REACH-IN MERCHANDISER

INSTALLATION & OPERATIONS MANUAL

VRB VRBH
VNRB VNRBH VNRBS

Table of Contents

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

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LIABILITY NOTICE

For Cases with Shelf Lighting Systems

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

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

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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_9/19

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 VNRB, VNRBS, VNRBH, VRB, and VRBH.

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 tem-peratures 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 1-770-388-0706.

CONTACTING THE FACTORY

If you need to contact Hillphoenix regarding a specific fixture, be certain that you have both the case model number and serial number (this information can be found on the data tag, located on the top-left interior of the case). When you have this information, call the toll-free number below and ask for a Service Parts Representative.

Hillphoenix
1925 Ruffin Mill Rd
Colonial Heights, VA 23834
Mon.-Fri. (8 a.m. to 5 p.m.)
Tel: 1-770-388-0706/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 lines. 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.

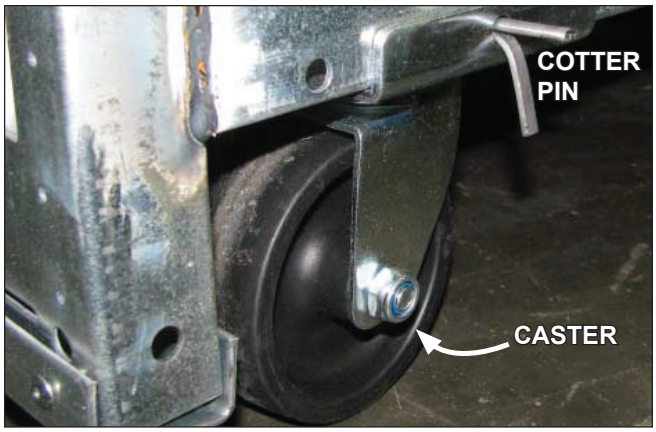


Fig. 1 Removing the casters is an easy process. Simply flatten and remove the cotter pins that are holding the casters in place. Then lift the case with a “J” bar and slide the caster assemblies out. The dismantled casters can now be discarded.

CAUTION!

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.

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 shelf standard. Add/remove shim packs as needed. For the horizontal level, repeat this process after placing the bubble level on the front sill.

Multi-Case

1. Remove any shelves (discard the shelf clips) and/or loose items (e.g. shipping braces, mirror assemblies, etc) from the cases that may interfere with case joining. **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.

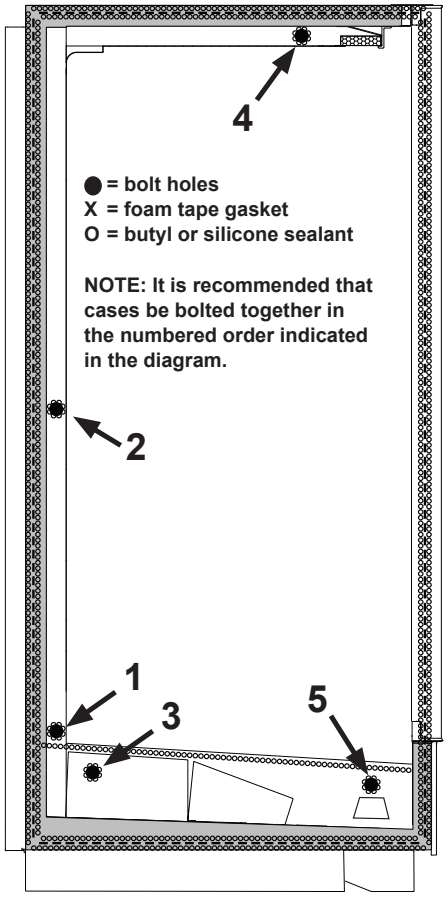


Fig. 2 Bolt holes, foam tape gasket and sealant

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 3–6 of this sequence for all remaining cases. Be certain to properly level all cases.
8. Install the seismic brackets (if included). See **Appendix H** for 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.

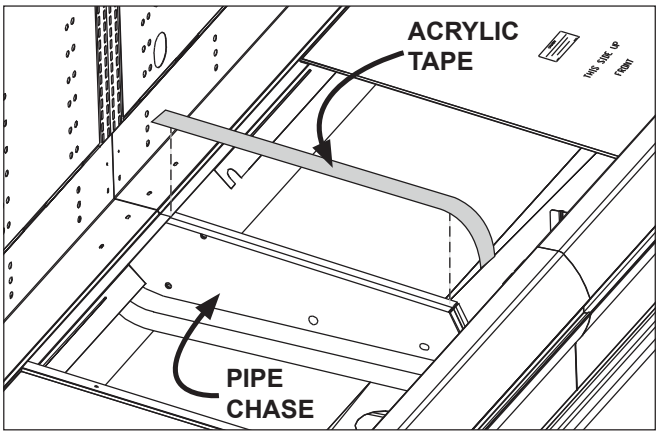


Fig. 3 Sealing the pipe chase

2. If non-insulated plexiglass partitions are included, see **Appendix G** for installation instructions.
3. Re-install shelves (or peg hook assemblies if applicable). Be aware that differing shelf configurations will affect energy consumption and case performance. If peg hook assemblies are to be installed, see **Appendix F** for more information.
4. Install the front panel (Fig. 4). The front panel bottom insert is a painted panel that ships loose with the case. The panel is inserted upward under the door frame exteriors and is supported without fasteners by setting the panel on the tabs as shown.
5. Make any adjustments that are necessary to properly align the front panels, then install the front panel trim that is supplied (Fig. 5).

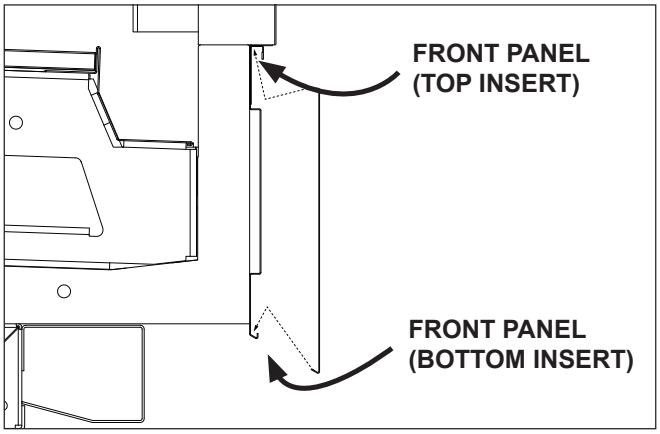


Fig. 4 Install front panel

Fig. 5 Front panel joint trim

6. Inside the case, use the supplied sex bolts to close the gap between the frames (Fig. 6). On the outside, run a thin bead of caulk along the case-to-case seam, then carefully push the T-Bar case frame joint trim into the space between the frames (Fig. 7).

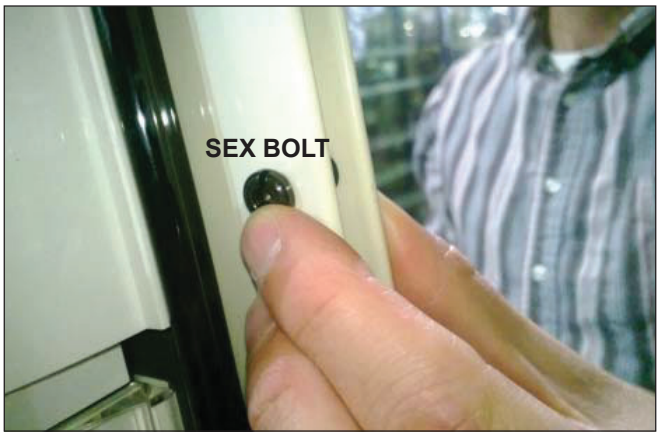


Fig. 6 Sex bolts for closing case frame gap

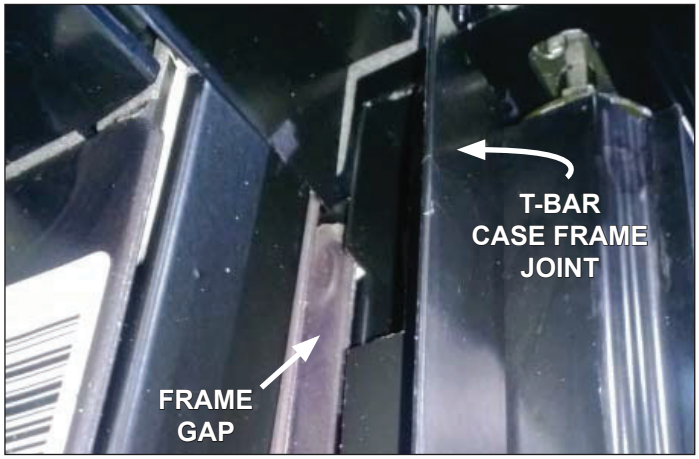


Fig. 7 T-Bar case frame joint trim seals case frame gap

Fig. 9 Leave 6 inches of extra bumper

7. Install the front kickplate (Fig. 8) to the kickplate retainer as shown. Install the end kickplates with screws provided and insert the plug buttons.

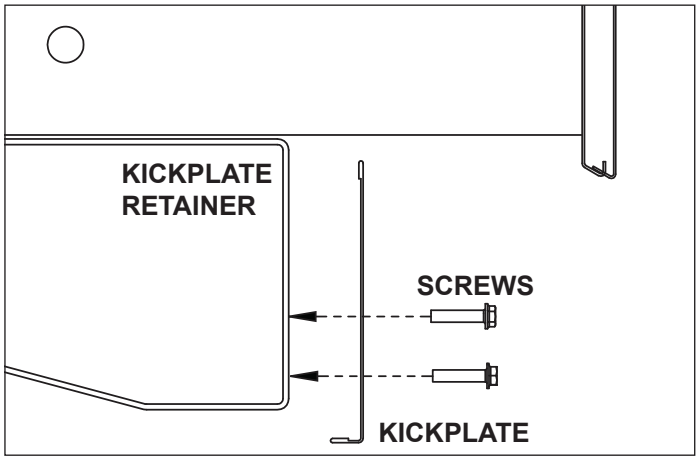


Fig. 8 Attach kickplate with supplied screws

8. Install the case top fascia (if included). See **Appendix D** for installation instructions.

9. Install electric display modules (if included). See **Appendix E** for installation instructions.

10. If the case is outfitted with a factory-installed, snap-on bumper track, install the snap-on track bumper onto the track, up to 96 feet. For rigid bumper, cut for as tight a fit as possible–to allow for minor shrinkage following start-up–and install. For rolled bumper, Hillphoenix recommends leaving an additional 6 inches of nose bumper at the ends to allow for shrinkage during the first 24–48 hours following case start-up (Fig. 9).

11. After sufficient time has passed, 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.

ATTENTION!

Connections are illustrated in dimensional drawings found in **Appendix A**.

REFRIGERATION

There are two refrigeration piping options for this case family: standard and rear top-box. Standard piping penetration is located at the front-right area of the case, fully visible in front of the fan plenum. The rear-box top option consists of piping enclosed in a foam box that exits at the back-right of the case, near the top.

Expansion valve and other controls—located on the left-hand side of the case—are accessed 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. 10) 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.

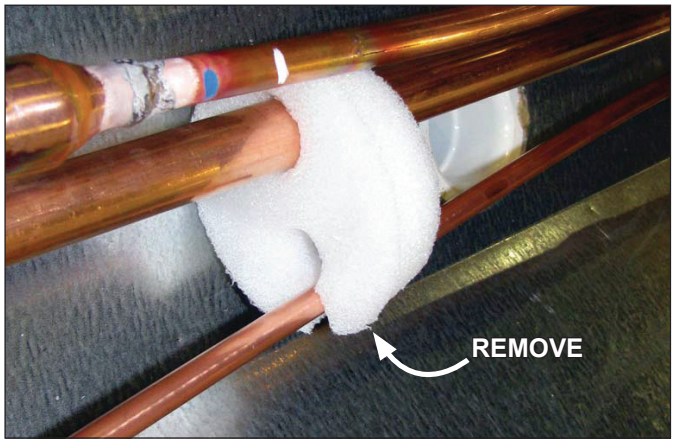


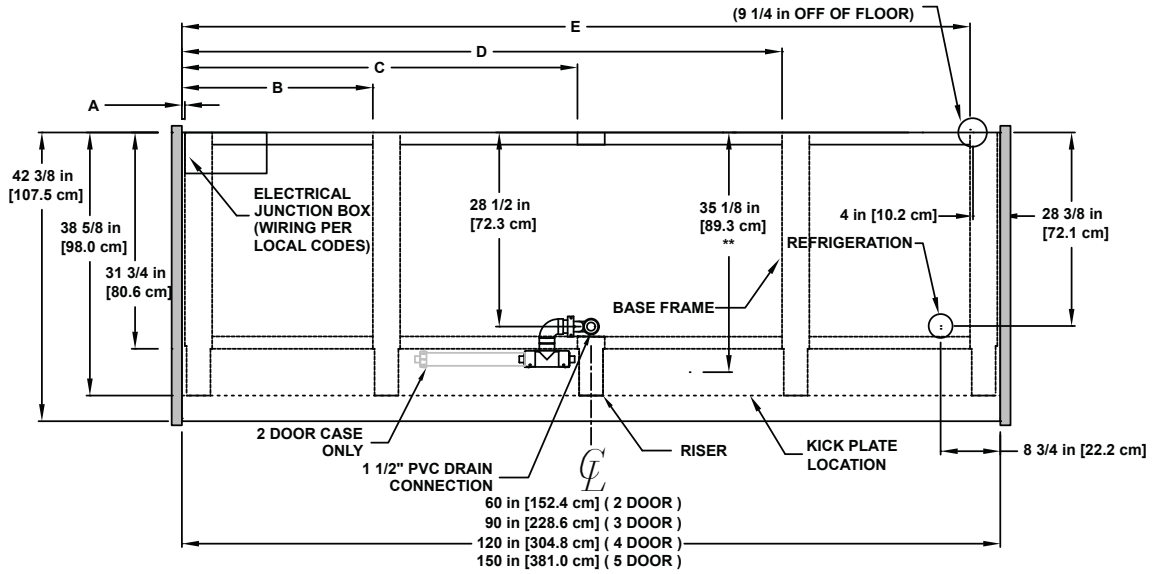
Fig. 10 Remove the shipping blocks

ATTENTION!

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

VRB/VRBH
VNRB/VNRBH/VNRBS

For piping locations in other case models, see pages of case dimensions.



NOTES:

*** : STUB-UP AREA**

**** : RECOMMENDED STUP-UP CENTERLINE FOR ELECTRICAL AND HUB DRAINS**

- **ENDS ADD APPROXIMATELY 1" TO CASE HEIGHT, 1/2" TO THE BACK & 1" TO THE FRONT**
- **A 2" MINIMUM AIR GAP IS REQUIRED BETWEEN THE REAR OF THE CASE AND A WALL**
- **SUCTION LINE (ALL LENGTHS) - 5/8"**
- **LIQUID LINE (ALL LENGTHS) - 3/8"**
- **AVAILABLE SHELF SIZES: 24", 27"**

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. 11). Be certain that all connections are water-tight and sealed with the appropriate PVC or ABS cement.

Fig. 11 “P” trap; drain line

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 fi nd it easy to remove. Simply lift the kickplate up from the "J" rail and pull it out, away from the case (see **Trim Out** section on pages 5-6).

ELECTRICAL

Electrical hookups are made to a junction box located top-rear-left of the case (Fig. 12).

For case-to-case wiring, run conduit between the junction boxes or run wiring through the raceway. For more detailed electrical wiring information, see **Appendix B**.

LIGHTING

Lighting for reach-in door cases is pre-installed during the manufacturing process. The main door frame light switch is located inside the case on the door frame mullion.
For cases featuring horizontal cornice lighting, a toggle switch is located on the left hand top flue panel.
For any questions or service needs, please contact our Case Division Customer Service Department toll-free at 1-800-283-1109.

Fig. 12 Junction box on top of case

ATTENTION!

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.

ATTENTION!

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

PRE-POWER CHECKLIST

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

- ☐ **Have you thoroughly examined the case for shipping damage? (see pg. 5)**
- ☐ **Have you removed and discarded the casters? (see pg. 5)**
- ☐ **Have you checked the vertical plumb of the case? The horizontal level? (see pg. 5)**
- ☐ **Have you applied the foam tape gasket and sealant between adjoining cases? (see pg. 5)**
- ☐ **Have you sealed the case-to-case joints by applying caulk and acrylic tape to the pipe-chase seam? (see pg. 6)**
- ☐ **Have you removed the shipping blocks from the refrigeration lines? (see pg. 8)**
- ☐ **Have you sealed any tank penetrations? (see pg. 8)**

ATTENTION!

