



REACH-IN DOOR MERCHANDISER

INSTALLATION & OPERATIONS MANUAL

VNRZ

CLARITY™

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*To ensure proper functionality and optimum performance, it is **STRONGLY** recommended that Hillphoenix display 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 Web site at www.hillphoenix.com.*

Hillphoenix®

A **DOVER™** COMPANY



P092877C
V1.0
01/15

REVISION HISTORY

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PRECAUTIONARY NOTICES

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 call out important messages in all Hillphoenix installation and operations handbooks with an accompanying alert symbol paired with the words "DANGER!", "WARNING!", or "ATTENTION!". All of these important messages will inform you of potential hazards and dangers to personal safety and health - as well as risks of case damage - if the instructions are not carefully followed.



ATTENTION!

Indicates an important point of information that is key to ensuring that case equipment functions properly.



CAUTION!

Indicates the potential threat of death or serious injury if all instructions are not followed carefully.



DANGER!

Indicates an immediate threat of death or serious injury if all instructions are not followed carefully.

SERVICE NOTICE

To ensure proper functionality and optimum performance, it is strongly recommended that Hillphoenix display 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 Web site at www.hillphoenix.com.

LIABILITY NOTICE

For Cases with Shelf Lighting Systems

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

systems, water hoses or other devices that spray liquids in Hillphoenix display cases with lighted shelves.

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

P079211M, REVO

GLYCOL NOTICE

For Systems Utilizing R-744 (CO2) Refrigerant

Use of glycol as a secondary refrigerant must be carried out in accordance with the procedures set forth in the Hillphoenix Second Nature Medium Temperature Secondary Refrigeration Installation Manual. This manual is available for download from the Hillphoenix website at the following link, <http://www.hillphoenix.com/refrigeration-systems/second-nature/>.

R-744 (CO2) NOTICE

For Systems Utilizing R-744 (CO2) Refrigerant

For refrigeration units that utilize R-744 (CO2), pressure relief and pressure-regulating relief valves may need to be installed based on the system capacity. The valves need to be located such that no stop valve is positioned between the relief valves and the parts or section of the system being protected.

When de-energizing refrigeration units containing R-744 (CO2), venting of the R-744 (CO2) refrigerant may occur through the pressure regulating relief valves. These valves are located on the refrigeration system and not on the case model. If venting does occur, the valve must not be defeated, capped, or altered by any means.



CAUTION!

Under no circumstance should any component be replaced or added without consulting Hillphoenix Field Service Engineering. Utilizing improper components may result in serious injury to persons or damage to the refrigeration system.

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 display 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 toll-free number listed below. Thank you for choosing Hillphoenix, and we wish you the very best in outstanding food merchandising.

CASE DESCRIPTION

This manual covers VNRZ reach-in door 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 (CRMA 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.

RECEIVING CASES

Examine fixtures carefully and in the event of shipping damage and/or shortages, please contact the Service Parts Department at 1-800-283-1109.

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.

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.

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.

PARTS ORDERING

If you need to contact Hillphoenix regarding specific fixtures/parts, call 1-800-283-1109 and ask for a Service Parts Representative. 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-right panel.*

If the parts are to be returned for credit, ask the Parts Department to furnish you with a Return Material Authorization Number.

Hillphoenix
1925 Ruffin Mill Rd.
Colonial Heights, VA 23834
Mon.-Fri. (8 a.m. to 5 p.m. EST)
Tel: 1-800-283-1109/Fax: 804-526-7450
Web site: 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 casters from the back of the case, lowering the base horse on to the shim packs. Repeat on the other end of the case.

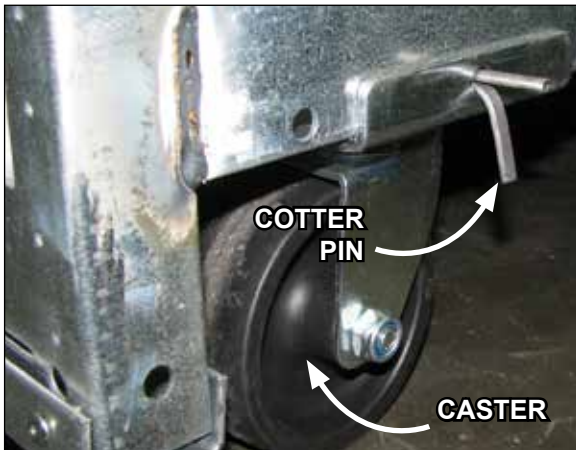


Fig. 1 Removing the casters is an easy process. Simply flatten and remove the cotter pins that are holding the casters in place. Then lift the case with a "J" bar and slide the caster assemblies out. The dismantled casters can now be discarded.



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. When the back-end of the case has been properly seated on the shim packs, insert an outrigger upside-down into the baseframe to use as a lifting surface. Using the "J" bar, simply lift the case (Fig. 2), then add or remove shims as necessary. **Do NOT use the tank bottom as a J bar lifting surface!**



Fig. 2 Using an inverted outrigger as a lifting surface.

3. Once the base horse 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.

Multi-Case

1. Remove any shelves (discard the shelf clips) and/or 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.

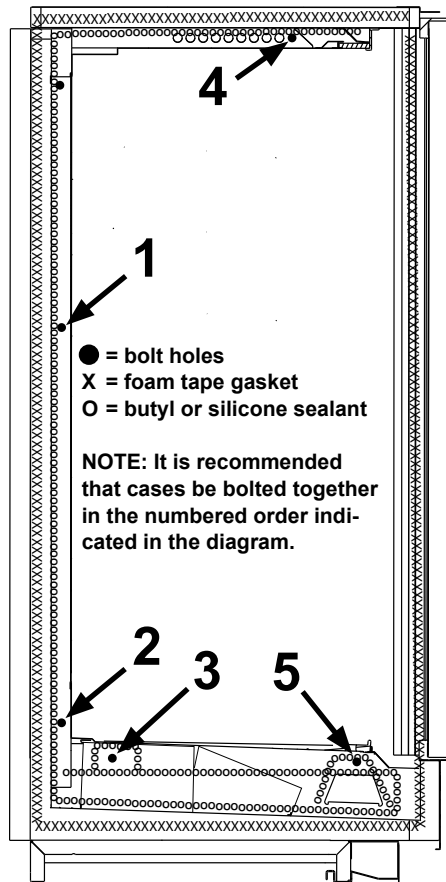


Fig. 3 Bolt holes, foam tape gasket and sealant

4. Apply the foam tape gasket (supplied) and butyl or silicone sealant to the end of the first case (Fig. 3).
5. 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.

