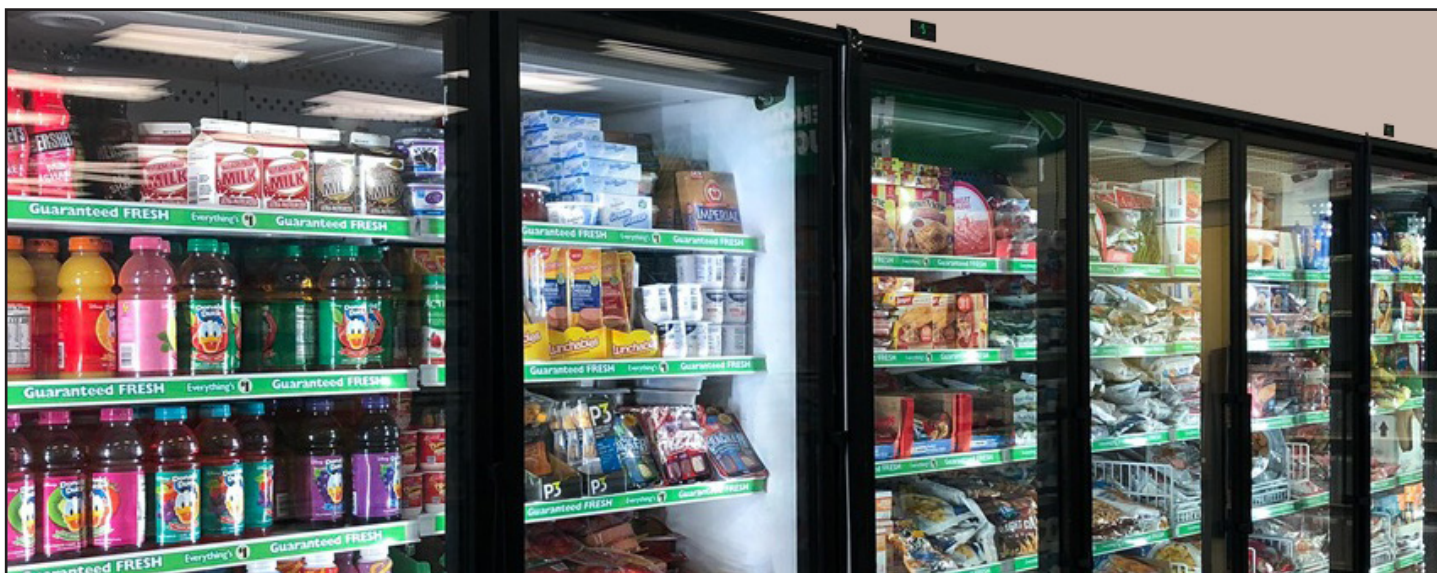




REACH-IN SELF-CONTAINED MERCHANDISER INSTALLATION & OPERATIONS MANUAL

JNRZHSA/JNRBHSA (R-290)

WARNING / FOR YOUR SAFETY

Do not store or use gasoline or other flammable vapors and liquids in the vicinity of this or any other appliance.

WARNING

R-290 flammable refrigerant in use. Improper installation, adjustment, alteration, service or maintenance can cause property damage, injury or death. Read the installation, operating and maintenance instructions thoroughly before installing or servicing this equipment.

ACCULINE™

Table of Contents

General Information	5	Case Cleaning & Fan Maintenance	30
Case Installation & Connections	6-24	Safety Devices & Service	31-33
Case Start-Up & Performance	25	Parts Ordering	34
Case Details	26-27	Appendices	35
Pre-Power Checklist	28	Defrost Synchronization Instructions	78
Airflow & Defrost.....	29	Addendum: Sequence of Operations	84-86

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.

Hillphoenix®

a **DOVER** company



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10/26

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

Rev.	Date	Change Description	Author
R0-V0	1/25	New Manual	T.A.G.
R1-V0	3/25	Electrical, Grease Trap, and Tech Sheet Updates	T.A.G.
R2-V0	3/25	Tech Sheets and Addendum: Sequence of Operations	T.A.G.
R3-V0	4/25	Tech Sheets and Addendum: Sequence of Operations	T.A.G.
R4-V0	5/25	Appendix A, Appendix D, and Appendix G	T.A.G.
R5-V0	11/25	Lighting Information and Tech Sheets	T.A.G.
R6-V0	2/26	Pump information, tech sheet updates, and GFCI information	T.A.G.
R7-V0	3/26	Tubing installation and standard installation information	T.A.G.
R8-V0	6/26	Case installation information and tech sheet updates	T.A.G.
R9-V0	10/26	Added case defrost synchronization instructions	T.A.G.

Thank you for choosing Hillphoenix for your food merchandising needs. This manual 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.

THIS UNIT CONTAINS R-290 FLAMMABLE REFRIGERANT. USE CAUTION WHEN HANDLING, MOVING OR SERVICING THE DISPLAY CASE. AVOID DAMAGING THE REFRIGERANT TUBING WHICH COULD INCREASE THE RISK OF A LEAK.

SHIPPING CASES

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

RECEIVING CASES

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

CASE DAMAGE

Claims for obvious damage must be 1) noted on either the freight bill or the express receipt and 2) signed by the carrier's agent; otherwise, the carrier may refuse the claim. If damage becomes apparent after the equipment is unpacked, retain all packing materials and submit a written request to the carrier for inspection within 14 days of receipt of the equipment.

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

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

LOST/MISSING ITEMS

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

SERVICE PARTS & TECHNICAL SUPPORT

For service parts questions regarding our cases, please contact our Service Parts Department at 1-833-372-7871 or orderparts@doverfoodretail.com

For technical questions regarding our cases, please contact our Technical Support Department at 1-833-280-5714.

CONTACTING THE FACTORY

If you need to contact Hillphoenix regarding a specific fixture, be certain that you have both the case model number and serial number. This information can be found on the data tag, located at the top-left interior, rear exterior panel or interior rear lower storage of the case. *Location may vary based on case design.* When you have this information, call the toll-free number listed above.

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

Tools Needed for Installation

- Hammer
- 1/4" Hex head
- 1/2" Hex head
- Pallet jack (J-bar)
- Forklift
- Wrench - 7/8"
- Wrench - 15/16"
- Bubble level or Laser transit

Summary of Installation

1. Unload cases from truck (**Receiving**)
2. Prepare cases to go through doorway (**Doorway Prep**)
3. Reinstallation of parts removed once cases are inside the store
4. After moving cases near installation place, install the drain, pump, and leak mitigation (if necessary)
5. Move cases into place and level cases
6. Case installation and trim out
7. Make connections (**Final Install**)

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 (Fig. 1). Unhook the strap from the wall and save the strap for a later step (Fig. 2).



Fig. 1 Decompress the ratchet



Fig. 2 Unhook strap from wall

Discard of any shipping wood dunnage properly.

2. Each case includes one of two base frame designs. The first one is the standard 5" base frame that is typical for reach-in case models and includes casters for easy handling. The second "optional" base frame is a 2+3 split base frame that allows entry into low doorway heights. It is shipped as a 2" base frame, allowing entry through low doorway heights (once CDU is removed). Once inside the store, install the ship loose 3" additional supports to do a proper install of the case. Do not pull on door handles or lean on the door glass when moving the case.



Fig. 3 Optional split base frame

3. Carefully inspect cases for damage before removing them from the truck. Any shipping damage should be noted.



CAUTION

Use adequate equipment, follow all safety requirements, and ensure blades are fully under the case prior to lifting. See **Appendix G** 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 (Fig. 4). Ensure that pallet blades extend past the second set of base feet on the case (Fig. 5). Avoid causing damage to the drain hub (Fig. 6). The case may also be lifted manually using a J-bar. See **Appendix G** for more on lifting locations.



CAUTION

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



Fig. 4 Base feet lifting points



Fig. 5 Pallet blades extend past the second set of base feet



Fig. 6 If using a pallet jack, avoid damaging the drain hub (centered left-right on case)



Fig. 7 Unload with forklift and tow straps

Check if any parts are missing. Then, taking the greatest care possible, unload the cases with a forklift and tow straps (Fig. 7).

Note: Only licensed forklift drivers may operate the forklift using the correct length forks or extensions for the length of the case.

Move the cases as close to the store's access, in as safe and easily accessible location, as possible. A more thorough inspection is possible once off of the truck.

DOORWAY PREP

Cases with R-290 condensing units are shipped with the condensing unit mounted (Fig. 8a). Move case into the store without removing the CDU, if possible, and skip to the **Case Prep** section of the manual (page 10). For low doorway entry, the condensing unit may have to be removed for any height restrictions. High charge units have condensing unit housing and piping covers that will have to be removed (Fig. 8b).

Note: Low charge units are shipped with the condensing unit inlet guard installed, see step 3 for its removal.

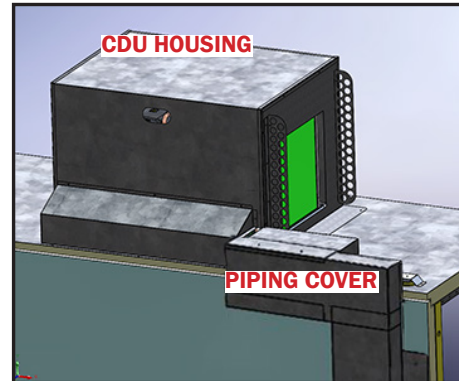


Fig. 8a Case shipped with CDU

HIGH CHARGE (>150) vs LOW CHARGE (<150)				
Model	2 Door	3 Door	4 Door	5 Door
JNRBHA	Low Charge	Low Charge	Low Charge	Low Charge
JNRZHA	Low Charge	High Charge	High Charge	High Charge

Fig. 8b Case charge per length

1. Release the (2) fasteners on the cap of the piping cover with a 1/4" hex head to remove the cap (Fig. 9a). This will expose the piping connections (Fig. 9b).

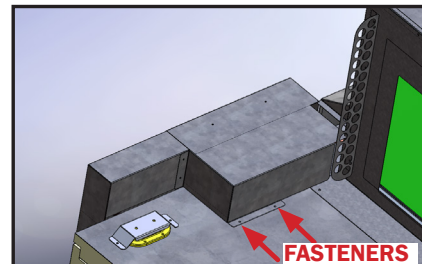


Fig. 9a Location of piping cap fasteners

⚠ ATTENTION

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

CASE INSTALLATION

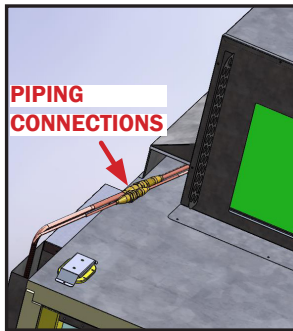


Fig. 9b Remove cap from piping cover

2. On the CDU housing, there are a total of (8) screws that will need to be removed: (3) at the back, (3) on the left, and (2) on the right side (Fig. 10). Once the screws are removed, cover can be lifted and removed (Fig. 11). Retain all screws and sheet metal that are removed.

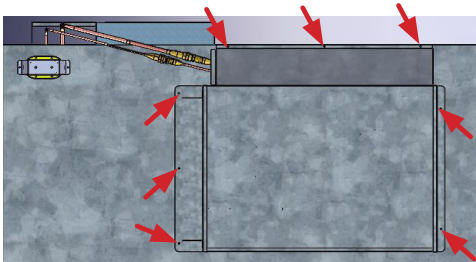


Fig. 10 CDU housing screw locations (top view)

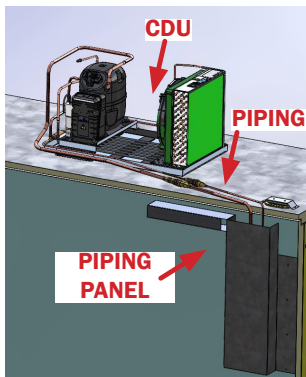


Fig. 11 Remove CDU housing

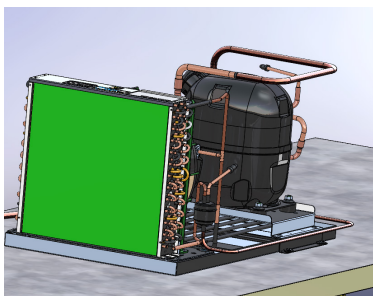


Fig. 12 CDU view

3. For low charge cases, the condensing unit inlet guard may need to be removed for doorway entry (Fig. 13). Remove screws connecting CDU inlet guard to top of case and lift housing to remove. Retain all screws and sheet metal that are removed.

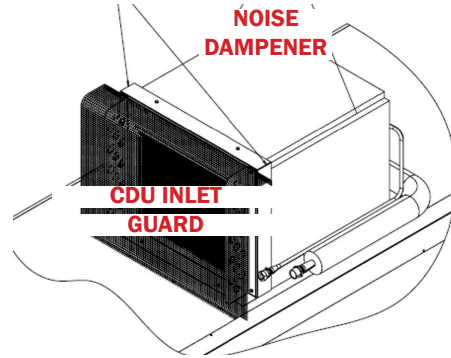


Fig. 13 Low charge housing

4. With the covers removed, couplings can be disconnected to safely remove condensing unit (Fig. 14). Using a 7/8" wrench, disconnect the male piping connection. Using a 15/16" wrench, disconnect the female piping connection.

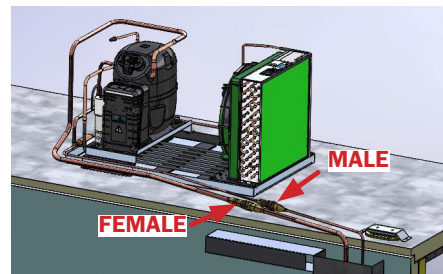


Fig. 14 Male and female piping connections

5. Gently push the connections to the rear of the case (Fig. 15) and bend them downward into the rear piping panel (Fig. 16). The piping connections can rest upon the metal cover to the left of the piping cover.

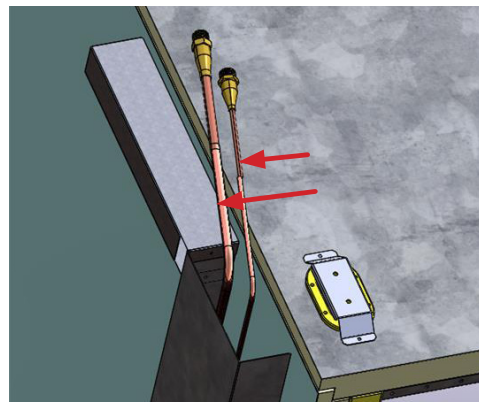


Fig. 15 Push connections towards case rear

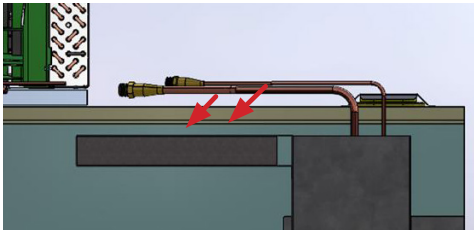


Fig. 16a Bend connections downward

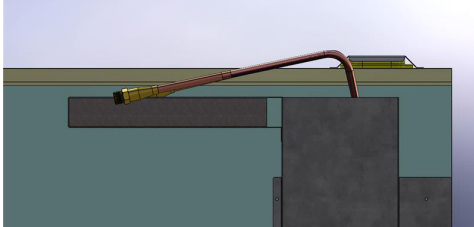


Fig. 16b Final view of piping

6. With connections out of the area, screws can now be removed. For 2 and 3-door cases, remove screws attaching CDU to top of the case (Fig. 17a) with 1/4" hex head. For 4 and 5-door cases, remove screws attaching CDU to top of the case (Figs. 17b-c) with 1/2" hex head.

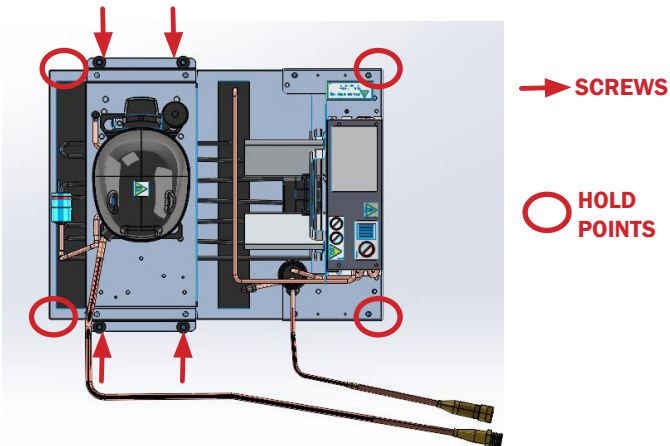


Fig. 17a 2, 3, 4, and 5-door MT CDU and 2-door LT CDU screws and hold points

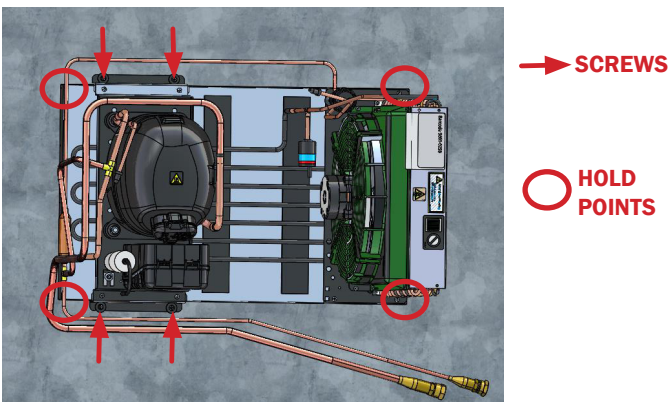


Fig. 17b 3-door LT CDU screws and hold points

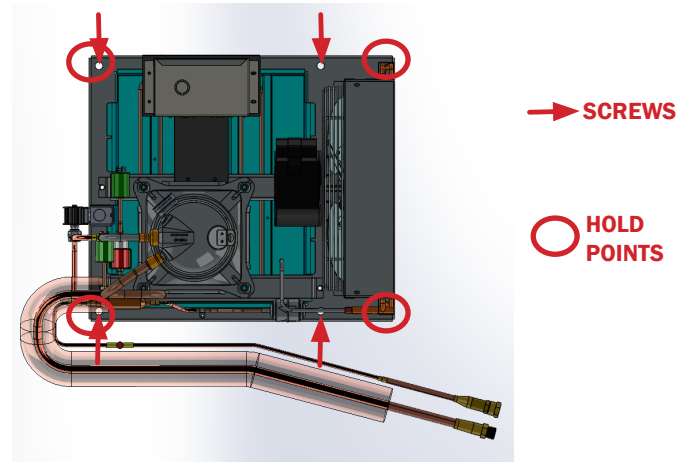


Fig. 17c 4 & 5-door LT CDU screws and hold points

Note: If case height is still too tall, 0.875" can be gained by removing the egress and cover. For additional height clearance, the oval egress cover can be removed. If no further height restrictions, proceed to step 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 (Fig. 18). **Do not remove this bracket at this time unless necessary.**



Fig. 18 Oval egress shipping bracket fasteners

- I. 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).
- II. 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.
- III. When the case has been moved into the store, two beads (~1/8"-1/4") of silicone will need to be applied around the egress under the flange and ~1/2 way down 3" wall (Fig. 19). Reassemble and seal the egress into the canopy. Reinstall (4) screws in the egress flange.

CASE INSTALLATION

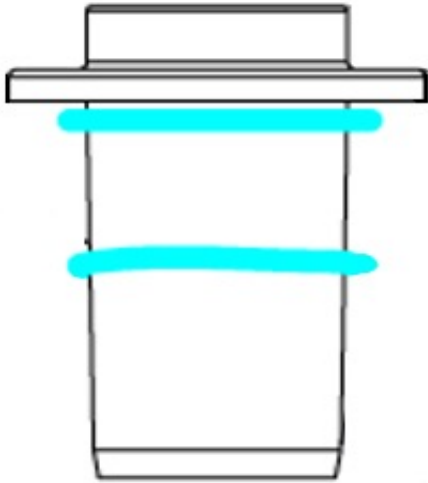


Fig. 19 Apply silicone under flange and ~1/2 way down 3" wall

7. Using a two-person team and the four corners of the drain pan as lift points, gently lift condensing unit from the top of the case (Fig. 20) and place in a safe location for later install. Case is ready for doorway entry (Fig. 21).

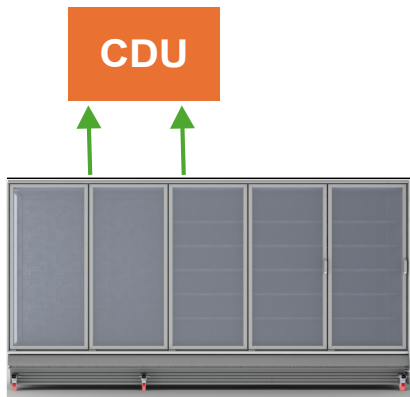


Fig. 20 Remove CDU

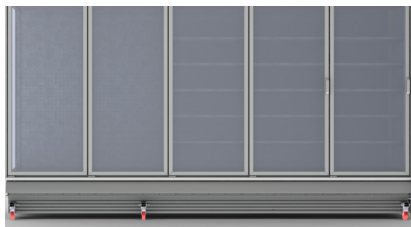


Fig. 21 Ready for doorway

! WARNING

If lifted through the base feet, pallet blades must extend past the second set of base feet on the case.

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.

CASE PREP

Once case is through the doorway, position case approximately 6' away from its final install position.

Reconnecting the CDU

1. Condensing unit can now be placed back on top of the case using a two-person team and the same drain pan hold points (Fig. 22). Reinstall CDU screws to secure the unit (Figs. 23a & 23b-c).

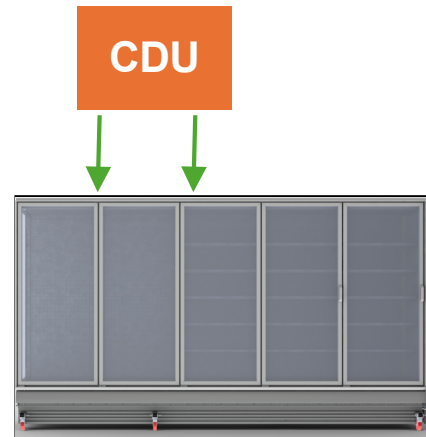


Fig. 22 Reinstall CDU

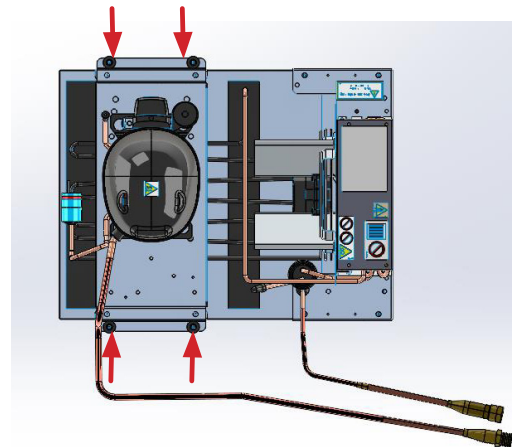


Fig. 23a Reinstall CDU screws (2 & 3 door MT)

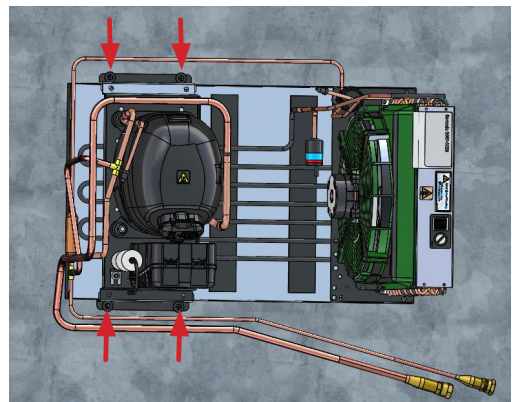


Fig. 23b Reinstall CDU screws (3 door LT)

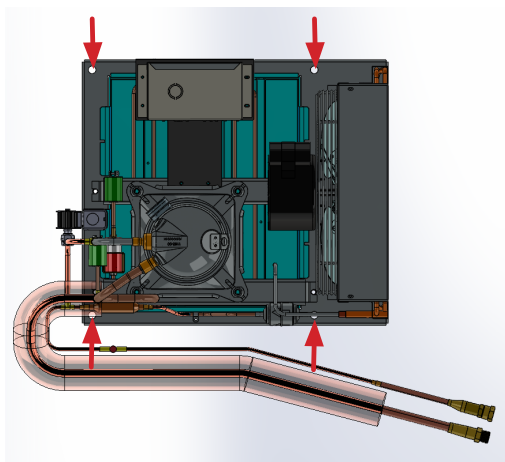


Fig. 23c Reinstall CDU screws (4 & 5 door LT)

2. Bend piping connections back into place and reconnect piping connections using wrenches noted in step 3 (Figs. 24-26).

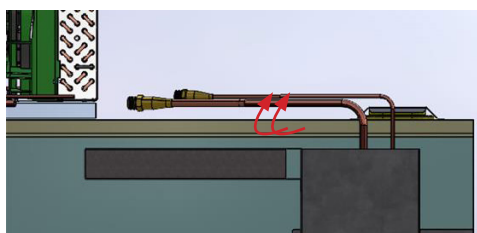


Fig. 24 Bend connections upward

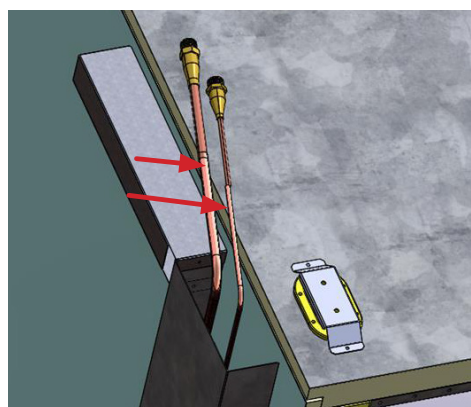


Fig. 25 Push connections towards case front



Fig. 26 Torque tightening requirements

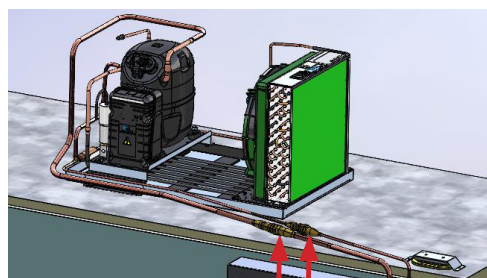


Fig. 27 Reconnect piping connections per the tightening torque specification in Fig. 26

Leak Mitigation Blower Sub-System (High Charge Cases)

CAUTION

The blower sub-system requires adequate access to the rear and bottom of the case. To ensure a trouble-free installation, it is recommended to assemble it on the case before installing it along the wall or into an existing lineup.

For Low Charge cases, skip to "Pump and Tubing Installation".

Note: To determine if a case is high charge or low charge, refer to Fig. 8b.

HIGH CHARGE (>150) vs LOW CHARGE (<150)				
Model	2 Door	3 Door	4 Door	5 Door
JNRBHA	Low Charge	Low Charge	Low Charge	Low Charge
JNRZHA	Low Charge	High Charge	High Charge	High Charge

Fig. 8b Case charge per length

3. With the cases 6' away from final position, high charge cases can now have the Leak Mitigation Blower Sub-system (Fig. 28) installed, allowing enough space for the drain to be assembled. The Leak Mitigation Blower Sub-system consists of the Blower sub-assembly and the Drain Adapter sub-assembly.

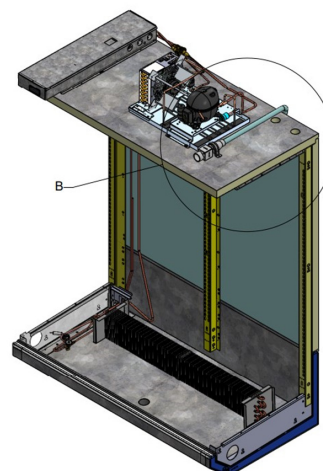


Fig. 28 Blower sub-assembly

CASE INSTALLATION

4. Install the PVC Drain Assembly (Figs. 29a and 29b) to the case drain hub on the bottom of the case. For high charge cases (>150g), the drain solution with adapter and blower systems (leak mitigation solution) is used, and the barb fitting should be pointing to the rear of the case. For low charge cases (<150g), the standard drain is used.

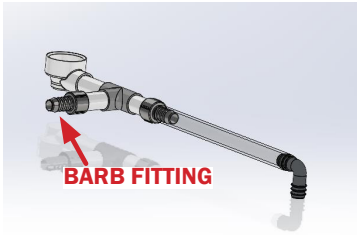


Fig. 29a Drain Assembly with Adapter (high charge)

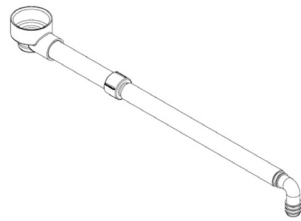


Fig. 29b Standard Drain Assembly (low charge)

5. Once the Drain Adapter is secured, attach the Long Vinyl tubing to the rear-facing barbed fitting (T-section) (Fig. 30).

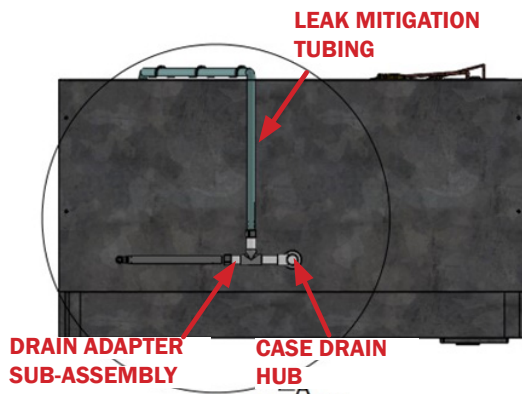


Fig. 30 Long vinyl tubing

6. Mount the ship loose blower to the top of the case, securing it with the ship loose clamp on its adapter body (Fig. 31).

Note: Blower must be located behind the CDU or the CDU metal housing.

7. Connect the vinyl tubing from the barb fitting of the drain adapter assembly on the bottom of the case to the blower on the top of the case by routing the vinyl tubing under the case and along the back of the case. (Fig. 31)

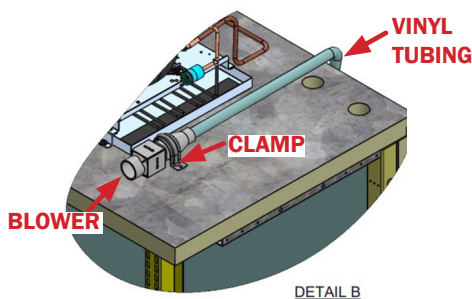


Fig. 31 Vinyl tubing to PVC blower

8. Now fix three of the tubing clamps provided in the package at equal intervals at the rear of the case. While fitting the clamps, ensure there is sufficient slack in the tubing of the assembly to prevent any form of tension or breakage at the drain adapter (Fig. 32).

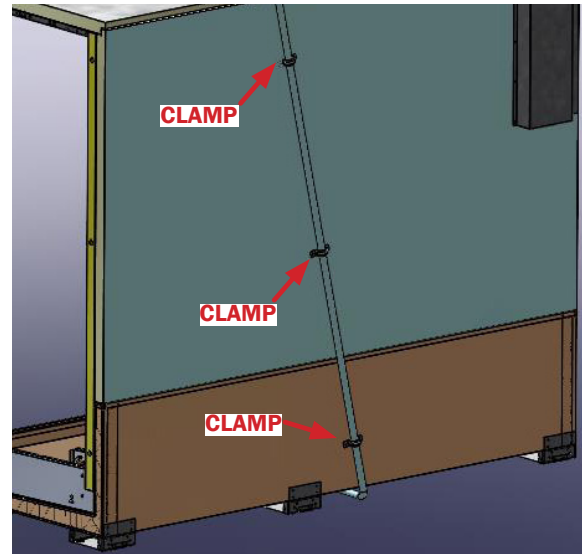


Fig. 32 Tubing clamps

Pump and Tubing Installation

There are two main pump solutions and one floor drain solution briefly explained below, with more detailed instructions on the following page.

- STANDARD (Pump):** The tube from the case drain routes to the plastic condensate tank, where it is secured to the small extension with a zip tie. (Fig. 33). The second tube is fitted onto the barbed fitting on the pump and is then routed to the CDU evap pan on top of the case.
- OPTIONAL (Filtered Pump):** The tube is routed to the filtered trap and secured with zip tie. The second tube is fitted onto the barbed fitting on the pump and is then routed to the CDU evap pan on top of the case. See Drain and Pump section on page 13 for more details.
- OPTIONAL (Floor Drain):** The tube from the case is routed to a floor drain located in the store.

Condensate Pump and Tubing Installation Instructions for Drain Options:

Standard Pump or Filtered Trap with Pump

Objective

To install and route condensate drain tubing from the pump (with tank) to the CDU evaporator pan/tray, ensuring proper drainage and secure fastening for stable operation across JNRB/ZHSA Units.

Required Components

- **Standard:** Submersible pump with tank (115V, 60Hz)
- **Optional:** Filtered trap with integrated condensate pump (use only if specified by project requirements)
- Clear tubing (3/8" O.D., supplied with pump kit)
- Clamps for securing tube
- Zip ties for securing tube
- Power source for pump (115V connection)
- Barb fitting + 90° brass elbow

Installation Steps

1. Position Condensate Pan and Pump

- Ensure the condensate tank is level and securely positioned.
- Completely submerge the pump inside the tank.
- **Standard Configuration:** Use submersible pump with tank. (Fig. 33)



Fig. 33 Condensate Tank

- **Optional Configuration:** Use filtered trap with integrated condensate pump if required by project specifications. (Fig. 34)

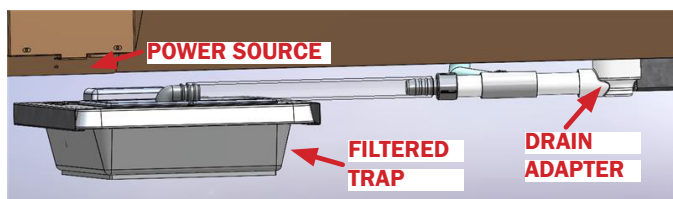


Fig. 34 Optional PVC Drain and Filtered Trap

2. Connect Tubing

- Thread the barb fitting + 90° brass elbow to the pump outlet.
- Attach the clear tubing (3/8" O.D.) to the barb fitting.
- Cut tubing to the required length to reach from the pump outlet to the inside of the CDU evaporator pan/tray on top of the case. Connect the tubing from the drain outlet nipple to the condensate tank (or the optional filtered trap) of the pump. Attach the 3/8" barbed check valve to the 1/4" N.P.T. elbow, and attach this assembly to the pump's discharge. BE CAREFUL NOT TO OVER-TIGHTEN.
- Ensure a snug fit at the outlet to prevent leaks.

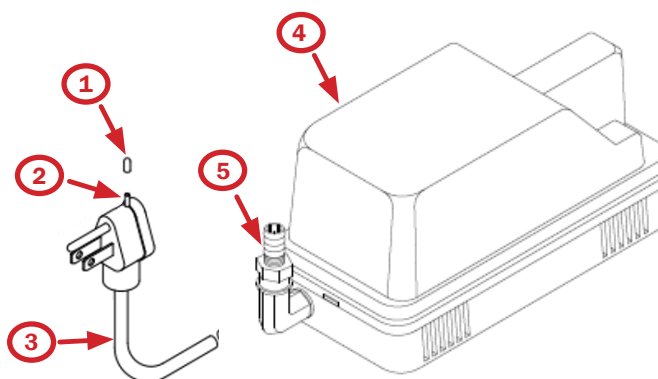


Fig. 35 Pump components

1	Breather Tube Cap
2	Breather Tube
3	Cord
4	Pump
5	Barb fitting

3. Route Tubing

- The tube from the case drain outlet is secured to the pump tanks (for both standard and optional configurations) using a zip tie assembly so that the tube discharges the case waste water into the tank.
- Gently route the tubing from the pump outlet toward the CDU evaporator pan/tray on top of the case. Avoid sharp bends or kinks to maintain smooth condensate flow.
- The tubing goes behind the case, where it is held in place with pipe straps and routed into the CDU evaporator pan/tray through the access port in the CDU housing, if equipped. See Figs. 36 and 37.

