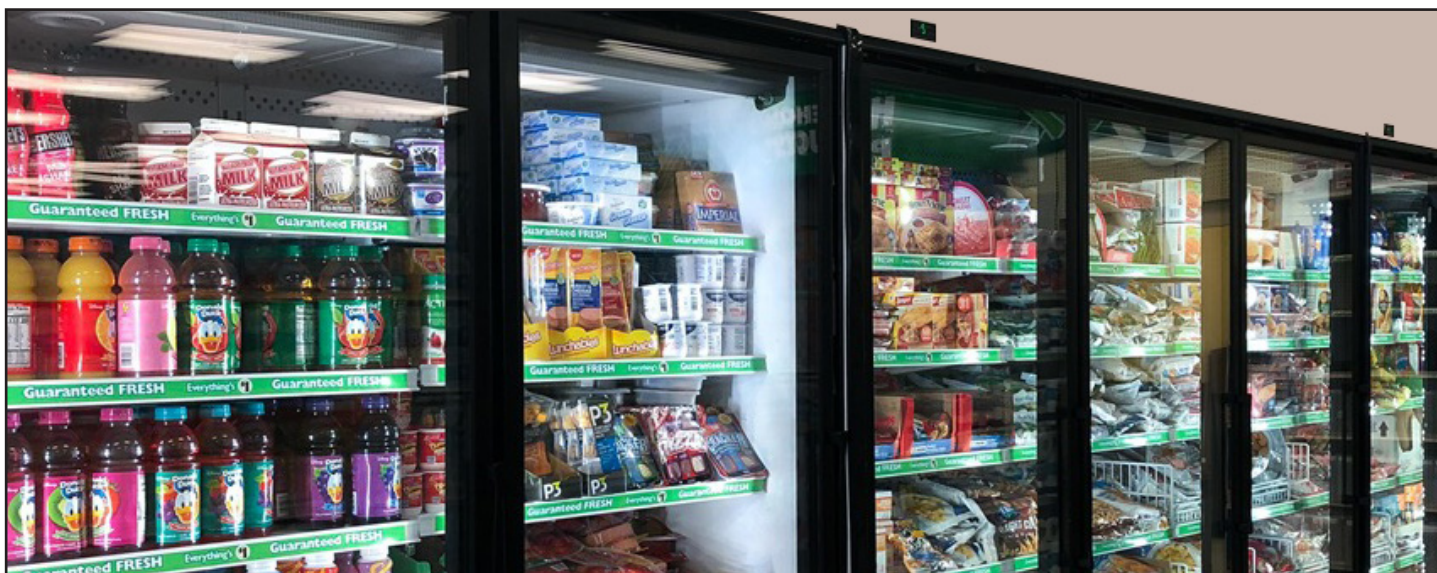




REACH-IN SELF-CONTAINED MERCHANDISER INSTALLATION & OPERATIONS MANUAL

JNRZHSА/JNRBHSА

ACCULINE™

Table of Contents

General Information	1	Airflow & Defrost.....	23
Case Installation	2-19	Case Cleaning & Fan Maintenance.....	24
Case Start-Up	20	Parts Ordering	25
Case Details	21	Appendices	26
Pre-Power Checklist	22		

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

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V.1 R.02
02/24



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LIABILITY NOTICE

For Cases with Shelf Lighting Systems

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

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

P079211M, REVO

Important

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

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

Hillphoenix® recommends that the installers and technicians installing and conducting maintenance of our refrigerated cases must take reasonable care of their own health and safety. As such Hillphoenix® requires the use of safety glasses, ear plugs, steel toed shoes, gloves, arm sleeves, knee guards, back supports and other such personal protective equipment as deemed reasonable for one's safety and protection during the installation and maintenance of our cases or as otherwise required by local ordinance, the general contractor or other governing authority.

 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 _04/22
- Manual Update_02/23
- Electrical Update_02/24

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 refrigerated 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 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 JNRBHSA and JNRZHSA reach-in self-contained merchandisers.

STORE CONDITIONS

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

REFRIGERATION SYSTEM OPERATION

Air-cooled condensing units require adequate ventilation for efficient performance. Minimum condensing temperatures should be no less than 70°F.

SHIPPING CASES

Transportation companies assume all liability from the time a shipment is received by them until the time it is delivered to the store. Hillphoenix's 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 customer.

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

LOST/MISSING ITEMS

All 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 the Hillphoenix 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 770-285-3100.

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: 804-526-4455/Fax: 804-526-1926
www.hillphoenix.com

CASE INSTALLATION

RECEIVING

1. Upon delivery, begin unloading the cases from the truck by depressing the ratchet to loosen the strap from the case top to the trailer wall that holds the case in place. Unhook the strap from the wall – save strap for a later step.



Remove and discard the wooden floor blocks that also hold the cases in place. Also remove the nails that held the floor blocks to the trailer.

2. Each case is provide with a special base frame that allows for maximum flexibility at delivery. The base-frame sits on 2" tall feet. If the store has a loading dock, simply push and drag the case off the trailer on its base-frame. Take extra care to not pull on the door handles or lean on the door glass.
3. Carefully inspect cases for damage before removing them from the truck. Then, taking the greatest care possible, unload the cases and ship-loose parts pallets with a forklift and tow straps. **Note: Only licensed forklift drivers may operate the forklift using the correct length forks or extensions for the length of the case.**



4. Move the cases as close to the store's access, in as safe and easily accessible location, as possible. The cases can be more carefully inspected here once off of the truck. Any shipping damage should be noted as soon as possible after unloading. Also check if any parts are missing.



5. Unpack and prepare the cases for install which includes removing the packing materials that keep the doors and shelves in place during shipping.



6. Other items may need to be loosened and moved out of the way to get the cases through tight openings at this point. These include the copper lines at top rear of the cases held on by clamps. Remove the clamps and flex the copper lines down and to the rear of the case if the store doorways are otherwise too tight. 1/4" screws hold the clamps on.

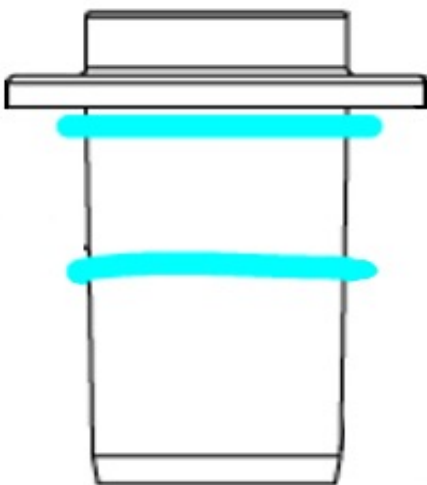


7. A shipping bracket that covers the oval egress at the top, rear-left of the case helps protect the egress while moving case into the store. **Do not remove this bracket at this time.**
- NOTE:** If case height is still too tall, 0.875" can be gained by removing the egress and cover.
- Remove the cover and lift the harnesses out of the egress. Secure a drawstring (wire, string or similar) to the harnesses, remove the cover from the harnesses, and attach the other end of the string to the cover. (The drawstring will be needed to retrieve the harnesses later). Carefully cut the silicone around and under the flange of the egress and gently pry up the egress and remove it from the canopy. Tuck the harnesses into the canopy and let the drawstring, egress and cover hang off the back of the case. Clean any remaining silicone off the egress and the canopy.



Shipping bracket that covers the oval egress at the top of the case

When the case has been moved into the store, 2 beads (~1/8"-1/4") of silicone will need to be applied around the egress as shown below (under flange and ~1/2 way down 3" wall). Reassemble and seal the egress into canopy. Reinstall 4 screws in egress flange.



Side view of the egress showing where silicone beads will need to be applied

Once a case is prepared per the prior step, it can be moved through doorways with a minimum of 80" clearance by lifting through the base feet with a hydraulic jack. Attach the ratchet strap from case top anchor point to the lifting equipment. The case should be hovered within 1/4" from the ground.

WARNING: If lifted through the base feet, blades must extend past the second set of base feet.

NOTE: Installers are responsible to comply with all OSHA, local, and store safety requirements. Installers are also responsible to provide equipment adequately sized for the task.



CAUTION

Use adequate equipment, follow all safety requirements and ensure blades are fully under the case prior to lifting. See Appendix F for Lifting Locations

Extreme care must be taken to ensure safety and to protect the case when using hydraulic pallet-rack jacks or other manual methods. Lift only at designated points on the base-frame (see Appendix F). The case may also be lifted manually using a J-bar.

*Important: Place the lift blade within the 6" space behind the front foot. Metal reinforcement is provided in this designated lift area.



If using a pallet jack, avoid damaging the drain hub (centered left-right on case).



Avoid the drain hub when using a pallet jack

CASE INSTALLATION



Only lift through the base feet



Hydraulic Jack



FLOOR PREP

1. Make sure to perform these steps prior to moving the cases to, and setting them in, their final positions. Rodent-exclusion angles may be required. Install those from the floor to the wall, behind the cases, per the architect's details. Also make sure to consult the plan sets to confirm whether the floor requires any advance preparations if seismic brackets are required.
2. Confirm with the general contractor at new stores, that you have the most current version of the store plans and building dimensions. Then, ask for the points of reference from which you should take dimensions to locate the cases.
3. At new and existing stores, mark the floor where the cases are to be located for the entire lineup using a laser transit (preferred method) and chalk lines. The lines should coincide with the outside edges of the case feet.
4. 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.



Case supported by wood blocks with lift points shown

Doorways to the sales floor through which the cases have to be moved, may also have to be partially dismantled to allow adequate clearance.

NOTE: Always check before moving the cases that there is adequate clearance.

It can be difficult to move cases through store aisles due to the typically narrow width of the aisles.



Product shelves may have to be unloaded or even temporarily moved aside in order to get the cases through. A J-bar may be needed on one end of the case to maneuver around corners.



Laser Transit

5. Locate the basehorse positions along the chalk lines and then place properly leveled shim packs at each location.

LINE-UP & INSTALLATION

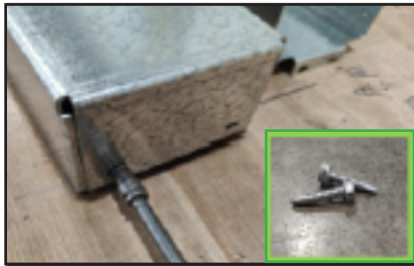
Single Case

* The ship-loose junction box will be required at a later step.

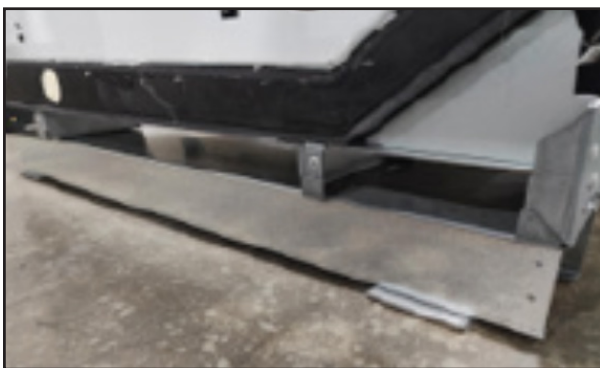
1. Move the case into position, leaving a minimum of 2" between the wall and back of case. This space must be unobstructed and is required in order to leave sufficient room for airflow behind the case.
2. Using a "J" bar, raise the case at each base foot and install the base risers. Lower the base risers on to the shim packs. Lift at designated points on the baseframe (see Appendix F).



Locate the Hat-sections and the Front Fastening Plates enclosed in the case.



Fasten the rear of each hat-section with 8-size Tek screws (2 nos.) provided.



Align each hat-section from front (at locator lip) at the center of each pair of fork pockets and shim them accordingly.

Check the alignment at the front/rear and now place the case over the hat-sections.



Now fasten the locator lip with 8-size Tek screws provided.



Place front fastening Plates over Side Fastening Holes; fasten plate with Tek screws on each side.

3. 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 shelves and deck pans from the ends of the cases. Also remove any shipping braces and other packing materials that were not removed previously. Keep all other loose items such as kick plates, end kick plates, nose bumper, fascia, etc. for later in the installation process.
2. Remove the return air grill at the case joint. The grill lifts out without fasteners and can 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.



Applying foam tape

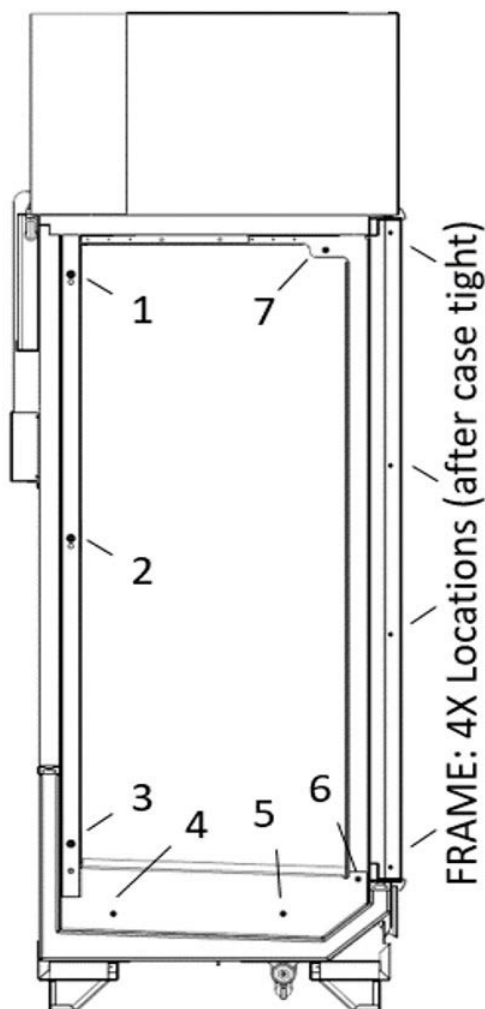
4. Apply the foam tape gasket (supplied) and one continuous bead of butyl or silicone sealant against the outer edge of the gasket for medium-temperature cases as shown on the next page. Apply two continuous beads of sealant, one inside and the other outside of the gasket for low-temperature cases.



Applying sealant

CASE INSTALLATION

5. Push the second case close to the first case and install the 3.25" riser feet before setting the case on the shim packs.

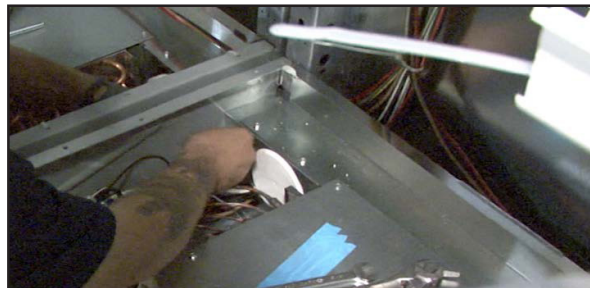


Bolt holes, foam tape gasket and sealant

6. Push the cases tightly together, then lightly bolt them together through the seven holes (shown below). Tighten all the joining bolts until all margins between the cases are equal.

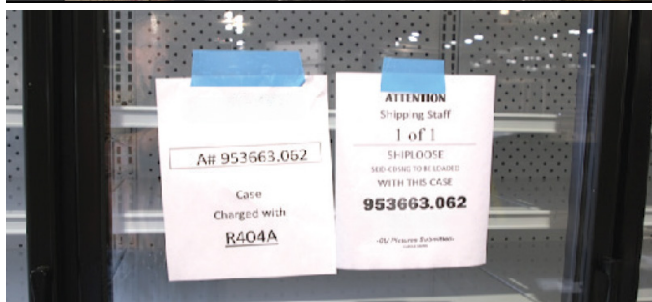
NOTE: Before starting the bolts, the cases must be as tightly together as possible and that the bolts should never be used to draw the cases together as doing so will result in damage to the cases.

7. Repeat steps 3–6 of this sequence for all of the remaining cases. Be certain to properly level all of the cases.
See **Appendix B** for the steps necessary to install seismic brackets where required by local ordinance.



CONDENSING UNIT

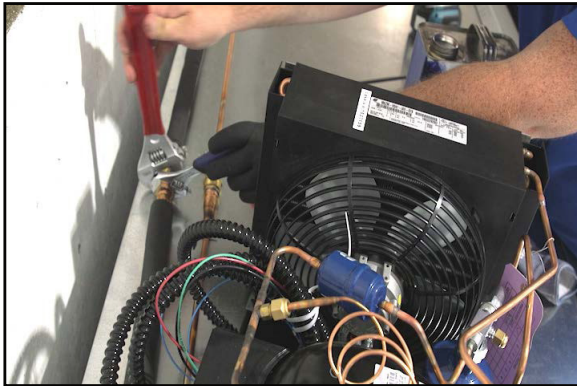
1. The pallets containing each ship-loose, refrigerant-charged, condensing unit are marked to identify the case with which it is to be matched and installed.
IMPORTANT: Match the condensing unit to its corresponding case by serial number.



2. The case and condensing unit have Parker 5000-series quick-connect refrigeration fittings. Remove the threaded caps to begin mating the fittings. Parker (the fittings manufacturer) recommends to lubricate the black poppet faces with a system-compatible lubricant as well as the threads on male fitting.



3. Match the refrigeration quick-connects of the condensing unit to those on the case. Then torque (18-20 ft-lb.) the fittings.



LIQUID AND SUCTION SERVICE VALVE PROCEDURES

Once the case to condensing unit quick connect fittings are connected, remove the service valve caps and back seat the liquid and suction service valve stems using a service wrench until the stems firmly stop. The table at the end of these steps provides guidance for the torque values that need to be applied to the valves.

1. The tools required for these steps are a torque wrench and a service wrench.

The units are not pumped down, but are shipped in "ready-to-install and run" configuration. Take care to connect the lines completely and confirm that any leak paths are avoided.

⚠ ATTENTION

Note that the case and condensing unit are shipped charged with refrigerant.

4. Secure the condensing unit to the case after the refrigeration connections are made using the lag bolts that held the condensing units to the pallets on which they were shipped. Appendix G (at the back of this manual) shows where on the top of the case the condensing unit should be installed.

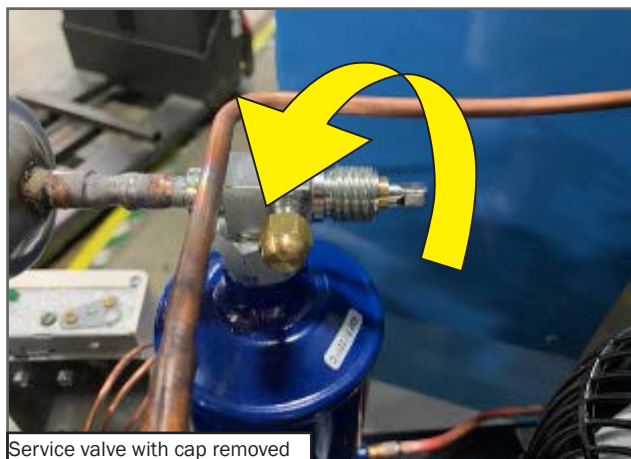
Not for Store; CDU and Condensate Pan wiring refer to Appendix C.



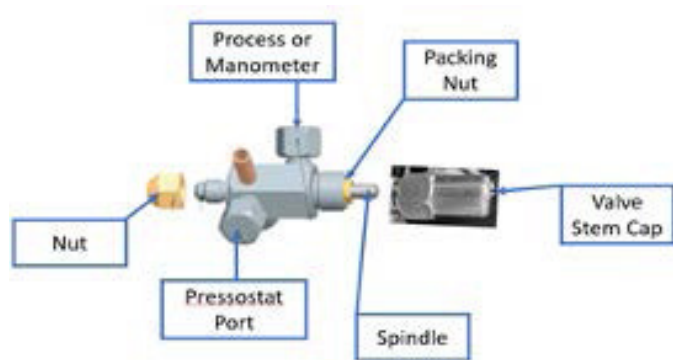
Torque wrench

CASE INSTALLATION

- Remove service valve caps on liquid and suction service valves after connecting the quick connects.

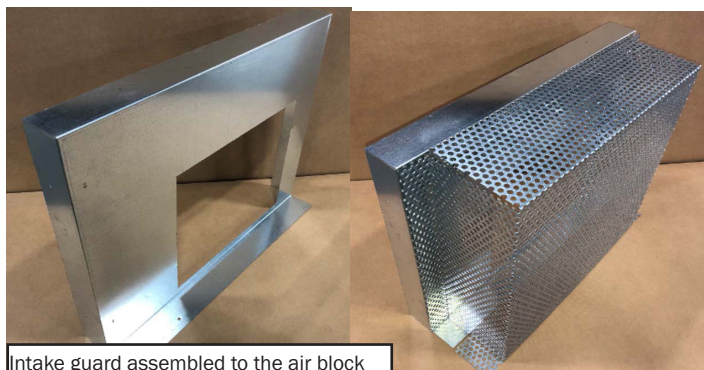


- Back seat (turn in a counterclockwise direction) the liquid and suction service valve stems with a service wrench until it firmly stops. See below for torque values.
- Replace service valve cap and torque to specified value.

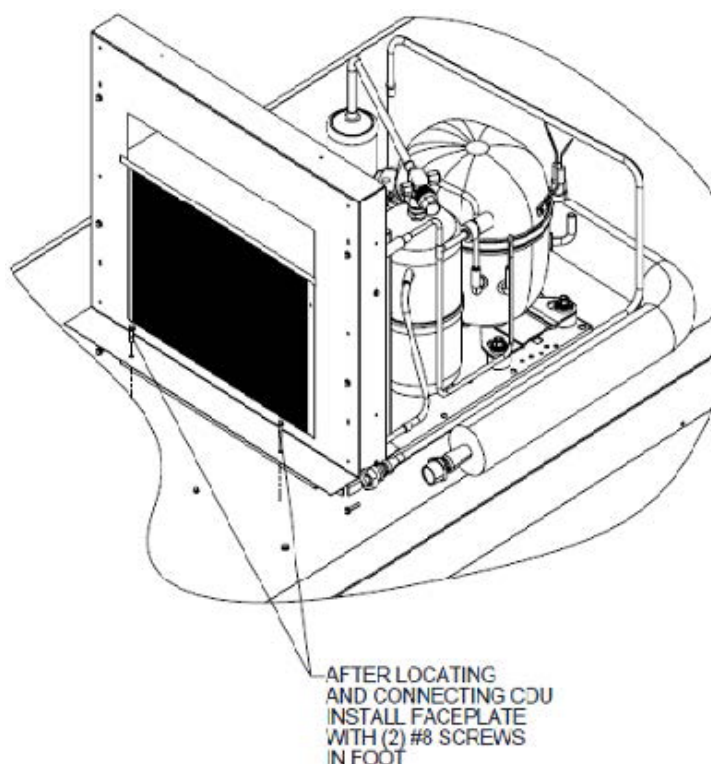


CONDENSING UNIT AIR-BLOCK

The condensing unit air-block is included with the shipped-loose parts.



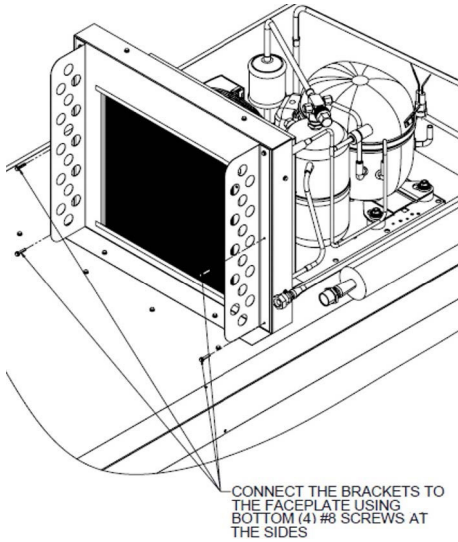
- Install the air block faceplate with (2) #8 tech screws into the foot of the unit.



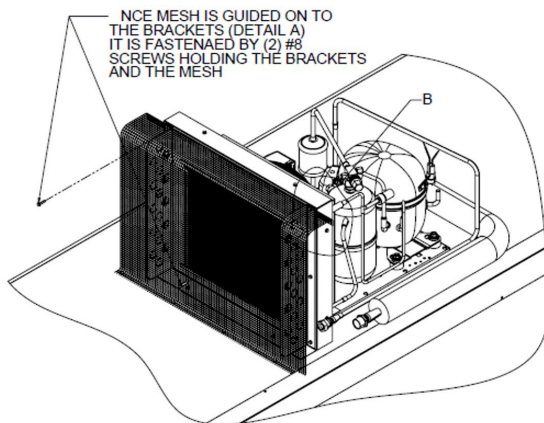
LIQUID AND SUCTION SERVICE VALVE TORQUE SETTINGS

Item	Kulthorn CDU			Embraco CDU		
	Wrench Size Required	Torque (N·m)	Torque (ft·lb)	Wrench Size Required	Torque (N·m)	Torque (ft·lb)
Spindle	8	30 ~ 34.5	23.8	1/4"	10 ~ 12	8.11
Packing Nut	12	10 ~ 13	8.5	N/A	N/A	N/A
Valve Stem Cap	S24	8 ~ 10	6.6	1-1/2" Hex	8	5.9
Process or Manometer	S14	8 ~ 11	7	7/16"	7 ~ 11	7
Rotoloc Connection	N/A	N/A	N/A	1-1/2" Hex	67 ~ 82	74.5

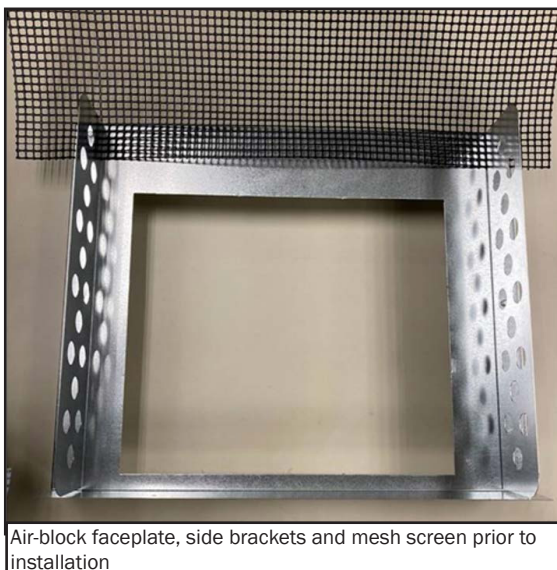
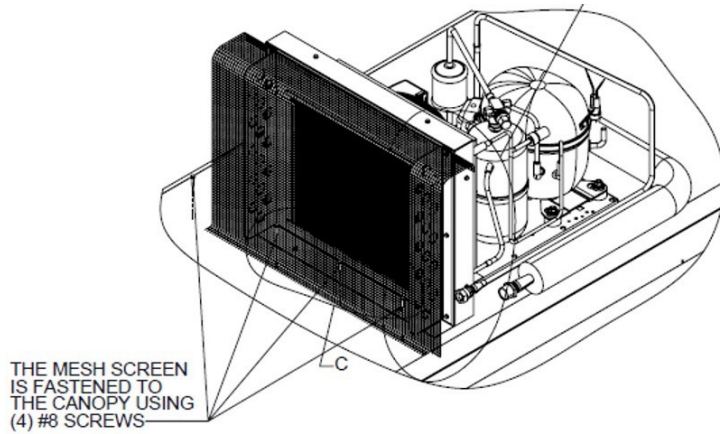
2. Attach the side brackets to the faceplate with (4) #8 tech screws through the bottom 4 holes of the faceplate.



