



MULTI-DECK MERCHANDISER

INSTALLATION & OPERATIONS MANUAL

3NDML-NRG 5DMLH-NRG 6DMLH-NRG
6DMLHR-NRG 6NDMLH-NRG 6MLH-NRG

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

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P112688K
V2.01
05/19



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LIABILITY NOTICE

For Cases with Shelf Lighting Systems

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

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

P079211M, REVO

Important

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

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



Revision History

- New Manual Format_07/12
- Added Glycol Notice_07/12
- Manual Update_01/19
- Manual Update_05/19

GENERAL INFORMATION

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

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

CASE DESCRIPTION

This manual specifically covers the 3 Series, 5 Series, and 6 Series Multi-Deck Merchandisers.

STORE CONDITIONS

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

REFRIGERATION SYSTEM OPERATION

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

SHIPPING CASES

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

RECEIVING CASES

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

CASE DAMAGE

Claims for obvious damage must be 1) noted on either the freight bill or the express receipt and 2) signed by the carrier's

agent; otherwise, the carrier may refuse the claim. If damage becomes apparent after the equipment is unpacked, retain all packing materials and submit a written request to the carrier for inspection within 14 days of receipt of the equipment.

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

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

LOST/MISSING ITEMS

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

SERVICE & TECHNICAL SUPPORT

For service or technical questions regarding display cases, please contact our Case Division Customer Service Department at the toll free number listed below. For questions regarding our refrigeration systems or electrical distribution centers, please contact our Systems Division Customer Service Department at 1-833-280-5714.

Hillphoenix
1925 Ruffin Mill Rd
Colonial Heights, VA 23834
Mon.-Fri. (8 a.m. to 5 p.m.)
Tel: 1-800-283-1109/Fax: 804-526-7450
Website: www.hillphoenix.com

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. Leveling is necessary to ensure proper case alignment and to avoid potential case damage. 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.
4. Locate basehorse positions along the chalk line. Spot properly leveled shim packs at each basehorse location.

LINE UP & INSTALLATION

Single Case

1. Roll the case into position, leaving a minimum of 2" between the wall and back of case. Using a "J" bar, raise the end of the case (under cross support), remove the caster assembly (Fig. 1) and lower the basehorse on to the shim packs. Repeat on the other end of the case.
2. Once the basehorse 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.

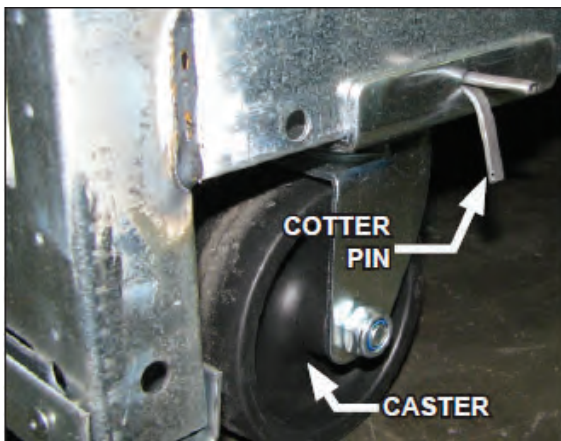


Fig. 1 Removing the casters is an easy process. Simply flatten and remove the cotter pins that are holding the casters in place. Then lift the case with a "J" bar and slide the caster assemblies out. The dismantled casters can now be discarded.

⚠ WARNING

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

Multi-Case

1. Remove the shelves (discard the shelf clips) and any loose items from the cases that may interfere with case joining (e.g. shipping braces, mirror assemblies, etc). **Keep all loose items as they will be used later in the installation process.**
2. Remove the return air grill at the case joint. The grill lifts out without fasteners and may be easily removed to gain clear access to the case-to-case joining bolts.
3. Follow the single-case installation instructions for the first case, then position the next case in the line-up approximately 3' away. Remove the casters on the end that is closest to the first case.
4. Apply the foam tape gasket (supplied) and a bead of butyl or silicone sealant to the end of the first case (Fig. 2). From the opposite end, push the second case to a position that is approximately 6" from the first case, then remove the remaining casters and position case on the shim packs.

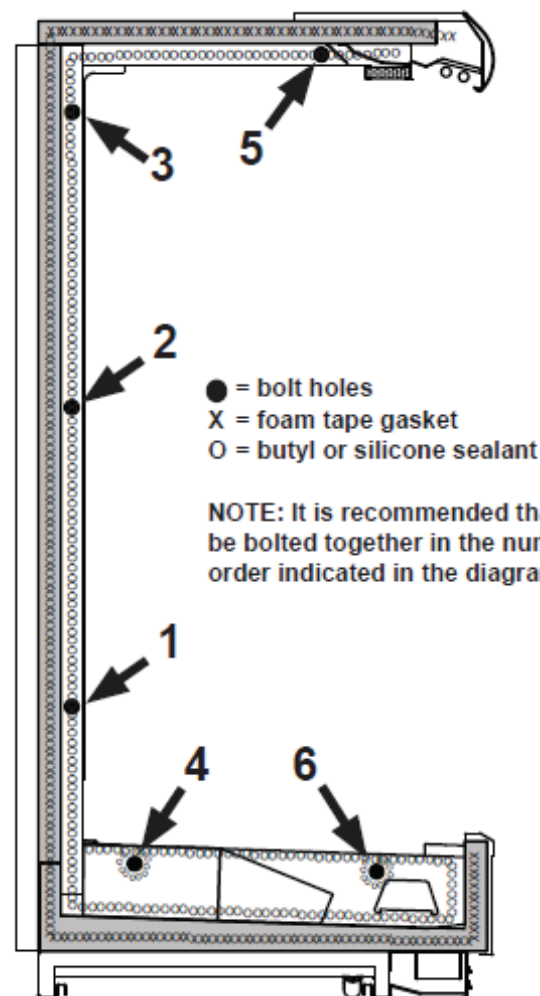


Fig. 2 Bolt holes, foam tape gasket and sealant

CASE INSTALLATION

5. Loosen the cornice joint at case end (cornice screws are located on top of the case). Be certain that cornice joints and pins are properly aligned. Cases are now ready to be joined.
6. Push the cases tightly together, then lightly bolt them together through the holes that are provided (Fig. 2). Tighten all the joining bolts until all margins are equal. Be careful not to over tighten.
7. Repeat steps 2-6 of this sequence for all remaining cases. Be certain to properly level all cases.
8. If seismic brackets are included, see **Appendix B** for detailed installation instructions.

TRIM OUT

1. Seal the case-to-case joints with caulk (supplied), then apply acrylic tape (supplied) over the pipe-chase seam (Fig. 3). The tape acts as a watershed preventing water from settling in the case joint.

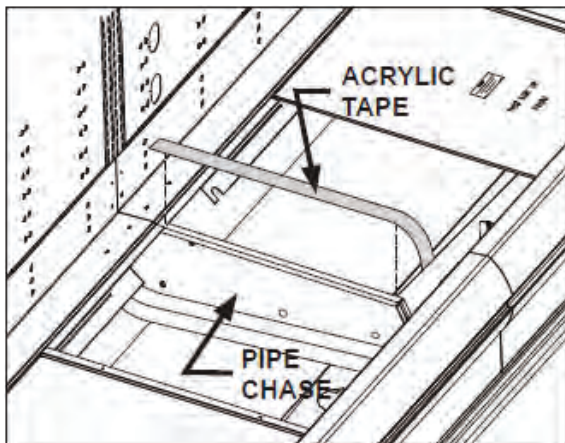


Fig. 3 Sealing the pipe chase

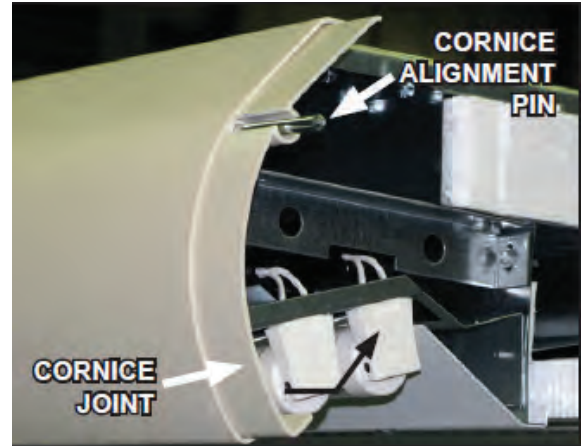


Fig. 4 Cornice joints



CAUTION

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

2. Install the mirror assembly and mirror scoop (if ordered). For installation instructions, see **Appendix D**.
3. Re-install shelves. Be aware that differing shelf configurations will affect energy consumption and case performance. If shelf fillers are utilized, it is important that they be installed flush with the rear baffle to ensure proper airflow in the case. For installation instructions, see **Appendix E**.
4. Tighten all cornice joints as needed (Fig. 4). Working outward from the center of the line-up, loosen the fasteners on the top and slide the cornices in one direction so that each joint aligns tightly together. Tighten the fasteners on top and apply an external joint band on the extreme ends of the lineup if a gap exists.
5. Properly align the front panels as needed, then install the front panel trim (supplied).
6. Attach the one-piece kick plate to the factory installed kickplate retainers with the screws provided.

REFRIGERATION

There are two refrigeration piping options for these cases: standard and top-box.

Standard piping penetration is located at the front-right area of the case, fully visible in front of the fan plenum. The topbox option consists of piping enclosed in a foam box that exits near the top of the the back-right area of the case.

If hot gas defrost is utilized, suction lines to each case in the circuit should be of equal distance from the main suction line. The expansion valve and other controls - located on the left-hand side of the case - are accessible by lifting the two left-hand deck pans (lifting the fan plenum is not required).

Before operating the case, be certain to remove the shipping blocks (Fig. 5) that protect the refrigeration lines during shipping. If it becomes necessary to penetrate the case tank in any area, be certain to seal any open gaps afterwards with canned-foam sealant and white RTV.

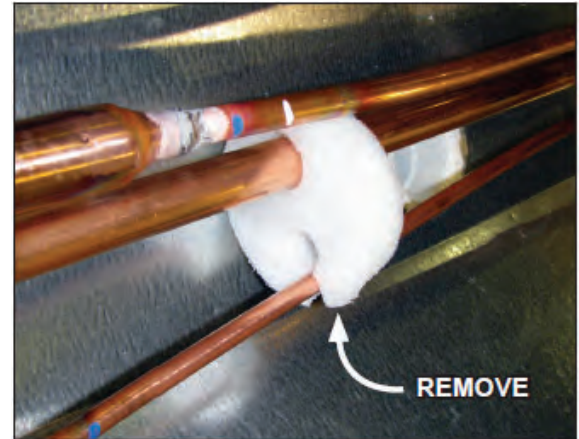


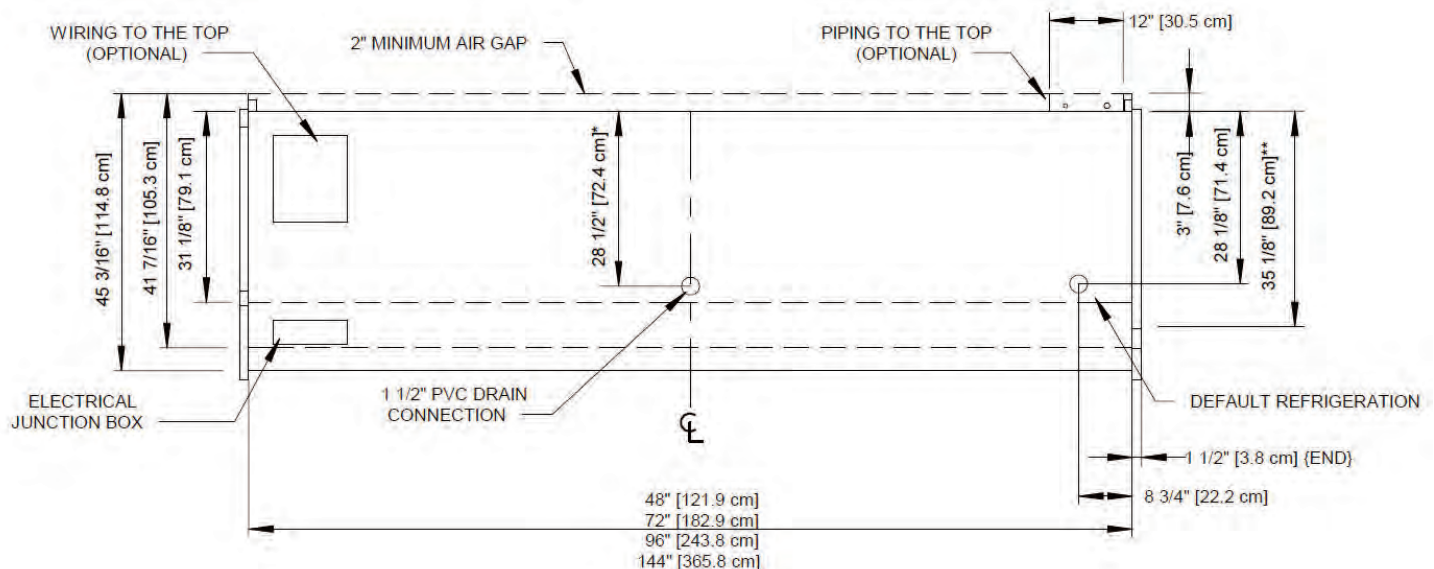
Fig. 5 Remove the shipping blocks

⚠ CAUTION

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

MODEL 6MLH-NRG

(6MLH-NRG show. For all other case piping locations, please see Technical Reference Sheet in Appendix A.)



CASE CONNECTIONS

PLUMBING

The drain outlet is specially molded out of PVC material and is located in the front-center of the case for convenient access. The “P” trap, furnished with the case, is constructed of schedule 40 PVC pipe (Fig. 6). Care should be given to ensure that all connections are water-tight and sealed with the appropriate PVC or ABS cement.



Fig. 6 “P” Trap

The drain lines can be run left or right of the tee with the proper pitch to satisfy local drainage requirements. Since the kickplate is shipped loose with the case, you should have open access to the drain line area during installation.

If the kickplate has been installed, you will find it very easy to remove. Simply remove the screws and pull the kickplate away from the case (see **Trim Out** section).

ELECTRICAL

Electrical hookups are made to a junction box located either at the bottom-front-left of the case (Fig. 7), at the top rear-left of the case (Fig. 8) or to the raceway running along the bottom-front of the case (Fig. 9).

For case-to-case wiring, run conduit between the junction boxes or run wiring through the raceway. When connecting to the junction box on the bottom-left side of the case, field wiring should exit box from the right side (furthest away from case wiring) to allow more room inside for wiring connections. For more detailed electrical wiring information, see **Appendix C**.

⚠ CAUTION

Be certain to clear the case of any loose packaging or case materials before energizing the case. Failure to do so may result in case damage or malfunction.



Fig. 7 Junction box beneath case

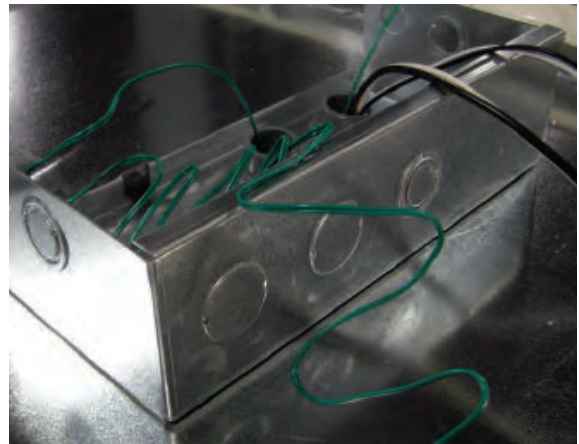


Fig. 8 Junction box on top of case

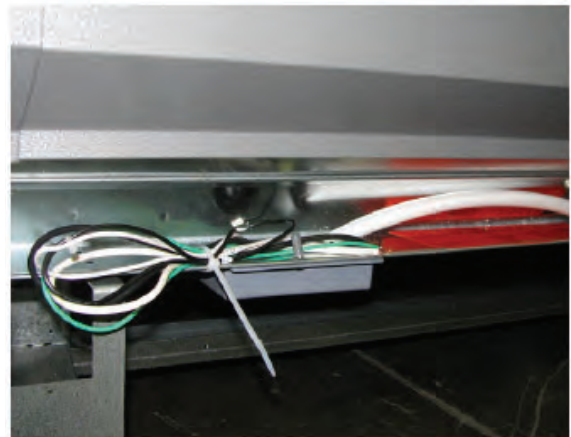


Fig. 9 Raceway

⚠ CAUTION

Be certain that all piping and electrical connections comply with local codes.

