fahrenheit. WARNING: When the measurement unit is changed the unit SET and the values of the parameters Hy, LS, US, ot, od, AL, AU, and if modified if necessary.

rE

Resolution (only °C): (dE= n) (diE= decimal between -9.9 and 9.9°C, ten integer

ld

Default display: (P1 + P2) F1= thermostat probe, P2= evaporation probe, Sp= SET Point (Only XR03CX).

dy

Display delay: (0÷15) min when the temperature increases, the display is updated of 1 °C/1°F after this time.

DEFROST

td

Defrost type: (dE= in) (DiE=) electric heater, compressor OFF, hot gas, compressor ON.

dE

Defrost termination temperature (only XR03CX): (50÷60°C) P2=E it sets the temperature measured by the evaporator probe, which causes the end of defrost.

Md

Maximum length for defrost: (0÷99 min). When the defrost time is exceeded the defrost stops by temperature. (Only XR04CX).

dA

Display during defrost: P1 (P1 + P2) F1= thermostat probe, P2= evaporation probe, Sp= SET Point (Only XR03CX).

dy

Display delay: (0÷15) min when the temperature increases, the display is updated of 1 °C/1°F after this time.

dF

Display during defrost: (dF= y) (y÷n) = decimal between -9.9 and 9.9°C; (Only XR03CX).

rt

Regulation with door open: (rd= y) (0÷99 min) time interval between the detection of defrost type.

di

Digital input delay: (0÷99 min) with 0 no defrost when P2m, (not evaporator probe: timed defrost) it sets the duration, when P2 y= not active. (0 no defrost) it sets the maximum time for defrost.

dA

Start defrost delay: (0÷99) min when the start of defrost is times are necessary to avoid overloading the plant.

Dp

Display during defrost: (Dp= y) (y÷n) is the real temperature, h= start defrost temperature; SP= SET POINT (Only XR03CX).

Dd

Drip time: (0÷99) min time interval between reaching defrost temperature and the restoration of the control's normal operation. This time allows the evaporator to eliminate water drops that might have formed due to defrost.

dF

Defrost at power-on: (dF= y) after power-on defrost starts; ms defrost doesn't start after power-on

ALARM

PU

Maximum temperature alarm: (AL=99°C) when this temperature is reached the alarm is enabled, after the Ad delay time.

AL

Minimum temperature alarm: (AL=95°C) when this temperature is reached the alarm is enabled, after the Ad delay time.

Ad

Temperature alarm delay: (0÷99 min) time interval between the detection of an alarm condition and alarm signalling.

dA

Exclusion of temperature alarm at startup: (0÷99 min) time interval between the detection of the temperature alarm condition after instrument power on and alarm signalling.

bs

Silencing buzzer (y): (Only XR03CX) ms= silencing disabled, alarm relay stays on till alarm conditions lasts; y= silent enabled: alarm relay is switched OFF by pressing a key as an alarm;

o1

Auxiliary relay configuration (dF=Fn/Au/AluN): (Only XR03CX), dF= defrost; Au= Fans; Alx= Alarm; Alx= auxiliary; Au= normal; AluN= neutral zone.

AP

Alarm relay polarity (LxOP): (Only XR03CX) Lx= when active is closed; OP= when active is opened.

DIGITAL INPUT (Only XR03CX)

IP

Digital input polarity: (+P= d) d= activated by closing the contact; Lx= activated by opening the contact.

id

Digital input configuration: (EA1b/d/Al/AluN): EA= alarm external; EA1= alarm external: EA message is displayed; b= alarm serious alarm; CA= message is displayed; d= door open switch function; d= defrost alarm activation; Al= most used; n= not activated; AluN= inversion of the kind of action;

id

Digital input delay: (0÷99 min) with IF=EA or bAl or y delay between the detection of the external alarm condition and its signalling. With IF=dF it represents the delay to activate the door alarm.

cD

Compressor and fan status when open door: (rd= n) n= no regulation if door is opened; y= when d is closed, regulated restarts even if door open alarm is present.

OTHER

d1

Thermosfate probe display (read only) (Only XR03CX).

d2

Evaporator probe display (read only) (Only XR03CX).

Pt

Parameter code table

rL

Software release

Pt

Parameter code table

ALARMS

AL

Maximum temperature alarm: (AL=99°C) when this temperature is reached the alarm is enabled, after the Ad delay time.