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.

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. Please keep products within the load limit line shown on the diagram below (Fig.13).

DEFROST & TEMPERATURE CONTROLS

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 **Appendix A**. Further adjustment may be required depending on store conditions.

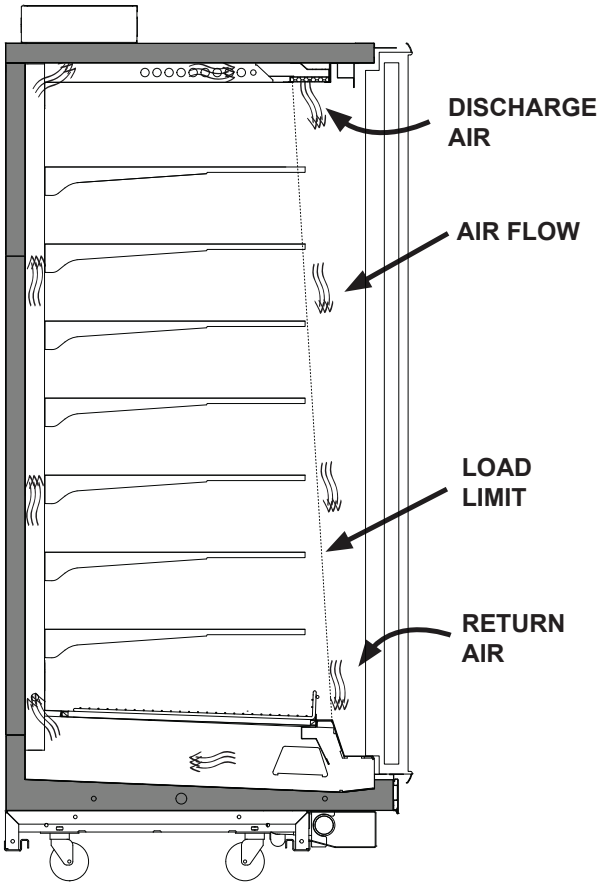


Fig. 13 Airflow

DETERMINING SUPERHEAT

To identify the correct superheat settings, complete the following steps:

1. Obtain suction pressure from the access port. Obtain the suction line temperature from the area near the TXV bulb at the outlet of the evaporator coil (Fig. 14).
2. Using the suction pressure reading and the Sporlan® temperature-pressure chart (**Appendix C**), convert pressure-to-temperature.
3. Finally, subtract the converted temperature reading from the actual temperature reading. The resulting number is the superheat setting—once this has been determined, adjust the TXV as needed to obtain the proper setting.

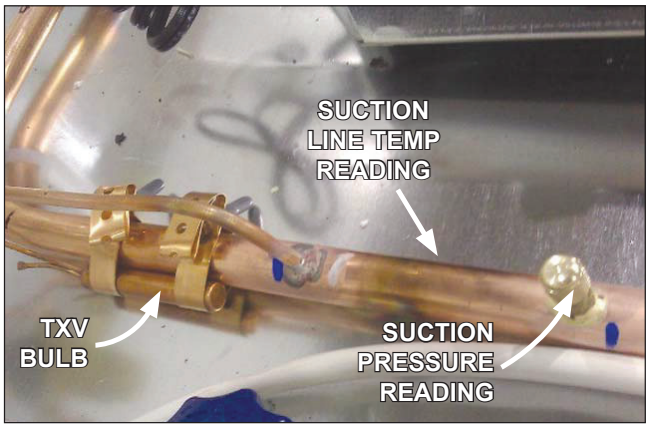


Fig. 14 Obtain pressure and temperature readings

DANGER!

SHOCK HAZARD

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

CAUTION!

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.

FANS

Reach-in door cases feature electronically commutated (ECM) fan motor assemblies, whereby the fan blade, fan motor, and basket are integrated into a single unit.

Fan assemblies 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. 15) from the receptacle on the exterior of the fan plenum. Push the power cord back through the plenum opening.
2. Remove fasteners, then lift out the entire fan basket.

(Reverse procedure when re-installing fan assembly.)

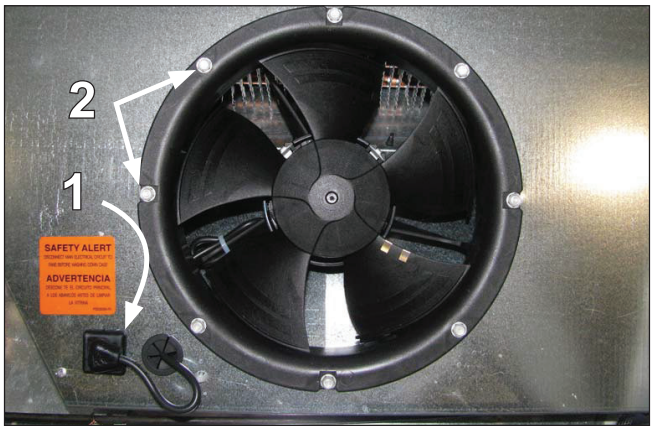


Fig. 15 Fan basket

ATTENTION!

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.

- 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 and other debris to the waste outlet. Check waste outlet before starting the cleaning process to insure it is unclogged. 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. 16).

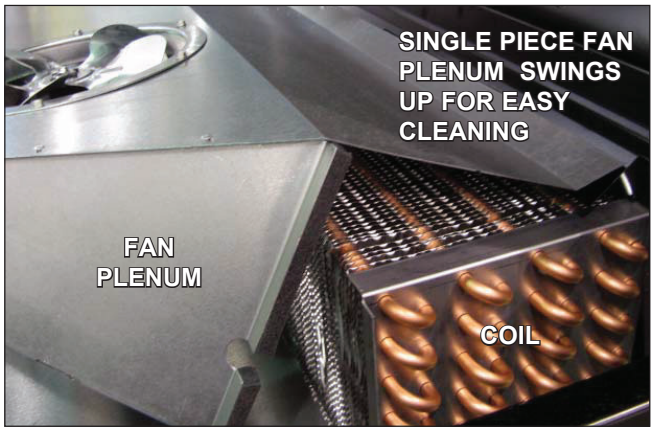


Fig. 16 Single-piece fan plenum and coil cover

- To clean the lights, shut off the lights in the case, then wipe them down with a soft, damp cloth. Avoid using harsh or abrasive cleaners as they may damage the lights. Be certain that the lights 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 cleaning solutions directly on 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 broom and a long-handled mop. Use warm water and a disinfecting cleaning solution when cleaning underneath the cases.

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.

APPENDIX

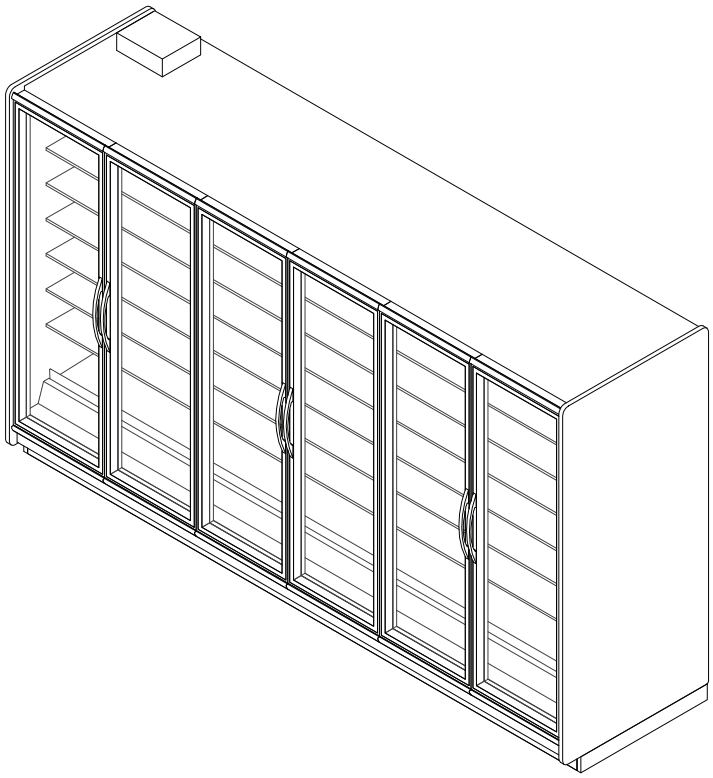
A1: TECHNICAL REFERENCE SHEET

VNRB

Narrow Reach-In Merchandiser
2, 3, 4, & 5 Door / 4', 6', 8' & 12' (Beverage / Dairy / Deli / Meat)

GENERAL NOTES

- 4-foot Bi-Swing cases consist of 2 (24") doors.
- 6-foot Bi-Swing cases consist of 3 (24") doors.
- 8-foot cases single swing consist of 3 (32") doors.
- 8-foot cases Bi-swing consist of 4 (24") doors.
- 12-foot cases single swing consist of 4 (36") doors.
- 12-foot cases Bi-swing consist of 6 (24") doors.
- Door frames are heated. Doors are not heated.
- Lighting controls - occupancy sensors are required.
  Option 1: OEM Provided: Lighting controls (on/off) are standard unless otherwise specified.
  Option 2: End User Provided: Lighting controls should be based on occupancy sensors.



SHIPPING WEIGHT	
Case	Weight
VNRB	---

2017 DOE COMPLIANT NSF c UL us 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.

VNRB

Rev. Date	Rev. #	Rev. Title
9-26-19	5	DATA UPDATE
9-26-19	4	ENDVIEW UPDATE

Hillphoenix
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A2: TECHNICAL REFERENCE SHEET

VNRB

Narrow Reach-In Merchandiser
2, 3, 4, & 5 Door / 4', 6', 8' & 12' (Beverage / Dairy / Deli / Meat)

ELECTRICAL DATA			
Case Length	Fans Per Case	High Efficiency Fans 120 Volt Amps	High Efficiency Fans 120 Volt Watts
2 Door	1	0.22	26
3 Door	2	0.43	52
4 Door	2	0.43	52
5 Door	3	0.65	78
4'	1	0.22	26
6'	2	0.43	52
8'	2	0.43	52
12'	3	0.65	78

LIGHTING DATA					
		OP45		OP55 (French Swing Only)	
		120 Volts		120 Volts	
Case Length	Door Size	Amps	Watts	Amps	Watts
2 Door	30"	0.36	43.1	---	---
3 Door	24"	0.54	65.2	---	---
4 Door	24"	0.73	87.3	---	---
5 Door	24"	0.91	109.4	---	---
4'	24"	---	---	0.26	31.0
6'	24"	---	---	0.52	61.9
8'	24"	---	---	0.52	61.9
8'	32"	0.54	65.2	---	---
12'	24"	---	---	0.77	92.8
12'	36"	0.73	87.3	---	---

ANTI CONDENSATE DATA					
		101 Frames		Vista Frames	
		Un Heated Doors		Un Heated Doors	
		ELMD, ELMH, I90		Vista C, I60	
		120 Volts		120 Volts	
Case Length	Door Size	Amps	Watts	Amps	Watts
2 Door	30"	0.36	43	0.36	43
3 Door	24"	0.57	68	0.57	68
4 Door	24"	0.79	95	0.79	95
5 Door	24"	0.98	118	0.98	118
4'	24"	0.19	23	0.19	23
6'	24"	0.40	48	0.40	48
8'	24"	0.44	53	0.44	53
8'	32"	0.58	70	0.58	70
12'	24"	0.70	84	0.70	84
12'	36"	0.84	101	0.84	101

2017 DOE COMPLIANT NSF c UL us 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.

VNRB

Rev. Date	Rev. #	Rev. Title
9-26-19	5	DATA UPDATE
9-26-19	4	ENDVIEW UPDATE

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A3: TECHNICAL REFERENCE SHEET

VNRB

Narrow Reach-In Merchandiser

2, 3, 4, & 5 Door / 4', 6', 8' & 12' (Beverage / Dairy / Deli / Meat)

GUIDELINES AND CONTROL SETTINGS

Application	Case Length	Door Size	BTUH/Door		Superheat Set Point @ Bulb (°F)	Evaporator (°F)	Discharge Air (°F)	Discharge Air Velocity (FPM)
			Conventional	Parallel				
Beverage	2 - 5 Door	30"	505	500	6 - 8	34	40	300
Beverage	4'	24"	405	400	6 - 8	34	40	300
Beverage	6'	24"	405	400	6 - 8	34	40	300
Beverage	8'	24"	405	400	6 - 8	34	40	300
Beverage	8'	32"	545	353	6 - 8	34	40	300
Beverage	12'	24"	405	400	6 - 8	34	40	300
Beverage	12'	36"	605	600	6 - 8	34	40	300
Deli	2 - 5 Door	30"	550	530	6 - 8	31	36	300
Deli	4'	24"	445	425	6 - 8	31	36	300
Deli	6'	24"	445	425	6 - 8	31	36	300
Deli	8'	24"	445	425	6 - 8	31	36	300
Deli	8'	32"	590	565	6 - 8	31	36	300
Deli	12'	24"	445	425	6 - 8	31	36	300
Deli	12'	36"	660	635	6 - 8	31	36	300
Meat	2 - 5 Door	30"	605	585	6 - 8	28	34	300
Meat	4'	24"	485	465	6 - 8	28	34	300
Meat	6'	24"	485	465	6 - 8	28	34	300
Meat	8'	24"	485	465	6 - 8	28	34	300
Meat	8'	32"	650	620	6 - 8	28	34	300
Meat	12'	24"	485	485	6 - 8	28	34	300
Meat	12'	36"	725	700	6 - 8	28	34	300

DEFROST CONTROLS

Defrosts Per Day	Timed-Off Defrost	
	Fail-Safe (Min)	Termination Temp (°F)
2	30	38

NOTES

- "---" indicates that this feature is not an option on this case model.
- Data listed is for Optimax Radiant. For other lighting options please contact your sales representative.
- 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.
- Light wattages above reflect 100% run time. To determine actual daily energy usage at 75ºF/55%RH conditions,reduce the light wattages above by 42%.