TRIM OUT

1. Seal the case-to-case joints with caulk (supplied), then apply acrylic tape (supplied) over the pipe-chase seam (Fig. 4). The tape acts as a watershed preventing water from settling in the case joint.
2. Re-install shelves. If shelf fillers are utilized, it is important that they be installed flush with the rear baffle to ensure proper airflow in the case.
3. Install the front panel (Fig. 5). 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.
4. Make any adjustments that are necessary to properly align the front panels, then install the front panel trim (supplied).
5. Install the front kickplate (Fig. 6) to the kickplate retainer as shown.

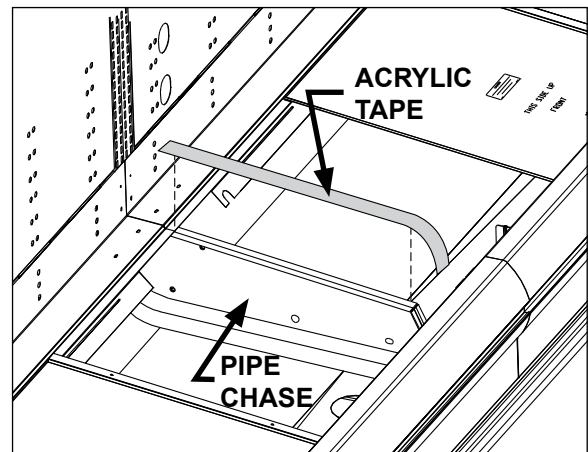


Fig. 4 Sealing the pipe chase

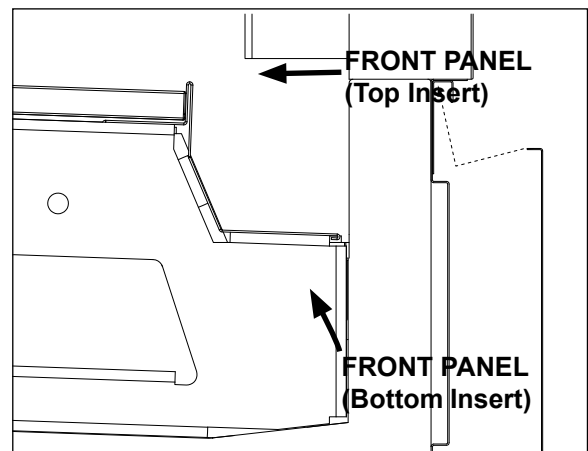


Fig. 5 Install front panel

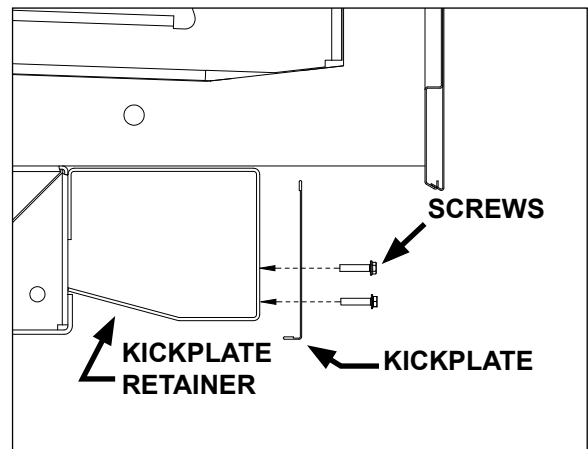


Fig. 6 Attach kickplate with supplied screws

REFRIGERATION

There are two refrigeration piping options for VNRZ cases: standard and top-rear.

As the diagrams below indicates, the piping penetration area is located at the front, right-hand side of the case, fully visible in front of the fan plenum. An optional piping to the top rear is provided with refrigeration pipes stubbed out and labelled at the top of the case. These pipes exit the case through the lower rear pipe egress and into a foam-filled box. Refrigeration connections are made at the top 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 deck pans (lifting the fan plenum is not required).

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. Before operating the case, be certain to remove the shipping blocks (Fig. 6) that protect the refrigeration lines during shipping.

Be certain that all piping connections are compliant with local codes.