AL

Minimum temperature alarm: (AL=95°C) when this temperature is reached the alarm is enabled, after the Ad delay time.

Ad

Temperature alarm delay: (0÷99 min) time interval between the detection of an alarm condition and alarm signalling.

dA

Exclusion of temperature alarm at startup: (0÷99 min) time interval between the detection of the temperature alarm condition after instrument power on and alarm signalling.

bs

Silencing buzzer (y): (Only XR03CX) ms= silencing disabled, alarm relay stays on till alarm conditions lasts; y= silent enabled: alarm relay is switched OFF by pressing a key as an alarm;

o1

Auxiliary relay configuration (dF=Fn/Au/AluN): (Only XR03CX), dF= defrost; Au= Fans; Alx= Alarm; Alx= auxiliary; Au= normal; AluN= neutral zone.

AP

Alarm relay polarity (LxOP): (Only XR03CX) Lx= when active is closed; OP= when active is opened.

DIGITAL INPUT (Only XR03CX)

IP

Digital input polarity: (+P= d) d= activated by closing the contact; Lx= activated by opening the contact.

id

Digital input configuration: (EA1b/d/Al/AluN): EA= alarm external; EA1= alarm external: EA message is displayed; b= alarm serious alarm; CA= message is displayed; d= door open switch function; d= defrost alarm activation; Al= most used; n= not activated; AluN= inversion of the kind of action;

id

Digital input delay: (0÷99 min) with IF=EA or bAl or y delay between the detection of the external alarm condition and its signalling. With IF=dF it represents the delay to activate the door alarm.

cD

Compressor and fan status when open door: (rd= n) n= no regulation if door is opened; y= when d is closed, regulated restarts even if door open alarm is present.

OTHER

d1

Thermosfate probe display (read only) (Only XR03CX).

d2

Evaporator probe display (read only) (Only XR03CX).

Pt

Parameter code table

rL

Software release

8. DIGITAL INPUTS

The free voltage digital input is programmable in different configurations by the 'IF' parameter.

DOOR SWITCH (IF=do)

It signals the door status and the corresponding relay output status through the 'dC' parameter: n = no output; y = relay the door open status. (Only XR04CX).

The door is opened, after the delay time set through parameter 'di', the door alarm is enabled, the display shows the message 'dA' and the regulation restarts if d = y. The alarm stops as soon as the external digital input is disabled again. With the door open, the high and low temperature alarms are disabled.

EXTERNAL ALARM (IF=EA)

As soon as the digital input is activated the unit will wait for 'dF' time delay before signalling the 'EA' alarm message. The outputs status don't change. The alarm stops just after the digital input is deactivated.

SERIOUS ALARM (IF=sa)

When the digital input is activated, the unit will wait for 'dF' time delay before signalling the 'CA' alarm message. The relay outputs are switched OFF. The alarm will stop as soon as the digital input is deactivated.

SWITCHING SECOND RELAY ON (IF=sa)

When 'IF=sa' switches on and of the second relay.

START DEFROST (IF=dF)

If in the digital there are the right conditions. After the defrost is finished, the normal regulation will restart only if the digital input is disabled otherwise the instrument will wait until the 'df' safety time is expired.

9. INSTALLATION AND MOUNTING

The instrument is provided with screw terminal block to connect cables with a cross section up to 2.5 mm². Before connecting cables make sure the power supply complies with the instrument's requirements. Separate the probe cables from the power supply cables, from the outputs and the power connections. Do not exceed the maximum current allowed on each relay, in case of heavier leads use a suitable external relay.

11. HOW TO USE THE HOT KEY

NOTE: the 'Ed' message is displayed for failed programming. In this case push again o key if you want to restart the upload again or remove the 'Hot Key' to abort the operation.

12. ALARM SIGNALLING

Mms. Cause Outputs

P1 Room probe failure Compressor output according to 'Cry' e 'On'

P2 Evaporator probe failure Detection end is not (Only, 25%)

TH Maximum temperature alarm Outputs unchanged

LA Minimum temperature alarm Outputs unchanged

EA External alarm Outputs unchanged

CA Serious external alarm All outputs OFF.

DA Door Open Compressor and fans restarts

13. TECHNICAL DATA

Housing: self extinguishing ABS.

