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.
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
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 11/20
TECHNICAL REFERENCE

BLF-SS
Self-Service Open Multi-Deck Merchandiser
77” (Bakery)

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.

<table>
<thead>
<tr>
<th>Shipping Weight</th>
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Hiller Phoenix 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 COMPLIANT~
ENGINNEERED 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.
### TECHNICAL REFERENCE

**BLF-SS**

Self-Service Open Multi-Deck Merchandiser  
77" (Bakery)

#### SYSTEM REQUIREMENTS

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<th>Case Length</th>
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#### ELECTRICAL DATA

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<th>High Efficiency Fans</th>
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#### LIGHTING DATA

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#### GUIDELINES AND CONTROL SETTINGS

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<tr>
<th>24hr Energy Usage (kWh/ft)</th>
<th>Suction Temperature @ Case Outlet (°F)</th>
<th>Superheat Set Point @ Bulb (°F)</th>
<th>Discharge Air (°F)</th>
<th>Discharge Air Velocity (FPM)</th>
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#### DEFROST CONTROLS

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#### 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.
- RLA - Running Load Amps
- LRA - Locked Rotor Amps

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**2017 DOE COMPLIANT**

**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.**
TECHNICAL REFERENCE

BLF-SS
Self-Service Open Multi-Deck Merchandiser
77" (Bakery)

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. Date | Rev. # | Rev. Title
----------|--------|------------------
10-02-20  | 2      | ENDVIEW UPDATE
05-18-20  | 1      | NEW STANDARDS

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.

2017 DOE COMPLIANT

BLF-SS
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 BLF-SS bakery application self-service open 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 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.)
LOCATIONS
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. The power cord shipping brace (Fig. 1) can be removed with a screw gun. As for case shipping braces, the same would be applied with sled runner or caster construction. If the braces are metal brackets or locks they can be removed with a screw gun. If they are wood blocks they can be removed with a J-bar. **Note: Shipping braces are normally located at each corner of the case. Some case models with casters will use bracing that surrounds the casters entirely and some will use braces that affix to the toekicks at each corner. (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. (Hillphoenix self-contained display cases are sometimes designed with casters. In most situations, one or two persons can easily move the case into position.) If there are casters simply roll them on to the store floor to the proper staging area. First remove all crating then all sled runner, caster, and/or power cord shipping braces. (Dependent on case design.)

**LOCATION**

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 or vertical (caster) supports as this will help ensure that the case is not settling over time.

7. Locate horizontal (Fig. 2) or vertical (caster) support positions along the chalk line. Spot properly leveled shim packs at each support location.

8. **(SLED RUNNERS)** If necessary, drill a hole in each end of every horizontal support (Fig. 3) 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.**

9. **(CASTERS)** If necessary, attach two brackets at two separate corners of the case (Fig. 4) and fasten to the floor with concrete anchors. **Note: The brackets do not need to be affixed in the exact locations specified here. However, be sure that the anchors are close to the corners and that at least two brackets are used, one at each corner.**
You can use more than two brackets for anchoring if you want further support this way.

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. (Most self-contained cases ship with bumper pre-installed.)

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/compressor compartment access panel back onto the base of case, if applicable.

Multi-Case

1. Remove any shelves (discard the shelf clips) and/or loose items from the cases that may interfere with case joining. Keep all loose items as they will be used later in the installation process.

2. Follow the single-case installation instructions for the first case, excluding #6, then position the next case in the line-up approximately 3’ away.

3. Move the second case to a position that is approximately 6” from the first case, then position case on the shim packs.

4. Push the cases tightly together, then lightly bolt them together through the holes provided (Fig. 5). Tighten all the joining bolts until all margins are equal. Be careful not to over tighten.

5. If applicable, the stub-up location can be found under the tank on the customer left. See technical reference on page 4 for access locations.
6. Apply case-to-case watershed (supplied) over the end frame seam (Fig. 6). The watershed prevents water from settling in the case joint.

7. Repeat steps 3-6 of this sequence for all remaining cases.

Be certain to properly level all cases.

8. Properly align the front panels as needed, then install, if applicable, front panel trim (supplied).

9. Install the bumper into pre-attached bumper track and snap into place.

10. After sufficient time has passed to allow for bumper shrinkage, cut away the excess bumper for final fit and finish. Be certain to use an appropriate cutting tool (tubing- or PVC-cutter) to ensure a smooth cut.

11. Install case shelves and reconnect lights. Be aware that differing shelf configurations will affect energy consumption and case performance.