CASE INSTALLATION

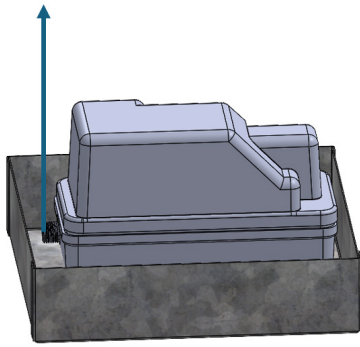


Fig. 36 Pump (non filtered trap)

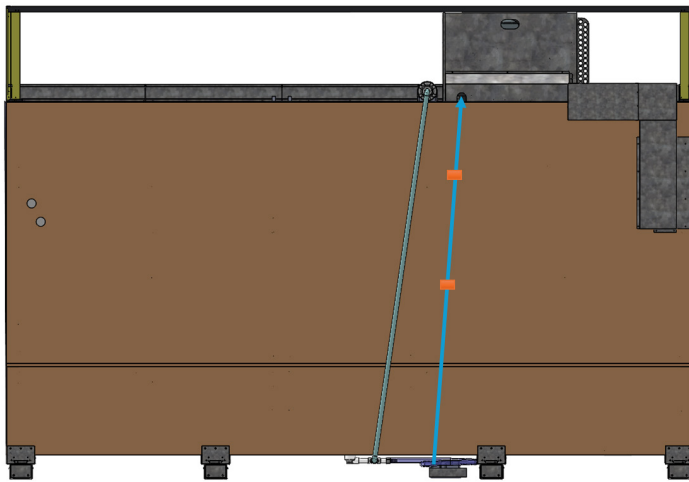


Fig. 37 Tubing route path

4. Secure Tubing

- Guide the 3/8" clear tubing from the pump outlet toward the CDU evaporator pan/tray.
- Insert tubing into the dedicated clamp located on the CDU base plate and tighten securely, remembering to not overtighten.

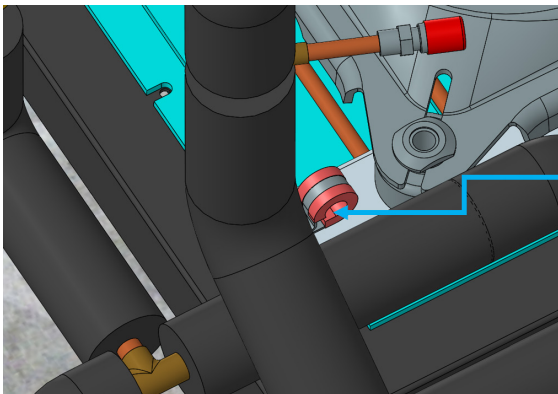


Fig. 38 Dedicated clamp on the CDU base plate (blue arrow)

5. Electrical Connection

- **IMPORTANT: Remove the "Breather Tube Cap" on the pump's power cord.** Plug the power cord into the pump receptacle (Fig. 39).
- Connect the pump to a 115V power source.
- Verify pressure-activated switch operation:
- Pump activates at ~1.6 inch water level.
- Pump shuts off at ~1.3 inch water level.



Fig. 39 Plug pump into pump receptacle

6. Final Checks

- Confirm tubing is securely fastened with no movement or sagging.
- Pour water into the tank to activate the pump and verify flow into the CDU evaporator pan.
- Inspect for leaks, misalignment, or hose movement.
- Ensure pump cycles correctly and tubing remains secure.

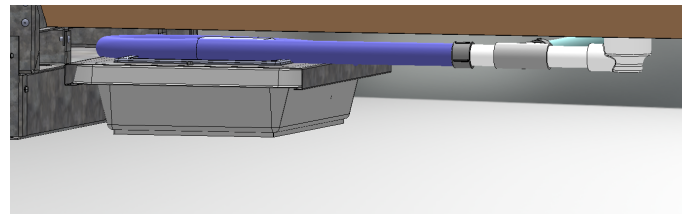


Fig. 40 Drain assembly, high charge R-290 case, front view

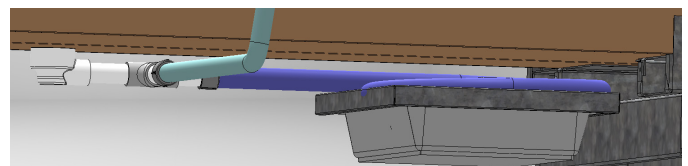


Fig. 41 Drain assembly, high charge R-290 case, rear view

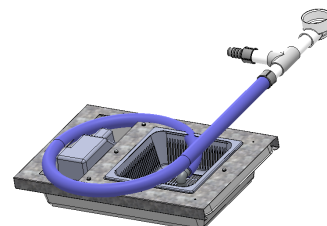


Fig. 42 Drain assembly, high charge R-290 case, top view

Pump Maintenance and Troubleshooting

Pumps have been designed to provide long, trouble-free service in normal operating conditions. However, if the pump fails to operate, please check the following:

! WARNING

Always disconnect from electrical outlet before servicing this pump.

- Is the pump getting electrical power? Check the circuit breaker and try another outlet to be sure.
- Has the intake screen become clogged?
- Are there any kinks or blockages in the discharge tubing?
- Is the impeller broken or jammed with debris?

! CAUTION

The cord of this pump contains a small “Breather Tube”. This tube is necessary for the proper operation of the pressure switch. Do not allow this tube to become blocked.

! WARNING

Do not remove the 4 screws that is holding the diaphragm cover in place. There are no serviceable parts in the switch mechanism; removing or loosening these screws may cause an electrical shock hazard.

! CAUTION

Cleaning the grate on the optional filtered trap periodically will prevent spill hazards from occurring.

LEVEL CASES

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 advanced 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. 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 (Fig. 43) and chalk lines (preferred method). The lines should coincide with the outside edges of the case feet.



Fig. 43 Laser transit

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.
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.
Note: Steps 2-9 are for the optional baseframe only.
2. Using a “J” bar, raise the case at each base foot and install the base risers. Lower the base risers onto the shim packs. Lift at designated points on the base frame (see **Appendix G**).
3. Locate the Hat sections and the front fastening plates enclosed in the case (Fig. 44).



Fig. 44 Hat section and front fastening plates

CASE INSTALLATION

4. Fasten the rear of each hat-section with 8-size Tek screws (2) provided (Fig. 45).
5. Align each hat section from front (at locator lip) at the center of each pair of fork pockets and shim them accordingly.
6. Check the alignment at the front/rear and now place the case over the hat sections (Fig. 46).

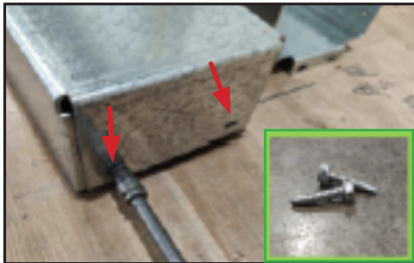


Fig. 45 Fasten rear of hat-section

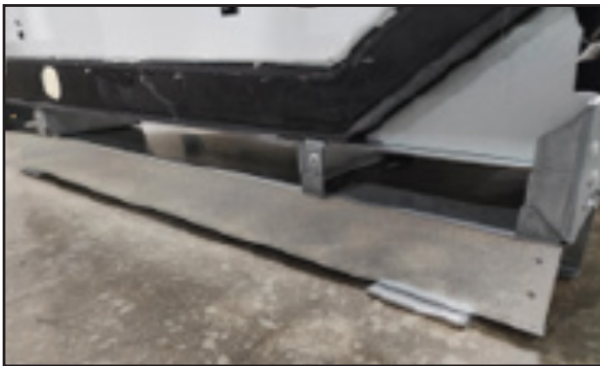


Fig. 46 Case over hat sections

7. Now fasten the locator lip with 8-size Tek screws provided (Fig. 47).



Fig. 47 Fasten locator lip

8. Place front fastening plates over side fastening holes; fasten plate with Tek screws on each side (Fig. 48).



Fig. 48 Fasten front plates to side fastening holes

9. Once the basecase 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 lineup approximately 3' away.
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 (Fig. 49).



Fig. 49 Apply foam tape (Medium Temp)

Apply two continuous beads of sealant, one inside and the other outside of the gasket for low temperature cases (Fig. 50).

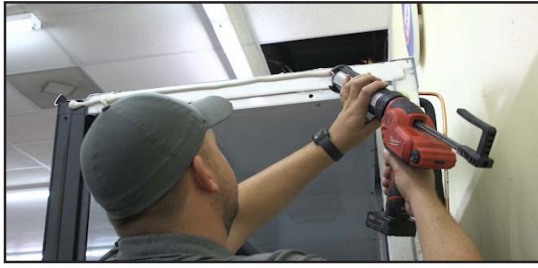


Fig. 50 Apply sealant (Low Temp)

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 (Fig. 51).



Fig. 51 Push second case close to first case

6. Push the cases tightly together, then lightly bolt them together through the six holes (Fig. 52). 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 (Fig. 53) 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.

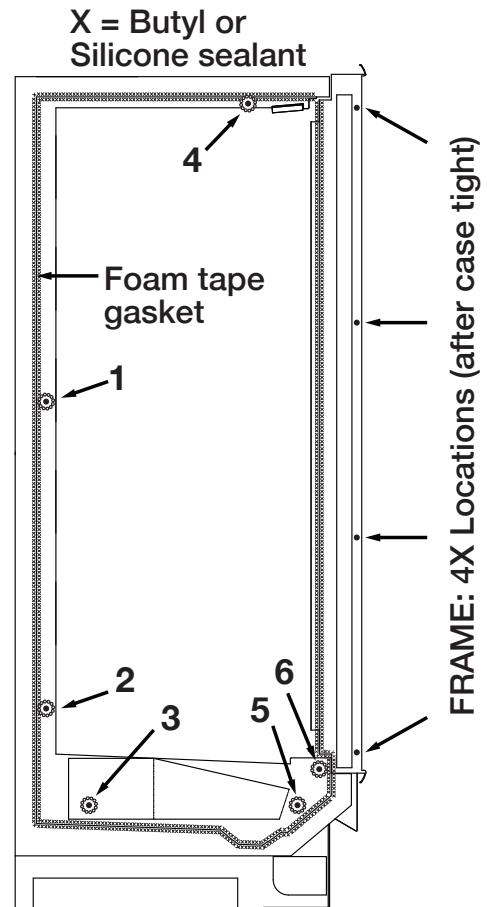


Fig. 52 Bolt holes, foam tape gasket, and sealant

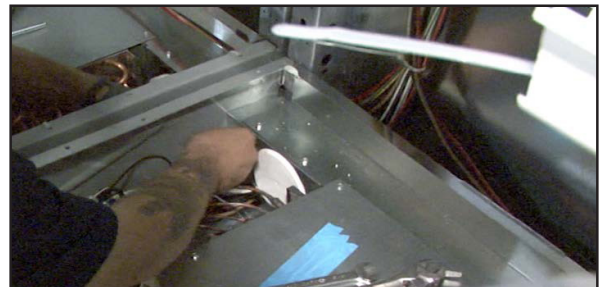


Fig. 53 Tightly align cases before bolting

CASE INSTALLATION



DANGER

Risk of electrical shock if the cord and strain relief are removed.

FINAL INSTALL

Electrical connections are made in the electrical junction box located at the top left of the case.

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 (Fig. 54). Refer to the diagram before attaching the components.

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

For JNRZHS/JNRBHS cases, the low voltage wires are the discharge air probe (green) and the defrost termination probe (orange) (Fig. 58). Please refer to the wiring diagrams in

Appendix C for more information.



Fig. 54 Electrical junction box diagram label

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

1. If egress cover was not removed in "DOORWAY PREP", remove the (2) #8 tek screws holding the egress cover (Fig. 55).

Note: The cover is attached to the case wire harnesses to facilitate their retrieval.



Fig. 55 Egress cover tek screws

2. Lift harnesses until taught - approximately 6" (Fig. 56).

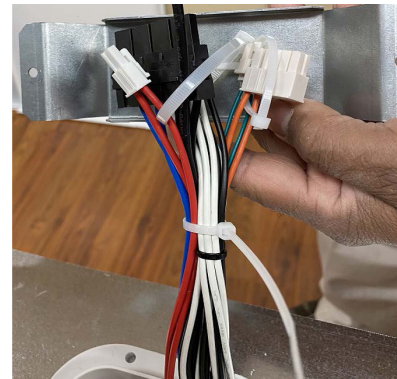


Fig. 56 Lift harness

3. Fit the high voltage harnesses into foam insert's larger hole. Fit low voltage harnesses into the smaller hole (Fig. 57). 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. The foam will be ~3/4" below top of egress (Fig. 58).

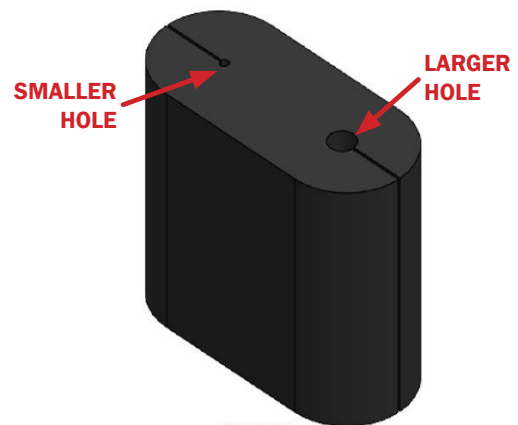


Fig. 57 Foam insert



Fig. 58 Foam recess limit: 3/4" below egress opening



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.

4. Remove the egress cover from the harnesses (Fig. 59).

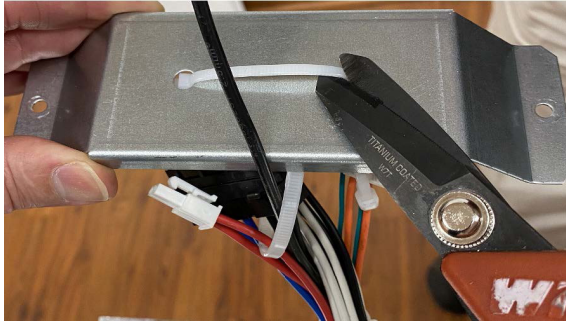


Fig. 59 Remove egress cover

5. Place the junction box on the canopy to the left of the condensing unit, feeding the harnesses through the bottom-rear of the box. (Fig. 60).

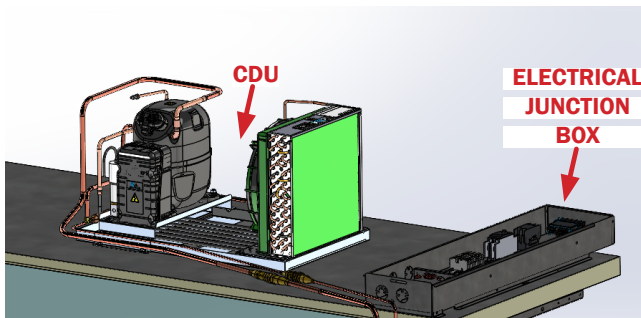


Fig. 60 Rear view of electrical junction box location

6. Plug the unique case harness connectors into their corresponding mates inside of the box (Fig. 61).

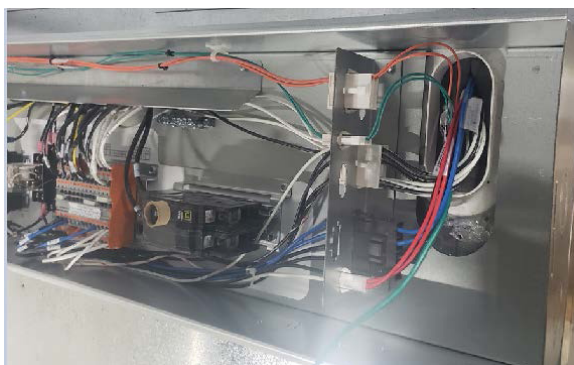


Fig. 61 Connect harnesses to their mates inside junction box

7. 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 (Fig. 62).

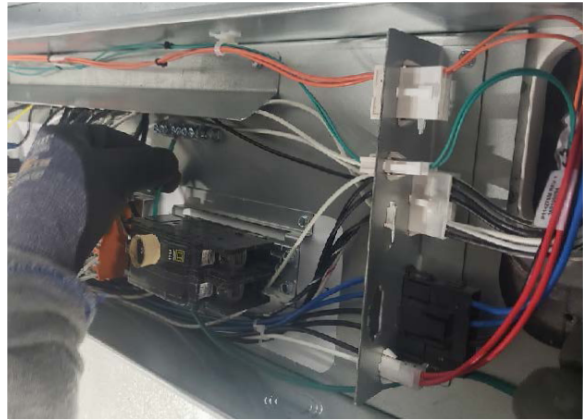


Fig. 62 Electrical Connections

⚠ ATTENTION

For store, CDU, and condensate pan wiring: Refer to **Appendix C**.

8. With piping connections reconnected and the electrical junction box installed, the condensing unit cover and piping cover can be placed back onto the high charge cases using the screws retained from "DOORWAY PREP" steps 1 and 2 (Fig. 63). Review those steps to ensure covers are fastened properly to complete installation (Fig. 64).

Note: For low charge cases, see next step.

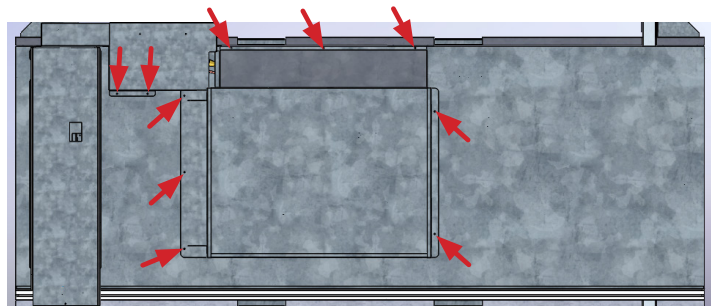


Fig. 63 Location of piping cap fasteners and CDU housing screws (3-5 door cases)

CASE INSTALLATION

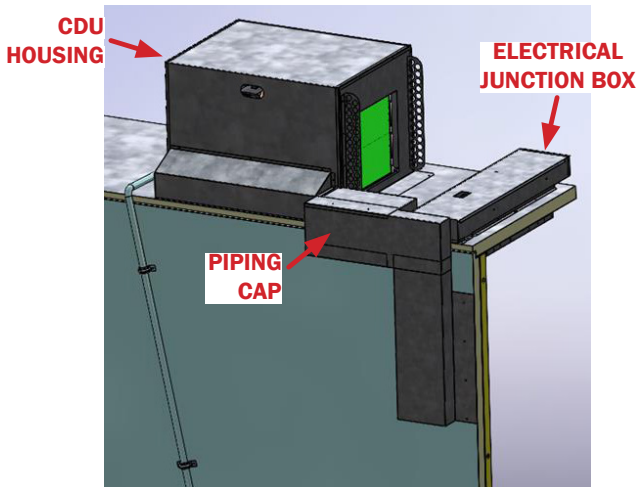


Fig. 64 Rear view of final install (high charge cases)

9. With piping connections reconnected and the electrical junction box installed on low charge cases, the condensing unit inlet guard can be placed back onto the cases using the screws retained from “DOORWAY PREP” step 3 (Fig. 65).

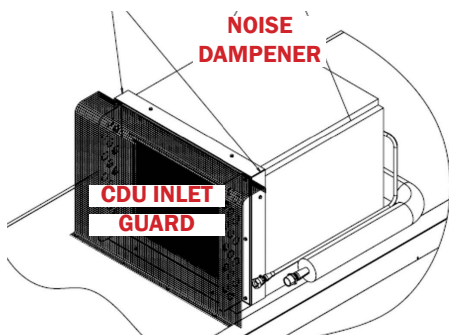


Fig. 65 Low charge housing air-block

FINAL POSITIONING

After the installation of all components is complete (Figs. 66), case can be moved into the final location.

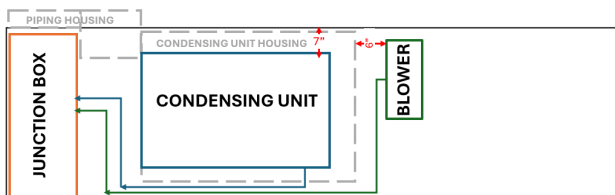


Fig. 66a High charge configuration

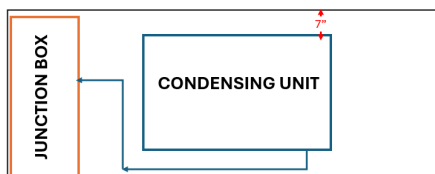


Fig. 66b Low charge configuration

TRIM OUT

1. Seal the interior case-to-case joints with the caulk and the acrylic tape from the ship loose parts applied over the pipe chase seam (Fig. 67). The tape acts as a watershed, preventing water from settling in the case joint.

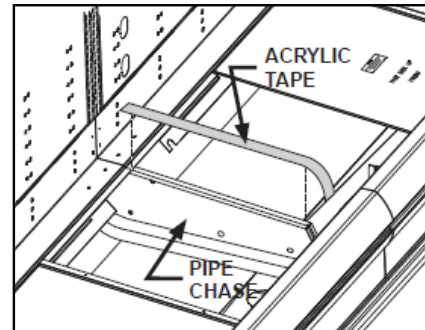


Fig. 67 Sealing the pipe chase

2. Reinstall the shelves that were previously removed.
3. Properly align the case front panels as needed, then install the front panel joint trim behind bumper tracks (Fig. 68). Location and style of track and bumper, if ordered, may vary.



Fig. 68 Front panel trim installed behind bumper tracks

Door Frame Trim Out

The Anthony doors may need to be removed when sealing the frame-to-frame joints, or the frame to foamed partitions. To remove the doors:

1. Disconnect hold-open assembly from door frame (Fig. 69).



Fig. 69 Disconnect hold-open assembly

2. Release the tension from the closing mechanism at the bottom of the door using a flat-head screwdriver, turning until the door tension to self close is eliminated (i.e. the door does not close by itself when left open) (Fig. 70).

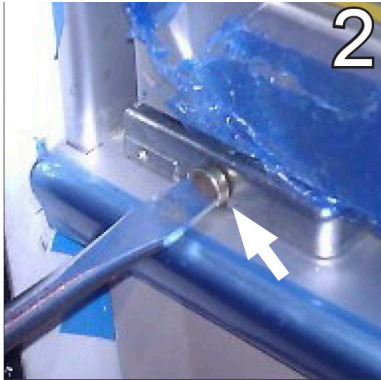


Fig. 70 Release tension from closing mechanism

3. Depress the spring clip at the top of the door downward (Fig. 71). Pull the top of the door free from the receptacle, then lift the door free from the lower hinge plate. Set the door aside.



Fig. 71 Depress spring clip at top of door

4. Use a clamp to close the gap between the frame end and the foam partition, which compresses the sealant applied earlier (Fig. 72).

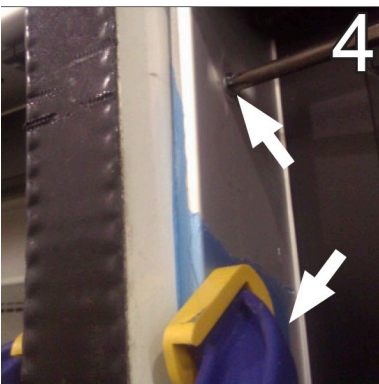


Fig. 72 Clamp to close gap between partition and frame

5. Tightly secure the frame to the partition using flathead self-tapping screws (#6), included with the ship loose parts. There should be no gap between the frame and foamed partition when done (Fig. 73).

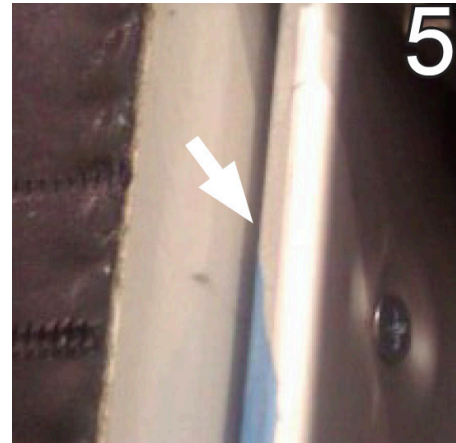


Fig. 73 Secure frame to partition

6. For case-to-case trim-out (no foam partition), carefully push the provided T-bar (Fig. 74) between the frames. Secure with the provided T-bolts.

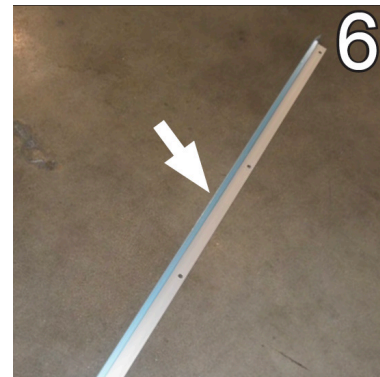


Fig. 74 Secure frame to partition

7. Reinstall the door by reversing steps 1-3.
8. Install the door frame joint trim with sex bolts (included with the ship loose parts) that bolt through the door frames (Fig. 75), tightening the bolts compressing the sealant that was applied earlier.



Fig. 75 Door frame trim installed

CASE INSTALLATION

Kickplate Trim Out

1. Install the end kickplates before the front kickplate (Fig. 76). The same end kickplate piece is used on both the left and right ends of the lineup or single cases.



Fig. 76 End kickplate installation

2. Slide the end kickplate front to rear, under the end of the case (Fig. 77). When the front flange is about $\frac{9}{16}$ " from the base foot, slide the front flange the rest of the way under the case, 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 kickplate is held in place when the front kickplate is installed in the next step.

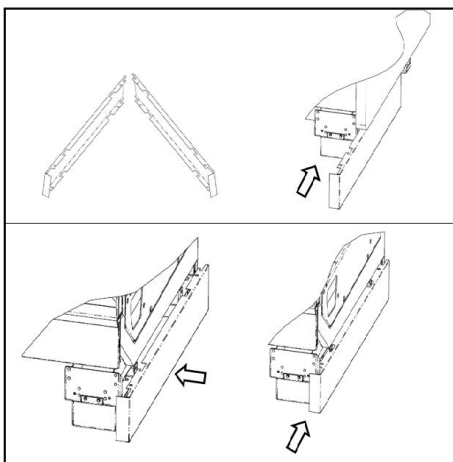


Fig. 77 End view of front kickplate install

3. Install the front kickplate by inserting its top flange behind the front panel of the case (Fig. 78) and then rotating it down to the floor.



Fig. 78 Insert kickplate's top flange behind front panel

4. Secure the kickplate with color-matched screws through pre-punched slots to the base frame (Fig. 79), completing the kickplate install (Fig. 80).



Fig. 79 Secure the kickplate to base frame



Fig. 80 Case lineup with kickplates installed

Top Fascia Trim Out

1. Align the front fascia to the curved flange of the door frame (Fig. 81). Then secure the bottom edge of the front fascia to the case through the pre-punched screw holes (Fig. 82).



Fig. 81 Align the front fascia to the curved flange of door



Fig. 82 Secure front fascia

2. Align the junction box's Carel controller display with the pre-punched cutout in the front fascia (Fig. 83). With box parallel to side of the case, egress flange will protrude out the left-hand (LH) side of the junction box.



Fig. 83 Align pre-punched cutout in front fascia

3. Secure the electrical box to the case body using (4) #8 tek screws (Fig. 84).

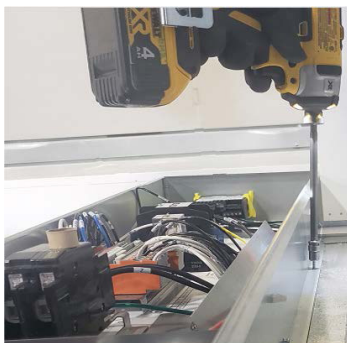


Fig. 84 Secure electrical junction box

4. Attach the two-part end panels (extend 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 the end panels to the case body.

5. Attach the support struts to the back of the panels. Install the support 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 2-door cases (Fig. 85).



Fig. 85 Extend to wall and secure

6. Install the fascia support brackets by securing end panels to the front fascia (Fig. 86).



Fig. 86 Secure end panel to front fascia

7. **Note: Make sure to leave approximately 1/2" between the strut and the junction box cover to allow the box to open (Fig. 87). The bracket can be installed flange-up to gain distance.**



Fig. 87 Front view of support bracket and junction box view

CASE INSTALLATION

8. Check the panel's vertical alignment (Fig. 88) and adjust if necessary.

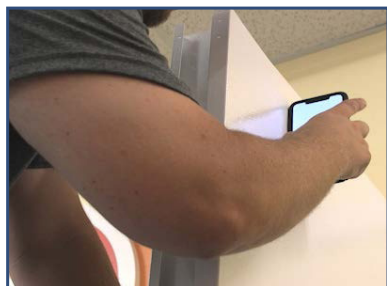


Fig. 88 Check vertical alignment

9. Attach the unpainted frame rail between adjacent panels (Fig. 89).

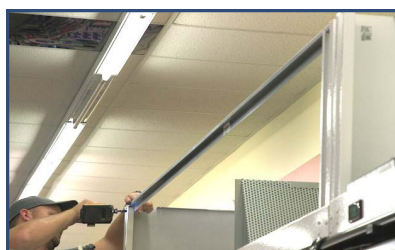


Fig. 89 Install unpainted frame rail

10. Mount the store signage to the fascia framework (Fig.90).

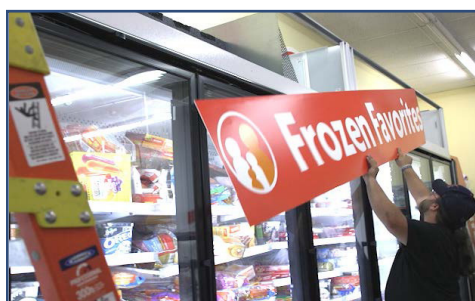


Fig. 90 Mount store signage to fascia

11. Install the front panel joint and door frame trim (Fig. 91).



Fig. 91 Install frame trim between doors

12. Install the top and bottom end-to-wall close-off panels for the opposite ends of the lineup (Fig. 92).

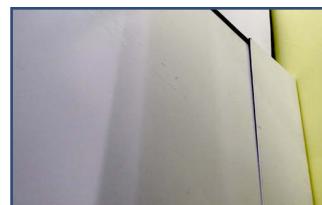


Fig. 92a Top close-off panel



Fig. 92b Bottom close-off panel

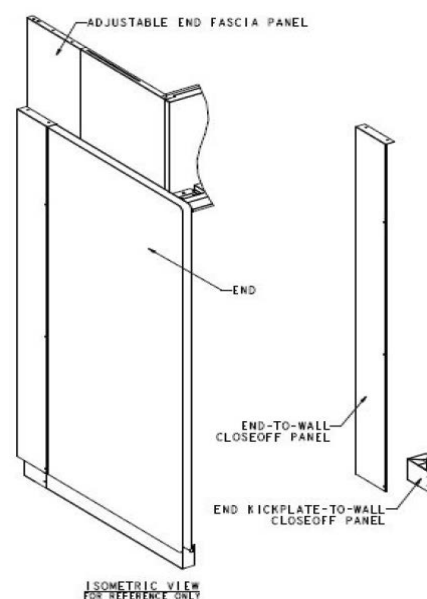


Fig. 92c Top and bottom close-off panels



ATTENTION

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

13. The close-off panel's hemmed top rests on top of the case's insulated end panel. Slide the close-off panel (Fig. 93) back to close any gaps to the wall behind the case. Fasten it to the case with #8 Tek screws through the pre-drilled holes in the panel.
4. Check that the evaporator fans are on and running properly (in the right direction) by removing the wire racks, return air grille, and lift the deck pans (Fig. 96).



Fig. 93 Bottom end-to-wall close-off panel



Fig. 96 Running evaporator fans

5. 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 (Fig. 97).

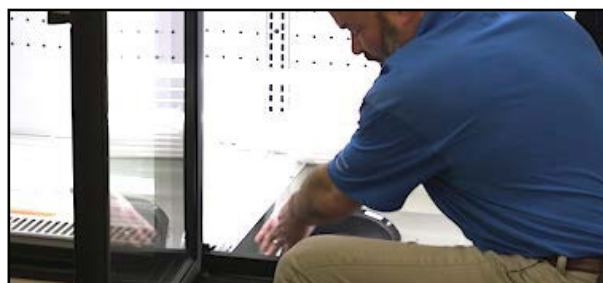


Fig. 97 Check pump operation

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 top of the case to turn on the case (Fig. 94).



Fig. 94 Switch location on junction box

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 (Fig. 95).



Fig. 95 Remote display

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

CAUTION

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

CASE DETAILS

REFRIGERATION

The condensing unit is located on top of the case for easy access (Fig. 98). 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 (lifting the fan plenum shroud is not necessary).

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

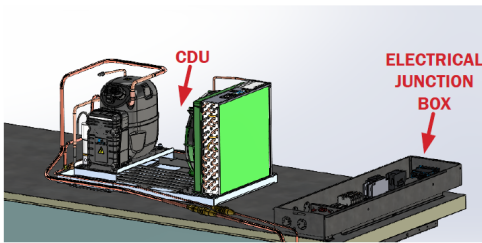


Fig. 98 CDU location

! ATTENTION

Connections are illustrated in dimensional drawings 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 drain assembly that is furnished with the case is constructed of schedule 40 PVC pipe (Fig. 99). Case runoff is drained through the drain assembly by plastic tubing to the pump underneath the case. The pump is connected by more plastic tubing to the condensate/evap pan on top of the case.

For more details on case plumbing, see the Case Prep section.

Note: Hillphoenix offers a version of the case that is designed for use with floor drains when floor drains are required by local ordinance.

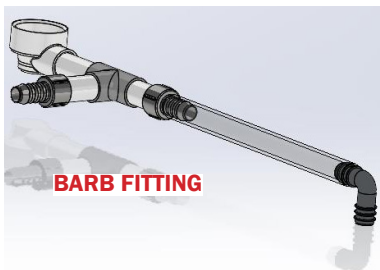


Fig. 99a High charge adapter

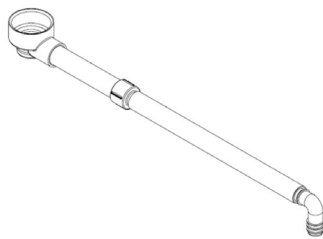


Fig. 99b. Low charge adapter

With the kickplate shipped loose (uninstalled), the drain line area under the case is accessible during installation. If the kickplate has already been installed, it is easy to remove. Remove the kickplate joint trim, then unscrew the upper and lower kickplates from the kickplate supports and remove them (see Trim Out instructions on pages 22-25).

Care should be taken to ensure that all connections are watertight and sealed with the appropriate PVC or ABS cement.

! CAUTION

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

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 preinstalled. Lighting can be implemented in two ways: through motion sensors on the case, or programmed within the controller using timers set for the appropriate time zone. Lighting instructions can be found on page 28. 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**.

! DANGER

JNRZHSa low temp cases require 4-wire power from the store. Neutral wire must be connected prior to starting case or else damage may occur.

! CAUTION

This case must be powered only in electrical installations with ground fault circuit interrupter (GFCI) circuit breakers or residual current device (RCD).

! CAUTION

Ensure that all piping and electrical connections comply with local codes.

MPXzero Lighting Schedule Setup Guide

1. Download the Carel phone application **Applica**.
2. Open **Applica** on your device.
3. Select **Bluetooth** and connect to the desired controller.

Tip: Hold the device in close proximity to the desired controller to ensure the intended case is being edited.

4. When prompted for a profile, select **Manufacturer**.
5. Enter **44** as the password when prompted.

Note: If “44” is not accepted, leave the password field blank.

6. Open the menu using the hamburger icon (≡) in the top left corner.

7. Select **Parameter List** from the menu options.

8. Select **DAY/NIGHT** from the parameter options at the top.

Note: There are 8 total time bands available. Start times are labeled as “tSx” and “tEx” are labeled as end times, where “x” ranges from 1 to 8.

9. For each time band, choose the “-d” (days) option and select the **All Days** option.

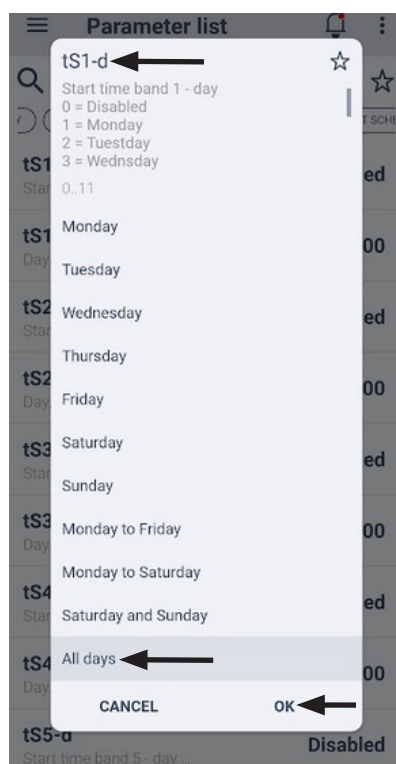


Fig. 100 Time band details

10. To set the lighting start times, choose the “-time” option for each **tSx** parameter and enter the desired start time for lighting.