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. 7)**
- ☐ **Have you removed and discarded the casters? (see pg. 7)**
- ☐ **Have you checked the vertical plumb of the case? The horizontal level? (see pg. 7)**
- ☐ **Have you applied the foam tape gasket and sealant between adjoining cases? (see pg. 7)**
- ☐ **Have you sealed the case-to-case joints by applying caulk and acrylic tape to the pipe-chase seam? (see pg. 8)**
- ☐ **Have you removed the shipping blocks from the refrigeration lines? (see pg. 9)**
- ☐ **Have you sealed any tank penetrations? (see pg. 9)**
- ☐ **Have you cleared the case of any loose packaging or case materials? (see pg. 10)**

LIGHTING & POWER SUPPLIES

Hill PHOENIX cases are equipped with LED luminaires. Depending on case configuration, LED power supplies operate both the canopy lights and shelf lights and are located in the electrical junction box beneath the case.

Both lighting systems have an ON/OFF switch that is located in the upper left-hand corner of the lighting assembly. Once cases have been properly positioned in the store and an electrician has connected the lighting circuit, the lights may be turned on to verify that they are connected and functioning properly.

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

REPLACING SHELF LED LUMINAIRES



1. Unplug



2. Remove

1. Unplug the LED luminaire.
2. Pinching the latching clips inward at the ends of the luminaire, rotate luminaire down at each end until hooks are free, then remove.
3. To install the new luminaire, place hook into shelf roll at shelf front and rotate rear of luminaire toward the shelf.
4. Depress the rear clip so that luminaire can finish rotation and until clip engages the shelf bracket.

REPLACING NON-SHELF LED LUMINAIRES

1. Squeeze plastic clips on the 4-pin connector at the end of the luminaire, then pull free of the receptacle.
2. At the other end, slide the luminaire to the opening and disengage from the metal housing slot.
3. To install the new luminaire, simply reverse the previous steps.



1. Squeeze plastic clips at one end, pinch the latching clips and pull the luminaires free.



2. Slide the other end to the opening in the sheet metal and disengage.



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 injury or death.

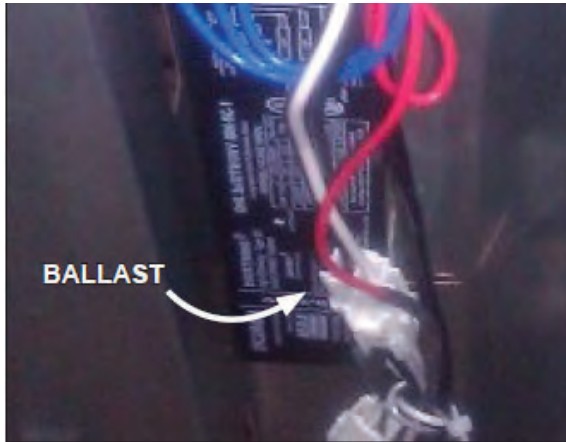
BALLAST/POWER SUPPLY ACCESS

Fig. 10 Clear view of the ballast once the light reflector is removed.

To gain access to the ballasts or power supplies, the reflectors may be removed easily by following these instructions:

1. Remove LED luminaires.
2. Remove screws along length of the reflector and carefully remove the reflector.
3. Ballasts/power supplies are now visible (Fig. 10).
4. To replace reflector, reverse the procedure. Insert reflector in front channel, lift into place, then replace the screws in the reflector.

⚠ CAUTION

If fascia is installed on top of the case, do not drill into the area above the ballast(s). Doing so may result in case damage.

⚠ WARNING

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

AIRFLOW, DEFROST & TEMPERATURE CONTROL

AIR FLOW & PRODUCT LOAD

It is important that you do not overload the food product display so that it impinges on the air flow pattern - overloading will cause malfunction and the loss of proper temperature levels, particularly when discharge and return air sections are covered. Air from the back of the case removes heat from the product and also reinforces the discharge air curtain. It is recommended to maintain a 1" to 2" below each shelf to allow airflow over the product. Please keep products within the load limit line shown on the diagram below (Fig. 11).

DEFROST & TEMPERATURE CONTROLS

Hill PHOENIX cases utilize electric, hot gas, or timed-off defrost. The primary components used for the defrost cycle are the various defrost termination sensors, which work to terminate the defrost cycle in the case. These controls may include 1) a Klixon® thermostat, 2) a sensor probe, or 3) a dial-type thermostat with sensor bulb (the thermostat will always be mounted with the electrical controls of the case - i.e., in the electrical junction box, in the electrical raceway, etc.).

If electric defrost is used, the defrost termination sensor will be located either behind the rear baffle or mounted to the coil. If hot gas defrost is used, the defrost termination sensor will be mounted to the dump line - the sensor

should always be mounted on the coil-side of the check valve or solenoid valve. Finally, if timed-off defrost is used, the refrigeration cycle is simply turned off by the case controls for a specified amount of time; therefore, there are generally no active defrost components utilized.

The discharge air probe monitors the temperature of the discharge air and may be used as the defrost termination sensor. The probe can generally be found behind the rear baffle, in the upper baffle, or in front of the honeycomb.

NOTE: if the discharge air probe is used for defrost termination, none of the termination sensors listed earlier will be installed in the case.

For more detailed information on suggested defrost times and settings, see **Appendices A**). Further adjustments may be required depending on store conditions.

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 (Fig. 12).
2. Using the suction pressure reading, convert pressure to temperature using the refrigerant manufacturer's Pressure-Temperature Chart. The dewpoint temperature should be utilized.
3. Finally, subtract the converted temperature reading from the actual temperature reading for superheat setting.

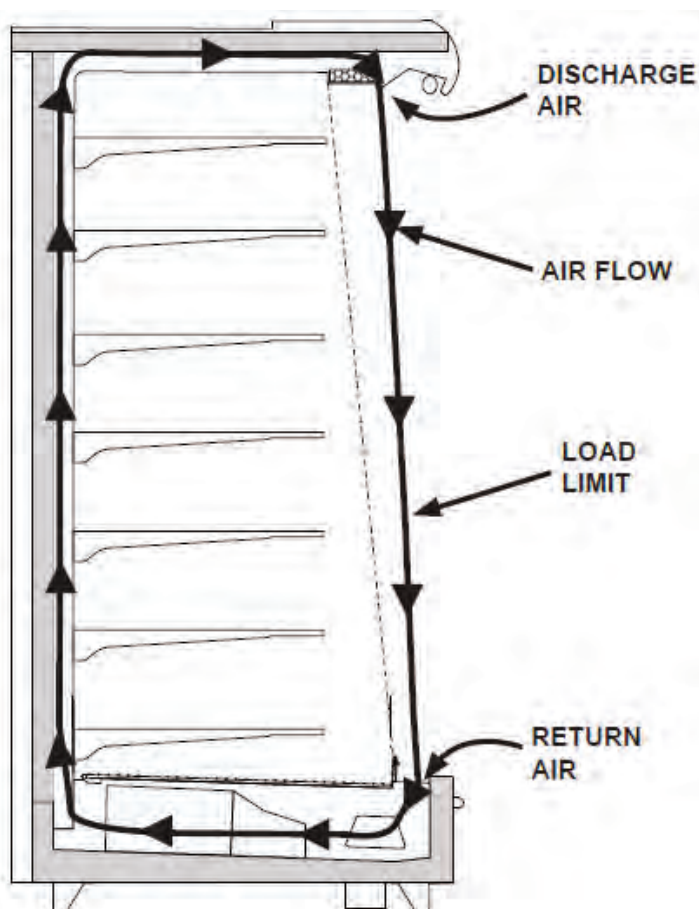


Fig. 11 Airflow

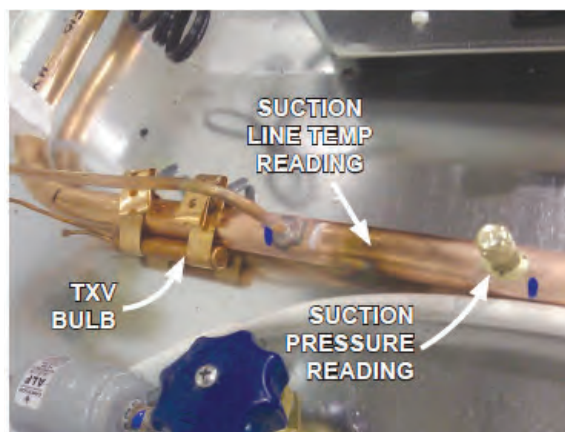


Fig. 12 Obtain pressure and temperature readings

⚠ 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 injury or death.

FANS

Fan speed is set during manufacturing. It is important that the fan speed be maintained as specified. **Do not attempt a field modification by altering the speed.**

Fan motors may be changed with an easy two-step process without lifting up the plenum, thereby avoiding the necessity to unload the entire product display to change the fan assembly:

1. Unplug the fan motor (Fig. 13), easily accessible outside the plenum. Be sure to push the power cord back through plenum opening to avoid damage to the power cord.
2. Remove fasteners, then lift out the entire fan motor.

Reverse procedure when re-installing fan basket.



Fig. 13 Fan basket

⚠ WARNING

Power cord must be pushed back through the plenum opening before removing the fan basket. Failure to do so may result in damage to the power cord.

CLEANING PROCEDURES

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 front 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.

- Lift the fan plenum to gain access to the coil for cleaning and maintenance (Fig. 14).
- To clean the lights, 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.
- 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 kickplate and clean underneath the case with a



Fig. 14 Single-piece fan plenum and coil cover



Fig. 15 Clean honeycomb

⚠ WARNING

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



Contact the Service Parts Department at:

1-800-283-1109

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**

***Serial plate is located inside the case on the top-left side.**

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

A	Technical Reference Sheet
B	Seismic Brackets
C	Electrical Wiring Diagrams
D	Mirror Assembly
E	Shelf Fillers

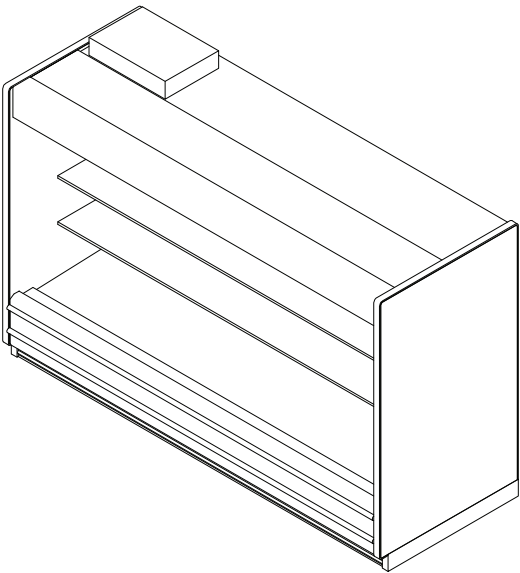
A1: TECHNICAL REFERENCE SHEET

3NDML-NRG

Multi-Deck Merchandiser with Synerg-E™
6' & 8' (Beverage/Dairy/Deli/Produce)

GENERAL NOTES:

- "----" indicates that feature is not an option on this case model and/or the data is not yet available.



SHIPPING WEIGHT	
Case	Weight
3NDML-NRG	---



COMPONENT

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.

3NDML-NRG

Rev. Date	Rev. #	Rev. Title
10-16-18	3	DATA UPDATE
6-18-18	2	NEW STANDARDS



A2: TECHNICAL REFERENCE SHEET

3NDML-NRG

Multi-Deck Merchandiser with Synerg-E™
6' & 8' (Beverage/Dairy/Deli/Produce)

ELECTRICAL DATA			
Case Length	Fans Per Case	High Efficiency Fans	
		120 Volts	
		Amps	Watts
6'	3	0.57	65.0
8'	3	0.57	65.0

LIGHTING DATA						
Case Length	Lights per row	Lights Length	Clearvoyant LED Lighting (Per Light Row)			
			Standard Power (Cornice or Shelf)		High Power (Cornice)	
			120 Volts		120 Volts	
			Amps	Watts	Amps	Watts
6'	2	3'	0.08	9.4	0.20	23.8
8'	2	3'	0.10	11.8	0.25	29.8

GUIDELINES AND CONTROL SETTINGS						
Application	BTUH/ft		Superheat Set Point @ Bulb (F)	Evaporator (F)	Discharge Air (F)	Discharge Air Velocity (FPM)
	Conventional	Parallel				
Dairy/Deli/Cut Product	1396	1343	6 - 8	28	33	210
Bulk Product/Beverage	1239	1225	6 - 8	32	37	210

DEFROST CONTROLS		
Defrosts Per Day	Timed-Off Defrost	
	Fail-Safe (Min)	Termination Temp (F)
6	45	47

NOTES:

- "---" indicates that feature is not an option on this case model and/or the data is not yet available.
- Listed BTUH/ft data represent unlighted shelves. For LED lighting, add 9 BTUH/ft per row of lighted shelving.
- BTUH load increases by 132 BTUH/ft when aftermarket merchandising accessories are utilized.
- Listed evaporator temperature represents unlighted shelves. For lighted shelves and/or aftermarket merchandising accessories, reduce the listed evaporator temperature by 2°F.
- Conventional Discharge Air Control – Recommended Settings: Cut-In Temp = Discharge Air + 2°F; Cut-Out Temp = Discharge Air - 2°F.
- Listed discharge air velocity represents the average velocity at the peak of defrost.
- Temperature and defrost settings listed above are recommended start-up settings. Final operational settings may need to be adjusted for the store condition in which the case operates.



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.

3NDML-NRG

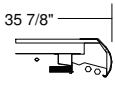
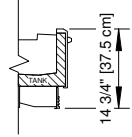
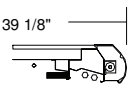
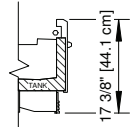
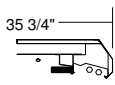
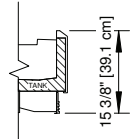
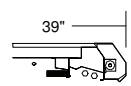
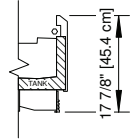
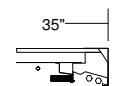
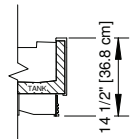
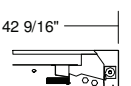
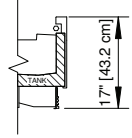
Rev. Date	Rev. #	Rev. Title
10-16-18	3	DATA UPDATE
6-18-18	2	NEW STANDARDS



A3: TECHNICAL REFERENCE SHEET

3NDML-NRG

Multi-Deck Merchandiser with Synerg-E™
6' & 8' (Beverage/Dairy/Deli/Produce)

CORNICE OPTIONS	FRONT OPTIONS
<u>CURVED CORNICE</u> 	<u>CLASSIC 2 STANDARD FRONT</u> 
<u>CURVED CORNICE WITH NIGHT COVER</u> 	<u>CLASSIC 2 17" FRONT W/ & W/O NOSE LIGHT</u> 
<u>FACETED CORNICE</u> 	<u>ANGLED FRONT</u> 
<u>FACETED CORNICE WITH NIGHT COVER</u> 	<u>ANGLED FRONT W/ & W/O NOSE LIGHT</u> 
<u>FLAT CORNICE</u> 	<u>FLAT FRONT</u> 
<u>FLAT CORNICE WITH NIGHT COVER</u> 	<u>17" FLAT FRONT W/ & W/O NOSE LIGHT</u> 



COMPONENT

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.