Case: frontal 32x74 mm, depth 60mm;

Mounting: panel mounting in a 71x29mm panel cut-out
dIXEL Operating Manual

Protection: IP20; Frontal protection: IP65
Connections: Screw terminal block ≤ 2.5 mm² wiring.
Power supply: according to the model: 12Vac/dc ±10%; 24Vac/dc ±10%, 230Vac ±10%, 50/60Hz,
250Vac ±10%, 50/60Hz
Power absorption: 3VA max
Display: 2 digits, red LED, 14.2 mm high; Inputs: Up to 2 NTC or PTC probes.
Digital input: free voltage contact
Relay outputs: compressor SPST 8(3) A, 250Vac or 20(8)A 250Vac
defrost or Aux: SPDT 8(3) A, 250Vac
Data storing: on the non-volatile memory (EEPROM).
Kind of action: 1B; Pollution grade: 2; Software class: A;
Rated impulse voltage: 2500V; Overvoltage Category: II
Operating temperature: 0÷60 °C; Storage temperature: -30÷85 °C.
Relative humidity: 20 ÷ 85% (no condensing)
Measuring and regulation range: NTC probe: -40÷110°C (-40÷230°F);
Resolution: 0,1 °C or 1°C or 1 °F (selectable); Accuracy (ambient temp. 25°C): ±0.7 °C ±1 digit

14. CONNECTIONS

XR03CX – 20A o 8A Compressor

NOTE: The compressor relay is 20(8)A or 16(6)A depending on the model.
NOTE: 120Vac o 24Vac/dc o 12Vac/dc connect to 6 and 7

XR04CX – 20A o 8A Compressor

NOTE: The compressor relay is 20(8)A or 16(6)A depending on the model.
NOTA: 120Vac o 24Vac/dc o 12Vac/dc connect to 6 and 7

15. DEFAULT SETTING VALUES

<table>
<thead>
<tr>
<th>LAB</th>
<th>EL</th>
<th>DESCRIPTION</th>
<th>RANGE</th>
<th>DEFAULT</th>
</tr>
</thead>
<tbody>
<tr>
<td>REGULATION</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hy</td>
<td>Differential</td>
<td>0.1 ÷ 25°C / 1 ÷ 45°F</td>
<td>2.0°C / 4°F</td>
<td></td>
</tr>
<tr>
<td>LS</td>
<td>Minimum Set Point</td>
<td>-55°C + SET + 67°F = SET</td>
<td>-55 °C / 99°F</td>
<td></td>
</tr>
<tr>
<td>US</td>
<td>Maximum Set Point</td>
<td>SET + 99°C / SET + 210°F</td>
<td>99 °C / 99°F</td>
<td></td>
</tr>
<tr>
<td>ot</td>
<td>First probe calibration</td>
<td>-9.9÷9.9°C / -18÷18°F</td>
<td>0.0</td>
<td></td>
</tr>
<tr>
<td>P2</td>
<td>Second probe presence (Only XR04CX)</td>
<td>n – Y</td>
<td>y</td>
<td></td>
</tr>
<tr>
<td>oE</td>
<td>Second probe calibration (Only XR04CX)</td>
<td>-9.9÷9.9°C / -18÷18°F</td>
<td>0.0</td>
<td></td>
</tr>
<tr>
<td>oC</td>
<td>Outputs activation delay at start up</td>
<td>0 ÷ 99 min</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Cy</td>
<td>Compressor ON time faulty probe</td>
<td>0 ÷ 99 min</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>Cn</td>
<td>Compressor OFF time faulty probe</td>
<td>0 ÷ 99 min</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>CH</td>
<td>Kind of Action (Only XR03CX)</td>
<td>CL + HI</td>
<td>CL</td>
<td></td>
</tr>
<tr>
<td>DISPLAY</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CF</td>
<td>Measurement units</td>
<td>°C / °F</td>
<td>°C / °F</td>
<td></td>
</tr>
<tr>
<td>rE</td>
<td>Resolution (only for °C)</td>
<td>dE – in</td>
<td>dE</td>
<td></td>
</tr>
<tr>
<td>Lt</td>
<td>Default Display (Only XR04CX)</td>
<td>P1-P2 - SP</td>
<td>P1</td>
<td></td>
</tr>
<tr>
<td>dy</td>
<td>Display delay</td>
<td>0 ÷ 15 min</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>DEFROST</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>td</td>
<td>Defrost type</td>
<td>EL – in</td>
<td>EL</td>
<td></td>
</tr>
<tr>
<td>dE</td>
<td>Defrost termination temperature</td>
<td>-50÷60°C / -58÷122°F</td>
<td>8.9°C / 46°F</td>
<td></td>
</tr>
<tr>
<td>id</td>
<td>Interval between defrost cycles</td>
<td>0 ÷ 99 hours</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Md</td>
<td>Maximum length for defrost</td>
<td>0 ÷ 99 min.</td>
<td>30</td>
<td></td>
</tr>
</tbody>
</table>