11. To set the lighting end times, choose the “-time” option for each **tEx** parameter and enter the desired end time for lighting.

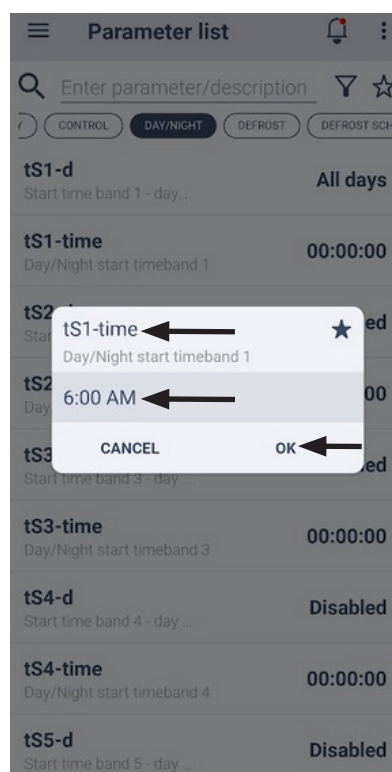


Fig. 101 Day start timeband example

12. When finished, open the menu (≡) and select **Disconnect**.

13. Select **Yes** to disconnect.

PRE-POWER CHECKLIST

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

Have you:

- ☐ Thoroughly examined the case for shipping damage? (see pg. 5)
- ☐ Checked the vertical plumb and the horizontal level of the case? (see pg. 15)
- ☐ Applied the foam tape gasket and sealant to the ends of one of each pair of adjoining cases? (see pg. 16)
- ☐ Sealed the case-to-case joints by applying caulk and acrylic tape to the pipe-chase seams? (see pg. 20)
- ☐ Confirmed that incoming power is properly connected? (see pg. 25)
- ☐ Checked that the condensing unit fan is running and that the compressor kicks on when the case is turned on? (see pg. 25)
- ☐ 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. 25)
- ☐ Checked that the evaporator fans are ON and running properly? (see pg. 25)
- ☐ Confirmed the pump is operating? (see pg. 25)
- ☐ Removed the shipping blocks from the refrigeration lines? (see pg. 26)

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 improper temperatures, particularly when the discharge honeycomb and return air grille are covered. Make sure to keep products within the load limit line (Fig. 102).

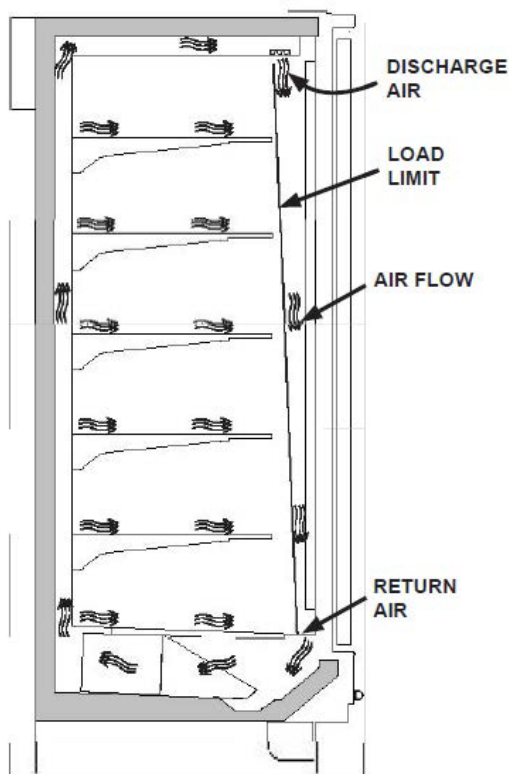


Fig. 102 Air flow, probe, and sensor locations

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.

JNRBHA cases utilize time off 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.

JNRZHA cases utilize hot gas defrost. The defrost termination probe is mounted on the suction line, under insulating tape, near the vertical suction header at the left end of the coil (Fig. 103). The discharge air probe monitors the temperature of the discharge air and is found behind the plug button in the upper flue panel.



Fig. 103 LT defrost termination probe sensor location

For more detailed information on suggested defrost times and settings, see **Appendix A**. Further adjustments 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 (Fig. 104).
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.

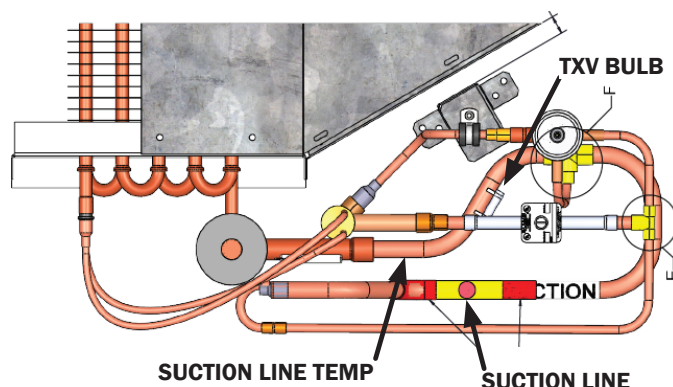


Fig. 104 Obtain pressure/temperature readings from these points

CASE CLEANING & MAINTENANCE

CLEANING PROCEDURES

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

- Ensure 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 ensure 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 (Fig. 105).



Fig. 105 Coil & single-piece fan plenum

- Clean the lights only when the lights are shut off on the case. 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 the 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 fixed blade pitch and a pre-programmed RPM specific to each model.

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

1. Unplug the fan motor (Fig. 106) 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 reinstalling the fan assembly.)

Note: Fan blades can be replaced separately, if needed.



Fig. 106 Fan basket

⚠ 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 reinstalling the fan in the field, orient the fan cord to the 7 o'clock position. Pull any excess cord slack forward and tie tightly.

SAFETY DEVICES

! WARNING

It is absolutely forbidden for the user to tamper with safety devices. Before using the refrigerated case, check that mechanical safety covers are properly in place. Any tampering shall render the warranty null and void and exonerate Hillphoenix from any liability with regard to users of the refrigerated case.

Only maintenance personnel may carry out maintenance tasks involving safety devices. These tasks are listed below:

SAFETY DEVICE	SCOPE OF INTERVENTION	ACTION
Incorporated over-pressure cut-out	On incorporated condenser unit	Cuts the electrical power of the compressor if the pressure of the refrigerant rises above the safety limits.
Ignition proof zone established around electrical junction box	On incorporated Condensing unit Condensor Fan	Prevents leak access to electrical components. Fans operate 100% of the times.
Case Internal leak mitigation system	External Blower system connected to the Tank drain adapter	Facilitates evacuation and dissipation of leaked charge during defrost cycle
Safety Housing (on cases with greater than 150gm charge) to be removed with tools for servicing	Sheet metal housing on Condensing unit	Prevents access to and protects piping in the Condensing Unit
Piping Cover (on cases with greater than 150gm charge) to be removed with tools for servicing	Sheet metal housing on external Copper piping	Prevents access to and protects external piping at the rear of the case

DESCRIPTION OF RESIDUAL DANGERS AND RISK

Residual Dangers

Dangers that have not been reduced/eliminated with the safety measures adopted on the refrigerated case can nevertheless be reduced/eliminated as long as users apply proper managerial practices.

- ☐ Ensure that all safety warning and labels are always in good condition; inspect them periodically and have them replaced whenever necessary.
- ☐ Do not install any spare parts that are not identical to the originals or of equivalent performance.
- ☐ Do not carry out any modifications or structural work without approval from Hillphoenix or a qualified field service technician.

- ☐ Should the refrigerated case be dented, inspect the structure visually or have qualified personnel carry out an inspection.

After a long period of disuse have a qualified field service technician carry out an inspection of the case to check that it is in good condition and working properly.

Residual Risks

While the refrigerated case has been designed to ensure maximum safety, there nevertheless remain some residual risks. Hillphoenix has identified the main **dangers and residual risks for users and maintenance personnel** as follows in the “Scheduled Maintenance Table” on the next page.

REFRIGERANT

This piece of equipment uses an R-290 refrigeration system. This equipment has been clearly marked on the serial tag the type of refrigerant that is being used. There is also a warning label stating that the unit contains R-290 refrigerant.

No smoking or open flames when servicing this equipment. If needed, use a Class B (CO₂ or dry powder) type fire extinguisher.

Only an authorized service technician, certified in R-290 systems, should service this equipment.

! DANGER**SHOCK HAZARD**

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

Use an R-290 approved fan for constant ventilation while working.

- If an R-290 approved fan is not available, make sure fan is at least 10' away from cabinet.
- Remove at least two panels from the base to allow air flow through the unit.
- Point the fan towards the bottom of the work area as R-290 is heavier than air.

The work area must be free from sources of ignition such as open flames and sparking electrical devices, like light switches. Keep a 10' perimeter around the case of clearance.

The propane gas used in the unit has no odor. The lack of smell does not indicate a lack of escaped gas.

It is recommended to post a “Flammable Refrigerant” placard in the area prior to servicing.

MANIFOLD SET

A R-134a manifold set can be used for servicing this equipment.

REFRIGERANT RECOVERY

Follow all national and local regulations for R-290 refrigerant recovery.

SCHEDULED MAINTENANCE TABLE

DESCRIPTION OF RESIDUAL RISK	CAUSE	SAFETY MEASURES
Danger of falls in area surrounding the cabinet	Presence of: stairs, columns etc. and/or slippery floors and objects and/or work tools	Mark out the relevant zones and highlight them with warning signs and symbols (e.g. yellow/black striped marker tape on stairs etc.) that are visible during both routine use and maintenance.
Danger of objects accidentally falling	Haphazard storage of tools/objects.	Use tool boxes in work areas. Ensure personnel are trained.
Danger of injury to hands, arms, legs, and head	During cleaning and maintenance there may be objects or parts of the cabinet protruding from the case itself (e.g. glass covers open during cleaning)	Mark out the work area with appropriate barriers. Always use the recommended personal safety devices.
Risk of refrigerating gas leaks	Accidental damage to pipes	Immediate shutdown of case operation. Disconnect electrical power supply. Contact a service technician.

LEAK CHECKING AND REPAIR

Leak check an R-290 system the same way you would an R-134a or R-404a system with the following exceptions:

1. Do not use a Halide leak detector on a R-290 system.
2. Electronic leak detector must be designated specifically for combustible gas.

A quality combustible gas leak detector is mandatory for hydrocarbon service work. Leak detector should be placed near the bottom of the cabinet, as R-290 is heavier than air.

When repairing a leak, it is recommended using oxygen free dry nitrogen with a trace gas not exceeding 200 PSI.

When accessing an R-290 system, proper charge is to be weighed into the system and the system is to be leak checked afterwards.

The R-290 equipment must have red process tubes and other devices through which the refrigerant is serviced, such as any service port. This color marking must remain on the equipment. If marking is removed, it must be replaced and extended at least 2.5 centimeters (1") from the compressor.



CAUTION

Component parts shall be replaced with like components. Service work shall be done by factory authorized service personnel, so as to minimize the risk of possible ignition due to incorrect parts or improper service.

CHARGING

Follow the charge amount specified on the data tag. It is recommended to use the shortest hoses possible to prevent undercharging.

- Component parts shall be replaced with like components. Service work shall be done by factory authorized service personnel, so as to minimize the risk of possible ignition due to incorrect parts or improper service.
- Ensure the system is sealed and leak checked
- Evacuate system to a minimum 500 microns
- Weigh in correct charge
- Leak check the system again
- Bleed the refrigerant from the high side hose to the low side hose
- Disconnect the hoses
- Remove line taps

CHARGING PORTS

Schrader port locations across the case are red marked to highlight them as charging ports per regulations (Fig. 107).



WARNING

Use caps with o-rings on schrader valves, post service.



Fig. 107 Schrader port locations

DE-ICING EVENTS

Depending on the severity of the icing event, there may not be enough capacity in the pan to accommodate all of the water. The recommended procedure is for the service technician to:

1. Carry a 3/8" vinyl tube
2. Connect this tube to the outlet of the pump
3. Pump excess water to a drain or into a 5 gallon bucket

If the technician does not have this hose on hand, then they can use the one attached to the pump by disconnecting it at the top of the case and reinstalling it when finished.

DANGER

FLAMMABLE

DANGER - Risk of Fire or Explosion. Flammable Refrigerant Used. Do Not Use Mechanical Devices To Defrost Refrigerator. Do Not Puncture Refrigerant Tubing.



CAUTION

It is highly recommended that a technician servicing a case with HC refrigerant is aware of safety considerations and maintenance procedures on how to safely handle flammable refrigerants.



Contact the Service Parts Department at:

1-833-372-7871

or

orderparts@doverfoodretail.com

Provide the following information about the part you are ordering:

- Model number and serial number* of the case for which the part is intended.
- Length of the part (if applicable).
- Color of part (if painted) or color of polymer part.
- Whether part is for left-hand or right-hand application.
- Quantity

*Data tag is located on the left end exterior panel or top interior of the case.

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



A	 Technical Reference Sheets
B	 Seismic Brackets
C	 Electrical Wiring
D	 Controllers and Setpoints
E	 Defrost Synchronization Instructions
F	 Fascia Frame
G	 Case Lifting Locations

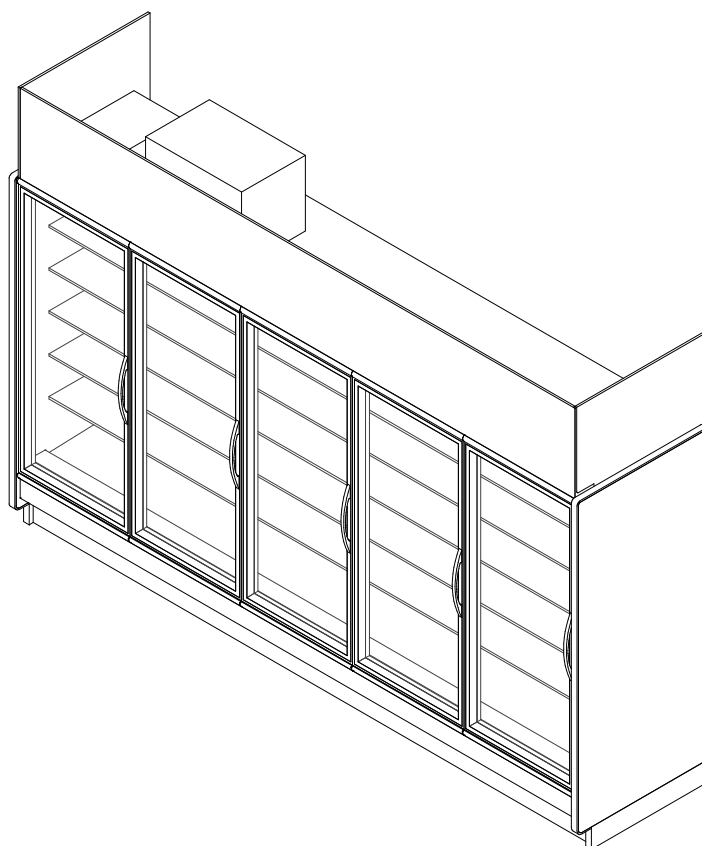
A1: TECHNICAL REFERENCE SHEET

JNRBHSA

2, 3, 4 & 5 Door / 6', 8', 12' High Narrow Reach-In Self Contained
Beverage/Bakery/Dairy/Cut Produce/Deli

GENERAL NOTES:

- "---" indicates that the feature is not an option with this case model and/or the data is not available at this time.
- Light controls - occupancy sensors are required.
- Option 1: OEM Provided: OEM anti-condensate and lighting controls (on/off) are standard unless otherwise specified.
- Option 2: End User Provided: Light controls should be based on occupancy sensors.
- WARNING: R-290 flammable refrigerant in use. Read the installation, operating and maintenance instructions thoroughly before installing or servicing this equipment.



SHIPPING WEIGHT	
Case	Weight
JNRBHSA	---



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Rev. Date	Rev. #	Rev. Title
09-21-26	7	ENDVIEW UPDATE
04-16-26	6	DATA UPDATE



A2: TECHNICAL REFERENCE SHEET

JNRBHSA

2, 3, 4 & 5 Door / 6', 8', 12' High Narrow Reach-In Self Contained
Beverage/Bakery/Dairy/Cut Produce/Deli



SYSTEM REQUIREMENT

Case Length	Volts	Wiring Type	Phase	Frequency (Hz)	Optional Factory Installed Plug		MCA	MOP	Total Load (Amps)	24hr Energy Usage (kWh)	THR (BTUH)
					Size	Amps					
2 Door	120	2 Wire + Gnd	1	60	NEMA 5-15P/L5-15P	6.95	8.1	15.0	7.0	7.0	995.2
3 Door	120	2 Wire + Gnd	1	60	NEMA 5-15P/L5-15P	7.70	8.9	15.0	7.6	9.9	1408.0
4 Door	120	2 Wire + Gnd	1	60	NEMA 5-15P/L5-15P	9.46	11.2	15.0	9.7	12.9	1834.0
5 Door	120	2 Wire + Gnd	1	60	NEMA 5-20P/L5-20P	12.88	15.8	20.0	13.4	16.8	2388.0
6'	120	2 Wire + Gnd	1	60	NEMA 5-15P/L5-15P	7.57	8.4	15.0	7.3	10.6	1501.0
8'	120	2 Wire + Gnd	1	60	NEMA 5-15P/L5-15P	8.61	9.7	15.0	8.3	11.8	1678.0
12'	120	2 Wire + Gnd	1	60	NEMA 5-20P/L5-20P	12.58	14.4	20.0	12.1	14.3	2033.0

ELECTRICAL DATA

Case Length	Fans Per Case	Evaporator Fans	
		120 Volts	
		Amps	Watts
2 Door	1	0.42	34
3 Door	2	0.84	68
4 Door	3	1.26	102
5 Door	3	1.26	102
6'	2	0.84	68
8'	2	0.84	68
12'	3	1.26	102

LIGHTING DATA

Case Length	Door Size	OP7 Single Swing		OP7 French Swing	
		120 Volts		120 Volts	
		Amps	Watts	Amps	Watts
2 Door	30"	0.28	33.0	---	---
3 Door	30"	0.41	49.2	---	---
4 Door	30"	0.55	65.4	---	---
5 Door	30"	0.68	81.6	---	---
6'	24"	---	---	0.44	52.3
8'	24"	---	---	0.44	52.3
12'	24"	---	---	0.64	76.6

NOTES:

- "----" indicates that this feature is not an option on this case model.
- 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.
- Heat dissipated to room listed for maximum design conditions, normal operating loads may be lower.
- Data listed is for Optimax. For other lighting options please contact your sales representative.
- Light wattages above reflect 100% run time. To determine actual daily energy usage at 75°F/55%RH conditions, reduce the light wattages above by 42%.
- The recommended evaporator temperature and defrost settings 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.
- Discharge air temperature values represent readings taken within the upper air channel immediately behind/upstream of the honeycomb.
- Listed discharge air velocity represents the average velocity immediately after defrost completion using a Testo 410i vane anemometer with anemometer air scoop (HP part number P109185M) positioned adjacent to the interior edge of the discharge honeycomb.



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09-21-26	7	ENDVIEW UPDATE
04-16-26	6	DATA UPDATE



A3: TECHNICAL REFERENCE SHEET

JNRBHSA

2, 3, 4 & 5 Door / 6', 8', 12' High Narrow Reach-In Self Contained
Beverage/Bakery/Dairy/Cut Produce/Deli



ANTI CONDENSATE DATA

Case Length	Door Size	101 Frames		Vista Frames	
		Un Heated Doors		Un Heated Doors	
		ELMD, I90		I60	
		120 Volts		120 Volts	
		Amps	Watts	Amps	Watts
2 Door	30"	0.36	43	0.36	43
3 Door	30"	0.55	66	0.55	66
4 Door	30"	0.75	90	0.75	90
5 Door	30"	0.94	113	0.94	113
6'	24"	0.39	47	0.39	47
8'	24"	0.43	52	0.43	52
12'	24"	0.68	82	0.68	82

GUIDELINES AND CONTROL SETTINGS

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

CONDENSING UNIT DATA

Case Length	Volts	Phase	Frequency (Hz)	Horsepower	RLA	LRA	Refrigerant	Refrigerant (g)	Room Area Min. (m)	Room Area Min. (ft)
2 Door	120	1	60	1/3	4.3	16.7	R-290	130	2.83	30.43
3 Door	120	1	60	1/3	4.3	16.7	R-290	140	3.04	32.77
4 Door	120	1	60	1/3	5.3	32.0	R-290	145	3.15	33.94
5 Door	120	1	60	1/2	8.4	40.2	R-290	150	3.26	35.11
6'	120	1	60	1/3	4.3	16.7	R-290	130	2.83	30.43
8'	120	1	60	1/3	5.3	32.0	R-290	134	2.91	31.37
12'	120	1	60	1/2	8.4	40.2	R-290	150	3.26	35.11

DEFROST CONTROLS

Case Length	Defrosts Per Day	Fail-Safe (Min)	Termination Temp (°F)
2-5 Door	2	46	40
6', 8', 12'	4	46	36



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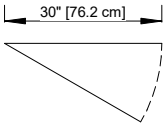
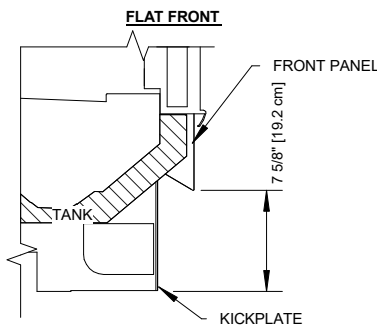
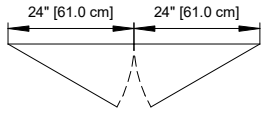
Rev. Date	Rev. #	Rev. Title
09-21-26	7	ENDVIEW UPDATE
04-16-26	6	DATA UPDATE



JNRBHSA

2, 3, 4 & 5 Door / 6', 8', 12' High Narrow Reach-In Self Contained
Beverage/Bakery/Dairy/Cut Produce/Deli



DOOR OPTIONS	FRONT OPTIONS
STANDARD SWING DOOR 2, 3, 4, & 5 - DOOR CASES 	
FRENCH DOOR 6', 8' & 12' CASES 	



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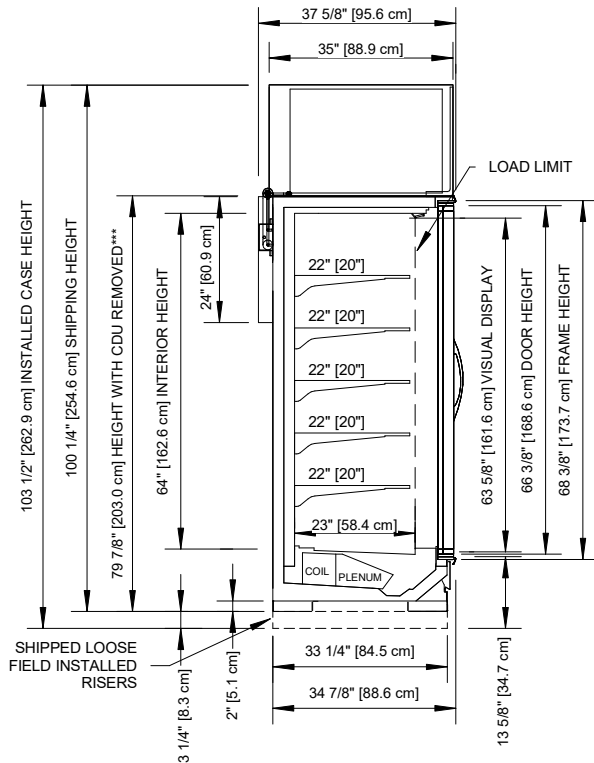
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09-21-26	7	ENDVIEW UPDATE
04-16-26	6	DATA UPDATE



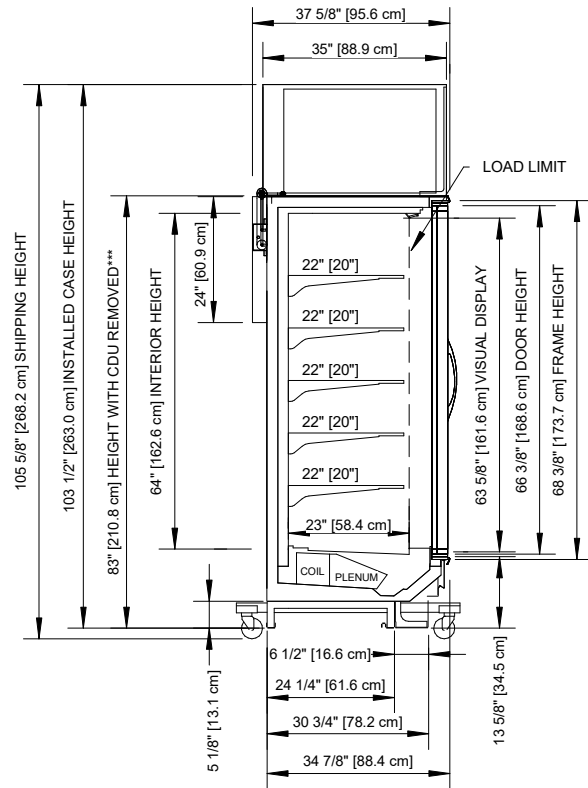
A5: TECHNICAL REFERENCE SHEET

JNRBHSA

2, 3, 4 & 5 Door / 6', 8', 12' High Narrow Reach-In Self Contained
Beverage/Bakery/Dairy/Cut Produce/Deli



SPECIALIZED



STANDARD



ENGINEERED FOR STORES WITH AMBIENT CONDITIONS NOT TO EXCEED 80°F (27°C) AND 55% RELATIVE HUMIDITY. 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
09-21-26	7	ENDVIEW UPDATE
04-16-26	6	DATA UPDATE



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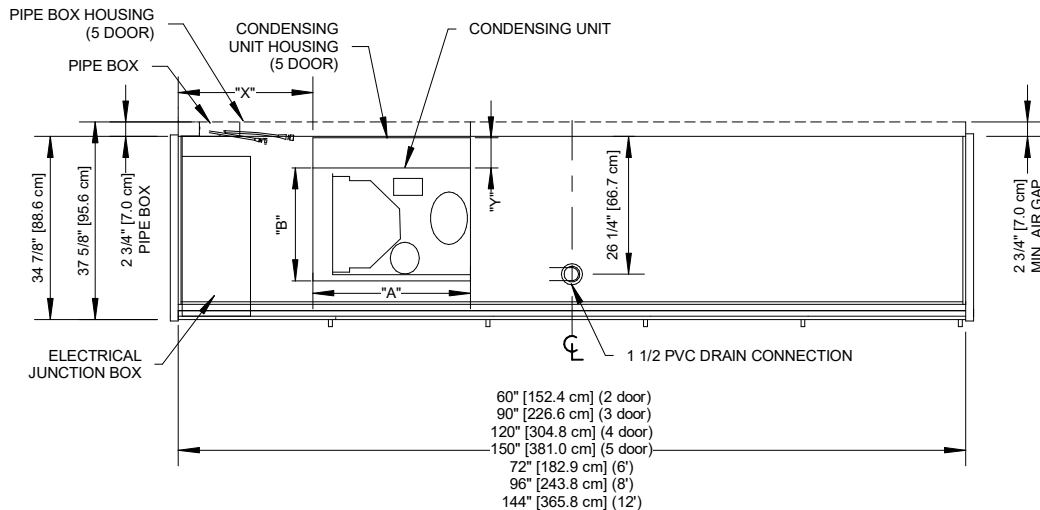
A6: TECHNICAL REFERENCE SHEET

JNRBHSA

2, 3, 4 & 5 Door / 6', 8', 12' High Narrow Reach-In Self Contained
Beverage/Bakery/Dairy/Cut Produce/Deli



CONDENSING UNIT SIZE AND POSITION R-290							
CASE LENGTH	2DR	3DR	4DR	5DR	6'	8'	12'
"X"	25.63"	25.63"	25.63"	25.63"	25.63"	25.63"	25.63"
"Y"	7.94"	7.94"	7.94"	7.94"	7.94"	7.94"	7.94"
"A"	21"	21"	25.9"	25.9"	21"	25.9"	25.9"
"B"	17.2"	17.2"	17.2"	17.2"	17.2"	17.2"	17.2"

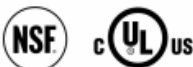


NOTES:

* : STUB-UP AREA.

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

- Specialized Base Frame (available on door length models ONLY):
- 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.



ENGINEERED FOR STORES WITH AMBIENT CONDITIONS NOT TO EXCEED 80°F (27°C) AND 55% RELATIVE HUMIDITY. 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
09-21-26	7	ENDVIEW UPDATE
04-16-26	6	DATA UPDATE



A7: TECHNICAL REFERENCE SHEET

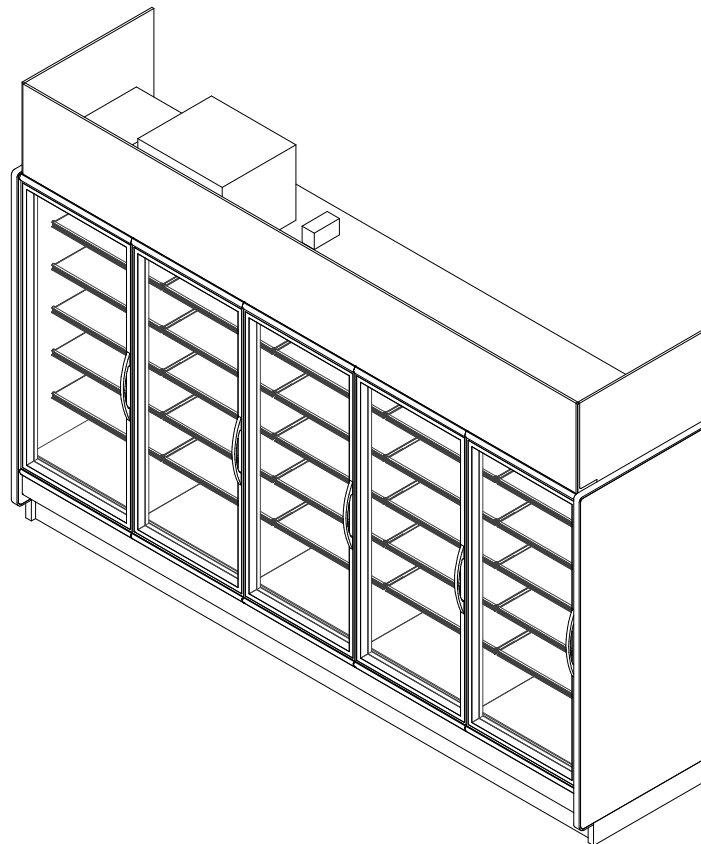
JNRZHSA

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



GENERAL NOTES:

- "----" indicates that the feature is not an option with this case model and/or the data is not available at this time.
- Light controls - occupancy sensors are required for heated doors only. Low E doors do not require the sensors.
- Option 1: OEM Provided: OEM anti-condensate and lighting controls (on/off) are standard unless otherwise specified.
- Option 2: End User Provided: Light controls should be based on occupancy sensors. Store level A/S control should be set to 30% minimum off time at 75°F/55%RH.
- WARNING: R-290 flammable refrigerant in use. Read the installation, operating and maintenance instructions thoroughly before installing or servicing this equipment.
- Condensate pump is optional. Non-electric condensation pan comes standard with case located within CDU and not shown on drawing. All field-supplied components must be certified for R290 (propane) applications.



SHIPPING WEIGHT	
Case	Weight
JNRZHSA	----



ENGINEERED FOR STORES WITH AMBIENT CONDITIONS NOT TO EXCEED 80°F (27°C) AND 55% RELATIVE HUMIDITY. 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.

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Rev. Date	Rev. #	Rev. Title
09-28-26	10	ENDVIEW UPDATES
04-24-26	9	NOTES UPDATE



A8: TECHNICAL REFERENCE SHEET

JNRZHS

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



SYSTEM REQUIREMENT

Case Length	Volts	Wiring Type	Phase	Frequency (Hz)	Optional Factory Installed Plug	MCA	MOP	Total Load (Amps)	24hr Energy Usage (kWh)	THR (BTUH)
2 Door	120/208	3 Wire + Gnd	1	60	NEMA 14-20/L14-20	8.8	15.0	7.5	22.1	3142.0
3 Door	120/208	3 Wire + Gnd	1	60	NEMA 14-20/L14-20	12.8	15.0	10.4	33.0	4692.0
4 Door	120/208	3 Wire + Gnd	1	60	NEMA L14-30	27.8	30.0	23.4	37.5	5331.0
5 Door	120/208	3 Wire + Gnd	1	60	NEMA L14-30	29.6	30.0	24.9	48.4	6881.0

ELECTRICAL DATA

Case Length	Fans Per Case	Evaporator Fans	
		120 Volts	
		Amps	Watts
2 Door	1	0.42	34
3 Door	2	0.84	68
4 Door	3	1.26	102
5 Door	3	1.26	102

LIGHTING DATA

Case Length	Door Size	OP7 Single Swing	
		120 Volts	
		Amps	Watts
2 Door	30"	0.28	33.0
3 Door	30"	0.41	49.2
4 Door	30"	0.55	65.4
5 Door	30"	0.68	81.6

ANTI CONDENSATE DATA

Case Length	Door Size	Individual Circuits									
		I90 Doors				ELMD Doors				Door Frame	
		Heated Doors		Low E Doors		Heated Doors		Low E Doors		101-LE	
		120 Volts		120 Volts		120 Volts		120 Volts		120 Volts	
		Amps	Watts	Amps	Watts	Amps	Watts	Amps	Watts	Amps	Watts
2 Door	30"	0.56	67	0.34	40	0.64	76	0.38	45	1.26	151
3 Door	30"	0.84	101	0.51	61	0.95	114	0.57	68	1.76	211
4 Door	30"	1.12	135	0.67	81	1.27	152	0.76	91	2.29	275
5 Door	30"	1.40	169	0.84	101	1.59	191	0.95	114	2.78	334

GUIDELINES AND CONTROL SETTINGS

Case Length	Application	Superheat Set Point @ Bulb (°F)	Discharge Air (°F)	Set Point Differential (°F)	Discharge Air Velocity (FPM)
2 - 5 Door	Frozen Food	3 - 8	- 2	4	250
2 - 5 Door	Frozen Food	3 - 8	- 2	4	250
2 - 5 Door	Ice Cream	3 - 8	- 9	4	250
2 - 5 Door	Ice Cream	3 - 8	- 9	4	250



ENGINEERED FOR STORES WITH AMBIENT CONDITIONS NOT TO EXCEED 80°F (27°C) AND 55% RELATIVE HUMIDITY. 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.

JNRZHS

Rev. Date	Rev. #	Rev. Title
09-28-26	10	ENDVIEW UPDATES
04-24-26	9	NOTES UPDATE



A9: TECHNICAL REFERENCE SHEET

JNRZHS

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



CONDENSING UNIT DATA										
Case Length	Volts	Phase	Frequency (Hz)	Horsepower	RLA	LRA	Refrigerant	Refrigerant (g)	Room Area Min. (m)	Room Area Min. (ft)
2 Door	208	1	60	1	3.9	25.4	R-290	150	3.26	35.11
3 Door	208	1	60	1 1/2	6.1	48.0	R-290	180	3.91	42.14
4 Door	208	1	60	2 1/2	18.0	75.0	R-290	260	5.65	60.87
5 Door	208	1	60	2 1/2	18.0	75.0	R-290	300	6.52	70.23

DEFROST CONTROLS			
Defrosts Per Day	Hot Gas Defrost		
	Run-Off Time (Min)	Fail-Safe (Min)	Termination Temp (°F)
1	0	30	72

NOTES:

- "---" indicates that this feature is not an option on this case model.
- 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.
- Heat dissipated to room listed for maximum design conditions, normal operating loads may be lower.
- Data listed is for Optimax. For other lighting options please contact your sales representative.
- Light wattages above reflect 100% run time. To determine actual daily energy usage at 75°F/55%RH conditions, reduce the light wattages above by 42% and reduce the A/S values above by the minimum off time.
- Anti-condensate heat values for Low E represent a door with no heat on the glass.
- Low energy doors (no heat on the glass) do not require anti-condensate or lighting controls. Frame A/S heat is cycled off during defrost cycles.
- Heated doors (heat on the glass) require anti-condensate and lighting controls. Frame A/S heat is cycled off during defrost cycles.
- The recommended evaporator temperature and defrost settings 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.
- Discharge air temperature values represent readings taken within the upper air channel immediately behind/upstream of the honeycomb.
- Listed discharge air velocity represents the average velocity immediately after defrost completion using a Testo 410i vane anemometer with anemometer air scoop (HP part number P109185M) positioned adjacent to the interior edge of the discharge honeycomb.