2017 DOE COMPLIANT NSF c UL us 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.

Rev. Date	Rev. #	Rev. Title
9-26-19	5	DATA UPDATE
9-26-19	4	ENDVIEW UPDATE

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A4: TECHNICAL REFERENCE SHEET

VNRB

Narrow Reach-In Merchandiser
2, 3, 4, & 5 Door / 4', 6', 8' & 12' (Beverage / Dairy / Deli / Meat)

SECOND NATURE DATA								
				BTUH/Door				
Case Model	No. of Coils	Application	Front Sill height	Conventional	Parallel	GPM/ft (DR)	Supply Fluid Temp (°F)	Discharge Air Temp (°F)
VNRB (30" Door)	1	Beverage	Std. Reach In	640	666	0.07	20	34
VNRB (30" Door)	1	Deli	Std. Reach In	710	697	0.10	20	31
VNRB (30" Door)	1	Meat	Std. Reach In	810	777	0.15	20	28
VNRB (30" Door)	1	Beverage	Std. Reach In	640	666	0.10	25	34
VNRB (30" Door)	1	Deli	Std. Reach In	740	697	0.16	25	31
VNRB (30" Door)	1	Meat	Std. Reach In	810	777	0.21	25	28
VNRB (Per Foot)	1	Beverage	Std. Reach In	268	266	0.03	20	34
VNRB (Per Foot)	1	Deli	Std. Reach In	284	139	0.04	20	31
VNRB (Per Foot)	1	Meat	Std. Reach In	324	311	0.06	20	28
VNRB (Per Foot)	1	Beverage	Std. Reach In	268	266	0.04	25	34
VNRB (Per Foot)	1	Deli	Std. Reach In	284	139	0.06	25	31
VNRB (Per Foot)	1	Meat	Std. Reach In	324	311	0.08	25	28

SECOND NATURE DATA									
						Timed-Off Defrost		Warm Fluid Defrost	
Case Model	No. of Coils	Application	Front Sill height	Supply Fluid Temp (°F)	No. of Defrost	Fail-Safe (Min)	Termination Temp (°F)	Fail-Safe (Min)	Termination Temp (°F)
VNRB (30" Door)	1	Beverage	Std. Reach In	20	2	60	47	26	49
VNRB (30" Door)	1	Deli	Std. Reach In	20	2	60	47	26	49
VNRB (30" Door)	1	Meat	Std. Reach In	20	2	60	47	26	49
VNRB (30" Door)	1	Beverage	Std. Reach In	25	2	60	47	26	49
VNRB (30" Door)	1	Deli	Std. Reach In	25	2	60	47	26	49
VNRB (30" Door)	1	Meat	Std. Reach In	25	2	60	47	26	49
VNRB (Per Foot)	1	Beverage	Std. Reach In	20	2	60	47	26	49
VNRB (Per Foot)	1	Deli	Std. Reach In	20	2	60	47	26	49
VNRB (Per Foot)	1	Meat	Std. Reach In	20	2	60	47	26	49
VNRB (Per Foot)	1	Beverage	Std. Reach In	25	2	45	42	26	49
VNRB (Per Foot)	1	Deli	Std. Reach In	25	2	45	42	26	49
VNRB (Per Foot)	1	Meat	Std. Reach In	25	2	45	42	26	49

NOTES

- All medium temperature data listed is for 35% by wt. PROPYLENE GLYCOL.
- Inhibited Propylene Glycol solution with water, such as Dowfrost or equivalent. (Dowfrost is a trademark of the Dow Chemical Company).
- Flowrates are determined by ASHRAE test conditions and may need to be adjusted based on store conditions.
- ** Flowrates are per case

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9-26-19	5	DATA UPDATE
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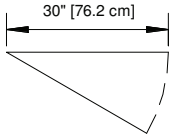
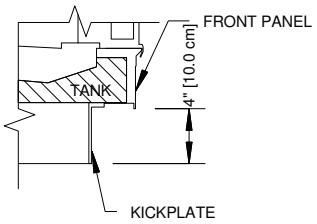
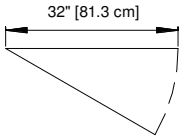
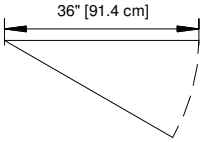
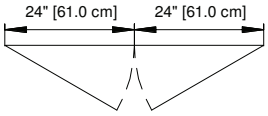
A5: TECHNICAL REFERENCE SHEET

VNRB

Narrow Reach-In Merchandiser
2, 3, 4, & 5 Door / 4', 6', 8' & 12' (Beverage / Dairy / Deli / Meat)

DOOR OPTIONS	FRONT OPTIONS
STANDARD SWING DOOR 2,3,4,5 - DOOR CASES 	**FLAT FRONT (V SERIES)** 
STANDARD SWING DOOR 8' CASE 	
STANDARD SWING DOOR 12' CASE 	
BI- SWING DOOR 4', 6', 8' & 12' CASES 	

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VNRB

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9-26-19	5	DATA UPDATE
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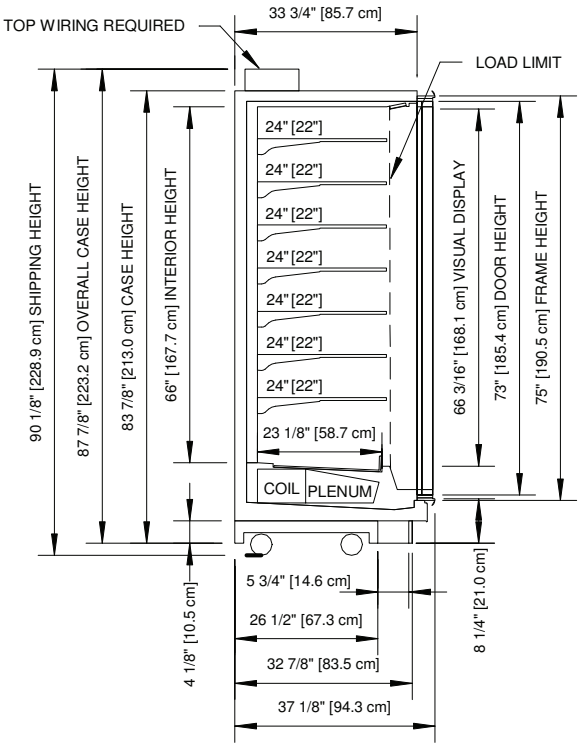
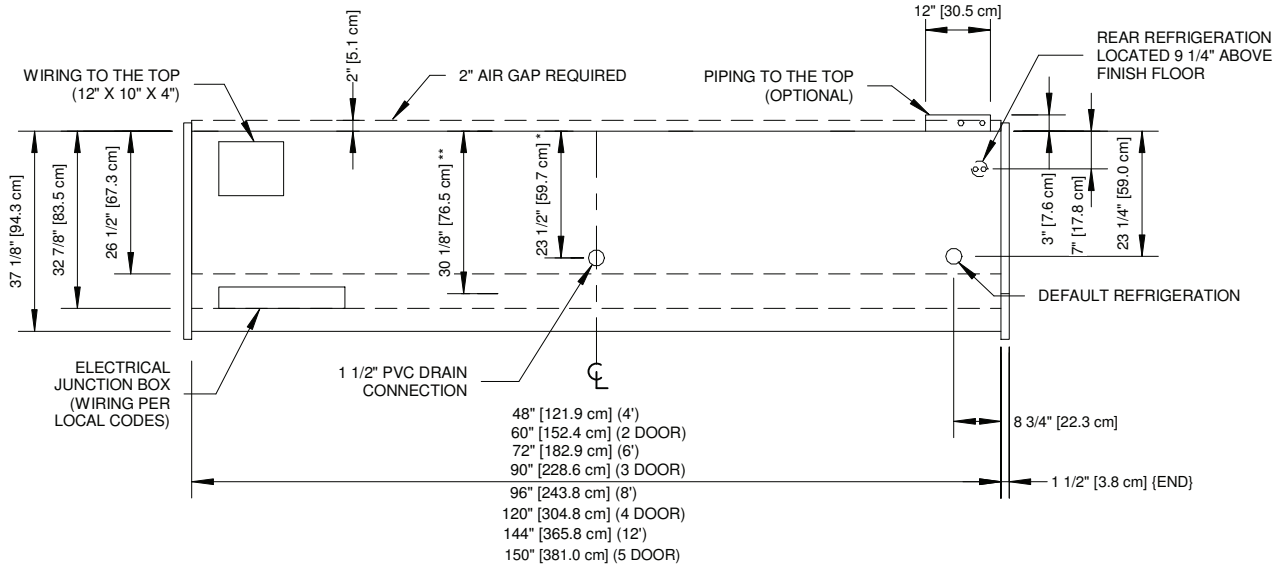
A6: TECHNICAL REFERENCE SHEET

VNRB

Narrow Reach-In Merchandiser
2, 3, 4, & 5 Door / 4', 6', 8' & 12' (Beverage / Dairy / Deli / Meat)





NOTES

* : STUB-UP AREA
** : RECOMMENDED STUB-UP CENTERLINE FOR ELECTRICAL AND HUB DRAINS.

- Ends add approximately 1" to case height, 1/2" to the back & 1" to the front.

2017 DOE COMPLIANT NSF c UL us 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.

VNRB

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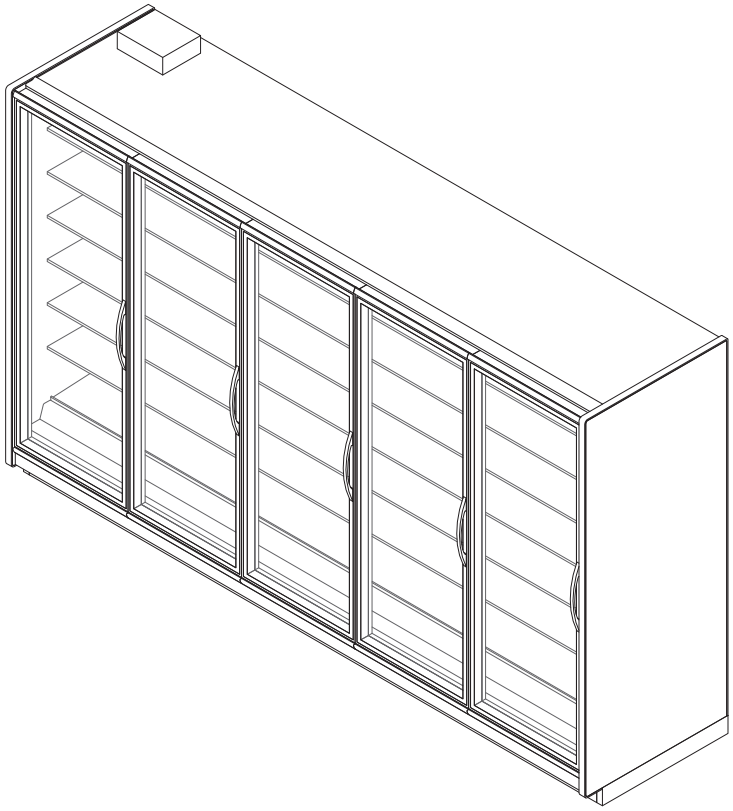
A7: TECHNICAL REFERENCE SHEET

VNRBH

Narrow Reach-In Merchandiser
2, 3, 4 & 5 Door / 4', 6', 8' & 12' (Beverage / Dairy / Deli / Meat)

GENERAL NOTES

- 4-foot cases Bi-swing consist of 2 (24") doors.
- 6-foot cases Bi-swing consist of 3 (24") doors.
- 8-foot cases single swing consist of 3 (32") doors.
- 8-foot cases Bi-swing consist of 4 (24") doors.
- 12-foot cases single swing consist of 4 (36") doors.
- 12-foot cases Bi-swing consist of 6 (24") doors.
- Door frames are heated. Doors are not heated.
- Lighting controls - occupancy sensors are required.
  Option 1: OEM Provided: Lighting controls (on/off) are standard unless otherwise specified.
  Option 2: End User Provided: Lighting controls should be based on occupancy sensors.



SHIPPING WEIGHT	
Case	Weight
VNRBH	---

2017 DOE COMPLIANT NSF c UL us 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.

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9-26-19	6	DATA UPDATE
9-25-19	5	ENDVIEW UPDATE

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A8: TECHNICAL REFERENCE SHEET

VNRBH

Narrow Reach-In Merchandiser
2, 3, 4 & 5 Door / 4', 6', 8' & 12' (Beverage / Dairy / Deli / Meat)

ELECTRICAL DATA			
Case Length	Fans Per Case	High Efficiency Fans 120 Volt Amps	High Efficiency Fans 120 Volt Watts
2 Door	2	0.43	52
3 Door	3	0.65	78
4 Door	4	0.87	104
5 Door	5	1.08	130
4'	1	0.22	26
6'	2	0.43	52
8'	2	0.43	52
12'	3	0.65	78

LIGHTING DATA					
Case Length	Door Size	OP45 120 Volts Amps	OP45 120 Volts Watts	OP55 (French Swing Only) 120 Volts Amps	OP55 (French Swing Only) 120 Volts Watts
2 Door	30"	0.36	43.1	---	---
3 Door	30"	0.54	65.2	---	---
4 Door	30"	0.73	87.3	---	---
5 Door	30"	0.91	109.4	---	---
4'	24"	---	---	0.25	31.0
6'	24"	---	---	0.52	61.9
8'	24"	---	---	0.52	61.9
8'	32"	0.54	65.2	---	---
12'	24"	---	---	0.77	92.8
12'	36"	0.73	87.3	---	---

ANTI CONDENSATE DATA					
Case Length	Door Size	101 Frames Un Heated Doors ELMD, ELMH, I90 120 Volts Amps	101 Frames Un Heated Doors ELMD, ELMH, I90 120 Volts Watts	Vista Frames Un Heated Doors Vista C, I60 120 Volts Amps	Vista Frames Un Heated Doors Vista C, I60 120 Volts Watts
2 Door	30"	0.37	44	0.37	44
3 Door	30"	0.58	70	0.58	70
4 Door	30"	0.81	97	0.81	97
5 Door	30"	1.02	122	1.02	122
4'	24"	0.19	23	0.19	23
6'	24"	0.40	48	0.40	48
8'	24"	0.44	53	0.44	53
8'	32"	0.44	53	0.44	53
12'	24"	0.71	85	0.71	85
12'	36"	0.86	103	0.86	103

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A9: TECHNICAL REFERENCE SHEET

VNRBH

Narrow Reach-In Merchandiser
2, 3, 4 & 5 Door / 4', 6', 8' & 12' (Beverage / Dairy / Deli / Meat)

GUIDELINES AND CONTROL DATA

Application	Case Length	Door Size	BTUH/ft		Superheat Set Point @ Bulb (°F)	Evaporator (°F)	Discharge Air (°F)	Discharge Air Velocity (FPM)
			Conventional	Parallel				
Beverage/Produce	2 - 5 Door	30"	565	565	6 - 8	34	39	270
Beverage/Produce	4'	24"	455	450	6 - 8	34	39	270
Beverage/Produce	6'	24"	455	450	6 - 8	34	39	270
Beverage/Produce	8'	24"	455	450	6 - 8	34	39	270
Beverage/Produce	8'	32"	605	600	6 - 8	34	39	270
Beverage/Produce	12'	24"	455	450	6 - 8	34	39	270
Beverage/Produce	12'	36"	680	675	6 - 8	34	39	270
Dairy/Deli/Cut Produce	2 - 5 Door	30"	600	595	6 - 8	31	36	270
Dairy/Deli/Cut Produce	4'	24"	480	475	6 - 8	31	36	270
Dairy/Deli/Cut Produce	6'	24"	480	475	6 - 8	31	36	270
Dairy/Deli/Cut Produce	8'	24"	480	475	6 - 8	31	36	270
Dairy/Deli/Cut Produce	8'	32"	640	635	6 - 8	31	36	270
Dairy/Deli/Cut Produce	12'	24"	480	475	6 - 8	31	36	270
Dairy/Deli/Cut Produce	12'	36"	720	715	6 - 8	31	36	270
Meat	2 - 5 Door	30"	625	615	6 - 8	28	34	270
Meat	4'	24"	500	490	6 - 8	28	34	270
Meat	6'	24"	500	490	6 - 8	28	34	270
Meat	8'	24"	500	490	6 - 8	28	34	270
Meat	8'	32"	665	655	6 - 8	28	34	270
Meat	12'	24"	500	490	6 - 8	28	34	270
Meat	12'	36"	750	735	6 - 8	28	34	270

DEFROST CONTROLS

Defrosts Per Day	Timed-Off Defrost	
	Fail-Safe (Min)	Termination Temp (°F)
2	30	28

NOTES

- "---" indicates that this feature is not an option on this case model and/or the data is not yet available.
- Data listed is for Optimax Radiant. For other lighting options please contact your sales representative.
- 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.
- Light wattages above reflect 100% run time.To determine actual daily energy usage at 75ºF/55%RH conditions, reduce the light wattages above by 42%.

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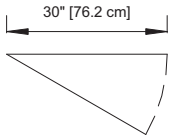
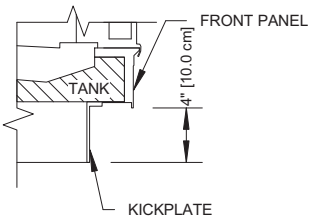
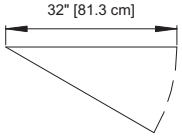
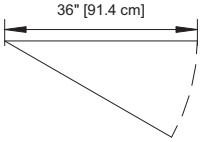
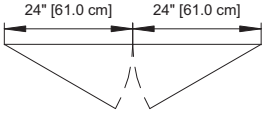
A10: TECHNICAL REFERENCE SHEET

VNRBH

Narrow Reach-In Merchandiser
2, 3, 4 & 5 Door / 4', 6', 8' & 12' (Beverage / Dairy / Deli / Meat)

DOOR OPTIONS	FRONT OPTION
STANDARD SWING DOOR 2,3,4,5 - DOOR CASES 	**FLAT FRONT (V SERIES)** 
STANDARD SWING DOOR 8' CASE 	
STANDARD SWING DOOR 12' CASE 	
BI- SWING DOOR 4', 6', 8' & 12' CASES 	

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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.