3. Guide the NCE mesh onto the brackets and fasten it with (2) #8 tech screws to hold the mesh to the brackets.



4. Fasten the bottom of the mesh screen to the top panel of the case (canopy) with (4) #8 tech screws.



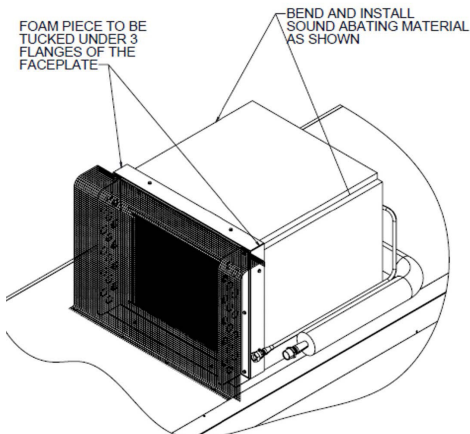
CASE INSTALLATION

NOISE DAMPENER

The noise dampener helps to reduce noise in the store from the condensing unit.



1. Form 3 sides of a rectangle with the foam enclosure (as shown) and tuck one end under the 3 flanges of the faceplate installed to the front of the condensing unit.
2. Locate the bottom edges of the enclosure against the canopy and the sides of the condensing unit base plate.

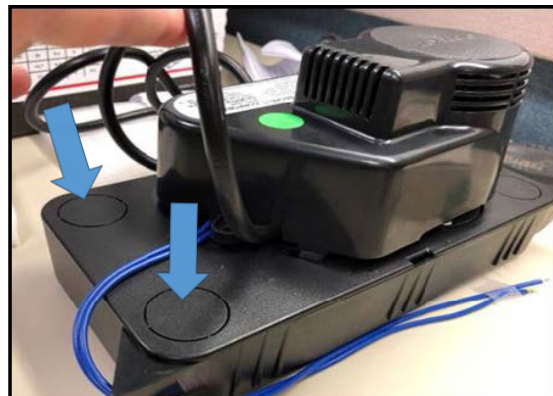


Diversitech pump - remove cardboard float protector prior to use.



Remove cardboard float protector from Diversitech pump

Beckett pump - remove plastic knockout indicated. Do not let plastic fall in the pump.



Liberty pump - Use the open inlet hole, next to the outlet hole, on Liberty pumps.

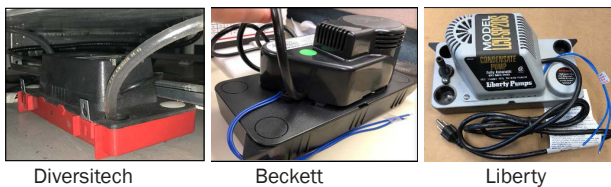


DRAIN AND PUMP

Hillphoenix recommends the use of floor drains to achieve the greatest energy-efficient operation.

Case configurations include ship-loose pumps and burn-off (evaporative) pans that manage the condensation generated by the case's normal operation for stores without floor drains. The following steps describe the installation of these components.

Current configurations of the case may be equipped with a pump from either of three suppliers:



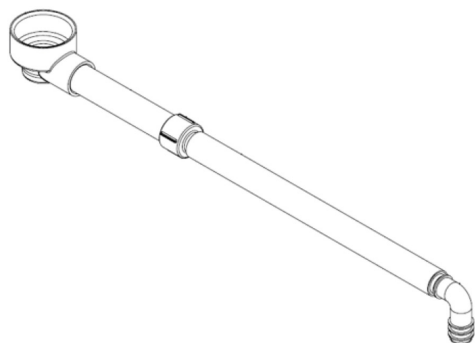
Diversitech

Beckett

Liberty

1. Unpack the pump, PVC drain trap, and 20-feet of plastic tubing included with the ship-loose parts. Remove all packing material:

2. Glue together the PVC drain parts to the drain hub using only approved PVC primer and cement. Position the PVC drain to face left toward the location where the pump will be installed.



Drain prior to installation



Approved PVC primer and cement

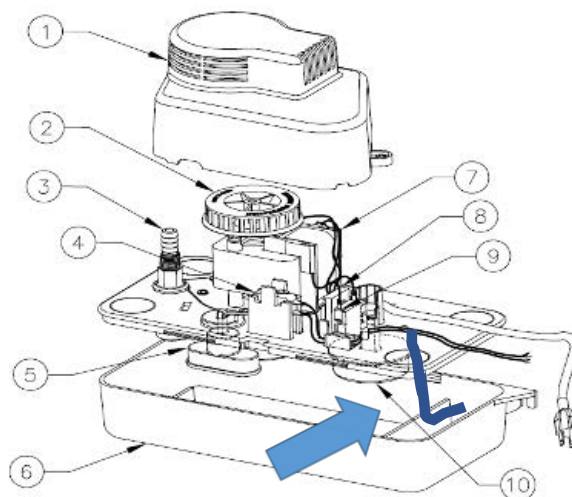
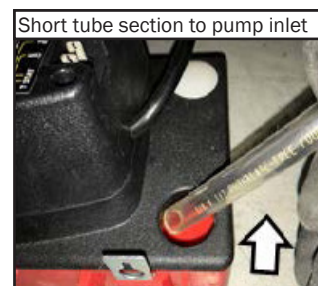
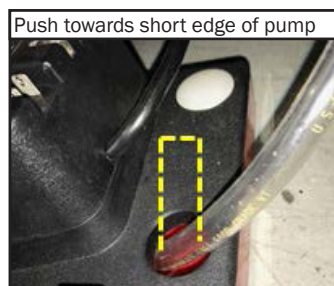


PVC drain oriented left toward where pump will be placed.

3. Cut a short enough section (18" typically) of tubing to reach from the outlet of the drain to the inlet of the pump. Connect the tubing from the drain outlet nipple to the pump inlet. Insert the tubing in the indicated pump inlet and along the short edge of the pump so that the tubing angles back toward the drain.

IMPORTANT: (Diversitech and Beckett) Orient tubing below the tank cover along the short side of the pump, otherwise it could interfere with the pump's float located below the motor.

4. Plug the pump's power cord into the pump receptacle.*
*The receptacle is Factory-installed on newer case models.



MODEL: CL201UL	
1	Motor / Switch Cover Motor / Cubierta del Flotador Moteur / Commutateur de Couverture
2	Fan Ventilador Ventilateur
3	Check Valve Válvula de retención Clapet de Refoulement
4	Safety Switch El Interruptor de Seguridad Commutateur de Sûreté
5	Safety Float Flotador de Seguridad Flotteur de Sûreté
6	Tank Tanque Le Réservoir
7	Motor Motor Moteur
8	Main Switch Holder Montaje - Interruptor Principal Crochet - l'Interrupteur Principal
9	Main Switch Interruptor Principal l'Interrupteur Principal
10	Main Float Flotador Principal Flotteur de Principal



CASE INSTALLATION

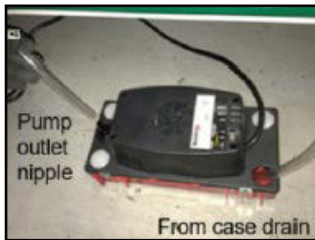
For customers requesting to enable the alarm feature:

Wire the dry contacts (yellow for Diversitech, blue for Beckett and Liberty) to the store's intended signal source and output.

Alarm wires are NON-energized and connect to the DRY-contacts of the float switch. Customers who are not employing the alarm may leave the wires as-is or cap them.

Diversitech Pump:

The red "Alarm" light will turn on if the tubing is holding the float up. Likewise, if the tubing holds the float down, the motor will not engage to pump water. If this happens, pull the tubing away from the pump and re-orient (lean) it toward the drain. Connect a long enough section of tubing to reach from the pump outlet (nipple) to the evaporative (condensate) pan on top of the case.



Long tube section from pump outlet nipple



Red "Alarm" light

Beckett Pump:

Beckett pumps do not have light indicators to assist with troubleshooting. Refer to the Maintenance & Troubleshooting guide below.



Pump with wiring and tubing

Beckett Pump:

MAINTENANCE & TROUBLE SHOOTING	
PROBLEM	REMEDY
1) Jammed control or safety float rod.	1) Check for interference with up and down movement. The lever on the switch should rise and then "click" as the float is pushed all the way up. It should then lower and "click" as the float is allowed to come all the way down.
2) Plugged discharge tube.	2) Unscrew the 3/8" barbed check-valve at the pump discharge and check for obstructions.
3) Floats not operating properly.	3) Clean the float rod and tank with detergent
4) Motor fails to run or runs intermittently.	4) Check for blown fuse. Check for stalled motor due to obstruction in the pump.

NOTE: Motor is protected by an automatic thermal overload. This may cause it to stop. Shut off power and allow 20 minutes for the motor to cool before restarting. If the motor smells burned or scorched, replace.

- The pump motor contains permanently lubricated bearings. Under normal operating conditions further lubrications is not necessary.
- Always replace cover to keep electrical parts clear of dust and grime.
- Call your Service Technician for conditions you cannot correct.

ELECTRICAL



Components as they appear installed on the case

Electrical connections are made in the electrical junction box located at the top left of the case (shown above). The cases use a Carel Case Controller. Lighting for the cases is pre-installed during manufacturing. Lighting controlled through motion sensors is standard on the case. The Anthony door/frame units are factory-installed and have anti-sweat control through the embedded controller in the standard configuration of the case.

Electrical Junction Box & Condensate (Evaporative) Pan

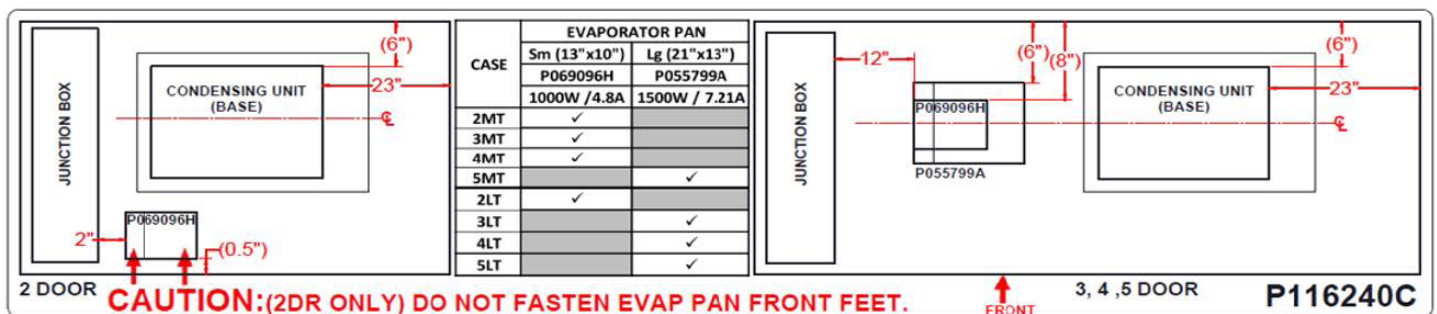
The electrical junction box is a ship-loose item. Inside the box is a foam egress insert needed in the following steps.

A diagram label on the side of the junction box, on top of the case, indicates exactly where each component is to be secured to the case. Refer to the diagram before attaching the components.

For any questions or service needs, please contact our Case Division Customer Service Department at 804-614-1457 or hillphoenix.com/company/contact-us



Junction box with component location diagram label on the side of the box shown



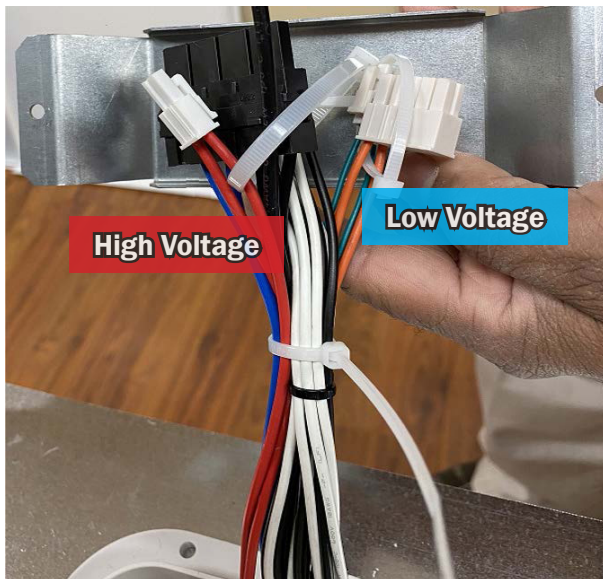
Component location diagram label on the side of the junction box detailing where components for 2-Door (left) and 3, 4, and 5-Door (right) cases should be situated

CASE INSTALLATION

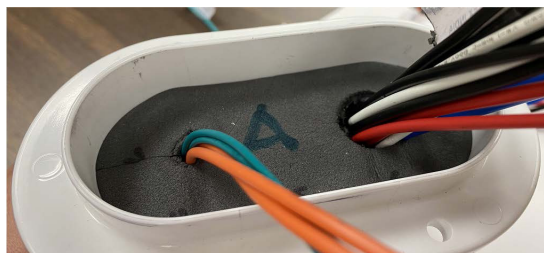
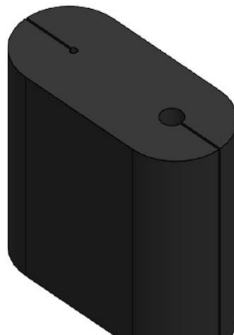
1. Remove (2) #8 tek screws holding the egress cover.) Note that the cover is attached to the case wire harnesses to facilitate their retrieval.



Lift harnesses until taught - approximately 6."



2. Fit the high voltage harnesses into foam insert's larger hole. Fit low voltage harnesses into the smaller hole. You may need to wiggle, twist or play with the wires to get them to seat more comfortably in the foam. Take care to evenly press/slide the foam insert into the egress until it bottoms out. (foam will be ~3/4" below top of egress).



⚠ CAUTION

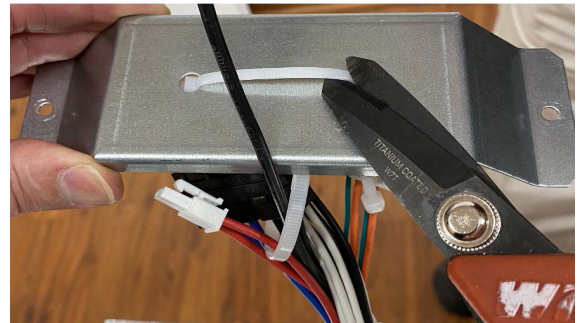
Ensure that the foam insert is not recessed more than 3/4" into the egress or it may interfere with air flow in the case.



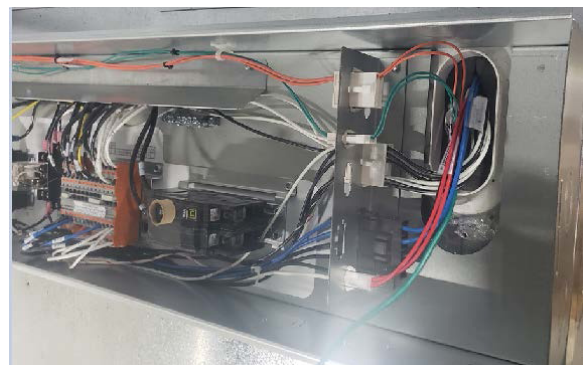
CAUTION

Straighten and wiggle the wires once the foam is inserted in the egress to help seal around them and to the egress. There must not be any visible path for air to leak out from the case. If there are any concerns about how well the egress is sealed, add permagum or silicone on top of the foam.

3. Remove the egress cover from the harnesses.



4. Place the junction box on the canopy, feeding the harnesses through the bottom-rear of the box. Plug the unique case harness connectors into their corresponding mates inside of the box.



5. Route the green case ground wire along the right-hand (RH) side of the box and in front of the circuit breaker and install ground wire to ground terminal block.



For Store, CDU and Condensate Pan wiring: Refer to Appendix C.

CONDENSATE (EVAPORATIVE) PAN

1. Locate the ship-loose condensate pan.



1000W or 1500W: Follow label instructions found on the RH side of the junction box. Cut away an additional section (48"-54" for 2DR, else 24"-30") of the plastic tubing for use in a later step.

2. Place the ship-loose condensate pan in the designated locations (shown on the label found on the RH side of the junction box. See label in the Electrical section.)
3. Hook the "V" shaped edge of the perforated metal cover under the pan's overhanging flange and rotate the cover down onto the pan. Insert a plastic bushing into the vertical flange of the cover.



4. Push the plastic tubing (from the pump) through the bushing and into the pan.

5. Insert the end of the tubing through the cut-out section of the cover, so that condensate water from the pump is directed into the pan.
6. Assemble short section of tubing from "Step 1" to the pan's overflow tube and direct it to the rear and down the back of the case. (In the event of one of the components failing, water will run off to the floor instead of collecting on the case top).
7. Fasten the pan to the case with #8 tech screws.



CAUTION

2DR cases only – Do Not fasten evaporative pan front feet to the case. Doing so may cause damage to the door frame assembly!

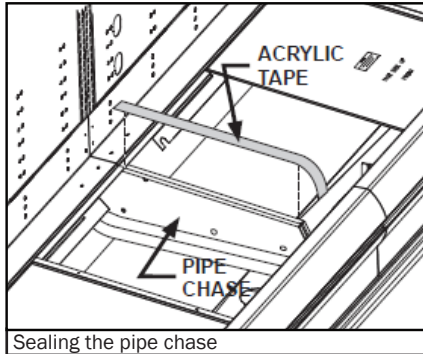


For Store, CDU and Condensate Pan wiring: Refer to Appendix C.

CASE INSTALLATION

TRIM OUT

1. Seal the interior case-to-case joints with the caulk, and then the acrylic, tape from the ship-loose parts applied over the pipechase seam (Fig. 2). The tape acts as a watershed preventing water from settling in the case joint.



2. Re-install the shelves that were previously removed.
3. Properly align the case front panels as needed, then install the front panel joint trim.
4. The Anthony doors may need be removed when sealing the frame-to-frame joints, or the frame to foamed-partitions. To remove the doors, release tension from the closing mechanism. Depress the spring clip at the top of the door. Pull the top door hinge from the receptacle and set the door aside. Reverse these steps to reinstall the doors.

Use a clamp to close the gap between the frame and the foam partition, which compresses the sealant that was applied earlier (shown on page 5). Tightly secure the frame to the partition using flat-head self-tapping (#6) screws (included with the ship-loose parts). There should be no gap between the frame and foamed-partition when done. For case-to-case joints, carefully push the T-bar (door frame joint trim piece) case frame joint trim into the space between the frames.



5. Install the door frame joint trim with sex bolts (included with the ship-loose parts) that bolt through the door frames. Tightening the bolts compresses the sealant that was applied earlier (on page 6).

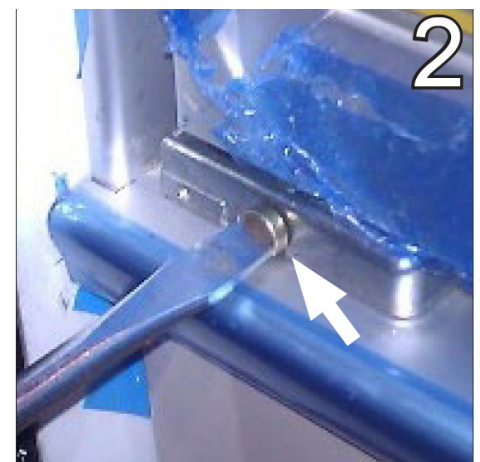


Door Frame Trim Out

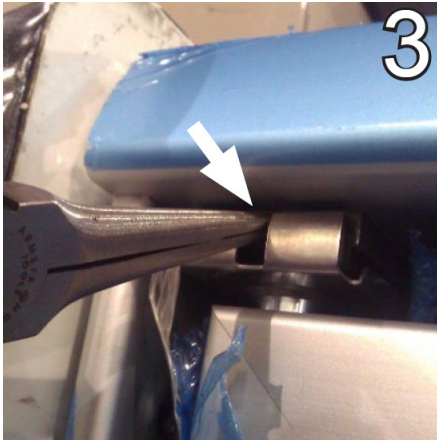
1. Disconnect hold-open assembly from door frame.



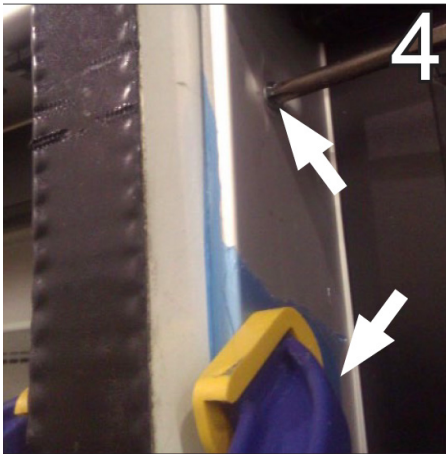
2. Release the tension from the closing mechanism at the bottom of the door using a flat-head screwdriver, turning until the screw is free of tension.



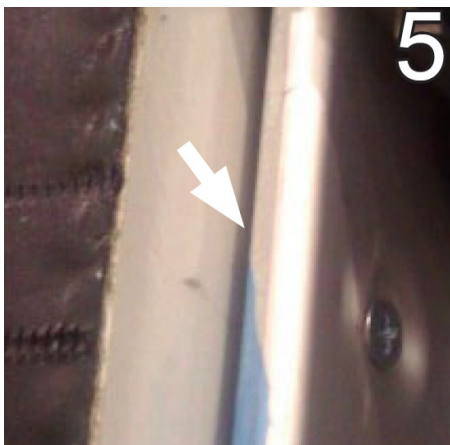
- Depress the spring clip at the top of the door. Pull the top of the door free from the receptacle, then lift door free from the lower hinge plate. Set the door aside.



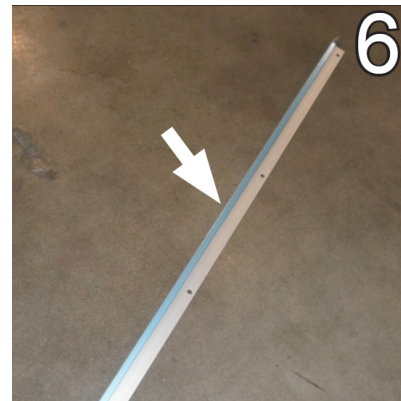
- Use a clamp to close the gap between the partition and the frame end.



- Tightly secure the frame to the partition using flat-head self-tapping screws (#6). There should now be no gap between the cases.



- For case-to-case trim-out (no foam partition), insert the provided frame trim between the frames, then secure with the provided T-bolts.



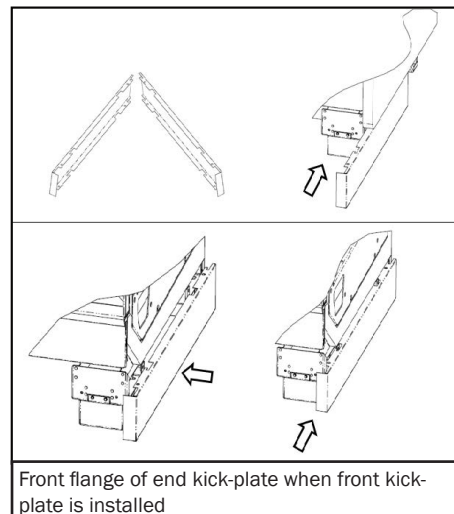
- Re-install the door by reversing steps 1-3.

Kickplate Trim Out

- Install the end kickplates before the front kickplate. The same end kickplate piece is used on both the left and right ends of the lineup or single cases.



- Slide the end kickplate front to rear, under the end of the case. When the front flange is about $\frac{9}{16}$ " from the base foot, slide it (the front flange) the rest of the way under the case also – then slide the whole kickplate the final $\frac{9}{16}$ " rearward so that the metal tabs nest behind the case base feet (included with the ship-loose parts). The front flange of the end kick-plate is held in place when the front kick-plate is installed in the next step.



CASE INSTALLATION

3. Install the front kickplate by inserting its top flange behind the front panel of the case and then rotating it down to the floor.



4. Secure the kickplate with color-matched screws through pre-punched slots to the base frame.



Top Fascia Trim Out

1. Align the front fascia to the curved flange of the door frame. Then secure the bottom edge of the front fascia to the case through the pre-punched screw holes.



The front fascia aligns to the door frame curved flange



2. Align the junction box's Carel controller display with the pre-punched cutout in the front fascia. With box parallel to side of the case, egress flange will protrude the left-hand (LH) side of the junction box.



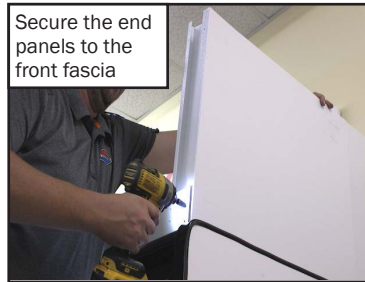
3. Secure the electrical box to the case body using (4) #8 tek screws.
4. Attach the two-part end panels (extended the nested back section of the panel to the wall behind the cases and secure the front and back sections to each other) to the front fascia using pre-punched screw holes. Then secure end panels to the case body.