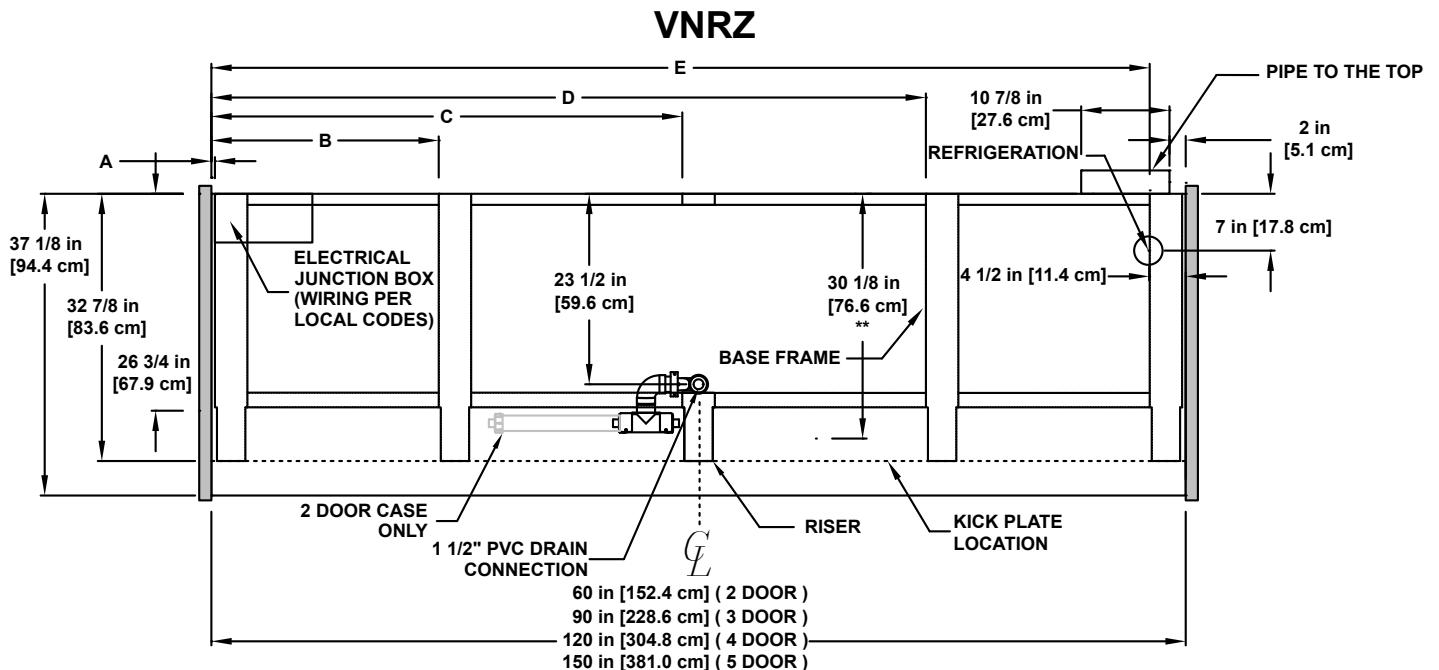


Fig. 6 Remove the shipping blocks



ATTENTION!

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



VNRZ	BASE FRAME STRUCTURE					
CASE LENGTH	DOORS	A	B	C	D	E
60"	2	3/8"	28"	55 1/2"		
90"	3	3/8"	28"	58"	85 1/2"	
120"	4	3/8"	28"	58"	88"	115 1/2"
150"	5	3/8"	28"	88"	118"	145 1/2"

* RISER SUPPORT

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. 7). Care should be given to ensure that all connections are water-tight and sealed with the appropriate PVC or ABS cement.



Fig. 7 "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 lift the kickplate up from the "J" rail and pull it out, away from the case. See the Trim Out section on page 6.

ELECTRICAL

Electrical hookups are made to a junction box located on the top-rear-left of the case (Fig. 8).

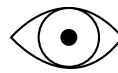
For case-to-case wiring, run conduit between the junction boxes. When connecting to the junction box on the bottom-left side of the case, field wiring should exit box from the right side (furthest away from case wiring) to allow more room inside for wiring connections. *For more detailed electrical wiring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

LIGHTING

LED lighting for VNRZ cases is pre-installed during the manufacturing process. For any questions or service needs, please contact our Case Division Customer Service Department toll-free at 1-800-283-1109.

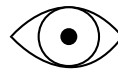


Fig. 8 Junction box on top of case



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.

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. 2)
- ☐ Have you removed and discarded the casters? (see pg. 3)
- ☐ Have you checked the vertical plumb of the case? The horizontal level? (see pg. 3)
- ☐ Have you applied the foam tape gasket and sealant between adjoining cases? (see pg. 3)
- ☐ Have you sealed the case-to-case joints by applying caulk and acrylic tape to the pipe-chase seam? (see pg. 4)
- ☐ Have you removed the shipping blocks from the refrigeration lines? (see pg. 5)
- ☐ Have you sealed any tank penetrations? (see pg. 5)
- ☐ Have you cleared the case of any loose packaging or case materials? (see pg. 6)

AIR FLOW & PRODUCT LOAD

Hillphoenix cases provide maximum product capacity within the refrigerated air envelope. Please keep products within the load limit line shown on the diagram below.

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.

FANS

VNRZ cases feature EC (electronically commutated) fan motor assemblies in which the evaporator fan blade, motor, and basket are integrated into a single unit. The EBM Papst fans have 8" fan blades with a factory-set blade pitch. Fans are pre-set for 1800 RPMs; if an airflow adjustment is required, replacement fans with a different RPM set-point may be ordered.

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

(Reverse procedure when re-installing fan assembly.)



Fig. 11 Fan basket

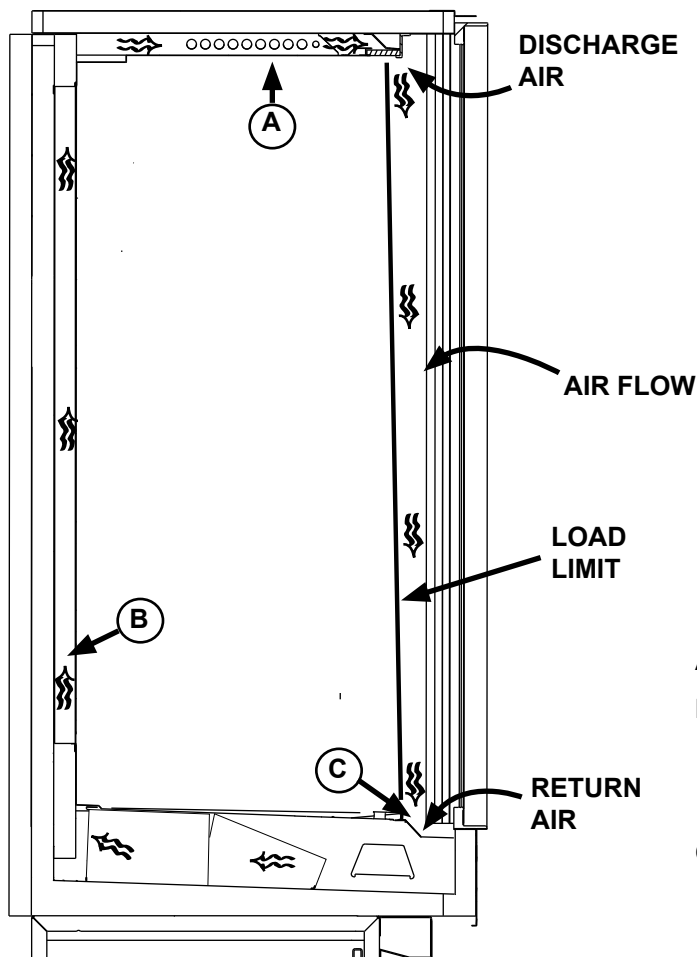


Fig. 10 Airflow; probe, sensor locations



CAUTION!