12. Install toekick/compressor compartment access panel back onto the base of case, if applicable.

⚠️ CAUTION

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

Some self-contained cases require a floor drain. If applicable, the drain outlet or “P” trap (Fig. 7) 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.

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.

ELECTRICAL

Electrical hookups are made through the electrical raceway that can be accessed by removing the rear raceway panel. 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. The case must be grounded. For more detailed electrical wiring information (see Appendix A).

Prior to plugging in and starting up the case always check the data tag located on the left end exterior panel or top interior of the case, as well as the voltage label found on the main power cord (Fig. 8) which can be found at the rear base panel. Note: Check that the voltage of the receptacle you are going to use for power and the voltage required for the case match.

REFRIGERATION & COMPRESSOR COMPARTMENT

A bottom mounted compressor compartment can be accessed by removing the front, rear or side panel. A top mounted compressor compartment is accessible by ladder to the top of the case.

Access locations and/or compartment configurations will vary based on case design. See technical reference on page 4 for
access locations and page 10 for a compressor compartment diagram.

**Pressure Switch & Power Supply**

1. After the main power cord (Fig. 8) located at the rear base panel of the case is plugged in and the power switch flipped to ON the case should begin normal operations.

2. If the case does not start-up after all of the above steps have been followed depress the pressure switch located behind the panel designated with the pressure switch location sticker (Fig. 9).

3. After establishing power the light control switch located next to the power switch on the upper front exterior toe-kick panel, can be flipped to the ON position (Fig. 10). The case should now be fully operational and all lights functioning when in the ON position.

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**COMPRESSOR COMPARTMENT DIAGRAM**

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A  Receiver  
B  Filter Dryer  
C  Site Glass  
D  Pressure Switch  
E  Dissipater Pan  
F  Start Kit  
G  Compressor  
H  Drain  
I  Condenser Coil  
J  Power Supply Box  
K  Condenser Fan

Note: Access locations and/or compartment configurations will vary based on case design.
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 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 LUMINAIRES

Removing LED luminaires:

1. Unplug the luminaire (Fig. 12).
2. Remove the screws from the light clamps (Fig. 13) 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.
3. Remove the closed clamps and inner rings (Fig. 14) by unclipping the clamp ends located above the screw opening. This will release the grip around the inner ring (Fig. 15) and allow for the two pieces to be separated from one another.
4. Carefully remove the inner rings from around the light rod.

DESIGN & POWER SUPPLIES

To gain access to the LED driver or power supplies remove the raceway cover (Fig. 11). The power supply can be located at the customer left side of the case.

REPLACING LED LIGHTS

Once store power is connected the Clearvoyant LED system should operate without the need for any significant mainte-
Re-installing LED luminaires:

1. Place a ring (Fig. 16) 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. 16) 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. 14) 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.
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 applied the sealant to the end breakers of adjoining cases? (see pg. 7)

☐ Have you sealed the case-to-case joints by applying caulk and acrylic tape to the end frame seam? (see pg. 7)

☐ Have you installed the toekick/compressor compartment access panel? (see pg. 8)

☐ Have you checked that the voltage of the receptacle you are going to use for power and the voltage required for the case match? (see pg. 9)

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

1. Check all lights to ensure they are all functioning properly.

2. Check case temperature and adjust controller as needed.
AIRFLOW & PRODUCT LOAD

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

It is important that you do not overload the food product display so that it impinges on the airflow pattern (Fig. 17). Overloading will cause malfunction and the loss of proper temperature levels.

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

---

WARING

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

DEFROST & TEMPERATURE CONTROLS

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

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

DETERMINING SUPERHEAT

To identify proper superheat settings, complete the following:

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

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.

**Fans and Pressure Plate**

1. Disconnect power to the case and wait for fans to come to a complete stand-still.
2. To access the underside of the fans first remove the screws on the top ends and front sill of the pressure plate cover (Fig. 18). Lift the pressure plate by use of the provided lift handles (Fig. 19). 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 (Fig. 20).

3. Clean as necessary. Use a spray bottle filled with an approved mild detergent and warm water.
4. Be sure to move the pressure plate back to its original position after cleaning and/or inspection is complete.
Condenser Air Intake Filter

Clean and remove the debris from the condenser air intake filter monthly. If filter is not cleaned regularly the head pressure will rise and cut all power off to the compressor by means of the pressure switch.