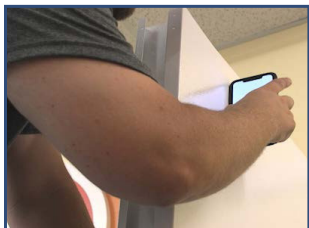
5. Attach the support struts to the back of the panel. Install the support bracket near the rear wall of the case to provide room to remove the junction box cover and to avoid the CDU suction line on 2dr cases.



6. Install the fascia support brackets. Locate brackets near the rear wall of the case to provide room to remove the junction box cover and to avoid the CDU suction line on 2dr cases.

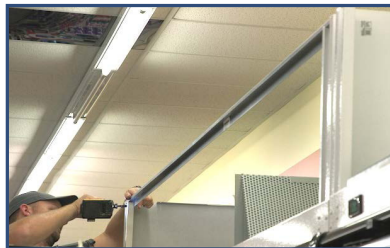


Install support bracket near the rear wall of the case.



Check the vertical alignment of the panel and adjust if necessary

7. Check the panel's vertical alignment and attach the unpainted frame rail between adjacent panels.



Unpainted frame rail installed between adjacent panels



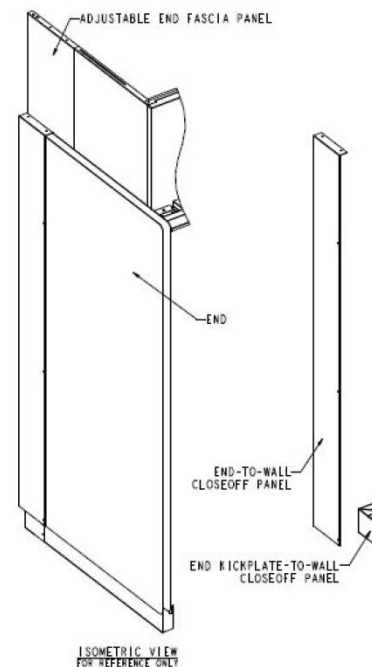
8. Mount the store signage to the fascia framework.



9. Install the front panel joint and door frame trim.
10. Install the top and bottom end-to-wall close-off panels for the opposite ends of the lineup.



Top and bottom of the top end-to-wall close-off panel

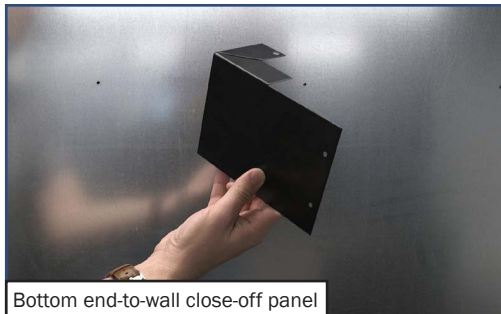


Refer to
Appendix
E for more
information
on installing
the fascia
framework.

Top and bottom end-to-wall close-off panels

CASE START-UP & DETAILS

11. The close-off panel's hemmed top rests on top of the case's insulated end panel. Slide the close-off panel back to close any gaps to the wall behind the case. Fasten it to the case with #8 Tech screws through the pre-drilled holes in the panel.

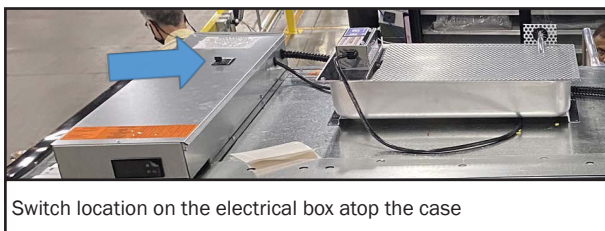


Bottom end-to-wall close-off panel

START-UP & PERFORMANCE CHECKS

When installation has been completed, the cases should be started up following these steps:

1. Confirm that incoming power is properly connected and then switch ON the electrical box breaker on at top of the case to turn on the case.



Switch location on the electrical box atop the case

2. Check that the condensing unit fan is running and that the compressor kicks on.
3. Check that the remote display at the top of the case confirms the compressor is running, that no faults are displaying, and that the current discharge air temperature is dropping.



Remote display

4. Turn on the case lighting with the lighting switch located in the upper right-hand side of the case's left-most door frame.



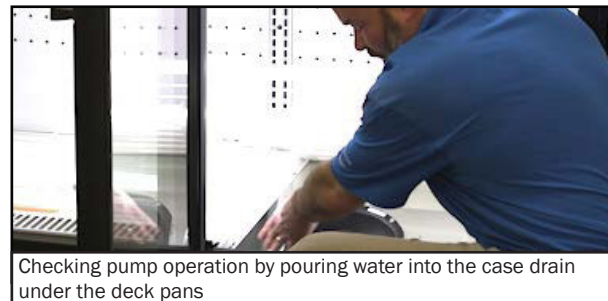
Lighting switch in the upper right-hand side of the case's left-most door frame

5. Check the evaporator fans are on and running properly (in the right direction) by removing the wire racks, return air grill and lift the deck pans.



Evaporator fans running

6. Confirm the pump is operating by pouring a container of water, large enough to fill the pump reservoir, down the case drain under the deck pans.



Checking pump operation by pouring water into the case drain under the deck pans

7. Verify that there is water in the evaporative pan on top of the case indicating that the pump is working.
8. Confirm that the float switch in the evaporative pan is working by lifting and holding it up for a few seconds.



Checking the evaporative pan float switch and heating element

- Confirm the heating element is working by watching to see if the water in the pan starts evaporating while holding the float up.

NOTE: Be careful to not touch the heating element which can cause burns.

- Check the remote display temperature reading one more time to confirm the case is pulling down to temperature after performing the other checks.

REFRIGERATION

The condensing unit is located on top of the case for easy access. Refrigerant piping runs down the rear of the case to and from the coil (evaporator) inside of the case. The expansion valve and other controls, which are located on the left-hand side of the case, are accessed by lifting the left-hand deck pans (it is not necessary to lift the fan plenum shroud).

Before operating the case, be certain to remove any shipping blocks 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 (Room Temp. Vulcanizing Silicone).



A condensing unit on top of the case

⚠ ATTENTION

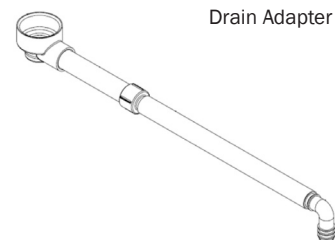
Connections are illustrated in the dimensional drawing in Appendix A.

PLUMBING

The drain outlet is specially molded out of PVC material and is located at the front-center of the case for convenient access. The "P" trap that is furnished with the case is constructed of schedule 40 PVC pipe (at right). Case run-off (from condensation and other sources) is drained through the "P" trap by plastic tubing to the pump underneath the case. The pump is connected by more plastic tubing to the condensate/evaporative pan on top of the case.

NOTE: Hillphoenix offers a version of the case that is designed for use with floor drains where required by local ordinance — evaporative heater pans are neither permitted nor offered with floor-drain case configurations per DOE requirements.

With the kickplate shipped loose (uninstalled), the drain line area under the case is readily accessible during installation. If the kickplate for some reason has been installed, it is easy to remove. Simply remove the kickplate joint trim, then unscrew the upper and lower kickplates from the kickplate supports and remove (see Trim Out instructions on pages 13-16). Care should be taken to ensure that all connections are water-tight and sealed with the appropriate PVC or ABS cement (see page 11).

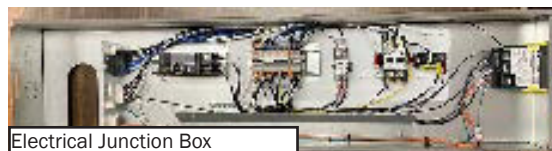


Drain Adapter

ELECTRICAL

Electrical connections are made in the electrical junction box located at the top left of the case. The cases use a Carel Case Controller. Lighting for the cases is pre-installed during manufacturing. Lighting controlled through motion sensors is standard on the case. The Anthony door/frame units are factory-installed and have anti-sweat control through the embedded controller in the standard configuration of the case. For any questions or service needs, please contact our Case Division Customer Service Department at 804-614-1457 or www.hillphoenix.com/company/contact-us/

For more detailed electrical wiring information, see **Appendix C**. For more detailed information on the Carel Case Controller and setpoints, see **Appendix D**.



Electrical Junction Box

⚠ DANGER

Case requires 4-wire power from the store. Neutral wire must be connected prior to starting case or else damage may occur.

⚠ CAUTION

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

⚠ CAUTION

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

PRE-POWER CHECKLIST

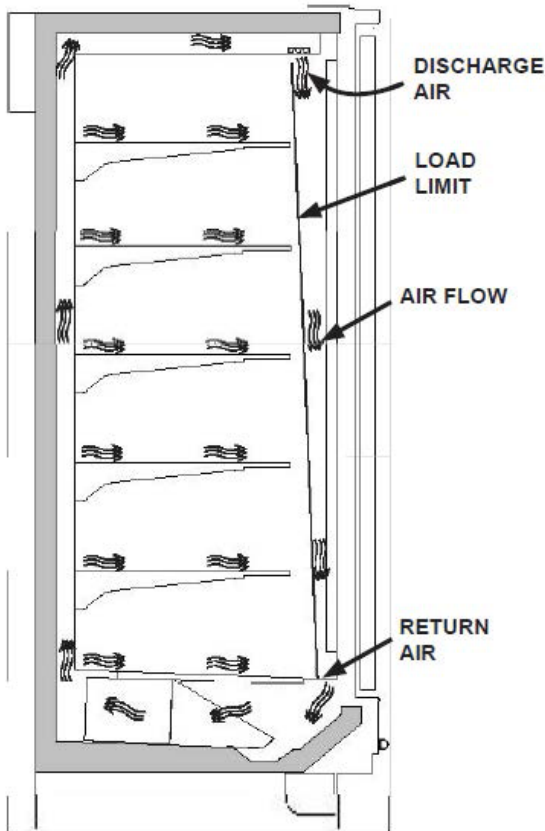
Before powering-up the case, and then when it's started, be certain that all of the steps listed below have been completed to ensure proper case functionality, safety, and compliance with warranty terms.

Have you:

- ☐ Thoroughly examined the case for shipping damage? (see pg. 2)
- ☐ Checked the vertical plumb and the horizontal level of the case? (see pg. 5)
- ☐ Applied the foam tape gasket and sealant to the ends of one of each pair of adjoining cases? (see pg. 5)
- ☐ Sealed the case-to-case joints by applying caulk and acrylic tape to the pipe-chase seams? (see pg. 16)
- ☐ Confirmed that incoming power is properly connected? (see pg. 20)
- ☐ Checked that the condensing unit fan is running and that the compressor kicks on when the case is turned on? (see pg. 20)
- ☐ Checked that the remote display at the top of the case confirms the compressor is running, that no faults are displaying and that the current discharge air temperature is dropping? (see pg. 20)
- ☐ Checked that the evaporator fans are ON and running properly (see pg. 20)
- ☐ Confirm the pump is operating (see pg. 20)
- ☐ Confirm that the float switch in the evaporative pan is working (see pg. 20)
- ☐ Confirm the heating element the evaporative pan is working (see pg. 21)
- ☐ Removed the shipping blocks from the refrigeration lines? (see pg. 21)

AIR FLOW & PRODUCT LOAD

Do not overload the product in the case so that it blocks the air flow pattern—doing so will result in reduced performance and the inability of the case to maintain proper temperature, particularly when the discharge honeycomb and return air grille are covered. Make sure to keep products within the load limit line shown on the diagram below.



Airflow; probe, sensor locations

DEFROST & TEMPERATURE CONTROLS

The primary components used for the defrost cycle are the various defrost termination sensors, which work to terminate the defrost cycle in the case.

JNRBHSA cases utilize Off-Time defrost. The defrost termination probe is housed at the rear wall, behind the lower rear baffle. 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.



LT defrost termination probe sensor location

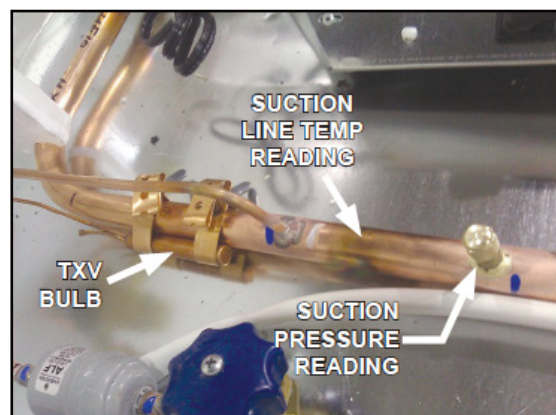
JNRZHSAs utilize electric defrost. The defrost termination probe is mounted into the coil package from the left end of the coil. The discharge air probe monitors the temperature of the discharge air and is found behind the plug button in the upper flue panel.

For more detailed information on suggested defrost times and settings, see Appendix A2. Further adjustment may be required depending on store conditions.

DETERMINING SUPERHEAT

To identify proper superheat settings, perform the following steps:

1. Obtain the 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 (shown below).
2. Using the suction pressure reading, 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.



Obtain pressure and temperature readings from these points

CASE CLEANING & FAN MAINTENANCE

CLEANING PROCEDURES

A periodic cleaning schedule should be established to maintain proper sanitation, insure maximum operating efficiency, and avoid the corrosive effect of food fluids on metal parts. Hillphoenix recommends cleaning once a week:

- Be certain that all electricity to the case is turned off before servicing or cleaning to avoid electrical shock. In some cases, more than one switch may need to be turned off to completely de-energize the case.
- All surfaces pitch downward to a drain trough, funneling liquids and other debris to the waste outlet. Check the waste outlet before starting the cleaning process to insure it is unclogged. Avoid introducing water faster than the case drain can carry it away.
- Access the coil for cleaning and maintenance by removing (2) screws at the ends of the plenums and gently sliding the plenum assembly forward taking care to not damage any of the refrigeration piping or electrical components beneath the plenum as show below.



Coil & single-piece fan plenum

- 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 the 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.

⚠ DANGER

SHOCK HAZARD

Always disconnect power to case when servicing or cleaning. Failure to do so may result in 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 result in severe cuts to the hands and arms.

FANS

Hillphoenix door cases feature electronic commutated fan motor assemblies. The fans have a factory-set blade pitch and a pre-configured RPM specific to each model.

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

1. Unplug the fan motor (shown below) 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 the fan assembly.)



⚠ CAUTION

The 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.

⚠ IMPORTANT

When re-installing the fan in field; orient the fan cord to the 7 o'clock position. Pull any excess cord slack forward and tie tightly.



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

A	Technical Reference Sheet
B	Seismic Brackets
C	Electrical Wiring
D	Controllers and Setpoints
E	Fascia Frame
F	Case Lifting Locations

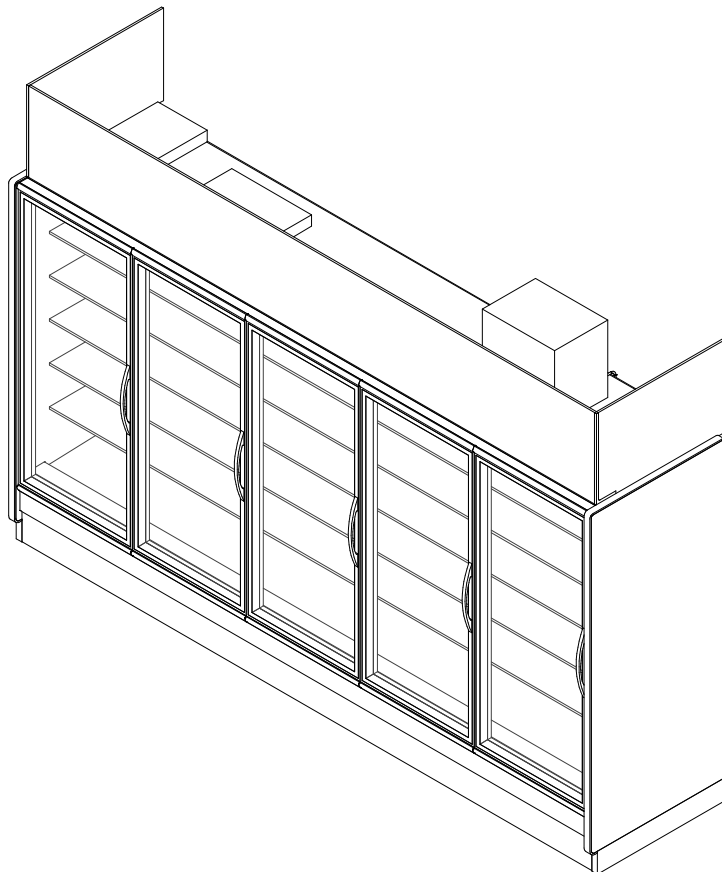
A1: TECHNICAL REFERENCE SHEET

JNRBHSA

2, 3, 4 & 5 Door High Narrow Reach-In Self Contained Merchandiser
Beverage/Bakery/Dairy/Cut Produce/Deli

GENERAL NOTES:

- Lighting Controls and Anti Sweat Heat Controls are Required
- Option 1: OEM Provided: Occupancy Sensor Based Lighting Controls (On/Off) & Hillphoenix provided embedded Anti Sweat Controls are standard, unless otherwise specified
- Option 2: End User Provided: Lighting Controls should be Occupancy Sensor Based or on a minimum 8 Hour Off Schedule. Customer provided A/S Heat Controls should be set to 30% minimum off time at 75°F/55%RH
- 2,3,4 & 5 door lengths available in 208V R448A condensing unit configuration.



SHIPPING WEIGHT	
Case	Weight
JNRBHSA	---

2017
DOE
COMPLIANT



COMPONENT

ALL MEASUREMENTS ARE TAKEN PER ASHRAE-72 SPECIFICATIONS. HILLPHOENIX REFRIGERATED DISPLAY CASES FOR SALE IN THE UNITED STATES MEET OR EXCEED DEPARTMENT OF ENERGY 2017 REQUIREMENTS.

JNRBHSA

Rev. Date	Rev. #	Rev. Title
02-07-23	20	ENDVIEW UPDATE
04-21-22	19	NOTES UPDATED

Hillphoenix
a **DOVER** company

A2: TECHNICAL REFERENCE SHEET

JNRBHSA

2, 3, 4 & 5 Door High Narrow Reach-In Self Contained Merchandiser
Beverage/Bakery/Dairy/Cut Produce/Deli

SYSTEM REQUIREMENT (R-448A REFRIGERANT)

Case Length	Volts	Phase	Frequency (Hz)	Minimum Circuit Ampacity	Maximum Overcurrent Protection	24hr Energy Usage (kWh)
2 Door	208	1	60	12.8	15.0	6.4
3 Door	208	1	60	12.9	15.0	7.2
4 Door	208	1	60	13.1	15.0	11.6
5 Door	208	1	60	17.6	20.0	13.7

GUIDELINES AND CONTROL SETTINGS (R-448A REFRIGERANT)

Case Length	Application	Superheat Set Point @ Bulb (°F)	Discharge Air (°F)	Set Point Differential (°F)	Discharge Air Velocity (FPM)
2-5 Door	Beverage	6 - 8	35	6	230
2-5 Door	Bakery/Dairy/Cut Produce	6 - 8	30	6	230
2-5 Door	Deli	6 - 8	29	6	230

CONDENSING UNIT DATA (R-448A REFRIGERANT)

Case Length	Volts	Phase	Frequency (Hz)	Horsepower	Running Load Amps (RLA)	Locked Rotor Amps (LRA)	Refrigerant	Refrigerant (Lbs)
2 Door	208	1	60	1/3	3.6	17.5	R448A	3.0
3 Door	208	1	60	1/3	3.6	17.5	R448A	3.0
4 Door	208	1	60	1/3	3.6	17.5	R448A	3.0
5 Door	208	1	60	1/2	4.6	22.0	R448A	3.0

DEFROST CONTROLS (R-448A REFRIGERANT)

Case Length	Defrosts Per Day	Run-Off Time (Min)	Fail-Safe (Min)	Termination Temp (°F)
2-5 Door	2	0	46	44

DEFROST SCHEDULE (R-448A REFRIGERANT)

Defrosts Per Day	Time
2	12 a.m. - 12 p.m.

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 below are recommended start-up settings. Final operational settings may need to be adjusted for the store conditions in which the case operates.
- The recommended evaporator temperatures may need to be adjusted based on system setup, store conditions, etc. The minimum recommended evaporator temperature is 4°F below the listed evaporator temperature.
- The 24 Hour Energy Value is based upon AHRI 1200 test conditions with Hillphoenix provided evaporator fans, condensing unit, LED lights, occupancy sensor based (on/off) lighting control, dew point based anti-sweat heat controller, condensate pump, evaporator pan, heated door frame, and un heated glass doors/off cycle defrost on medium temp cases.
- Discharge air temperature values represent readings taken within the upper air channel immediately behind/upstream of the honeycomb.



ALL MEASUREMENTS ARE TAKEN PER ASHRAE-72 SPECIFICATIONS. HILLPHOENIX REFRIGERATED DISPLAY CASES FOR SALE IN THE UNITED STATES MEET OR EXCEED DEPARTMENT OF ENERGY 2017 REQUIREMENTS.

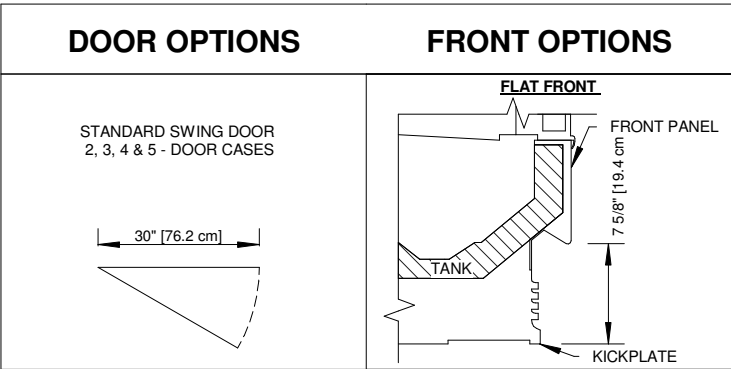
JNRBHSA

Rev. Date	Rev. #	Rev. Title
02-07-23	20	ENDVIEW UPDATE
04-21-22	19	NOTES UPDATED

Hillphoenix
a DOWER company

JNRBHSA

2, 3, 4 & 5 Door High Narrow Reach-In Self Contained Merchandiser
Beverage/Bakery/Dairy/Cut Produce/Deli



ALL MEASUREMENTS ARE TAKEN PER ASHRAE-72 SPECIFICATIONS. HILLPHOENIX REFRIGERATED DISPLAY CASES FOR SALE IN THE UNITED STATES MEET OR EXCEED DEPARTMENT OF ENERGY 2017 REQUIREMENTS.

JNRBHSA

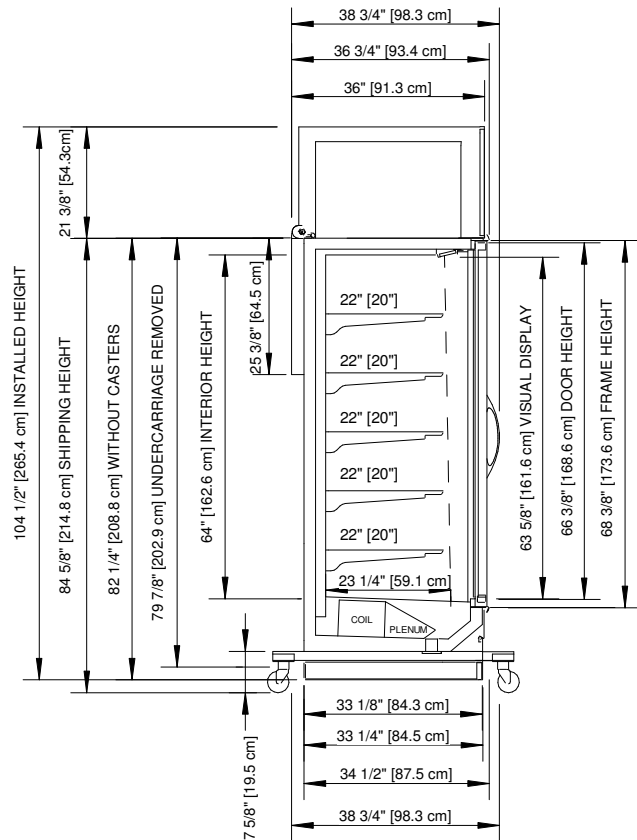
Rev. Date	Rev. #	Rev. Title
02-07-23	20	ENDVIEW UPDATE
04-21-22	19	NOTES UPDATED



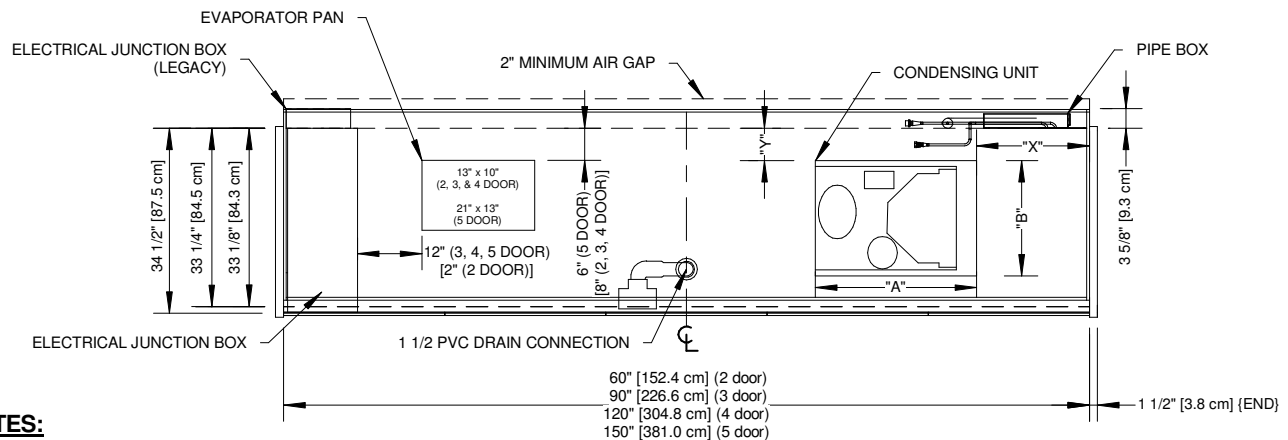
A4: TECHNICAL REFERENCE SHEET

JNRBHSA

2, 3, 4 & 5 Door High Narrow Reach-In Self Contained Merchandiser
Beverage/Bakery/Dairy/Cut Produce/Deli



CONDENSING UNIT SIZE AND POSITION R448A				
CASE LENGTH	2DR	3DR	4DR	5DR
"X"	23"	23"	23"	23"
"Y"	6"	6"	6"	6"
"A"	19.0"	19.0"	19.0"	19.0"
"B"	14.0"	14.0"	14.0"	14.0"



NOTES:

* : STUB-UP AREA.