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



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.

- A. Discharge Air Probe
- B. Electric Defrost Termination Control Sensor Bulb
Electric Defrost Termination Probe
Timed-Off Defrost Termination Control Sensor Bulb
Temperature Control Sensor Bulb
- C. Reverse Air Defrost Termination Control Sensor Bulb
Return Air Probe

DEFROST & TEMPERATURE CONTROLS

Hillphoenix cases utilize electric or hot gas defrost. All low-temperature reach-in cases have local defrost controls that terminate defrost cycles in individual cases, as well as rack-system controls for circuit termination. The primary components are the various defrost termination sensors, which work to terminate the defrost cycle. These controls may include 1) a Klixon® thermostat (mounted on the dump line on the coil side of the check valve or solenoid valve for hot gas), 2) a sensor probe, (inserted 8" into the lower left coil end plate for electric defrost or mounted on the dump line on the coil side of the check valve or solenoid valve for hot gas) or 3) a dial-type thermostat with sensor bulb mounted to the left end of the coil for electric defrost or mounted on the dump line on the coil side of the check valve or solenoid valve for hot gas) - i.e., in the electrical junction box, in the electrical raceway, etc.).

*For more detailed information on suggested defrost times and settings, see **Appendices A & B**. Further adjustment 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 temperature pressure chart (see Appendix B1 for supplied pressure-temperature chart).
3. Finally, subtract the converted temperature reading from the actual temperature reading for superheat setting.

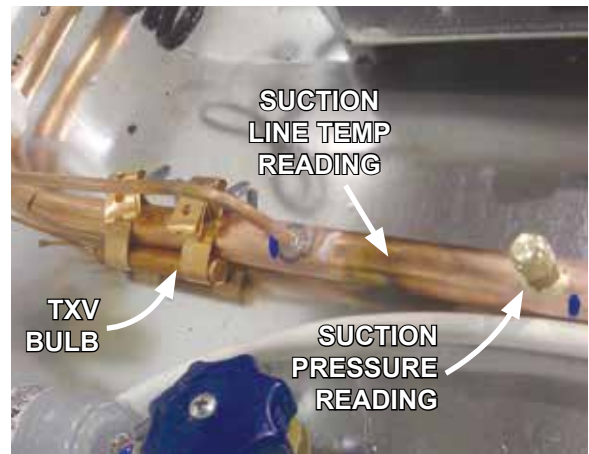


Fig. 12 Obtain pressure and temperature readings



DANGER!

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

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/ to the front of the case where the waste outlet is located for easy access. Check waste outlet to insure it is not clogged before starting the cleaning process and avoid introducing water faster than the case drain can carry it away.
- To clean the LED luminaires, shut off the lights in the case, then wipe the luminaires down with a soft, damp cloth. Avoid using harsh or abrasive cleaners as they may damage the lights. Be certain that the luminaires are completely dry before re-energizing.
- If any potentially harmful cleaners are used, be certain to provide a temporary separator (e.g., cardboard, plastic rap, 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.



Fig. 13 Single-piece fan plenum and coil cover



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: 770-285-3024

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 components 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 Road, 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 web site at www.hillphoenix.com



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SPORLAN PRESSURE-TEMPERATURE CHART	C1
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NON-INSULATED PARTITION INSTALLATION INSTRUCTIONS	E1

A1 ELECTRICAL DATA

Electrical Data

Doors	Fans Per Case	High Efficiency Fans		Defrost Heaters				Drain Heater	
				1-Phase					
		120 Volts		208 Volts		240 Volts		120 Volts	
		Amps	Watts	Amps	Watts	Amps	Watts	Amps	Watts
2-door	2	0.60	52	7.46	1552	8.62	2068	1.27	152
3-door	3	1.00	78	10.93	2274	12.58	3018	1.43	171
4-door	4	1.30	104	14.35	2984	16.63	3992	1.89	227
5-door	5	1.60	130	17.50	3640	20.17	4840	2.29	275

Lighting Data

Doors	LED Lighting			
	Optimax ⁴ Pro		GE IMMERSION	
	120 Volts		120 Volts	
	Amps	Watts	Amps	Watts
2-door	0.36	43	0.33	39
3-door	0.53	64	0.48	58
4-door	0.71	85	0.64	77
5-door	0.88	106	0.80	96

Anti-Condensate Heater Data

Doors	Combined Anti-Condensate Circuits (Door and Frame)				Individual Circuits					
	Heated Option (IG and Rails)		Low E (Heated Rails Only)		Heated Doors		Low E Doors		101-LE Door Frame	
	120 Volts		120 Volts							
	Amps	Watts	Amps	Watts	Amps	Watts	Amps	Watts	Amps	Watts
2-door	2.60	312	1.96	235	1.02	122	0.38	46	1.58	190
3-door	3.84	461	2.88	346	1.53	184	0.57	68	2.31	277
4-door	5.11	613	3.83	460	2.04	245	0.76	91	3.07	368
5-door	6.36	763	4.76	571	2.55	306	0.95	114	3.81	457

Guidelines & Control Settings

Application	Door	BTUH/door		Evaporator (°F)	Superheat Set Point @ Bulb (°F)	Discharge Air (°F)	Discharge ⁶ Air Velocity (FPM)
		Conventional	Parallel				
Frozen	Heated	1091	1071	-7	3 - 5	-1	455
	Low E	1037	1017	-7	3 - 5	-1	455
Ice Cream	Heated	1188	1159	-15	3 - 5	-8	455
	Low E	1129	1101	-15	3 - 5	-8	455

Defrost Controls

Defrosts Per Day	Electric Defrost			Hot Gas Defrost		
	Fail-Safe (min)	Termination Temp (°F)	Run-Off Time (min)	Fail-Safe (min)	Termination Temp (°F)	Run-Off Time (min)
1	46	50	0	24	73	13 - 15