The filter will either have a slide-out screen or pull-off magnetic application. **Note: Prior to cleaning, be sure to remove the filter from the case completely and move to a distance far enough away that no debris will come in to contact with the case or the product inside.** Both can be cleaned with an air hose and/or rinsed with water. Be sure to remove all debris and wait until completely dry before placing back on to the case. (Top mounted compressors will not have an air intake filter.)

Case Cleaning

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. 21), as well as the screws from the top ends and front sill of the pressure plate cover (Fig. 18). **Be sure to save the removed screws for reassembly.**

Coil Inspection

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.

**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.

**CAUTION**

Be sure to clean the condenser air intake filter monthly. Failure to do so may result in loss of normal compressor functions and case damage.
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.
A1 .................................................................................................................. Wiring Information
B1-B3 ........................................................................................................ Dixell Operating Instructions
C1 .................................................................................................. Sporlan Pressure-Temperature Chart
D1 .......................................................................................................... Parts List
TBD
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 signaling
13. Technical data
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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 and humid conditions.
- Fit 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).
- In case of applications in industrial environments, the use of mains filters (our mod. FT1) is recommended.
- Do not use the instrument as a safety device.

3. GENERAL DESCRIPTION

The XR03CX, in 32x74x58mm 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 signaling or as auxiliary output. It provides an HTC probe input and a digital input for alarm signaling, for 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 via the HOTTLEY.

The XR04CX, in 32x74x58mm 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 one for defrost. It provides two HTC 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 via the HOTTLEY.

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 is timed through parameters "Cy" 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:
- "dEL" — defrost through electrical heater (compressor OFF)
- "dHOT" — 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, the interval is started, its length is set in the id parameter. With dEL the defrost time is disabled.

6. FRONT PANEL COMMANDS

Visualisation

- "ON" — to return to normal visualisation after the operation.
- "L1" — to exit the "FIRST LEVEL" (user level) and viceversa.
- "L2" — "The First level" (user level) and viceversa.
- "FL" — to start a manual defrost.
- "SP" — to change the set value.
- "HELP" — to display the help.
- "SET" — to change the set value.
- "OFF" — to display the OFF status.
- "DEF" — to display the defrost status.
- "L1" — to return to normal visualisation and viceversa.
- "L2" — to display the "L1" message.

Parameters

- "SP" — to change the set value.
- "DEF" — to display the defrost status.
- "L1" — to return to normal visualisation and viceversa.

7. PARAMETERS

- "id" — interval between defrost cycles (default 300s).
- "Md" — maximum length of defrost interval (default 1800s).
- "Cy" — temperature increase compensation for defrost (default 0.5°C).
- "Cn" — temperature decrease compensation for defrost (default 0.5°C).
- "DEF" — defrost status.
- "L1" — "First level" (user level) and viceversa.
- "L2" — "The First level" (user level) and viceversa.

HIDDEN MENU

The hidden menu includes all the parameters of the instrument.

HOW TO ENTER THE HIDDEN MENU

1. Enter the Programming mode by pressing the SET+ or 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.

NOTE1: if none parameter is present in L1, after 3s the "OFF" message is displayed. Keep the keys pressed till the L2 message is displayed.

NOTE2: the set value is stored even when the procedure is exited by waiting the time-out to expire.

HOW TO CHANGE A PARAMETER VALUE

To change the parameter’s value operate as follows:
1. Enter the Programming mode by pressing the SET+ or 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.

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

HOW TO MOVE A PARAMETER FROM THE HIDDEN MENU TO THE FIRST LEVEL AND VICEVERSA.

Each parameter present in the HIDDEN MENU can be removed or put into "THE FIRST LEVEL" (user level) by pressing SET+ in HIDDEN MENU when a parameter is present in First Level the decimal point is on.

TO LOCK THE KEYBOARD

- Keep pressed for more than 3s the or keys.
- The "OFF" message will be displayed and the keyboard will be locked. If a key is pressed more than 3s the "OFF" message will be displayed.

TO UNLOCK THE KEYBOARD

Keep pressed together for more than 3s the or keys till the "ON" message will be displayed.