ENGINEERED FOR STORES WITH AMBIENT CONDITIONS NOT TO EXCEED 80°F (27°C) AND 55% RELATIVE HUMIDITY. 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.

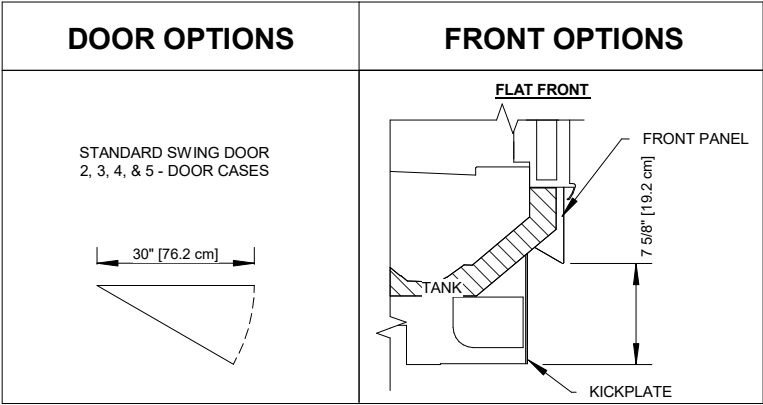
JNRZHS

Rev. Date	Rev. #	Rev. Title
09-28-26	10	ENDVIEW UPDATES
04-24-26	9	NOTES UPDATE



JNRZHSA

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

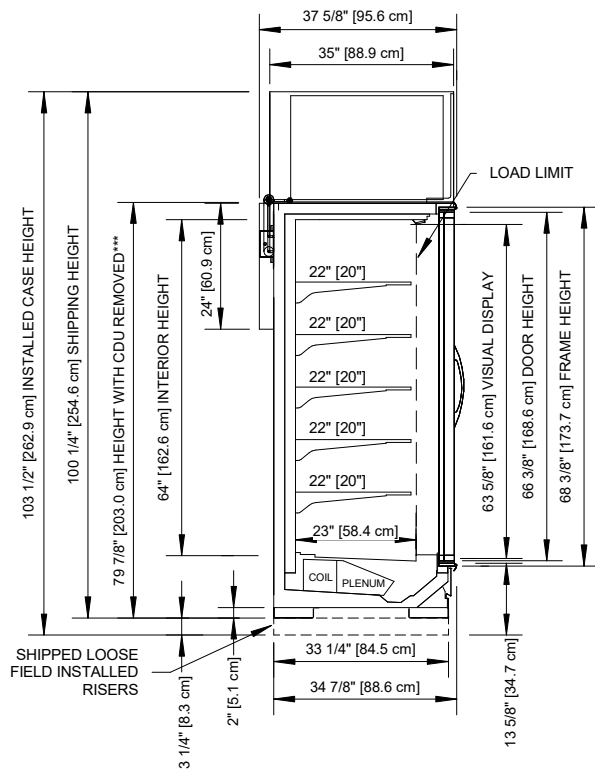
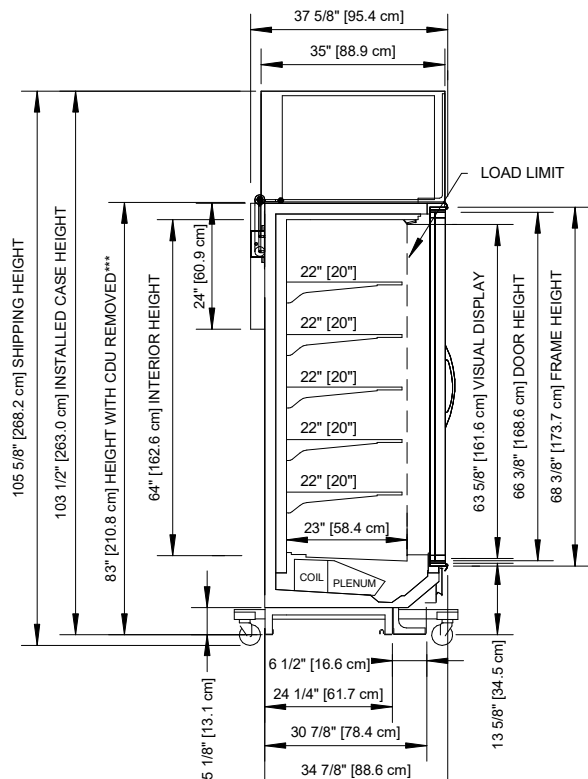


ENGINEERED FOR STORES WITH AMBIENT CONDITIONS NOT TO EXCEED 80°F (27°C) AND 55% RELATIVE HUMIDITY. ALL MEASUREMENTS ARE TAKEN PER ASHRAE-72 SPECIFICATIONS. HILLPHOENIX REFRIGERATED DISPLAY CASES FOR SALE IN THE UNITED STATES MEET OR EXCEED DEPARTMENT OF ENERGY 2017 REQUIREMENTS.

JNRZHSA

Rev. Date	Rev. #	Rev. Title
09-28-26	10	ENDVIEW UPDATES
04-24-26	9	NOTES UPDATE



JNRZHS2, 3, 4 & 5 Door High Narrow Reach-In Self Contained Merchandiser
Frozen Food/Ice Cream**SPECIALIZED****STANDARD**

ENGINEERED FOR STORES WITH AMBIENT CONDITIONS NOT TO EXCEED 80°F (27°C) AND 55% RELATIVE HUMIDITY. 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.

JNRZHS

Rev. Date	Rev. #	Rev. Title
09-28-26	10	ENDVIEW UPDATES
04-24-26	9	NOTES UPDATE



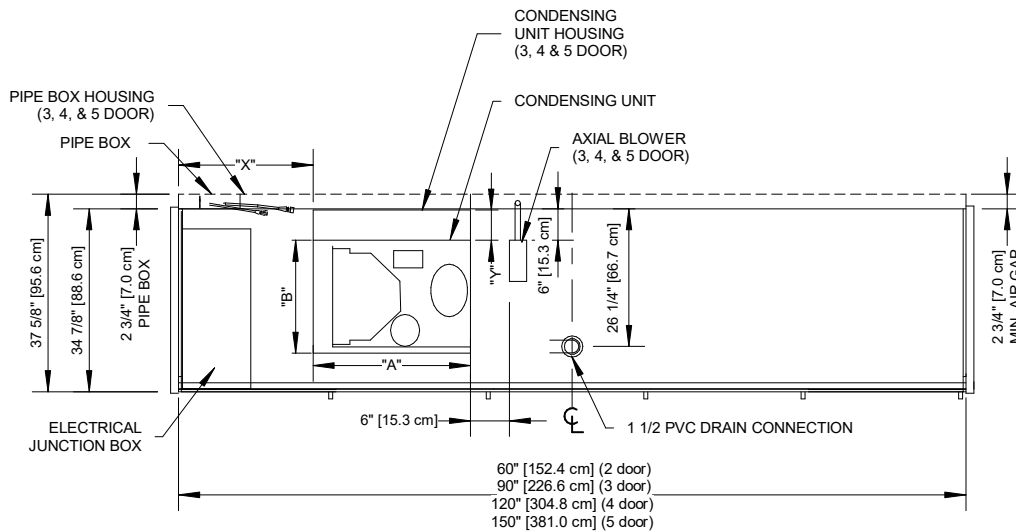
A12: TECHNICAL REFERENCE SHEET

JNRZHS A

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



CONDENSING UNIT SIZE AND POSITION R-290				
CASE LENGTH	2DR	3DR	4DR	5DR
"X"	25.63"	25.63"	25.63"	25.63"
"Y"	7.94"	7.94"	7.94"	7.94"
"A"	25.9"	25.8"	22.75"	22.75"
"B"	17.2"	17.3"	19.89"	19.89"



NOTES:

* : STUB-UP AREA

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

*** Specialized Base Frame:

- Case fits through 80" doorway after CDU is removed in the field.
- 2" lifting brackets (installed) & 3.25" ship loose risers combine for 5" baseframe once installed.
- Drain traps ship loose.
- Ends add approximately 1/2" to the back & 1" to the front (end panel height included in case height).
- The standard pump is shipped loose with the case unless another selection on the drain option is selected, such as filtered pump or floor drain package. Check your work order and manual for installation details.



ENGINEERED FOR STORES WITH AMBIENT CONDITIONS NOT TO EXCEED 80°F (27°C) AND 55% RELATIVE HUMIDITY. 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.

JNRZHS A

Rev. Date	Rev. #	Rev. Title
09-28-26	10	ENDVIEW UPDATES
04-24-26	9	NOTES UPDATE



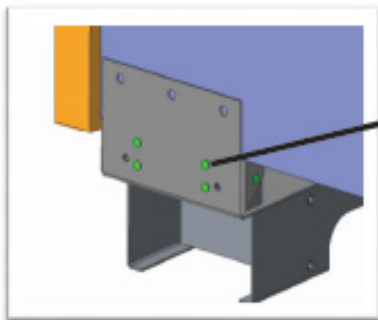
a SOVER company

B1: SEISMIC BRACKETS

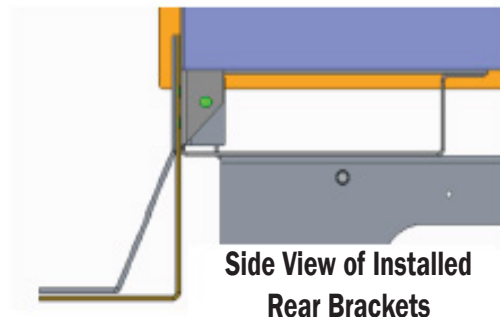
The case constraint brackets are installed on the rear and front base of the case. Brackets are designed for use with the split base frame configuration.

Rear Brackets Installation:

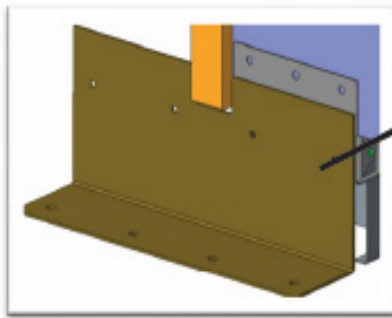
- Two 12G brackets are placed on the rear of the case and captured together by same HILTI thread for improved section modulus of anchor
- Screws pass through both parts and into the factory installed case rear-feet
- Wide part included anchor along case-to-case interface
- Single-width parts for anchor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



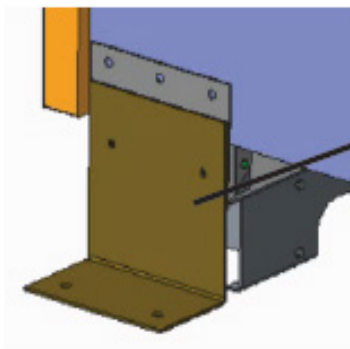
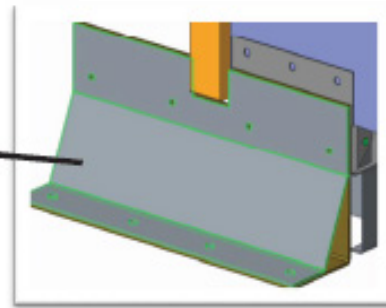
Rear Feet of
the Case



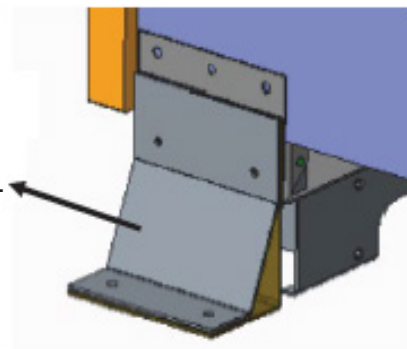
Side View of Installed
Rear Brackets



P/No: F885142AGL
P/No: F885144GGL



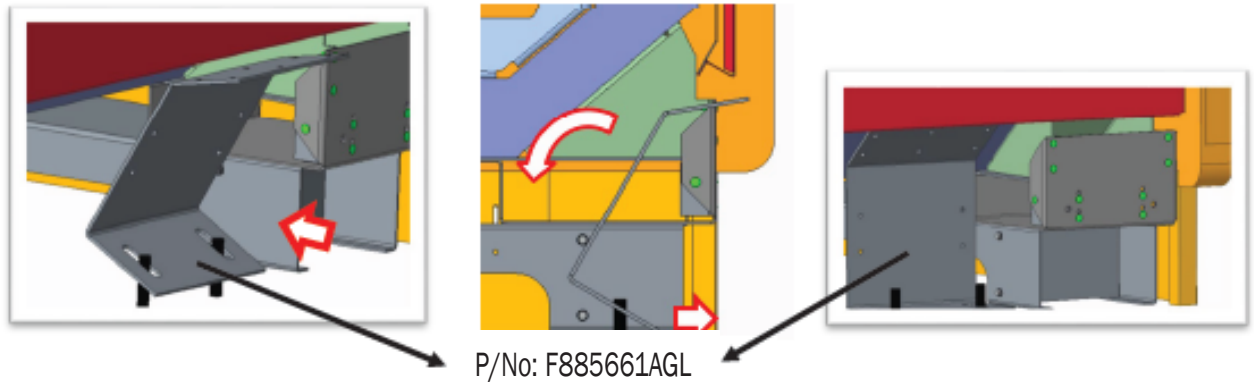
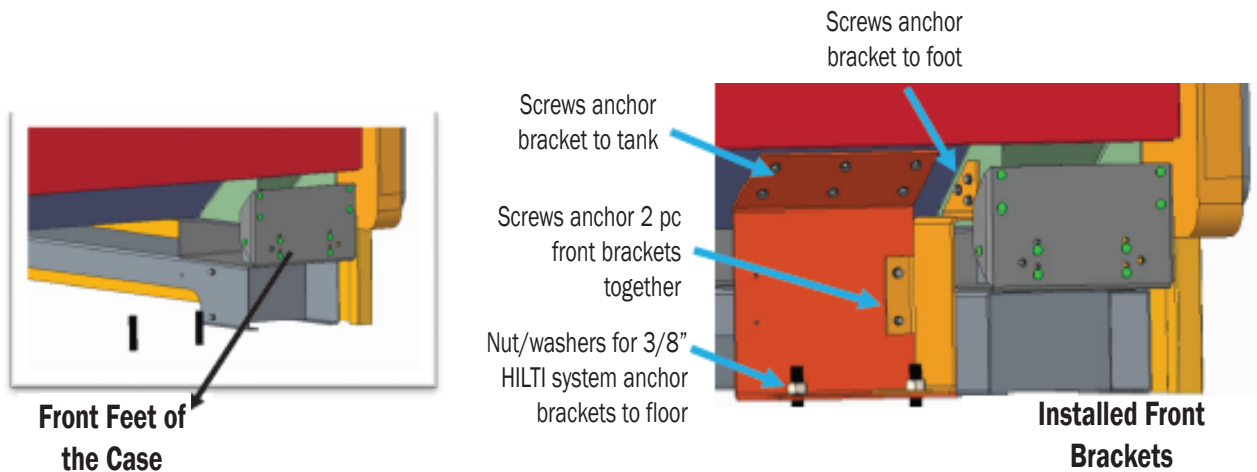
P/No: F884947FGL
P/No: F885143KGL



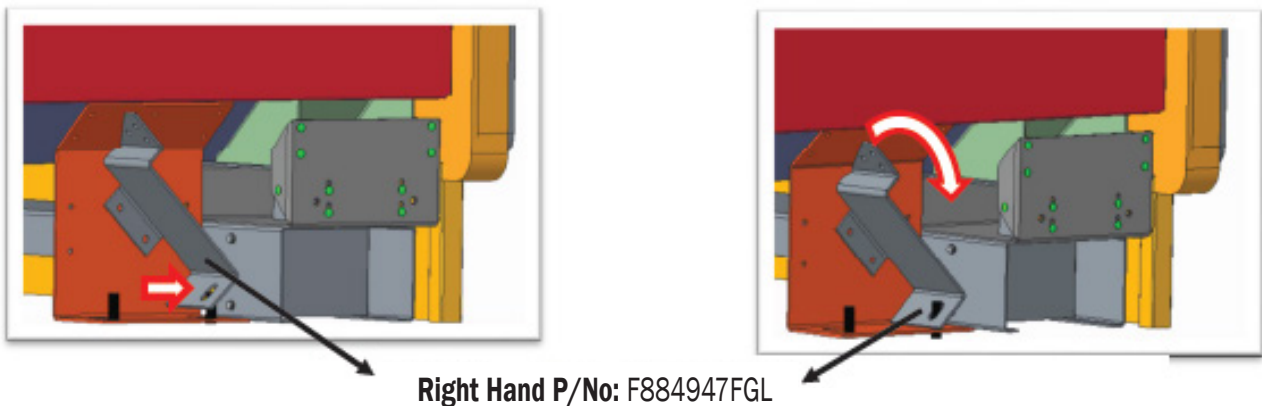
B2: SEISMIC BRACKETS

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

CAD SYMBOLS			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	
DA/DT	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		FU	FUSE	
TR	TRANSFORMER		CDU	CONDENSING UNIT	

6	11/14/2024	SHS	123456	MOTION SENSOR WIRING AND TB LAYOUT UPDATED
5	11/05/2024	SRAI	123700	MOTION SENSOR AND VALVE NOMENCLATURE UPDATED
4	10/04/2024	SRAI	123209	BLOWER AND VALVES WIRING UPDATED
3	08/19/2024	SRAI	123209	WIRE GAUGE UPDATED IN THE TB LAYOUT
2	07/18/2024	SRAI	123274	RELAY FOOT PRINT ROTATED & WIRE 55 MOVED
1	07/10/2024	SRAI	123270	SAFETY CONTACTOR CKT REPLACED WITH BLOWER CKT
0	05-24-2024	SRAI	123286	FOR INITIAL REVIEW AND RELEASE
REV	DATE	REV BY	ECN	DESCRIPTION

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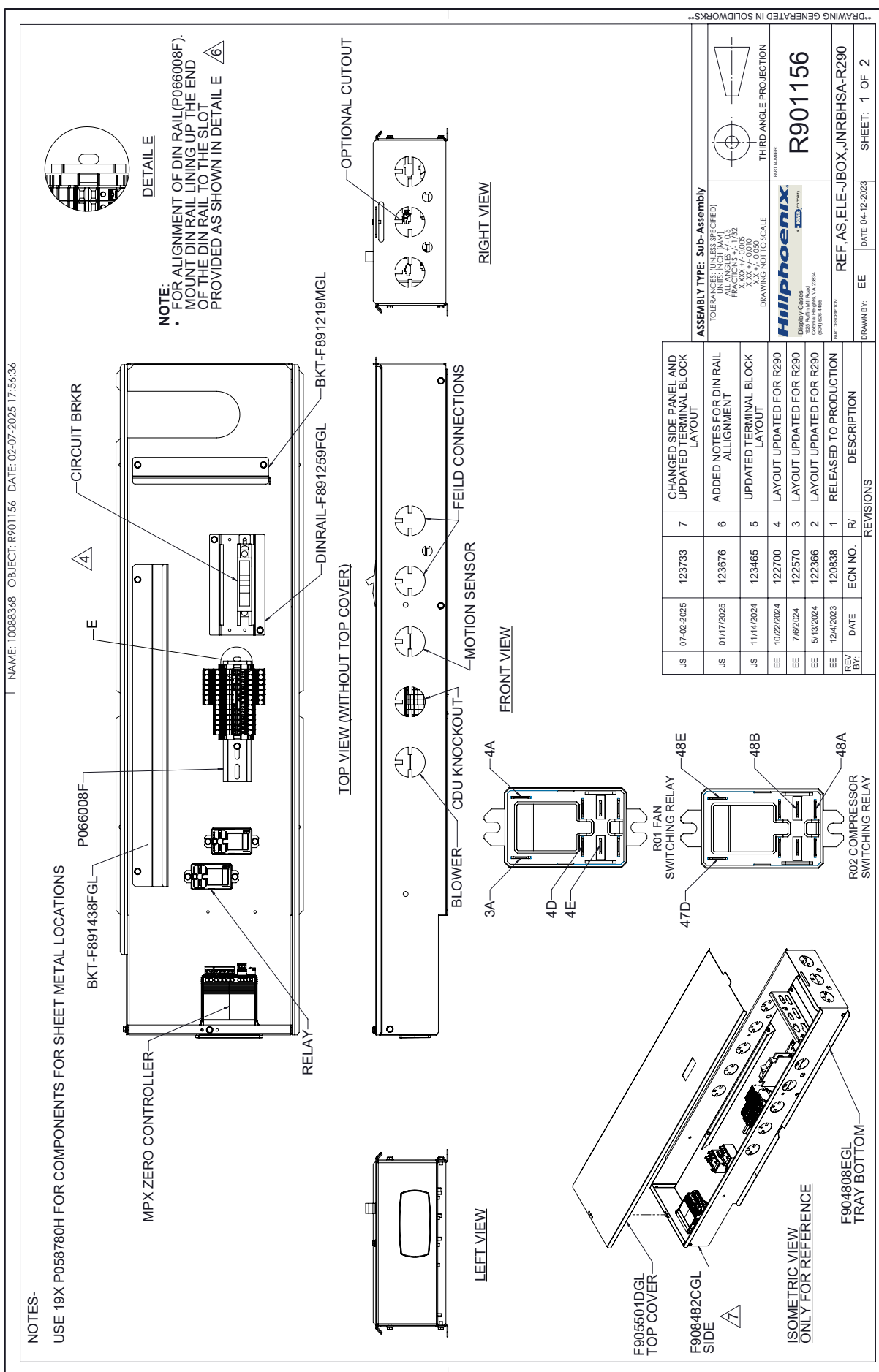
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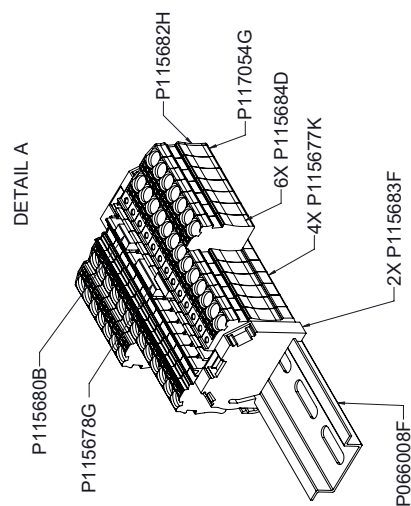
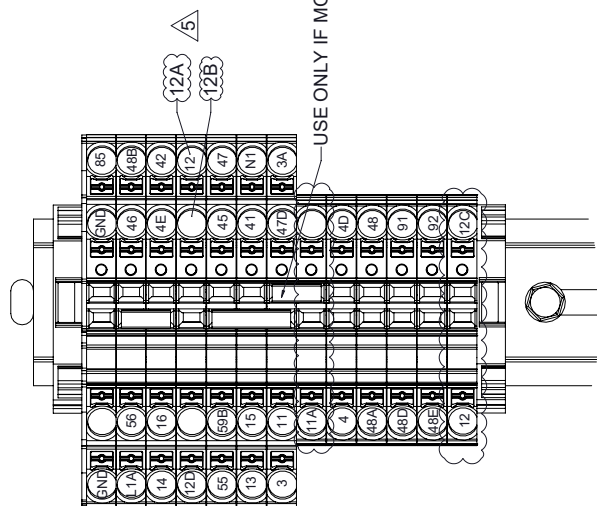
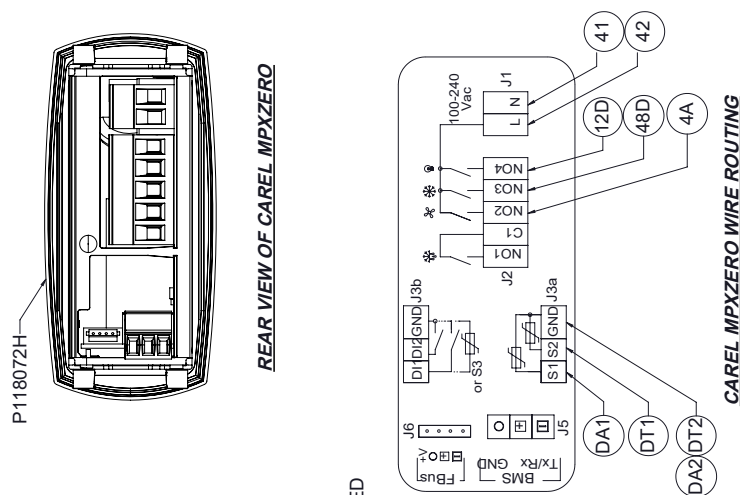
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C2: ELECTRICAL WIRING (JNRBHSA)



C3: ELECTRICAL WIRING (JNRBHSA)

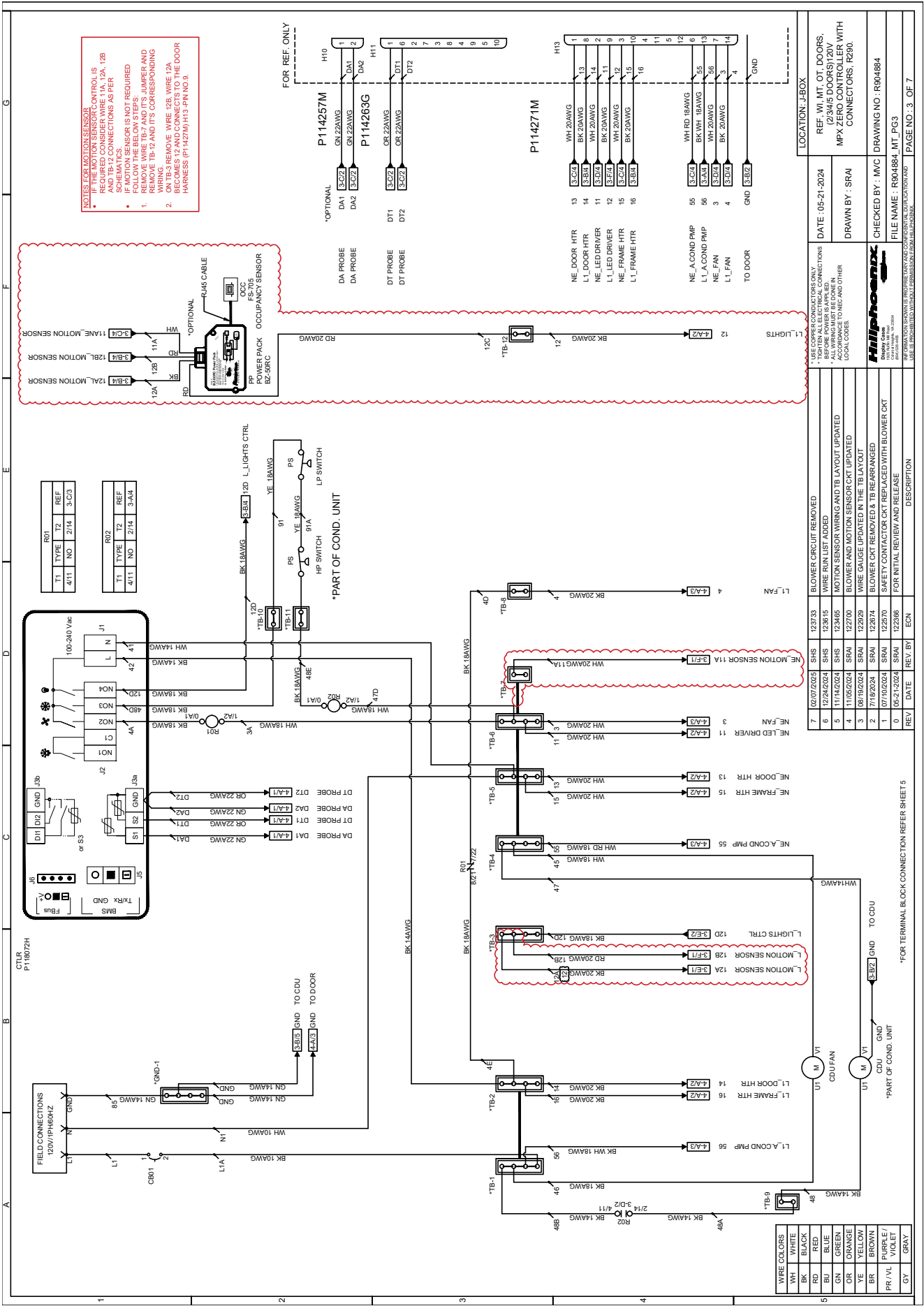
NOTE:
USE R904884 AS REF FOR MT SCHEMATICS
UNLESS OTHERWISE SPECIFIED, WIRES COMES FROM PIG TAIL HARNESS
TB-TERMINAL BLOCK



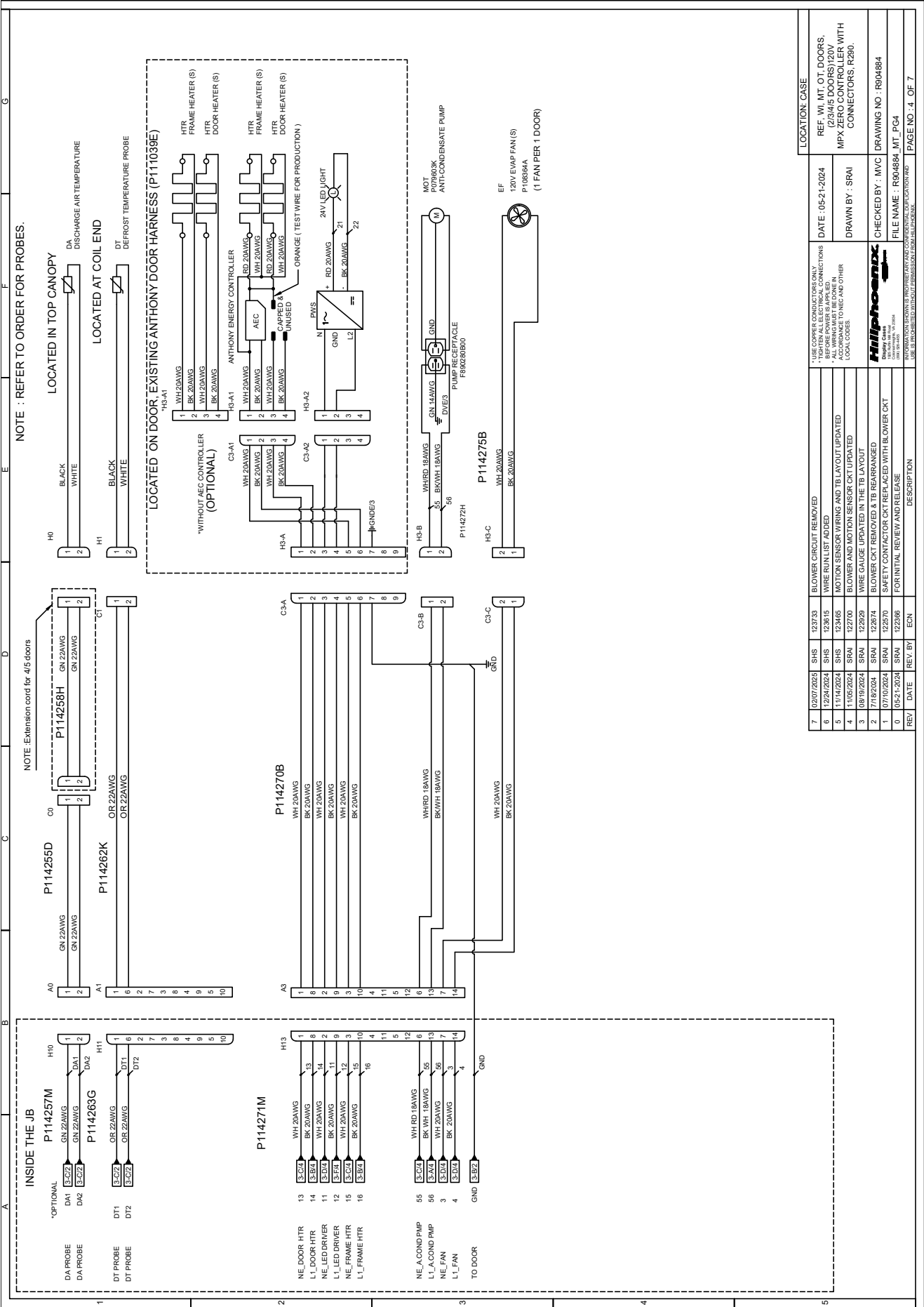
 Display Cases 10000 Crescent Heights, NV 89004 (801) 526-4455	PRINT NUMBER R901156
DRAWN BY: EE DATE: 04-12-2023	REF AS ELE-J BOX, JINRBHSA-R290 SHEET: 2 OF 2

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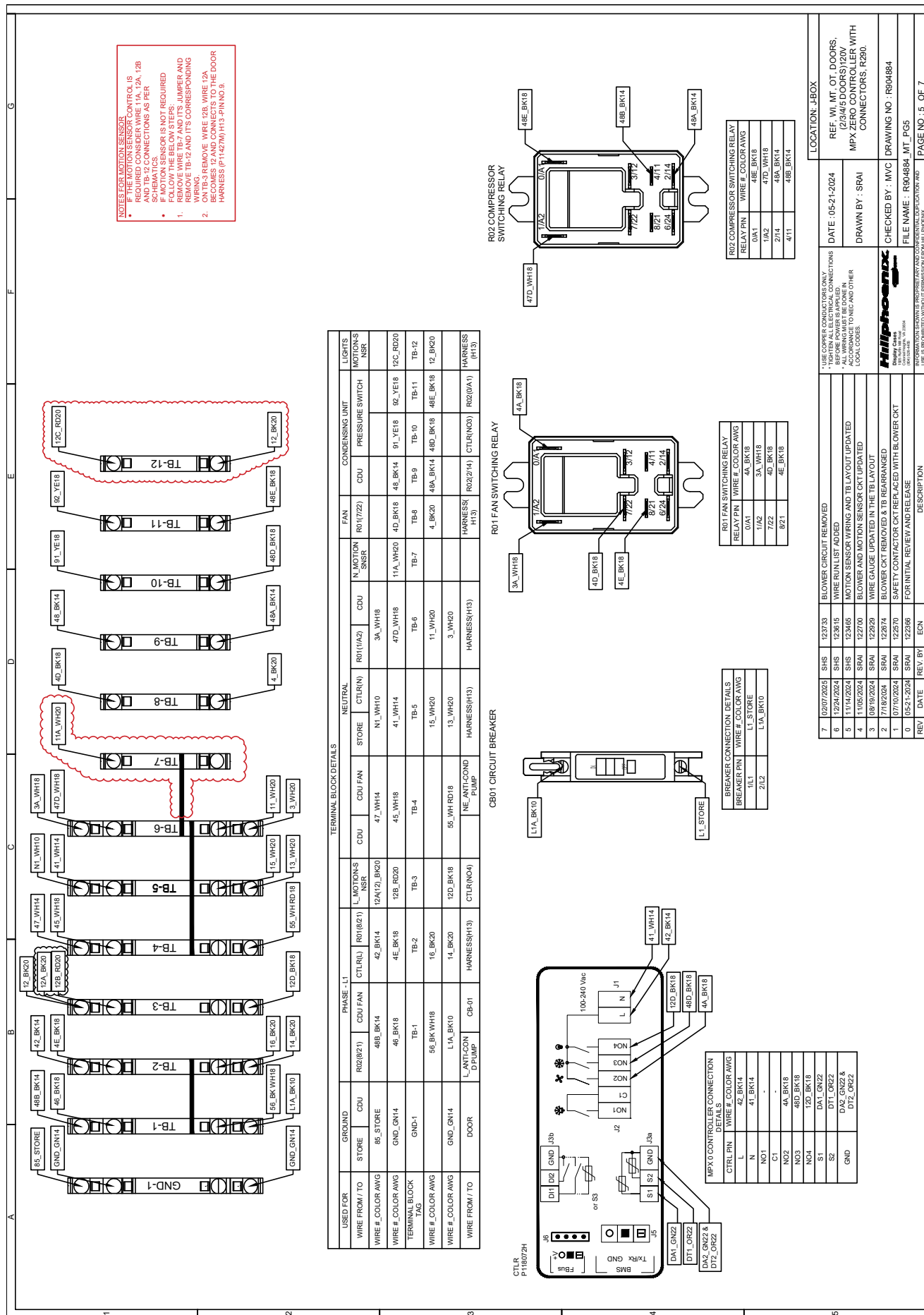
C4: ELECTRICAL WIRING (JNRBHSA)