3NDML-NRG

Rev. Date	Rev. #	Rev. Title
10-16-18	3	DATA UPDATE
6-18-18	2	NEW STANDARDS

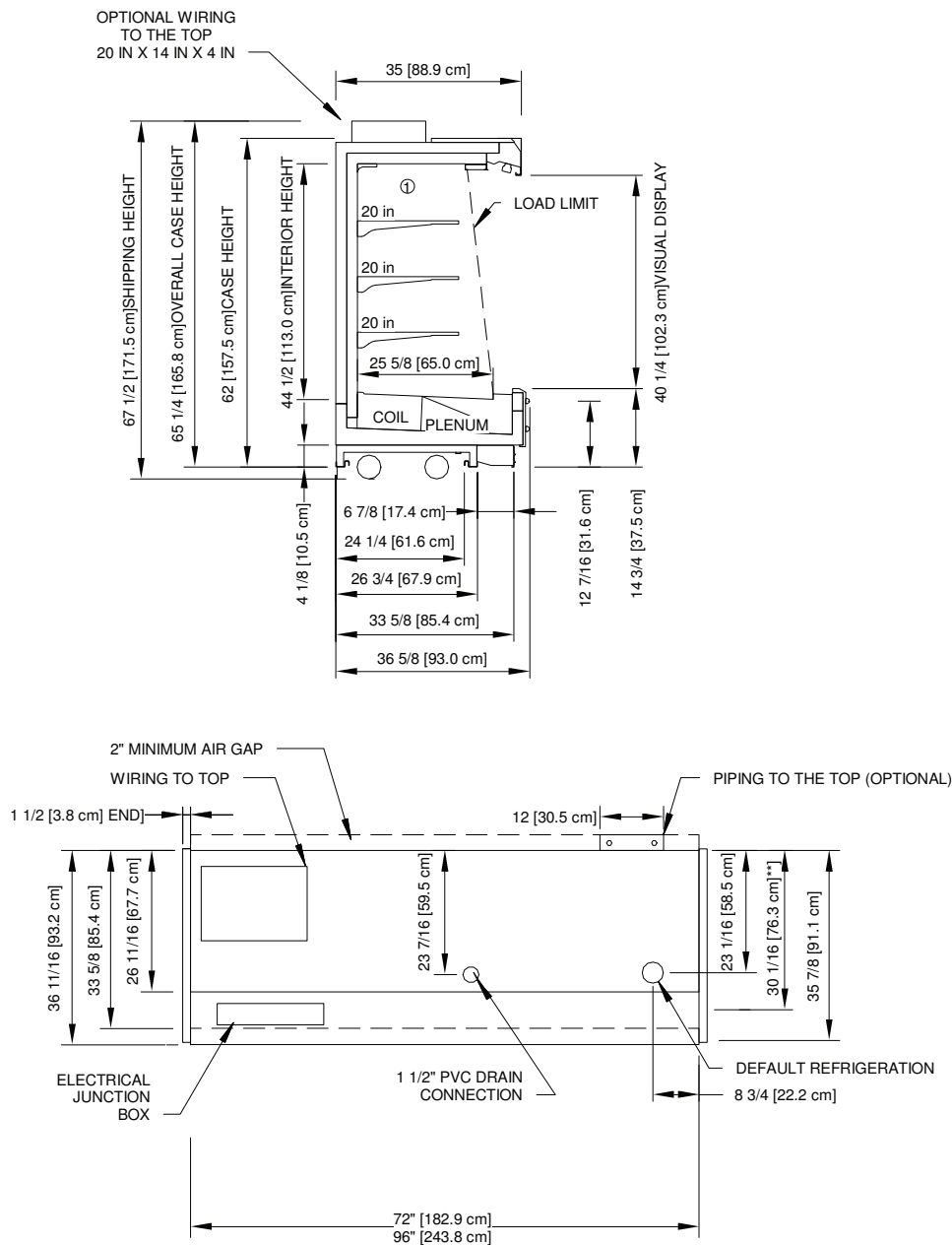


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A4: TECHNICAL REFERENCE SHEET

3NDML-NRG

Multi-Deck Merchandiser with Synerg-E™
6' & 8' (Beverage/Dairy/Deli/Produce)



NOTES:

- * : STUB-UP AREA
- ** : RECOMMENDED STUB-UP CENTERLINE FOR ELECTRICAL AND HUB DRAINS
- ① : AVAILABLE SHELF SIZES: 10", 12", 14", 16", 18", 20", 22" & 24"

- Ends add approximately 1" to case height
- Back panels add approximately 1" to the rear of the case



3NDML-NRG

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.

Rev. Date	Rev. #	Rev. Title
10-16-18	3	DATA UPDATE
6-18-18	2	NEW STANDARDS



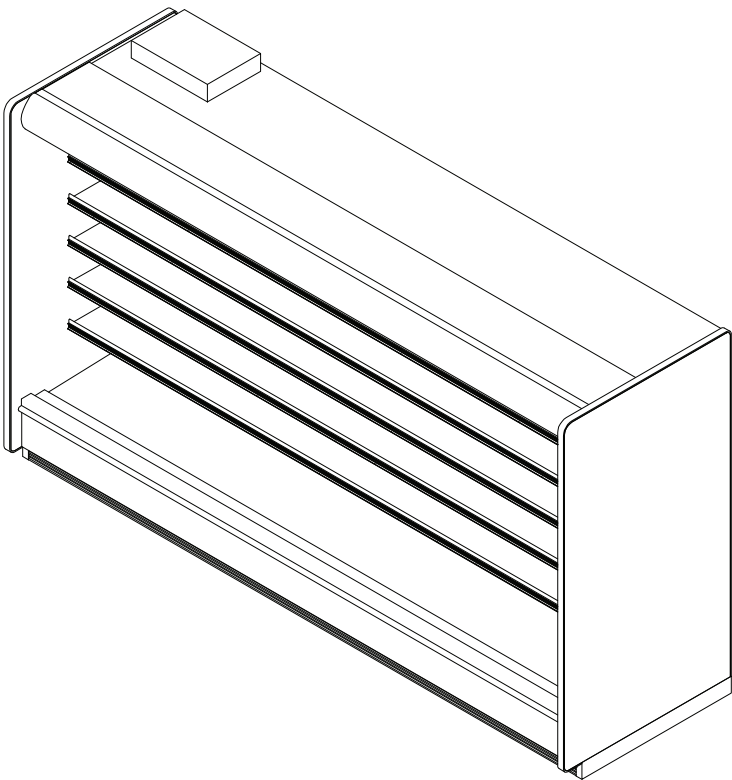
A5: TECHNICAL REFERENCE SHEET

5DMLH-NRG

High Multi-Deck Merchandiser with Synerg-E™
4', 6', 8' & 12' (Beverage / Dairy / Deli / Produce)

GENERAL NOTES:

- "---" indicates that the feature is not an option for this case model and/or the data is not yet available.
- LED lights only.
- Maximum of 5 rows of standard output LED lighted shelves.



SHIPPING WEIGHT	
Case	Weight
5DMLH-NRG	---



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.

5DMLH-NRG

Rev. Date	Rev. #	Rev. Title
10-15-18	3	DATA UPDATE
7-3-18	2	NEW STANDARDS



A6: TECHNICAL REFERENCE SHEET

5DMLH-NRG

High Multi-Deck Merchandiser with Synerg-E™
4', 6', 8' & 12' (Beverage / Dairy / Deli / Produce)

ELECTRICAL DATA			
Case Length	Fans Per Case	High Efficiency Fans	
		120 Volt	
		Amps	Watts
4'	2	0.38	43.0
6'	3	0.57	65.0
8'	3	0.57	65.0
12'	4	0.73	87.0

LIGHTING DATA					
Case Length	Lights per row	Clearvoyant v4 LED Lighting (Per Light Row)			
		Standard Power (Cornice or Shelf)		High Power (Cornice Only)	
		120 Volts		120 Volts	
		Amps	Watts	Amps	Watts
4'	1	0.05	5.9	0.12	14.9
6'	2	0.08	9.4	0.20	23.8
8'	2	0.10	11.8	0.25	29.9
12'	3	0.15	17.6	0.37	44.8

GUIDELINES AND CONTROL SETTINGS						
Application	BTUH/ft		Superheat Set Point @ Bulb (°F)	Evaporator (°F)	Discharge Air (°F)	Discharge Air Velocity (FPM)
	Conventional	Parallel				
Dairy/Deli/Cut Produce	1608	1360	6 - 8	30	33	320
Beverage/Bulk Produce	1315	1110	6 - 8	32	37	320

DEFROST CONTROLS			
Application	Defrosts Per Day	Timed-Off Defrost	
		Fail-Safe (Min)	Termination Temp (F)
Dairy/Deli/Cut Produce	6	45	47
Beverage/Bulk Produce	2	30	47

NOTES:

- "---" indicates that the feature is not an option for this case model and/or the data is not yet available.
- Listed BTUH/ft data represent unlighted shelves. For LED lighting, add 9 BTUH/ft to determine Total Case Lighting BTUH Load, then divide by the length of the case to obtain a value in BTUH/ft.
- BTUH load increases by 132 BTUH/ft when aftermarket merchandising accessories are utilized.
- Listed evaporator temperature represents unlighted shelves. For lighted shelves and/or aftermarket merchandising accessories, reduce the listed evaporator temperature by 2°F.
- Conventional Discharge Air Control – Recommended Settings: Cut-In Temp = Discharge Air + 2°F; Cut-Out Temp = Discharge Air - 2°F.
- Listed discharge air velocity represents the average velocity immediately after defrost.
- Temperature and defrost settings listed above are recommended start-up settings. Final operational settings may need to be adjusted for the store conditions in which the case operates.
- The recommended evaporator temperatures may need to be adjusted based on system setup, store conditions, etc. The minimum recommended evaporator temperature is 4°F below the listed evaporator temperature.



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.

5DMLH-NRG

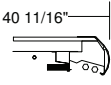
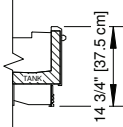
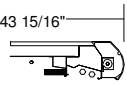
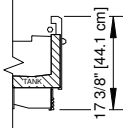
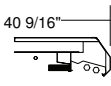
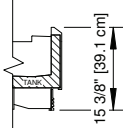
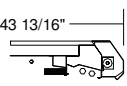
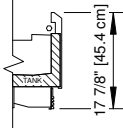
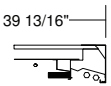
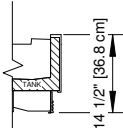
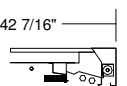
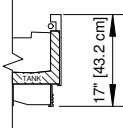
Rev. Date	Rev. #	Rev. Title
10-15-18	3	DATA UPDATE
7-3-18	2	NEW STANDARDS



A7: TECHNICAL REFERENCE SHEET

5DMLH-NRG

High Multi-Deck Merchandiser with Synerg-E™
4', 6', 8' & 12' (Beverage / Dairy / Deli / Produce)

CORNICE OPTIONS	FRONT OPTIONS
<u>CURVED CORNICE</u> 	<u>CLASSIC 2 STANDARD FRONT</u> 
<u>CURVED CORNICE WITH NIGHT COVER</u> 	<u>CLASSIC 2 17" FRONT W/ & W/O NOSE LIGHT</u> 
<u>FACETED CORNICE</u> 	<u>ANGLED FRONT</u> 
<u>FACETED CORNICE WITH NIGHT COVER</u> 	<u>ANGLED FRONT W/ & W/O NOSE LIGHT</u> 
<u>FLAT CORNICE</u> 	<u>FLAT FRONT</u> 
<u>FLAT CORNICE WITH NIGHT COVER</u> 	<u>17" FLAT FRONT W/ & W/O NOSE LIGHT</u> 



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.

5DMLH-NRG

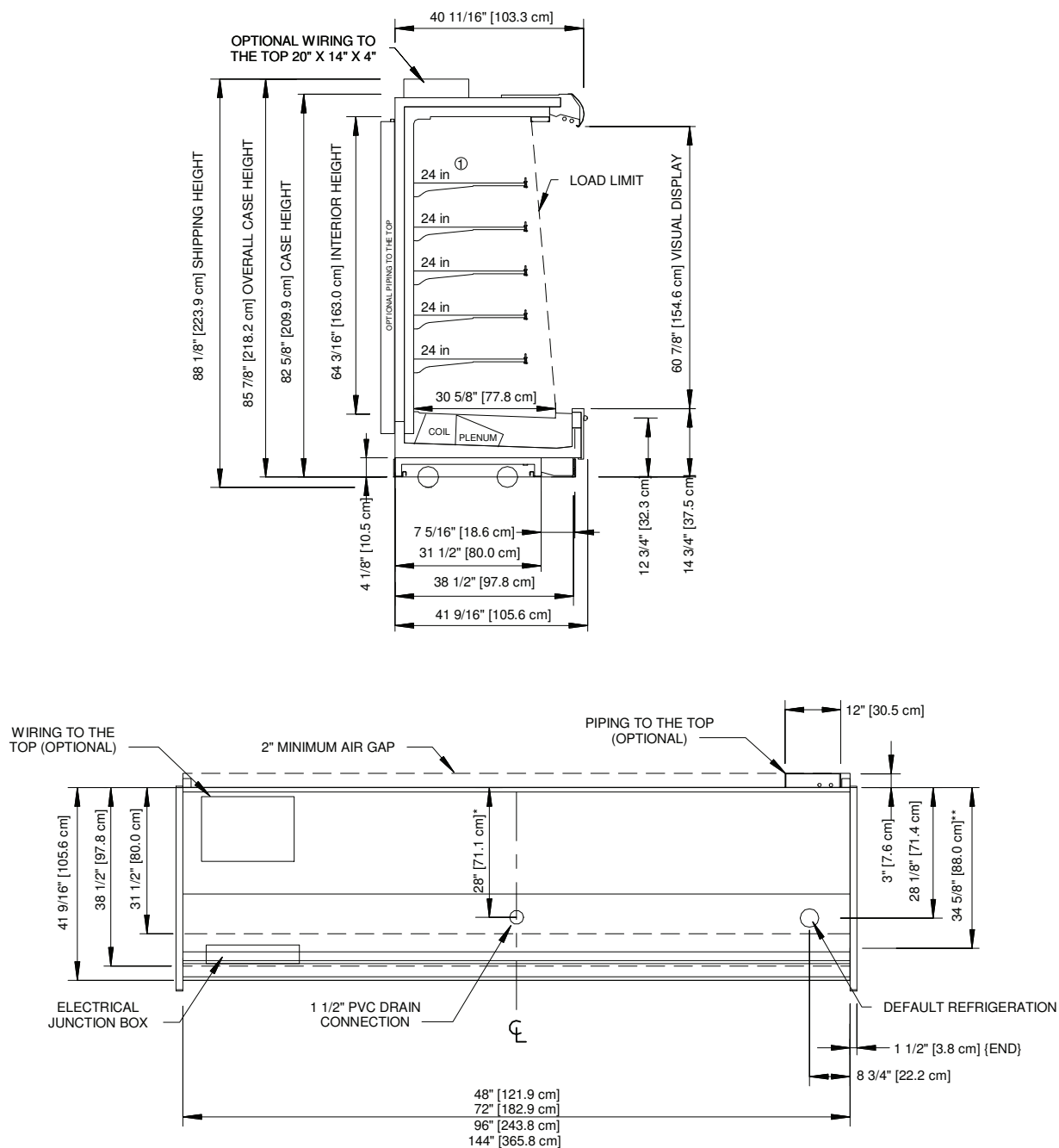
Rev. Date	Rev. #	Rev. Title
10-15-18	3	DATA UPDATE
7-3-18	2	NEW STANDARDS

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A8: TECHNICAL REFERENCE SHEET

5DMLH-NRG

High Multi-Deck Merchandiser with Synerg-E™
4', 6', 8' & 12' (Beverage / Dairy / Deli / Produce)



NOTES:

- * : STUB-UP AREA
- ** : RECOMMENDED STUB-UP CENTERLINE FOR ELECTRICAL AND HUB DRAINS
- ① : AVAILABLE SHELF SIZES: 10", 12", 14", 16", 18", 20", 22" & 24"

- Ends add approximately 1" to case height.
- Back panels add approximately 1" to the rear of the case.



COMPONENT

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.

5DMLH-NRG

Rev. Date	Rev. #	Rev. Title
10-15-18	3	DATA UPDATE
7-3-18	2	NEW STANDARDS



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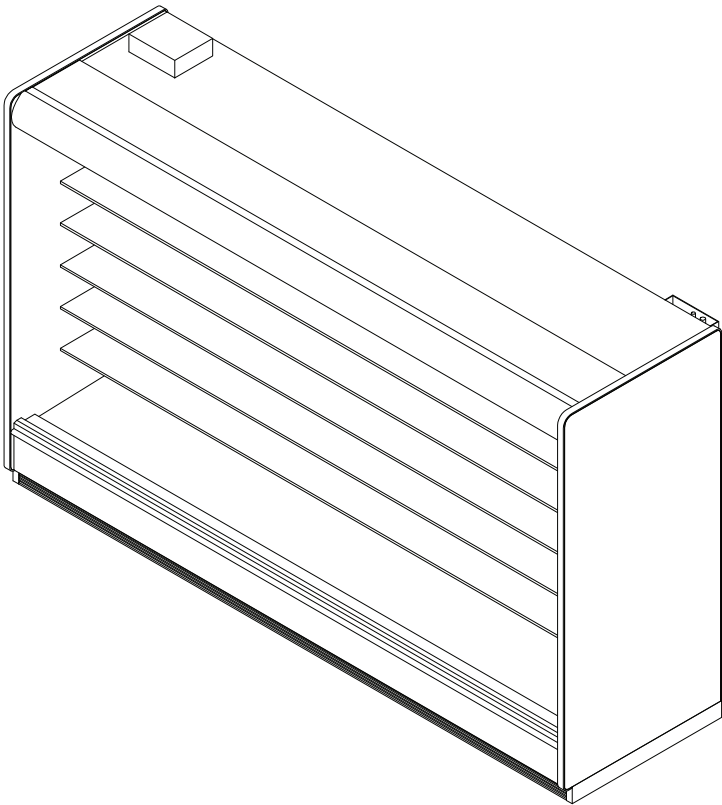
A9: TECHNICAL REFERENCE SHEET

6DMLH-NRG

High Multi-Deck Merchandiser with Synerg-E™
4', 6', 8' & 12' (Beverage / Dairy / Deli / Produce)

GENERAL NOTES

- "---" indicates that the feature is not an option with this model and/or the data is not yet available.
- LED lights only.
- Maximum of 6 rows of standard output LED shelves.