6. FRONT PANEL COMMANDS
B2: DIXEL OPERATING INSTRUCTIONS

Hy Differential: (0.1°C + 25°C) intervention differential for set point. Compressor Cut IN is set at the temperature reaches the set point.
LS Minimum SET POINT (0÷50°C SET:5°F SET:+5°F SET). Sets the minimum value for the set point.

of First probe calibration: (0÷90°C) allows to adjust possible offset of the first probe.
P2 Evaporator probe presence: n= not present; y= the stoppage of temperature. (Only XR04CX).
eO Second probe calibration: (0÷90°C) allows to adjust possible offset of the second probe. (Only XR04CX).
dO Outputs activation delay at start up: (0÷90min) This function is enabled at the initial 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 OFF time with faulty probe: (0÷90 min) time during which the compressor is active in case of faulty thermostat. With 0=Cy compressor is always active.
CH Kind of Action (Only XR03CX): cL=c; oE=Off.

DISPLAY

CF Measurement unit: (°C=°F) °C=Centigrade; °F=Fahrenheit. WARNING: When the measurement unit is changed the SET point and the values of the parameters Hy, LS, oF, of, AU, Al have to be checked and modified if necessary.
e Resolution (only for °C) (de=4+0): y=decimal between 0.9 and 9.9°F: inf=integer
Lt Default display: (P1 + P2) P1=thermostat probe; P2= evaporator 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

id Defrost type: (EL-in) eL=e; EL=electrical heater, compressor OFF; EL= hot gas, compressor ON.
eD Defrost termination temperature (Only XR04CX): (0÷50°C) if P2Fy it sets the temperature measured by the evaporator probe, which causes the end of defrost.
df Interval between defrost cycles: (0÷90 min) Determines the time interval between the beginning of two defrost cycles.
Md Maximum length for defrost: (0÷90 min) with 0=no defrost) when P2m, (not evaporator probe; timed defrost) it sets the defrost duration, when P2 n= (defrost end based on temperature) it sets the maximum length for defrost.
dt Start defrost delay: (0÷90min) This is useful when different defrost start times are necessary to avoid overloading the plant.
Df Display during defrost: (IF) IF=5k IF=5k; IF real temperature; IF= start defrost temperature; SP= start defrost temperature; SF= start defrost temperature; SF= stop defrost.
Df Defrost range: (0÷99°C) when this temperature is reached the alarm is triggered for 5 minutes.
Df Defrost type: (rt / it / St / dF) rt= start defrost type; it= start defrost time; St= start defrost temperature; dF= delay time.
Df Dip time: (0÷90 min) time interval between reaching defrost termination temperature and the restarting of the control’s normal operation. This time allows the evaporator to eliminate water drops that might have formed due to defrost.
Pf Defrost at power-on: (y÷n) y=power on defrost starts; n=power on defrost doesn’t start at power-on.

ALARMS

AU Maximum temperature alarm: (±60°C) when this temperature is reached the alarm is enabled, after the "Ad" delay time.
AL Minimum temperature alarm: (±50°C) when this temperature is reached the alarm is enabled, after the "Ad" delay time.
Ad Temperature alarm delay: (0÷90 min) time interval between the detection of an alarm condition and alarm signalling.
dA Exclusion of temperature alarm at start-up: (0÷90 min) time interval between the detection of the temperature alarm condition after instrument power on and alarm signalling.
ba Silence buzzer (y/n): (Only XR03CX) bA=disabling alarm relay stays on till alarm conditions lasts: y= silence enabling: alarm relay is switched OFF by pressing a key during an alarm.
b1 Auxiliary relay configuration (dF/finAl/pn): (Only XR03CX) dF=defrost; fn= Fan; AL= Alarm; Al= auxiliary; db= neutral zone.
AP Alarm relay polarity (cf/Op): (Only XR03CX) cL= when active is closed; Op= when active is opened.

DIGITAL INPUT (Only XR03CX)

IP Digital input polarity: (0=Off ; 1=On) activated by closing the contact; cl=activated by opening the contact.
If Digital input configuration: (EA/bA/do/dF/Au/Hc) EA= external alarm; EA message is displayed; bA= serious alarm "CA" message is displayed; do= door switch function; dF= defrost activation; Au= not used; Hc= inversion of the kind of action.
di Digital input delay: (0÷99 min) with ifEA or bA delay between the detection of the external alarm condition and its signalling. With ifEA it represents the delay to activate the door open.
Cc Compressor and fan status when open door: (noPinPin=Pin; n= normal; f= Fans OFF; Op= Compressor OFF; Fs= Compressor and fans OFF;)
rd Regulation with open door: (n= no regulation if door is opened; y= when di is closed) regulation restarts if even door open alarm is present.

OTHER

d1 Thermostat probe display (read only)
d2 Evaporator probe display (read only) (Only XR03CX)
P1 Parameter code table
l Software release

8. DIGITAL INPUTS

The free voltage digital input is programmable in different configurations by the "if" parameter.