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

- Specialized Base Frame:
- Case fits through 80" doorway in the as shipped configuration with 2" fork lift brackets.
- 2" lifting brackets (installed) & 3.25" ship loose risers combine for 5" baseframe once installed.
- Drain traps ship loose.
- Ends add approximately 1" to case height, 1/2" to the back & 1" to the front.



ALL MEASUREMENTS ARE TAKEN PER ASHRAE-72 SPECIFICATIONS. HILLPHOENIX REFRIGERATED DISPLAY CASES FOR SALE IN THE UNITED STATES MEET OR EXCEED DEPARTMENT OF ENERGY 2017 REQUIREMENTS.

JNRBHSA

Rev. Date	Rev. #	Rev. Title
02-07-23	20	ENDVIEW UPDATE
04-21-22	19	NOTES UPDATED

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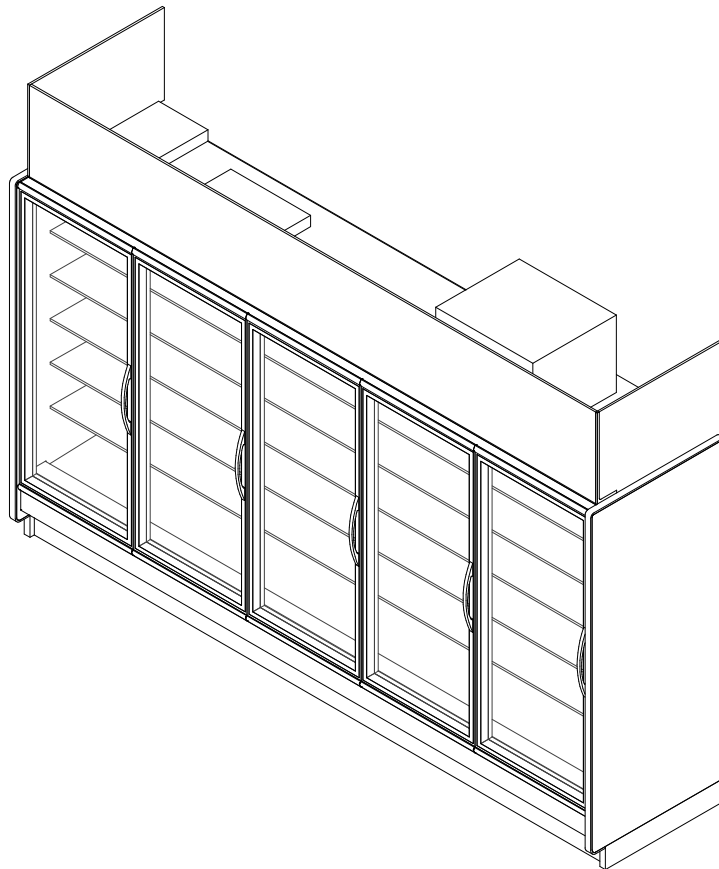
A5: TECHNICAL REFERENCE SHEET

JNRZHSA

2, 3, 4 & 5 Door High Narrow Reach-In Self Contained Merchandiser
Frozen Food

GENERAL NOTES:

- Lighting Controls and Anti Sweat Heat Controls are Required
- Option 1: OEM Provided: Occupancy Sensor Based Lighting Controls (On/Off) & Hillphoenix provided embedded Anti Sweat Controls are standard, unless otherwise specified
- Option 2: End User Provided: Lighting Controls should be Occupancy Sensor Based or on a minimum 8 Hour Off Schedule. Customer provided A/S Heat Controls should be set to 30% minimum off time at 75°F/55%RH
- 2,3,4, & 5 door case lengths are available in 208V R448A Condensing Unit Configuration



SHIPPING WEIGHT	
Case	Weight
JNRZHSA	---



COMPONENT

ALL MEASUREMENTS ARE TAKEN PER ASHRAE-72 SPECIFICATIONS. HILLPHOENIX REFRIGERATED DISPLAY CASES FOR SALE IN THE UNITED STATES MEET OR EXCEED DEPARTMENT OF ENERGY 2017 REQUIREMENTS.

JNRZHSA

Rev. Date	Rev. #	Rev. Title
01-08-24	16	NOTES UPDATE
02-07-23	15	ENDVIEW UPDATE

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A6: TECHNICAL REFERENCE SHEET

JNRZHSA

2, 3, 4 & 5 Door High Narrow Reach-In Self Contained Merchandiser
Frozen Food

SYSTEM REQUIREMENT (R448A)						
Case Length	Volts	Phase	Frequency (Hz)	Minimum Circuit Ampacity	Maximum Overcurrent Protection	24hr Energy Usage (kWh)
2 Door	208	1	60	17.9	20.0	20.1
3 Door	208	1	60	24.0	30.0	25.3
4 Door	208	1	60	25.4	30.0	34.4
5 Door	208	1	60	27.9	30.0	40.0

GUIDELINES AND CONTROL SETTINGS (R448A)				
Case Length	Superheat Set Point @ Bulb (°F)	Set Point Differential (°F)	Discharge Air (°F)	Discharge Air Velocity (FPM)
2 Door	3 - 5	4	- 9	250
3 Door	3 - 5	4	- 9	250
4 Door	3 - 5	4	- 9	250
5 Door	3 - 5	4	- 9	250

CONDENSING UNIT DATA (R448A)								
Case Length	Volts	Phase	Frequency (Hz)	Horsepower	Running Load Amps (RLA)	Locked Rotor Amps (LRA)	Refrigerant	Refrigerant (Lbs)
2 Door	208	1	60	1	6.5	40.0	R448A	4.0
3 Door	208	1	60	1 1/2	8.7	45.0	R448A	4.0
4 Door	208	1	60	2 1/4	9.1	74.0	R448A	4.75
5 Door	208	1	60	2 1/4	9.1	74.0	R448A	5.5

DEFROST CONTROLS (R448A)			
Defrosts Per Day	Electric Defrost		
	Run-Off Time (Min)	Fail-Safe (Min)	Termination Temp (°F)
1	0	46	48

DEFROST SCHEDULE (R448A)	
Defrosts Per Day	Time
1	12 midnight

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 using a Testo 410i Anemometer.
- Temperature and defrost settings listed below are recommended start-up settings. Final operational settings may need to be adjusted for the store conditions in which the case operates.
- The recommended evaporator temperatures may need to be adjusted based on system setup, store conditions, etc. The minimum recommended evaporator temperature is 4°F below the listed evaporator temperature.
- The 24 Hour Energy Value is based upon AHRI 1200 test conditions with Hillphoenix provided evaporator fans, condensing unit, LED lights, occupancy sensor based (on/off) lighting control, dew point based anti-sweat heat controller, condensate pump, evaporator pan, heated door frame, and heated glass doors/electric defrost on low temp cases.
- Discharge air temperature values represent readings taken within the upper air channel immediately behind/upstream of the honeycomb.
- For optimal performance in HFC applications, it is recommended to close the liquid line and close the suction line during defrost. Defrost parameters may need to be adjusted if other methods are used.



ALL MEASUREMENTS ARE TAKEN PER ASHRAE-72 SPECIFICATIONS. HILLPHOENIX REFRIGERATED DISPLAY CASES FOR SALE IN THE UNITED STATES MEET OR EXCEED DEPARTMENT OF ENERGY 2017 REQUIREMENTS.

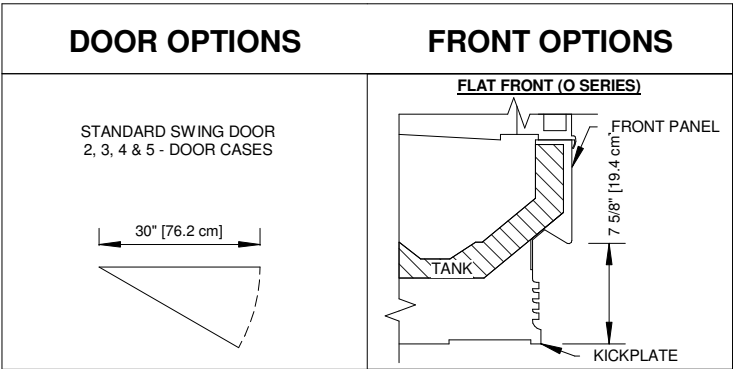
JNRZHSA

Rev. Date	Rev. #	Rev. Title
01-08-24	16	NOTES UPDATE
02-07-23	15	ENDVIEW UPDATE

Hillphoenix
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JNRZHSA

2, 3, 4 & 5 Door High Narrow Reach-In Self Contained Merchandiser
Frozen Food



ALL MEASUREMENTS ARE TAKEN PER ASHRAE-72 SPECIFICATIONS. HILLPHOENIX REFRIGERATED DISPLAY CASES FOR SALE IN THE UNITED STATES MEET OR EXCEED DEPARTMENT OF ENERGY 2017 REQUIREMENTS.

JNRZHSA

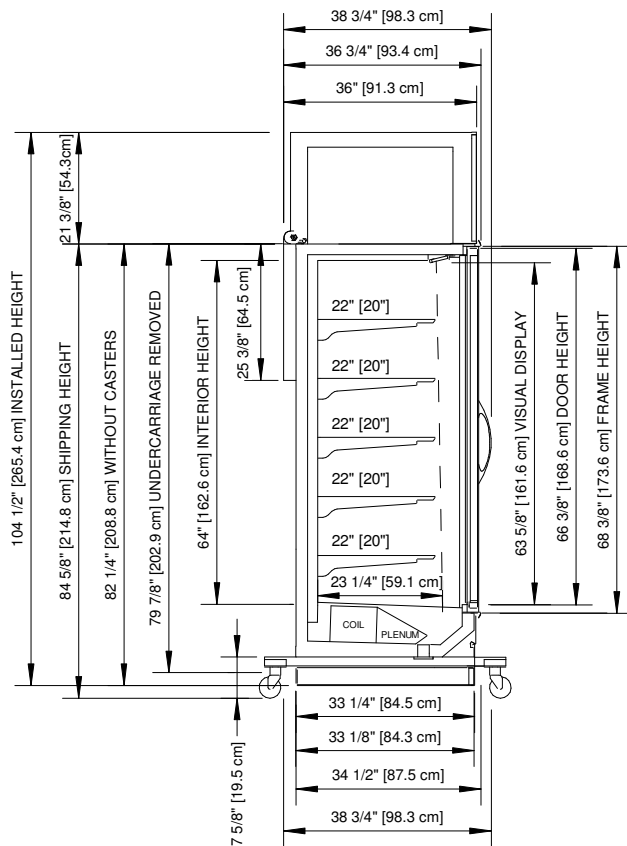
Rev. Date	Rev. #	Rev. Title
01-08-24	16	NOTES UPDATE
02-07-23	15	ENDVIEW UPDATE



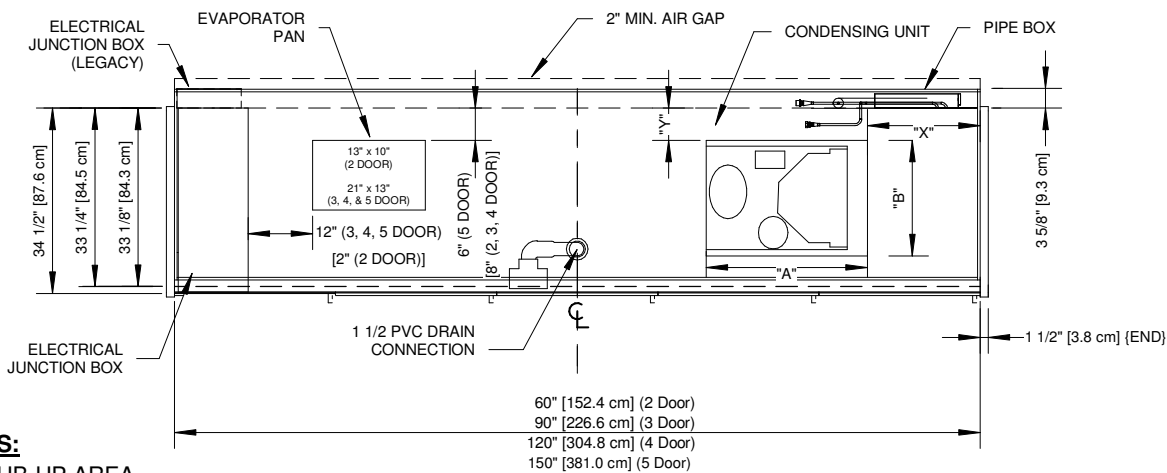
A8: TECHNICAL REFERENCE SHEET

JNRZHS A

2, 3, 4 & 5 Door High Narrow Reach-In Self Contained Merchandiser
Frozen Food



CONDENSING UNIT SIZE AND POSITION R448A				
CASE LENGTH	2DR	3DR	4DR	5DR
"X"	23"	23"	23"	23"
"Y"	6"	6"	6"	6"
"A"	21.0"	21.0"	24.0"	24.0"
"B"	16.0"	16.0"	24.0"	24.0"



NOTES:

* : STUB-UP AREA

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

- Specialized Base Frame.
- Case fits through 80" doorway in the as shipped configuration with 2" fork lift brackets.
- 2" lifting brackets (installed) & 3.25" ship loose risers combine for 5" baseframe once installed.
- Drain traps ship loose.
- Ends add approximately 1" to case height, 1/2" to the back & 1" to the front.



JNRZHS A

ALL MEASUREMENTS ARE TAKEN PER ASHRAE-72 SPECIFICATIONS. HILLPHOENIX REFRIGERATED DISPLAY CASES FOR SALE IN THE UNITED STATES MEET OR EXCEED DEPARTMENT OF ENERGY 2017 REQUIREMENTS.

Rev. Date	Rev. #	Rev. Title
01-08-24	16	NOTES UPDATE
02-07-23	15	ENDVIEW UPDATE

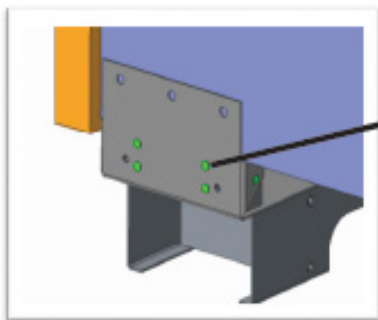
Hillphoenix
a DOVER company

B1: SEISMIC BRACKETS

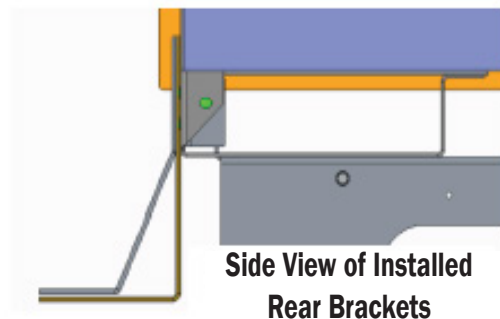
The case constraint brackets are installed on the rear and front base of the case. Brackets are designed for use with the split base frame configuration.

Rear Brackets Installation:

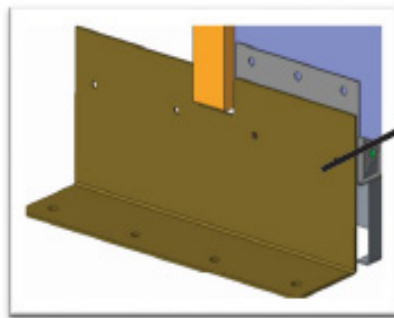
- Two 12G brackets are placed on the rear of the case and captured together by same HILTI thread for improved section modulus of anchor
- Screws pass through both parts and into the factory installed case rear-feet
- Wide part included anchor along case-to-case interface
- Single-width parts for anchor at ends of a single case or ends of line-up



Rear Feet of
the Case

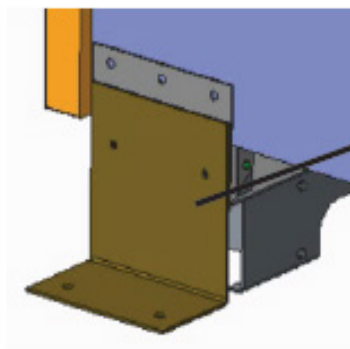
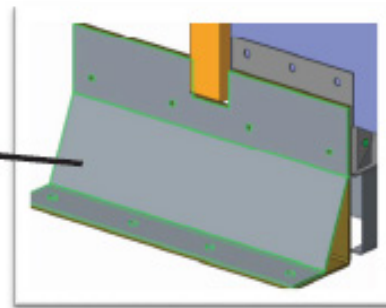


Side View of Installed
Rear Brackets



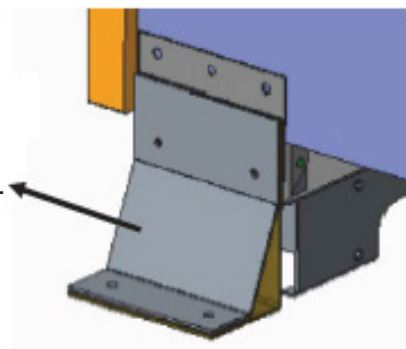
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P/No: F885144GGL



P/No: F884947FGL

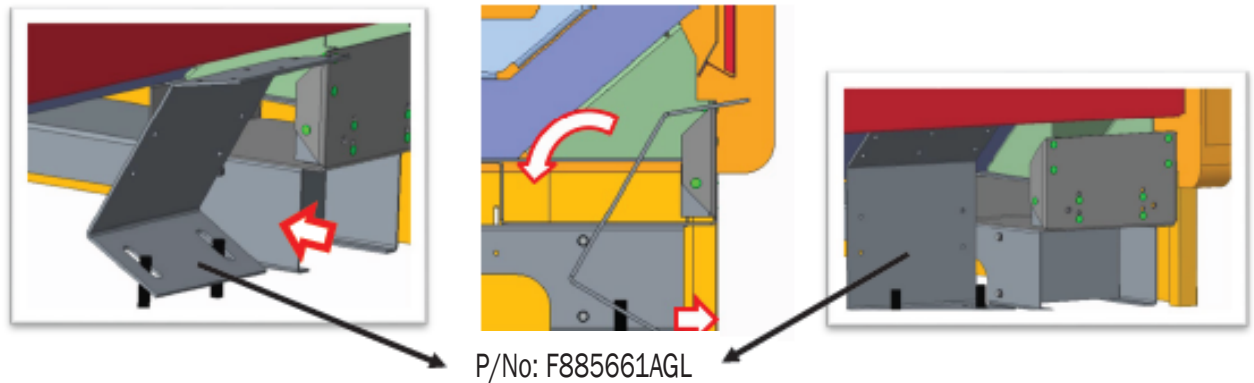
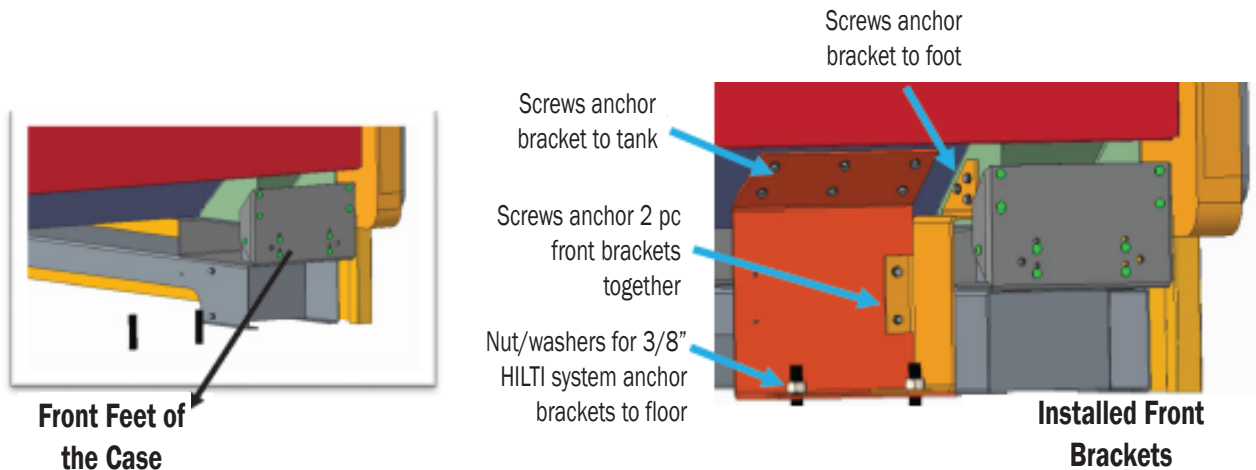
P/No: F885143KGL



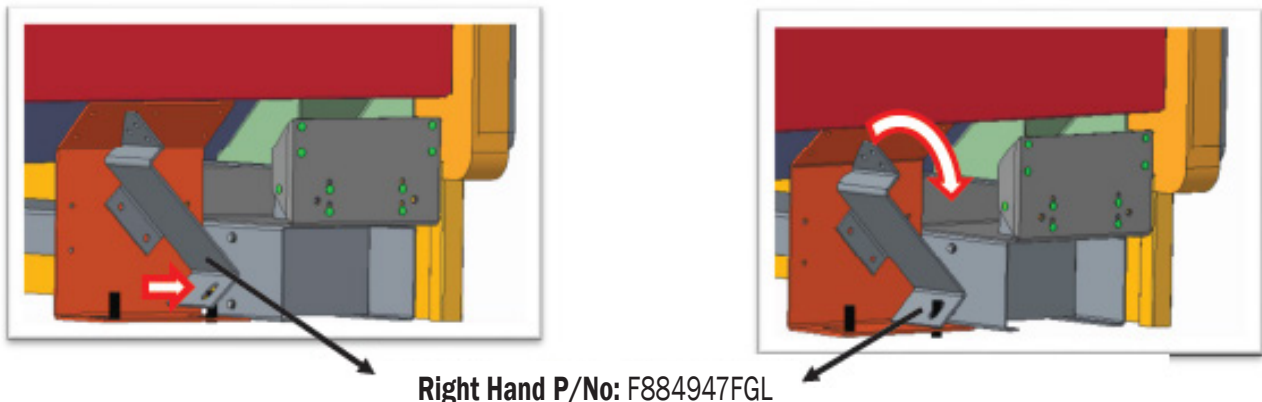
B2: SEISMIC BRACKETS

Front Brackets Installation:

- Two piece bracket system is used on the front of the case
- The front field-install brackets remain hidden from shoppers (behind aesthetic kick-plate panels)
- First piece is slotted front to rear so it can rotate onto the 1" tall HILTI threads from front of case



- Second piece rotates from the side
- Left and right hand version of part - for attachment to front base foot
- This part is slotted side-to-side so it can rotate onto the 1" tall HILTI threads from side



Left Hand P/No: (Not Shown in Picture) F885143KGL

C1: ELECTRICAL WIRING DIAGRAM

WIRE 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

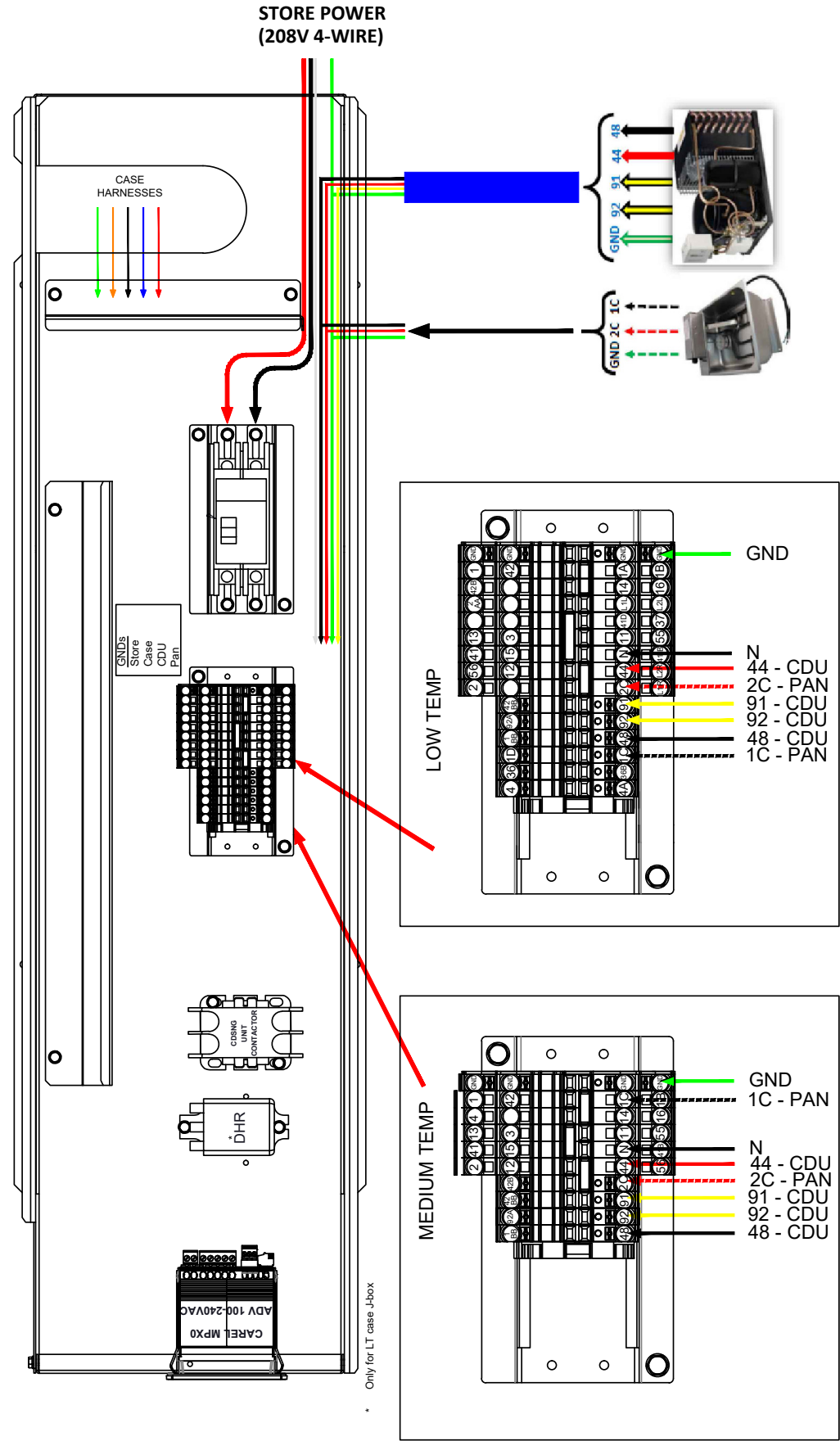
For safety and code compliance, ground fixture at the time of installation.