1 Do not remotely break the 120v fan circuit. Loss of local control/defrost termination will occur.

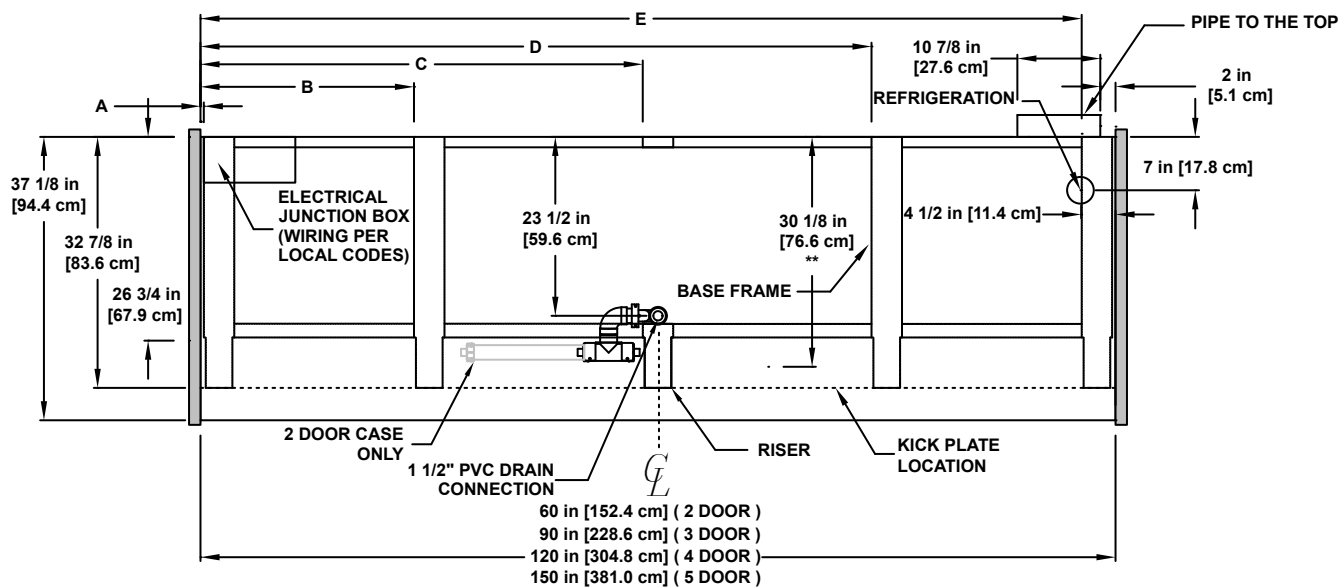
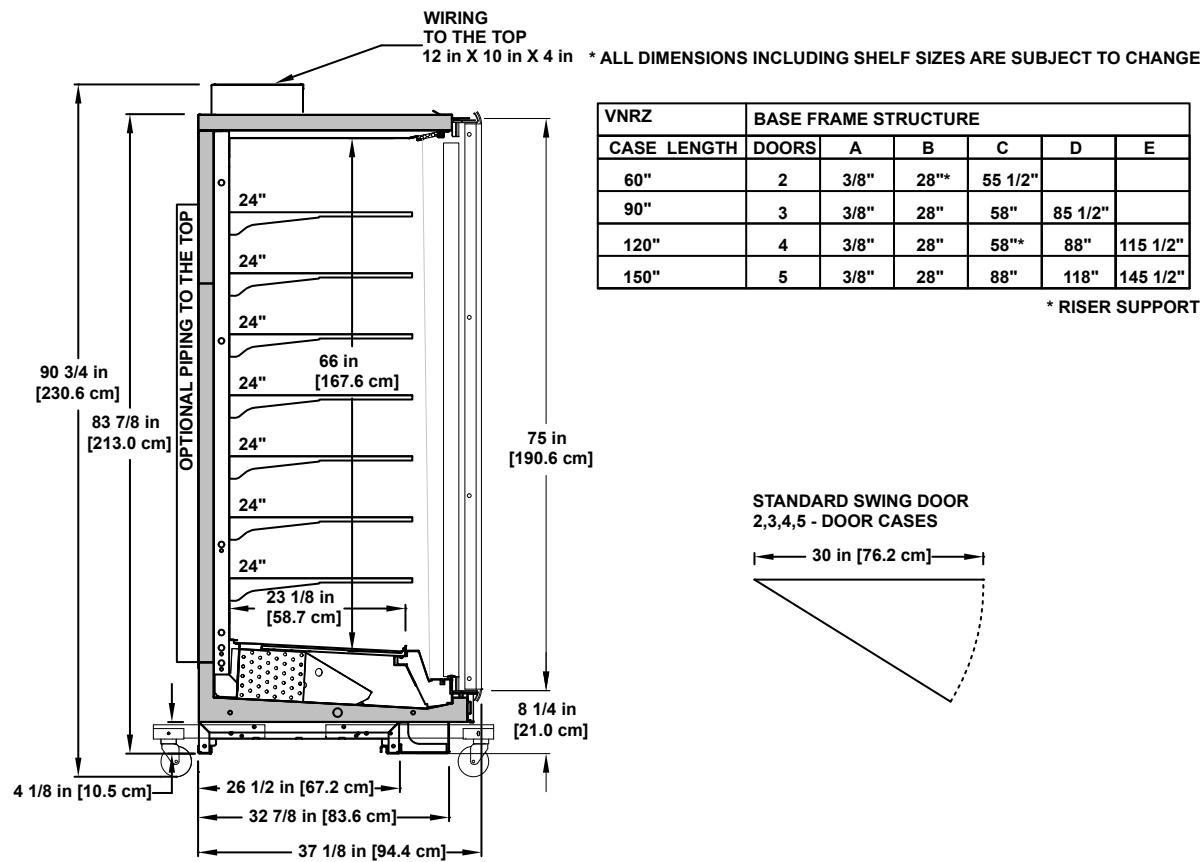
2 Drain heater and fan motors share the same circuit (separate cycles). Be certain that the circuit wiring is properly sized to handle the higher current draw of the tank heater.