DOOR SWITCH (ifFdo)

It signals the door status and the corresponding relay output status through the "6c" parameter: n= normal (any change); F= Fan Off; CF= Compressor Off; FC= Compressor and fans Off.

1.4 ALARM RECOVERY

Probe alarms P1 and P2 start some seconds after the fault in the related probe; they automatically stop some seconds after the probe restarts normal operation. Check connections before replacing the probe. Temperature alarms “HA” and “LA” automatically stop as soon as the temperature returns to normal values.

13. TECHNICAL DATA

Housing: self extinguishing ABS.
Case: Rittal 32x24 mm; depth 60mm; Mounting: panel mounting in a 71x25mm panel cut-out
**B3: DIXELL OPERATING INSTRUCTIONS**

### Protection
- IP20: Frontal protection
- IP65: General protection

### Connections
- Screw terminal block: ≤ 2.5 mm² wiring

### Power Supply
- According to the model: 12Vac/dc, ±10%; 24Vac/dc, ± 10%; 230Vac ±10%, 50/60Hz, 110Vac ±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 Impulsive Voltage
- 2500V

### Overvoltage Category
- II

### Operating Temperature
- 0÷60 °C

### Storage Temperature
- -30÷85 °C

### Relative Humidity
- 20 % y 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

![Diagram of XR03CX -20A o 8A Compressor]

**NOTE:** The compressor relay is 20(8)A or 16(6)A depending on the model.

**NOTE:** 120Vac or 24Vac/dc or 12Vac/dc connect to 6 and 7

#### XR04CX -20A o 8A Compressor

![Diagram of 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 6-7

### 15. DEFAULT SETTING VALUES

<table>
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<tr>
<th>LABEL</th>
<th>DESCRIPTION</th>
<th>RANGE</th>
<th>DEFAULT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hy</td>
<td>Differential</td>
<td>0.1 ÷ 25°C/1 ÷ 45°F</td>
<td>2.0°C/4°F</td>
</tr>
<tr>
<td>L5</td>
<td>Minimum Set Point</td>
<td>-55°C+/SET/77°F+/SET</td>
<td>-55 °C / 99 °F</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>
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<td>ot</td>
<td>First probe calibration</td>
<td>-9.9÷9.9°C/-18÷18°F</td>
<td>0.0</td>
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<tr>
<td>P2</td>
<td>Second probe presence (Only XR04CX)</td>
<td>n – y</td>
<td>y</td>
</tr>
<tr>
<td>oe</td>
<td>Second probe calibration (Only XR04CX)</td>
<td>-9.9÷9.9°C/-18÷18°F</td>
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<tr>
<td>od</td>
<td>Outputs activation delay at start up</td>
<td>0 ÷ 99 min</td>
<td>0</td>
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<tr>
<td>AC</td>
<td>Anti-short cycle delay</td>
<td>0 ÷ 50 min</td>
<td>1</td>
</tr>
<tr>
<td>Cy</td>
<td>Compressor ON time faulty probe</td>
<td>0 ÷ 99 min</td>
<td>15</td>
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<tr>
<td>Cn</td>
<td>Compressor OFF time faulty probe</td>
<td>0 ÷ 99 min</td>
<td>30</td>
</tr>
<tr>
<td>CH</td>
<td>Kind of Action (Only XR04CX)</td>
<td>CL + Ht</td>
<td>cl</td>
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</table>

### DISPLAY

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<td>P1-P2 - SP</td>
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<td>dy</td>
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### DEFROST

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<td>Defrost termination temperature</td>
<td>-50÷50°C/-58÷122°F</td>
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<td>id</td>
<td>Interval between defrost cycles</td>
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<td>Md</td>
<td>Maximum length for defrost</td>
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**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
[www.dixell.com](http://www.dixell.com) E-mail: dixell@dixell.com
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D1: PARTS LIST

A  Light Guard
B  Case Top
C  Interior End Panel
D  Die Board Plex
E  Die Board
F  Condenser Air Exhaust
G  Front Toekick
H  Air Return
I  Product Stop
J  Insulated Drain Pan
K  End Panel Trim
L  End Panel
M  End Toekick
N  Outside Back
O  Compressor Compartment
P  Bottom Deck
Q  Adjustable Shelf Bracket
R  Price Tag Molding
S  Inside Back
T  Shelf Standard
U  Air Discharge
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.