VNRBH

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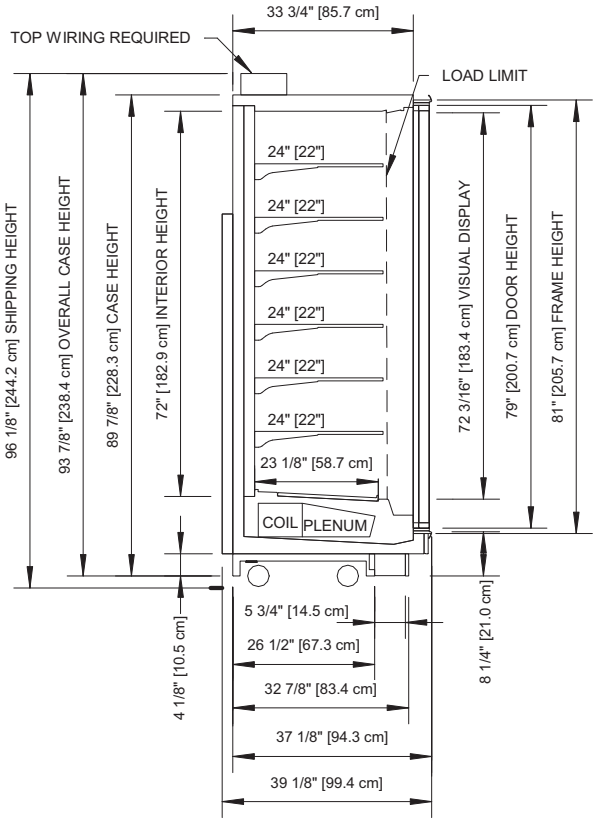
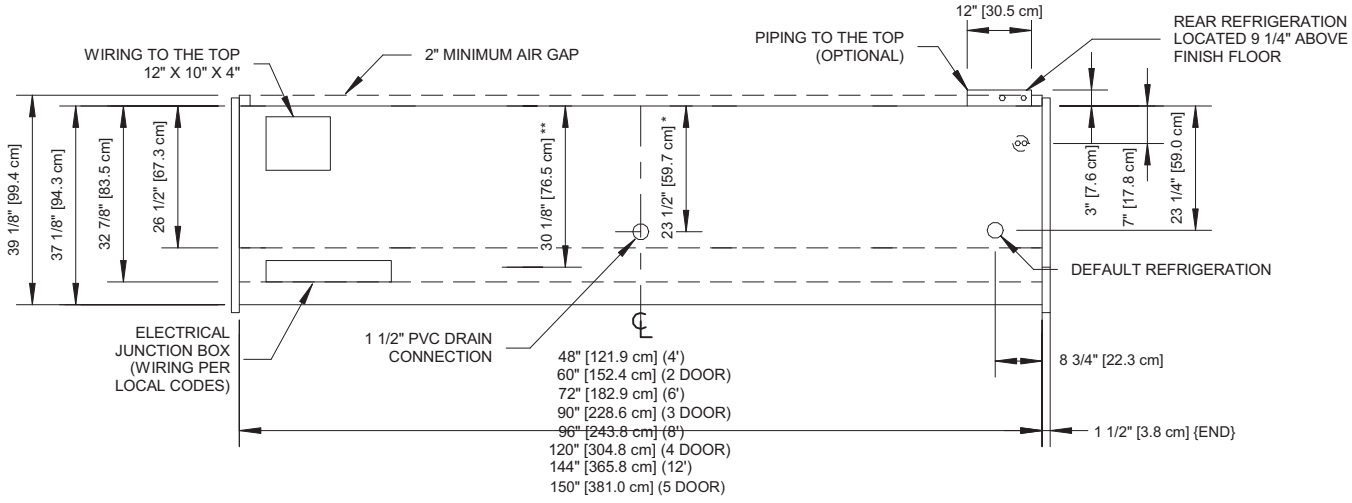
A11: TECHNICAL REFERENCE SHEET

VNRBH

Narrow Reach-In Merchandiser
2, 3, 4 & 5 Door / 4', 6', 8' & 12' (Beverage / Dairy / Deli / Meat)





NOTES

* : STUB-UP AREA
** : RECOMMENDED STUB-UP CENTERLINE FOR ELECTRICAL AND HUB DRAINS.

- Ends add approximately 1" to case height, 1/2" to the back & 1" to the front.

2017 DOE COMPLIANT NSF c UL us 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.

VNRBH

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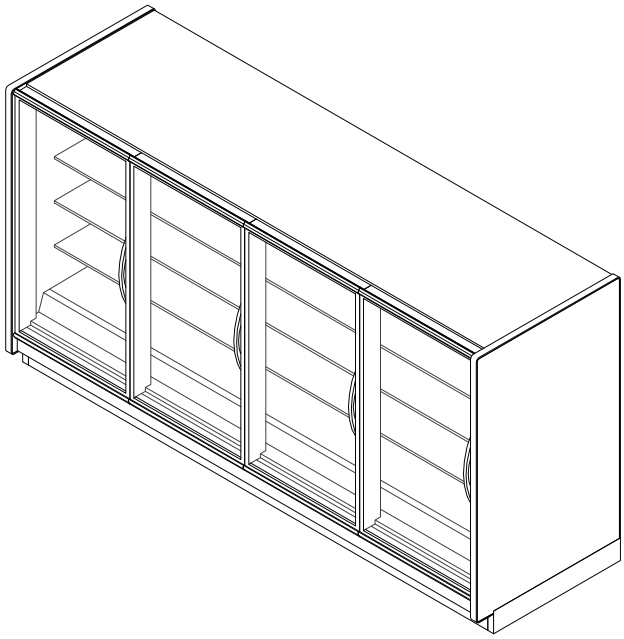
A12: TECHNICAL REFERENCE SHEET

VNRBS

Narrow Reach-In Merchandiser
3 & 4 Door (Beverage / Dairy / Deli / Meat)

GENERAL NOTES

- Door frames are heated. Doors are not heated.
- Lighting controls - occupancy sensors are required.
  Option 1: OEM Provided: Lighting controls (on/off) are standard unless otherwise specified.
  Option 2: End User Provided: Lighting controls should be based on occupancy sensors.



SHIPPING WEIGHT	
Case	Weight
VNRBS	---

2017 DOE COMPLIANT NSF c UL us 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.

VNRBS

Rev. Date	Rev. #	Rev. Title
4-22-19	4	DATA UPDATE
1-22-19	3	ENDVIEW UPDATE

Hillphoenix
A DOVER COMPANY

A13: TECHNICAL REFERENCE SHEET

VNRBS

Narrow Reach-In Merchandiser
3 & 4 Door (Beverage / Dairy / Deli / Meat)

ELECTRICAL DATA			
Case Length	Fans Per Case	High Efficiency Fans 120 Volt Amps	Watts
3 Door	2	0.43	52
4 Door	2	0.43	52

LIGHTING DATA							
Case Length	Door Size	OP45 120 Volts Amps	Watts	OP55 (French Swing Only) 120 Volts Amps	Watts	Optimax Pro 24 Low 120 Volts Amps	Watts
3 Door	30"	0.49	58.2	---	---	0.35	42.2
4 Door	30"	0.65	77.6	---	---	0.47	56.3

ANTI CONDENSATE DATA						
Case Length	Door Size	Number of Doors	Infinity 90 120 Volts Amps	Watts	Vista C I60 120 Volts Amps	Watts
3 Door	30"	3	0.47	56.4	0.47	56.4
4 Door	30"	4	0.65	78.0	0.65	78.0

GUIDELINES AND CONTROL SETTINGS								
Application	Case Length	Door Size	BTUH/ft Conventional	Parallel	Superheat Set Point @ Bulb (°F)	Evaporator (°F)	Discharge Air (°F)	Discharge Air Velocity (FPM)
Beverage/Produce	3 & 4 Door	30"	374	363	6 - 8	34	38	145
Dairy/Deli/Cut Produce	3 & 4 Door	30"	410	385	6 - 8	31	35	145
Meat	3 & 4 Door	30"	441	413	6 - 8	28	33	145

DEFROST CONTROLS		
Defrosts Per Day	Timed-Off Defrost Fail-Safe (Min)	Termination Temp (F)
2	30	42

2017 DOE COMPLIANT NSF c UL us 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.

Rev. Date	Rev. #	Rev. Title
4-22-19	4	DATA UPDATE
1-22-19	3	ENDVIEW UPDATE

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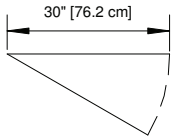
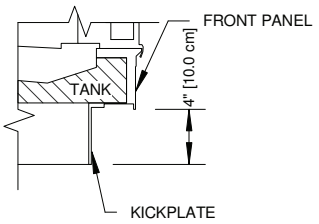
A14: TECHNICAL REFERENCE SHEET

VNRBS

Narrow Reach-In Merchandiser
3 & 4 Door (Beverage / Dairy / Deli / Meat)

DOOR OPTIONS	FRONT OPTIONS
STANDARD SWING DOOR 3 & 4 - DOOR CASES  	**FLAT FRONT (V SERIES)** 

2017 DOE COMPLIANT NSF c UL us 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.

VNRBS

Rev. Date	Rev. #	Rev. Title
4-22-19	4	DATA UPDATE
1-22-19	3	ENDVIEW UPDATE

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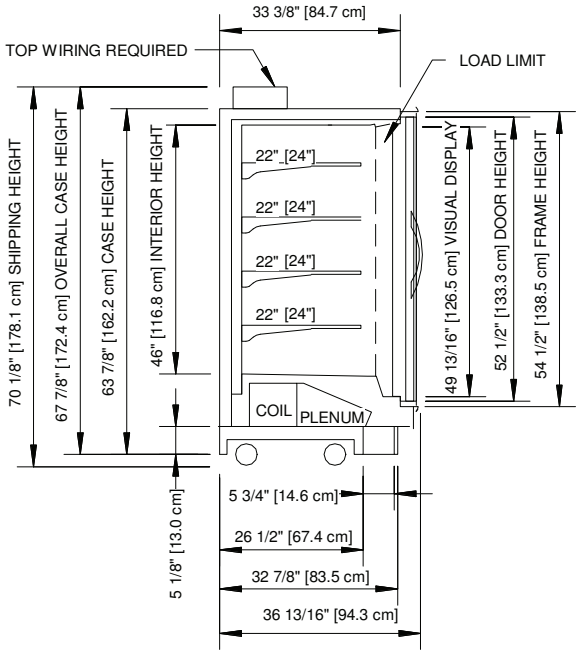
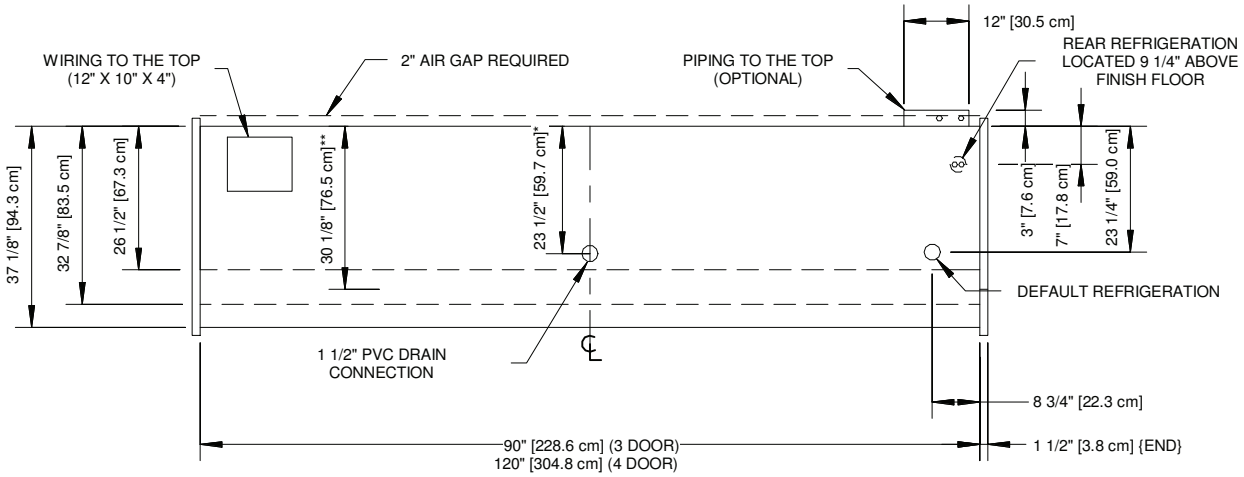
A15: TECHNICAL REFERENCE SHEET

VNRBS

Narrow Reach-In Merchandiser
3 & 4 Door (Beverage / Dairy / Deli / Meat)





NOTES

* : STUB-UP AREA.

** : RECOMMENDED STUB-UP CENTERLINE FOR ELECTRICAL AND HUB DRAINS.

- Ends add approximately 1" to case height, 1/2" to the back & 1" to the front.

2017 DOE COMPLIANT NSF c UL us 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.

VNRBS

Rev. Date	Rev. #	Rev. Title
4-22-19	4	DATA UPDATE
1-22-19	3	ENDVIEW UPDATE

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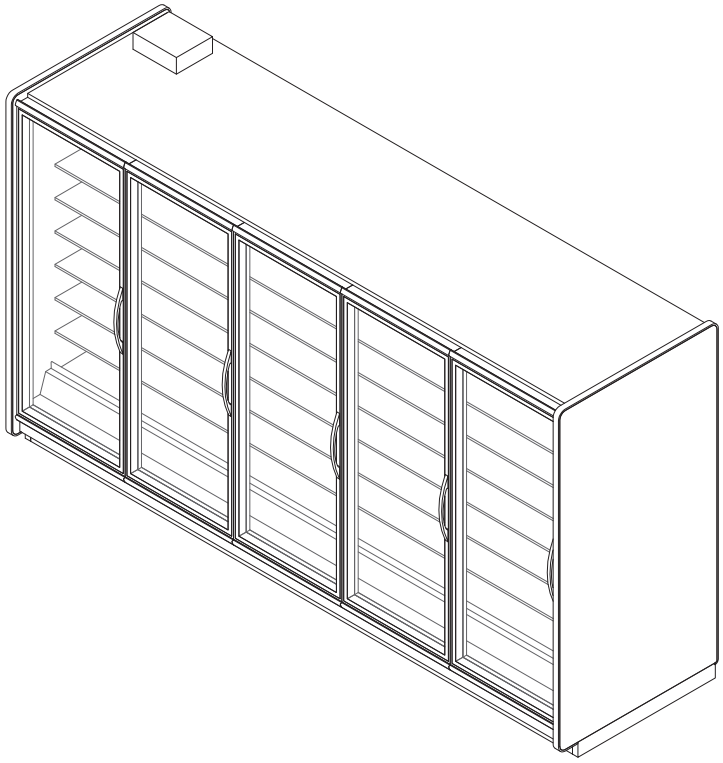
A16: TECHNICAL REFERENCE SHEET

VRB

Reach-In Merchandiser
2, 3, 4, & 5 Door / 4', 6', 8', & 12' (Beverage / Dairy / Deli / Meat / Produce)

GENERAL NOTES

- 4-foot case Bi-Swing consist of 2 (24") doors.
- 6-foot case Bi-Swing consist of 3 (24") doors.
- 8-foot cases single swing consist of 3 (32") doors.
- 8-foot case Bi-swing consist of 4 (24") doors.
- 12-foot cases single swing consist of 4 (36") doors.
- 12-foot cases Bi-swing consist of 6 (24") doors.
- Door frames are heated. Doors are not heated.
- Lighting controls - occupancy sensors are required.
  Option 1: OEM Provided: Lighting controls (on/off) are standard unless otherwise specified.
  Option 2: End User Provided: Lighting controls should be based on occupancy sensors. Store level A/S control should be set to 20% minimum off time at 75°F/55%RH.