3 Figure given is maximum amps per phase.

4 Low-power lights. High-power option available.

5 Values provided are for doors with no heat on the glass.

6 Average discharge air velocity at peak of defrost.

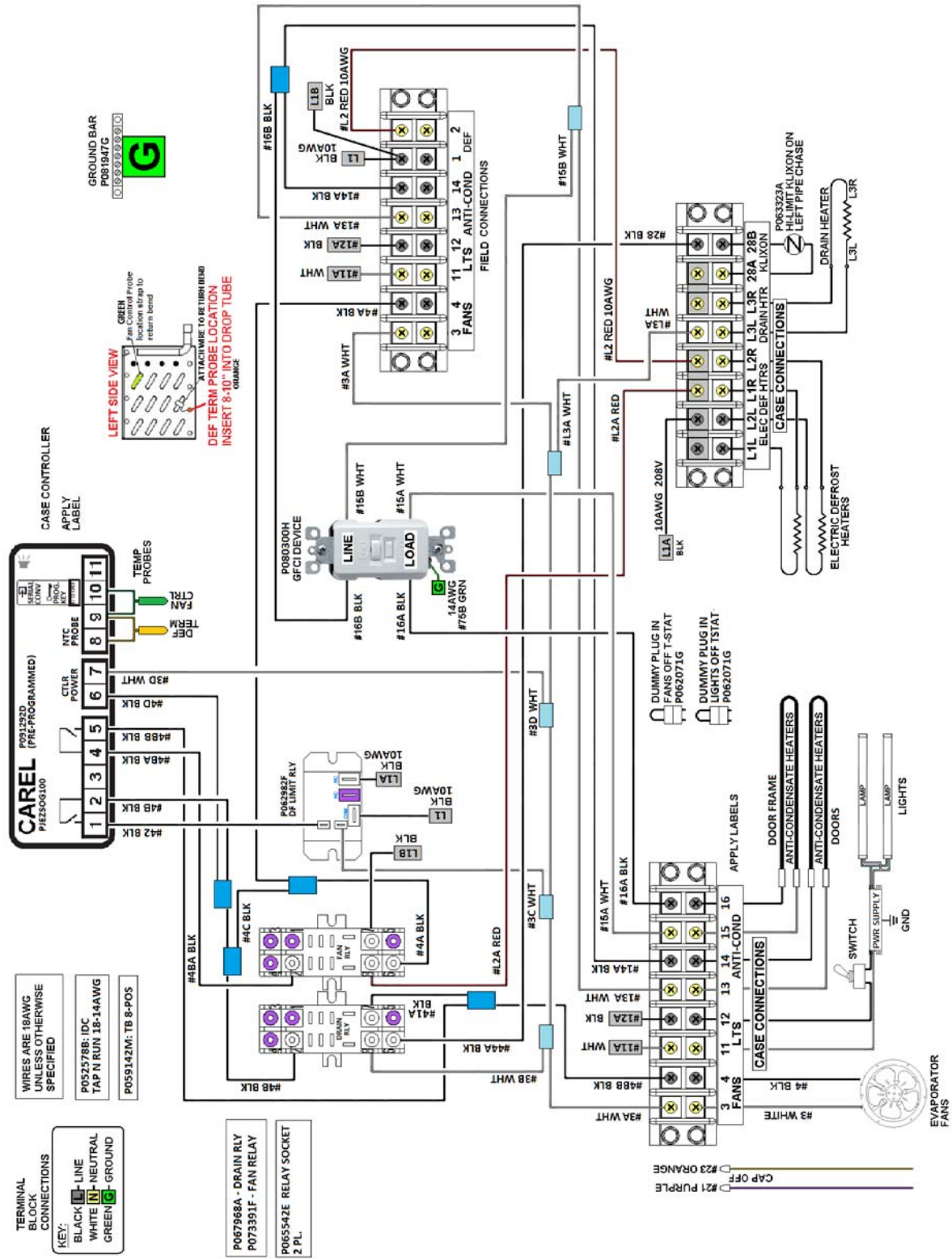


NOTES:

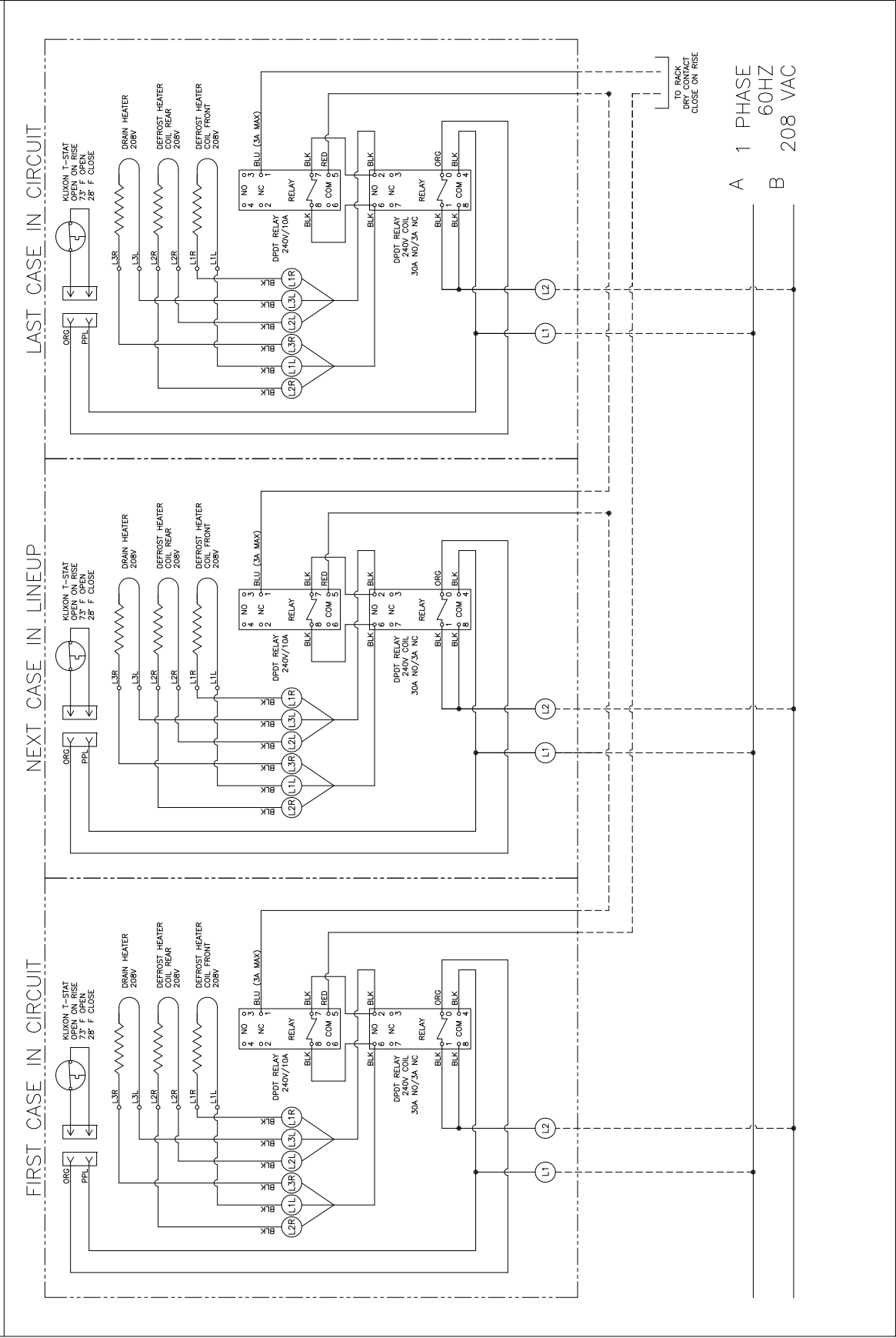
- * : STUB-UP AREA
- ** : RECOMMENDED STUB-UP CENTERLINE FOR ELECTRICAL AND HUB DRAINS
- ENDS ADD APPROXIMATELY 1" TO CASE HEIGHT, 1/2" TO THE BACK & 1" TO THE FRONT
- A 2" MINIMUM AIR GAP IS REQUIRED BETWEEN THE REAR OF THE CASE AND A WALL
- SUCTION LINE (ALL LENGTHS) - 5/8"
- LIQUID LINE (ALL LENGTHS) - 3/8"
- AVAILABLE SHELF SIZES: 24" & 22"