CAUTION

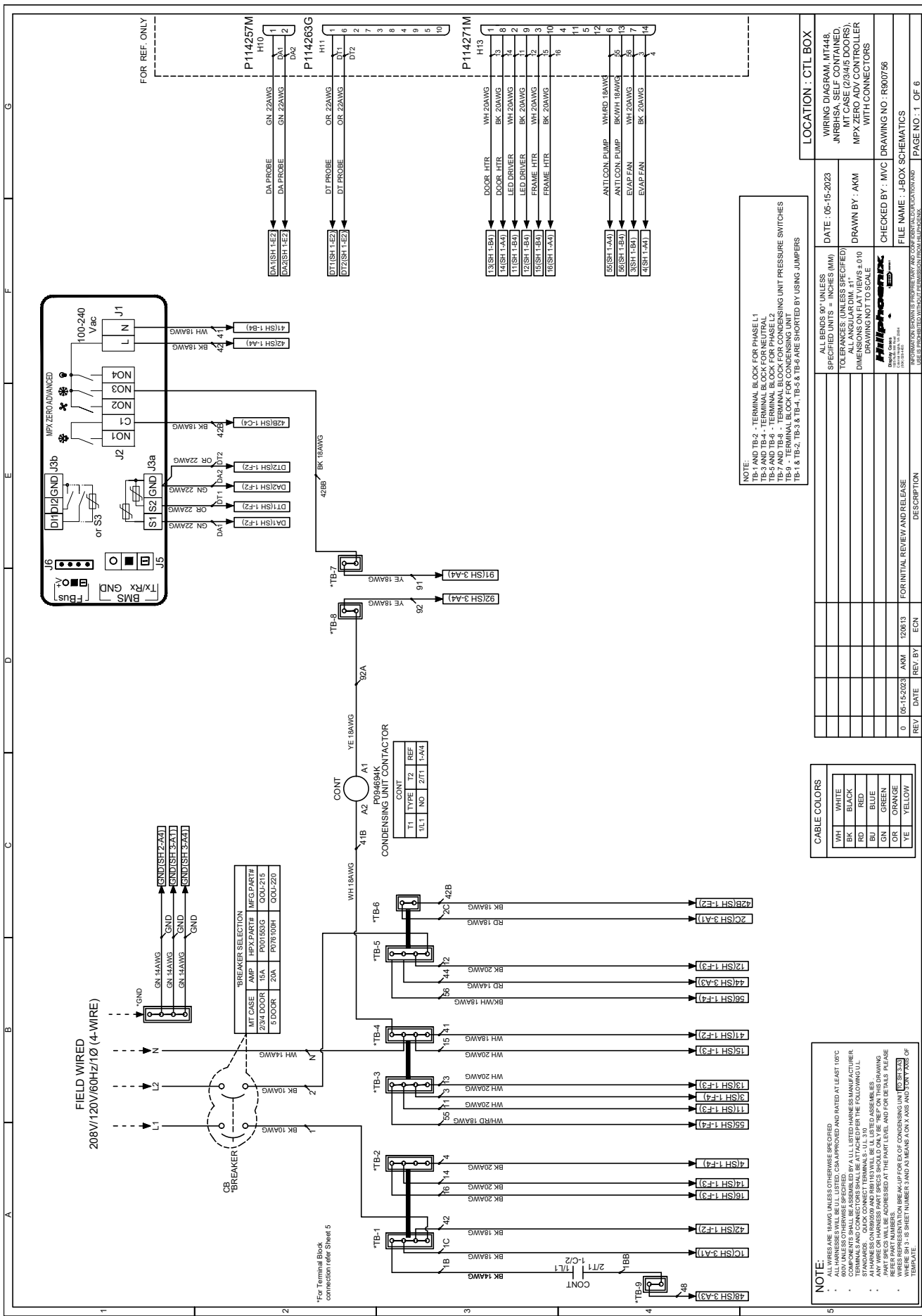
Risk of electric shock. More than one power supply. Disconnect all power supplies before servicing.

C2: ELECTRICAL WIRING DIAGRAM (R448A)

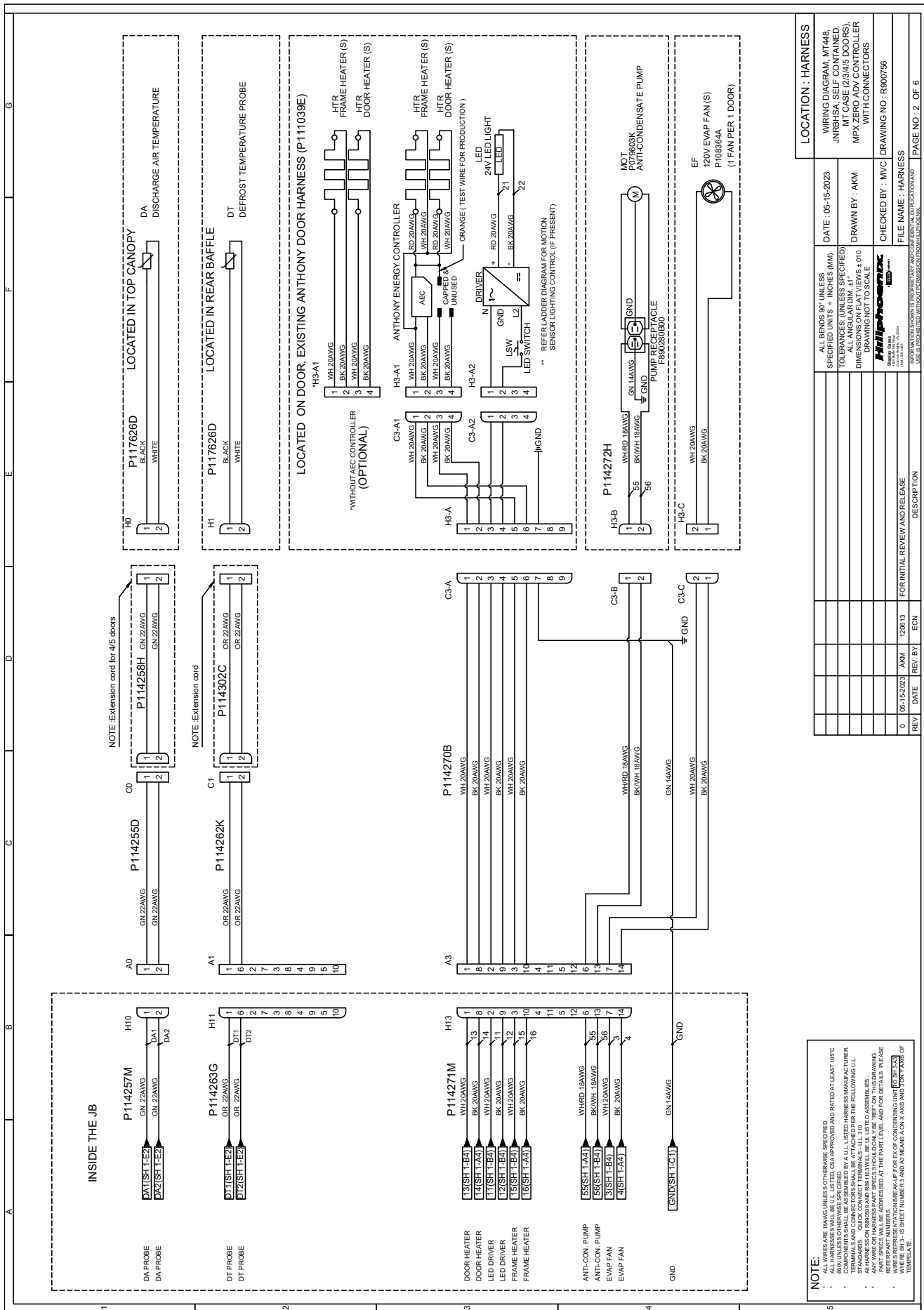
JNR*H SA : Universal field wiring reference



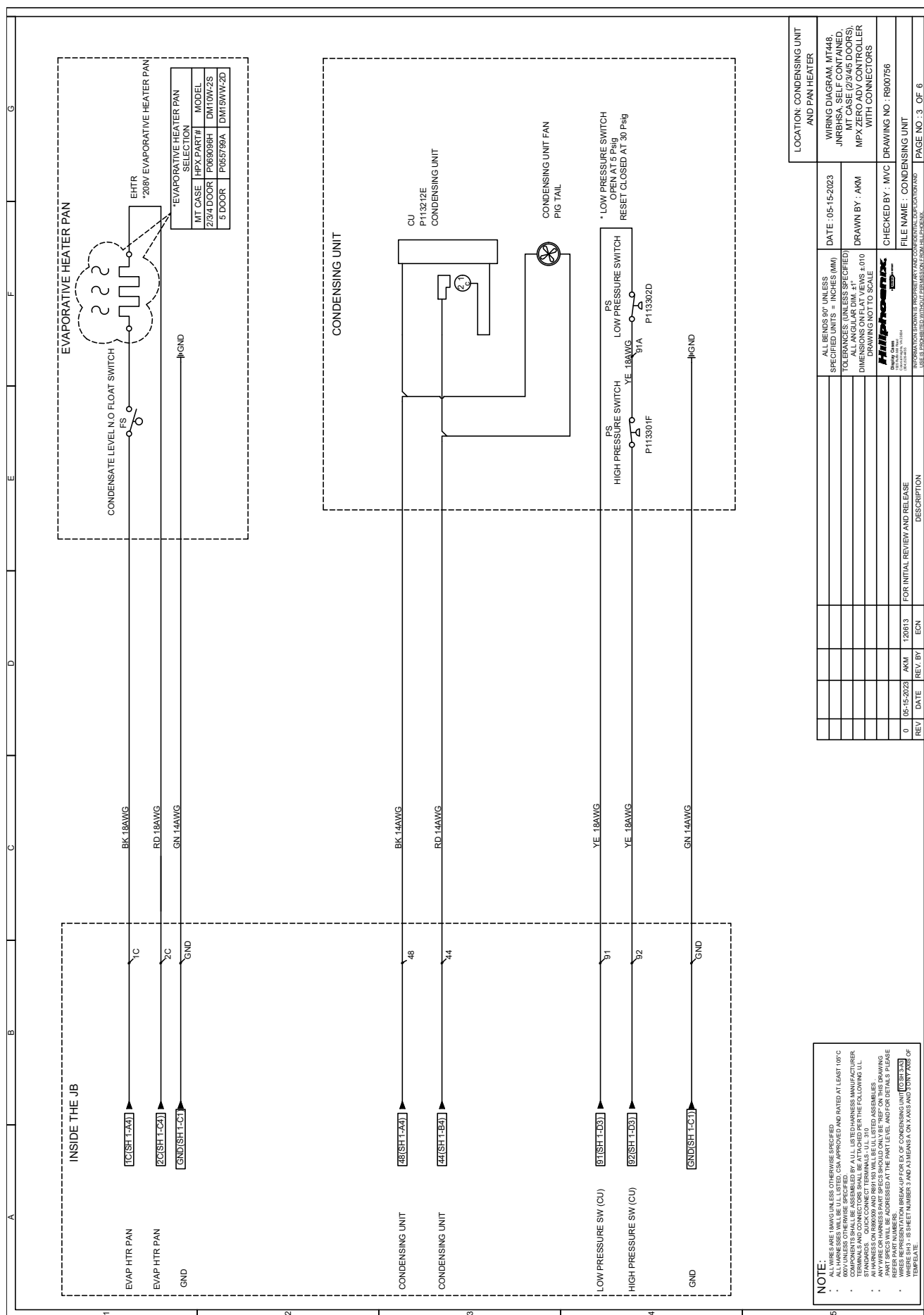
C3: JNRBHSA 2-5 ELECTRICAL WIRING DIAGRAM (R448A)



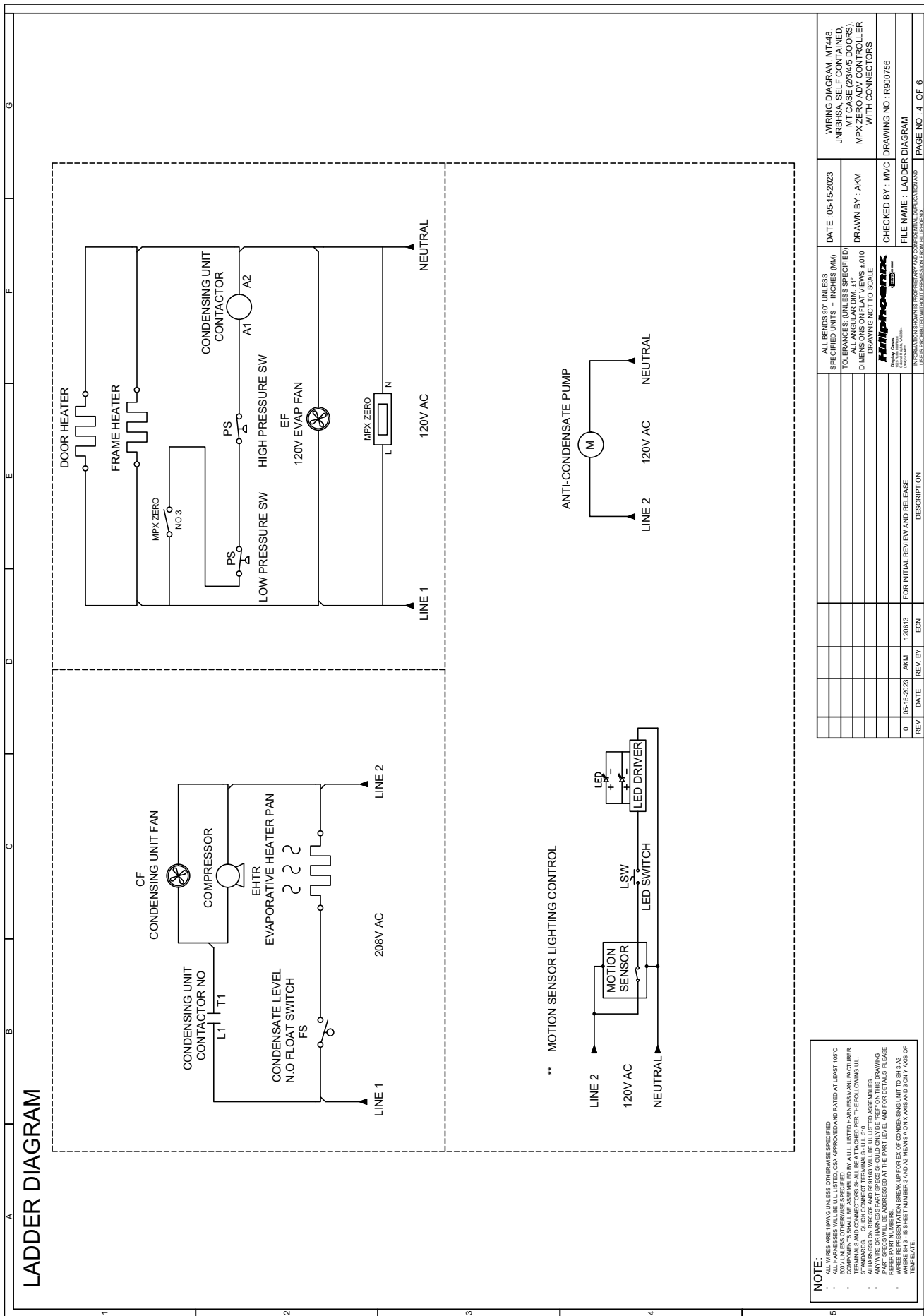
C4: JNRBHSA 2-5 ELECTRICAL WIRING DIAGRAM (R448A)



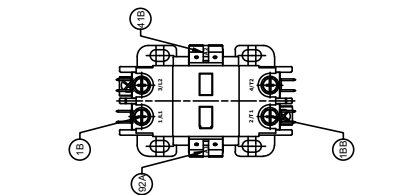
C5: JNRBHSA 2-5 ELECTRICAL WIRING DIAGRAM (R448A)



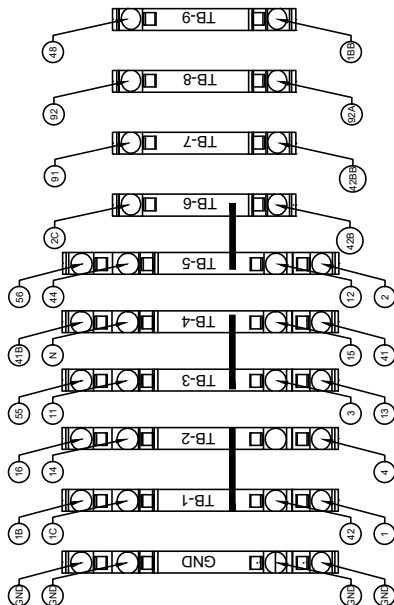
C6: JNRBHSA 2-5 ELECTRICAL WIRING DIAGRAM (R448A)



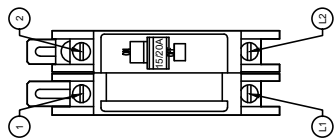
C7: JNRBHSA 2-5 ELECTRICAL WIRING DIAGRAM (R448A)



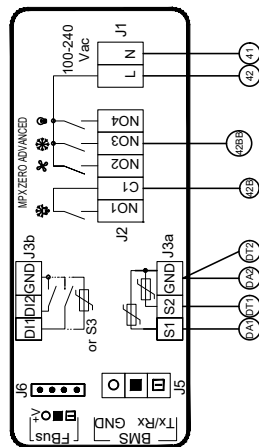
CONTACTOR CONNECTION DETAILS	
CONTACTOR PIN	WIRE #
L1	1B
T1	1B8
L2	-
T2	-
A1	92A
A2	41B



TERMINAL BLOCK DETAILS						PRESSURE SWITCH (CU)	CONDENSING UNIT
USED FOR	GROUND	PHASE 1	NEUTRAL	PHASE L2			
WIRE # FOR PIN 1	GND	1B	16	55	41B	56	
WIRE # FOR PIN 2	GND	1C	14	11	N	44	91
TERMINAL TAG	GND	1B	14	11	41B	56	92
WIRE # FOR PIN 3	GND	42	3	15	12	42B	92A
WIRE # FOR PIN 4	GND	1	4	13	41	42B	92A



BREAKER CONNECTION DETAILS	
BREAKER PIN	WIRE #
L1	L1
L2	L2
T1	1
T2	2



MPX ZERO CONTROLLER CONNECTION DETAILS	CTRL PIN	WIRE #
	L	42
	N	41
	C1	42B
	NO3	42BB
	S1	DA1
	S2	DT1
	GND	DA2 & DT2

[illegible]

REV	DATE	REV. BY	ECN	DESCRIPTION	FOR INITIAL REVIEW AND RELEASE
0	05-15-2023	AKM	120613		
ALL BENDS 90° UNLESS SPECIFICALLY NOTED. (AKM) SPREADSHEETS MUST BE USED FOR ALL BENDS. (AKM) TOES AND POINTS MUST BE DESCRIBED. ALL ANGULAR DIM. ±1° DIMENSIONS ON FLAT VIEWS ±.010 DIMENSIONS NOT TO SCALE PhilProtek <i>Design & Drafting</i> © 2023 PhilProtek LLC. All Rights Reserved. PhilProtek is a registered trademark of PhilProtek LLC.					
				DATE: 05-15-2023	LOCATION : CTL BOX
				WIRING DIAGRAM, MT448, JNRHSA, SELF CONTAINED, MT CASE (23/45 DOORS), MPX ZERO FLOW CONTROLLER WITH CONNECTORS	
				CHECKED BY : MVC	DRAWING NO : R800756
				FILE NAME : WIRE CONNECTION DETAILS	
				PAGE NO : 5	OF : 6
INFORMATION HEREON IS PROPRIETARY AND CONFIDENTIAL. NO REPRODUCTION OR DISSEMINATION OF THIS INFORMATION IS PERMITTED WITHOUT THE WRITTEN PERMISSION OF PHILPROTEK LLC.					

C8: JNRBHSA 2-5 ELECTRICAL WIRING DIAGRAM (R448A)

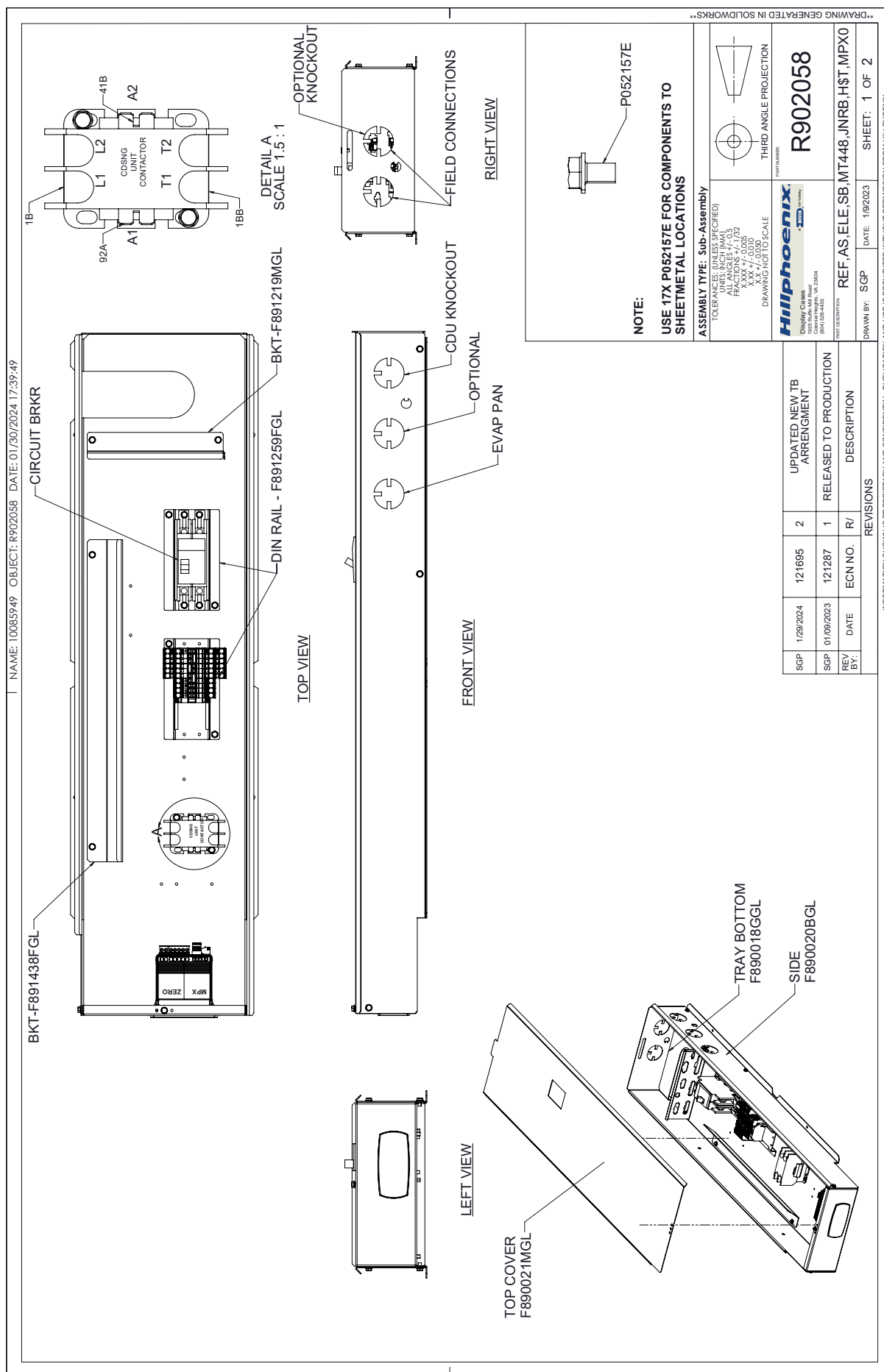
A	B	C	D	E	F	G
CAD SYMBOLS						
TAG	SYMBOL DESCRIPTION	SYMBOL				
CB	1 POLE CIRCUIT BREAKER					
CB	2 POLE CIRCUIT BREAKER					
TB	2 - CONDUCTOR THROUGH TERMINAL BLOCK					
TB	4 - CONDUCTOR THROUGH TERMINAL BLOCK					
R / CONT	RELAY CONTACTOR COIL					
R / CONT	RELAY / CONTACTOR NO OR NC CONTACT					
R	FORM C RELAY CONTACT					
SSR	SOLID STATE RELAY					
GND	GROUND CONNECTION					
DAVDT	TEMPERATURE PROBE					
HTR	HEATER					
DRIVER / PWS	LED DRIVER / POWER SUPPLY					
LIGHT	LED LIGHT					
AEC	ANTHONY ENERGY CONTROLLER					
LSW	LED SWITCH					
TR	TRANSFORMER					

CAD SYMBOLS						
TAG	SYMBOL DESCRIPTION	SYMBOL				
H1# / C3#	PLUG CONNECTOR					
A1# / H3#	RECEPTACLE CONNECTOR					
RECP	PUMP RECEPTACLE					
FS	FLOAT SWITCH					
PS	HIGH PRESSURE SWITCH					
PS	LOW PRESSURE SWITCH					
SW	THERMODISC T-STAT					
JUMPER	TERMINAL BLOCK SHORT LINK / JUMPER					
CT	CURRENT TRANSFORMER					
PT	PRESSURE TRANSDUCER					
EF	EVAP FAN					
LS	LIQUID SOLENOID					
EEV	ELECTRONIC EXPANSION VALVE					
###	WIRE NUMBER					