SHIPPING WEIGHT	
Case	Weight
VRB	---

2017 DOE COMPLIANT NSF c UL us 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.

VRB

Rev. Date	Rev. #	Rev. Title
9-26-19	6	DATA UPDATE
9-26-19	5	ENDVIEW UPDATE

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A17: TECHNICAL REFERENCE SHEET

VRB

Reach-In Merchandiser

2, 3, 4, & 5 Door / 4', 6', 8', & 12' (Beverage / Dairy / Deli / Meat / Produce)

ELECTRICAL DATA			
Case Length	Fans Per Case	High Efficiency Fans 120 Volt Amps	High Efficiency Fans 120 Volt Watts
2 Door	1	0.22	26
3 Door	2	0.43	52
4 Door	2	0.43	52
5 Door	3	0.65	78
4'	1	0.22	26
6'	2	0.43	52
8'	2	0.43	52
12'	3	0.65	78

LIGHTING DATA					
Case Length	Door Size	OP45 120 Volts Amps	OP45 120 Volts Watts	OP55 (French Swing Only) 120 Volts Amps	OP55 (French Swing Only) 120 Volts Watts
2 Door	30"	0.36	43.1	---	---
3 Door	30"	0.54	65.2	---	---
4 Door	30"	0.73	87.3	---	---
5 Door	30"	0.91	109.4	---	---
4'	24"	---	---	0.26	31.0
6'	24"	---	---	0.52	61.9
8'	24"	---	---	0.52	61.9
8'	32"	0.54	65.2	---	---
12'	24"	---	---	0.77	92.8
12'	36"	0.73	87.3	---	---

ANTI CONDENSATE DATA					
		101 Frames Un Heated Doors ELMD, ELMH, I90 120 Volts		Vista Frames Un Heated Doors Vista C, I60 120 Volts	
Case Length	Door Size	Amps	Watts	Amps	Watts
2 Door	30"	0.22	43	0.36	43
3 Door	30"	0.43	68	0.57	68
4 Door	30"	0.43	95	0.79	95
5 Door	30"	0.65	118	0.98	118
4'	24"	0.19	23	0.19	23
6'	24"	0.40	48	0.40	48
8'	24"	0.44	53	0.44	53
8'	32"	0.58	70	0.58	70
12'	24"	0.70	84	0.70	84
12'	36"	0.84	101	0.84	101

2017 DOE COMPLIANT NSF c UL us 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.

VRB

Rev. Date	Rev. #	Rev. Title
9-26-19	6	DATA UPDATE
9-26-19	5	ENDVIEW UPDATE

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A18: TECHNICAL REFERENCE SHEET

VRB

Reach-In Merchandiser

2, 3, 4, & 5 Door / 4', 6', 8', & 12' (Beverage / Dairy / Deli / Meat / Produce)

GUIDELINES AND CONTROL SETTINGS

Application	Case Length	Door Size	BTUH/ft		Superheat Set Point @ Bulb (°F)	Evaporator (°F)	Discharge Air (°F)	Discharge Air Velocity (FPM)
			Conventional	Parallel				
Beverage/Produce	2 - 5 Door	30"	555	550	6 - 8	34	39	235
Beverage/Produce	4'	24"	445	440	6 - 8	34	39	235
Beverage/Produce	6'	24"	445	440	6 - 8	34	39	235
Beverage/Produce	8'	24"	445	440	6 - 8	34	39	235
Beverage/Produce	8'	32"	595	585	6 - 8	34	39	235
Beverage/Produce	12'	24"	445	440	6 - 8	34	39	235
Beverage/Produce	12'	36"	665	660	6 - 8	34	39	235
Deli/Dairy/Cut Produce	2 - 5 Door	30"	605	580	6 - 8	31	35	235
Deli/Dairy/Cut Produce	4'	24"	485	465	6 - 8	31	39	235
Deli/Dairy/Cut Produce	6'	24"	485	465	6 - 8	31	35	235
Deli/Dairy/Cut Produce	8'	24"	485	465	6 - 8	31	35	235
Deli/Dairy/Cut Produce	8'	32"	645	620	6 - 8	31	35	235
Deli/Dairy/Cut Produce	12'	24"	485	465	6 - 8	31	35	235
Deli/Dairy/Cut Produce	12'	36"	725	695	6 - 8	31	35	235
Meat	2 - 5 Door	30"	665	640	6 - 8	28	33	235
Meat	4'	24"	530	510	6 - 8	28	33	235
Meat	6'	24"	530	510	6 - 8	28	33	235
Meat	8'	24"	530	510	6 - 8	28	33	235
Meat	8'	32"	710	680	6 - 8	28	33	235
Meat	12'	24"	530	510	6 - 8	28	33	235
Meat	12'	36"	795	765	6 - 8	28	33	235

DEFROST CONTROLS

Defrosts Per Day	Timed-Off Defrost	
	Fail-Safe (Min)	Termination Temp (F)
2	30	38

NOTES

- "---" indicates that this feature is not an option on this case model.
- 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.
- Light wattages above reflect 100% run time. To determine actual daily energy usage at 75ºF/55%RH conditions, reduce the light wattages above by 42%.

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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
9-26-19	6	DATA UPDATE
9-26-19	5	ENDVIEW UPDATE

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A19: TECHNICAL REFERENCE SHEET

VRB

Reach-In Merchandiser

2, 3, 4, & 5 Door / 4', 6', 8', & 12' (Beverage / Dairy / Deli / Meat / Produce)

SECOND NATURE DATA

Case Model	No. of Coils	Application	Front Sill height	BTUH/FT		GPM/ft (DR)	Supply Fluid Temp (°F)	Discharge Air Temp (°F)
				Conventional	Parallel			
VRB (30" Door)	1	Beverage	Std. Reach In	640	666	0.07	20	34
VRB (30" Door)	1	Deli	Std. Reach In	710	697	0.10	20	31
VRB (30" Door)	1	Meat	Std. Reach In	810	777	0.15	20	28
VRB (30" Door)	1	Beverage	Std. Reach In	640	666	0.10	25	34
VRB (30" Door)	1	Deli	Std. Reach In	710	697	0.16	25	31
VRB (30" Door)	1	Meat	Std. Reach In	810	777	0.21	25	28
VRB (Per Foot)	1	Beverage	Std. Reach In	268	266	0.03	20	34
VRB (Per Foot)	1	Deli	Std. Reach In	284	139	0.04	20	31
VRB (Per Foot)	1	Meat	Std. Reach In	324	311	0.06	20	28
VRB (Per Foot)	1	Beverage	Std. Reach In	268	266	0.04	25	34
VRB (Per Foot)	1	Deli	Std. Reach In	284	139	0.06	25	31
VRB (Per Foot)	1	Meat	Std. Reach In	324	311	0.08	25	28

SECOND NATURE DATA

Case Model	No. of Coils	Application	Front Sill height	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)
VRB (30" Door)	1	Beverage	Std. Reach In	20	2	60	47	26	49
VRB (30" Door)	1	Deli	Std. Reach In	20	2	60	47	26	49
VRB (30" Door)	1	Meat	Std. Reach In	20	2	60	47	26	49
VRB (30" Door)	1	Beverage	Std. Reach In	25	2	60	42	26	49
VRB (30" Door)	1	Deli	Std. Reach In	25	2	60	42	26	49
VRB (30" Door)	1	Meat	Std. Reach In	25	2	60	42	26	49
VRB (Per Foot)	1	Beverage	Std. Reach In	20	2	60	47	26	49
VRB (Per Foot)	1	Deli	Std. Reach In	20	2	60	47	26	49
VRB (Per Foot)	1	Meat	Std. Reach In	20	2	60	47	26	49
VRB (Per Foot)	1	Beverage	Std. Reach In	25	2	45	42	26	49
VRB (Per Foot)	1	Deli	Std. Reach In	25	2	45	42	26	49
VRB (Per Foot)	1	Meat	Std. Reach In	25	2	45	42	26	49

NOTES

- All medium temperature data listed is for 35% by wt. PROPYLENE GLYCOL.
- Inhibited Propylene Glycol solution with water, such as Dowfrost or equivalent. (Dowfrost is a trademark of the Dow Chemical Company).
- Flowrates are determined by ASHRAE test conditions and may need to be adjusted based on store conditions.
- ** Flowrates are per case

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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
9-26-19	6	DATA UPDATE
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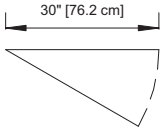
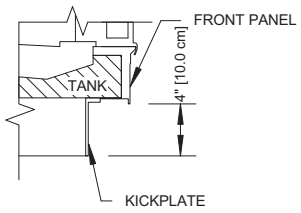
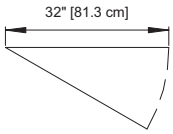
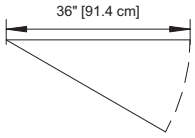
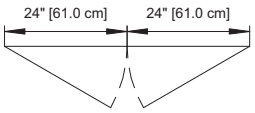
A20: TECHNICAL REFERENCE SHEET

VRB

Reach-In Merchandiser
2, 3, 4, & 5 Door / 4', 6', 8', & 12' (Beverage / Dairy / Deli / Meat / Produce)

DOOR OPTIONS	FRONT OPTIONS
STANDARD SWING DOOR 2, 3, 4 & 5 - DOOR CASES 	**FLAT FRONT (V SERIES)** 
STANDARD SWING DOOR 8' CASE 	
STANDARD SWING DOOR 12' CASE 	
BI- SWING DOOR 4', 6', 8' & 12' CASES 	

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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.

VRB

Rev. Date	Rev. #	Rev. Title
9-26-19	6	DATA UPDATE
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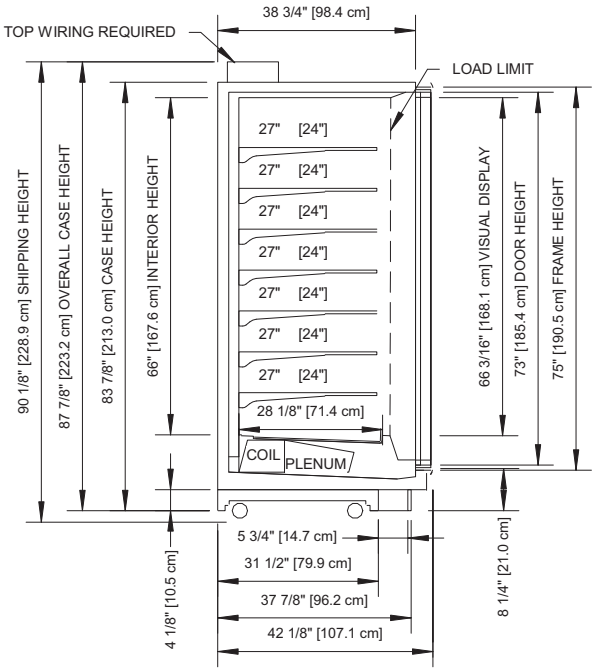
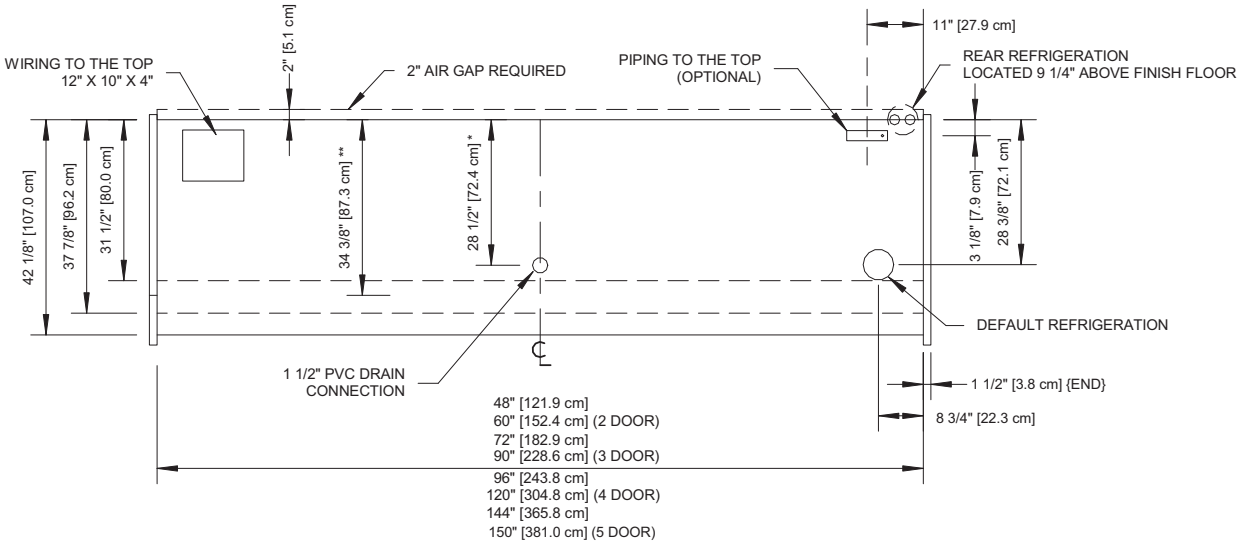
A21: TECHNICAL REFERENCE SHEET

VRB

Reach-In Merchandiser

2, 3, 4, & 5 Door / 4', 6', 8', & 12' (Beverage / Dairy / Deli / Meat / Produce)





NOTES

* : STUB-UP AREA

** : RECOMMENDED STUB-UP CENTERLINE FOR ELECTRICAL AND HUB DRAINS

- Ends add approximately 1" to case height, 1/2" to the back & 1" to the front

2017 DOE COMPLIANT NSF c UL us 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.

VRB

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9-26-19	6	DATA UPDATE
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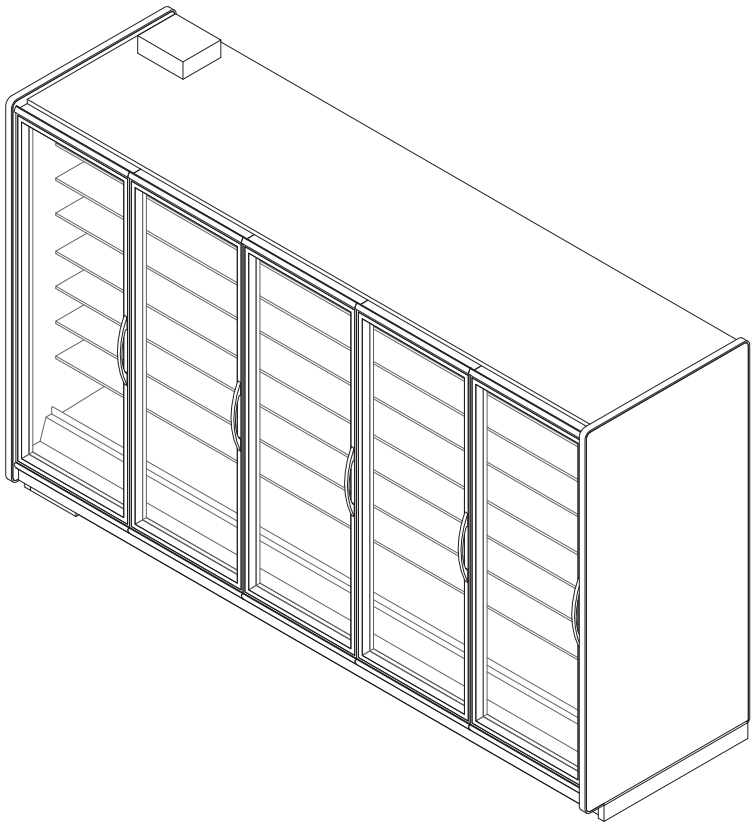
A22: TECHNICAL REFERENCE SHEET

VRBH

Reach-In Merchandiser
2, 3, 4, 5 Door / 4', 6', 8' & 12' (Beverage / Dairy / Deli / Meat)

GENERAL NOTES

- 4-foot Bi-Swing cases consist of 2 (24") doors
- 6-foot Bi-Swing cases single swing consist of 3 (24") doors.
- 8-foot cases single swing consist of 3 (32") doors
- 8-foot case Bi-swing consist of 4 (24") doors
- 12-foot cases single swing consist of 4 (36") doors
- 12-foot cases Bi-swing consist of 6 (24") doors
- Door frames are heated. Doors are not heated.
- Lighting controls - occupancy sensors are required.
  Option 1: OEM Provided: Lighting controls (on/off) are standard unless otherwise specified.
  Option 2: End User Provided: Lighting controls should be based on occupancy sensors.