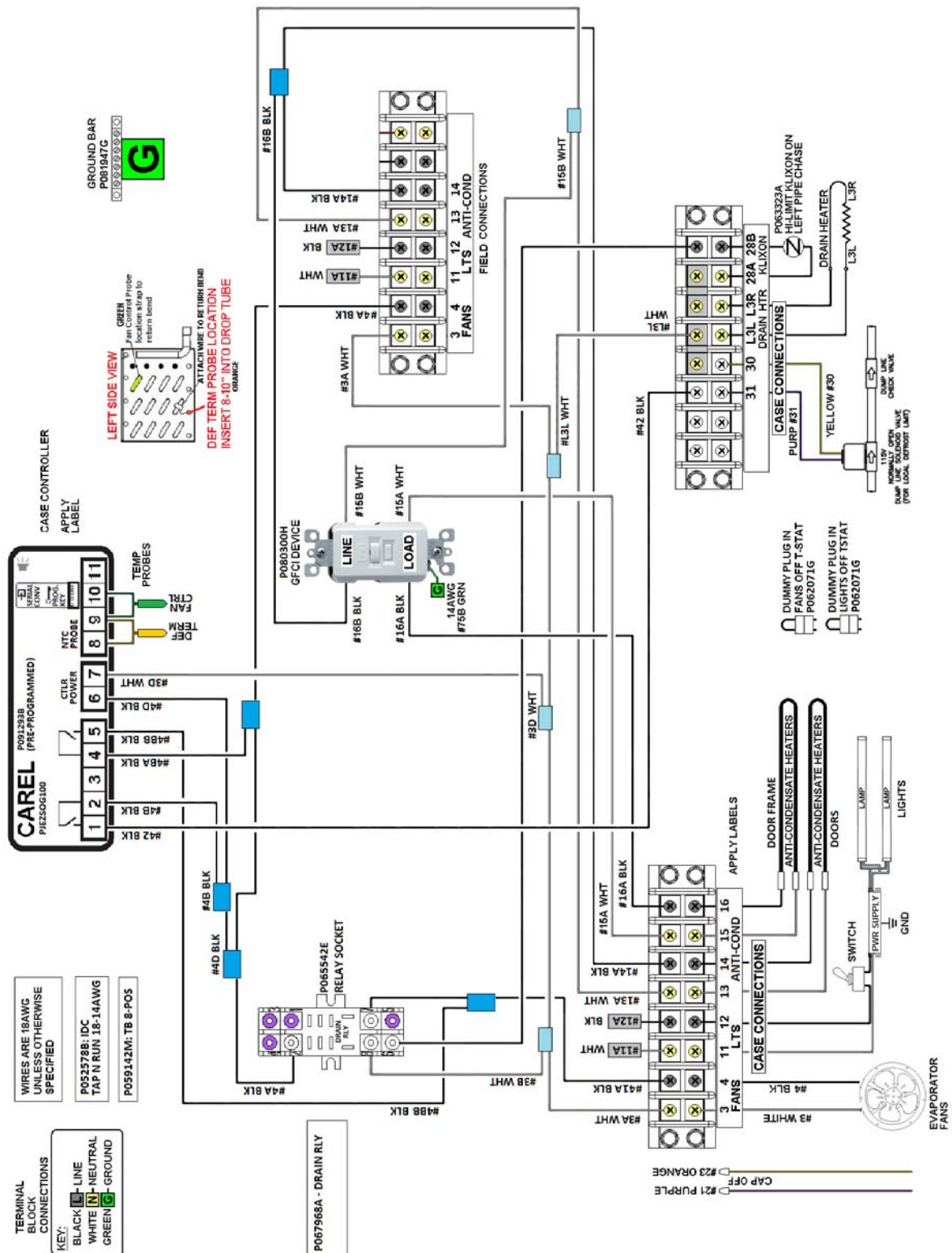
<div>ATTENTION ELECTRICIAN</div> <div>:FOR SAFETY AND CODE COMPLIANCE GROUND FIXTURE AT TIME OF INSTALLATION</div> <div>:CAUTION</div> <div>RISK OF ELECTRIC SHOCK. MORE THAN ONE POWER-SUPPLY. DISCONNECT ALL POWER-SUPPLIES BEFORE SERVICING.</div> <div>P901598E - R4</div>	WIRE IDENTIFICATION	BLACK	WHITE	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					77
	IG RECEPTACLE	26	43						79
	GFI RECEPTACLE	56	55						
	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