0	05-15-2023	AKM	120613	FOR INITIAL REVIEW AND RELEASE		
REV	DATE	REV BY	ECN	DESCRIPTION		

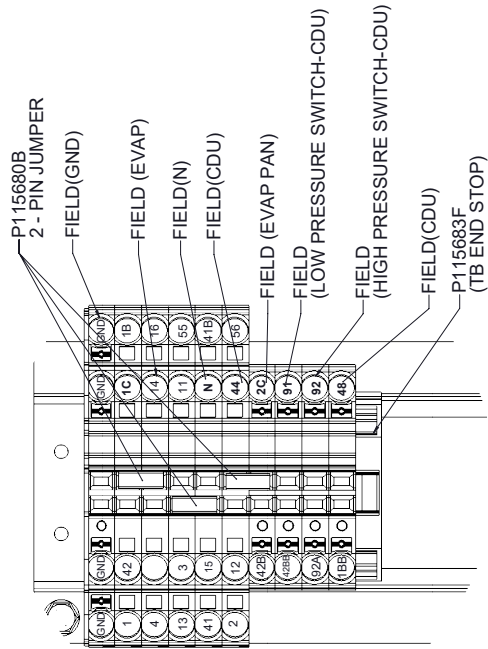
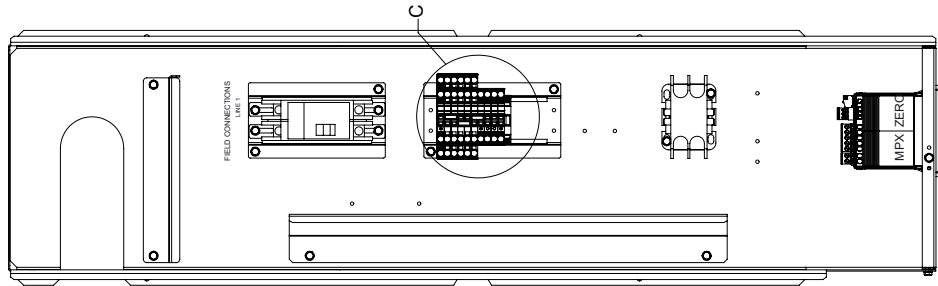
ALL DIMENSIONS IN UNITS AS SPECIFIED UNLESS OTHERWISE SPECIFIED (INCHES (MM))		DATE : 05-15-2023	WIRING DIAGRAM, MT448, JNRBHA, SELF CONTAINED, MT CASE (2/3/4/5 DOORS), MPX ZERO ADV CONTROLLER WITH CONNECTORS
TOLERANCES (UNLESS SPECIFIED) ALL ANGULAR DIM ±1° DIMENSIONS ON FLAT VIEWS ±0.10 DRAWING NOT TO SCALE		DRAWN BY : AKM	
Philphoenix 1000 West 10th Street, Suite 100, Phoenix, AZ 85006-1000		CHECKED BY : MVC	DRAWING NO : R800756
		FILE NAME : CAD SYMBOLS	
		LOCATION AND DATE OF REVISION	PAGE NO : 6 OF 6

C9: JNRBHSA 2-5 ELECTRICAL WIRING DIAGRAM (R448A)

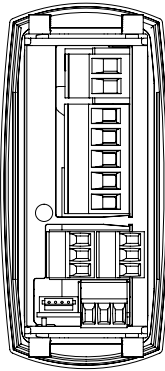


C10: JNRBHSA 2-5 ELECTRICAL WIRING DIAGRAM (R448A)

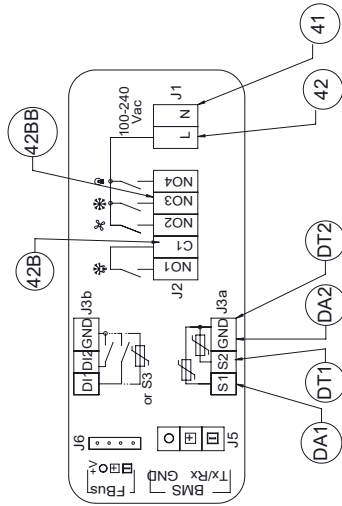
* USE R900756 AS REF FOR MT SCHEMATICS
* UNLESS OTHERWISE SPECIFIED, WIRES COME FROM PIG TAIL HARNESS
* TB = TERMINAL BLOCK



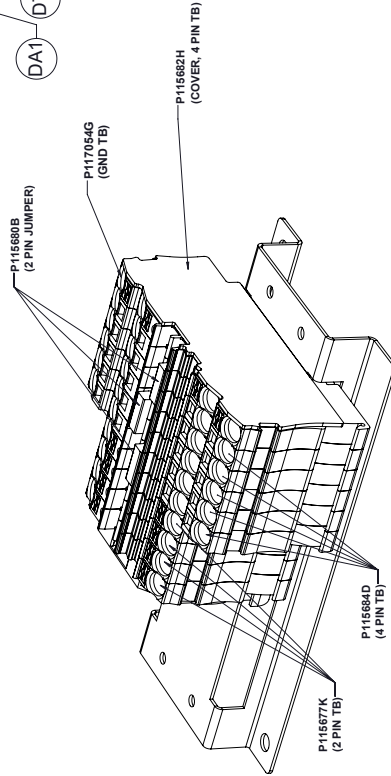
DETAIL C



REAR VIEW OF MPXZERO



CAREL MPXZERO WIRE ROUTING





Display Center
1000 North Main Street
Phoenix, AZ 85004
(602) 944-4400

Part Number

R902058

REF: AS.ELE.SB.MT448.JNRB.HST.MPX0

Drawn By: SGP

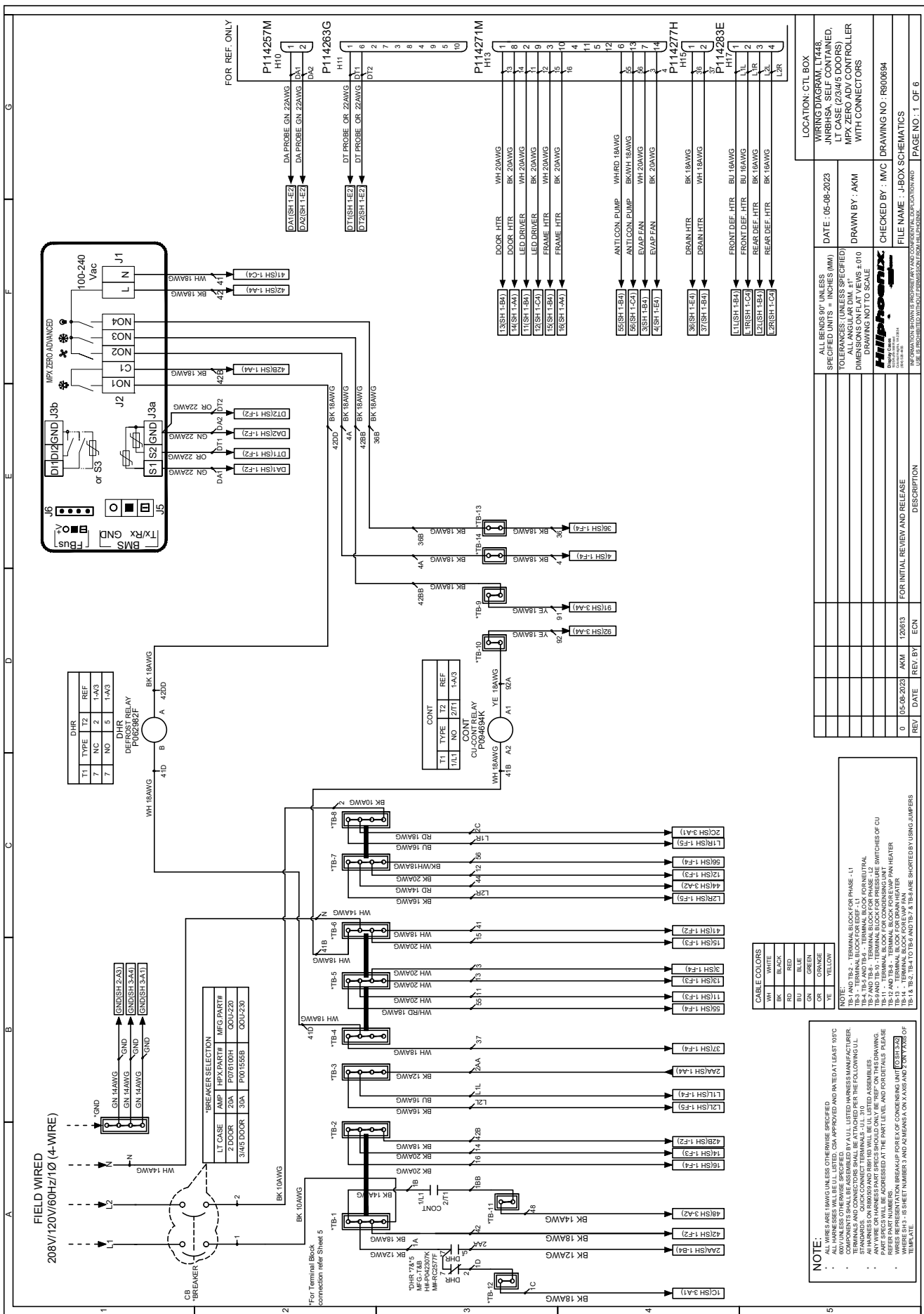
Date: 1/9/2023

Sheet: 2 of 2

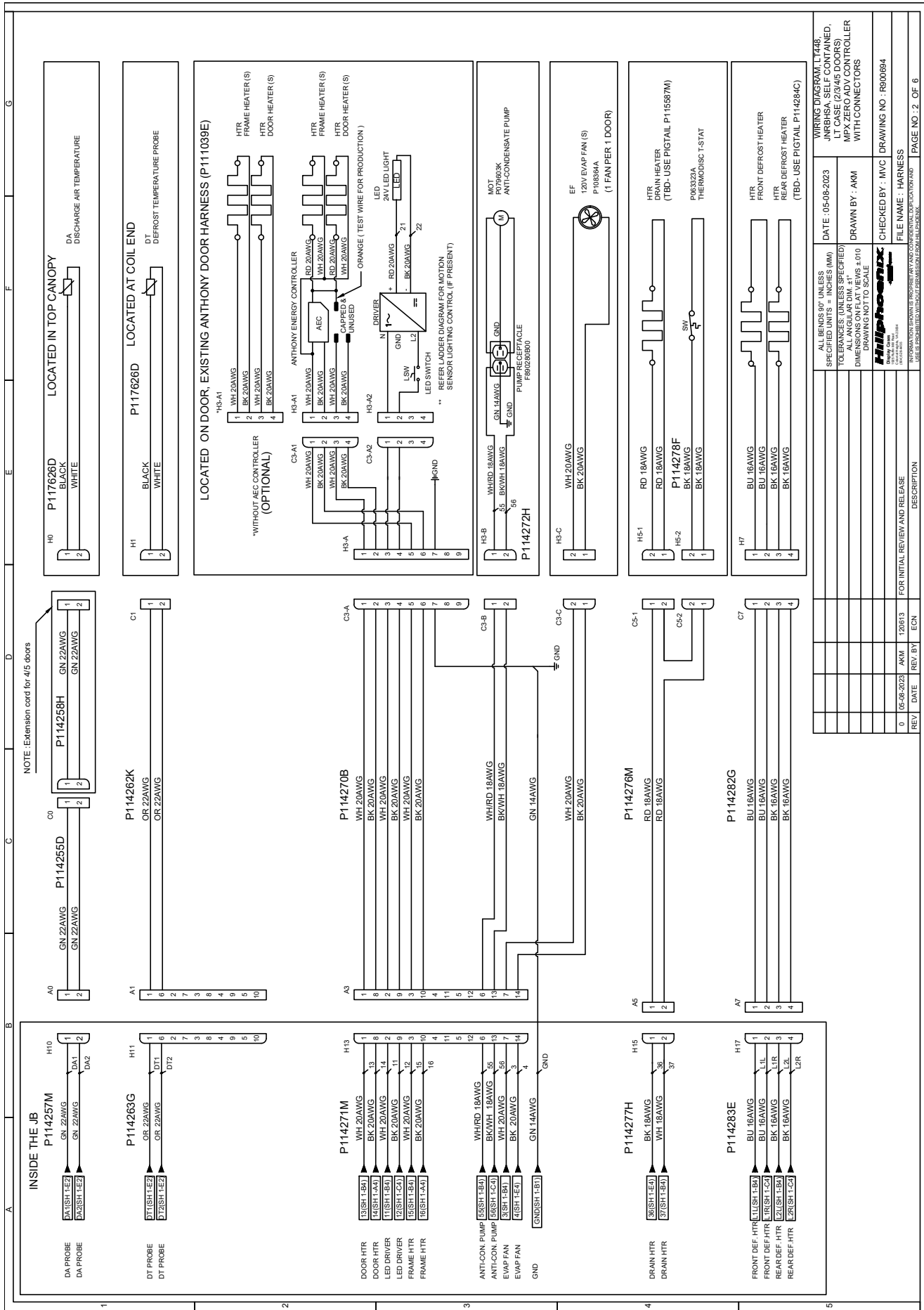
INFORMATION SHOWN IS PROPRIETARY AND CONFIDENTIAL. DUPLICATION AND USE IS PROHIBITED WITHOUT PERMISSION FROM HILPHENOX

“DRAWING GENERATED IN SOLIDWORKS”

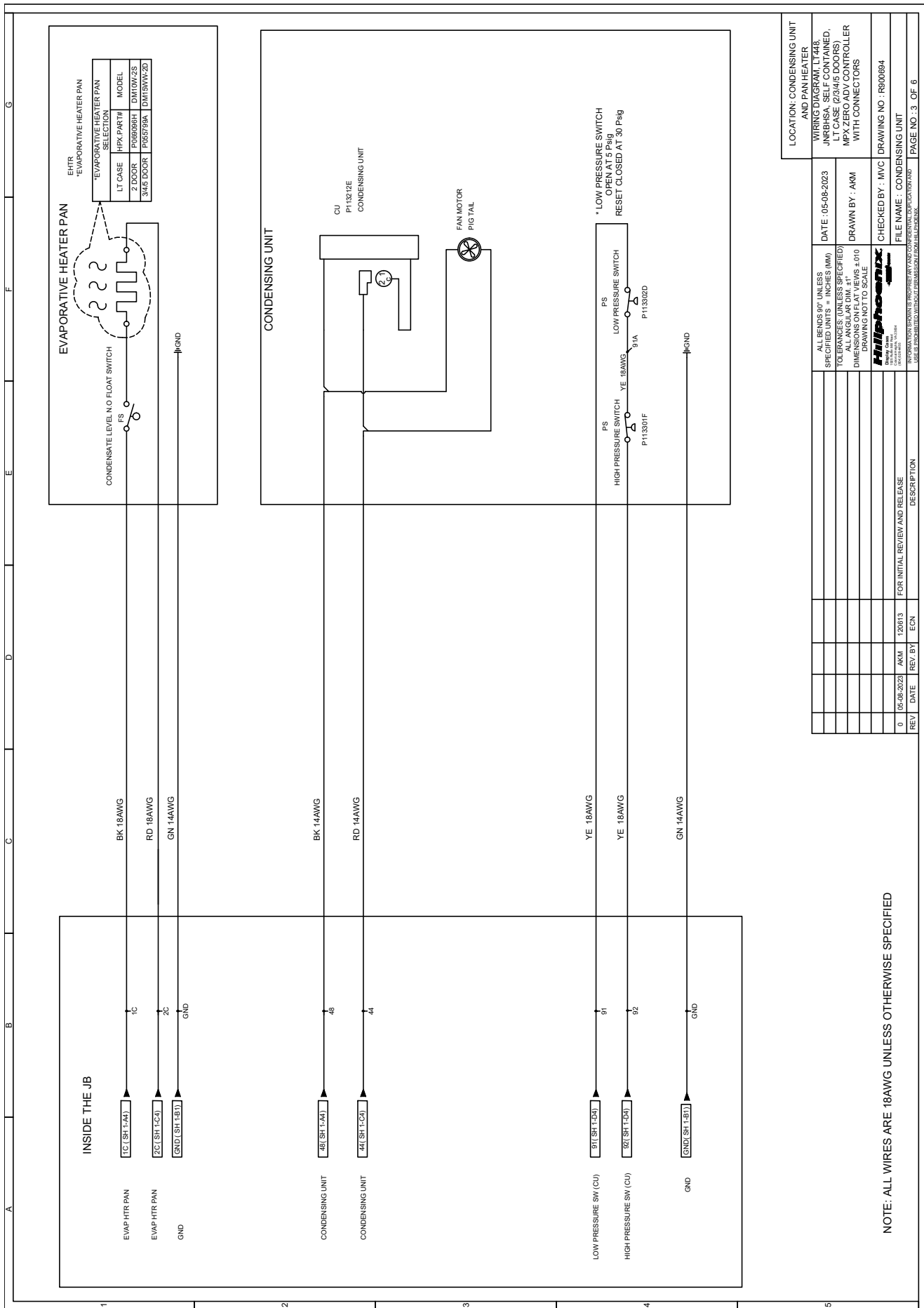
C11: JNRZHS-A 2-5 ELECTRICAL WIRING DIAGRAM (R448A)



C12: JNRZHS 2-5 ELECTRICAL WIRING DIAGRAM (R448A)

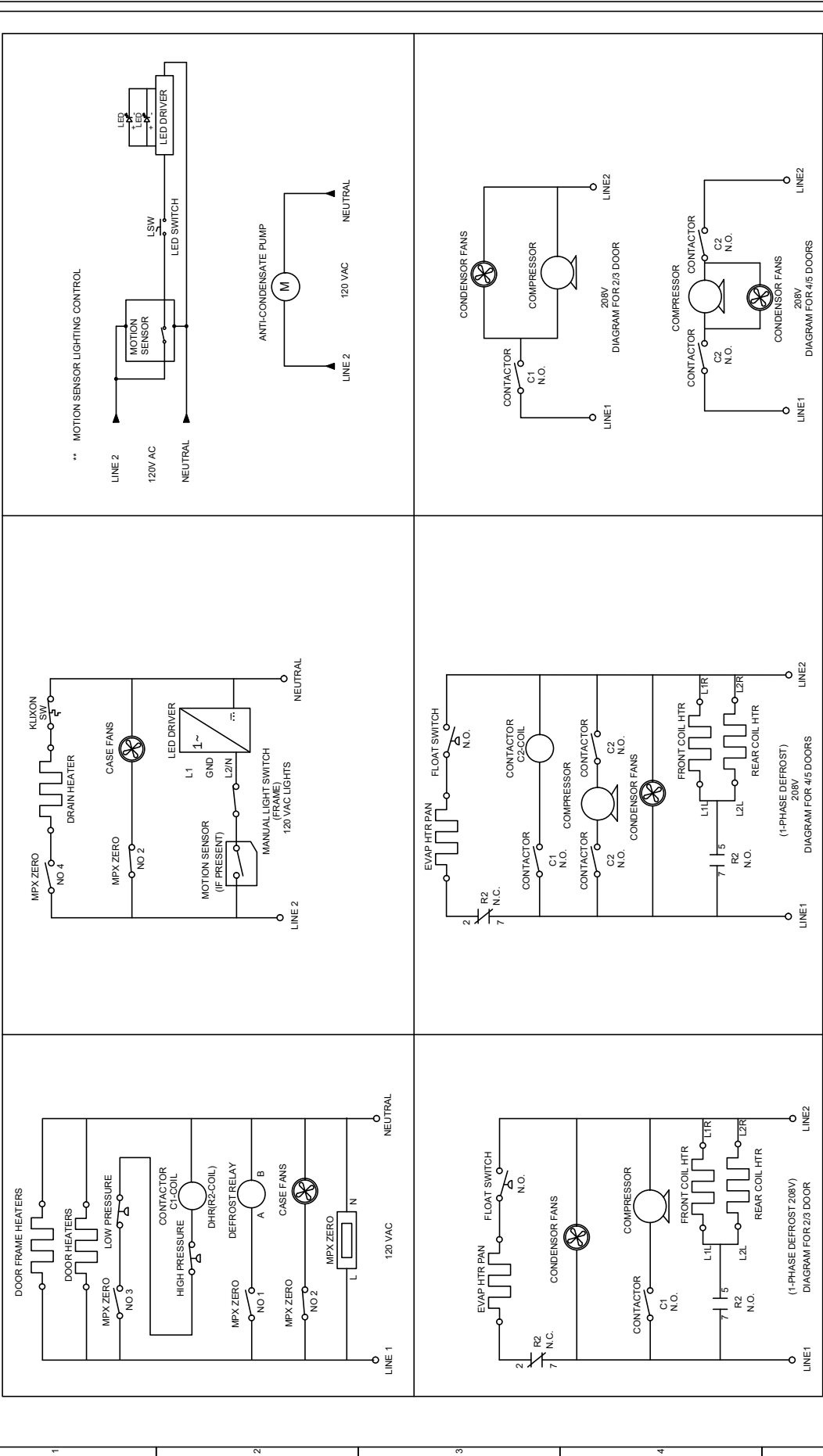


C13 JNRZHS 2-5 ELECTRICAL WIRING DIAGRAM (R448A)



C14: JNRZHS 2-5 ELECTRICAL WIRING DIAGRAM (R448A)

LADDER DIAGRAM

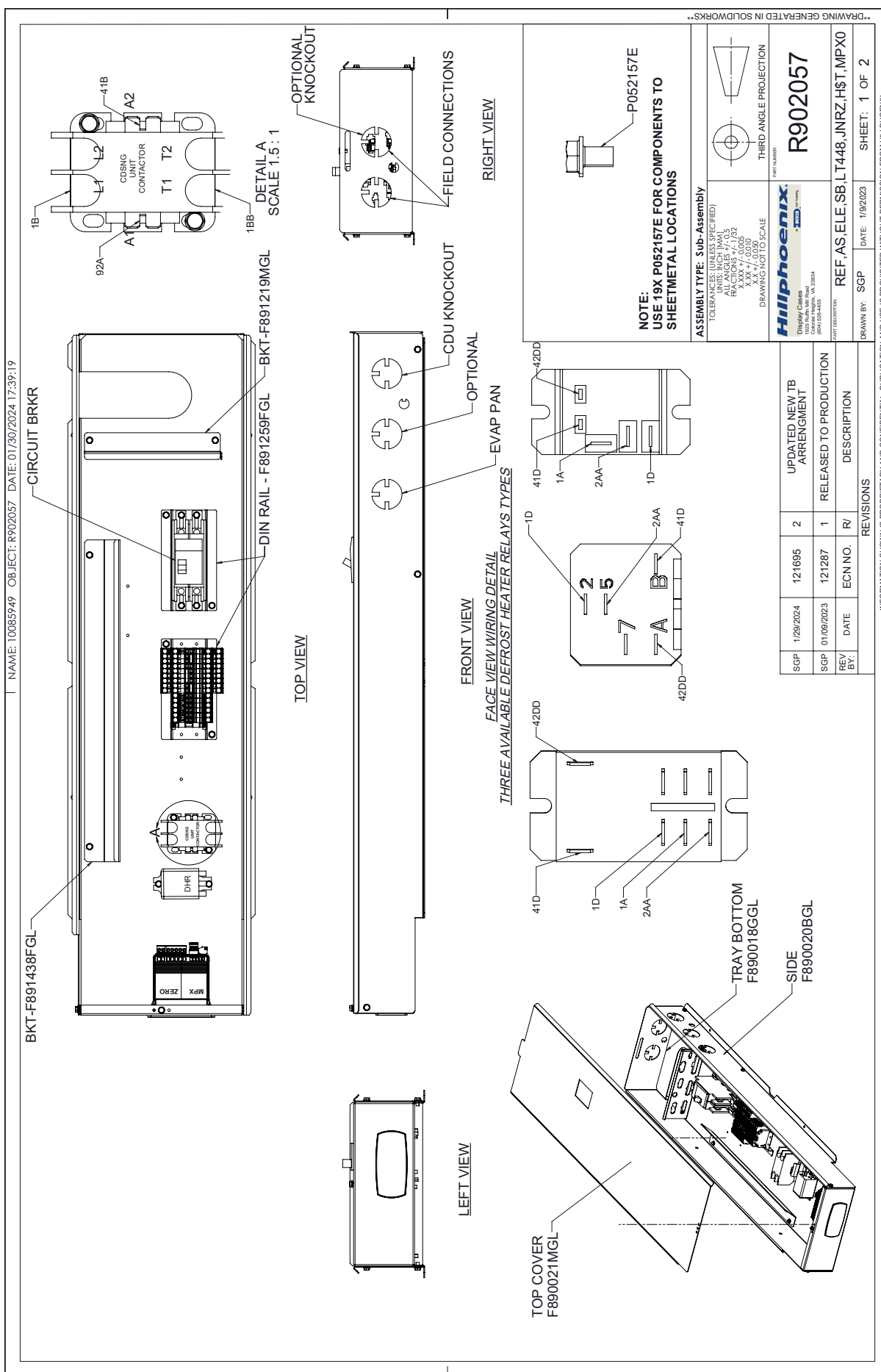


C16: JNRZHS 2-5 ELECTRICAL WIRING DIAGRAM (R448A)