SHIPPING WEIGHT	
Case	Weight
VRBH	---

2017 DOE COMPLIANT NSF c UL us 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.

VRBH

Rev. Date	Rev. #	Rev. Title
9-26-19	6	DATA UPDATE
9-25-19	5	ENDVIEW UPDATE

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A DOVER COMPANY

A23: TECHNICAL REFERENCE SHEET

VRBH

Reach-In Merchandiser
2, 3, 4, 5 Door / 4', 6', 8' & 12' (Beverage / Dairy / Deli / Meat)

ELECTRICAL DATA			
Case Length	Fans Per Case	High Efficiency Fans 120 Volt Amps	High Efficiency Fans 120 Volt Watts
2 Door	1	0.22	26
3 Door	2	0.43	52
4 Door	2	0.43	52
5 Door	3	0.65	78
4'	1	0.22	26
6'	2	0.43	52
8'	2	0.43	52
12'	3	0.65	78

LIGHTING DATA					
Case Length	Door Size	OP45 120 Volts Amps	OP45 120 Volts Watts	OP55 (French Swing Only) 120 Volts Amps	OP55 (French Swing Only) 120 Volts Watts
2 Door	30"	0.36	43.1	---	---
3 Door	30"	0.54	65.2	---	---
4 Door	30"	0.73	87.3	---	---
5 Door	30"	0.91	109.4	---	---
4'	24"	---	---	0.26	31.0
6'	24"	---	---	0.52	61.9
8'	24"	---	---	0.52	61.9
8'	32"	0.54	65.2	---	---
12'	24"	---	---	0.77	92.8
12'	36"	0.73	87.3	---	---

ANTI CONDENSATE DATA					
Case Length	Door Size	101 Frames Un Heated Doors ELMD, ELMH, I90 120 Volts Amps	101 Frames Un Heated Doors ELMD, ELMH, I90 120 Volts Watts	Vista Frames Un Heated Doors Vista C, I60 120 Volts Amps	Vista Frames Un Heated Doors Vista C, I60 120 Volts Watts
2 Door	30"	0.37	44	0.37	44
3 Door	30"	0.58	70	0.58	70
4 Door	30"	0.81	97	0.81	97
5 Door	30"	1.02	122	1.02	122
4'	24"	0.19	23	0.19	23
6'	24"	0.40	48	0.40	48
8'	24"	0.44	53	0.44	53
8'	32"	0.59	71	0.59	71
12'	24"	0.71	85	0.71	85
12'	36"	0.86	103	0.86	103

2017 DOE COMPLIANT NSF c UL us 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.

VRBH

Rev. Date	Rev. #	Rev. Title
9-26-19	6	DATA UPDATE
9-25-19	5	ENDVIEW UPDATE

Hillphoenix
A DOVER COMPANY

A24: TECHNICAL REFERENCE SHEET

VRBH

Reach-In Merchandiser
2, 3, 4, 5 Door / 4', 6', 8' & 12' (Beverage / Dairy / Deli / Meat)

GUIDELINES AND CONTROL SETTINGS

Application	Case Length	Door Size	BTUH/ft		Superheat Set Point @ Bulb (°F)	Evaporator (°F)	Discharge Air (°F)	Discharge Air Velocity (FPM)
			Conventional	Parallel				
Beverage/Produce	2 - 5 Door	30"	625	620	6 - 8	34	39	235
Beverage/Produce	4'	24"	500	495	6 - 8	34	39	235
Beverage/Produce	6'	24"	500	495	6 - 8	34	39	235
Beverage/Produce	8'	24"	500	495	6 - 8	34	39	235
Beverage/Produce	8'	32"	665	660	6 - 8	34	39	235
Beverage/Produce	12'	24"	500	495	6 - 8	34	39	235
Beverage/Produce	12'	36"	750	745	6 - 8	34	39	235
Deli/Dairy/Cut Produce	2 - 5 Door	30"	695	685	6 - 8	31	35	235
Deli/Dairy/Cut Produce	4'	24"	555	550	6 - 8	31	35	235
Deli/Dairy/Cut Produce	6'	24"	555	550	6 - 8	31	35	235
Deli/Dairy/Cut Produce	8'	24"	555	550	6 - 8	31	35	235
Deli/Dairy/Cut Produce	8'	32"	740	730	6 - 8	31	35	235
Deli/Dairy/Cut Produce	12'	24"	555	550	6 - 8	31	35	235
Deli/Dairy/Cut Produce	12'	36"	830	825	6 - 8	31	35	235
Meat	2 - 5 Door	30"	785	725	6 - 8	28	33	235
Meat	4'	24"	630	580	6 - 8	28	33	235
Meat	6'	24"	630	580	6 - 8	28	33	235
Meat	8'	24"	630	580	6 - 8	28	33	235
Meat	8'	32"	840	775	6 - 8	28	33	235
Meat	12'	24"	630	580	6 - 8	28	33	235
Meat	12'	36"	945	870	6 - 8	28	33	235

DEFROST CONTROLS

Defrosts Per Day	Timed-Off Defrost	
	Fail-Safe (Min)	Termination Temp (F)
2	30	38

NOTES

- "---" indicates that this feature is not an option on this case model and/or the data is not yet available.
- Lighting data shown is for Optimax Radiant.
- 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.
- Light wattages above reflect 100% run time. To determine actual daily energy usage at 75ºF/55%RH conditions, reduce the light wattages above by 42%.

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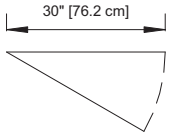
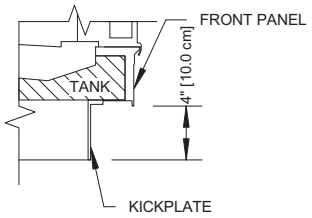
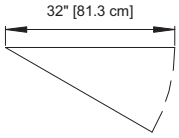
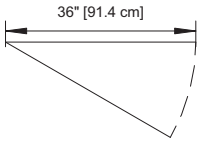
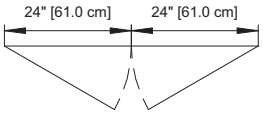
A25: TECHNICAL REFERENCE SHEET

VRBH

Reach-In Merchandiser
2, 3, 4, 5 Door / 4', 6', 8' & 12' (Beverage / Dairy / Deli / Meat)

DOOR OPTIONS	FRONT OPTIONS
STANDARD SWING DOOR 2, 3, 4 & 5 - DOOR CASES 	**FLAT FRONT (V SERIES)** 
STANDARD SWING DOOR 8' CASE 	
STANDARD SWING DOOR 12' CASE 	
BI- SWING DOOR 4', 6', 8' & 12' CASES 	

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9-26-19	6	DATA UPDATE
9-25-19	5	ENDVIEW UPDATE

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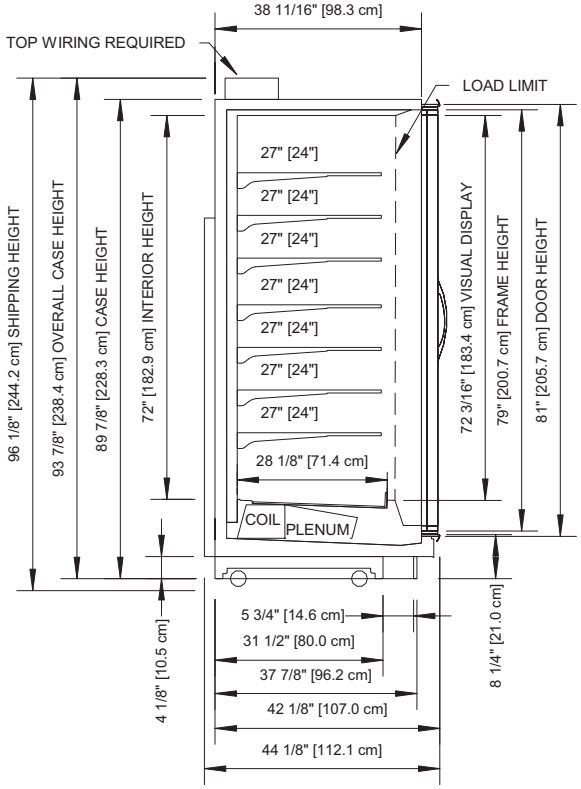
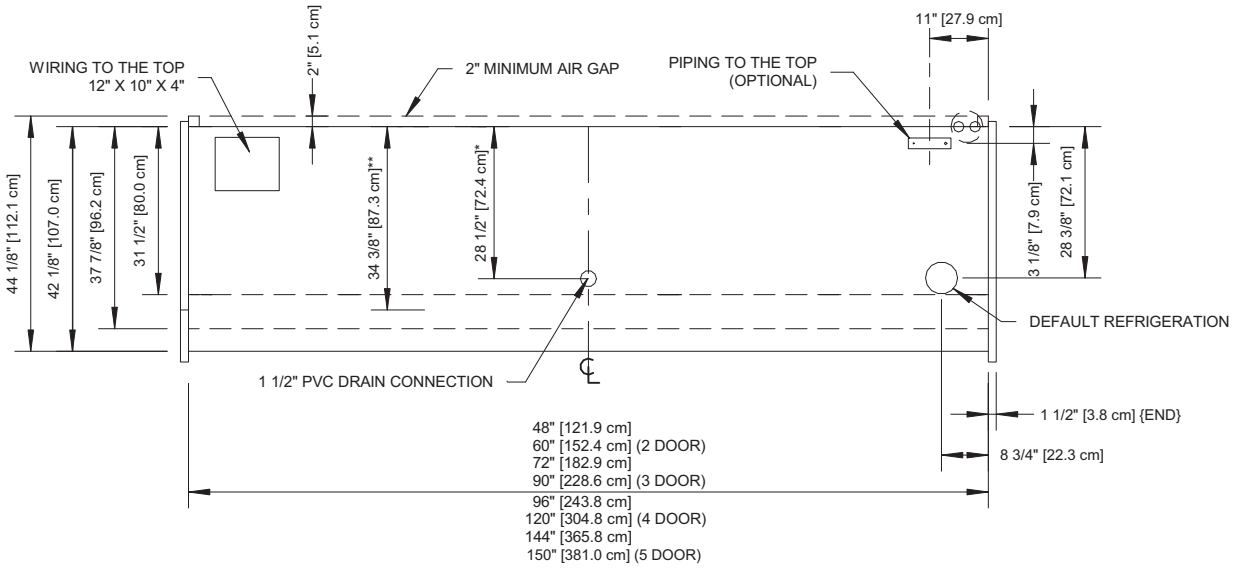
A26: TECHNICAL REFERENCE SHEET

VRBH

Reach-In Merchandiser
2, 3, 4, 5 Door / 4', 6', 8' & 12' (Beverage / Dairy / Deli / Meat)





NOTES

* : STUB-UP AREA

** : RECOMMENDED STUB-UP CENTERLINE FOR ELECTRICAL AND HUB DRAINS

- Ends add approximately 1" to case height, 1/2" to the back & 1" to the front

2017 DOE COMPLIANT NSF c UL us COMPONENT

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9-26-19	6	DATA UPDATE
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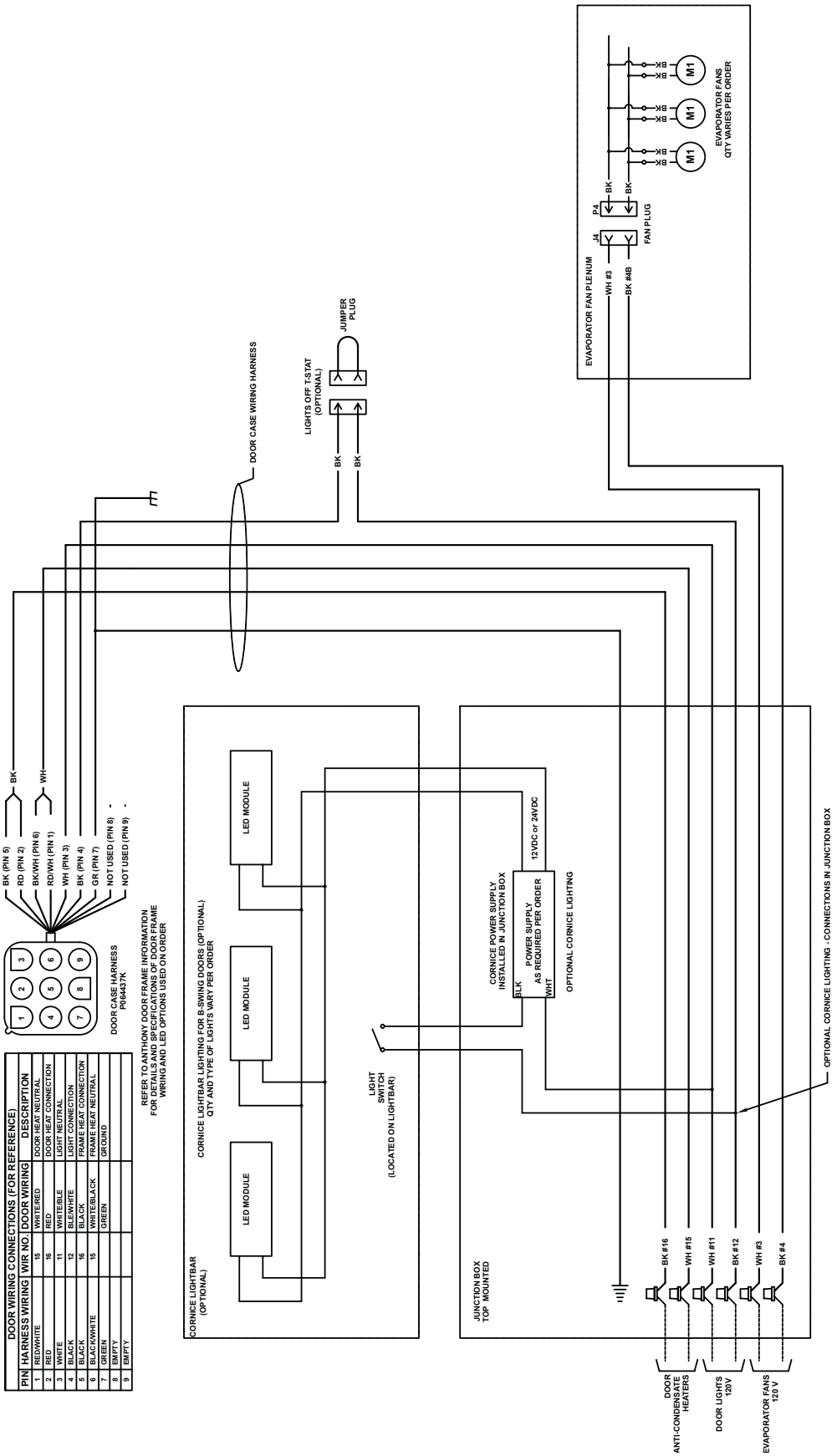
B1: ELECTRICAL WIRING DIAGRAM



B2: ELECTRICAL WIRING DIAGRAM

WIRING IDENTIFICATION

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						
AISLE WARMER	10	9						
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

ATTENTION: ELECTRICIAN

For safety and code compliance, ground fixture at the time of installation.

CAUTION

Risk of electric shock. More than one power supply. Disconnect all power supplies before servicing.