SHIPPING WEIGHT	
Case	Weight
6DMLH-NRG	---



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.

6DMLH-NRG

Rev. Date	Rev. #	Rev. Title
5-1-19	5	ENDVIEW UPDATE
2-7-19	4	DATA UPDATE



A10: TECHNICAL REFERENCE SHEET

6DMLH-NRG

High Multi-Deck Merchandiser with Synerg-E™
4', 6', 8' & 12' (Beverage / Dairy / Deli / Produce)

ELECTRICAL DATA			
Case Length	Fans Per Case	High Efficiency Fans	
		120 Volts	
		Amps	Watts
4'	2	0.38	43
6'	3	0.57	65
8'	3	0.57	65
12'	4	0.76	87

LIGHTING DATA						
Case Length	Lights per row	Lights Length	Clearvoyant LED Lighting (Per Light Row)			
			Standard Power (Cornice or Shelf)		High Power (Cornice)	
			120 Volts		120 Volts	
			Amps	Watts	Amps	Watts
4'	1	4'	0.05	5.9	0.12	14.9
6'	2	3'	0.08	9.4	0.20	23.8
8'	2	4'	0.10	11.8	0.25	29.9
12'	3	4'	0.15	17.6	0.37	44.8

GUIDELINES AND CONTROL SETTINGS						
Application	BTUH/ft		Superheat Set Point @ Bulb (°F)	Evaporator (°F)	Discharge Air (°F)	Discharge Air Velocity (FPM)
	Conventional	Parallel				
Dairy/Deli/Cut Produce	1695	1585	6 - 8	28	31	260
Bulk Produce/Beverage	1545	1475	6 - 8	34	37	260

DEFROST CONTROLS			
Application	Defrosts Per Day	Timed-Off Defrost	
		Fail-Safe (Min)	Termination Temp (°F)
Dairy/Deli/Cut Produce	6	45	47
Bulk Produce/Beverage	2	30	47

NOTES:

- "---" indicates that the feature is not an option with this model and/or the data is not yet available.
- Listed BTUH/ft data represent unlighted shelves. For LED lighting, add 9 BTUH/ft to determine Total Case Lighting BTUH Load, then divide by the length of the case to obtain a value in BTUH/ft. BTUH load increases by 132 BTUH/ft when aftermarket merchandising accessories are utilized.
- Listed evaporator temperature represents unlighted shelves. For lighted shelves and/or aftermarket merchandising accessories, reduce the listed evaporator temperature by 2°F.
- Conventional Discharge Air Control – Recommended Settings: Cut-In Temp = Discharge Air + 2°F; Cut-Out Temp = Discharge Air - 2°F.
- Listed discharge air velocity represents the average velocity immediately after defrost.
- Temperature and defrost settings listed above are recommended start-up settings. Final operational settings may need to be adjusted for the store conditions in which the case operates.
- The recommended evaporator temperatures may need to be adjusted based on system setup, store conditions, etc. The minimum recommended evaporator temperature is 4°F below the listed evaporator temperature.



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.

6DMLH-NRG

Rev. Date	Rev. #	Rev. Title
5-1-19	5	ENDVIEW UPDATE
2-7-19	4	DATA UPDATE



A11: TECHNICAL REFERENCE SHEET

6DMLH-NRG

High Multi-Deck Merchandiser with Synerg-E™
4', 6', 8' & 12' (Beverage / Dairy / Deli / Produce)

SECOND NATURE DATA

Case Model	No. of Coils	Application	Front Sill Type	BTUH/FT (DR)		GPM/ft (DR)	Supply Fluid Temp (°F)	Discharge Air Temp (°F)
				Conventional	Parallel			
6DMLH-NRG	1	Dairy/Deli/Cut Produce	Standard	1695	1585	0.42	20	31
6DMLH-NRG	1	Bulk Produce/Beverage	Standard	1545	1475	0.17	20	37
6DMLH-NRG	1	Dairy/Deli/Cut Produce	Standard	1695	1585	0.76	25	31
6DMLH-NRG	1	Bulk Produce/Beverage	Standard	1545	1475	0.32	25	37

SECOND NATURE DATA

Case Model	No. of Coils	Application	Front Sill Type	Supply Fluid Temp (°F)	No. of Defrost	Timed-Off Defrost		Warm Fluid Defrost	
						Fail Safe (Min)	Termination Temp (°F)	Fail Safe (Min)	Termination Temp (°F)
6DMLH-NRG	1	Dairy/Deli/Cut Produce	Standard	20	6	60	47	26	49
6DMLH-NRG	1	Bulk Produce/Beverage	Standard	20	6	60	47	26	49
6DMLH-NRG	1	Dairy/Deli/Cut Produce	Standard	25	6	45	42	26	49
6DMLH-NRG	1	Bulk Produce/Beverage	Standard	25	6	45	42	26	49



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.

6DMLH-NRG

Rev. Date	Rev. #	Rev. Title
5-1-19	5	ENDVIEW UPDATE
2-7-19	4	DATA UPDATE

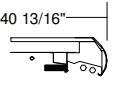
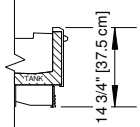
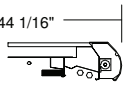
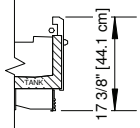
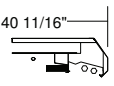
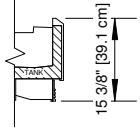
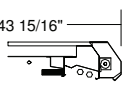
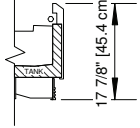
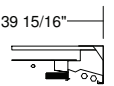
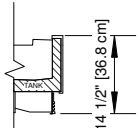
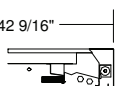
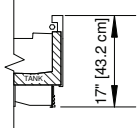


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A12: TECHNICAL REFERENCE SHEET

6DMLH-NRG

High Multi-Deck Merchandiser with Synerg-E™
4', 6', 8' & 12' (Beverage / Dairy / Deli / Produce)

CORNICE OPTIONS	FRONT OPTIONS
<u>CURVED CORNICE</u> 	<u>CLASSIC 2 STANDARD FRONT</u> 
<u>CURVED CORNICE WITH NIGHT COVER</u> 	<u>CLASSIC 2 17" FRONT W/ & W/O NOSE LIGHT</u> 
<u>FACETED CORNICE</u> 	<u>ANGLED FRONT</u> 
<u>FACETED CORNICE WITH NIGHT COVER</u> 	<u>ANGLED FRONT W/ & W/O NOSE LIGHT</u> 
<u>FLAT CORNICE</u> 	<u>FLAT FRONT</u> 
<u>FLAT CORNICE WITH NIGHT COVER</u> 	<u>17" FLAT FRONT W/ & W/O NOSE LIGHT</u> 



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.

6DMLH-NRG

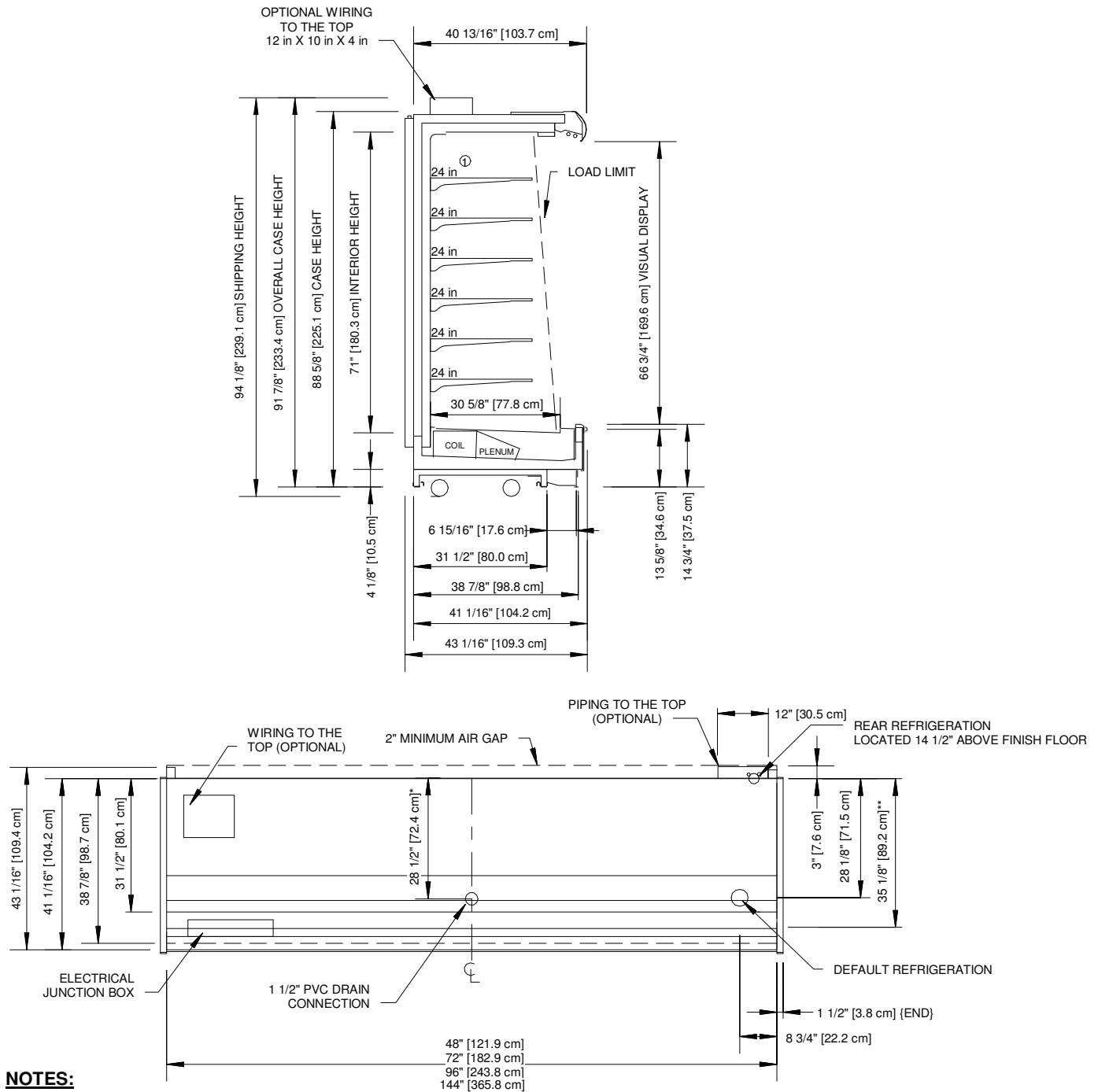
Rev. Date	Rev. #	Rev. Title
5-1-19	5	ENDVIEW UPDATE
2-7-19	4	DATA UPDATE



A13: TECHNICAL REFERENCE SHEET

6DMLH-NRG

High Multi-Deck Merchandiser with Synerg-E™
4', 6', 8' & 12' (Beverage / Dairy / Deli / Produce)



NOTES:

- * : STUB-UP AREA
- ** : RECOMMENDED STUB-UP CENTERLINE FOR ELECTRICAL AND HUB DRAINS
- ① : AVAILABLE SHELF SIZES: 18", 20", 22" & 24"

- End add approximately 1" to case height



COMPONENT

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.

6DMLH-NRG

Rev. Date	Rev. #	Rev. Title
5-1-19	5	ENDVIEW UPDATE
2-7-19	4	DATA UPDATE



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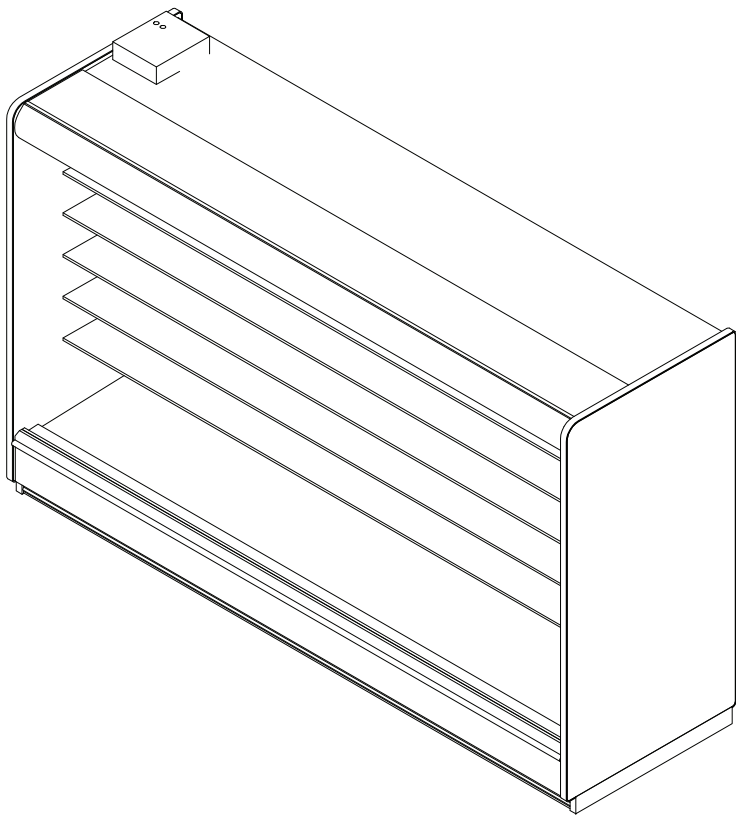
A14: TECHNICAL REFERENCE SHEET

6DMLHR-NRG

Rear Load Multi-Deck Merchandiser with Synerg-E™
6', 8' & 12' (Dairy / Deli)

GENERAL NOTES

- "----" indicates that the feature is not available for this model and/or that the data is not yet available.
- LED lights only.
- Maximum of 6 rows of standard output LED lighted shelves.



SHIPPING WEIGHT	
Case	Weight
6DMLHR-NRG	---



ALL MEASUREMENTS ARE TAKEN PER
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REFRIGERATED DISPLAY CASES FOR SALE IN THE
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OF ENERGY 2017 REQUIREMENTS.

6DMLHR-NRG

Rev. Date	Rev. #	Rev. Title
10-15-18	3	DATA UPDATE
6-14-18	2	NEW STANDARDS



A15: TECHNICAL REFERENCE SHEET

6DMLHR-NRG

Rear Load Multi-Deck Merchandiser with Synerg-E™
6', 8' & 12' (Dairy / Deli)

ELECTRICAL DATA			
Case Length	Fans Per Case	High Efficiency Fans	
		120 Volt	
		Amps	Watts
6'	3	0.57	65.0
8'	4	0.76	87.0
12'	6	1.14	130.0

LIGHTING DATA					
Case Length	Lights per row	Clearvoyant v4 LED Lighting (Per Light Row)			
		Standard Power (Cornice or Shelf)		High Power (Cornice Only)	
		120 Volts		120 Volts	
		Amps	Watts	Amps	Watts
6'	2	0.57	65.0	0.20	23.8
8'	2	0.76	87.0	0.25	29.9
12'	3	1.14	130.0	0.37	44.8

GUIDELINES AND CONTROL SETTINGS					
BTUH/ft		Superheat Set Point @ Bulb (°F)	Evaporator (°F)	Discharge Air (°F)	Discharge Air Velocity (FPM)
Conventional	Parallel				
1756	1500	6 - 8	25	34	200

DEFROST CONTROLS		
Defrosts Per Day	Timed-Off Defrost	
	Fail-Safe (Min)	Termination Temp (F)
6	45	47

NOTES:

- "---" indicates that the feature is not available for this model and/or that the data is not yet available.
- Listed BTUH/ft data represent unlighted shelves. For LED lighting, add 9 BTUH/ft per row of lighted shelving.
- BTUH load increases by 132 BTUH/ft when aftermarket merchandising accessories are utilized.
- Listed evaporator temperature represents unlighted shelves. For lighted shelves and/or aftermarket merchandising accessories, reduce the listed evaporator temperature by 2°F.
- Conventional Discharge Air Control – Recommended Settings: Cut-In Temp = Discharge Air + 2°F; Cut-Out Temp = Discharge Air - 2°F.
- Listed discharge air velocity represents the average velocity immediately after defrost.
- Temperature and defrost settings listed above are recommended start-up settings. Final operational settings may need to be adjusted for the store conditions in which the case operates.
- The recommended evaporator temperatures may need to be adjusted based on system setup, store conditions, etc. The minimum recommended evaporator temperature is 4°F below the listed evaporator temperature.