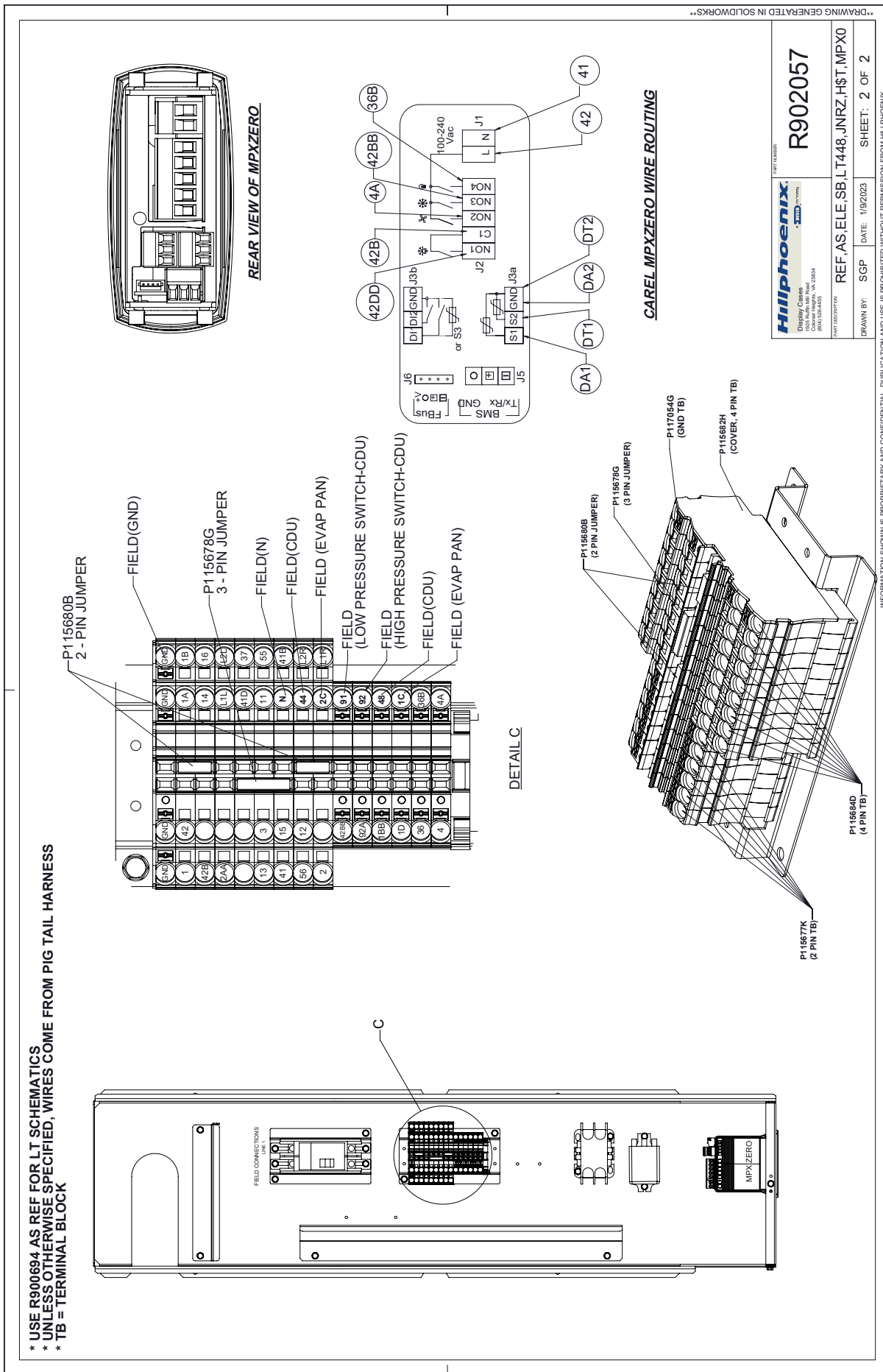
A		B		C		D		E		F		G	
CAD SYMBOLS													
TAG	SYMBOL DESCRIPTION			SYMBOL			TAG	SYMBOL DESCRIPTION			SYMBOL		
CB	1 POLE CIRCUIT BREAKER						H1# / C3#	PLUG CONNECTOR					
CB	2 POLE CIRCUIT BREAKER						A1# / H3#	RECEPTACLE CONNECTOR					
TB	2 - CONDUCTOR THROUGH TERMINAL BLOCK						RECP	PUMP RECEPTACLE					
TB	4 - CONDUCTOR THROUGH TERMINAL BLOCK						FS	FLOAT SWITCH					
R / CONT	RELAY/ CONTACTOR COIL						PS	HIGH PRESSURE SWITCH					
R / CONT	RELAY / CONTACTOR NO OR NC CONTACT						PS	LOW PRESSURE SWITCH					
R	FORM C RELAY CONTACT						SW	THERMODISC T-STAT					
SSR	SOLID STATE RELAY						JUMPER	TERMINAL BLOCK SHORT LINK / JUMPER					
GND	GROUND CONNECTION						CT	CURRENT TRANSFORMER					
DAVDT	TEMPERATURE PROBE						PT	PRESSURE TRANSDUCER					
HTR	HEATER						EF	EVAP FAN					
DRIVER / PWS	LED DRIVER / POWER SUPPLY						LS	LIQUID SOLENOID					
LIGHT	LED LIGHT						EEV	ELECTRONIC EXPANSION VALVE					
AEC	ANTHONY ENERGY CONTROLLER						###	WIRE NUMBER					
LSW	LED SWITCH												
TR	TRANSFORMER												

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C17: JNRZHS 2-5 ELECTRICAL WIRING DIAGRAM (R448A)



C18: JNRZHS A 2-5 ELECTRICAL WIRING DIAGRAM (R448A)



D1: CONTROLLERS AND SETPOINTS

Parameter table

Code	Description	Def	Min	Max	UOM	User Terminal	JNRBHTA MT 1 DR	JNRBHTA MT 2-5 DR	JNRZSHA LT 2-5 DR
Analogue inputs									
/P1	Type of probe, group 1 (S1, S2, S3) 0 = PT1000 Standard Range -50T150 °C 1 = NTC Standard Range -50T90 °C	1	0	1	-	S	YES		
/P5	Configuration of analogue output Y1: 0 = 0-10 V, 6 = PWM.	6	0	6	-	S	NO		
/FA	0 = Function disabled 1 = Probe S1 2 = Serial probe S12 3 = Serial probe S13 4 = Serial probe S14	1	-4	3	-	S	YES	1	1
/F5	Assign indoor temperature probe (S1) - see FA	2	-4	3	-	S	YES	2	2
/F6	Assign outdoor temperature probe (S2) - see FA	3	-4	3	-	S	YES	0	0
/F7	Assign auxiliary temperature/pressure probe 1 (Saux1) - see FA	0	-4	3	-	S	NO		
/F8	Assign auxiliary temperature/pressure probe 2 (Saux2) - see FA	0	-4	3	-	S	NO		
/F9	Assign ambient temperature probe (SA) - see FA	0	-4	3	-	S	NO		
/F10	Assign ambient humidity probe (SH) - see FA	0	-4	3	-	S	NO		
/F11	Assign glass temperature probe (SV) - see FA	0	-4	3	-	S	NO		
/F12	Assign dewpoint value (SDP) - see FA	0	-4	3	-	S	NO		
/F13	Defrost temperature probe (SD) calibration	0	-20	20	°C/F	S	NO		
/F14	Intake temperature probe (SI) calibration	0	-20	20	°C/F	S	NO		
/F15	Defrost temperature probe 2 (SD2) calibration	0	-20	20	°C/F	S	NO		
/F16	Auxiliary temperature/pressure probe 1 (Saux1) calibration	0	-20	20	°C/F	S	NO		
/F17	Auxiliary temperature/pressure probe 2 (Saux2) calibration	0	-20	20	°C/F	S	NO		
/F18	Ambient temperature probe (SA) calibration	0	-20	20	°C/F	S	NO		
/F19	Ambient humidity probe (SH) calibration	0	-20	20	°C/F	S	NO		
/F20	Glass temperature probe (SV) calibration	0	-20	20	°C/F	S	NO		
/F21	Dewpoint value (SDP) calibration	0	-20	20	°C/F	S	NO		
/F22	Condenser temperature probe calibration	0	-20	20	°C/F	S	NO		
/F23	Analogue probe measurement stability	9	1	15	-	M	NO		

Control	ON/OFF command 0 = OFF, 1 = ON	0	0	1	-	S	YES		
/A	Virtual probe composition	0	0	100	%	S	NO		
/r1	0 = Air off probe S1 100 = Air on probe S1	-50	-50	12	°C/F	M	NO	25	25
/r2	Minimum set point	50	r1	200	°C/F	M	NO	80	80
/r3	Automatic night set point variation	0	-50	50	°C/F	S	NO		
/r4	0 = Air off probe S1 100 = Air on probe S1	0	0	1	-	S	NO		
/r5	Master sensor valve configuration	0	0	20	°C/F	S	NO		
/r6	0 = local valve, 1 = network valve (connected to Main)	0	0	1	-	S	YES	30	-5
/S1	Set point	50	r1	12	°C/F	U	YES	36	
/S2	Intake probe set point with double thermostat	50	r1	12	°C/F	S	NO		
/r7	Differential	2	0.1	99.9	°C/F	U	YES	6	4
/r8	Operating mode 0 = Direct, 1 = Reverse	0	0	1	-	U	NO		
/r9	Set point S12 differential with double thermostat	0	0	99.9	°C/F	S	NO		
/r10	Virtual probe composition for glass temp. probe estimate	20	0	100	%	S	NO		
/r11	0 = Air off probe S1 100 = Air on probe S1	2	-20	20	°C/F	S	NO		
/r12	Coeff. A for glass temp. probe estimate	22	0	100	-	S	NO		
/r13	Coeff. B for glass temp. probe estimate	2	-20	20	°C/F	S	NO		
/r14	Offset for anti-sweat modulation	0	0	20	°C/F	S	NO		
/r15	Differential for anti-sweat modulation	70	0	100	%	S	NO		
/r16	Manual anti-sweat heater activation percentage (of period 'rH1')	5	0	180	min	U	NO		
/r17	0 = function disabled	0	0	999	min	U	NO		
/r18	Max time for Clean status	0	0	240	min	S	NO		
/r19	Maximum time for Standby status	0	0	240	min	S	NO		
/r20	Time light stays on after closing the door	0	0	240	min	U	NO		
/r21	Safety timeout for double thermostat function	0	0	240	min	M	NO		
/r22	Double thermostat function logic	0	0	1	-	M	NO		
/r23	0 = AND logic, 1 = OR logic								

Code	Description	Def	Min	Max	UOM	User Terminal	JNRBHTA MT 1 DR	JNRBHTA MT 2-5 DR	JNRZSHA LT 2-5 DR
Digital outputs									
DOA	Assign solenoid/compressor digital output 0 = not configured 1 = digital input 1 (ID1) 2 = digital output 2 (ID2) 3 = digital input 3 (ID3) 4 = digital input 4 (ID4)	2	0	4	-	S	NO	3	3
DOB	Assign alarm digital output - see DOA	0	0	4	-	S	NO		
DOC	Assign auxiliary digital output - see DOA	0	0	4	-	S	NO		
DOD	Assign auxiliary digital output serving the Main on the Secondary devices - see DOA	0	0	4	-	S	NO		
DOE	Assign light digital output - see DOA	4	0	4	-	S	NO	0	0
DOF	Assign light digital output serving the Main on the Secondary devices - see DOA	0	0	4	-	S	NO		
DOG	Assign defrost digital output - see DOA	1	0	4	-	S	NO	0	1
DOH	Assign auxiliary evaporator defrost digital output - see DOA	0	0	4	-	S	NO		
DOI	Assign second ON/OFF compressor digital output - see DOA	0	0	4	-	S	NO		
DOJ	Assign evaporator fan digital output - see DOA	3	0	4	-	M	NO	0	2
DON	Assign digital output for liquid valve (pump down)	0	0	4	-	S	NO		
DOO	Assign timed digital output - see DOA	0	0	4	-	M	NO	0	4
DOQ	Assign anti-sweat heater digital output - see DOA	0	0	4	-	S	NO		
DOA	Assign hot gas defrost digital output - see DOA	0	0	4	-	M	NO		
DOU	Assign digital output for max fan speed connection	0	0	4	-	M	NO		
DOV	Assign digital output for min fan speed connection	0	0	4	-	M	NO		
DOX	Solenoid/compressor digital output logic 0 = direct, 1 = reverse	0	0	1	-	M	NO		
ROA	Alarm digital output logic - see ROA	0	0	1	-	M	NO		
ROB	Auxiliary digital output logic - see ROA	0	0	1	-	M	NO		
ROD	Auxiliary serving the Main on the Secondary devices digital output logic - see ROA	0	0	1	-	M	NO		
ROE	Light digital output logic - see ROA	0	0	1	-	S	NO		
ROF	Logic serving the Main on the Secondary devices digital output logic - see ROA	0	0	1	-	S	NO		
ROG	Defrost digital output logic - see ROA	0	0	1	-	S	NO		
ROH	Auxiliary evaporator defrost digital output logic - see ROA	0	0	1	-	S	NO		
ROI	Evaporator fan digital output logic - see ROA	0	0	1	-	S	NO		
RON	Liquid valve digital output logic - see ROA	0	0	1	-	M	NO		
ROP	Drain heater digital output logic - see ROA	0	0	1	-	M	NO		
ROQ	Anti-sweat heater digital output logic - see ROA	0	0	1	-	M	NO		
ROAA	Hot gas defrost digital output logic - see ROA	0	0	1	-	M	NO		
ROB	Maximum fan speed connection digital output logic - see ROA	0	0	1	-	M	NO		
ROU	Minimum fan speed connection digital output logic - see ROA	0	0	1	-	M	NO		
ROJ	Alarm switched with time bands	0	0	1	-	M	NO		
H9	0 = Light 1 = AUX	0	0	1	-	S	NO		
DO12	Relay Type	-	-	-	-	-	-	3	3
DO22	0: normal mode 2: cycled mode	-	-	-	-	-	-	3	3
DO32	1: delayed mode 3: zero crossing	-	-	-	-	-	-	3	3
DO14		-	-	-	-	-	-	3	3
Digital Inputs									
DI3	Assign start defrost digital input - see DIA	0	-1	2	-	S	NO	1	1

D2: CONTROLLERS AND SETPOINTS

Code	Description	Def	Min	Max	UOM	User	Terminal	JNRBHA MT 1 DR	JNRBHA MT 2-5 DRLT 2-5 DR	JNRZSHA
Defrost										
d0	Type of defrost 0 = heater by temperature 1 = reserved 2 = heater by time 3 = hot gas by time 4 = temperature control with heater by time	0	0	4	-	S	YES			
dEP	Assign probe for end defrost in advance 0 = Not configured 1 = Outlet (Sn) 2 = Defrost (Sd) 3 = Intake (Sr) 4 = Defrost 2 (Scd2) 5 = Auxiliary 1 (Saux1) 6 = Auxiliary 2 (Saux2) 7 = Ambient humidity (SU) 8 = Ambient humidity (SV) 9 = Glass temperature (SV) 10 = Dew point (SDP) 11 = Virtual probe (SV)	0	0	11	-	S	NO			
dET	Temperature threshold for end defrost in advance	50	99.9	99.9	°C	S	NO			
d2	End defrost synchronised by Main 0 = not synchronised, 1 = synchronised	1	0	1	-	S	NO			
d3	Send start network defrost signal (for Main) 0 = ignore start network defrost signal (for Secondary) 0 = no, 1 = yes	0	0	1	-	S	NO			
d4	Defrost on power on 0 = Main = network defrost, Secondary = local defrost 0 = No, 1 = Yes	0	0	1	-	S	NO			
d5	Defrost delay at power-on or (for Secondary) after control signal from Main 0 = delay disabled	0	0	240	min	S	NO			
d6	Display on terminals during defrost 0 = temperature alternating with 'dEF' 1 = freeze display 2 = 'dEF'	1	0	2	-	U	NO	0	0	0
d7	Dripping time after defrost (fans off) 0 = no dripping	2	0	15	min	S	NO	0	0	0
d8	Skip defrost 0 = disabled, 1 = enabled	0	0	1	-	S	NO			
d9	Bypass high temperature alarm time after defrost 0 = compressor protection times observed, 1 = compressor protection times ignored	30	1	240	min	S	NO			
d10	Defrost time in Running time mode	1	0	1	-	M	NO			
d11	Defrost temperature threshold in Running time mode	0	0	240	min	S	NO			
d12	Pump down duration 0 = pump down disabled	-30	-50	50	°C/F	S	NO			
d13	Compressor off time in sequential stop defrost mode 0 = function disabled	0	0	999	s	M	NO			
d14	Compressor operating time in sequential stop defrost mode	0	0	45	min	M	NO			
d15	Additional end defrost temperature delta in power defrost mode	120	0	240	min	M	NO			
d16	Additional maximum defrost time delta in power defrost mode	0	-20	20	°C/F	S	NO			
d17	Additional maximum defrost time delta in power defrost mode	0	0	600	min	S	NO			
d18	Normal defrost duration for skip defrost	75	0	100	%	S	NO			
d19	End defrost by timeout signal 0 = disabled, 1 = enabled	0	0	1	-	S	NO			
d20	Defrost priority over continuous cycle 0 = No, 1 = Yes	0	0	1	-	M	NO			
d21	Assign probe 1 to determine start defrost (dd1-dd2) - see FSa	0	0	14	-	S	NO			
d22	Assign probe 2 to determine start defrost (dd1-dd2) - see FSa	0	0	14	-	S	NO			
d23	Temperature differential threshold to start defrost	50	99.9	99.9	°C	S	NO			
d24	Threshold evaluation time to start defrost	60	15	240	min	S	NO			
d25	Compressor frequency during hot gas defrost procedure	140	0	255	Hz	S	NO			
d26	Compressor frequency during dripping phase after hot gas defrost	140	0	255	Hz	S	NO			
d27	Hot gas activation delay	0	0	300	s	S	NO			

Code	Description	Def	Min	Max	UOM	User	Terminal	JNRBHA MT 1 DR	JNRBHA MT 2-5 DRLT 2-5 DR	JNRZSHA
Defrost scheduling										
td1	Defrost 1 to 8 - day 0 = event disabled 1 to 7 = Monday to Sunday 8 = Monday to Friday 9 = from Monday to Saturday 10 = Saturday & Sunday 11 = every day	0	0	11	day	S	NO	0	0	11
td1.8-h	Defrost 1 to 8 - hours	0	0	23	hours	S	NO	0	0	3
td1.8-m	Defrost 1 to 8 - minutes	0	0	59	minutes	S	NO			
td1.8-P	Defrost 1 to 8 - enable power defrost: 0 = normal, 1 = power defrost	0	0	1	-	S	NO			
td1	Number of daily defrosts (td1) 0 = Disabled 1 = 24 hours and 0 Minutes 2 = 12 hours and 0 Minutes 3 = 8 hours and 0 Minutes 4 = 6 hours and 0 Minutes 5 = 4 hours and 0 Minutes 6 = 3 hours and 0 Minutes 7 = 2 hours and 0 Minutes 8 = 1 hour and 0 Minutes 9 = 30 minutes and 0 Minutes 10 = 20 minutes and 0 Minutes 11 = 10 minutes and 0 Minutes 12 = 5 minutes and 0 Minutes 13 = 2 minutes and 0 Minutes 14 = 1 minute and 0 Minutes 15 = 30 seconds and 0 Minutes 16 = 20 seconds and 0 Minutes 17 = 10 seconds and 0 Minutes 18 = 5 seconds and 0 Minutes 19 = 2 seconds and 0 Minutes 20 = 1 second and 0 Minutes	0	0	14	-	S	NO			
d2S	Number of daily defrosts (td2) - see d1S	0	0	14	-	S	NO			
Evaporator fans										
F0	Evaporator fan management 0 = always on 1 = activation based on Sa - Sb (see FSa and FSb) 2 = activation based on Sa (Sa = first probe, Sb = second probe)	0	0	2	-	S	YES	0	0	2
F1	Evaporator fan activation threshold (only if F0 = 1 or 2)	-5	-50	50	°C/F	S	YES	30	30	30
F2	Evaporator fans with compressor off 0 = see F0 1 = always off	1	0	1	-	S	YES	0	0	0
F3	Evaporator fans during defrost 0 = on, 1 = off	1	0	1	-	S	F3	0	0	1
F4	Post-dripping time after defrost (fans off with control active)	2	0	15	min	S	NO			
F5	Fan activation differential (including variable speed)	2	0.1	20	°C/F	S	YES			
F6	Evaporator fan cutoff temperature (hysteresis 1°C)	50	F1	50	°C/F	S	NO			
F7	Maximum evaporator fan speed	100	F7	100	%	M	NO			
F8	Minimum evaporator fan speed	0	0	F6	%	M	NO			
F9	Evaporator fan peak time	0	0	240	s	M	NO			
F10	Evaporator fan running time at maximum speed 0 = Function disabled	0	0	240	min	M	NO			
FSa	First fan control probe 0 = Not configured 1 = Outlet (Sn) 2 = Defrost (Sd) 3 = Intake (Sr) 4 = Defrost 2 (Scd2) 5 = Ambient humidity (SU) 6 = Ambient humidity (SV) 7 = Ambient (SA) 8 = Ambient humidity (SU) 9 = Glass temperature (SV) 10 = Dew point (SDP) 11 = Virtual probe (SV)	2	0	11	-	M	NO			
FSb	Second fan control probe - see FSa	11	0	11	-	M	NO			
Fpd	Evaporator fans during post-dripping 0 = On, 1 = Off	0	0	1	-	0	NO			
POM	Unit cooling capacity indication	4000	0	32000	watts	M	NO			

ALL BEINGS 90° UNLESS SPECIFIED

UNITS = INCHES (MM)

TOLERANCES UNLESS SPECIFIED

DIMENSIONS ON FLAT VIEWS ± 0.05

DIMENSIONS ON ROUND VIEWS ± 0.05

DRAWING NOT TO SCALE

Display Cards

Phoenix

Phoenix Contact GmbH, D-42699 Solingen, Germany

REV: 01/10/24 121802 X RELEASED TO PRODUCTION

BY: DATE: ECN: NOIR/ DESCRIPTION

DRAWN BY: AMW DATE: 01/10/24

SETPOINTS, MPXzero
2-5DR LT, 1DR MT,
AND 2-5DR MT

R903688

SHEET 2 OF 4

D3: CONTROLLERS AND SETPOINTS

Code	Description	Def	Min	Max	UOM	User Terminal	JNRBHS MT 1 DR	JNRBHS MT 2.5 DRLT	JNRZSHA 2-5 DR
Connectivity									
In	Type of unit 0 = Secondary, 1 = Main	0	0	1	-	S	YES	1	1
H0	Serial or Main/Secondary network address 0 = 1 stop bit, no parity 3 = 2 stop bits, even parity 4 = 1 stop bit, odd parity 5 = 2 stop bits, odd parity	199	0	247	-	S	YES		
H1	BMS serial port baudrate (bits) 0 = 1 stop bit, no parity 3 = 2 stop bits, even parity 4 = 1 stop bit, odd parity 5 = 2 stop bits, odd parity	1	0	5	-	S	YES		
H2	BMS serial port baudrate (bits) 0 = 1 stop bit, no parity 3 = 2 stop bits, even parity 4 = 1 stop bit, odd parity 5 = 2 stop bits, odd parity	4	0	8	-	S	YES		
H3	BMS serial port protocol 0 = Carel, 1 = Modbus	1	0	1	-	S	YES		

Fields									
Sn	No. of slaves in the local network 0 = no slaves	0	0	9	-	S	NO		
H4	Bus port baudrate (bits) 0 = 1200 1 = 2400 2 = 4800 3 = 9600 4 = 19200	4	0	1	-	S	NO		

Notice: on fixed DEFAULT values for VCC serial

Display									
/5	Unit of measure 0 = °C/°F, 1 = °F/°C	0	0	1	-	S	YES	1	1
/6	Display decimal point 0 = Yes, 1 = No	0	0	1	-	S	NO	1	1
/11	Display on user terminal 0 = Disabled, 1 = Enabled 10 = Virtual probe 11 to 14 = Serial Probe 1 to 4 15 = Temperature set point	9	0	15	-	S	NO		
H5	Enable keypad and NFC functions 0 = Disabled, 1 = Enabled	1	0	1	-	U	NO		
H8	Buzzer 0 = No, 1 = Yes	1	0	1	-	U	NO		
ON	Unit On/Off command on display	1	0	1	-	S	NO		
ONK	Enable unit On/Off from keypad	1	0	1	-	S	NO		
ONS	Enable unit On/Off from supervisor	0	0	1	-	S	NO		

SETPOINTS, MPXzero 2-5DR LT, 1DR MT, AND 2-5DR MT									
Units = INCHES (MM)									
TOLERANCES UNLESS SPECIFIED									
DIMENSIONS ON FLAT VIEWS ± 0.10									
DIMENSIONS ON ROUND VIEWS ± 0.05									
DRAWING NOT TO SCALE									
Phoenix									
Display Case									
SETPOINT R903688									

SHEET 3 OF 4

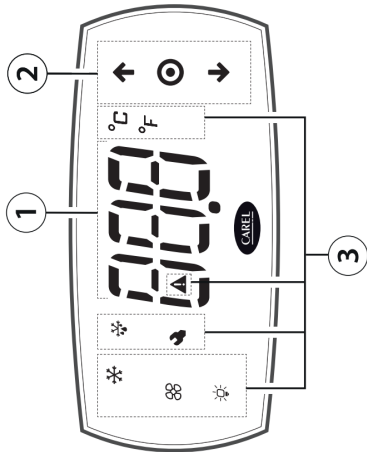
Code	Description	Def	Min	Max	UOM	User Terminal	JNRBHS MT 1 DR	JNRBHS MT 2.5 DRLT	JNRZSHA 2-5 DR
Solenoid/compressor									
c0	Delay to enable solenoid/compressor and evaporator fans at power-on	0	0	240	min	M	NO		
c1	Minimum time between consecutive compressor starts	0	0	15	min	M	NO		
c2	Minimum compressor OFF time	0	0	15	min	M	NO	5	5
c3	Minimum compressor ON time	0	0	15	min	M	NO	5	5
c4	ON time for duty setting operation (t off = 15 minutes, fixed value) 0 = compressor/valve always OFF 100 = compressor/valve always ON	0	0	100	min	M	NO		
cc	Running time in continuous cycle	1	0	15	hours	M	NO		
c6	Low temperature alarm bypass time after continuous cycle	60	0	240	min	M	NO		
c11	Second compressor start delay	4	0	250	s	S	NO		
c12	Second compressor start mode 0 = delay at start and in normal control 1 = delay at start only	0	0	1	-	S	NO		

Alarms									
A0	High and low temp. alarm reset differential	2	0.1	20	°C/°F	S	YES		
A1	Alarm thresholds (AL, AH) relative to the set point St or absolute 0/1 = relative absolute	0	0	1	-	S	NO	0	0
A2	Alarm thresholds (AL2, AH2) relative to the set point St or absolute 0/1 = relative absolute	0	0	1	-	S	NO		
A6	Configure compressor operation during external alarm (immediate or delayed) with fixed 15 min OFF time 0 = always OFF 100 = always ON	0	0	100	min	S	NO		
A10	Configure solenoid/compressor control during external alarm (immediate or delayed) with fixed 15 min OFF time 0 = always ON 100 = always OFF	0	0	100	min	S	NO		
A11	Delay time for delayed external alarm 0 = Signal-only alarm 1 = Signal and alarm	0	0	240	min	S	NO		
AA	Assign probe for high (AH/AHA) and low (AL/ALA) temperature alarms - see AA 0 = Not configured 1 = Outlet (Sm) 2 = Defrost (Sd) 3 = Intake (St) 4 = Defrost 2 (Sd2) 5 = Auxiliary 1 (Saux1) 6 = Auxiliary 2 (Saux2) 7 = Ambient (Sa) 8 = Gas (Sg) 9 = Glass temperature (Svt) 10 = Dewpoint (SdP) 11 = Virtual probe (Sv)	1	0	11	-	S	YES		
AA2	Assign probe for high (AH2, AHA2) and low (AL2, ALA2) temperature alarms - see AA	1	0	11	-	S	NO		
AL	Low temperature alarm threshold (relative to set point)	4	0	50	°C/°F	S	YES	6	6
ALA*	Low temperature alarm threshold (absolute threshold)	0	-50	50	°C/°F	S	NO		
AH*	High temperature alarm threshold (relative to set point)	10	0	50	°C/°F	S	YES	69	30
AHA*	High temperature alarm threshold (absolute threshold)	0	-50	200	°C/°F	S	NO		
AL2	Low temperature alarm threshold 2	0	0	50	°C/°F	S	NO		
ALA2*	Low temperature alarm threshold 2 (absolute threshold)	0	-50	50	°C/°F	S	NO		
AH2	High temperature alarm threshold 2	0	0	50	°C/°F	S	NO		
AHA2*	High temperature alarm threshold 2 (absolute threshold)	0	-50	200	°C/°F	S	NO		
Ad	Delay time for high and low temperature alarms (AHAHA, AL/ALA)	120	0	240	min	U	YES		
Ad2	Delay time for high and low temp. alarms (AH2/AHA2, AL2/ALA2)	30	1	240	min	U	NO		
Ar	Signal alarms from Secondary to Main 0 = not enabled, 1 = enabled	1	0	1	-	S	NO		
Add	High temperature alarm bypass time for door open	30	1	240	min	U	NO		
Tdoor	Door open: alarm delay	30	1	240	min	S	NO		
Hid	HACCP alarm delay 0 = monitoring disabled	0	0	240	min	S	NO		

Notice *: for alarms with an absolute activation threshold (A1=1) the thresholds AL/ALA2 and AHA/AHA2 need to be set correctly (default full scale, absolute alarms disabled).