ALARMS

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>AU</td>
<td>Maximum temperature alarm</td>
<td>ALL÷99°C / ALL÷210°F</td>
</tr>
<tr>
<td>AL</td>
<td>Minimum temperature alarm</td>
<td>-55°C÷ALU÷67°F÷ALU</td>
</tr>
<tr>
<td>Ad</td>
<td>Temperature alarm delay</td>
<td>0 ÷ 99 min</td>
</tr>
<tr>
<td>dA</td>
<td>Exclusion of temperature alarm at startup</td>
<td>0 ÷ 99 min</td>
</tr>
</tbody>
</table>

DIGITAL INPUT (Only XR03CX)

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>IP</td>
<td>Digital input polarity</td>
</tr>
<tr>
<td>IF</td>
<td>Digital input configuration</td>
</tr>
<tr>
<td>dl</td>
<td>Digital input delay</td>
</tr>
<tr>
<td>dC</td>
<td>Compressor and fan status when open door</td>
</tr>
<tr>
<td>rd</td>
<td>Regulation with door open</td>
</tr>
</tbody>
</table>

OTHER

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>d1</td>
<td>Thermostat probe display</td>
</tr>
<tr>
<td>d2</td>
<td>Evaporator probe display</td>
</tr>
<tr>
<td>Pt</td>
<td>Parameter code table</td>
</tr>
<tr>
<td>RL</td>
<td>Firmware release</td>
</tr>
</tbody>
</table>

dIXEL S.p.a.
Z.I. Via dell’Industria, 27 - 32010 Pieve d’Alpago (BL) ITALY
tel. +39 - 0437 - 98 33 - fax +39 - 0437 - 98 93 13
http://www.dixell.com E-mail: dixell@dixell.com
### TEMPERATURE PRESSURE CHART - at sea level