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.

6DMLHR-NRG

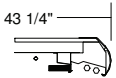
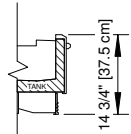
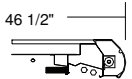
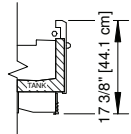
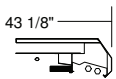
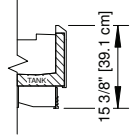
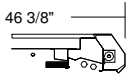
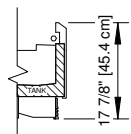
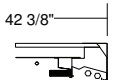
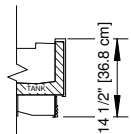
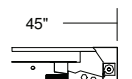
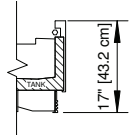
Rev. Date	Rev. #	Rev. Title
10-15-18	3	DATA UPDATE
6-14-18	2	NEW STANDARDS



A16: TECHNICAL REFERENCE SHEET

6DMLHR-NRG

Rear Load Multi-Deck Merchandiser with Synerg-E™
6', 8' & 12' (Dairy / Deli)

CORNICE OPTIONS	FRONT OPTIONS
<u>CURVED CORNICE</u> 	<u>CLASSIC 2 STANDARD FRONT</u> 
<u>CURVED CORNICE WITH NIGHT COVER</u> 	<u>CLASSIC 2 17" FRONT W/ & W/O NOSE LIGHT</u> 
<u>FACETED CORNICE</u> 	<u>ANGLED FRONT</u> 
<u>FACETED CORNICE WITH NIGHT COVER</u> 	<u>ANGLED FRONT W/ & W/O NOSE LIGHT</u> 
<u>FLAT CORNICE</u> 	<u>FLAT FRONT</u> 
<u>FLAT CORNICE WITH NIGHT COVER</u> 	<u>17" FLAT FRONT W/ & W/O NOSE LIGHT</u> 



COMPONENT

ALL MEASUREMENTS ARE TAKEN PER
ASHRAE-72-2005 SPECIFICATIONS. HILLPHOENIX
REFRIGERATED DISPLAY CASES FOR SALE IN THE
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OF ENERGY 2017 REQUIREMENTS.

6DMLHR-NRG

Rev. Date	Rev. #	Rev. Title
10-15-18	3	DATA UPDATE
6-14-18	2	NEW STANDARDS

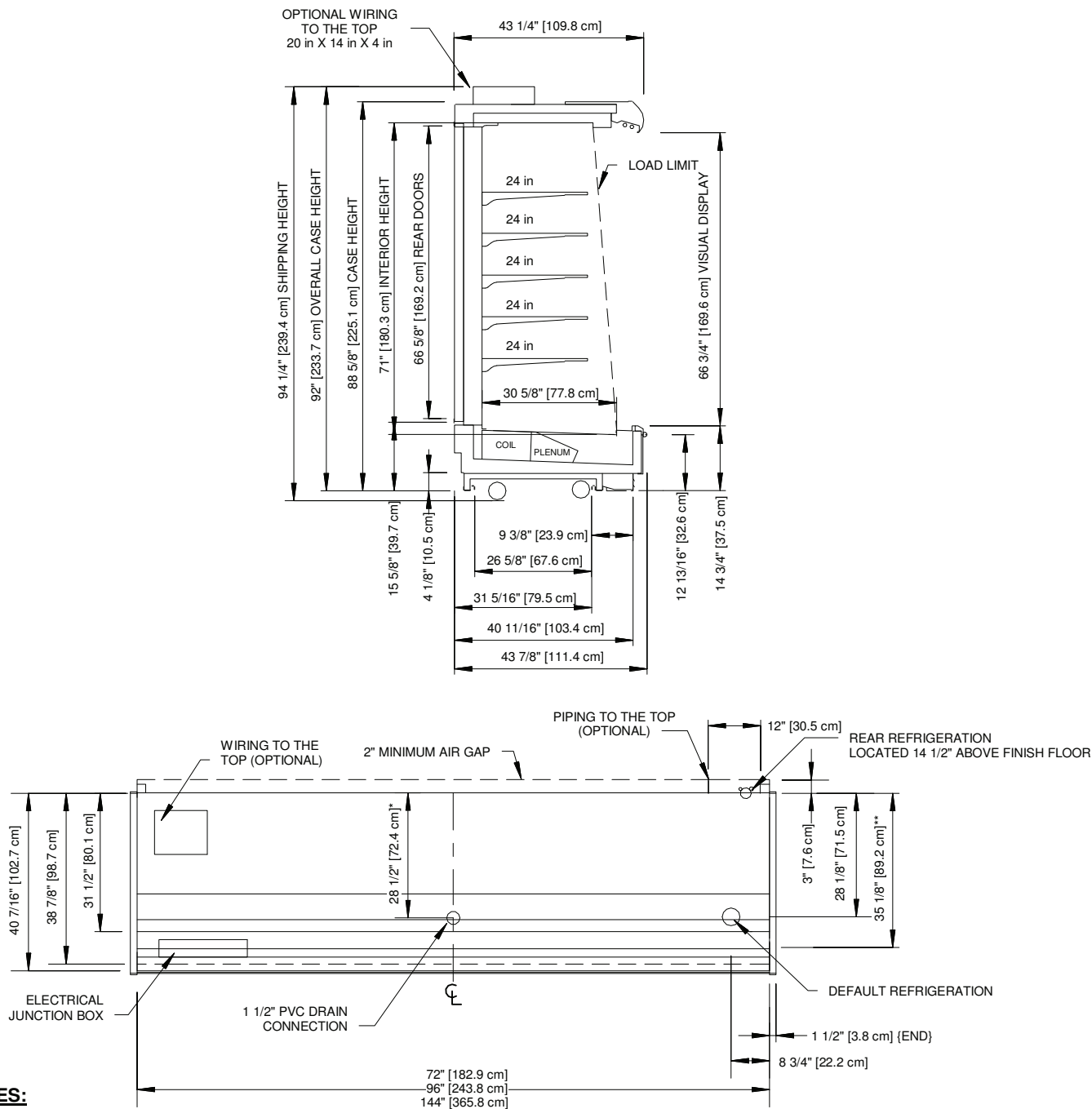


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A17: TECHNICAL REFERENCE SHEET

6DMLHR-NRG

Rear Load Multi-Deck Merchandiser with Synerg-E™
6', 8' & 12' (Dairy / Deli)



NOTES:

- * : STUB-UP AREA
- ** : RECOMMENDED STUP-UP CENTERLINE FOR ELECTRICAL AND HUB DRAINS
- ① : AVAILABLE SHELF SIZES: 18", 20", 22" & 24"

- End add approximately 1" to case height, 1/2" to the back & 1" to the front
- Back panels add approximately 1" to the rear of the case suction line 7/8"
- Rear-loading cases are designed for the rear door to open into an operating cooler
- Peg shelving systems are not to be used with rear-loading cases



6DMLHR-NRG

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Rev. Date	Rev. #	Rev. Title
10-15-18	3	DATA UPDATE
6-14-18	2	NEW STANDARDS

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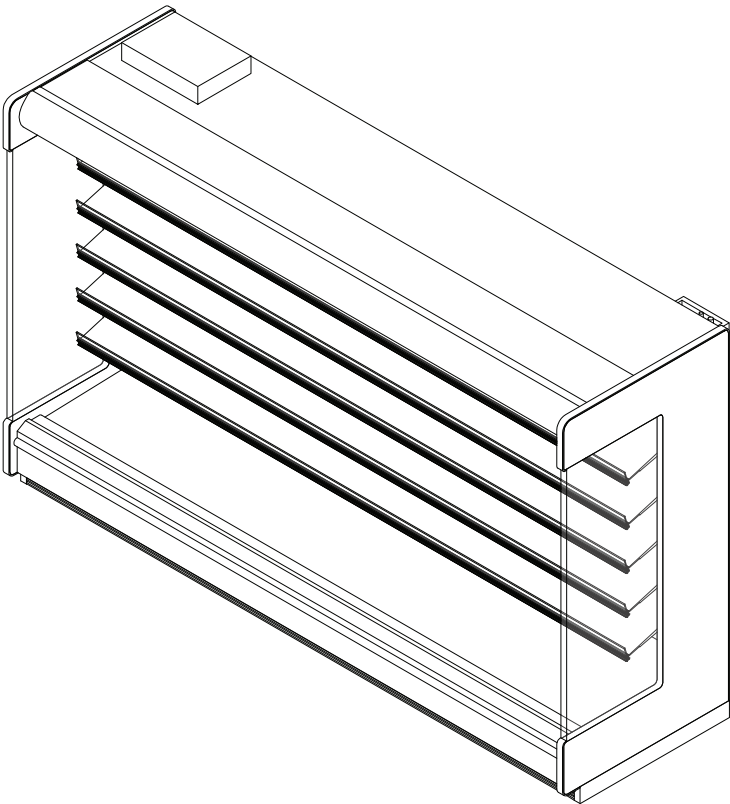
A18: TECHNICAL REFERENCE SHEET

6MLH-NRG

High Multi-Deck Merchandiser with Synerg-E™
4', 6', 8' & 12' (Deli/Meat)

GENERAL NOTES

- "---" indicates that the feature is not an option for this case model and/or the data is not yet available.
- LED lights only.
- Maximum of 6 rows of standard output LED shelves.
- For optimal case performance in fresh meat (deli/meat) applications, Hillphoenix recommends that the merchandising depth in the bin area not exceed 4 inches.
- For optimal case performance, mirrors should be equally spaced between the adjacent mirrors and case ends.



SHIPPING WEIGHT	
Case	Weight
6MLH-NRG	---



COMPONENT

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.

6MLH-NRG

Rev. Date	Rev. #	Rev. Title
5-1-19	7	ENDVIEW UPDATE
1-7-19	6	ENDVIEW UPDATE



A19: TECHNICAL REFERENCE SHEET

6MLH-NRG

High Multi-Deck Merchandiser with Synerg-E™
4', 6', 8' & 12' (Deli/Meat)

ELECTRICAL DATA

Case Length	Fans Per Case	High Efficiency Fans	
		120 Volt	
		Amps	Watts
4'	2	0.80	62
6'	3	1.20	92
8'	3	1.20	92
12'	4	1.60	123

LIGHTING DATA

Case Length	Lights per row	Clearvoyant v4 LED Lighting (Per Light Row)			
		Standard Power (Cornice or Shelf)		High Power (Cornice Only)	
		120 Volts		120 Volts	
		Amps	Watts	Amps	Watts
4'	1	0.05	5.9	0.12	14.9
6'	2	0.08	9.4	0.20	23.8
8'	2	0.10	11.8	0.25	29.9
12'	3	0.15	17.6	0.37	44.8

GUIDELINES AND CONTROL SETTINGS

Application	Front Sill height	BTUH/ft		Superheat Set Point @ Bulb (°F)	Evaporator (°F)	Discharge Air (°F)	Discharge Air Velocity (FPM)
		Conventional	Parallel				
Deli/Meat	14"	2028	1844	6 - 8	22	30	230
Deli/Meat	17"	1904	1731	6 - 8	22	30	230

DEFROST CONTROLS

Application	Defrosts Per Day	Timed-Off Defrost	
		Fail-Safe (Min)	Termination Temp (°F)
Deli/Meat	8	45	48

NOTES:

- Listed BTUH/ft data represents unlighted shelves. For LED lighting, add 9 BTUH/ft to determine Total Case Lighting BTUH Load. The published BTU Loads represent 4 rows of 22" shelves angled 17°. For other shelving configurations, add 100 BTUH/ft.
- Conventional Discharge Air Control – Recommended Settings: Cut-In Temp = Discharge Air + 2°F; Cut-Out Temp = Discharge Air - 2°F.
- Listed discharge air velocity represents the average velocity at the peak of defrost.
- Temperature and defrost settings listed above are recommended start-up settings. Final operational settings may need to be adjusted for the store conditions in which the case operates.
- The recommended evaporator temperatures may need to be adjusted based on system setup, store conditions, etc. The minimum recommended evaporator temperature is 4°F below the listed evaporator temperature.



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6MLH-NRG

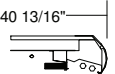
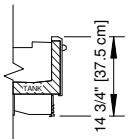
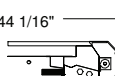
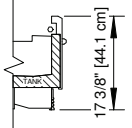
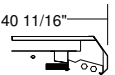
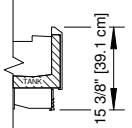
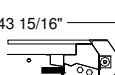
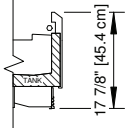
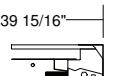
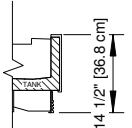
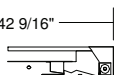
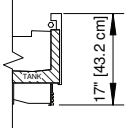
Rev. Date	Rev. #	Rev. Title
5-1-19	7	ENDVIEW UPDATE
1-7-19	6	ENDVIEW UPDATE



A20: TECHNICAL REFERENCE SHEET

6MLH-NRG

High Multi-Deck Merchandiser with Synerg-E™
4', 6', 8' & 12' (Deli/Meat)

CORNICE OPTIONS	FRONT OPTIONS
<u>CURVED CORNICE</u> 	<u>CLASSIC 2 STANDARD FRONT</u> 
<u>CURVED CORNICE WITH NIGHT COVER</u> 	<u>CLASSIC 2 17" FRONT W/ & W/O NOSE LIGHT</u> 
<u>FACETED CORNICE</u> 	<u>ANGLED FRONT</u> 
<u>FACETED CORNICE WITH NIGHT COVER</u> 	<u>ANGLED FRONT W/ & W/O NOSE LIGHT</u> 
<u>FLAT CORNICE</u> 	<u>FLAT FRONT</u> 
<u>FLAT CORNICE WITH NIGHT COVER</u> 	<u>17" FLAT FRONT W/ & W/O NOSE LIGHT</u> 



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6MLH-NRG

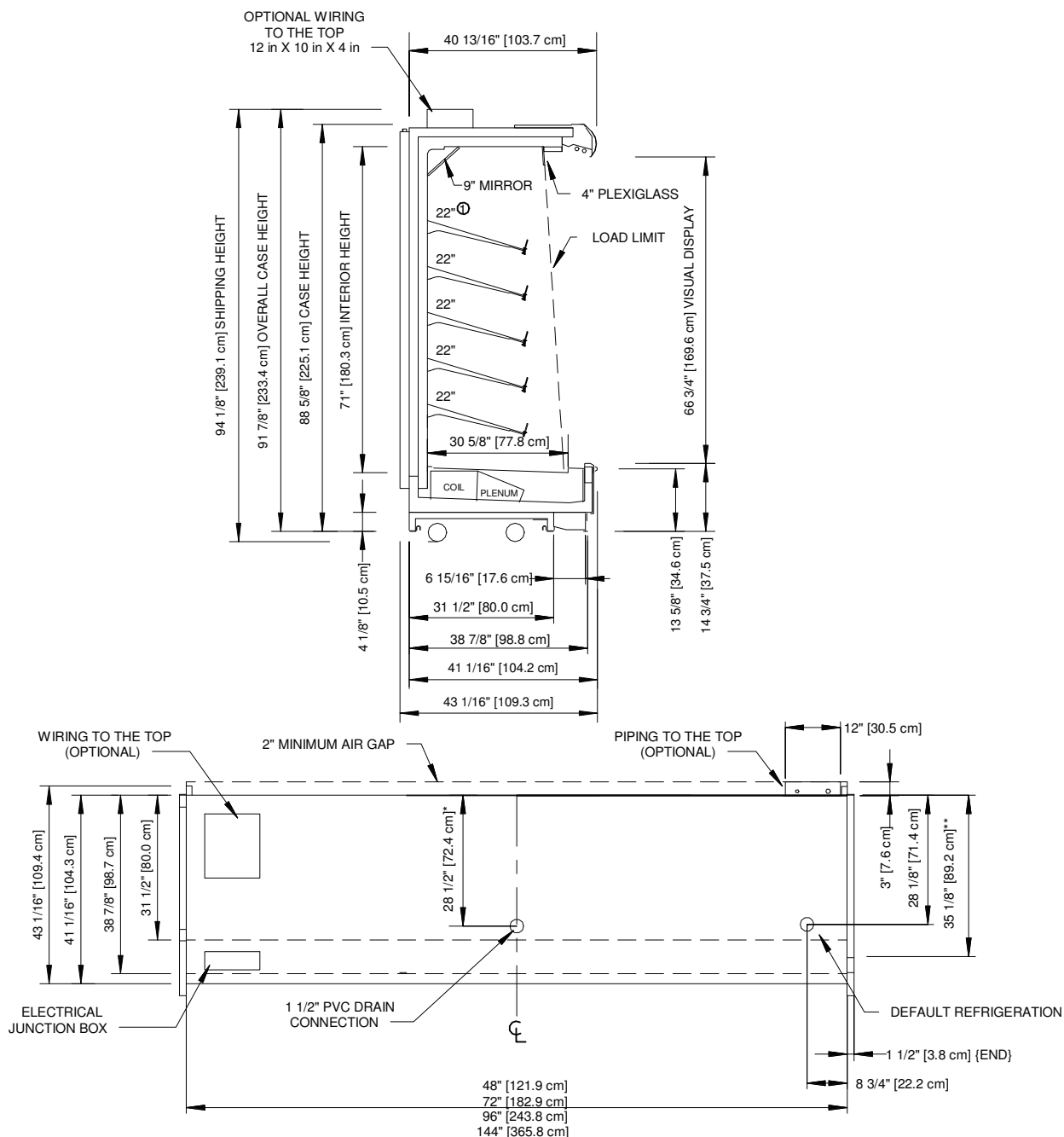
Rev. Date	Rev. #	Rev. Title
5-1-19	7	ENDVIEW UPDATE
1-7-19	6	ENDVIEW UPDATE



A21: TECHNICAL REFERENCE SHEET

6MLH-NRG

High Multi-Deck Merchandiser with Synerg-E™
4', 6', 8' & 12' (Deli/Meat)



NOTES:

- * : STUB-UP AREA
- ** : RECOMMENDED STUP-UP CENTERLINE FOR ELECTRICAL AND HUB DRAINS
- ① : AVAILABLE SHELF SIZES: 16", 18", 20" & 22" (14" only available with cascade arrangement)

- Ends add approximately 1" to case height.
- Back panels add approximately 1" to the rear of the case.
- 4" plexiglass is required behind the honeycomb.
- The minimum shelf size in a cascade arrangement is 14".
- The minimum shelf size is 16" when all of the shelves are of equal size.
- Contact factory for available mirror sizes.