ELECTRIC DEFROST (208V; 1-PHASE)



ELECTRIC DEFROST CIRCUIT CONTROL
(208V; 1-PHASE)





C1 SPORLAN PRESSURE-TEMPERATURE CHART

Vacuum-Inches of Mercury Bold Italic Figures		TEMPERATURE PRESSURE CHART - at sea level										Pressure-Pounds Per Square Inch Gauge	
TEMPERATURE		REFRIGERANT (SPORLAN CODE)					TEMPERATURE					REFRIGERANT (SPORLAN CODE)	
(°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
-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
-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
-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
-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
-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
-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
-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
-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
-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
-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
-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
-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
-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
-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
-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
-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
-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
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
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
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
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
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
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
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
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
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
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
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
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

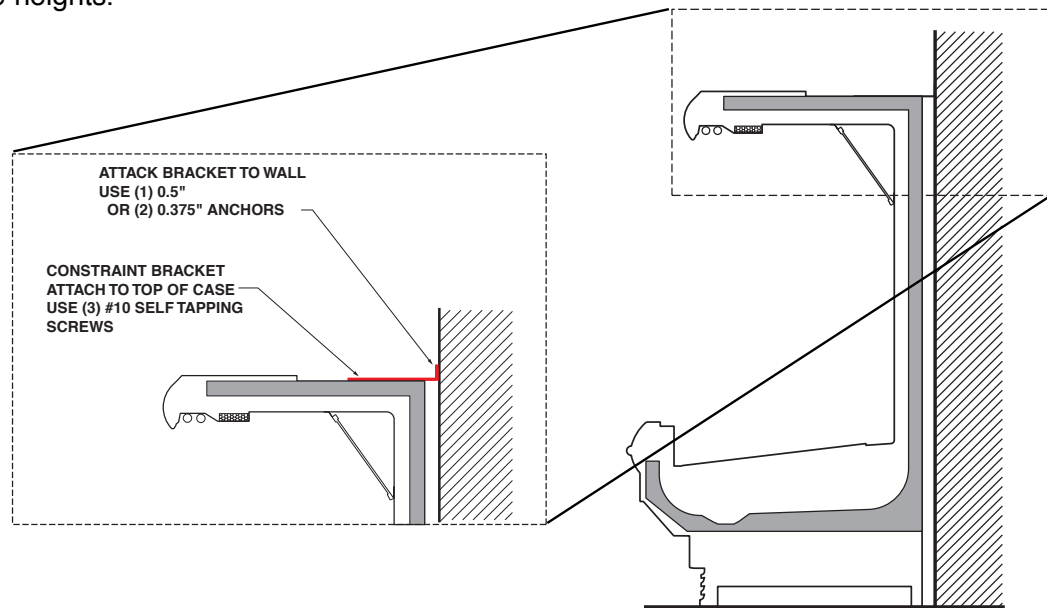
To determine subcooling for R-404A use BUBBLE POINT values (Temperatures above 50°F — Gray Background); to determine superheat for R-404A, use DEW POINT values (Temperatures 50°F and below).
** = exceeds critical temperature

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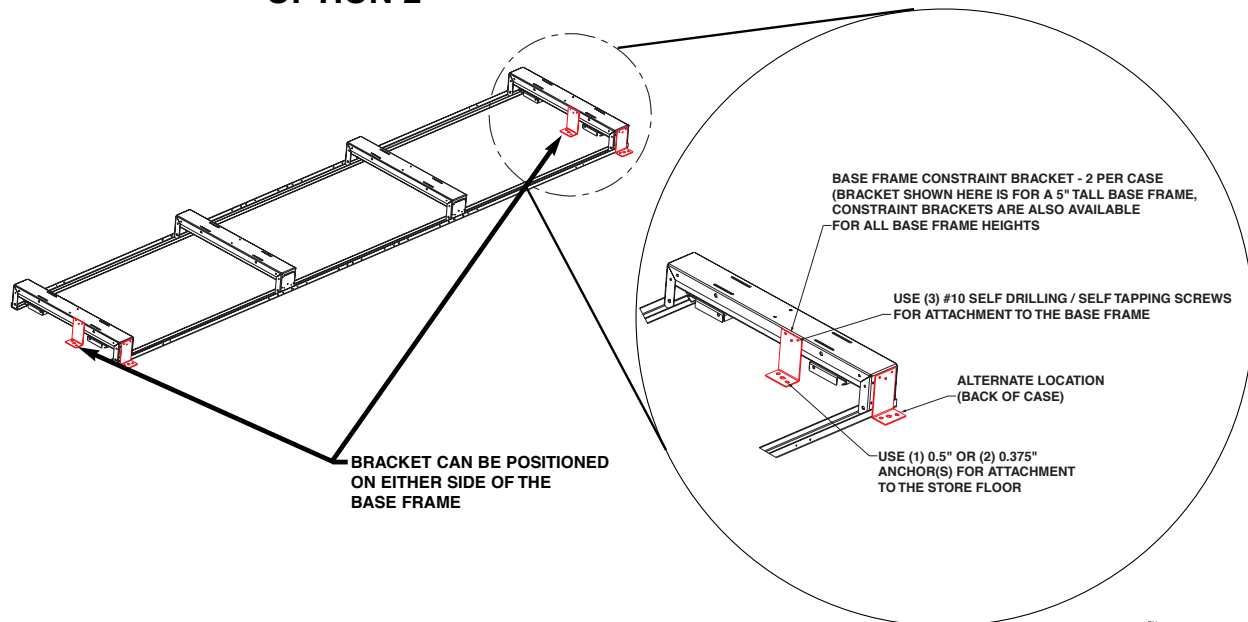
Constraint Bracket Installation

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



D2 SEISMIC BRACKET (4")