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

<table>
<thead>
<tr>
<th>TEMPERATURE</th>
<th>REFRIGERANT (SPORLAN CODE)</th>
<th>TEMPERATURE</th>
<th>REFRIGERANT (SPORLAN CODE)</th>
<th>TEMPERATURE</th>
<th>REFRIGERANT (SPORLAN CODE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(°F)</td>
<td>(°C)</td>
<td>134a (J)</td>
<td>404A (S)</td>
<td>507 (P)</td>
<td>717 (A)</td>
</tr>
<tr>
<td>-60</td>
<td>-51.1</td>
<td>21.8</td>
<td>7.3</td>
<td>5.8</td>
<td>18.6</td>
</tr>
<tr>
<td>-55</td>
<td>-48.3</td>
<td>20.3</td>
<td>3.9</td>
<td>2.2</td>
<td>16.6</td>
</tr>
<tr>
<td>-50</td>
<td>-45.6</td>
<td>18.7</td>
<td>0.1</td>
<td>0.9</td>
<td>14.3</td>
</tr>
<tr>
<td>-45</td>
<td>-42.8</td>
<td>16.9</td>
<td>2.0</td>
<td>3.0</td>
<td>11.7</td>
</tr>
<tr>
<td>-40</td>
<td>-40.0</td>
<td>14.8</td>
<td>4.3</td>
<td>5.4</td>
<td>8.8</td>
</tr>
<tr>
<td>-35</td>
<td>-37.2</td>
<td>12.5</td>
<td>6.8</td>
<td>8.1</td>
<td>5.4</td>
</tr>
<tr>
<td>-30</td>
<td>-34.4</td>
<td>9.8</td>
<td>9.6</td>
<td>11.0</td>
<td>1.6</td>
</tr>
<tr>
<td>-25</td>
<td>-31.7</td>
<td>6.9</td>
<td>12.7</td>
<td>14.1</td>
<td>1.3</td>
</tr>
<tr>
<td>-20</td>
<td>-28.9</td>
<td>3.7</td>
<td>16.0</td>
<td>17.6</td>
<td>3.6</td>
</tr>
<tr>
<td>-18</td>
<td>-27.8</td>
<td>2.3</td>
<td>17.4</td>
<td>19.1</td>
<td>4.6</td>
</tr>
<tr>
<td>-16</td>
<td>-26.7</td>
<td>0.8</td>
<td>18.9</td>
<td>20.6</td>
<td>5.6</td>
</tr>
<tr>
<td>-14</td>
<td>-25.6</td>
<td>0.4</td>
<td>20.4</td>
<td>22.2</td>
<td>6.7</td>
</tr>
<tr>
<td>-12</td>
<td>-24.4</td>
<td>1.1</td>
<td>22.0</td>
<td>23.8</td>
<td>7.8</td>
</tr>
<tr>
<td>-10</td>
<td>-23.3</td>
<td>1.9</td>
<td>23.6</td>
<td>25.5</td>
<td>9.0</td>
</tr>
<tr>
<td>-8</td>
<td>-22.2</td>
<td>2.8</td>
<td>25.3</td>
<td>27.3</td>
<td>10.3</td>
</tr>
<tr>
<td>-6</td>
<td>-21.1</td>
<td>3.6</td>
<td>27.0</td>
<td>29.1</td>
<td>11.5</td>
</tr>
<tr>
<td>-4</td>
<td>-20.0</td>
<td>4.6</td>
<td>28.8</td>
<td>30.9</td>
<td>12.9</td>
</tr>
<tr>
<td>-2</td>
<td>-18.9</td>
<td>5.5</td>
<td>30.7</td>
<td>32.8</td>
<td>14.3</td>
</tr>
<tr>
<td>0</td>
<td>-17.8</td>
<td>6.5</td>
<td>32.6</td>
<td>34.8</td>
<td>15.7</td>
</tr>
<tr>
<td>1</td>
<td>-17.2</td>
<td>7.0</td>
<td>33.6</td>
<td>35.8</td>
<td>16.4</td>
</tr>
<tr>
<td>2</td>
<td>-16.7</td>
<td>7.5</td>
<td>34.6</td>
<td>36.9</td>
<td>17.2</td>
</tr>
<tr>
<td>3</td>
<td>-16.1</td>
<td>8.0</td>
<td>35.6</td>
<td>37.9</td>
<td>18.0</td>
</tr>
<tr>
<td>4</td>
<td>-15.6</td>
<td>8.5</td>
<td>36.6</td>
<td>39.0</td>
<td>18.8</td>
</tr>
<tr>
<td>5</td>
<td>-15.0</td>
<td>9.1</td>
<td>37.7</td>
<td>40.0</td>
<td>19.6</td>
</tr>
<tr>
<td>6</td>
<td>-14.4</td>
<td>9.6</td>
<td>38.7</td>
<td>41.1</td>
<td>20.4</td>
</tr>
<tr>
<td>7</td>
<td>-13.9</td>
<td>10.2</td>
<td>39.8</td>
<td>42.3</td>
<td>21.2</td>
</tr>
<tr>
<td>8</td>
<td>-13.3</td>
<td>10.8</td>
<td>40.9</td>
<td>43.4</td>
<td>21.1</td>
</tr>
<tr>
<td>9</td>
<td>-12.8</td>
<td>11.3</td>
<td>42.0</td>
<td>44.5</td>
<td>22.9</td>
</tr>
<tr>
<td>10</td>
<td>-12.2</td>
<td>11.9</td>
<td>43.1</td>
<td>45.7</td>
<td>23.8</td>
</tr>
<tr>
<td>11</td>
<td>-11.7</td>
<td>12.5</td>
<td>44.3</td>
<td>46.9</td>
<td>24.7</td>
</tr>
</tbody>
</table>

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
D1: PARTS LIST

A  Plex
B  Upper Deck and Air Discharge Perforations
C  Product Stop (Upper Deck)
D  Air Discharge (Mid Deck)
E  Mid Deck and Air Discharge Perforations
F  Product Stop (Mid Deck)
G  Lower Deck and Air Discharge Perforations
H  Wood Cladding (Optional)
I  Air Discharge (Lower Deck)
J  Toekick
K  Air Return (Lower Deck)
L  Product Stop (Lower Deck)
M  Insulated Drain Pan Compartment
N  Leg Detail (Optional)
O  Bracket Detail (Optional)
P  Compartment Access Panel
Q  Air Return (Mid Deck)
R  Product Stop (Mid Deck)
S  Air Discharge (Lower Deck)
T  Air Discharge (Mid Deck)
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.