C1: SPORTAN PRESSURE-TEMPERATURE CHART

Vacuum-Inches of Mercury
Bold Italic Figures

SPORLAN

TEMPERATURE PRESSURE CHART - at sea level

Pressure-Pounds Per
Square Inch Gauge

TEMPERATURE		REFRIGERANT (SPORLAN CODE)					TEMPERATURE		REFRIGERANT (SPORLAN CODE)					TEMPERATURE		REFRIGERANT (SPORLAN CODE)				
(°F)	(°C)	134a (J)	404A (S)	507 (P)	717 (A)	744 - CO_2	(°F)	(°C)	134a (J)	404A (S)	507 (P)	717 (A)	744 - CO_2	(°F)	(°C)	134a (J)	404A (S)	507 (P)	717 (A)	744 - CO_2
-60	-51.1	21.8	7.3	5.8	18.6	79.9	12	-11.1	13.1	45.4	48.1	25.6	357.4	42	5.6	37.0	88.8	92.8	61.6	569.3
-55	-48.3	20.3	3.9	2.2	16.6	91.1	13	-10.6	13.8	46.6	49.3	26.5	363.4	43	6.1	38.0	90.6	94.6	63.1	577.6
-50	-45.6	18.7	0.1	0.9	14.3	103.4	14	-10.0	14.4	47.8	50.5	27.5	369.5	44	6.7	39.0	92.4	96.5	64.7	586.0
-45	-42.8	16.9	2.0	3.0	11.7	116.6	15	-9.4	15.0	49.0	51.8	28.4	375.6	45	7.2	40.1	94.2	98.3	66.3	594.5
-40	-40.0	14.8	4.3	5.4	8.8	131.0	16	-8.9	15.7	50.2	53.0	29.4	381.8	46	7.8	41.1	96.0	100.2	67.9	603.1
-35	-37.2	12.5	6.8	8.1	5.4	146.5	17	-8.3	16.4	51.5	54.3	30.4	388.0	47	8.3	42.2	97.9	102.1	69.5	611.7
-30	-34.4	9.8	9.6	11.0	1.6	163.1	18	-7.8	17.0	52.7	55.6	31.4	394.3	48	8.9	43.2	99.8	104.1	71.1	620.5
-25	-31.7	6.9	12.7	14.1	1.3	181.0	19	-7.2	17.7	54.0	56.9	32.4	400.7	49	9.4	44.3	101.7	106.0	72.8	629.3
-20	-28.9	3.7	16.0	17.6	3.6	200.2	20	-6.7	18.4	55.3	58.3	33.5	407.2	50	10.0	45.4	103.6	108.0	74.5	638.3
-18	-27.8	2.3	17.4	19.1	4.6	208.3	21	-6.1	19.1	56.6	59.6	34.6	413.8	55	12.8	51.2	115.3	118.3	83.4	684.4
-16	-26.7	0.8	18.9	20.6	5.6	216.5	22	-5.6	19.9	58.0	61.0	35.7	420.4	60	15.6	57.4	126.0	129.2	92.9	733.1
-14	-25.6	0.4	20.4	22.2	6.7	225.0	23	-5.0	20.6	59.3	62.4	36.8	427.1	65	18.3	64.0	137.3	140.7	103.2	784.2
-12	-24.4	1.1	22.0	23.8	7.8	233.8	24	-4.4	21.3	60.7	63.8	37.9	433.8	70	21.1	71.1	149.3	153.0	114.2	838.1
-10	-23.3	1.9	23.6	25.5	9.0	242.7	25	-3.9	22.1	62.1	65.3	39.0	440.7	75	23.9	78.7	162.0	165.9	125.9	894.9
-8	-22.2	2.8	25.3	27.3	10.3	251.9	26	-3.3	22.9	63.5	66.7	40.2	447.6	80	26.7	86.7	175.4	179.6	138.4	954.9
-6	-21.1	3.6	27.0	29.1	11.5	261.3	27	-2.8	23.7	64.9	68.2	41.4	454.6	85	29.4	95.2	189.5	194.1	151.8	1018
-4	-20.0	4.6	28.8	30.9	12.9	271.0	28	-2.2	24.5	66.4	69.7	42.6	461.7	90	32.2	104.3	204.5	209.3	166.1	**
-2	-18.9	5.5	30.7	32.8	14.3	280.9	29	-1.7	25.3	67.8	71.2	43.8	468.8	95	35.0	113.9	220.2	225.4	181.2	**
0	-17.8	6.5	32.6	34.8	15.7	291.0	30	-1.1	26.1	69.3	72.7	45.0	476.1	100	37.8	124.2	236.8	242.3	197.3	**
1	-17.2	7.0	33.6	35.8	16.4	296.2	31	-0.6	26.9	70.8	74.3	46.3	483.4	105	40.6	135.0	254.2	260.1	214.4	**
2	-16.7	7.5	34.6	36.9	17.2	301.5	32	0.0	27.8	72.4	75.9	47.6	490.8	110	43.3	146.4	272.5	278.8	232.5	**
3	-16.1	8.0	35.6	37.9	18.0	306.8	33	0.6	28.6	73.9	77.5	48.9	498.3	115	46.1	158.4	291.8	298.5	251.6	**
4	-15.6	8.5	36.6	39.0	18.8	312.1	34	1.1	29.5	75.5	79.1	50.2	505.8	120	48.9	171.2	312.1	319.2	271.9	**
5	-15.0	9.1	37.7	40.1	19.6	317.6	35	1.7	30.4	77.1	80.7	51.6	513.4	125	51.7	184.6	333.3	340.9	293.3	**
6	-14.4	9.6	38.7	41.1	20.4	323.1	36	2.2	31.3	78.7	82.4	52.9	521.2	130	54.4	198.7	355.6	363.8	315.8	**
7	-13.9	10.2	39.8	42.3	21.2	328.6	37	2.8	32.2	80.3	84.1	54.3	529.0	135	57.2	213.6	379.1	387.8	339.6	**
8	-13.3	10.8	40.9	43.4	22.1	334.2	38	3.3	33.1	82.0	85.8	55.7	536.9	140	60.0	229.2	403.7	413.0	364.7	**
9	-12.8	11.3	42.0	44.5	22.9	339.9	39	3.9	34.1	83.7	87.5	57.2	544.8	145	62.8	245.7	429.6	439.5	391.0	**
10	-12.2	11.9	43.1	45.7	23.8	345.7	40	4.4	35.0	85.4	89.2	58.6	552.9	150	65.6	262.9	456.8	467.4	418.7	**
11	-11.7	12.5	44.3	46.9	24.7	351.5	41	5.0	36.0	87.1	91.0	60.1	561.0	155	68.3	281.0	485.5	497.0	447.8	**

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

D1: CASE TOP FASCIA

If case top fascia is included for installation, secure the front and rear fascia panels at the ends with the provided Tek screws. The front fascia panels have a hole in the center near the bottom. If required, route the motion sensor cable through this hole (Fig. 1).

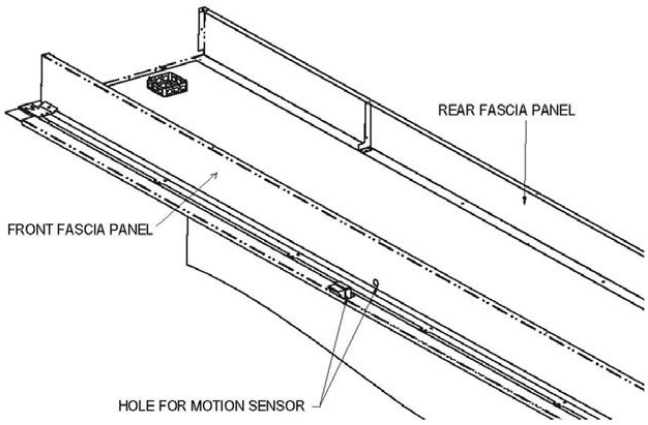


Fig. 1 Front and rear fascia

Attach the vertical gussets (Fig. 2) to the panels to provide additional stiffness. Slide the gusset into the inside of the fascia panel and align the holes at the top. Fasten with screws at the top and through the bottom.

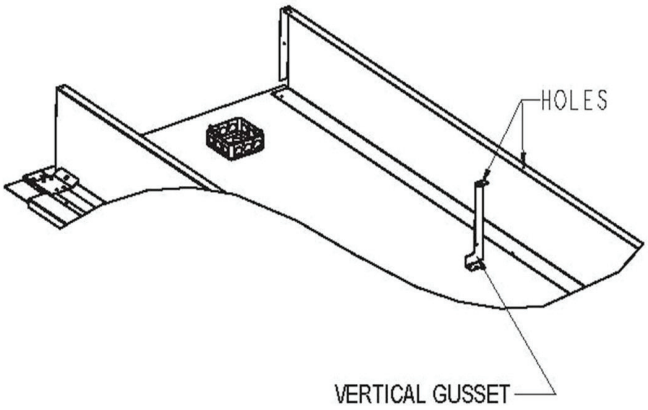


Fig. 2 Attach vertical gussets

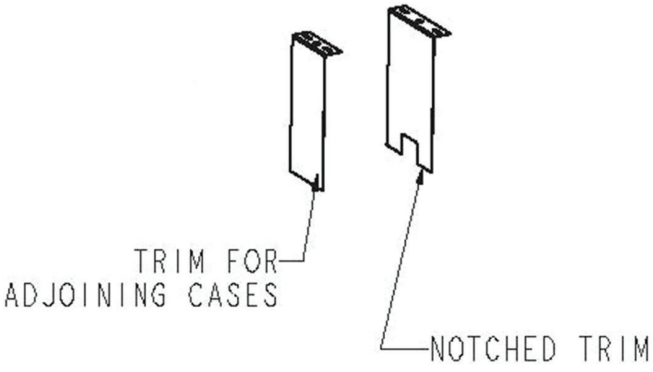


Fig. 3 Notched trim

Install the provided case-to-case fascia joint trim with the provided screws. Use the notched trim (Fig. 3) for bridging over a foamed partition.

Install the adjustable end fascia panels (Fig. 4). Nest one panel inside the other and slide to the desired distance. Fasten with screws once the desired front to rear distance is obtained.

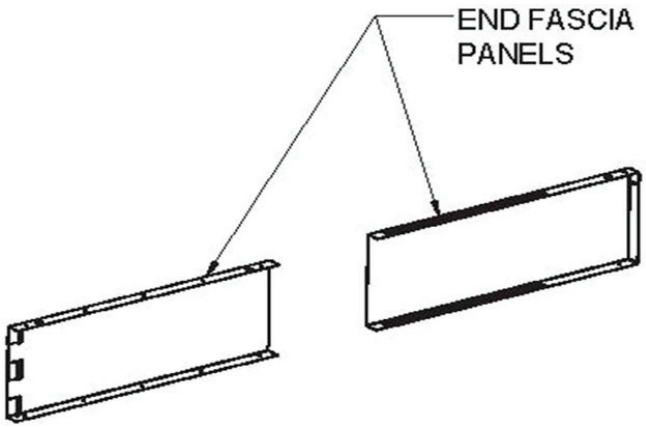


Fig. 4 Install end fascia panels

Note: If ballast supports are present, utilize the support structure shown in Fig. 5 below.

The fascia is fastened directly to the ballast supports at (a) using the provided Tek screws. Brackets are fastened to the fascia at (b) and to the supports at (c). Brackets are fastened to the end fascia at (d) and the tank at (e). “L” brackets are screwed into the supports or tank at (f).

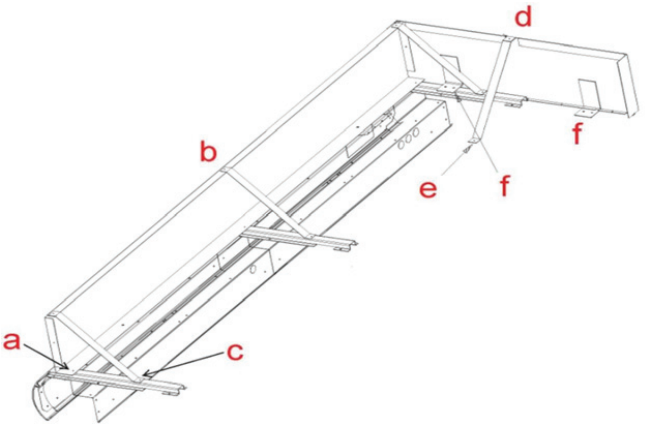


Fig. 5 Attaching fascia to ballast supports

E1: ELECTRONIC DISPLAY MODULE

The electronic display module (EDM) is installed within a protective enclosure (Fig. 1) and is initially secured to the top-rear area of the case. Unscrew the display module from this location.

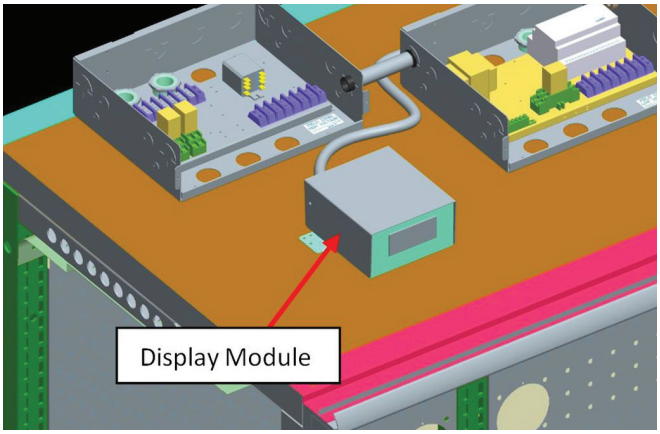


Fig. 1 Electronic display module inside protective enclosure

Pull the display module forward to the front, left-hand side of the case. If top fascia is utilized, slide the display module through the pre-cut rectangular hole in the fascia (Fig. 2) until it sits flush against the cornice.

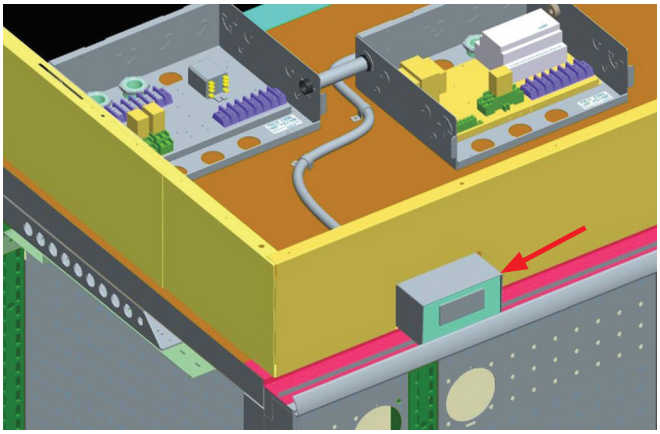


Fig. 2 Slide EDM through pre-cut hole in fascia

Align the pre-drilled holes in the display module and the fascia (Fig. 3), then secure the module using the provided screws.

NOTE: these instructions do not apply to Airewave fascia.

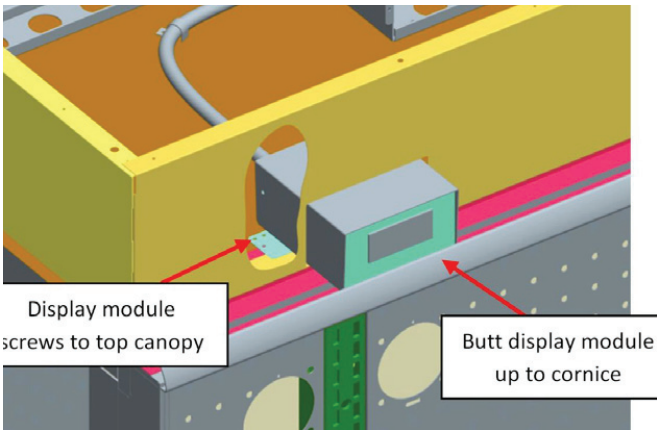


Fig. 3 Align with pre-cut holes and secure with screws

If top fascia is not included, align the front of the display module flush to the front of the cornice (Fig. 4), locating the left edge of the display module 9.25” from the left end of the case. Secure the display module by drilling two screws into the top canopy.

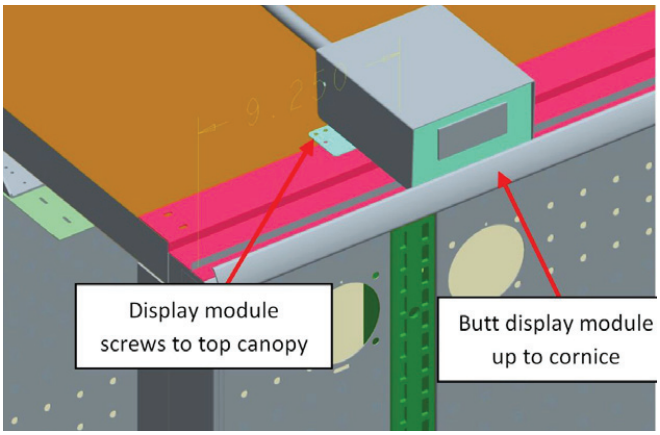
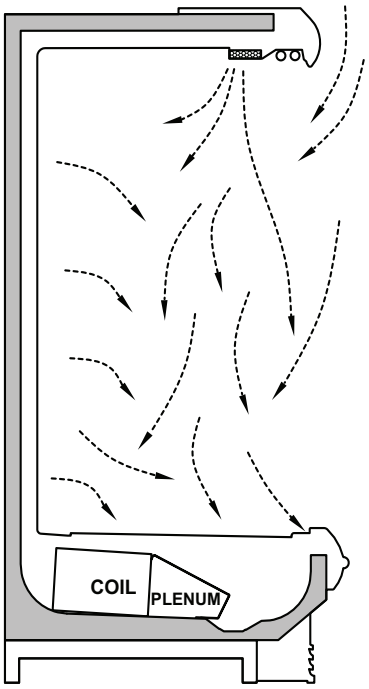


Fig. 4 Align with cornice front and secure with screws

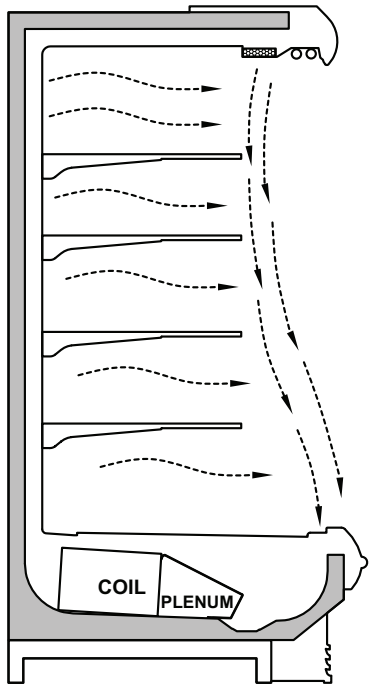
F1: PEG HOOKS

When a case merchandiser's shelves are removed, air drifts back to the rear duct and swirls around, thus breaking the protective air envelope and allowing case air to mix with ambient store air (Fig. 1). When the shelves are present, air flows from the top and back, forming a protective barrier against the ambient store air (Fig. 2).