C5: ELECTRICAL WIRING (JNRBHSA)



C6: ELECTRICAL WIRING (JNRBHSA)



C7: ELECTRICAL WIRING (JNRBHSA)

R290, CONNECTORIZED HARNESS --- R904884									
SLNO	WIRE #	LENGTH	COLOR	AWG	WIRE P#	WIRE FROM	STRIP LENGTH	TO	REMARKS
INCOMER WIRES									
1	L1	18"	BLACK	10AWG	P001631A	STORE	0.35"(9MM)	CB01	
2	L1A	18"	BLACK			TB-1		CB-01	
3	N1		WHITE		P001632K	TB-5	0.47"(12MM)	STORE	0.35"(9MM)
4	85	142"(HARNESS)	GREEN	14AWG	P002454G	GND-1			
CONTROLLER									
5	42	18"	BLACK	14AWG	P001548G	CTLR(L)		TB-2	
6	41	18"	WHITE		P001547K	CTLR(N)		TB-5	
7	GND	20"	GREEN	14AWG	P002454G	CDU		GND-1	0.47"(12MM)
8	GND		GREEN	14AWG	P002454G	DOOR	0.35"(9MM)		
9	4A					CTLR(NO2)		R01(O/A1)	0.35"(9MM (RED FLG-P096492E))
10	48D		BLACK	18AWG	P001278A	CTLR(NO3)		TB-10	
11	12D					CTLR(NO4)		TB-3	0.47"(12MM)
RELAYS									
12	3A	10"	WHITE	18AWG	P001277C	R01(1/A2)		TB-6	
13	47D	10"	WHITE	18AWG	P001277C	R02(1/A2)		TB-6	
14	48E	10"	BLACK	18AWG	P001278A	R02(O/A1)	0.35"(9MM (RED FLG-P096492E))	TB-11	
15	4D					R01(7/22)		TB-8	
16	4E	14"	BLACK	18AWG	P001278A	R01(8/21)		TB-2	
17	47		WHITE		P001547K	CDU	0.35"(9MM)	TB-4	0.47"(12MM)
18	48B					R01(4/11)		TB-1	
19	48A	18"	BLACK	14AWG	P001548G	R01(2/14)	0.35"(9MM (RED FLG-P096492E))	TB-9	
20	48					CDU		TB-9	
21	45		RED	18AWG	P001415K	CDU FAN	0.35"(9MM)	TB-4	
22	46		BLACK		P001278A	CDU FAN		TB-1	
7/02/2025 SHS 123733 BLOWER CIRCUIT REMOVED									
6/12/24/2024 SHS 123815 WIRE RUN LIST ADDED									
5/11/14/2024 SHS 123465 MOTION SENSOR WIRING AND TBLAYOUT UPDATED									
4/11/06/2024 SR01 122700 BLOWER AND MOTION SENSOR CKT UPDATED									
3/08/19/2024 SR01 122929 WIRE GAUGE UPATED IN THE TB LAYOUT									
2/7/19/2024 SR01 122874 BLOWER CKT REMOVED & TB REARRANGED									
1/07/10/2024 SR01 122870 SAFETY CONTACTOR CKT REPLACED WITH BLOWER CKT									
0/05/21/2024 SR01 122896 FOR INITIAL REVIEW AND RELEASE									
REV	DATE	REV BY	ECN	DESCRIPTION					
LOCATION: JBOX									
REF. VI, MT, OT, DOORS, (2/3/4/5 DOORS)120V MPX ZERO CONTROLLER WITH CONNECTORS, R260.									
DATE: 05-21-2024									
DRAWN BY : SR01									
CHECKED BY : MVC									
FILE NAME : R904884_MT_PG6									
DRAWING NO : R904884									
PAGE NO : 6 OF 7									

C8: ELECTRICAL WIRING (JNRBHSA)

HARNESS									
23	DA1	30" (HARNESS)	GREEN	22AWG	P114257M (HARNESS)	HARNESS (H10)	NA	CTLR(S1)	0.354" (HARNESS)
24	DA2							CTLR(GND)	
25	DT2	30" (HARNESS)	ORANGE	22AWG	P114260C (HARNESS)	HARNESS (H11)	NA	CTLR(S2)	0.354" (HARNESS)
26	DT1								
27	TB 13		WHITE					TB-5	
28	TB 15								
29	TB 14		BLACK					TB-2	
30	TB 16								
31	TB 11	18.11" (HARNESS)	WHITE	20AWG	P114271M (HARNESS)	HARNESS (13)	NA	TB-6	0.354" (HARNESS)
32	TB 12		BLACK					TB-3 OR TB-15	
33	TB 3		WHITE					TB-6	
34	TB 4		BLACK					TB-8	
35	TB 55		WHITE					TB-4	
36	TB 56		BLACK	18AWG				TB-1	
37	12 (OR 12A)	18.11" (HARNESS) / 7" M_SNSR-BK	BLACK	20AWG	HARNESS / (M_SNSR-BK)	HARNESS (13) / (M_SNSR-BK)	NA	TB-3	0.354" (HARNESS)
38	TB 12B	7"	RED	20AWG	M_SNSR WIRE	M_SNSR-RD	NA	TB-3	
39	TB 12C					M_SNSR-WH		TB-12	0.47" (12MM)
40	TB 11A		WHITE					TB-7	
41	TB 91	15"	YELLOW	18AWG		LP SWITCH	NA	TB-10	0.35" (9MM)
42	TB 91A		YELLOW	18AWG	P001417E	HP SWITCH	NA	LP SWITCH	0.35" (9MM)
43	TB 92		YELLOW	18AWG		HP SWITCH	NA	TB-11	0.35" (9MM)
									OPTIONAL

7	02/07/2025	SHS	123733	BLOWER CIRCUIT REMOVED
8	12/24/2024	SHS	123815	WIRE RUN LIST ADDED
9	11/14/2024	SHS	123405	MOTION SENSOR WIRING AND LAYOUT UPDATED
10	11/06/2024	SR41	122700	BLOWER AND MOTION SENSOR CKT UPDATED
11	08/19/2024	SR41	122929	WIRE GAUGE UPDATED IN THE TB LAYOUT
12	7/19/2024	SR41	122874	BLOWER CKT REMOVED & TB REARRANGED
13	07/10/2024	SR41	122870	SAFETY CONTACTOR CKT REPLACED WITH BLOWER CKT
14	05/21/2024	SR41	122896	FOR INITIAL REVIEW AND RELEASE
REV	DATE	REV BY	ECN	DESCRIPTION

1. TIGHTEN ALL ELECTRICAL CONNECTIONS
2. ALL WIRING MUST BE DONE IN ACCORDANCE TO NEC AND OTHER LOCAL CODES

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CHECKED BY : MVC
FILE NAME : R004884_MT_PG7
DRAWING NO : R004884

DATE : 05-21-2024
DRAWN BY : SR41
REF. VI, MT, OT, DOORS, (2/34/5 DOORS) 120V MPX ZERO CONTROLLER WITH CONNECTORS, R260.

LOCATION : JBOX

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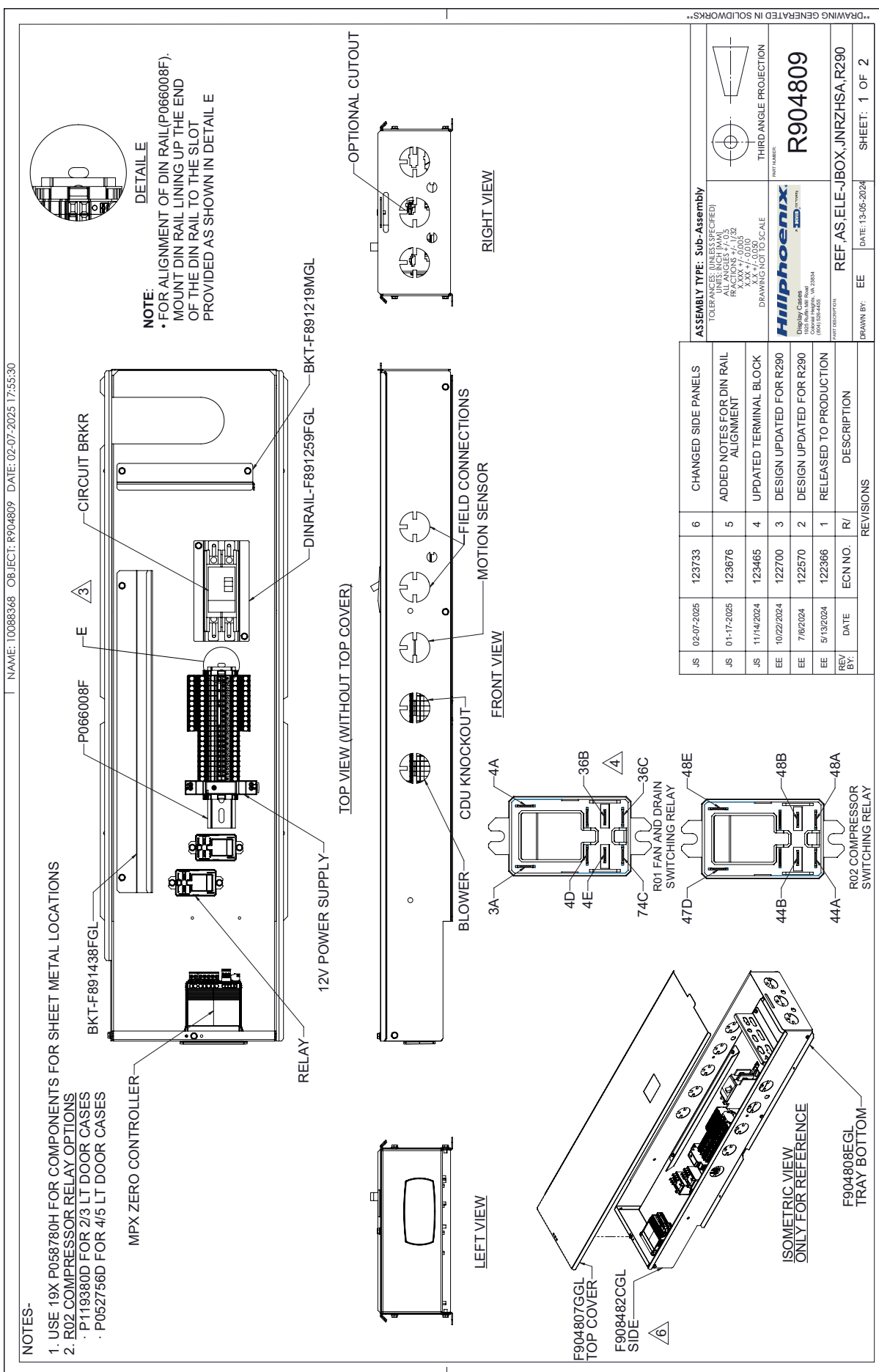
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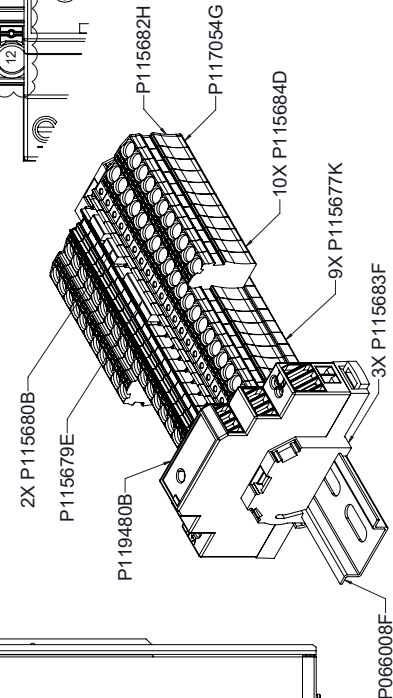
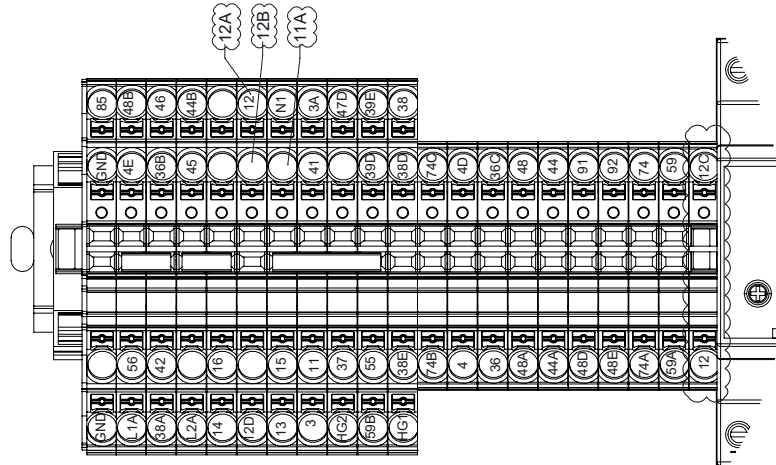
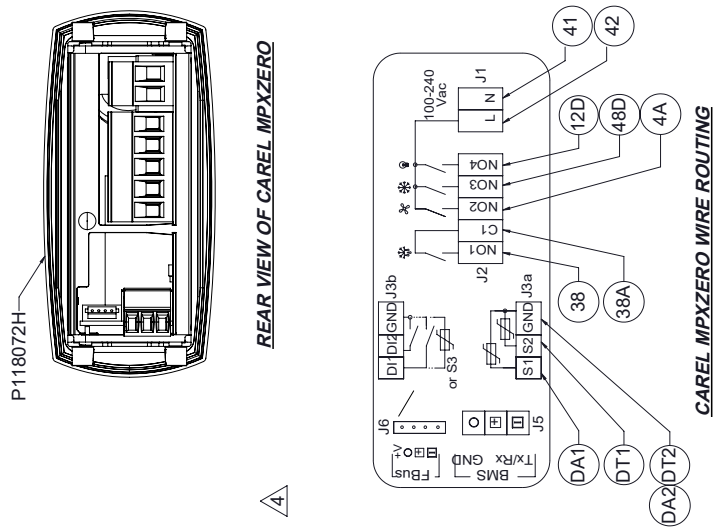
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C9: ELECTRICAL WIRING (JNRZHSA)



C10: ELECTRICAL WIRING (JNRZHSA)

NOTE:-
USE R904883 AS REF FOR LT SCHEMATICS
UNLESS OTHERWISE SPECIFIED. WIRES COMES FROM PIG TAIL HARNESS
TB-TERMINAL BLOCK



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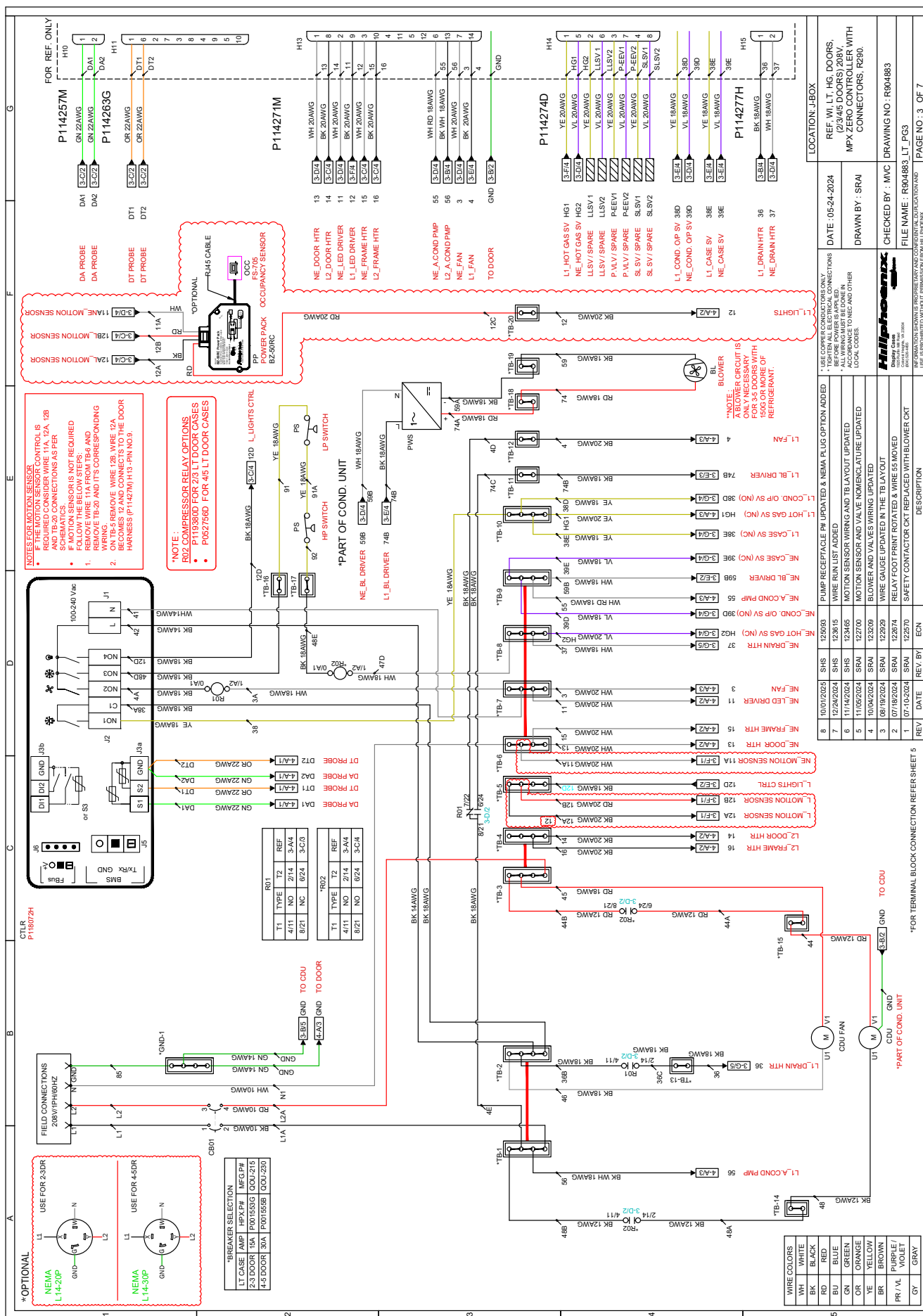
R904809

REF: AS, ELE-JBOX, JNRZHSA, R290

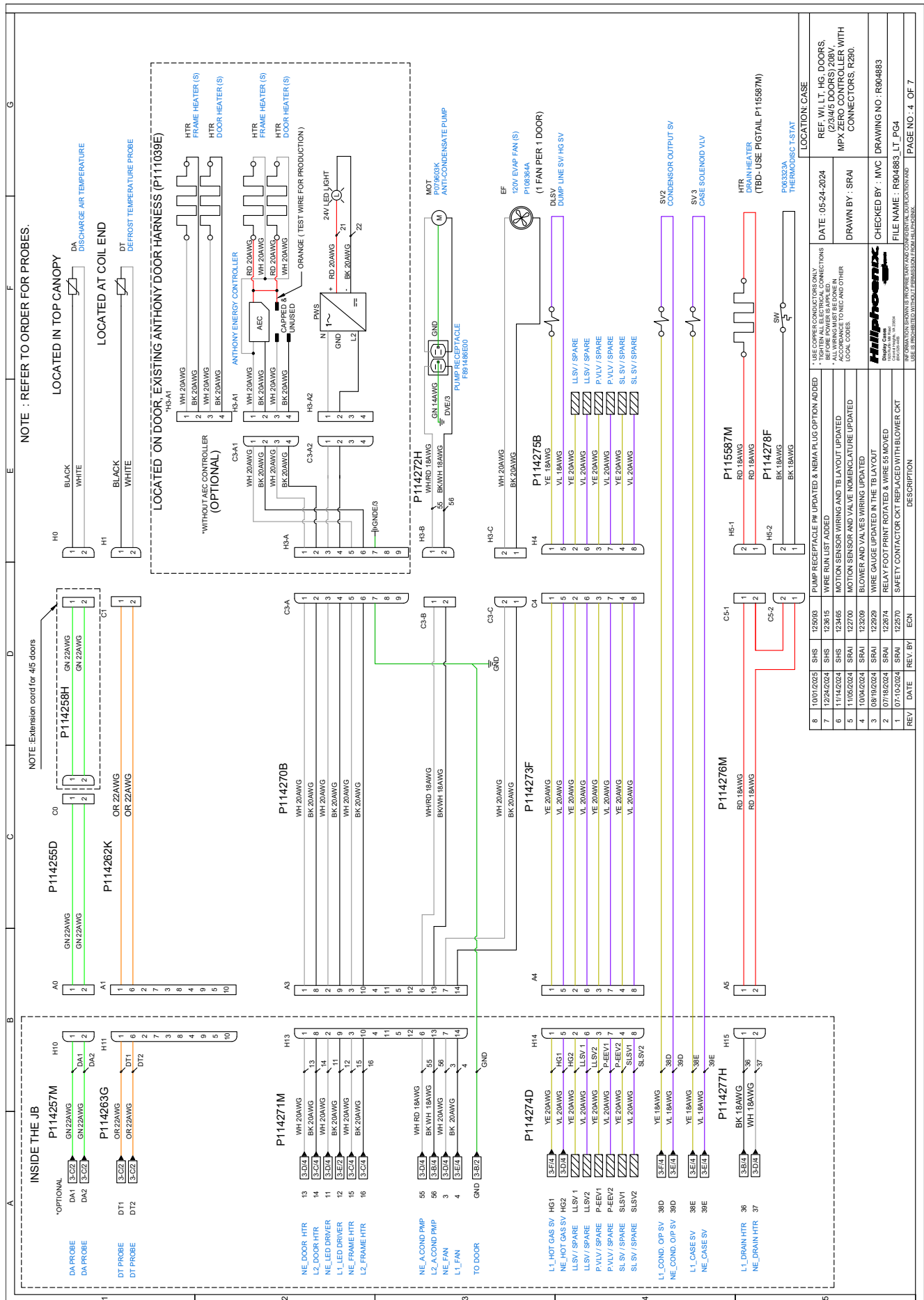
DRAWN BY: EE DATE: 13-05-2024 SHEET: 2 OF 2

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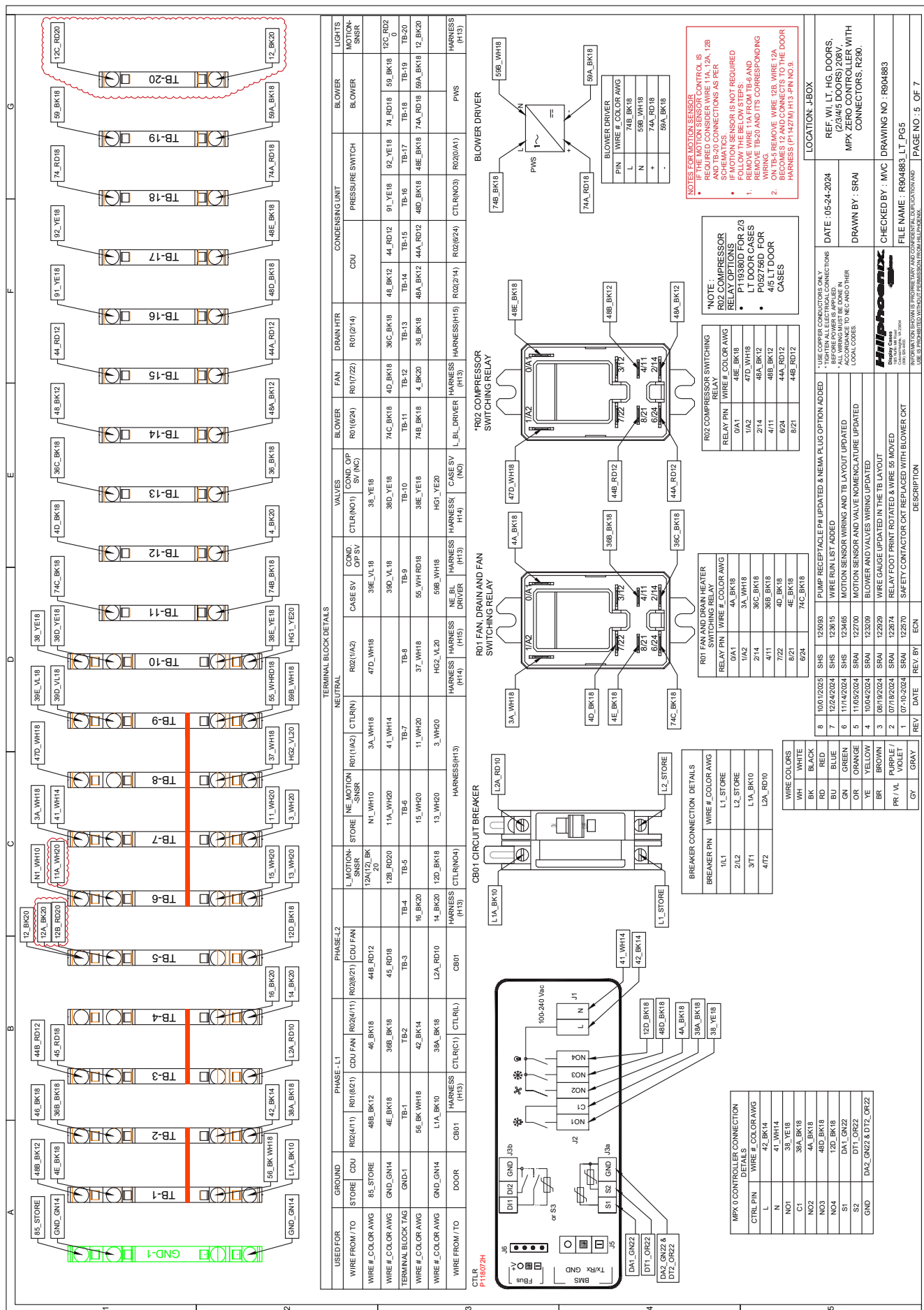
C11: ELECTRICAL WIRING (JNRZHSA)



C12: ELECTRICAL WIRING (JNRZHSA)



C13: ELECTRICAL WIRING (JNRZHSA)



C14: ELECTRICAL WIRING (JNRZHSA)

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C15: ELECTRICAL WIRING (JNRZHSA)

[illegible]

Parameter table

Code	Description	Def	Min	Max	UOM	User Terminal	JNRBHA MT 2.5 DRLT 2.5 DR
Analogue inputs							
/P1	Type of probe, group 1 (S1, S2, S3) 0 = PT1000 Standard Range -50/150 °C 1 = NTC Standard Range -50/90 °C	1	0	1	-	S	YES
/P5	Configuration of analogue output Y1: 0 = 0-10 V, 6 = PWM.	6	0	6	-	S	NO
/P6	Configuration of analogue output Y2: 0 = 0-10 V, 6 = PWM.	6	0	6	-	S	NO
Digital inputs							
/A	0 = Function disabled 1 = Serial probe S11 2 = Serial probe S12 3 = Serial probe S13 4 = Serial probe S14	1	4	3	-	S	YES
/B	Assign defrost temperature probe (SD) - see /FA	2	4	3	-	S	YES
/C	Assign intake temperature probe (Si) - see /FA	3	4	3	-	S	YES
/F	Assign defrost temperature probe 2 (SD2) - see /FA	0	4	3	-	S	NO
/F/G	Assign auxiliary temperature/pressure probe 1 (Saux1) - see /FA	0	4	3	-	S	NO
/F/H	Assign auxiliary temperature/pressure probe 2 (Saux2) - see /FA	0	4	3	-	S	NO
/F/I	Assign ambient temperature probe (SA) - see /FA	0	4	3	-	S	NO
/F/L	Assign ambient humidity probe (SU) - see /FA	0	4	3	-	S	NO
/F/M	Assign glass temperature probe (SV) - see /FA	0	4	3	-	S	NO
/F/N	Assign dewpoint value (SP) - see /FA	0	4	3	-	S	NO
/A	Outlet temperature probe (Sm) calibration	0	-20	20	°C/F	S	NO
/B	Defrost temperature probe (Si) calibration	0	-20	20	°C/F	S	NO
/C	Intake temperature probe (Sj) calibration	0	-20	20	°C/F	S	NO
/F	Defrost temperature probe 2 (SD2) calibration	0	-20	20	°C/F	S	NO
/F/G	Auxiliary temperature/pressure probe 1 (Saux1) calibration	0	-20	20	°C/F	S	NO
/F/H	Auxiliary temperature/pressure probe 2 (Saux2) calibration	0	-20	20	°C/F	S	NO
/I	Ambient temperature probe (SA) calibration	0	-20	20	°C/F	S	NO
/L	Ambient humidity probe (SU) calibration	0	-20	20	°C/F	S	NO
/M	Glass temperature probe (SV) calibration	0	-20	20	°C/F	S	NO
/N	Dewpoint value (SP) calibration	0	-20	20	°C/F	S	NO
/O	Condenser temperature probe calibration	0	-20	20	°C/F	M	NO
/Z	Analogue probe measurement stability	9	1	15	-	M	NO

Control							
ON	ON/OFF command 0 = OFF, 1 = ON	0	0	1	-	S	YES
/A	Virtual probe composition 0 = Air off probe Sm 100 = Air on probe Sr	0	0	100	%	S	NO
/Z	Minimum set point	-50	-20	20	°C/F	M	NO
/Z	Maximum set point	50	20	200	°C/F	M	NO
/R	Automatic night set point variation 0 = Air on probe Sr 0.1 = Air on probe Sv, 1 = intake probe Sr	0	-50	50	°C/F	S	NO
r6	Control offset with probe error	0	0	1	-	S	NO
ro	Master sensor valve configuration	0	0	20	°C/F	S	NO
r7	0 = local valve, 1 = network valve (connected to Main)	0	0	1	-	S	YES
S1	Set point	50	r1	r2	°C/F	U	YES
S2	Intake probe set point with double thermostat	50	r1	r2	°C/F	S	NO
rd	Differential	2	0.1	99.9	°C/F	U	YES
rC	Operating mode 0 = Direct, 1 = Reverse	0	0	1	-	U	NO
rd2	Set point S2 differential with double thermostat 0.0 = function disabled	0	0	99.9	°C/F	S	NO
rHS	Virtual probe composition for glass temp. probe estimate	20	0	100	%	S	NO
rHA	0 = Air off probe Sm	2	-20	20	°C/F	S	NO
rHB	Coefr. A for glass temp. probe estimate	22	0	100	-	S	NO
rHb	Coefr. B for glass temp. probe estimate	2	-20	20	°C/F	S	NO
rHb	Offset for anti-sweat modulation	0	0	20	°C/F	S	NO
rHu	Differential for anti-sweat modulation (of period THt)	70	0	100	%	S	NO
rHt	Manual anti-sweat heater activation period 0 = function disabled	5	0	180	min	S	NO
rHt	Max time for Clean status	0	0	999	min	U	NO
Stt	Maximum time for Standby status	0	0	240	min	S	NO
H14	Time light stays on after closing the door	0	0	240	min	U	NO
dbS	Safety timeout for double thermostat function	0	0	240	min	M	NO
db1	Double thermostat function logic 0 = AND logic, 1 = OR logic	0	0	1	-	M	NO

Code	Description	Def	Min	Max	UOM	User Terminal	JNRBHA MT 2.5 DRLT 2.5 DR
Digital outputs							
DOA	Assign solenoid/compressor digital output 0 = not configured 1 = digital input 3 (ID3) 2 = digital output 1 (ID1) 3 = digital input 4 (ID4)	2	0	4	-	S	NO
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 digital output serving the Main on the Secondary 0 = digital input 3 (ID3) 1 = digital output 1 (ID1) 2 = digital output 2 (ID2) 3 = digital input 4 (ID4)	0	0	4	-	S	NO
DOE	Assign light digital output - see DOA	4	0	4	-	S	NO
DOF	Assign defrost digital output - see DOA	0	0	4	-	S	NO
DOG	Assign defrost digital output - see DOA	1	0	4	-	S	NO
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	-	S	NO
DOk	Assign evaporator fan digital output - see DOA	0	0	4	-	S	NO
DOl	Assign digital output for liquid valve (pump down)	0	0	4	-	S	NO
DOM	Assign timed digital output - see DOA	0	0	4	-	S	NO
DOP	Assign train heater digital output - see DOA	0	0	4	-	S	NO
DOQ	Assign anti-sweat heater digital output - see DOA	0	0	4	-	S	NO
DOAA	Assign not gas defrost digital output - see DOA	0	0	4	-	S	NO
DOu	Assign digital output for max fan speed connection	0	0	4	-	S	NO
DOv	Assign digital output for min fan speed connection	0	0	4	-	S	NO
DOw	Assign digital output for max fan speed connection	0	0	4	-	S	NO
DOx	Assign digital output for min fan speed connection	0	0	4	-	S	NO
ROA	Alarm digital output logic - see ROA	0	0	1	-	M	NO
ROB	Alarm digital output logic - see ROA	0	0	1	-	M	NO
ROC	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	Light 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
ROj	Liquid valve digital output logic - see ROA	0	0	1	-	S	NO
ROk	Drain heater digital output logic - see ROA	0	0	1	-	M	NO
ROl	Anti-sweat heater digital output logic - see ROA	0	0	1	-	M	NO
ROm	Hot gas defrost digital output logic - see ROA	0	0	1	-	M	NO
ROn	Maximum fan speed connection digital output logic - see ROA	0	0	1	-	M	NO
ROo	Minimum fan speed connection digital output logic - see ROA	0	0	1	-	M	NO
ROp	Output switched with time bands	0	0	1	-	M	NO
HR	0 = Light 1 = AUX	0	0	1	-	S	NO
DOT1	Relay Type	-	-	-	-	-	3
DOT2	0 = direct mode 2: cycled mode	-	-	-	-	-	3
DOT3	0 = direct mode 1: delayed mode 3: zero crossing	-	-	-	-	-	3
DOT4		-	-	-	-	-	3
Digital inputs							
DIu	Assign start defrost digital input - see DIA	0	-1	2	-	S	NO

Note:
For full parameter list and instructions, please refer to Carel's website
<https://www.carel.com/documents/10191/0/2B0300106EN/aa0a54c-0dec-45b4-bc81d1f63fa?version=1.0>