6MLH-NRG

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.

Rev. Date	Rev. #	Rev. Title
5-1-19	7	ENDVIEW UPDATE
1-7-19	6	ENDVIEW UPDATE

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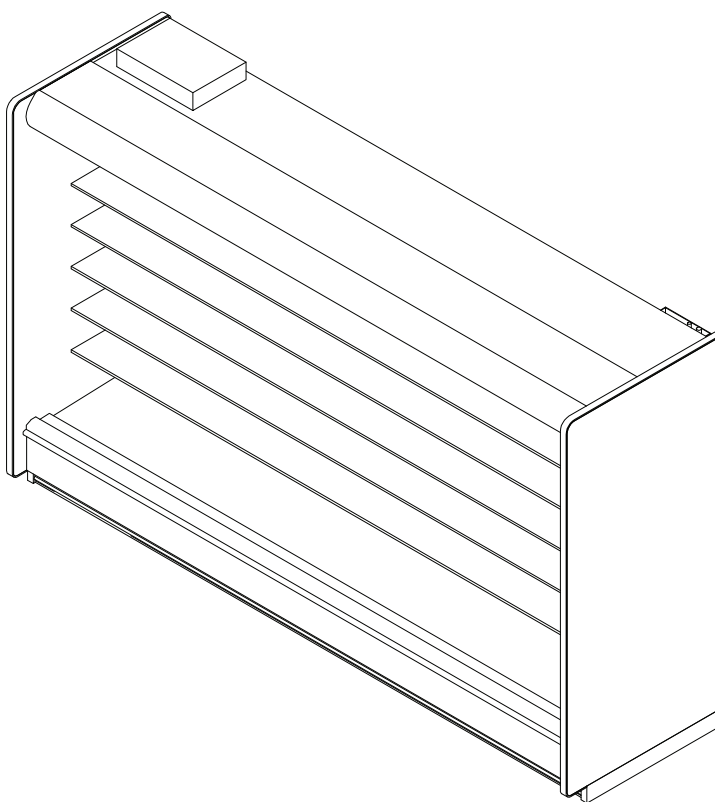
A22: TECHNICAL REFERENCE SHEET

6NDMLH-NRG

Narrow Multi-Deck Merchandiser with Synerg-E™
4', 6', 8' & 12' (Beverage / Dairy / Deli / Produce)

GENERAL NOTES

- "-" indicates that the feature is not available for this case model and/or the data is not available yet.
- LED lights only.
- Maximum of 6 rows of standard output LED shelves.



SHIPPING WEIGHT	
Case	Weight
6NDMLH-NRG	---



COMPONENT

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.

6NDMLH-NRG

Rev. Date	Rev. #	Rev. Title
10-15-18	3	DATA UPDATE
4-23-18	2	NEW STANDARDS

Hillphoenix
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A23: TECHNICAL REFERENCE SHEET

6NDMLH-NRG

Narrow Multi-Deck Merchandiser with Synerg-E™
4', 6', 8' & 12' (Beverage / Dairy / Deli / Produce)

ELECTRICAL DATA

Case Length	Fans Per Case	High Efficiency Fans	
		120 Volt	
		Amps	Watts
4'	2	0.38	43.0
6'	3	0.57	65.0
8'	3	0.57	65.0
12'	4	0.76	87.0

LIGHTING DATA

Case Length	Lights per row	Clearvoyant v4 LED Lighting (Per Light Row)			
		Standard Power (Cornice or Shelf)		High Power (Cornice Only)	
		120 Volts		120 Volts	
		Amps	Watts	Amps	Watts
4'	1	0.05	5.9	0.12	14.9
6'	2	0.08	9.4	0.20	23.8
8'	2	0.10	11.8	0.25	29.9
12'	3	0.15	17.6	0.37	44.8

GUIDELINES AND CONTROL SETTINGS

Application	BTUH/ft		Superheat Set Point @ Bulb (°F)	Evaporator (°F)	Discharge Air (°F)	Discharge Air Velocity (FPM)
	Conventional	Parallel				
Dairy/Deli/Cut Produce	1862	1748	6 - 8	28	31	260
Beverage/Bulk Produce	1860	1819	6 - 8	34	37	260

DEFROST CONTROLS

Application	Defrosts Per Day	Timed-Off Defrost	
		Fail-Safe (Min)	Termination Temp (F)
Dairy/Deli/Cut Produce	6	40	47
Beverage/Bulk Produce	2	30	47

NOTES:

- "- - -" indicates that the feature is not available for this case model and/or the data is not available yet.
- Listed BTUH/ft data represent unlighted shelves. For LED lighting, add 9 BTUH/ft to determine Total Case Lighting BTUH Load, then divide by the length of the case to obtain a value in BTUH/ft. BTUH load increases by 132 BTUH/ft when aftermarket merchandising accessories are utilized.
- Listed evaporator temperature represents unlighted shelves. For lighted shelves and/or aftermarket merchandising accessories, reduce the listed evaporator temperature by 2°F.
- Conventional Discharge Air Control – Recommended Settings: Cut-In Temp = Discharge Air + 2°F; Cut-Out Temp = Discharge Air - 2°F.
- Listed discharge air velocity represents the average velocity immediately after defrost.
- Temperature and defrost settings listed below are recommended start-up settings. Final operational settings may need to be adjusted for the store conditions in which the case operates.
- The recommended evaporator temperatures may need to be adjusted based on system setup, store conditions, etc. The minimum recommended evaporator temperature is 4°F below the listed evaporator temperature.



COMPONENT

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.

6NDMLH-NRG

Rev. Date	Rev. #	Rev. Title
10-15-18	3	DATA UPDATE
4-23-18	2	NEW STANDARDS



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A24: TECHNICAL REFERENCE SHEET

6NDMLH-NRG

Narrow Multi-Deck Merchandiser with Synerg-E™
4', 6', 8' & 12' (Beverage / Dairy / Deli / Produce)

SECOND NATURE DATA

Case Model	No. of Coils	Application	Front Sill Type	BTUH/ft (DR)		GPM/ft (DR)	Supply Fluid Temp (°F)	Discharge Air Temp (°F)
				Conventional	Parallel			
6NDMLH-NRG	1	Dairy/Deli/Cut Produce	Standard	1862	1748	0.46	20	31
6NDMLH-NRG	1	Beverage/Bulk Produce	Standard	1860	1819	0.21	20	37
6NDMLH-NRG	1	Dairy/Deli/Cut Produce	Standard	1862	1748	0.83	25	31
6NDMLH-NRG	1	Beverage/Bulk Produce	Standard	1860	1819	0.38	25	37

SECOND NATURE DATA

Case Model	No. of Coils	Application	Front Sill Type	Supply Fluid Temp (°F)	No. of Defrost	Timed Off Defrost		Warm Fluid Defrost	
						Fail Safe (Min)	Termination Temp (°F)	Fail Safe (Min)	Termination Temp (°F)
6NDMLH-NRG	1	Dairy/Deli/Cut Produce	Standard	20	6	60	47	26	49
6NDMLH-NRG	1	Beverage/Bulk Produce	Standard	20	6	60	47	26	49
6NDMLH-NRG	1	Dairy/Deli/Cut Produce	Standard	25	6	45	42	26	49
6NDMLH-NRG	1	Beverage/Bulk Produce	Standard	25	6	45	42	26	49



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REFRIGERATED DISPLAY CASES FOR SALE IN THE
UNITED STATES MEET OR EXCEED DEPARTMENT
OF ENERGY 2017 REQUIREMENTS.

6NDMLH-NRG

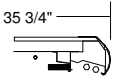
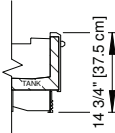
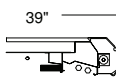
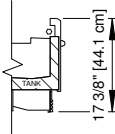
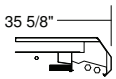
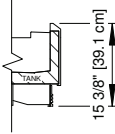
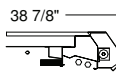
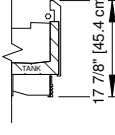
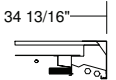
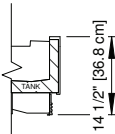
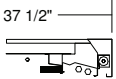
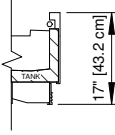
Rev. Date	Rev. #	Rev. Title
10-15-18	3	DATA UPDATE
4-23-18	2	NEW STANDARDS

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A25: TECHNICAL REFERENCE SHEET

6NDMLH-NRG

Narrow Multi-Deck Merchandiser with Synerg-E™
4', 6', 8' & 12' (Beverage / Dairy / Deli / Produce)

CORNICE OPTIONS	FRONT OPTIONS
<u>CURVED CORNICE</u> 	<u>CLASSIC 2 STANDARD FRONT</u> 
<u>CURVED CORNICE WITH NIGHT COVER</u> 	<u>CLASSIC 2 17" FRONT W/ & W/O NOSE LIGHT</u> 
<u>FACETED CORNICE</u> 	<u>ANGLED FRONT</u> 
<u>FACETED CORNICE WITH NIGHT COVER</u> 	<u>ANGLED FRONT W/ & W/O NOSE LIGHT</u> 
<u>FLAT CORNICE</u> 	<u>FLAT FRONT</u> 
<u>FLAT CORNICE WITH NIGHT COVER</u> 	<u>17" FLAT FRONT W/ & W/O NOSE LIGHT</u> 



ALL MEASUREMENTS ARE TAKEN PER
ASHRAE-72-2005 SPECIFICATIONS. HILLPHOENIX
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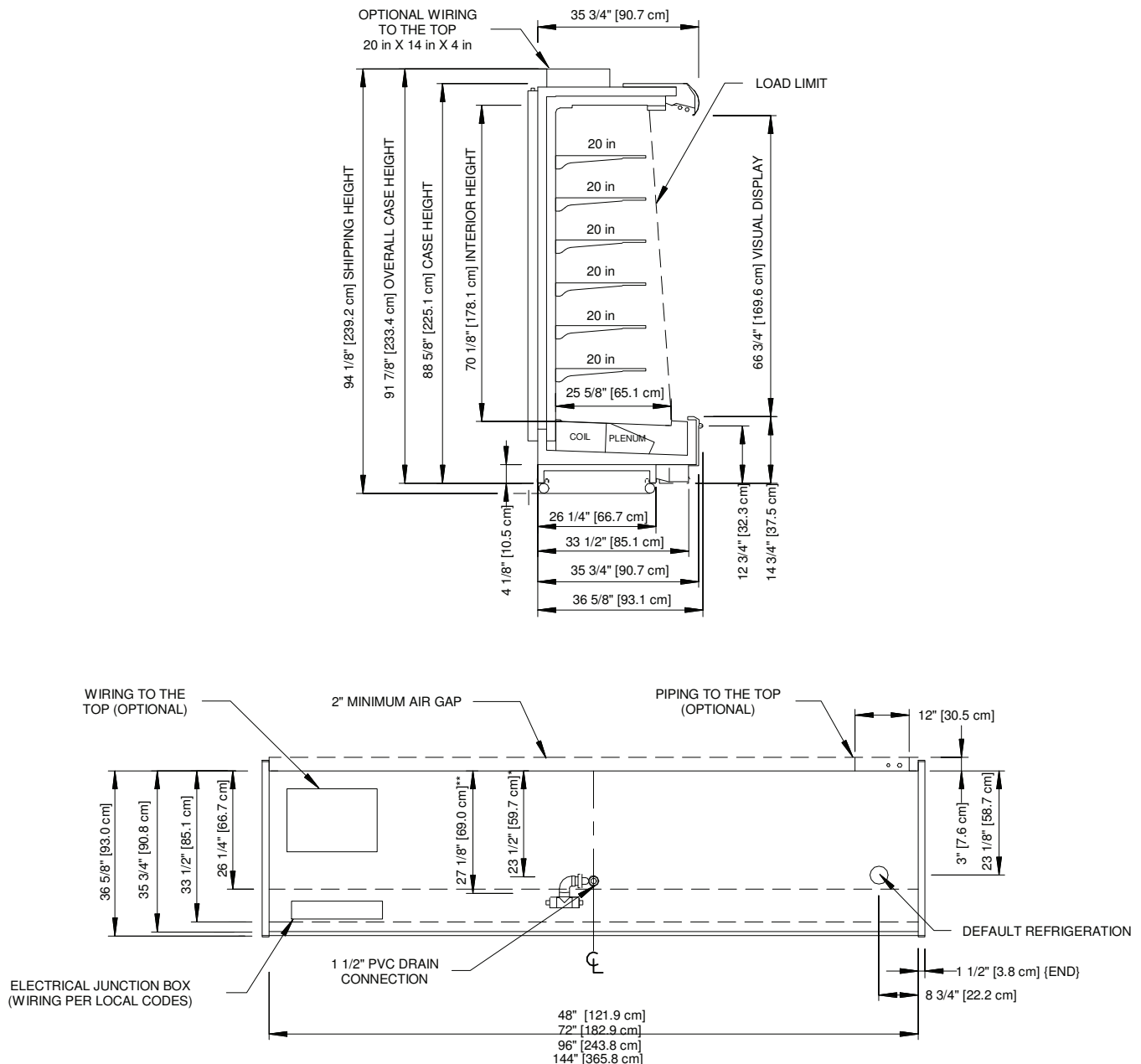
Rev. Date	Rev. #	Rev. Title
10-15-18	3	DATA UPDATE
4-23-18	2	NEW STANDARDS

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A26: TECHNICAL REFERENCE SHEET

6NDMLH-NRG

Narrow Multi-Deck Merchandiser with Synerg-E™
4', 6', 8' & 12' (Beverage / Dairy / Deli / Produce)



NOTES:

- * : STUB-UP AREA
- ** : RECOMMENDED STUB-UP CENTERLINE FOR ELECTRICAL AND HUB DRAINS
- ① : AVAILABLE SHELF SIZES: 10", 12", 14", 16", 18", 20"

- Ends add approximately 1" to case height
- Back panels add approximately 1" to the rear of the case



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.