1

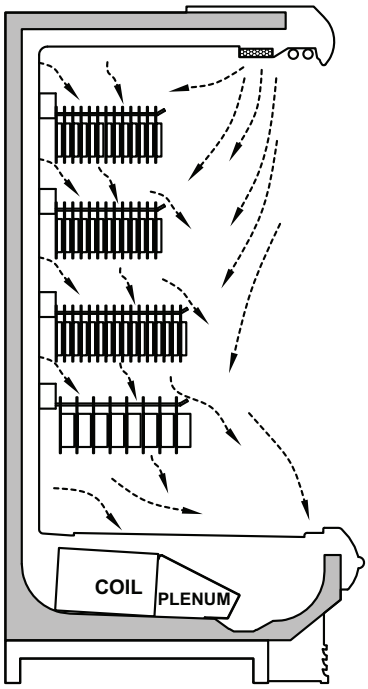


2

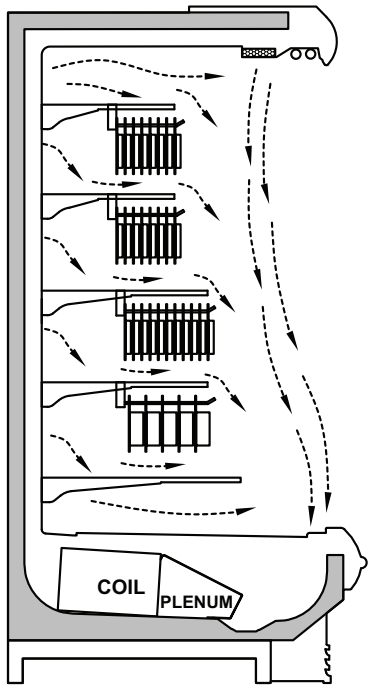


When peg bars are present, air falls through openings between packages and fails to maintain a protective barrier (Fig. 3). When the bars are fully stocked, the effect is minimized; however, product temperatures will not be optimal. Sweating may be noticed on the top duct panel above the bars and frost will build up on the coil faster, requiring more frequent defrost cycles. For proper set-up of a merchandiser with peg bars, install a solid baffle above each row of peg bars - except for the bottom shelf - to maintain proper air flow and temperatures inside the case. Non-load-bearing solid air baffles should run the same width as the peg bars.

3



4



G1: NON-INSULATED ACRYLIC PARTITIONS

Use the following instructions to install Hillphoenix non insulated partitions. It is recommended that all shelves and deck pans from both sides of the partition be removed to avoid any potential damage or injury.

Step 1: Mount the two vertical retainer brackets to the shelf standard (figures 1 & 2) using the supplied tek screws (8-18x3/4). The rectangular cutouts in the retainers must align with the rectangular slots in the shelf standard. Vertical Retainer Bracket #1 should be located below the 3rd slot from the top and Vertical Bracket #2 should be located above the 6th slot from the bottom. The grooves in the vertical retainer brackets must be centered on the case to case joint. The tek screws are to be drilled through the pre-drilled holes in the retainer brackets as shown in figure 3. Note that the vertical and horizontal retainer brackets are identical.

Step 2: Slide the Plexiglas partition into the vertical retainer brackets. Use the supplied retainer bolts and nuts (8-32x1/2) to secure the Plexiglas partition to the vertical retainer brackets as shown in figure 3. Drill additional holes in the Plexiglas if the pre-drilled holes in the Plexiglas do not line up with the holes in the retainer brackets.

Step 3: Slide Horizontal Retainer Bracket #2 onto the bottom of the Plexiglas partition as shown in figure 2. Align the partition parallel to the pipe chase and secure the bracket by drilling directly into the pipe chase using the supplied tek screws. Slide Horizontal Retainer Bracket #1 onto the top of the Plexiglas partition and secure it to the top flue of the case using the supplied tek screws. Secure the partition using the retainer bolts and nuts in the horizontal retainer brackets as done in step 2.

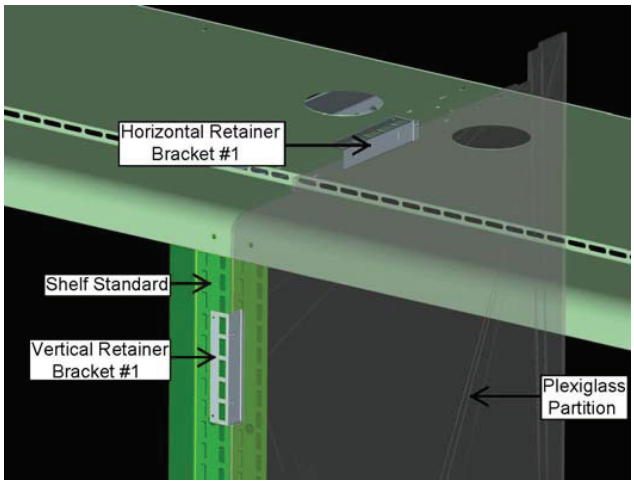


Figure 1: Top of Plexiglas Partition

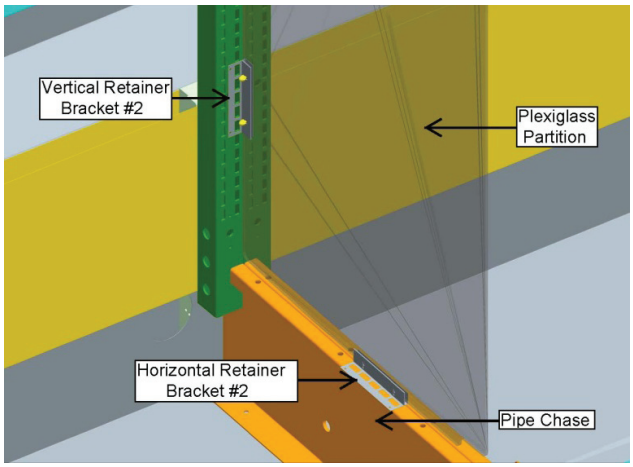


Figure 2: Bottom of Plexiglas

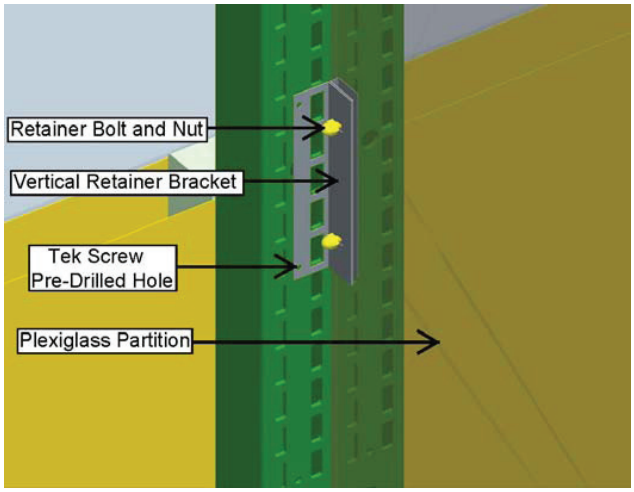
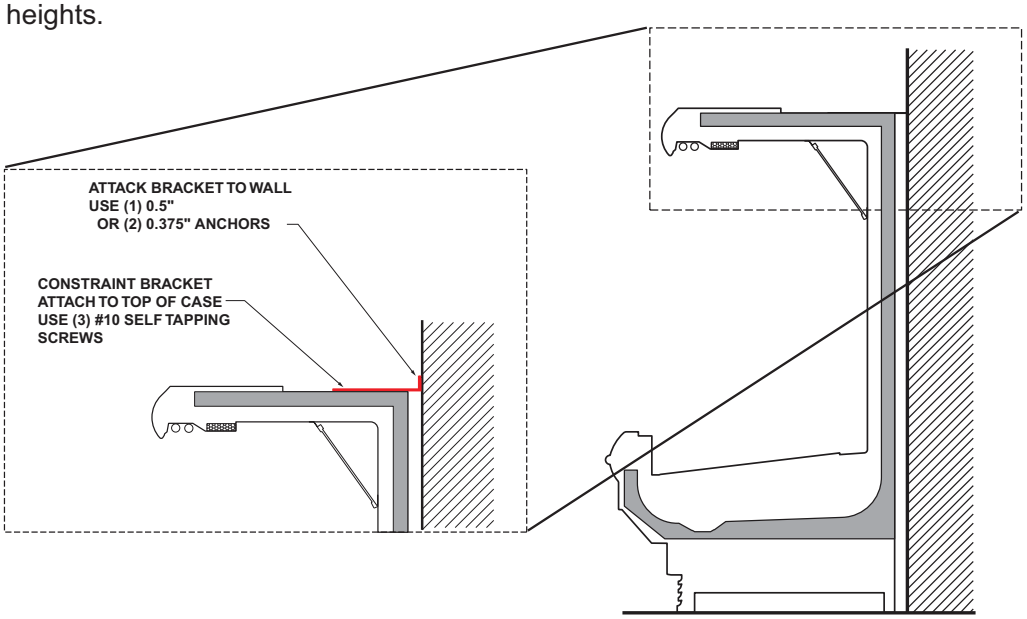


Figure 3: Vertical Retainer Bracket Installation

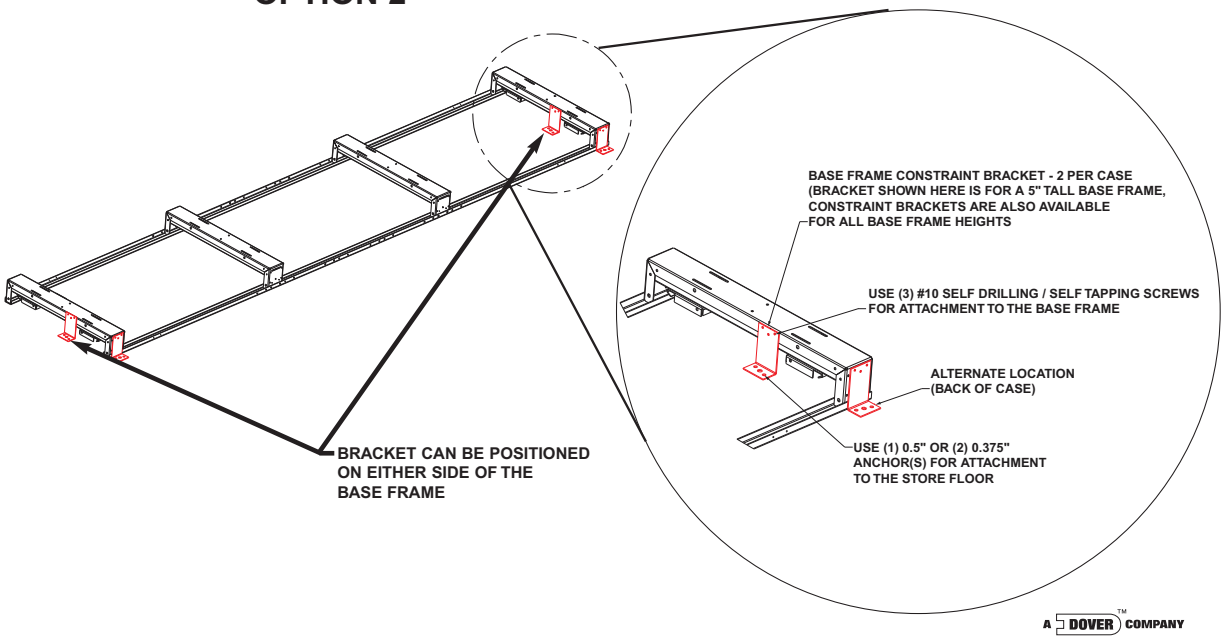
H1: SEISMIC BRACKETS

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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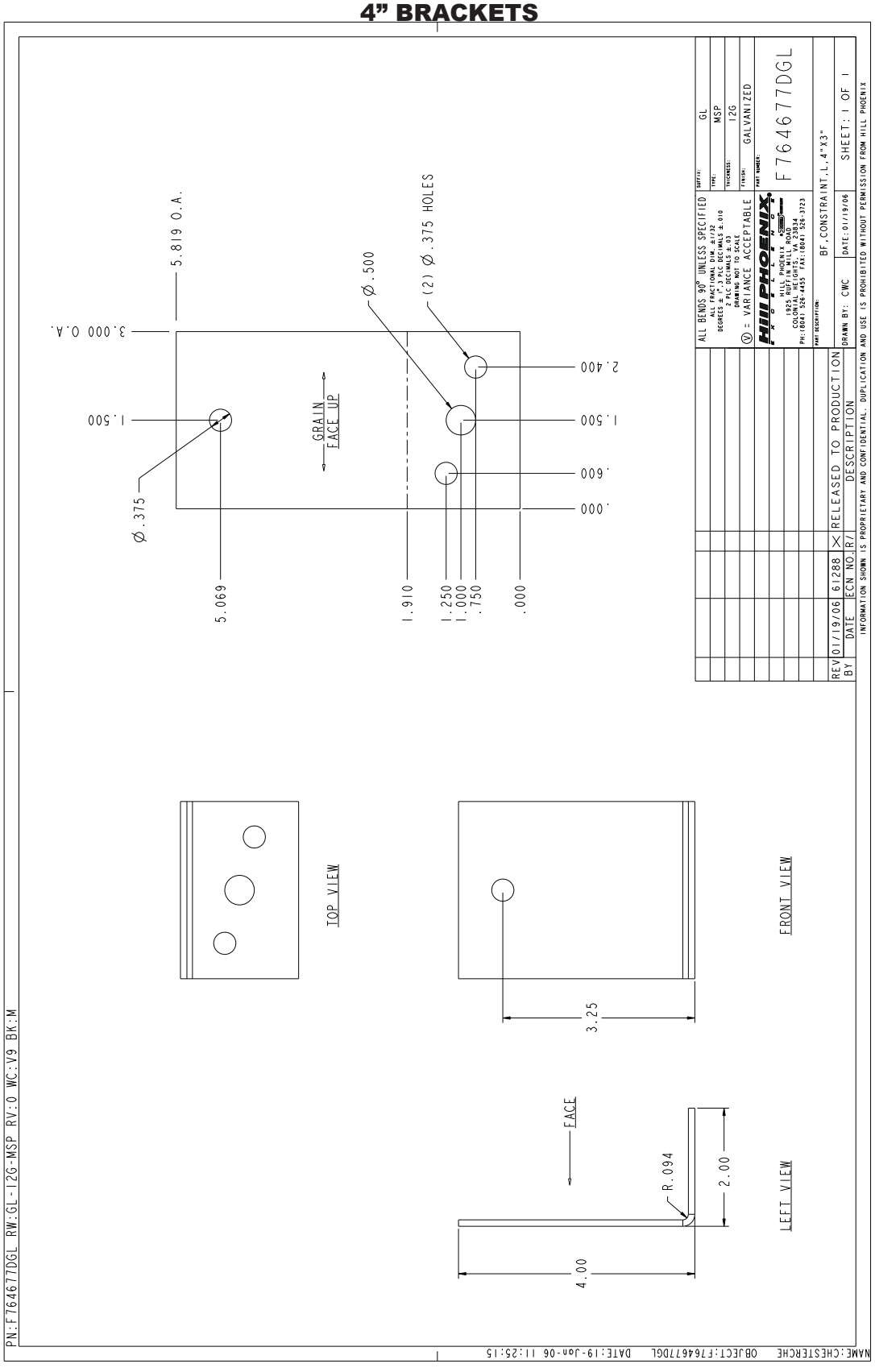
H2: SEISMIC BRACKETS

4” BRACKETS



Hillphoenix

A DOVER COMPANY

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®
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Tel: 1-800-283-1109

1925 Ruffin Mill Rd, Colonial Heights, VA 23834