		ALL BENDS 90° UNLESS SPECIFIED		INCHES (MM)	
		UNITS: (UNLESS OTHERWISE SPECIFIED)		ALL ANGULAR DIM. ±1°	
		ALL DIMENSIONS ON FRACTIONS 1/16, 1/8, 3/16, 1/2, 5/8, 3/4, 7/8, 1 1/2, 2 1/2, 3 1/2, 4 1/2, 5 1/2, 6 1/2, 7 1/2, 8 1/2, 9 1/2, 10 1/2, 11 1/2, 12 1/2, 13 1/2, 14 1/2, 15 1/2, 16 1/2, 17 1/2, 18 1/2, 19 1/2, 20 1/2, 21 1/2, 22 1/2, 23 1/2, 24 1/2, 25 1/2, 26 1/2, 27 1/2, 28 1/2, 29 1/2, 30 1/2, 31 1/2, 32 1/2, 33 1/2, 34 1/2, 35 1/2, 36 1/2, 37 1/2, 38 1/2, 39 1/2, 40 1/2, 41 1/2, 42 1/2, 43 1/2, 44 1/2, 45 1/2, 46 1/2, 47 1/2, 48 1/2, 49 1/2, 50 1/2, 51 1/2, 52 1/2, 53 1/2, 54 1/2, 55 1/2, 56 1/2, 57 1/2, 58 1/2, 59 1/2, 60 1/2, 61 1/2, 62 1/2, 63 1/2, 64 1/2, 65 1/2, 66 1/2, 67 1/2, 68 1/2, 69 1/2, 70 1/2, 71 1/2, 72 1/2, 73 1/2, 74 1/2, 75 1/2, 76 1/2, 77 1/2, 78 1/2, 79 1/2, 80 1/2, 81 1/2, 82 1/2, 83 1/2, 84 1/2, 85 1/2, 86 1/2, 87 1/2, 88 1/2, 89 1/2, 90 1/2, 91 1/2, 92 1/2, 93 1/2, 94 1/2, 95 1/2, 96 1/2, 97 1/2, 98 1/2, 99 1/2, 100 1/2, 101 1/2, 102 1/2, 103 1/2, 104 1/2, 105 1/2, 106 1/2, 107 1/2, 108 1/2, 109 1/2, 110 1/2, 111 1/2, 112 1/2, 113 1/2, 114 1/2, 115 1/2, 116 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1204 1/2, 1205 1/2, 1206 1/2, 1207 1/2, 1208 1/2, 1209 1/2, 1210 1/2, 1211 1/2, 1212 1/2, 1213 1/2, 1214 1/2, 1215 1/2, 1216 1/2, 1217 1/2, 1218 1/2, 1219 1/2, 1220 1/2, 1221 1/2, 1222 1/2, 1223 1/2, 1224 1/2, 1225 1/2, 1226 1/2, 1227 1/2, 1228 1/2, 1229 1/2, 1230 1/2, 1231 1/2, 1232 1/2, 1233 1/2, 1234 1/2, 1235 1/2, 1236 1/2, 1237 1/2, 1238 1/2, 1239 1/2, 1240 1/2, 1241 1/2, 1242 1/2, 1243 1/2, 1244 1/2, 1245 1/2, 1246 1/2, 1247 1/2, 1248 1/2, 1249 1/2, 1250 1/2, 1251 1/2, 1252 1/2, 1253 1/2, 1254 1/2, 1255 1/2, 1256 1/2, 1257 1/2, 1258 1/2, 1259 1/2, 1260 1/2, 1261 1/2, 1262 1/2, 1263 1/2, 1264 1/2, 1265 1/2, 1266 1/2, 1267 1/2, 1268 1/2, 1269 1/2, 1270 1/2, 1271 1/2, 1272 1/2, 1273 1/2, 1274 1/2, 1275 1/2, 1276 1/2, 1277 1/2, 1278 1/2, 1279 1/2, 1280 1/2, 1281 1/2, 1282 1/2, 1283 1/2, 1284 1/2, 1285 1/2, 1286 1/2, 1287 1/2, 1288 1/2, 1289 1/2, 1290 1/2, 1291 1/2, 1292 1/2, 1293 1/2, 1294 1/2, 1295 1/2, 1296 1/2, 1297 1/2, 1298 1/2, 1299 1/2, 1300 1/2, 1301 1/2, 1302 1/2, 1303 1/2, 1304 1/2, 1305 1/2, 1306 1/2, 1307 1/2, 1308 1/2, 1309 1/2, 1310 1/2, 1311 1/2, 1312 1/2, 1313 1/2, 1314 1/2, 1315 1/2, 1316 1/2, 1317 1/2, 1318 1/2, 1319 1/2, 1320 1/2, 1321 1/2, 1322 1/2, 1323 1/2, 1324 1/2, 1325 1/2, 1326 1/2, 1327 1/2, 1328 1/2, 1329 1/2, 1330 1/2, 1331 1/2, 1332 1/2, 1333 1/2, 1334 1/2, 13			

D2: CONTROLLERS AND SETPOINTS

Code	Description	Def	Min	Max	UOM	User	Terminal	JNRBHSA	JNRZSHA
Defrost									
d0	Type of defrost 0 = heater by temperature 1 = hot gas by temperature 2 = heater by time 3 = hot gas by time 4 = temperature control with heater by time	0	0	4	-	S	YES	0	1
dEP	Assign probe for end defrost in advance 0 = Not configured 1 = Outlet (Sn) 2 = Defrost (Sd) 3 = Inlet (Si) 4 = Defrost 2 (Sd2) 5 = Auxiliary 1 (Saux1) 6 = Auxiliary 2 (Saux2) 7 = Ambient (SA) 8 = Ambient humidity (SU) 9 = Glass temperature (SVt) 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 = no, 1 = yes Ignore start network defrost signal (for Secondary) 0 = no, 1 = yes	0	0	1	-	S	NO		
d1	Maximum interval between consecutive defrosts	8	0	240	hours	S	YES	12	24
dt1	End defrost temperature (read by Sd)	8	-50	50	°C/F	S	YES	40	72
dt2	End defrost temperature (read by Sd2)	8	-50	50	°C/F	S	NO		
dp1	Maximum defrost duration	45	1	240	min	S	YES	46	30
dp2	Max secondary evaporator defrost duration	45	1	240	min	S	NO		
d4	Defrost on power on (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
dd	Dripping time after defrost (fans off) 0 = no dripping	2	0	15	min	S	NO	0	0
d7	Skp defrost 0 = disabled, 1 = enabled	0	0	1	-	S	NO		
d8	Bypass high temperature alarm time after defrost Defrost priority over compressor protection times 0 = compressor protection times observed, 1 = compressor protection times ignored	30	1	240	min	S	NO		
d10	Defrost time in Running time mode 0 = function disabled	0	0	240	min	S	NO		
d11	Defrost temperature threshold in Running time mode 0 = pump down disabled 0 = function disabled	-30	-50	50	°C/F	S	NO		
ds1	Compressor off time in sequential stop defrost mode 0 = function disabled	0	0	999	s	M	NO		
ds2	Compressor operating time in sequential stop defrost mode	0	0	45	min	M	NO		
ddt	Additional end defrost temperature delta in power defrost mode 0 = -20	120	0	240	min	M	NO		
dn	Additional maximum defrost time delta in power defrost mode End defrost by timeout signal 0 = disabled, 1 = enabled	0	0	60	min	S	NO		
r3	Defrost priority over continuous cycle 0 = No, 1 = Yes	75	0	100	%	S	NO		
c7	Defrost priority over continuous cycle 0 = No, 1 = Yes	0	0	1	-	S	NO		
dd1	Assign probe 1 to determine start defrost (dd1-dd2) - see FSa	0	0	14	-	S	NO		
dd2	Assign probe 2 to determine start defrost (dd1-dd2) - see FSa	0	0	14	-	S	NO		
tdt	Temperature differential threshold to start defrost	50	99.9	99.9	°C	S	NO		
tdf	Threshold evaluation time to start defrost	60	15	240	min	S	NO		
cdF	Compressor frequency during hot gas defrost procedure	140	0	255	Hz	S	NO		
ddf	Compressor frequency during dripping phase after hot gas defrost	140	0	255	Hz	S	NO		
dHG	Hot gas activation delay	0	0	300	s	S	NO		

Code	Description	Def	Min	Max	UOM	User	Terminal	JNRBHSA	JNRZSHA
Defrost scheduling									
tdt1	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	11
tdt1.8-h	Defrost 1 to 8 - hours	0	0	23	hours	S	NO	0	3
tdt1.8-mm	Defrost 1 to 8 - minutes	0	0	59	minutes	S	NO		
tdt1.8-P	Defrost 1 to 8 - enable power defrost: 0 = normal, 1 = power defrost	0	0	1	-	S	NO		
dtS	Number of daily defrosts (dt1) 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 = 3 hours and 26 Minutes	0	0	14	-	S	NO		
d2S	Number of daily defrosts (dt2) - see dtS	0	0	14	-	S	NO		

Code	Description	Def	Min	Max	UOM	User	Terminal	JNRBHSA	JNRZSHA
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	2
F1	Evaporator fan activation threshold (only if F0 = 1 or 2) 0 = see F0	-5	-50	50	°C/F	S	YES	30	40
F2	Evaporator fans with compressor dff 0 = always off	1	0	1	-	S	YES	0	0
F3	Evaporator fans during defrost 0 = on, 1 = off	1	0	1	-	S	F3	0	1
Fd	Post-dripping time after defrost (fans off with control active)	2	0	15	min	S	NO		
Fid	Fan activation differential (including variable speed)	2	0.1	20	°C/F	S	YES		
F5	Evaporator fan cut-in temperature (hysteresis 1 °C)	50	F1	50	°C/F	S	NO		
F6	Maximum evaporator fan speed	100	F1	100	%	M	NO		
F7	Minimum evaporator fan speed	0	0	F6	%	M	NO		
F8	Evaporator fan peak time 0 = function disabled	0	0	240	min	M	NO		
F10	Evaporator fan forcing time at maximum speed 0 = Function disabled	0	0	240	min	M	NO		
FSa	First fan control probe 0 = Not configured 1 = Outlet (Sm) 2 = Defrost (Sd) 3 = Inlet (Si) 4 = Inlet 2 (Sd2) 5 = Auxiliary 1 (Saux1) 6 = Auxiliary 2 (Saux2) 7 = Ambient (SA) 8 = Ambient humidity (SU) 9 = Glass temperature (SVt) 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 BENDS 90° UNLESS SPECIFIED

UNITS: INCHES (MM)

LOGIC: (0 = OFF, 1 = ON)

ALL ANGULAR DIM. IN °

ALL DIMENSIONS ON FAMES ARE TO FACE UNLESS NOTED OTHERWISE

TRAVERSING NOT TO SCALE

Display Cases

AKM 01/16/25 123680 3 EVAP FANS SETPOINT UPDATED

AKM 11/14/24 123469 2 SETPOINT UPDATED FOR LIGHT

AKM 07/25/24 122707 1 UPDATED PRODUCTION SETPOINT

REV 07/19/24 122638 X RELEASED TO PRODUCTION

BY DATE ECN NOR DESCRIPTION

SETPOINTS, MPXzero

2-5DR LT & MT

R290, DOLLAR-TREE

R905649

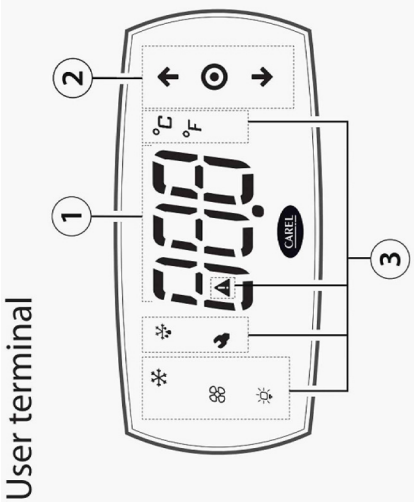
SHEET 2 OF 4

D3: CONTROLLERS AND SETPOINTS

Code	Description	Def	Min	Max	UOM	User Terminal	JNFBHSA	JNRZSHA
Solenoid/compressor								
c0	Delay to enable solenoid/compressor and evaporation 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
c3	Minimum compressor ON time	0	0	15	min	M	NO	5
c4	ON time for duty setting operation (Toff = 15 minutes, fixed value) 0 = compressor always OFF 1 = compressor 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 sta 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
A2	Alarm thresholds (AL2, AH2) relative to the set point S12 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 OFF 100 = always ON	0	0	100	min	S	NO	
A11	Delay times for delayed external alarm 0 = Signal-only alarm 1 = Signal and temperature alarms	0	0	240	min	S	NO	
AA	Assign probe for high (AH/AHA) and low (AL/ALA) temperature alarms 0 = Not configured 1 = Outlet (Sm) 2 = Defrost (Sd) 3 = Intake (Sr) 4 = Defrost 2 (Sd2) 5 = Auxiliary 1 (Stux1) 6 = Auxiliary 2 (Stux2) 7 = Ambient (SA) 8 = Room temperature (Srt) 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	
ALA	Low temperature alarm threshold (relative to set point)	4	0	50	°C/°F	S	YES	6
ALAH	Low temperature alarm threshold (absolute threshold)	0	-50	50	°C/°F	S	NO	
AHA	High temperature alarm threshold (relative to set point)	10	0	50	°C/°F	S	YES	30
AHA2	High temperature alarm threshold (absolute threshold)	0	-50	200	°C/°F	S	NO	69
AL2	Low temperature alarm threshold 2	0	0	50	°C/°F	S	NO	
AL2*	Low temperature alarm threshold 2 (absolute threshold)	0	-50	50	°C/°F	S	NO	
AHA2*	High temperature alarm threshold 2 (absolute threshold)	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 (AH/AHA, 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	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 ALA/ALA2 and AHA/AHA2 need to be set correctly (default full scale, absolute alarms disabled).								

Code	Description	Def	Min	Max	UOM	User Terminal	JNFBHSA JNRZSHA JNRZ90
Connectivity							
In	Type of unit 0 = Secondary, 1 = Main	0	0	1	-	S	YES 1 1
H0	Serial or Main/Secondary network address	199	0	247	-	S	YES
H1	BMS serial port configuration (stop bits and parity) 0 = 1 stop bit, no parity 1 = 2 stop bit, even parity 2 = 2 stop bit, odd parity 3 = 2 stop bit, even parity 4 = 2 stop bit, odd parity	1	0	5	-	S	YES
H2	BMS serial port baudrate (bits) 0 = 1200 1 = 2400 2 = 4800 3 = 9600 4 = 19200 5 = 38400 6 = 57600 7 = 115200	4	0	8	-	S	YES
H3	BMS serial port protocol 0 = Carrel, 1 = Modbus	1	0	1	-	S	YES
Fieldbus							
Sn	No. of slaves in the local network 0 = no Slaves	0	0	9	-	S	NO
H4	FBus port baudrate (bits) 0 = 1200 1 = 2400 2 = 4800 3 = 9600 4 = 19200 5 = 38400 6 = 57600 7 = 115200	4	0	1	-	S	NO
Notice: on board DEFAULT values for VCP serial							
Display							
/5	Unit of measure 0 = °C/barg, 1 = °F/psig	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 = Terminal disabled 1 to 3 = Probe 1 to 3 4 to 8 = Reserved 9 = Control probe 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 display	1	0	1	-	S	NO
ONS	Enable unit On/Off from supervisor	0	0	1	-	S	NO
Day/Night							
ts1.8-d	Start time band 1 to 8 day/day - see (td1.8-d)	0	0	11	day	S	NO 11 11
ts1.8-h	Start time band 1 to 8 day: hours	0	0	23	hours	S	NO 6 6
ts1.8-mm	Start time band 1 to 8 day: minutes	0	0	59	minutes	S	NO
te1.8-d	End time band 1 to 8 day/day - see (td1.8-d)	0	0	11	day	S	NO 11 11
te1.8-h	End time band 1 to 8 day: hours	0	0	23	hours	S	NO 0 0
te1.8-mm	End time band 1 to 8 day: minutes	0	0	59	minutes	S	NO
TOLERANCES: UNLESS SPECIFIED							
DIMENSIONS ON FRACTIONS: 1/16, 1/8, 1/4, 1/2, 3/4, 1, 1 1/2, 2, 3, 4, 6, 8, 12, 16, 24, 36, 48, 60, 72, 96, 120, 144, 180, 240, 300, 360, 480, 600, 720, 960, 1200, 1440, 1800, 2400, 3000, 3600, 4800, 6000, 7200, 9600, 12000, 14400, 18000, 24000, 30000, 36000, 48000, 60000, 72000, 96000, 120000, 144000, 180000, 240000, 300000, 360000, 480000, 600000, 720000, 960000, 1200000, 1440000, 1800000, 2400000, 3000000, 3600000, 4800000, 6000000, 7200000, 9600000, 12000000, 14400000, 18000000, 24000000, 30000000, 36000000, 48000000, 60000000, 72000000, 96000000, 120000000, 144000000, 180000000, 240000000, 300000000, 360000000, 480000000, 600000000, 720000000, 960000000, 1200000000, 1440000000, 1800000000, 2400000000, 3000000000, 3600000000, 4800000000, 6000000000, 7200000000, 9600000000, 12000000000, 14400000000, 18000000000, 24000000000, 30000000000, 36000000000, 48000000000, 60000000000, 72000000000, 96000000000, 120000000000, 144000000000, 180000000000, 240000000000, 300000000000, 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Parameter categories visible on the 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
	Flashing	Compressor starts active
	Solenoid/compensator	Compressor starts active
	Evaporator fan	Evaporator fan on
	Lights	Light on
	Defrost	Awaiting defrost
	Service	Maintenance request
	Alarm	Alarm acknowledged
	Unit of measure	Unit of measure °C
	Unit of measurement	Unit of measurement °F

Tab. 3.2

3.2.1 Keypad

Button	Description	Function
↑	UP / DOWN	• Increase/decrease the value • Scroll direct access functions • LED on: scroll menu, parameters, direct access functions • Pressed briefly: scroll menu, set parameter values
⊙	PRG	• 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.

- Procedure: To navigate the menu tree, use the following buttons:
- UP and DOWN to navigate the menu and set the values;
 - PRG to enter the menu items and save the changes made;
 - PRG (S) to select the menu item or ESC to return to the previous branch. Example of how to set parameter S1 (set point):
1. Wait for the standard display to be shown.
 2. Press PRG, the display will show "Loc" (display locked).
 3. Press and hold PRG and until "PSR" is shown.
 4. When PSR is shown, press PRG and use the UP arrow to enter the password: 33.
 5. Press PRG, the first category of parameters is displayed: VISC-Display.
 6. Press DOWN, the second category of parameters is displayed: CLC (Control).
 7. Press DOWN until reaching parameter S1 (set point) and PRG to display the value.
 8. Press UP/DOWN to modify the value.
 9. Press PRG to save the setting and return to the parameter code.
 10. Press PRG for 3 sec or press and hold PRG until the parameter S1 is displayed. Press PRG to select ESC (Control) and follow step 5 to 8 to set the other categories. Press PRG for 3 s or b) press PRG for 3 s.
 11. Press DOWN to move to the next category (CLC) and follow step 5 to 8 to set the other categories. Press PRG for 3 s or b) press PRG for 3 s.
 12. After having completed the settings, to exit the PRG, press PRG for 3 s or b) press PRG for 3 s.

Mobile device and PC

The APPLICA and SPARK software can be used to configure the controller from a mobile device (smartphone, tablet), via N-C (Near Field Communication) or Bluetooth. The controller can be programmed according to the profile used for access to APPLICA or SPARK, with different parameter visibility depending on the rights associated with each profile (User, Service, Maintenance). Procedure:

1. download the Applica app;
2. on the mobile device start the app for commissioning the controller;
3. activate N-C;
4. bring the mobile device closer to the controller, less than 10 mm away;
5. follow the instructions shown on the display.

3.2.5 Direct functions

The following functions can be activated directly from the keypad or via the app:

Icon	Display	On/Off
	Light	Cabinet light
	Circ	Continuous cycle
	dFt	Defrost
	Net	Network defrost (Main only)
	Cln	Clean cabinet
	ON	Unit ON with control request

Tab. 3.1

- Procedure:
1. go to the standard display;
 2. press PRG until "... " is shown and then release immediately to unlock the display
 3. press PRG again to access the direct commands (the first item will be the light command Lht);
 4. press PRG to turn the light on/off and DOWN to move to the next direct function;
 5. follow the previous steps for all the other functions;
 6. When finished, press Esc to exit.

1. Go to the standard display,
2. Press PRG until "... " is displayed and then release immediately.
3. Press PRG again, Lht is displayed, the UP and DOWN buttons light up. Press PRG to turn the light on/off. Press DOWN to activate the next function (Clk) or press Esc to exit.
4. Select Esc to exit
5. The standard display is shown

ALL BENDS 90° UNLESS SPECIFIED				INCHES (MM)
UNITS				UNITS
DO NOT SCALE				DO NOT SCALE
ALL ANGULAR DIMENSIONS ARE TO FACE UNLESS NOTED OTHERWISE. DIMENSIONS OF FORMS TO SCALE DRAWING NOT TO SCALE				ALL ANGULAR DIMENSIONS ARE TO FACE UNLESS NOTED OTHERWISE. DIMENSIONS OF FORMS TO SCALE DRAWING NOT TO SCALE
AKM 01/16/25 123680 3 EVAP FANS SETPOINT UPDATED				SETPOINTS: MPXzero
AKM 11/14/24 123469 2 SETPOINT UPDATED FOR LIGHT				2-5DR LT & MT,
AKM 07/25/24 122707 1 UPDATED PRODUCTION SETPOINT				R290, DOLLAR-TREE
REV 07/19/24 122638 X RELEASED TO PRODUCTION				R905649
BY DATE ECN NO/R DESCRIPTION				
DRAWN BY: AKM DATE: 07/19/24				

Parameter table

Code	Description	Def	Min	Max	UOM	User Terminal	JNRBHA MT 2.5 DRLT 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
/P6	Configuration of analogue output Y2: 0 = 0-10 V, 6 = PWM.	6	0	6	-	S	NO
Digital Inputs							
/A	0 = Function disabled 1 = Serial probe S11 2 = Serial probe S12 3 = Serial probe S13 4 = Serial probe S14	1	4	3	-	S	YES
/B	Assign defrost temperature probe (SD) - see /FA	2	4	3	-	S	YES
/C	Assign intake temperature probe (Si) - see /FA	3	4	3	-	S	YES
/F	Assign defrost temperature probe 2 (Sd2) - see /FA	0	4	3	-	S	NO
/F/G	Assign auxiliary temperature/pressure probe 1 (Saux1) - see /FA	0	4	3	-	S	NO
/F/H	Assign auxiliary temperature/pressure probe 2 (Saux2) - see /FA	0	4	3	-	S	NO
/F/I	Assign ambient temperature probe (SA) - see /FA	0	4	3	-	S	NO
/F/L	Assign ambient humidity probe (SU) - see /FA	0	4	3	-	S	NO
/F/M	Assign glass temperature probe (SV) - see /FA	0	4	3	-	S	NO
/F/N	Assign dewpoint value (SP) - see /FA	0	4	3	-	S	NO
/G	Outlet temperature probe (Sm) calibration	0	-20	20	°C/F	S	NO
/G	Intake temperature probe (Si) calibration	0	-20	20	°C/F	S	NO
/G	Defrost temperature probe (Sd) calibration	0	-20	20	°C/F	S	NO
/G	Defrost temperature probe 2 (Sd2) calibration	0	-20	20	°C/F	S	NO
/H	Auxiliary temperature/pressure probe 1 (Saux1) calibration	0	-20	20	°C/F	S	NO
/H	Auxiliary temperature/pressure probe 2 (Saux2) calibration	0	-20	20	°C/F	S	NO
/I	Ambient temperature probe (SA) calibration	0	-20	20	°C/F	S	NO
/L	Ambient humidity probe (SU) calibration	0	-20	20	°C/F	S	NO
/M	Glass temperature probe (SV) calibration	0	-20	20	°C/F	S	NO
/N	Dewpoint value (SP) calibration	0	-20	20	°C/F	S	NO
/O	Condenser temperature probe calibration	0	-20	20	°C/F	M	NO
/Z	Analogue probe measurement stability	9	1	15	-	M	NO

Control							
ON	ON/OFF command 0 = OFF, 1 = ON	0	0	1	-	S	YES
/A	Virtual probe composition 0 = Air off probe Sm 100 = Air on probe Sr	0	0	100	%	S	NO
/R	Minimum set point	-50	-20	20	°C/F	M	NO
/R	Maximum set point	50	20	20	°C/F	M	NO
/R	Automatic night set point variation	0	-50	50	°C/F	S	NO
/R	Set point for night set point variation	0	-50	50	°C/F	S	NO
/R	Set point for probe Sv, 1 = intake probe Sr	0	0	1	-	S	NO
/R	Control offset with probe error	0	0	20	°C/F	S	NO
/R	Master sensor valve configuration	0	0	1	-	S	NO
/R	0 = local valve, 1 = network valve (connected to Main)	0	0	1	-	S	NO
/S	Set point	50	1	2	°C/F	U	YES
/S	Make probe set point with double thermostat	50	1	2	°C/F	S	NO
/S	Differential	2	0.1	99.9	°C/F	U	YES
/S	Operating mode 0 = Direct, 1 = Reverse	0	0	1	-	U	NO
/S	Set point S2 differential with double thermostat	0	0	99.9	°C/F	S	NO
/S	0.0 = function disabled	20	0	100	%	S	NO
/RHS	Virtual probe composition for glass temp. probe estimate	2	-20	20	°C/F	S	NO
/RHA	0 = Air off probe Sm	2	-20	20	°C/F	S	NO
/RHB	Coefr. A for glass temp. probe estimate	22	0	100	%	S	NO
/RHB	Coefr. B for glass temp. probe estimate	2	-20	20	°C/F	S	NO
/RHB	Offset for anti-sweat modulation	0	0	20	°C/F	S	NO
/RHB	Differential for anti-sweat modulation	0	0	20	°C/F	S	NO
/RHB	Manual anti-sweat heater activation percentage (d period TH)	70	0	100	%	S	NO
/RHB	Manual anti-sweat heater activation period	5	0	180	min	S	NO
/RHB	0 = function disabled	0	0	999	min	U	NO
/RHB	Max time for Clean status	0	0	240	min	S	NO
/RHB	Maximum time for Standby status	0	0	240	min	S	NO
/RHB	Time light stays on after closing the door	0	0	240	min	U	NO
/RHB	Safety timeout for double thermostat function	0	0	240	min	M	NO
/RHB	Double thermostat function logic	0	0	1	-	M	NO
/RHB	0 = AND logic, 1 = OR logic	0	0	1	-	M	NO

Code	Description	Def	Min	Max	UOM	User Terminal	JNRBHA MT 2.5 DRLT 2.5 DR
Digital outputs							
/DOA	Assign solenoid/compressor digital output 0 = not configured 1 = digital input 3 (ID3) 2 = digital output 1 (ID1) 3 = digital input 4 (ID4)	2	0	4	-	S	NO
/DOB	Assign alarm digital output - see DOA	0	0	4	-	S	NO
/DOC	Assign auxiliary digital output - see DOA	0	0	4	-	S	NO
/DOE	Assign light digital output serving the Main on the Secondary	0	0	4	-	S	NO
/DOF	Assign light digital output serving the Main on the Secondary devices - see DOA	4	0	4	-	S	NO
/DOG	Assign defrost digital output - see DOA	0	0	4	-	S	NO
/DOH	Assign auxiliary evaporator defrost digital output - see DOA	1	0	4	-	S	NO
/DOH	Assign second ON/OFF compressor digital output - see DOA	0	0	4	-	S	NO
/DOI	Assign evaporator fan digital output - see DOA	0	0	4	-	S	NO
/DOJ	Assign evaporator fan digital output (pump down)	3	0	4	-	S	NO
/DOK	Assign digital output for liquid valve (pump down)	0	0	4	-	S	NO
/DOL	Assign timed digital output - see DOA	0	0	4	-	S	NO
/DOP	Assign train heater digital output - see DOA	0	0	4	-	S	NO
/DOQ	Assign anti-sweat heater digital output - see DOA	0	0	4	-	S	NO
/DOQ	Assign not gas defrost digital output - see DOA	0	0	4	-	S	NO
/DOA	Assign digital output for max fan speed connection	0	0	4	-	S	NO
/DOU	Assign digital output for min fan speed connection	0	0	4	-	S	NO
/DOU	Assign digital output for max fan speed connection	0	0	4	-	S	NO
/ROA	Assign digital output logic - see ROA	0	0	1	-	S	NO
/ROB	Assign digital output logic - see ROA	0	0	1	-	S	NO
/ROC	Assign digital output logic - see ROA	0	0	1	-	S	NO
/ROD	Auxiliary serving the Main on the Secondary devices digital output logic - see ROA	0	0	1	-	S	NO
/ROE	Light digital output logic - see ROA	0	0	1	-	S	NO
/ROF	Light 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
/ROH	Evaporator fan digital output logic - see ROA	0	0	1	-	S	NO
/ROH	Liquid valve digital output logic - see ROA	0	0	1	-	S	NO
/ROH	Drain heater digital output logic - see ROA	0	0	1	-	S	NO
/ROH	Anti-sweat heater digital output logic - see ROA	0	0	1	-	S	NO
/ROA	Hot gas defrost digital output logic - see ROA	0	0	1	-	S	NO
/ROU	Maximum fan speed connection digital output logic - see ROA	0	0	1	-	S	NO
/ROU	Minimum fan speed connection digital output logic - see ROA	0	0	1	-	S	NO
/ROU	Output switched with time bands	0	0	1	-	S	NO
/H8	0 = Light 1 = AUX	0	0	1	-	S	NO
/DOT1	Relay Type	-	-	-	-	-	3
/DOT2	0 = mode 2, cycled mode	-	-	-	-	-	3
/DOT3	0 = mode 1, delayed mode 3, zero crossing	-	-	-	-	-	3
/DOT4		-	-	-	-	-	3
Digital inputs							
/DIU	Assign start defrost digital input - see DIA	0	-1	2	-	S	NO

Note:
For full parameter list and instructions, please refer to Carel's website
<https://www.carel.com/documents/10191/0/2B0300106EN/aa0a54c-0dec-45b4-bc812d1fc3fa?version=1.0>

ALL BENDS 90° UNLESS SPECIFIED		INCHES (MM)
UNITS: (UNLESS OTHERWISE SPECIFIED)		ALL ANGULAR DIM. ±1°
DIMENSIONS OF PANELS ARE 9.0 ±0.3		DRAWING NOT TO SCALE
Hilphoenix		Display Cases
Carel Heating & Cooling Controls		DATE: 01/16/25
REV: 01/16/25	12/36/80	RELEASED TO PRODUCTION
BY:	DATE:	DESCRIPTION
R908294		

D6: CONTROLLERS AND SETPOINTS

Code	Description	Def	Min	Max	UOM	User	Terminal	JNRBHA	JNRZSHA
Defrost									
d0	Type of defrost 0 = heater by temperature 1 = hot gas by temperature 2 = heater by time 3 = hot gas by time 4 = temperature control with heater by time	0	0	4	-	S	YES	0	1
dEP	Assign probe for end of defrost in advance 0 = Not configured 1 = Outlet (Sn) 2 = Defrost (Sd) 3 = Intake (Si) 4 = Defrost 2 (Sd2) 5 = Auxiliary 1 (Saux1) 6 = Auxiliary 2 (Saux2) 7 = Ambient (SA) 8 = Ambient humidity (SU) 9 = Glass temperature (SV4) 10 = Dew point (SDP) 11 = Virtual probe (SV)	0	0	11	-	S	NO		
dET	Temperature threshold for end of 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	Maximum interval between consecutive defrosts	8	0	240	hours	S	YES	12	24
d5	End defrost temperature (read by Sd)	8	-50	50	°C/F	S	YES	40	72
d6	Maximum defrost duration	45	1	240	min	S	YES	46	30
d7	Max secondary evaporator defrost duration	45	1	240	min	S	NO		
d8	Defrost on power on (Main = network defrost; Secondary = local defrost) 0 = No, 1 = Yes	0	0	1	-	S	NO		
d9	Defrost delay at power-on or (for Secondary) after control signal from Main 0 = delay disabled	0	0	240	min	S	NO		
d10	Display on terminals during defrost 0 = temperature alternating with 'dEF' 1 = freeze display 2 = 'dEF'	1	0	2	-	U	NO	0	0
d11	Dripping time after defrost (fans off) 0 = no dripping	2	0	15	min	S	NO	0	0
d12	Skip defrost 0 = disabled, 1 = enabled	0	0	1	-	S	NO		
d13	Bypass high temperature alarm time after defrost	30	1	240	min	S	NO		
d14	Defrost priority over compressor protection times 0 = compressor protection times observed, 1 = compressor protection times ignored	1	0	1	-	M	NO		
d15	Defrost time in Running time mode 0 = function disabled	0	0	240	min	S	NO		
d16	Defrost temperature threshold in Running time mode 0 = pump down disabled 0 = function disabled	-30	-50	50	°C/F	S	NO		
d17	Pump down duration 0 = pump down disabled 0 = function disabled	0	0	999	s	M	NO		
d18	Compressor off time in sequential stop defrost mode 0 = function disabled	0	0	45	min	M	NO		
d19	Compressor operating time in sequential stop defrost mode	120	0	240	min	M	NO		
d20	Additional end defrost temperature delta in power defrost mode	0	-20	20	°C/F	S	NO		
d21	Additional maximum defrost time delta in power defrost mode	0	0	60	min	S	NO		
d22	Nominal defrost duration for skip defrost 0 = disabled, 1 = enabled	75	0	100	%	S	NO		
d23	End defrost by timeout signal 0 = disabled, 1 = enabled	0	0	1	-	S	NO		
d24	Defrost priority over continuous cycle 0 = No, 1 = Yes	0	0	1	-	M	NO		
d25	Assign probe 1 to determine start defrost (d1-d2) - see FSa	0	0	14	-	S	NO		
d26	Assign probe 2 to determine start defrost (d1-d2) - see FSa	0	0	14	-	S	NO		
d27	Temperature differential threshold to start defrost	50	99.9	99.9	°C	S	NO		
d28	Threshold evaluation time to start defrost	60	15	240	min	S	NO		
d29	Compressor frequency during hot gas defrost procedure	140	0	255	Hz	S	NO		
d30	Compressor frequency during dripping phase after hot gas defrost	140	0	255	Hz	S	NO		
d31	Hot gas activation delay	0	0	300	s	S	NO		

Code	Description	Def	Min	Max	UOM	User	Terminal	JNRBHA	JNRZSHA
Defrost scheduling									
d1	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	11
d2	Defrost 1 to 8 - hours 0 = Disabled 1 to 7 = 1 to 8 - minutes 8 = 3 hours and 0 minutes 9 = 2 hours and 40 minutes 10 = 2 hours and 24 minutes 11 = 2 hours and 11 minutes 12 = 2 hours and 0 minutes 13 = 1 hour and 50 minutes 14 = 1 hour and 40 minutes 15 = 1 hour and 30 minutes	0	0	23	hours	S	NO	0	3
d3	Defrost 1 to 8 - minutes 0 = normal, 1 = power defrost	0	0	59	minutes	S	NO		
d4	Defrost 1 to 8 - enable power defrost: 0 = normal, 1 = power defrost	0	0	1	-	S	NO		
d5	Number of daily defrosts (d1) 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	0	0	14	-	S	NO		
d6	Number of daily defrosts (d2) - 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	2
F1	Evaporator fan activation threshold (only if F0 = 1 or 2)	-5	-50	50	°C/F	S	YES	30	40
F2	Evaporator fans with compressor off 0 = see F0 1 = always off	1	0	1	-	S	YES	0	0
F3	Evaporator fans during defrost on, 1 = on time after defrost (fans off with control active) 0 = off	0	0	15	min	S	F3	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 cut-off 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 = function disabled	0	0	240	s	M	NO		
F10	Evaporator fan forcing time at maximum speed 0 = function disabled	0	0	240	min	M	NO		
F11	First fan control probe 0 = Not configured 1 = Outlet (Sn) 2 = Defrost (Sd) 3 = Intake (Si) 4 = Ambient (SA) 5 = Ambient humidity (SU) 6 = Auxiliary 1 (Saux1) 7 = Auxiliary 2 (Saux2) 8 = Ambient humidity (SU) 9 = Glass temperature (SV4) 10 = Dew point (SDP) 11 = Virtual probe (SV)	2	0	11	-	M	NO		
FSa	Second fan control probe - see FSa 0 = On, 1 = Off	11	0	11	-	M	NO		
Fsb	Evaporator fans during post-dripping 0 = On, 1 = Off	0	0	1	-	M	NO		
Fpd	Unit cooling capacity indication	4000	0	32000	watts	M	NO		

ALL BENDS 90° UNLESS SPECIFIED
UNITS: INCHES (MM)
TOLERANCES: (UNLESS OTHERWISE SPECIFIED)
DIMENSIONS OF FAMES: 0.03 & 0.05
DRAWING NOT TO SCALE
Hilphoenix
Display Cases
General Repairs
1000 W. 10th St. Suite 100
Grand Rapids, MI 49506
Tel: 616.221.1111
Fax: 616.221.1112
Email: info@hilphoenix.com
DATE: 01/16/25
DRAWN BY: AKM

SETPOINTS: MPX0.2-5DR LT
& MT.R290.BETA CASE, STD
WITH LIGHTING SCHEDULE

R908294

SHEET 2 OF 4

D7: CONTROLLERS AND SETPOINTS

Code	Description	Def	Min	Max	UOM	User Terminal	JNRBUSA MT 2-5 DRLT 2-5 DR
Solenoid/compressor							
c0	Delay to enable solenoid/compressor and evaporation 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
c3	Minimum compressor ON time	0	0	15	min	M	NO
c4	ON time for duty setting operation (Toff = 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 start only	0	0	1	-	S	NO

Code	Description	Def	Min	Max	UOM	User Terminal	JNRBUSA MT 2-5 DRLT 2-5 DR
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 SI or absolute 0/1 = relative absolute	0	0	1	-	S	NO
A2	Alarm thresholds (AL2, AH2) relative to the set point S12 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 OFF 100 = always ON	0	0	100	min	S	NO
A11	Delay time for delayed external alarm 0 = Signal-only alarm 1 = Not configured	0	0	240	min	S	NO
AA	Assign probe for high (AH/AHA) and low (AL/ALA) temperature alarms 1 = Outlet (Sm) 2 = Defrost (Sd) 3 = Intake (Si) 4 = Defrost 2 (Sd2) 5 = Auxiliary 1 (Saux1) 6 = Auxiliary 2 (Saux2) 7 = Ambient (Sa) 8 = Reseal 9 = Glass temperature (Svt) 10 = Dewpoint (SdP) 11 = Virtual probe (Sv)	1	0	11	-	S	YES
A42	Assign probe for high (AH2, AHA2) and low (AL2, ALA2) temperature alarms - see AA	1	0	11	-	S	NO
ALA*	Low temperature alarm threshold (relative to set point)	4	0	50	°C/°F	S	YES
ALH*	High temperature alarm threshold (absolute threshold)	0	-50	50	°C/°F	S	NO
AHA*	High temperature alarm threshold (relative to set point)	10	0	50	°C/°F	S	YES
AL2*	Low temperature alarm threshold (absolute threshold)	0	-50	200	°C/°F	S	NO
AH2*	High temperature alarm threshold 2 (absolute threshold)	0	-50	50	°C/°F	S	NO
AHA2*	High temperature alarm threshold 2 (absolute threshold)	0	-50	200	°C/°F	S	NO
A4	Delay time for high and low temperature alarms (AH/AHA, AL/ALA)	120	0	240	min	U	YES
A2	Delay time for high and low temp. alarms (AH2/AHA2, AL2/ALA2)	30	1	240	min	U	NO
A1	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
H10	HACCP alarm delay 0 = nonotifying disabled	0	0	240	min	S	NO
Notice *: for alarms with an absolute activation threshold (A1=1) the thresholds ALA/AHA2 and AHA/AHA2 need to be set correctly default full scale, absolute alarms disabled.							