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Rev. Date	Rev. #	Rev. Title
10-15-18	3	DATA UPDATE
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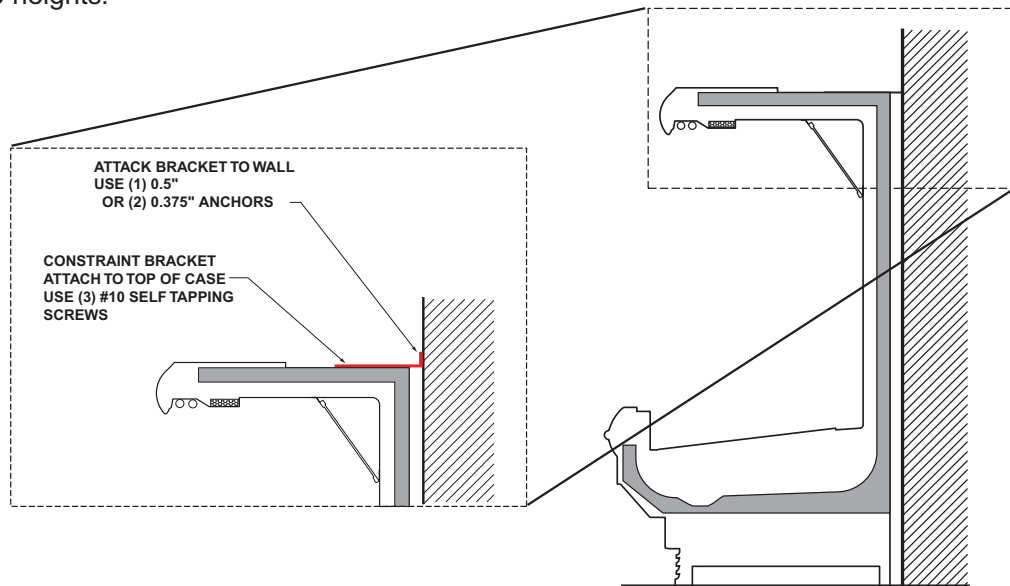
B1: SEISMIC BRACKETS

CONSTRAINT BRACKET INSTALLATION

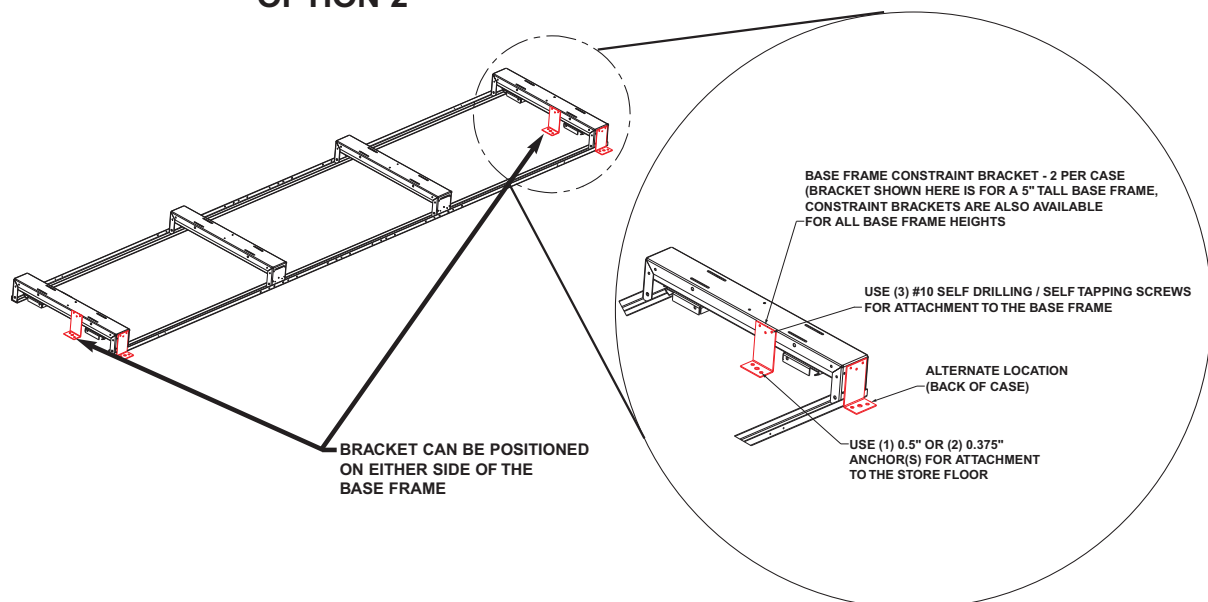
Hill PHOENIX
E X C E L L E N C E

The case constraint brackets can be installed in 2 ways. Option 1 can be used on multi-deck cases and uses an "L" bracket to attach the case to a vertical wall, as shown below. Option 2 can be used on multi-deck cases or on cases that do not have a canopy. Attach the "L" brackets to the base frames in either of the locations shown below. Brackets are available for all base frame heights.

OPTION 1

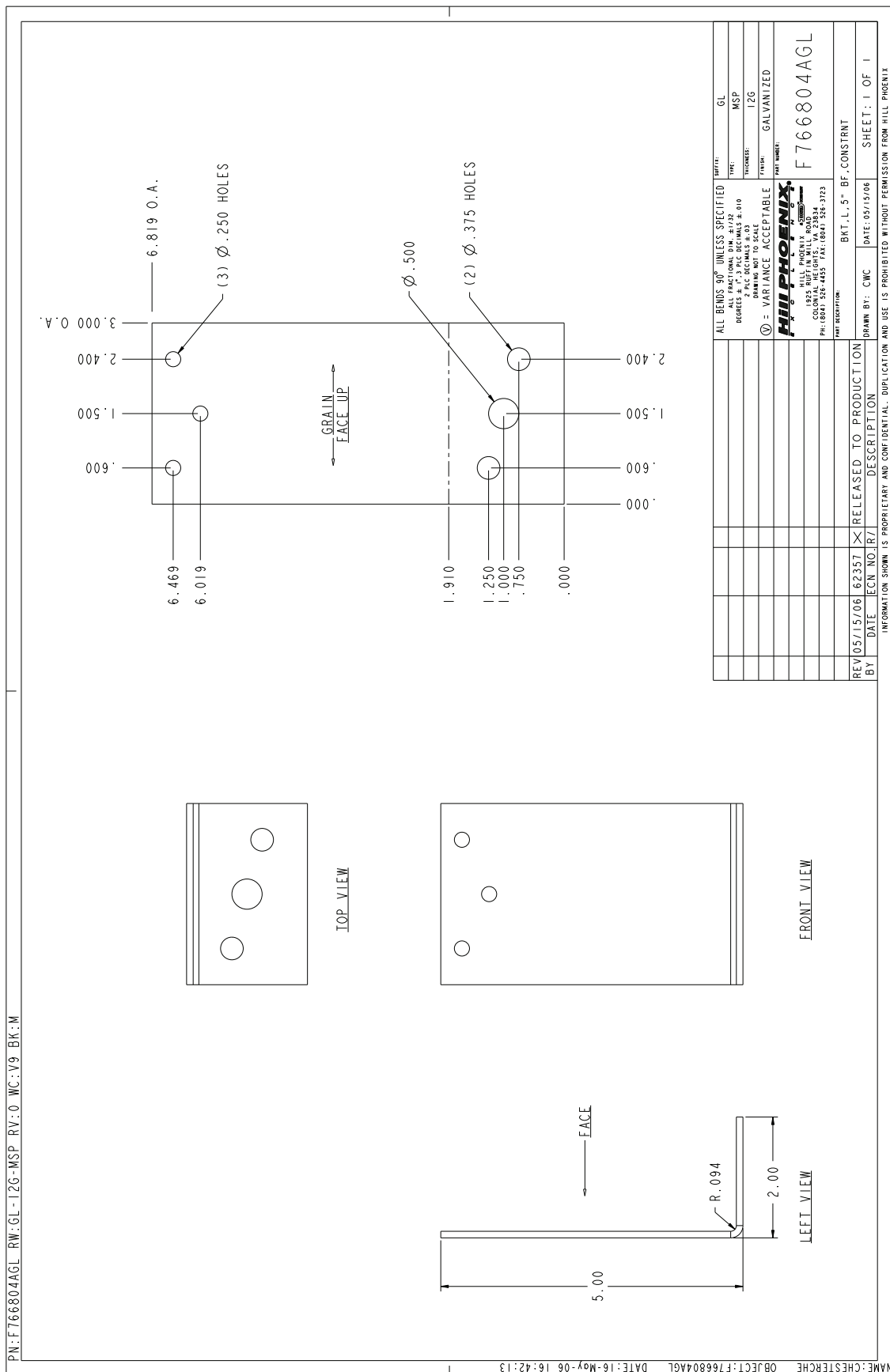


OPTION 2

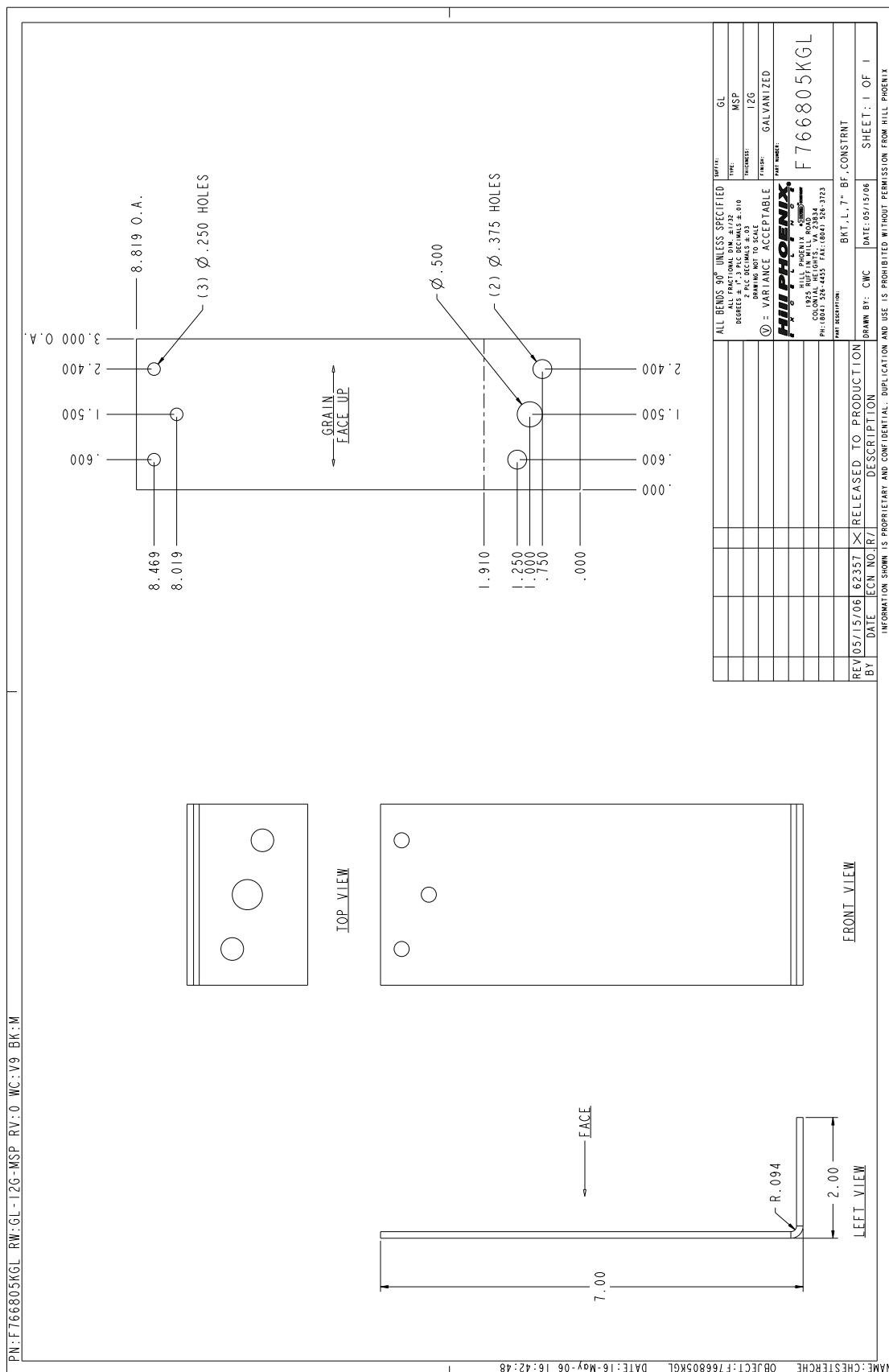


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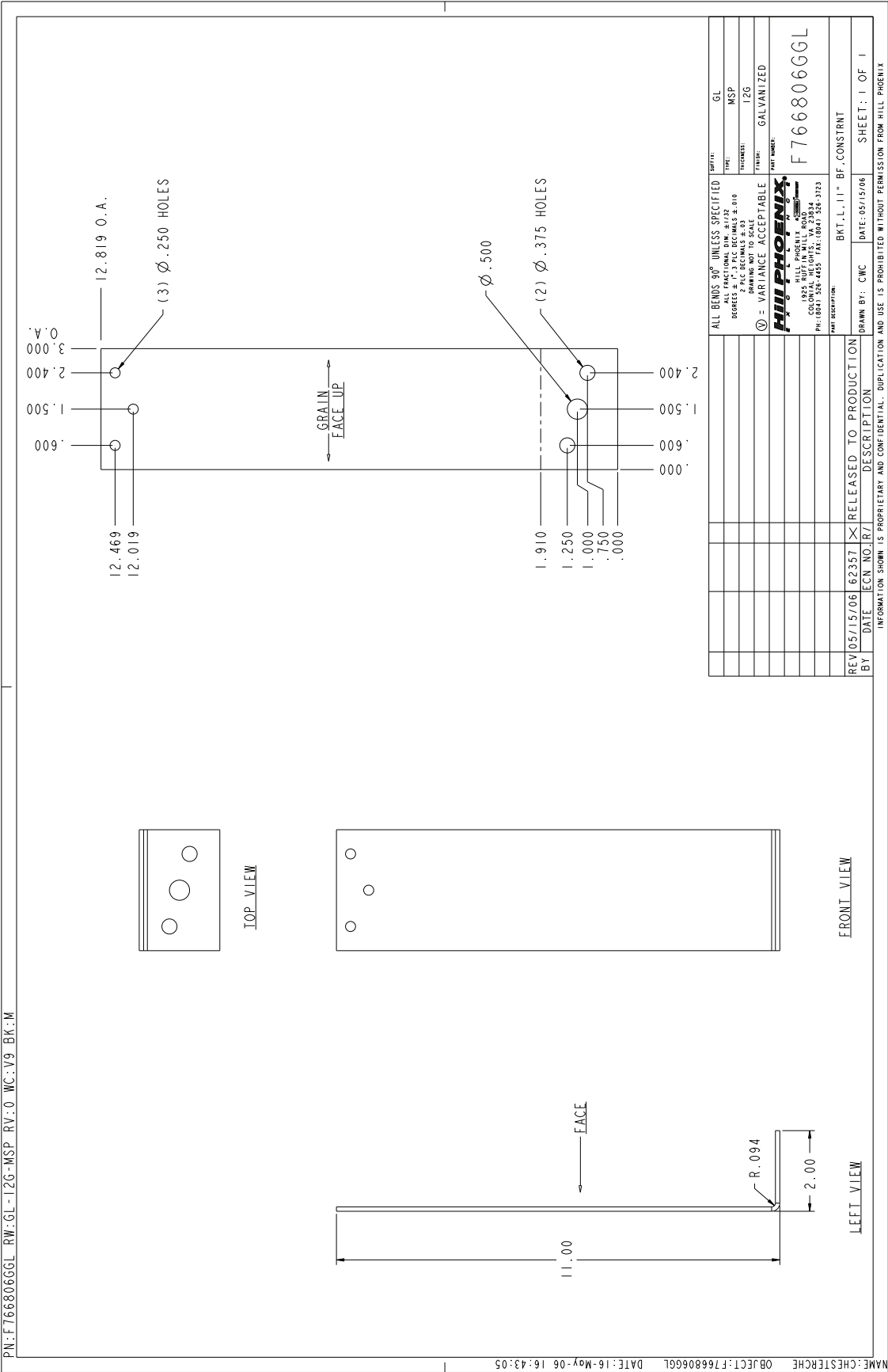
B2: SEISMIC BRACKETS