SHEET 3 OF 4

User terminal



Key:

1	Main field
2	Keypad
3	Operating mode

3.2.2 Display

The icons provide information on device operation and/or the activation of certain functions, as shown in the table.		
Icon	Function	On
	Compressor	Compressor starts active
	Exhaust fan	Exhaust fan on
	Light	Light on
	Defrost	Awaiting defrost
	Service	Maintenance request
	Alarm	Alarm acknowledged
	Unit of measure °C	Unit of measure °C
	Unit of measurement degrees Fahrenheit	Unit of measure °F

3.2.1 Keypad

Button	Description	Function
UP / DOWN		- Increase/decrease the value - Scroll direct access functions - Enter direct access functions, direct access functions - LED flashing set parameter values
PRG		Pressed briefly: - Save value and return to the parameter code - Mute buzzer Pressed and held (hold until "..." is shown): - Enter direct access function menu (from main screen) and activate/deactivate functions Pressed and held (hold after "..." is shown): - Enter programming mode or return to previous level without saving - LED on: main screen/programming mode

Notice: when scrolling, a button is enabled only when illuminated.

Parameter categories visible on the user terminal

- Procedure 3b: navigate the menu tree, use the following buttons:
- UP and DOWN to navigate the menu and set the values;
 - PRG (3a) to save the values;
 - PRG (3a) to select the menu item or ESC to return to the previous branch. Example of how to set parameter S3 (set point):

D5: CONTROLLERS AND SETPOINTS

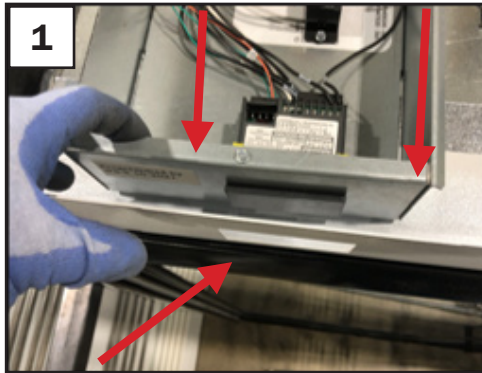
Setpoints for MPXzero Advanced - S0MPSA4B03S0274 (P118072H)				
NAME	ACRONYM	Value LT 2-5 DR	Value MT 2-5 DR	Value MT 1DR
Temp Unit	/5	1	1	1
Decimal pt	/6	1	1	1
Control Diff	rd	4	6	6
Minimum SetP	r1	-25	25	25
Maximum SetP	r2	80	80	80
Temp Setpoint	St	-5	30	36
Comp On Time	c2	5	5	5
Comp Off Time	c3	5	5	5
Defrost Interval	dl	24	12	12
Defrost Term Temp	dt1	48	40	40
Max Defrost Time	dP1	46	46	46
Drip Time	dd	0	0	0
Alarm Type	A1	0	0	0
High Temp Alarm	AH	69	30	30
Low Temp Alarm	AL	6	6	6
Fan Management	F0	2	0	0
Fan Start Temp	F1	30	30	30
Fans with comp	F2	0	0	0
Fan cycle defrost	F3	1	0	0
Defrost Day	td1-d	11	0	0
Defrost Hour	td1-hh	3	0	0
Defrost Display	d6	0	0	0
Discharge Air	/FA	1	1	1
Defrost Termination	/Fb	2	2	2
Return Air	/Fc	0	0	0
Drain Heater	DOP	4	0	0
Defrost Heaters	DOG	1	0	0
Fans	DOI	2	0	0
Compressor	DOA	3	3	3
Lights	DOE	0	0	0
Main/Secondary type	In	1	1	1
Defrost Trigger DI	DId	1	1	1
Relay Type	DOT1	3	3	3
	DOT2	3	3	3
	DOT3	3	3	3
	DOT4	3	3	3
P118567K				

E1: FASCIA FRAME

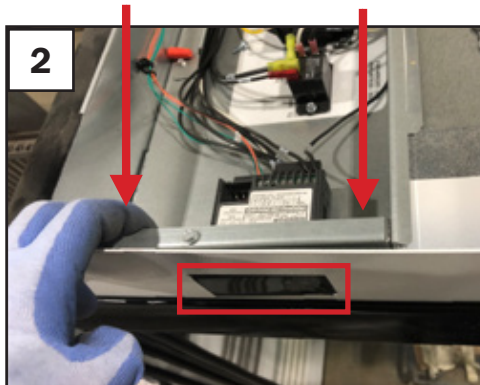
NOTES:

- Both sides of the fascia frame are called the “End Fascia”, as the frame is symetrical and either end can be right or left.
- Holes on top of the front panels are for paint line, no field screws needed (see last picture in instructions for example).

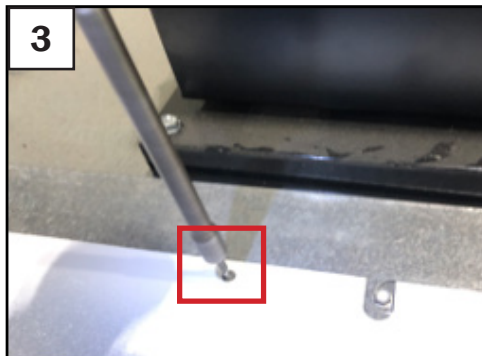
Push Base (white metal frame) into black frame-flange so it sits tight against it.



Slide gray controller box against white painted cut-out on top of the case so the controller face shows through cut-out.



Fasten fascia base to the case at the punched out holes only.



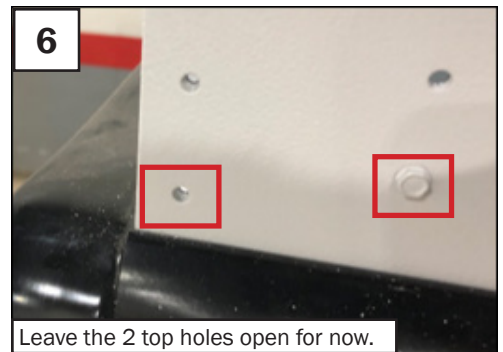
Nest the smaller, adjustable end fascia inside the larger end fascia.



Fasten the top of the bigger, end fascia to the smaller end fascia.

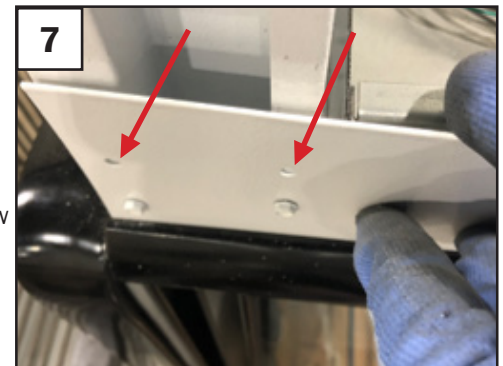


Fasten the end fascia at the bottom two holes ONLY.



Leave the 2 top holes open for now.

Keep top two screw holes of base loose for now until step 14



Fasten the end fascia you are currently working on, to case.

Repeat steps 4-8 for the other end fascia side.



E2: FASCIA FRAME

PLACE the top metal frame bar across one end fascia to the other. Do not fasten the metal bar to the frame at this point.



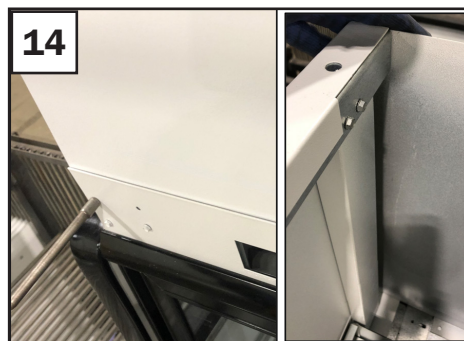
Slide panels behind fascia base.



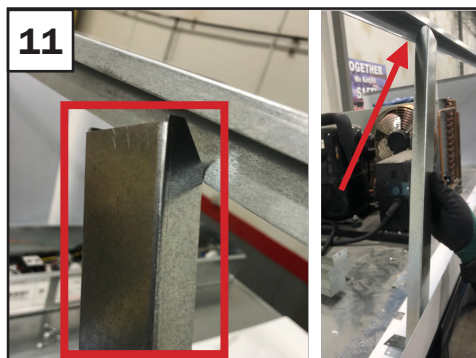
Fasten from REAR (pre-punched)



Fasten top front screws (base) to secure panels.



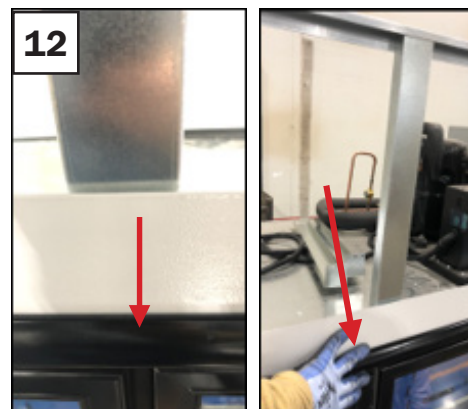
Slide vertical trim piece into the bottom of the top frame bar.



Slide trim tight against panels that were just installed in step 13.



Align vertical trim piece to the center frame mullions below.



Fasten the panels and the vertical trim pieces using the pre-punched holes only



E2: FASCIA FRAME

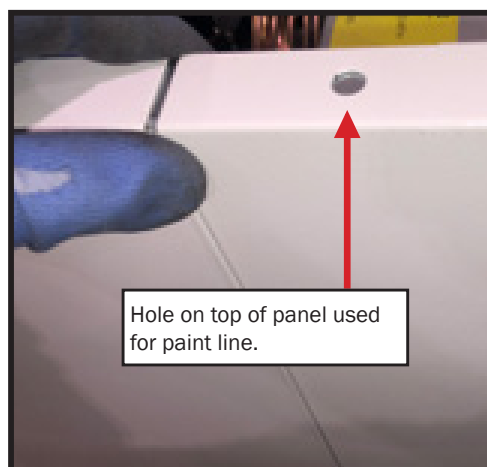
View of the final product,
taken from the back



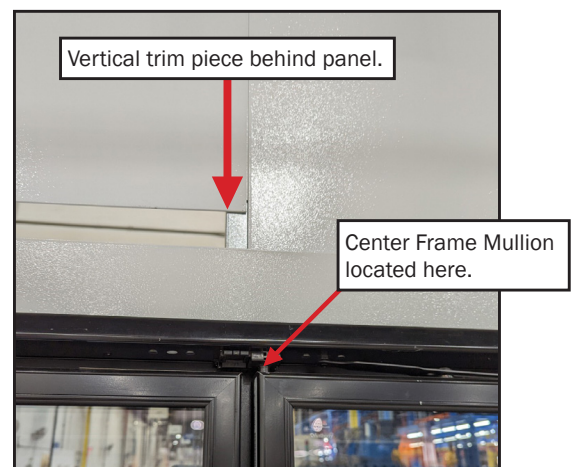
View of final set up with
fascia installed on top of
case.



EXAMPLES:



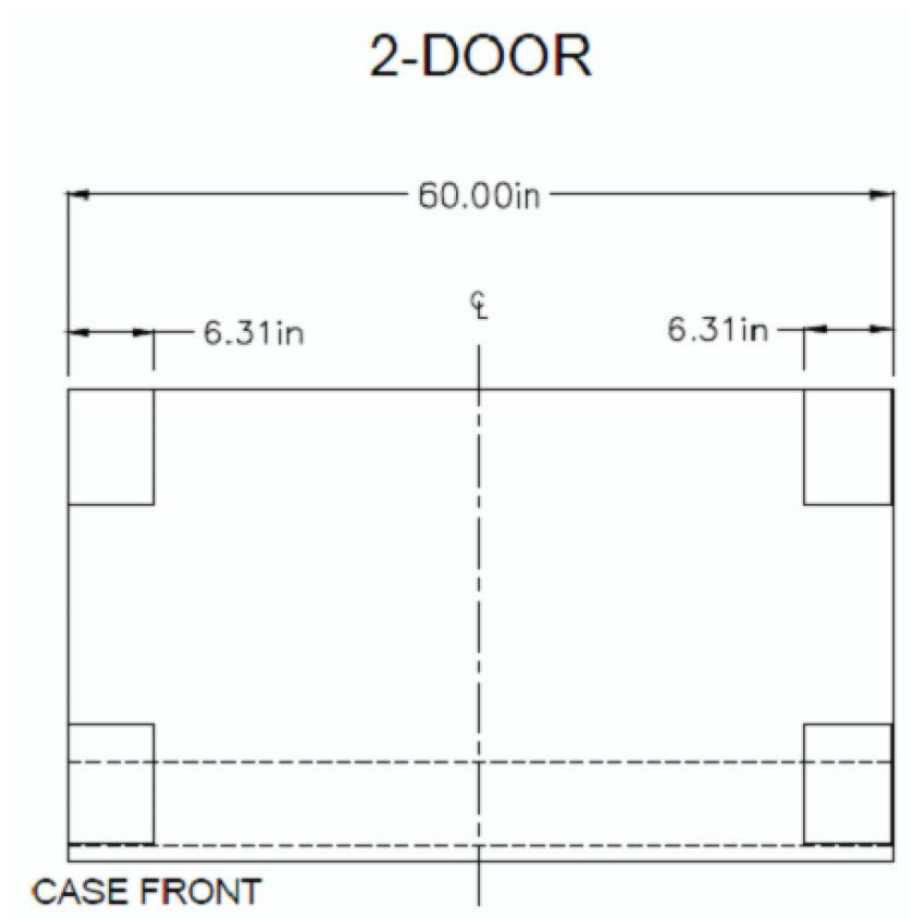
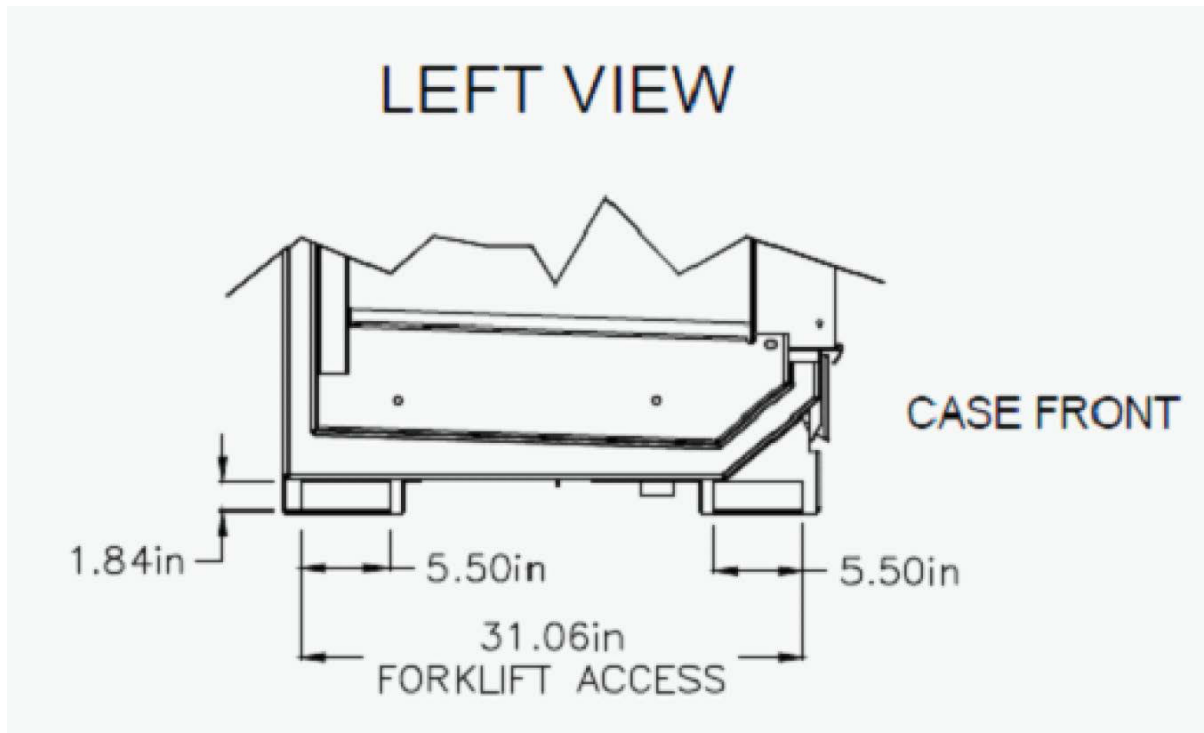
NOTE: This is an example of a hole on top of the fascia that is not to be used as a screw hole. There are several of these on the fascia panels and are used by Hillphoenix for painting purposes.



NOTE: The vertical trim pieces are required above every center frame mullion.

F1: CASE LIFTING LOCATIONS

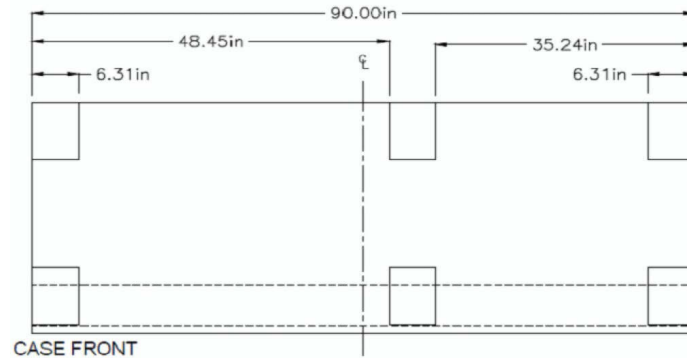
Base Frame Lifting Locations for Forklift – JNRBHSA/JNRZHSA



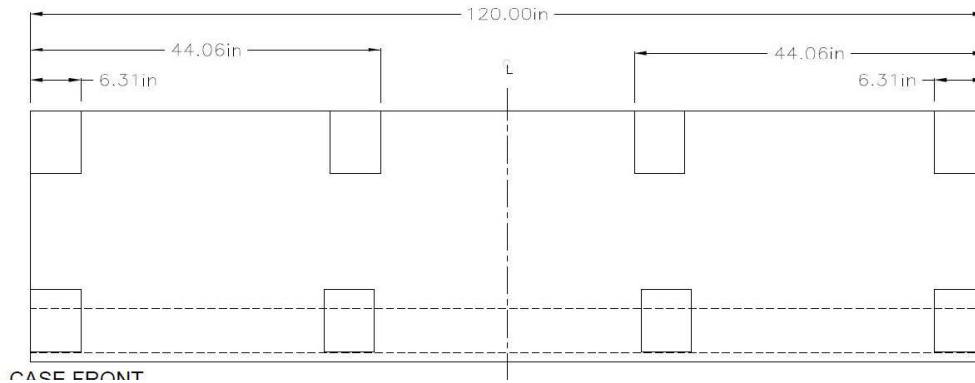
F2: CASE LIFTING LOCATIONS

Base Frame Lifting Locations for Forklift – JNRBHSA/JNRZHSA

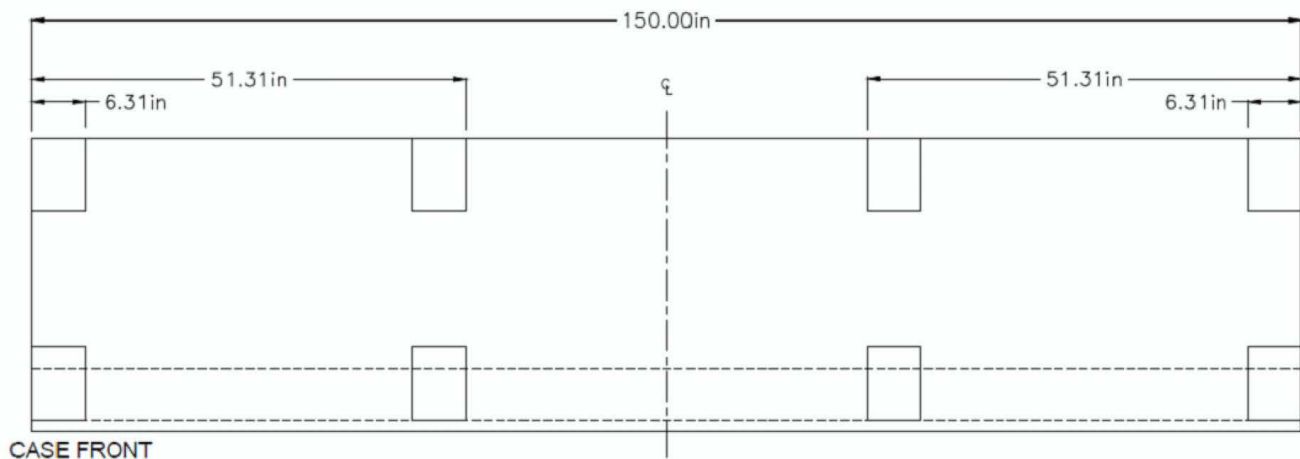
3-DOOR



4-DOOR



5-DOOR



Warning Maintenance & Case Care

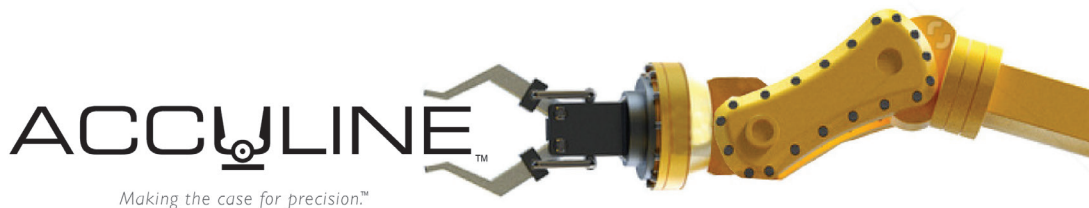
When cleaning cases the following must be performed PRIOR to cleaning:

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.



Tel: 1-804-614-1457

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WARRANTY

HEREINAFTER REFERRED TO AS MANUFACTURER

FOURTEEN MONTH WARRANTY. MANUFACTURER'S PRODUCT IS WARRANTED TO BE FREE FROM DEFECTS IN MATERIAL AND WORKMANSHIP UNDER NORMAL USE AND MAINTENANCE FOR A PERIOD OF FOURTEEN MONTHS FROM THE DATE OF ORIGINAL SHIPMENT. A NEW OR REBUILT PART TO REPLACE ANY DEFECTIVE PART WILL BE PROVIDED WITHOUT CHARGE, PROVIDED THE DEFECTIVE PART IS RETURNED TO MANUFACTURER. THE REPLACEMENT PART ASSUMES THE UNUSED PORTION OF THE WARRANTY.

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

The fourteen month warranty shall not apply:

1. To any unit or any part thereof which has been subject to accident, alteration, negligence, misuse or abuse, operation on improper voltage, or which has not been operated in accordance with the manufacturer's recommendation, 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. Outside the continental United States.
4. To labor cost for replacement of parts, or for freight, shipping expenses, sales tax or upgrading.
5. When the operation is impaired due to improper installation.
6. When installation and startup forms are not properly complete or returned within two weeks after startup.

THIS PLAN DOES NOT COVER CONSEQUENTIAL DAMAGES. Manufacturer shall not be liable under any circumstances for any consequential damages, including loss of profit, additional labor cost, loss of refrigerant or food products, or injury to personnel or property caused by defective material or parts or for any delay in its performance hereunder due to causes beyond its control. The foregoing shall constitute the sole and exclusive remedy of any purchases and the sole and exclusive liability of Manufacturer in connection with this product.

The Warranties are Expressly in Lieu of All Other Warranties, Express of Implied and All Other Obligations or Liabilities on Our Part. The Obligation to Repair or Replace Parts or Components Judged to be Defective in Material or Workmanship States Our Entire Liability Whether Based on Tort, Contract or Warranty. We Neither Assume Nor Authorize Any Other Person to Assume for Us Any Other Liability in Connection with Our Product.

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