Code	Description	Def	Min	Max	UOM	User Terminal	JNRBUSA MT 2-5 DRLT 2-5 DR
Connectivity							
In	Type of unit 0 = Secondary, 1 = Main	0	0	1	-	S	YES
H0	Serial or Main/Secondary network address	169	0	247	-	S	YES
H1	BMS serial port configuration (stop bits and parity) 0 = 1 stop bit, no parity 1 = 2 stop bits, even parity 2 = 1 stop bit, odd parity 3 = 2 stop bits, odd parity	1	0	5	-	S	YES
H2	BMS serial port baudrate (bits) 0 = 1200 1 = 2400 2 = 4800 3 = 9600 4 = 19200 5 = 38400 6 = 57600 7 = 115200	4	0	8	-	S	YES
H3	BMS serial port protocol 0 = Cansel, 1 = Modbus	1	0	1	-	S	YES

Fieldbus	No. of slaves in the local network	Def	Min	Max	UOM	User Terminal	JNRBUSA MT 2-5 DRLT 2-5 DR
Sn	0 = no Slaves	0	0	9	-	S	NO
H4	Fbus port baudrate (bits) 0 = 1200 1 = 2400 2 = 4800 3 = 9600 4 = 19200 5 = 38400 6 = 57600 7 = 115200	4	0	1	-	S	NO
Notice: on fixed DEFAULT values for VCP serial							

Display	Unit of measure	Def	Min	Max	UOM	User Terminal	JNRBUSA MT 2-5 DRLT 2-5 DR
/5	°C = °Cdeg, 1 = °F = °Fsig	0	0	1	-	S	YES
/6	Display decimal point 0 = Yes, 1 = No	0	0	1	-	S	NO
/11	Display on user terminal 0 = Terminal disabled 1 to 3 = Probe 1 to 3 4 to 8 = Reserved 9 = Control probe	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 display	1	0	1	-	S	NO
ONS	Enable unit On/Off from supervisor	0	0	1	-	S	NO

Day/Night	Start time band 1 to 8 day/day - see (d1...8-d)	Def	Min	Max	UOM	User Terminal	JNRBUSA MT 2-5 DRLT 2-5 DR
1st 1.8-d	Start time band 1 to 8 day/day - see (d1...8-d)	0	0	11	day	S	NO
1st 1.8-hh	Start time band 1 to 8 day/day: hours	0	0	23	hours	S	NO
1st 1.8-mm	Start time band 1 to 8 day/day: minutes	0	0	59	minutes	S	NO
1st 1.8-d	End time band 1 to 8 day/day - see (d1...8-d)	0	0	11	day	S	NO
1st 1.8-hh	End time band 1 to 8 day/day: hours	0	0	23	hours	S	NO
1st 1.8-mm	End time band 1 to 8 day/day: minutes	0	0	59	minutes	S	NO

ALL BENDS 90° UNLESS SPECIFIED

UNITS: INCHES (MM)
DIMENSIONS: (UNLESS OTHERWISE SPECIFIED)
ALL DIMENSIONS ARE TO FACE UNLESS NOTED OTHERWISE
DIMENSIONS OF PANELS ARE TO FACE UNLESS NOTED OTHERWISE
DRAWING NOT TO SCALE

Hilphoenix
Display Cases
General Purpose
Manufactured in the USA

SETPOINTS: MPX0.2-5DR LT & MT, R290, BETA CASE, STD WITH LIGHTING SCHEDULE

REV: 01/16/25 12:36:80
BY: DATE: ECN: NO/RX
DESCRIPTION: RELEASED TO PRODUCTION

R908294

DRAWN BY: AKM DATE: 01/16/25

Parameter categories visible on the user terminal

Mobile device and PC
The 'APLICA' app and SPARK software can be used to configure the controller from a mobile device (smartphone, tablet), via NFC (Near Field Communication) or Bluetooth. The controller can be programmed according to the profile used for access to APLICA or SPARK, with different parameter visibility depending on the rights associated with each profile (User, Service, Manufacturer). Procedure:

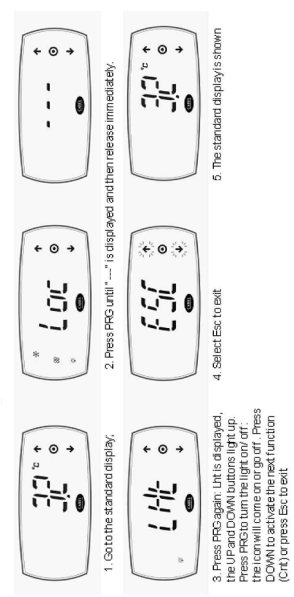
- download the 'APLICA' app;
- on the mobile device start the app for commissioning the controller;
- activate NFC (or place the controller closer to the controller, less than 10 mm away);
- follow the instructions shown on the display.

3.2.5 Direct functions
The following functions can be activated directly from the keypad or via the app:

Icon	Display	On/Off
☼	Unit	Cabinet light
⚙	Unit	Continuous cycle
⚙	dEF	Defrost
⚙	dFn	Network defrost (Main only)
⚙	CLn	Clean cabinet
⚙	ON	Unit ON with control request

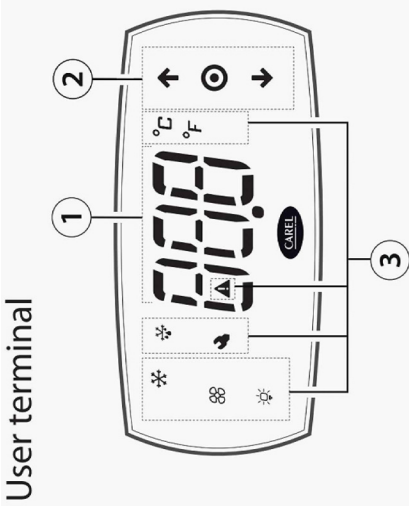
Procedure:

- go to the standard display;
- press PRG until "—" is shown and then release immediately to unlock the display
- press PRG again to access the direct commands (the first item will be the light command Lht);
- press PRG to turn the light on/off and DOWN to move to the next direct function;
- follow the previous steps for all the other functions;
- When finished, press Esc to exit.



ALL BENDS 90° UNLESS SPECIFIED	INCHES (MM)
UNIT(S)	UNIT(S)
DO NOT SCALE	DO NOT SCALE
ALL ANGULAR DIM. IN °	ALL ANGULAR DIM. IN °
ALL DIMENSIONS ON FORMS ARE TO FACE UNLESS NOTED OTHERWISE	ALL DIMENSIONS ON FORMS ARE TO FACE UNLESS NOTED OTHERWISE
TRAVERSING NOT TO SCALE	TRAVERSING NOT TO SCALE
Display Cases	Display Cases
CONSTRUCTION	CONSTRUCTION
DATE: 01/16/25	DATE: 01/16/25
BY: REV 01/16/25	BY: REV 01/16/25
ECN NO/R	ECN NO/R
RELEASED TO PRODUCTION	RELEASED TO PRODUCTION
R908294	R908294

SHEET 4 OF 4



- Key:**
- Main field
 - Keypad
 - 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 status active
⚙	Exhaust/compressor active
⚙	Exhaust fan on
⚙	Light on
⚙	Defrost active
⚙	Awaiting defrost
⚙	Maintenance request
⚙	Alarm
⚙	Alarm acknowledged
⚙	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
↓	UP / DOWN	• Scroll direct access functions
⚙	PRG	• LED on scroll menu parameters, direct access functions
⚙	PRG	• Pressed briefly: set parameter values
⚙	PRG	• Save value and return to the parameter code
⚙	PRG	• Mute buzzer
⚙	PRG	• Pressed and held (hold until "—" is shown):
⚙	PRG	• Enter direct access function menu (from main screen) and activate/deactivate functions
⚙	PRG	• Pressed and held (hold after "—" is shown):
⚙	PRG	• Enter programming mode or return to previous level without saving
⚙	PRG	• LED on main screen/programming mode

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

Parameter table

Code	Description	Def	Min	Max	UOM	User Terminal	JNRBHA MT 2.5 DRLT 2.5 DR
Analogue Inputs							
/P1	Type of probe, group 1 (S1, S2, S3) 0 = PT1000 Standard Range -50/150 °C 1 = NTC Standard Range -50/90 °C	1	0	1	-	S	YES
/P5	Configuration of analogue output Y1: 0 = 0-10 V, 6 = PWM.	6	0	6	-	S	NO
/P6	Configuration of analogue output Y2: 0 = 0-10 V, 6 = PWM.	6	0	6	-	S	NO
Digital Inputs							
/A	0 = Function disabled 1 = Serial probe S11 2 = Serial probe S12 3 = Serial probe S13 4 = Serial probe S14	1	4	3	-	S	YES
/B	Assign defrost temperature probe (SD) - see /FA	2	4	3	-	S	YES
/C	Assign intake temperature probe (SI) - see /FA	3	4	3	-	S	YES
/F	Assign defrost temperature probe 2 (SD2) - see /FA	0	4	3	-	S	NO
/F/G	Assign auxiliary temperature/pressure probe 1 (Saux1) - see /FA	0	4	3	-	S	NO
/F/H	Assign auxiliary temperature/pressure probe 2 (Saux2) - see /FA	0	4	3	-	S	NO
/F/I	Assign ambient temperature probe (SA) - see /FA	0	4	3	-	S	NO
/F/L	Assign ambient humidity probe (SU) - see /FA	0	4	3	-	S	NO
/F/M	Assign glass temperature probe (SV) - see /FA	0	4	3	-	S	NO
/F/N	Assign dewpoint value (SP) - see /FA	0	4	3	-	S	NO
/I/A	Outlet temperature probe (Sm) calibration	0	-20	20	°C/F	S	NO
/I/B	Defrost temperature probe (SI) calibration	0	-20	20	°C/F	S	NO
/I/C	Intake temperature probe (Sj) calibration	0	-20	20	°C/F	S	NO
/I/D	Defrost temperature probe 2 (SD2) calibration	0	-20	20	°C/F	S	NO
/I/E	Auxiliary temperature/pressure probe 1 (Saux1) calibration	0	-20	20	°C/F	S	NO
/I/F	Auxiliary temperature/pressure probe 2 (Saux2) calibration	0	-20	20	°C/F	S	NO
/I/G	Ambient temperature probe (SA) calibration	0	-20	20	°C/F	S	NO
/I/H	Ambient humidity probe (SU) calibration	0	-20	20	°C/F	S	NO
/I/I	Glass temperature probe (SV) calibration	0	-20	20	°C/F	S	NO
/I/J	Dewpoint value (SP) calibration	0	-20	20	°C/F	S	NO
/I/K	Condenser temperature probe calibration	0	-20	20	°C/F	M	NO
/I/L	Analogue probe measurement stability	9	1	15	-	M	NO

Control							
ON	ON/OFF command 0 = OFF, 1 = ON	0	0	1	-	S	YES
/A	Virtual probe composition 0 = Air off probe Sm 100 = Air on probe Sr	0	0	100	%	S	NO
/I	Minimum set point	-50	-20	20	°C/F	M	NO
/I2	Maximum set point	50	20	20	°C/F	M	NO
/I4	Automatic night set point variation 0.1 = Air on probe Sr, 1 = Air on probe Sr	0	-50	50	°C/F	S	NO
r6	Master sensor valve configuration 0 = local valve, 1 = network valve (connected to Main)	0	0	1	-	S	NO
r7	Set point	50	1	2	°C/F	U	YES
S2	Make probe set point with double thermostat	50	1	2	°C/F	S	NO
r3	Differential	2	0.1	99.9	°C/F	U	YES
rC	Operating mode 0 = Direct, 1 = Reverse	0	0	1	-	U	NO
rD2	Set point S2 differential with double thermostat 0.0 = function disabled	0	0	99.9	°C/F	S	NO
rHS	Virtual probe composition for glass temp. probe estimate	20	0	100	%	S	NO
rHA	0 = Air off probe Sm	2	-20	20	°C/F	S	NO
rHB	Coefr. A for glass temp. probe estimate	22	0	100	-	S	NO
rHB	Coefr. B for glass temp. probe estimate	2	-20	20	°C/F	S	NO
rHB	Differential for anti-sweat modulation	0	0	20	°C/F	S	NO
rHu	Manual anti-sweat heater activation percentage (of period TH1)	70	0	100	%	S	NO
rHt	Manual anti-sweat heater activation period	5	0	180	min	S	NO
rHt	0 = function disabled	0	0	999	min	U	NO
SLT	Max time for Clean status	0	0	240	min	S	NO
SLT	Maximum time for Standby status	0	0	240	min	S	NO
HT4	Time light stays on after closing the door	0	0	240	min	U	NO
dBS	Safety timeout for double thermostat function	0	0	240	min	M	NO
db1	Double thermostat function logic 0 = AND logic, 1 = OR logic	0	0	1	-	M	NO

Code	Description	Def	Min	Max	UOM	User Terminal	JNRBHA MT 2.5 DRLT 2.5 DR
Digital outputs							
DOA	Assign solenoid/compressor digital output 0 = not configured 1 = digital input 3 (ID3) 2 = digital output 1 (ID1) 3 = digital input 4 (ID4)	2	0	4	-	S	NO
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 digital output serving the Main on the Secondary	0	0	4	-	S	NO
DOE	Assign light digital output - see DOA	4	0	4	-	S	NO
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
DOH	Assign auxiliary evaporator defrost digital output - see DOA	0	0	4	-	S	NO
DOK	Assign second ON/OFF compressor digital output - see DOA	0	0	4	-	S	NO
DOI	Assign evaporator fan digital output - see DOA	3	0	4	-	S	NO
DOj	Assign evaporator fan digital output (pump down)	0	0	4	-	S	NO
DOm	Assign timed digital output - see DOA	0	0	4	-	S	NO
DOp	Assign train heater digital output - see DOA	0	0	4	-	S	NO
DOQ	Assign anti-sweat heater digital output - see DOA	0	0	4	-	S	NO
DOAA	Assign not gas defrost digital output - see DOA	0	0	4	-	S	NO
DOt	Assign digital output for max fan speed connection	0	0	4	-	S	NO
DOu	Assign digital output for min fan speed connection	0	0	4	-	S	NO
ROA	Alarm digital output logic: 0 = direct, 1 = reverse	0	0	1	-	M	NO
ROB	Alarm digital output logic - see ROA	0	0	1	-	M	NO
ROC	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	Light 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
ROI	Auxiliary evaporator defrost digital output logic - see ROA	0	0	1	-	S	NO
ROj	Evaporator fan digital output logic - see ROA	0	0	1	-	S	NO
ROp	Liquid valve digital output logic - see ROA	0	0	1	-	S	NO
ROQ	Drain heater digital output logic - see ROA	0	0	1	-	S	NO
ROAA	Hot gas defrost digital output logic - see ROA	0	0	1	-	S	NO
ROt	Maximum fan speed connection digital output logic - see ROA	0	0	1	-	S	NO
ROu	Minimum fan speed connection digital output logic - see ROA	0	0	1	-	S	NO
ROv	Output switched with time bands	0	0	1	-	S	NO
H8	0 = Light 1 = AUX	0	0	1	-	S	NO
DOT1	Relay Type	-	-	-	-	-	3
DOT2	0 = mode 2, cycled mode	-	-	-	-	-	3
DOT3	0 = mode 1, delayed mode 3, zero crossing	-	-	-	-	-	3
DOT4		-	-	-	-	-	3
Digital inputs							
DIu	Assign start defrost digital input - see DIA	0	-1	2	-	S	NO

Note:
For full parameter list and instructions, please refer to Carel's website
<https://www.carel.com/documents/10191/0/%2B0300106EN/aa0a54c-0dec-45b4-bc812d1fc3fa?version=1.0>

ALL BENDS 90° UNLESS SPECIFIED		INCHES (MM)
UNITS: (UNLESS OTHERWISE SPECIFIED)		ALL ANGULAR DIM. ±1°
DIMENSIONS ON FRACTIONS 1/16, 1/8, 3/16, 1/2, 5/8, 3/4, 1		DECIMAL EQUIVALENTS TO SCALE
DRAWING NOT TO SCALE		
Hilphoenix		
Display Cases		
Carel Heating & Cooling Controls		
R908293		
REV: 01/16/25	12/36/80	RELEASED TO PRODUCTION
BY: DATE	ECN: NO/R	DESCRIPTION
DRAWN BY: AKM		DATE: 01/16/25
SETPOINTS: MPX0.2-5DR LT & MT, R290, BETA CASE, STD WITH MOTION SENSOR		

Code	Description	Def	Min	Max	UOM	User	User Terminal	INRBUSSA MT 2-5 DR	INR25SHA LT 2-5 DR
d0	Type of defrost 0 = heater by temperature 1 = hot gas by temperature 2 = heater by time 3 = hot gas by time 4 = temperature control with heater by time	0	0	4	-	S	YES	0	1
dEP	Assign probe for end defrost in advance 0 = Not configured 1 = Auxiliary 1 (Saux1) 2 = Defrost (Sd) 3 = Ambient (Sui) 4 = Inlet (Si) 5 = Defrost 2 (Sd2) 6 = Dew point (SDP) 7 = Virtual probe (Sv) 8 = Auxiliary 2 (Saux2) 9 = Ambient (Sui) 10 = Glass temperature (Svt) 11 = Dew point (SDP) 12 = 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 = yes, 1 = no ignore start network defrost signal (for Secondary) 0 = No, 1 = yes	0	0	1	-	S	NO		
d1	Maximum interval between consecutive defrosts	8	0	240	hours	S	YES	12	24
d11	End defrost temperature (read by Sd)	8	-50	50	°C/F	S	YES	40	72
d12	End defrost temperature (read by Sd2)	8	-50	50	°C/F	S	NO		
dP1	Maximum defrost duration	45	1	240	min	S	YES	46	30
dP2	Max secondary evaporator defrost duration	45	1	240	min	S	NO		
d4	Defrost on power on 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
d4	Dripping time after defrost (fans off) 0 = no dripping	2	0	15	min	S	NO	0	0
d7	Stop defrost 0 = disabled, 1 = enabled	0	0	1	-	S	NO		
d8	Bypass high temperature alarm time after defrost Defrost priority over compressor protection lines 0 = compressor protection times observed, 1 = compressor protection times ignored	30	1	240	min	S	NO		
d9	Defrost time in Running time mode 0 = function disabled	1	0	1	-	M	NO		
d10	Defrost temperature threshold in Running time mode 0 = pump down disabled 1 = pump down disabled	0	0	240	min	S	NO		
dH1	Pump down duration 0 = compressor off time in sequential stop defrost mode 1 = function disabled	-30	-50	50	°C/F	S	NO		
dS1	Compressor operating time in sequential stop defrost mode 0 = 45 min	0	0	45	min	M	NO		
dS2	Compressor operating time in sequential stop defrost mode 0 = 240 min	120	0	240	min	M	NO		
d11	Additional end defrost temperature delta in power defrost mode 0 = -20 °C/F	0	-20	20	°C/F	S	NO		
d12	Additional maximum defrost time delta in power defrost mode 0 = 60 min	0	0	60	min	S	NO		
dH	Nominal defrost duration for skip defrost 0 = function disabled	75	0	100	%	S	NO		
r3	End defrost by timeout signal 0 = disabled, 1 = enabled	0	0	1	-	S	NO		
c7	Defrost priority over continuous cycle 0 = No, 1 = Yes	0	0	1	-	M	NO		
dd1	Assign probe 1 to determine start defrost (dd1-dd2) - see F Sa	0	0	14	-	S	NO		
dd2	Assign probe 2 to determine start defrost (dd1-dd2) - see F Sa	0	0	14	-	S	NO		
td1	Temperature differential threshold to start defrost 0 = 50 °C	50	99.9	°C	S	NO			
td2	Threshold evaluation time to start defrost 0 = 15 min	60	15	240	min	S	NO		
cdF	Compressor frequency during hot gas defrost procedure 0 = 255 Hz	140	0	255	Hz	S	NO		
cdH	Compressor frequency during dripping phase after hot gas defrost 0 = 255 Hz	140	0	255	Hz	S	NO		
dH3	Hot gas activation delay 0 = 300 s	0	0	300	s	S	NO		

Code	Description	Def	Min	Max	UOM	Use	User Terminal	INRBU5A INR25HA MT 2-5 DR LT 2-5 DR
Defrost scheduling								
Defrost 1 to 8 - day								
0 = event disabled								
1 = Monday to Sunday								
2 = Monday to Friday								
3 = from Monday to Sunday								
10 = Saturday & Sunday								
11 = every day								
td1, 8-h	Defrost 1 to 8 - hours	0	0	23	hours	S	NO	0
td1, 8-min	Defrost 1 to 8 - minutes	0	0	59	minutes	S	NO	0
td1, 8-P	Defrost 1 to 8 - enable power defrost: 0 = normal, 1 = power defrost	0	0	1	-	S	NO	0
Number of daily defrosts (td1)								
8 = 3 hours and 0 minutes								
9 = 2 hours and 40 minutes								
10 = 2 hours and 0 minutes								
11 = 2 hours and 0 minutes								
12 = 2 hours and 11 minutes								
13 = 1 hour and 0 minutes								
14 = 30 minutes								
d1S		0	0	14	-	S	NO	0
d2S	Number of daily defrosts (td2) - see d1S	0	0	14	-	S	NO	0
Evaporator fans								
Evaporator fan management								
F0	0 = always on 1 = activation based on Sa - Sb (see F5a and F5b) 2 = activation based on Sa (Sa activation based on Sb) (Sa activation based on Sb)	0	0	2	-	S	YES	0
F1	Evaporator fan activation threshold (only if F0 = 1 or 2)	-5	-50	50	°C/°F	S	YES	30
F2	0 = see F0 1 = always off	1	0	1	-	S	YES	0
F3	Evaporator fans during defrost 0 = on, 1 = off	1	0	1	-	S	F3	0
F4	Post-dipping 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 cut-off temperature (hysteresis °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	0 = Function disabled Evaporator fan forcing time at maximum speed 1 = Function disabled	0	0	240	min	M	NO	
First fan control probe								
0 = Fan control ignored								
1 = Outlet (Sd)								
2 = Defrost (Sd)								
3 = Intake (S)								
4 = Defrost 2 (Sd2)								
5 = Auxiliary 1 (Saux1)								
6 = Auxiliary 2 (Saux2)								
7 = Ambient (SA)								
8 = Ambient humidity (SU)								
9 = Ambient pressure (SW)								
10 = Dew point (SP)								
11 = Virtual probe (SV)								
F5a		2	0	11	-	M	NO	
Second fan control probe - see F5a								
F5b	Evaporator fan control probe - see F5a	11	0	11	-	M	NO	
Fpd	Evaporator fans during post-dipping 0 = On, 1 = off	0	0	1	-	NO	NO	
PCM	Unit cooling capacity indication	4000	0	32000	watts	M	NO	
ALL BENDS 90° UNLESS SPECIFIED								
UNITS = INCHES (MM)								
- TOLERANCES: UNLESS SPECIFIED								
ALL ANGULAR DIM. ± 0.1°								
DIMENSIONS ON FORMED VIEWS ± 0.5								
DIMENSIONS ON UNFORMED VIEWS ± 0.3								
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ALL BENDS 90° UNLESS SPECIFIED

UNITS =	INCHES (MM)
TOLERANCES (UNLESS SPECIFIED)	ALL ANGULAR DIM. ±1°
DIMENSIONS ON FLAT VIEWS	+0.10
DIMENSIONS ON FORMED VIEWS	±0.03
DRAWING NOT TO SCALE	

Hilphoenix

Display Cases
Regional Distrib. VA 23064

R908293

SHEET 2 OF 4

Code	Description	Def	Min	Max	UOM	User Terminal	UNRENTA MT	UNRENTA 2-5 DR	UNRENTA 2-5 DR LT	UNRENTA 2-5 DR
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	5
c3	Minimum compressor ON time	0	0	15	min	M	NO	5	5	5
c4	ON time for dry setting operation (Toff = 15 minutes, fixed value) 0 = compressor always OFF 100 = compressor 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		High and low temp. alarm reset differential	2	0.1	20	"C"/F	S	YES	
A0	Alarm thresholds (AL, AH) relative to the set point St or absolute 0/1 = relative absolute	Alarm thresholds (AL, AH) relative to the set point St or absolute 0/1 = relative absolute	0	0	1	-	S	NO	0
A2	Alarm thresholds (AL2, AH2) relative to the set point S2 or absolute 0/1 = relative absolute	Alarm thresholds (AL2, AH2) relative to the set point S2 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	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 ON	Configure solenoid/compressor control during external alarm (immediate or delayed) with fixed 15 min OFF time 0 = always ON 100 = always ON	0	0	100	min	S	NO	
A11	Delay time for delayover external alarm 0 = Signal-only alarm	Delay time for delayover external alarm 0 = Signal-only alarm	0	0	240	min	S	NO	
AA	Assign probe for high (AH/AHA) and low (AL/ALA) temperature alarms 0 = Not configured 1 = Outlet (Sm) 2 = Inlet (Sd) 3 = Inlet (Sv) 4 = Defrost 2 (Sd2) 5 = Auxiliary 1 (Saux1) 6 = Auxiliary 2 (Saux2) 7 = Ambient (SA) 8 = Reserved 9 = Gas temperature (St) 10 = Dewpoint (Sdp) 11 = Virtual Probe (Sv)	Assign probe for high (AH2/AHA2) and low (AL2, ALA2) temperature alarms 0 = Not configured 1 = Outlet (Sm) 2 = Inlet (Sd) 3 = Inlet (Sv) 4 = Defrost 2 (Sd2) 5 = Auxiliary 1 (Saux1) 6 = Auxiliary 2 (Saux2) 7 = Ambient (SA) 8 = Reserved 9 = Gas temperature (St) 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 (relative to set point) 0 = Not configured 1 = Outlet (Sm) 2 = Inlet (Sd) 3 = Inlet (Sv) 4 = Defrost 2 (Sd2) 5 = Auxiliary 1 (Saux1) 6 = Auxiliary 2 (Saux2) 7 = Ambient (SA) 8 = Reserved 9 = Gas temperature (St) 10 = Dewpoint (Sdp) 11 = Virtual Probe (Sv)	Assign probe for high (AH2, AHA2) and low (AL2, ALA2) temperature alarms (relative to set point) 0 = Not configured 1 = Outlet (Sm) 2 = Inlet (Sd) 3 = Inlet (Sv) 4 = Defrost 2 (Sd2) 5 = Auxiliary 1 (Saux1) 6 = Auxiliary 2 (Saux2) 7 = Ambient (SA) 8 = Reserved 9 = Gas temperature (St) 10 = Dewpoint (Sdp) 11 = Virtual Probe (Sv)	1	0	11	-	S	NO	
AL	Low temperature alarm threshold (relative to set point) 0 = Not configured 1 = Outlet (Sm) 2 = Inlet (Sd) 3 = Inlet (Sv) 4 = Defrost 2 (Sd2) 5 = Auxiliary 1 (Saux1) 6 = Auxiliary 2 (Saux2) 7 = Ambient (SA) 8 = Reserved 9 = Gas temperature (St) 10 = Dewpoint (Sdp) 11 = Virtual Probe (Sv)	Low temperature alarm threshold (relative to set point) 0 = Not configured 1 = Outlet (Sm) 2 = Inlet (Sd) 3 = Inlet (Sv) 4 = Defrost 2 (Sd2) 5 = Auxiliary 1 (Saux1) 6 = Auxiliary 2 (Saux2) 7 = Ambient (SA) 8 = Reserved 9 = Gas temperature (St) 10 = Dewpoint (Sdp) 11 = Virtual Probe (Sv)	4	0	50	"C"/F	S	YES	6
AL*	Low temperature alarm threshold (absolute threshold) 0 = Not configured 1 = Outlet (Sm) 2 = Inlet (Sd) 3 = Inlet (Sv) 4 = Defrost 2 (Sd2) 5 = Auxiliary 1 (Saux1) 6 = Auxiliary 2 (Saux2) 7 = Ambient (SA) 8 = Reserved 9 = Gas temperature (St) 10 = Dewpoint (Sdp) 11 = Virtual Probe (Sv)	Low temperature alarm threshold (absolute threshold) 0 = Not configured 1 = Outlet (Sm) 2 = Inlet (Sd) 3 = Inlet (Sv) 4 = Defrost 2 (Sd2) 5 = Auxiliary 1 (Saux1) 6 = Auxiliary 2 (Saux2) 7 = Ambient (SA) 8 = Reserved 9 = Gas temperature (St) 10 = Dewpoint (Sdp) 11 = Virtual Probe (Sv)	0	-50	50	"C"/F	S	NO	
AH*	High temperature alarm threshold (relative to set point) 0 = Not configured 1 = Outlet (Sm) 2 = Inlet (Sd) 3 = Inlet (Sv) 4 = Defrost 2 (Sd2) 5 = Auxiliary 1 (Saux1) 6 = Auxiliary 2 (Saux2) 7 = Ambient (SA) 8 = Reserved 9 = Gas temperature (St) 10 = Dewpoint (Sdp) 11 = Virtual Probe (Sv)	High temperature alarm threshold (relative to set point) 0 = Not configured 1 = Outlet (Sm) 2 = Inlet (Sd) 3 = Inlet (Sv) 4 = Defrost 2 (Sd2) 5 = Auxiliary 1 (Saux1) 6 = Auxiliary 2 (Saux2) 7 = Ambient (SA) 8 = Reserved 9 = Gas temperature (St) 10 = Dewpoint (Sdp) 11 = Virtual Probe (Sv)	10	0	50	"C"/F	S	YES	30
AH*	High temperature alarm threshold (absolute threshold) 0 = Not configured 1 = Outlet (Sm) 2 = Inlet (Sd) 3 = Inlet (Sv) 4 = Defrost 2 (Sd2) 5 = Auxiliary 1 (Saux1) 6 = Auxiliary 2 (Saux2) 7 = Ambient (SA) 8 = Reserved 9 = Gas temperature (St) 10 = Dewpoint (Sdp) 11 = Virtual Probe (Sv)	High temperature alarm threshold (absolute threshold) 0 = Not configured 1 = Outlet (Sm) 2 = Inlet (Sd) 3 = Inlet (Sv) 4 = Defrost 2 (Sd2) 5 = Auxiliary 1 (Saux1) 6 = Auxiliary 2 (Saux2) 7 = Ambient (SA) 8 = Reserved 9 = Gas temperature (St) 10 = Dewpoint (Sdp) 11 = Virtual Probe (Sv)	0	-50	200	"C"/F	S	NO	
AL2*	Low temperature alarm threshold 2 (absolute threshold) 0 = Not configured 1 = Outlet (Sm) 2 = Inlet (Sd) 3 = Inlet (Sv) 4 = Defrost 2 (Sd2) 5 = Auxiliary 1 (Saux1) 6 = Auxiliary 2 (Saux2) 7 = Ambient (SA) 8 = Reserved 9 = Gas temperature (St) 10 = Dewpoint (Sdp) 11 = Virtual Probe (Sv)	Low temperature alarm threshold 2 (absolute threshold) 0 = Not configured 1 = Outlet (Sm) 2 = Inlet (Sd) 3 = Inlet (Sv) 4 = Defrost 2 (Sd2) 5 = Auxiliary 1 (Saux1) 6 = Auxiliary 2 (Saux2) 7 = Ambient (SA) 8 = Reserved 9 = Gas temperature (St) 10 = Dewpoint (Sdp) 11 = Virtual Probe (Sv)	0	0	50	"C"/F	S	NO	
AL2*	Low temperature alarm threshold 2 (absolute threshold) 0 = Not configured 1 = Outlet (Sm) 2 = Inlet (Sd) 3 = Inlet (Sv) 4 = Defrost 2 (Sd2) 5 = Auxiliary 1 (Saux1) 6 = Auxiliary 2 (Saux2) 7 = Ambient (SA) 8 = Reserved 9 = Gas temperature (St) 10 = Dewpoint (Sdp) 11 = Virtual Probe (Sv)	Low temperature alarm threshold 2 (absolute threshold) 0 = Not configured 1 = Outlet (Sm) 2 = Inlet (Sd) 3 = Inlet (Sv) 4 = Defrost 2 (Sd2) 5 = Auxiliary 1 (Saux1) 6 = Auxiliary 2 (Saux2) 7 = Ambient (SA) 8 = Reserved 9 = Gas temperature (St) 10 = Dewpoint (Sdp) 11 = Virtual Probe (Sv)	0	-50	50	"C"/F	S	NO	
AH2*	High temperature alarm threshold 2 (absolute threshold) 0 = Not configured 1 = Outlet (Sm) 2 = Inlet (Sd) 3 = Inlet (Sv) 4 = Defrost 2 (Sd2) 5 = Auxiliary 1 (Saux1) 6 = Auxiliary 2 (Saux2) 7 = Ambient (SA) 8 = Reserved 9 = Gas temperature (St) 10 = Dewpoint (Sdp) 11 = Virtual Probe (Sv)	High temperature alarm threshold 2 (absolute threshold) 0 = Not configured 1 = Outlet (Sm) 2 = Inlet (Sd) 3 = Inlet (Sv) 4 = Defrost 2 (Sd2) 5 = Auxiliary 1 (Saux1) 6 = Auxiliary 2 (Saux2) 7 = Ambient (SA) 8 = Reserved 9 = Gas temperature (St) 10 = Dewpoint (Sdp) 11 = Virtual Probe (Sv)	0	-50	200	"C"/F	S	NO	
AHA2	Delay time for high and low temperature alarms (AH/AHA, AL/ALA) 0 = Not configured 1 = Outlet (Sm) 2 = Inlet (Sd) 3 = Inlet (Sv) 4 = Defrost 2 (Sd2) 5 = Auxiliary 1 (Saux1) 6 = Auxiliary 2 (Saux2) 7 = Ambient (SA) 8 = Reserved 9 = Gas temperature (St) 10 = Dewpoint (Sdp) 11 = Virtual Probe (Sv)	Delay time for high and low temperature alarms (AH/AHA, AL/ALA) 0 = Not configured 1 = Outlet (Sm) 2 = Inlet (Sd) 3 = Inlet (Sv) 4 = Defrost 2 (Sd2) 5 = Auxiliary 1 (Saux1) 6 = Auxiliary 2 (Saux2) 7 = Ambient (SA) 8 = Reserved 9 = Gas temperature (St) 10 = Dewpoint (Sdp) 11 = Virtual Probe (Sv)	120	0	240	min	U	YES	
A2	Delay time for high and low temp. alarms (AH2/AHA2, AL2/ALA2) 0 = Not configured 1 = Outlet (Sm)	Delay time for high and low temp. alarms (AH2/AHA2, AL2/ALA2) 0 = Not configured 1 = Outlet (Sm)	30	1	240	min	U	YES	
A*	Signal alarms from Secondary to Main 0 = not enabled, 1 = enabled	Signal alarms from Secondary to Main 0 = not enabled, 1 = enabled	1	0	1	-	S	NO	
A4	High temperature alarm bypass time for door open 0 = Not configured 1 = 1 min 2 = 2 min 3 = 3 min 4 = 4 min 5 = 5 min 6 = 6 min 7 = 7 min 8 = 8 min 9 = 9 min 10 = 10 min 11 = 11 min 12 = 12 min 13 = 13 min 14 = 14 min 15 = 15 min 16 = 16 min 17 = 17 min 18 = 18 min 19 = 19 min 20 = 20 min 21 = 21 min 22 = 22 min 23 = 23 min 24 = 24 min 25 = 25 min 26 = 26 min 27 = 27 min 28 = 28 min 29 = 29 min 30 = 30 min 31 = 31 min 32 = 32 min 33 = 33 min 34 = 34 min 35 = 35 min 36 = 36 min 37 = 37 min 38 = 38 min 39 = 39 min 40 = 40 min 41 = 41 min 42 = 42 min 43 = 43 min 44 = 44 min 45 = 45 min 46 = 46 min 47 = 47 min 48 = 48 min 49 = 49 min 50 = 50 min 51 = 51 min 52 = 52 min 53 = 53 min 54 = 54 min 55 = 55 min 56 = 56 min 57 = 57 min 58 = 58 min 59 = 59 min 60 = 60 min 61 = 61 min 62 = 62 min 63 = 63 min 64 = 64 min 65 = 65 min 66 = 66 min 67 = 67 min 68 = 68 min 69 = 69 min 70 = 70 min 71 = 71 min 72 = 72 min 73 = 73 min 74 = 74 min 75 = 75 min 76 = 76 min 77 = 77 min 78 = 78 min 79 = 79 min 80 = 80 min 81 = 81 min 82 = 82 min 83 = 83 min 84 = 84 min 85 = 85 min 86 = 86 min 87 = 87 min 88 = 88 min 89 = 89 min 90 = 90 min 91 = 91 min 92 = 92 min 93 = 93 min 94 = 94 min 95 = 95 min 96 = 96 min 97 = 97 min 98 = 98 min 99 = 99 min 100 = 100 min 101 = 101 min 102 = 102 min 103 = 103 min 104 = 104 min 105 = 105 min 106 = 106 min 107 = 107 min 108 = 108 min 109 = 109 min 110 = 110 min 111 = 111 min 112 = 112 min 113 = 113 min 114 = 114 min 115 = 115 min 116 = 116 min 117 = 117 min 118 = 118 min 119 = 119 min 120 = 120 min 121 = 121 min 122 = 122 min 123 = 123 min 124 = 124 min 125 = 125 min 126 = 126 min 127 = 127 min 128 = 128 min 129 = 129 min 130 = 130 min 131 = 131 min 132 = 132 min 133 = 133 min 134 = 134 min 135 = 135 min 136 = 136 min 137 = 137 min 138 = 138 min 139 = 139 min 140 = 140 min 141 = 141 min 142 = 142 min 143 = 143 min 144 = 144 min 145 = 145 min 146 = 146 min 147 = 147 min 148 = 148 min 149 = 149 min 150 = 150 min 151 = 151 min 152 = 152 min 153 = 153 min 154 = 154 min 155 = 155 min 156 = 156 min 157 = 157 min 158 = 158 min 159 = 159 min 160 = 160 min 161 = 161 min 162 = 162 min 163 = 163 min 164 = 164 min 165 = 165 min 166 = 166 min 167 = 167 min 168 = 168 min 169 = 169 min 170 = 170 min 171 = 171 min 172 = 172 min 173 = 173 min 174 = 174 min 175 = 175 min 176 = 176 min 177 = 177 min 178 = 178 min 179 = 179 min 180 = 180 min 181 = 181 min 182 = 182 min 183 = 183 min 184 = 184 min 185 = 185 min 186 = 186 min 187 = 187 min 188 = 188 min 189 = 189 min 190 = 190 min 191 = 191 min 192 = 192 min 193 = 193 min 194 = 194 min 195 = 195 min 196 = 196 min 197 = 197 min 198 = 198 min 199 = 199 min 200 = 200 min 201 = 201 min 202 = 202 min 203 = 203 min 204 = 204 min 205 = 205 min 206 = 206 min 207 = 207 min 208 = 208 min 209 = 209 min 210 = 210 min 211 = 211 min 212 = 212 min 213 = 213 min 214 = 214 min 215 = 215 min 216 = 216 min 217 = 217 min 218 = 218 min 219 = 219 min 220 = 220 min 221 = 221 min 222 = 222 min 223 = 223 min 224 = 224 min 225 = 225 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511 = 511 min 512 = 512 min 513 = 513 min 514 = 514 min 515 = 515 min 516 = 516 min 517 = 517 min 518 = 518 min 519 = 519 min 520 = 520 min 521 = 521 min 522 = 522 min 523 = 523 min 524 = 524 min 525 = 525 min 526 = 526 min 527 = 527 min 528 = 528 min 529 = 529 min 530 = 530 min 531 = 531 min 532 = 532 min 533 = 533 min 534 = 534 min 535 = 535 min 536 = 536 min 537 = 537 min 538 = 538 min 539 = 539 min 540 = 540 min 541 = 541 min 542 = 542 min 543 = 543 min 544 = 544 min 545 = 545 min 546 = 546 min 547 = 547 min 548 = 548 min 549 = 549 min 550 = 550 min 551 = 551 min 552 = 552 min 553 = 553 min 554 = 554 min 555 = 555 min 556 = 556 min 557 = 557 min 558 = 558 min 559 = 559 min 560 = 560 min 561 = 561 min 562 = 562 min 563 = 563 min 564 = 564 min 565 = 565 min 566 = 566 min 567 = 567 min 568 = 568 min 569 = 569 min 570 = 570 min 571 = 571 min 572 = 572 min 573 = 573 min 574 = 574 min 575 = 575 min 576 = 576 min 577 = 577 min 578 = 578 min 579 = 579 min 580 = 580 min 581 = 581 min 582 = 582 min 583 = 583 min 584 = 584 min 585 = 585 min 586 = 586 min 587 = 587 min 588 = 588 min 589 = 589 min 590 = 590 min 591 = 591 min 592 = 592 min 593 = 593 min 594 = 594 min 595 = 595 min 596 = 596 min 597 = 597 min 598 = 598 min 599 = 599 min 600 = 600 min 601 = 601 min 602 = 602 min 603 = 603 min 604 = 604 min 605 = 605 min 606 = 606 min 607 = 607 min 608 = 608 min 609 = 609 min 610 = 610 min 611 = 611 min 612 = 612 min 613 = 613 min 614 = 614 min 615 = 615 min 616 = 616 min 617 = 617 min 618 = 618 min 619 = 619 min 620 = 620 min 621 = 621 min 622 = 622 min 623 = 623 min 624 = 624 min 625 = 625 min 626 = 626 min 627 = 627 min 628 = 628 min 629 = 629 min 630 = 630 min 631 = 631 min 632 = 632 min 633 = 633 min 634 = 634 min 635 = 635 min 636 = 636 min 637 = 637 min 638 = 638 min 639 = 639 min 640 = 640 min 641 = 641 min 642 = 642 min 643 = 643 min 644 = 644 min 645 = 645 min 646 = 646 min 647 = 647 min 648 = 648 min 649 = 649 min 650 = 650 min 651 = 651 min 652 = 652 min 653 = 653 min 654 = 654 min 655 = 655 min 656 = 656 min 657 = 657 min 658 = 658 min 659 = 659 min 660 = 660 min 661 = 661 min 662 = 662 min 663 = 663 min 664 = 664 min 665 = 665 min 666 = 666 min 667 = 667 min 668 = 668 min 669 = 669 min 670 = 670 min 671 = 671 min 672 = 672 min 673 = 673 min 674 = 674 min 675 = 675 min 676 = 676 min 677 = 677 min 678 = 678 min 679 = 679 min 680 = 680 min 681 = 681 min 682 = 682 min 683 = 683 min 684 = 684 min 685 = 685 min 686 = 686 min 687 = 687 min 688 = 688 min 689 = 689 min 690 = 690 min 691 = 691 min 692 = 692 min 693 = 693 min 694 = 694 min 695 = 695 min 696 = 696 min 697 = 697 min 698 = 698 min 699 = 699 min 700 = 700 min 701 = 701 min 702 = 702 min 703 = 703 min 704 = 704 min 705 = 705 min 706 = 706 min 707 = 707 min 708 = 708 min 709 = 709 min 710 = 710 min 711 = 711 min 712 = 712 min 713 = 713 min 714 = 714 min 715 = 715 min 716 = 716 min 717 = 717 min 718 = 718 min 719 = 719 min 720 = 720 min 721 = 721 min 722 = 722 min 723 = 723 min 724 = 724 min 725 = 725 min 726 = 726 min 727 = 727 min 728 = 728 min 729 = 729 min 730 = 730 min 731 = 731 min 732 = 732 min 733 = 733 min 734 = 734 min 735 = 735 min 736 = 736 min 737 = 737 min 738 = 738 min 739 = 739 min 740 = 740 min 741 = 741 min 742 = 742 min 743 = 743 min 744 = 744 min 745 = 745 min 746 = 746 min 747 = 747 min 748 = 748 min 749 = 749 min 750 = 750 min 751 = 751 min 752 = 752 min 753 = 753 min 754 = 754 min 755 = 755 min 756 = 756 min 757 = 757 min 758 = 758 min 759 = 759 min 760 = 760 min 761 = 761 min 762 = 762 min 763 = 763 min 764 = 764 min 765 = 765 min 766 = 766 min 767 = 767 min 768 = 768 min 769 = 769 min 770 = 770 min 771 = 771 min 772 = 772 min 773 = 773 min 774 = 774 min 775 = 775 min								