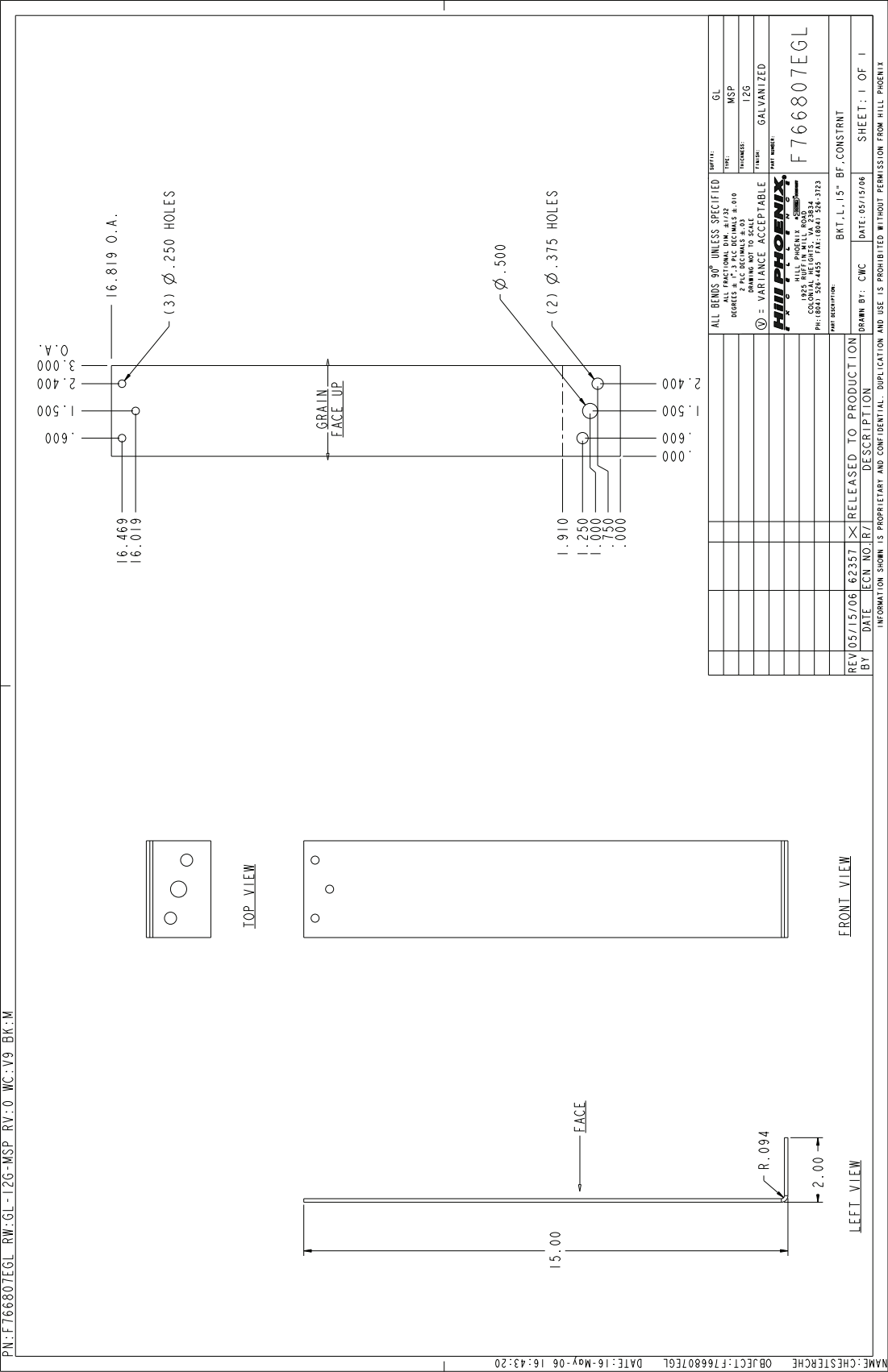
B3: SEISMIC BRACKETS



B4: SEISMIC BRACKETS



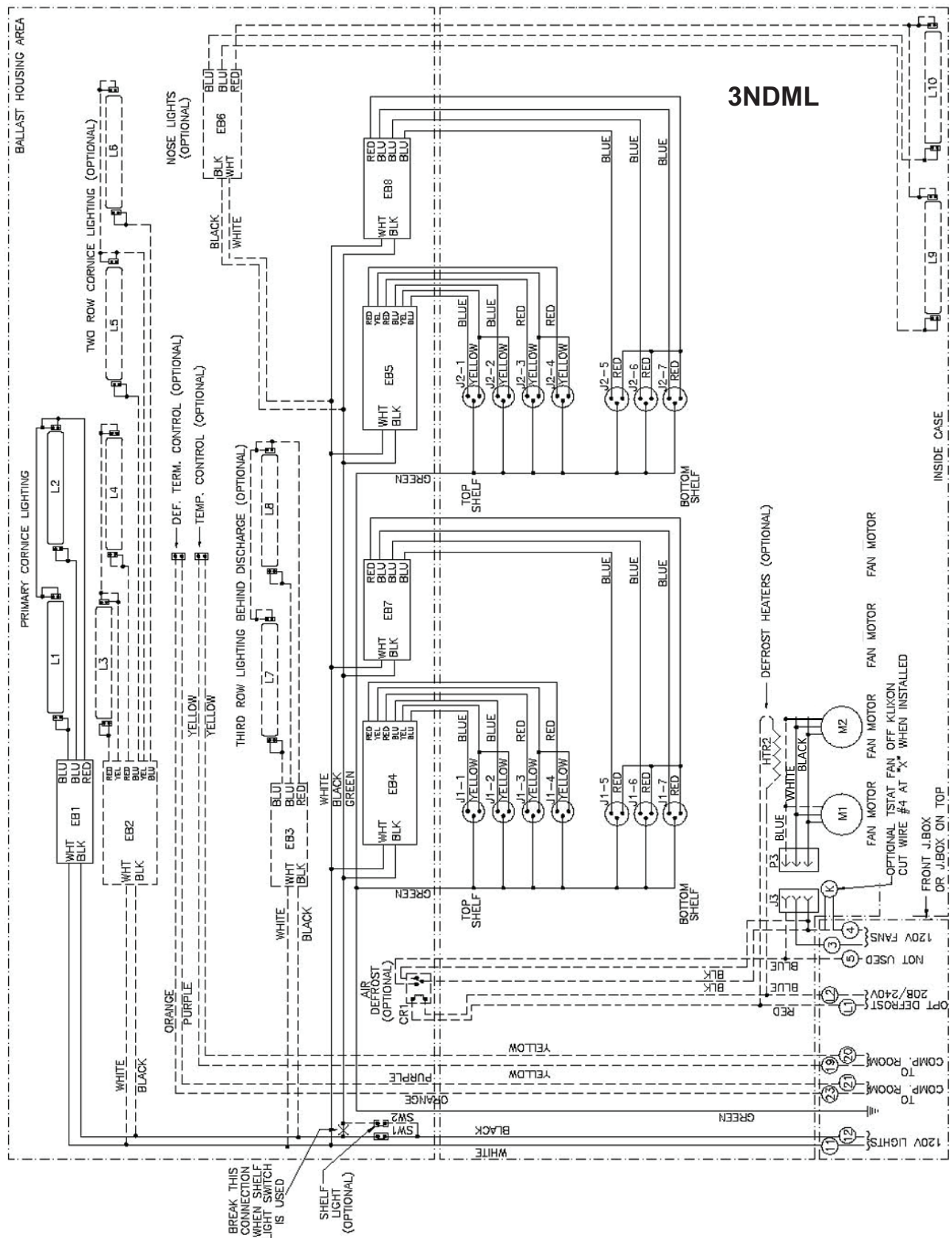
B5: SEISMIC BRACKETS



C1: ELECTRICAL WIRING DIAGRAMS

<div>ATTENTION ELECTRICIAN</div> <div>:FOR SAFETY AND CODE COMPLIANCE GROUND FIXTURE AT TIME OF INSTALLATION</div> <div>:CAUTION</div> <div>RISK OF ELECTRIC SHOCK. MORE THAN ONE POWER-SUPPLY. DISCONNECT ALL POWER-SUPPLIES BEFORE SERVICING.</div> <div>P901598E - R4</div>	WIRE IDENTIFICATION	BLACK	WHITE	BLUE	RED	YELLOW	PURPLE	ORANGE	GREEN
	DEFROST HEATERS (1-PHASE)	1,2							
	DEFROST HEATERS (3-PHASE)	L1		L3	L2				
	ANTI-CONDENSATE HEATERS	14	13						
		16	15						
		18	17						
		10	9						
	AISLE WARMER								
	DRAIN HEATER	36	37						
	PRIMARY FANS	4	3	40					
	SECONDARY FANS	6	5						
	AMBIENT FANS	8	7						
	LIGHTS	12	11						
	BELL	60,62							
	TEMPERATURE CONTROL					19,20			
	DEFROST TERMINATION CONTROL	22					21	23	
	DEFROST SAFETY CUT-OUT CONTROL	28					27	29	
	LIQUID LINE SOLENOID					30	31		
	SUCTION LINE SOLENOID					38	39		
	CASE/CONTROLLER POWER	42	41						
	TRANSFORMER	24	25						
	CAPACITOR	34		35					
	RECEPTACLE	32	33						75
	SYSTEM NEUTRAL (3-PHASE)		N						
	POWER CORD (SELF-CONTAINED)	58	57						
	SERVICE LIGHT (HI-PRESSURE)	53,54							
	HIGH PRESSURE SWITCH			49,50					
	DUAL PRESSURE SWITCH	51,52							
	CONDENSING UNIT POWER	48	47		44 220V				
	CONDENSING UNIT FAN		45	46					
	IG RECEPTACLE	26	43						77
	GFI RECEPTACLE	56	55						79
	HUMIDIFIER	70	71						
	REFRIGERATED PAN SOLENOID	65 220V	65				64		
	REFRIGERATED PAN BYPASS SOLENOID	67 220V	67	66					
	AIR HEATER DEFROST SOLENOID	69 220V	69					68	
	MAIN SECONDARY FLUID SOLENOID	73 220V	73		72				
	AIR DEFROST FAN	74	59						
	SECONDARY COOLANT PUMP	76	61						
	TANK FLUSH SOLENOID	87 220V	87						86
	MISTING SOLENOID	89 220V	89			88			
	DRIP DOWN TIMER					90			
	REAR STORAGE BOX FANS	94	95						
	GROUND TO EXTERIOR/FRAME								81
	GROUND TO INTERIOR LINER								83
	GROUND TO JUNCTION BOX								85
	GROUND TO LIGHTS								97

C2: ELECTRICAL WIRING DIAGRAMS

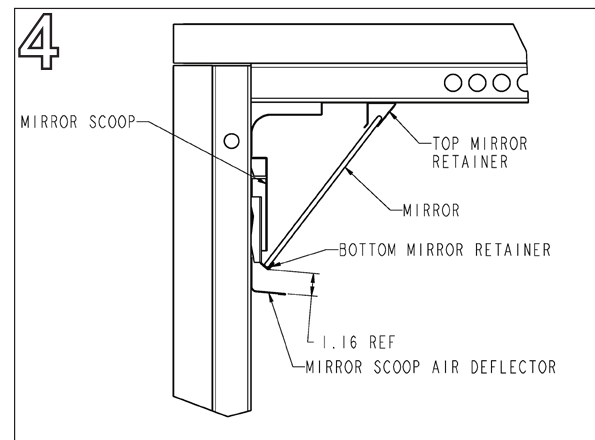
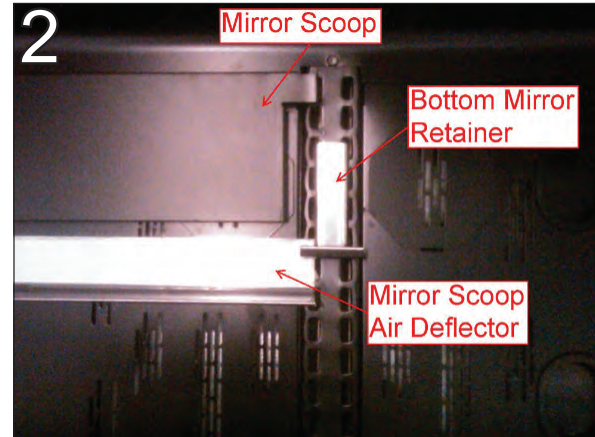
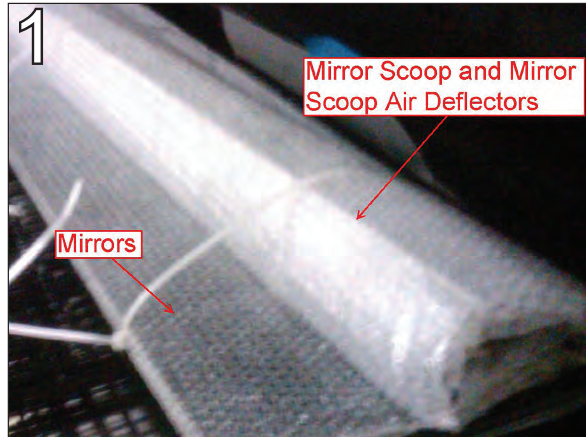


D1: MIRROR ASSEMBLY

Mirror scoops, air deflectors, and mirrors will be packaged in a protective wrapping (Fig. 1). Unwrap the mirror scoop and air deflectors.

Both the top and bottom mirror retainers are pre-installed during the manufacturing process (Fig. 2). Install the mirror scoop, leaving one row of holes between the mirror scoop and the bottom mirror retainers (Fig. 3). Install the mirror scoop air deflector directly below the bottom mirror retainers. There will be some overlap of these 2 components (Fig. 3).

Unwrap and install the mirrors using the top and bottom mirror retainers. The full assembly is shown in Figure 4.

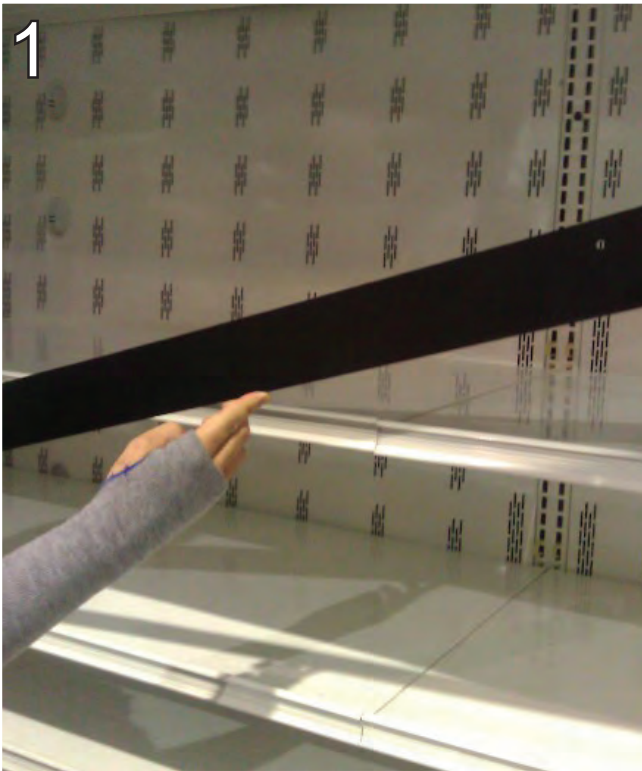


E1: SHELF FILLERS

Shelf fillers (Fig. 1) are included to ensure that proper airflow is maintained when shelves are placed in an angled position.

To install, remove the shelves, then snap the shelf filler into place on the shelf (Fig. 2).

Once the shelf is re-installed with the attached shelf filler, push the shelf filler back until it is flush with the rear baffle (Fig. 3) to ensure proper airflow within the display area.





Hill PHOENIX, Inc.
Hereinafter Referred To As Manufacturer

LIMITED WARRANTY

GENERAL WARRANTY

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

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

The warranty shall not apply:

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

MODIFICATIONS TO GENERAL WARRANTY

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

DISPLAY CASE AND SPECIALTY PRODUCTS CLEARVOYANT® LED LIGHTING

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

REMEDY LIMITATION/DAMAGES EXCLUSION

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

EXCLUSIVE WARRANTY

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

Submit warranty claims to:

**Hillphoenix Refrigeration & Power
Systems Division**
2016 Gees Mill Road
Conyers, GA 30013
Att'n: Tom Bradshaw
Phone: 770-285-3267
tom.bradshaw@hillphoenix.com

Hillphoenix Display Case Division
1925 Ruffin Mill Road
Colonial Heights, VA 23834
Att'n: Harry Moy
Phone: 804-614-1457
harrymoy@hillphoenix.com

Hillphoenix Specialty Products Division
703 Franklin Street
Keosauqua, IA 52565
Attn: Jake Bair
Phone: 319-293-8551
jake.bair@hillphoenix.com

Warning

Maintenance & Case Care

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

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

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

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

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

Hillphoenix®

A  **DOVER**™ COMPANY

Tel: 1-800-283-1109

1925 Ruffin Mill Rd, Colonial Heights, VA 23834

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

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

Visit our website at www.hillphoenix.com