Code		Description		Def	Min	Max	UOM	User Terminal	User Terminal	INRBUISA INR25SHA
Connectivity										
in		Types of unit 0 = Secondary, 1 = Main		0	0	1	-	S	YES	1
H0	Serial or Main/Secondary network address		199	0	247	-	S	YES		
H1	BMS serial port configuration (stop bits and parity) 0 = 1 stop bit, even parity 1 = 2 stop bit, no parity 2 = 1 stop bit, odd 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 = 1200 1 = 2400 2 = 4800 3 = 9600		4	0	8	-	S	YES		
H3	BMS serial port protocol 0 = Carel, 1 = Modbus		1	0	1	-	S	YES		

Fieldbus						
Sn	No. of slaves in the local network 0 = no Slaves	0	0	9	-	S NO
H4	FBus port baudrate (bits) 0 = 1200 5 = 38400					
	1 = 2400					
	2 = 4800	4	0	1	-	S NO
	3 = 9600					
	4 = 19200					

Notice: on fixed DEFAULT values for VQC serial

Display		0	0	1	-	S	YES	1
5	Unit of measure 0 = °C/barg, 1 = °F/psig							
6	Display decimal point 0 = Yes, 1 = No							
	Display on user terminal 0 = Terminal disabled 1 to 3 = Probe 1 to 3 4 = Reserved 9 = Control Probe		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

Day/Night	Start time band 1 to 8 day: hours - see (t01...8_d)	0	0	11	day	S	NO	0
t01...8_d	Start time band 1 to 8 day: hours	0	0	23	hours	S	NO	0
t01...8_h	Start time band 1 to 8 day: minutes	0	0	59	minutes	S	NO	0
t01...8_m	Start time band 1 to 8 day: minutes	0	0	11	minutes	S	NO	0
t01...8_d	End time band 1 to 8 day: hours - see (t01...8_d)	0	0	23	hours	S	NO	0
t01...8_h	End time band 1 to 8 day: minutes	0	0	59	minutes	S	NO	0
t01...8_m	End time band 1 to 8 day: minutes	0	0	11	minutes	S	NO	0

[illegible]

D13: 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: DEFROST SYNCHRONIZATION INSTRUCTIONS

Programming Controllers

Parameters Ln, Sn, and H0 need to be changed in the controller from their factory settings to properly run synchronized defrosts.

Note: See Fig. 2 for more information about the parameter values.

- Ln - type of unit (main or secondary), where main = 1 and secondary = 0
- Sn - number of secondary devices (only for the main controller)
- H0 - serial or main/secondary network address
- d2 - end defrost synchronized by main, where 1 = synchronized and 0 = not synchronized
- d3 - send start network defrost, where 0 = yes and 1 = no for **main**
- d3 - ignore start network defrost signal, where 0 = no and 1 = yes for **secondary**

Note: Changes can be made directly on the controller, or by using the Carel Applica phone app (Fig. 1).



Fig. 1 Carel Applica icon



CAUTION

Carel MPXzero Advanced has a software bug that puts the secondary cases into defrost immediately if communication is lost from the main controller. If this happens, product temperatures could be adversely affected. Service contractors should check communication integrity if unexpected defrosts are occurring.

The Carel adapter, which is not provided with the case, is required to properly wire the main controller to the secondary controller(s) on the J6 controller connector. These can be purchased from Hillphoenix After Market Services by referencing the part number P127134E. It can also be purchased by referencing the Carel part number BXOPZC4020010.

The J6 fieldbus connector on the main controller is networked to the J5 BMS connector on secondary controller(s).

A 120 ohm resistor must be added for the termination of each communication loop, wired across TX/RX+ and TX/RX-.

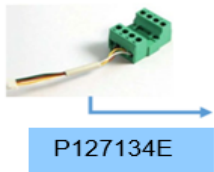
After successfully setting up the synchronized defrost, the plexi case dividers can be removed.



CAUTION

H0 numbers must not repeat within a store management system.

REQUIRED FOR FBUS
CONNECTION ON MAIN
CONTROLLER ONLY



Main/Secondary network for MPXzero Advanced M/S

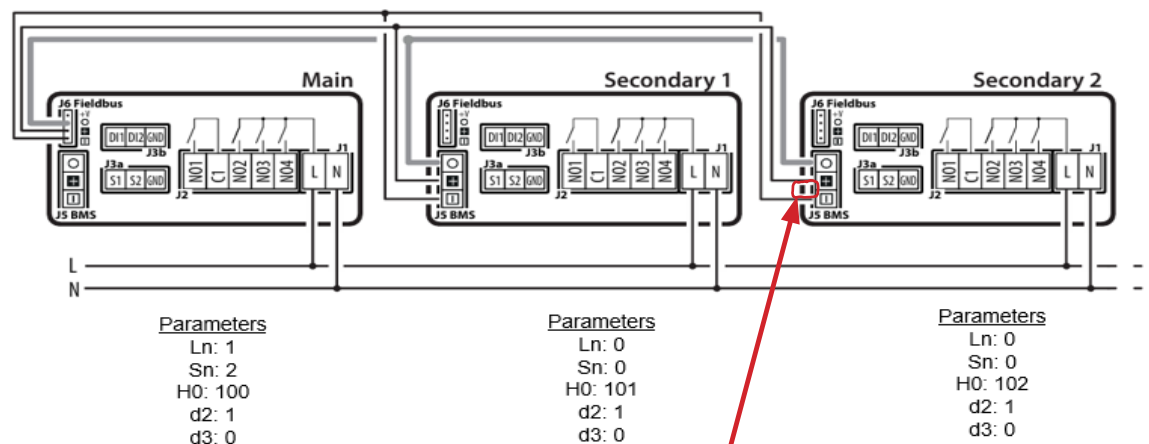


Fig. 2 Communication network connections and parameters

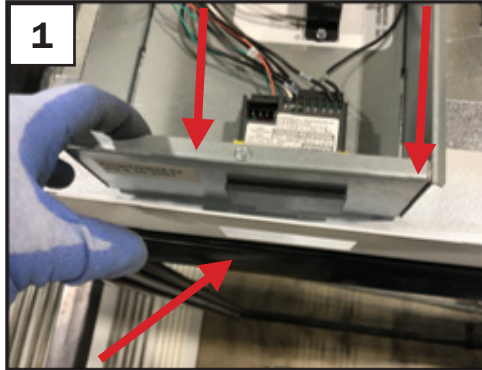
120 ohm resistor (circled in red on Secondary 2)

F1: FASCIA FRAME

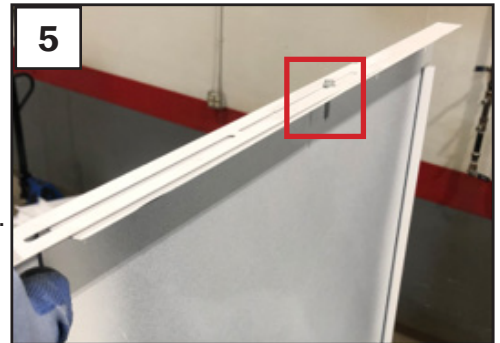
NOTES:

- 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).

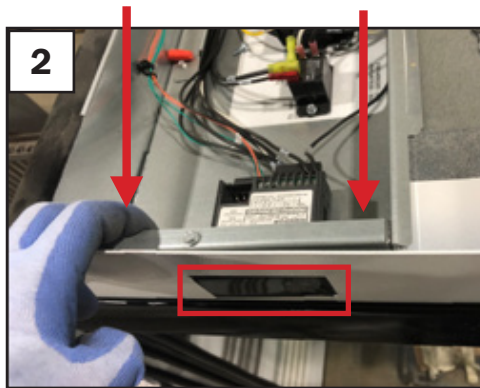
Push Base (white metal frame) into black frame-flange so it sits tight against it.



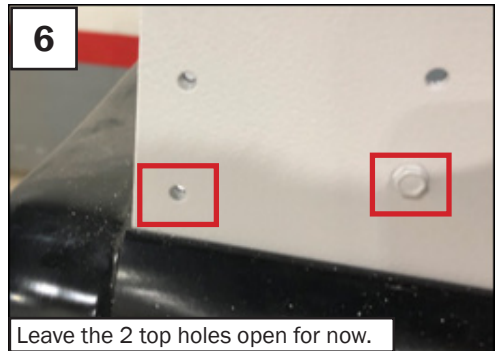
Fasten the top of the bigger, end fascia to the smaller end fascia.



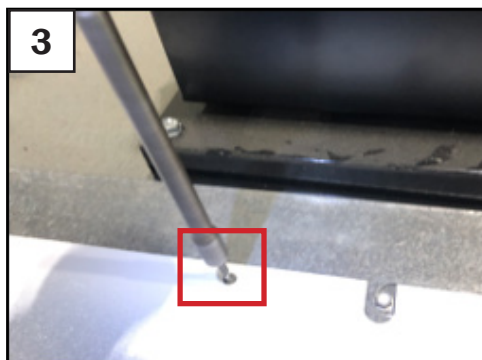
Slide gray controller box against white painted cut-out on top of the case so the controller face shows through cut-out.



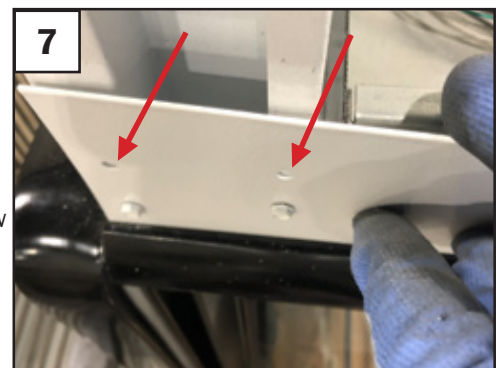
Fasten the end fascia at the bottom two holes ONLY.



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



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



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



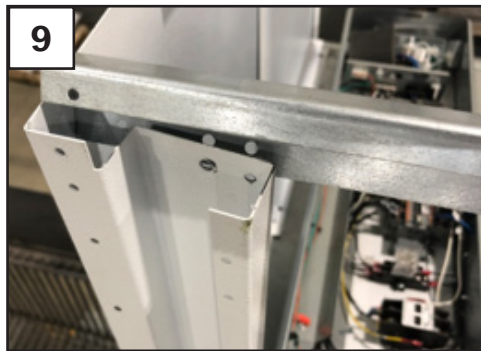
Fasten the end fascia you are currently working on, to case.

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



F2: FASCIA FRAME

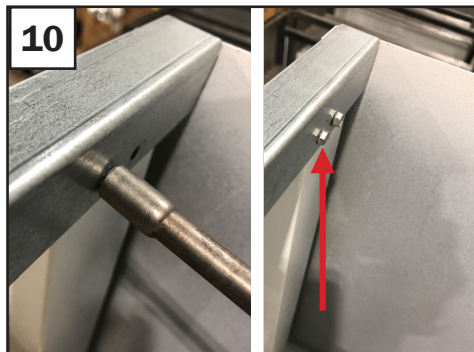
PLACE the top metal frame bar across one end fascia to the other. Do not fasten the metal bar to the frame at this point.



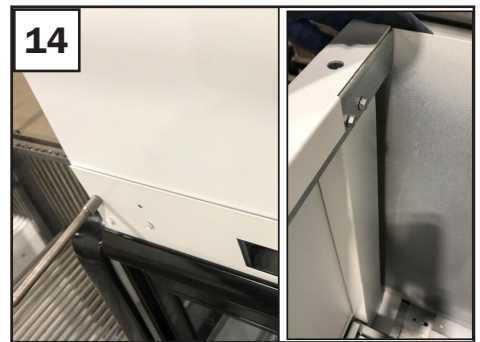
Slide panels behind fascia base.



Fasten from REAR (pre-punched)



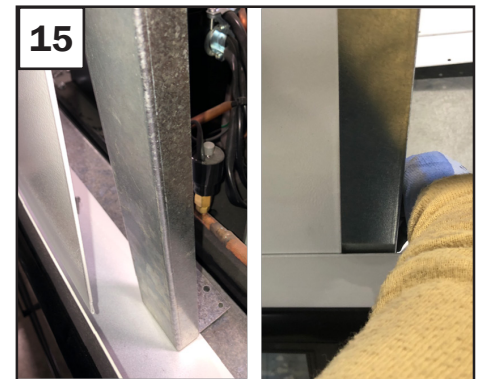
Fasten top front screws (base) to secure panels.



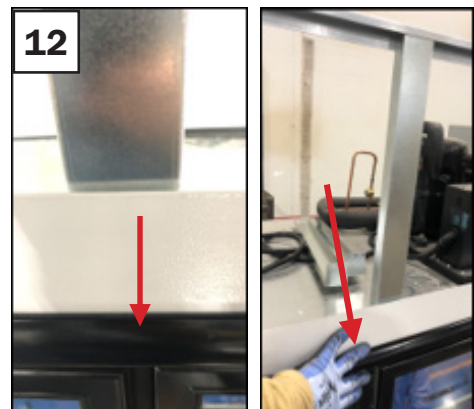
Slide vertical trim piece into the bottom of the top frame bar.



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

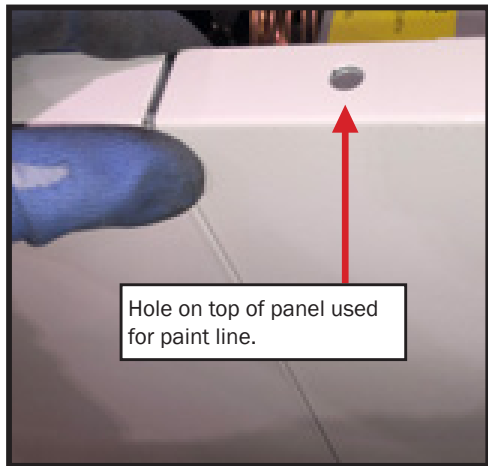


F3: FASCIA FRAME

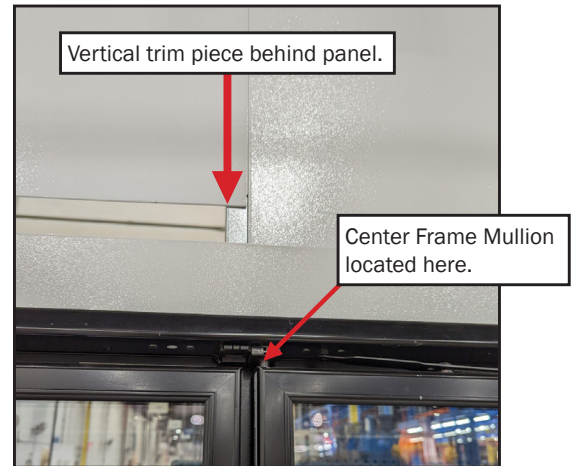
View of final set up with fascia installed on top of case.



EXAMPLES:



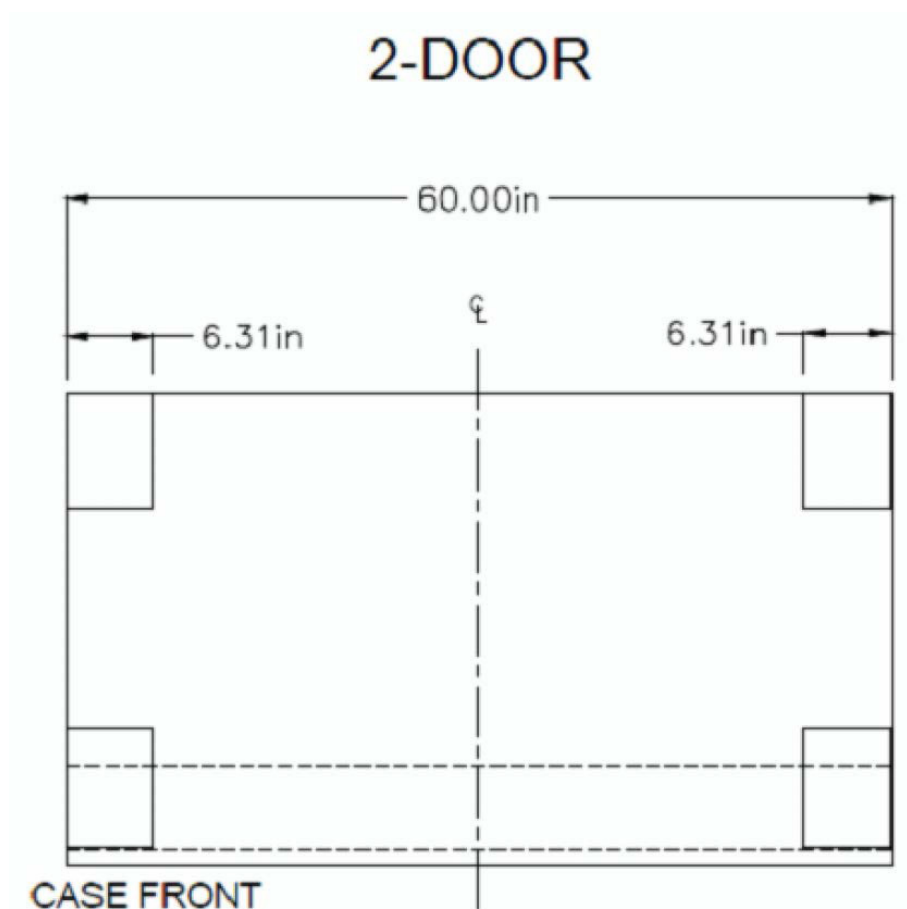
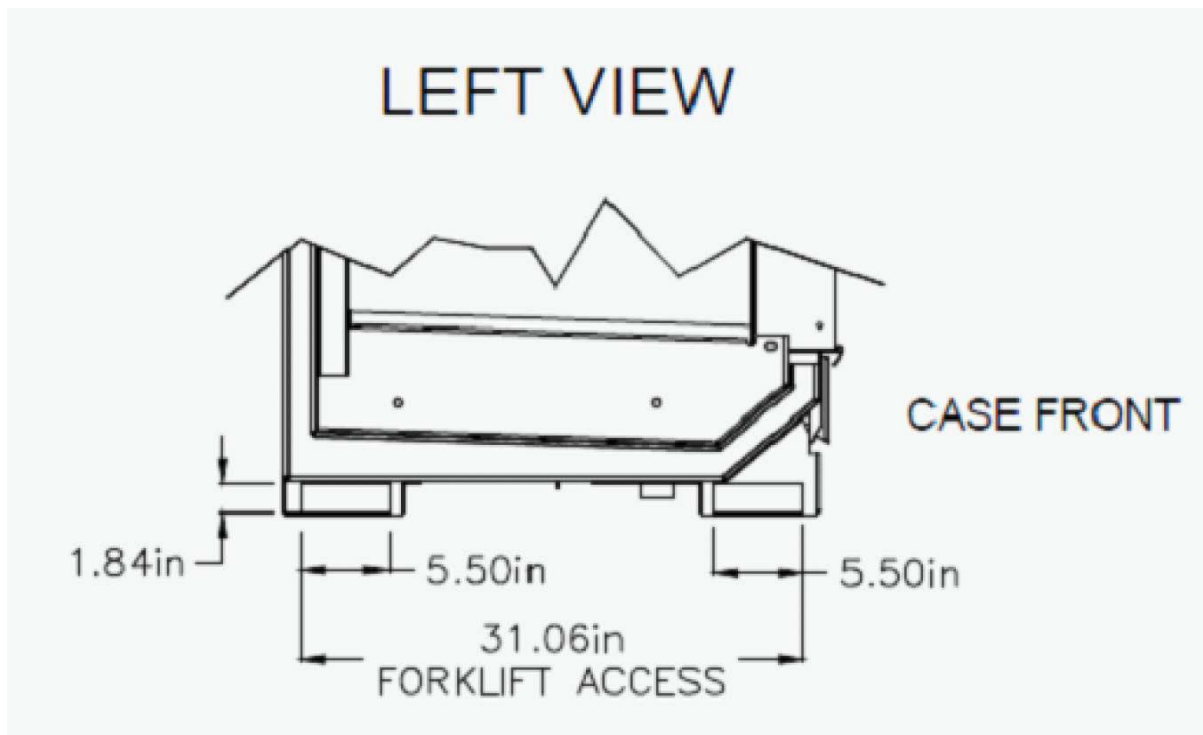
NOTE: This is an example of a hole on top of the fascia that is not to be used as a screw hole. There are several of these on the fascia panels and are used by Hillphoenix for painting purposes.



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

G1: CASE LIFTING LOCATIONS

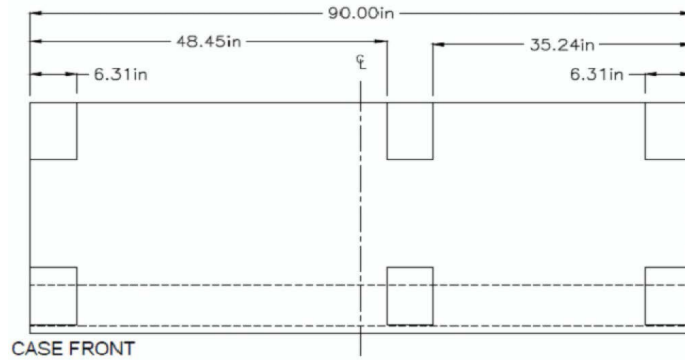
Base Frame Lifting Locations for Forklift – JNRBHSA/JNRZHSA



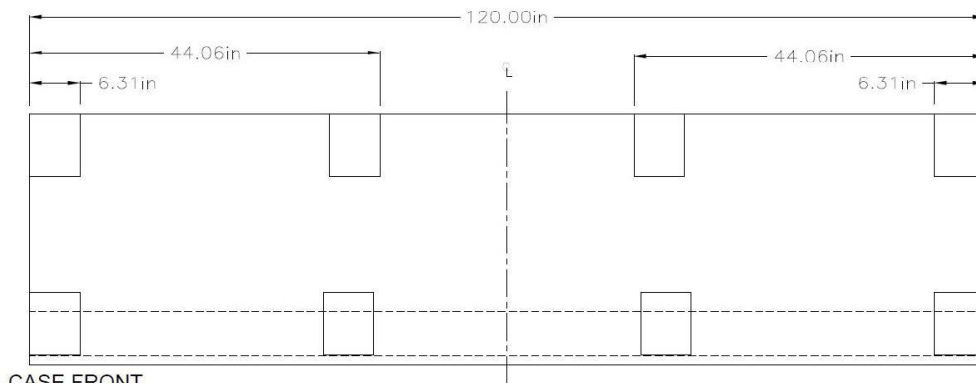
G2: CASE LIFTING LOCATIONS

Base Frame Lifting Locations for Forklift – JNRBHSA/JNRZHSA

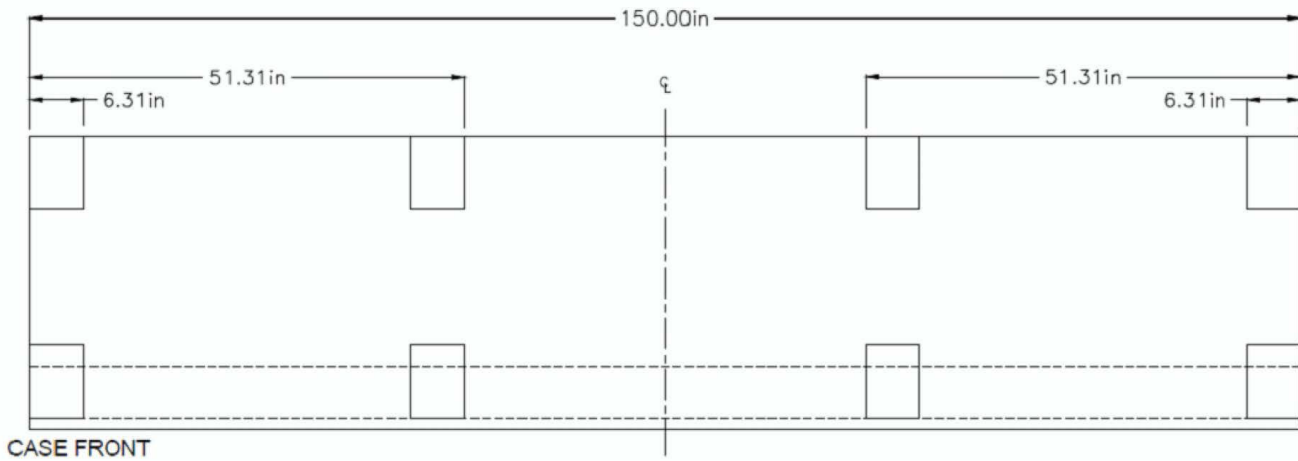
3-DOOR



4-DOOR



5-DOOR



ADDENDUM: SEQUENCE OF OPERATIONS - R-290 CASE START-UP

Pre-checks

1. Before providing power to the Case, confirm that the building's power is in lockout / tagout.
2. Confirm that the circuit breaker installed on the Case is in the OFF position.
3. Verify the power from the building is correct for the case, in both the number of phases and voltage.
4. Make the necessary input power connections on the Case junction box field terminal blocks and circuit breaker.
5. Confirm that the field power terminal block wiring is landed per the Case wiring diagram.
6. Confirm that there are no objects in the Case from field install and all covers are installed.
7. When ready to start up the Case, confirm the building power lockout / tagout is removed.
8. Confirm that the connections of the case harnesses are secure and fully snapped into their mating connectors. Also, check the female connectors for debris prior to making the connections.

Start-Up

1. To power the case, switch the Case circuit breaker to the ON position.
2. The MPXzero controller will begin its boot-up process, and after roughly 1 minute, the compressor will start up, and the condensing unit fans will begin running.
3. The Case will be in a defrost cycle upon its FIRST power up. If the controller is powered OFF and then back ON, the Case will be in regulation.
 - A. If the Case is in a defrost cycle, the evaporator fans will be OFF in a Low-Temp Door Case only if the coil suction line temperature is above 40°F. For all other Case types, the evaporator fans will be ON regardless of the suction line temperature.
4. If a motion sensor is installed on the Case, the lights will not come on until activity is sensed in front of the Case.

*See table 1 on the last Addendum page for the Quick Reference of the Expected Operation for Each Component.

5. If the Case starts in a defrost cycle, the controller will switch to refrigeration mode once the defrost termination temperature is reached.



- A. For Low-Temp Door Cases, the defrost termination temperature is 72°F on the suction line.
 - B. For Low Temp Door Cases, the fans will remain OFF until the suction line temperature reached 40°F during pulldown.
6. Check the MPXzero display for the status of the Case.

- A. If in defrost, the defrost icon will be illuminated and the fans icon may or may not be illuminated depending on the Case type.



- B. If in refrigeration mode, the compressor icon will be illuminated and there should be no alarms present.
7. While the Case is in refrigeration mode, check that case is pulling down to temperature by observing the value of the discharge air displayed on the controller. The value should be steadily dropping.



8. During pulldown, the compressor will run continuously until the Case temperature setpoint is reached.
9. When the Case temperature setpoint is reached, the compressor will cycle ON and OFF per the cut-in/cut-out settings.
 - A. Note that there is a minimum runtime for compressor, which is set to 5 min.
10. The evaporator fans will run continuously while in refrigeration mode (and when below 40°F for LT door Cases).
11. For Cases that are less than 150g, the condensing unit fans will cycle ON/OFF with compressor. For Cases that are greater than 150g, the condensing unit fans will be ON continuously.
12. Keep monitoring the display to ensure that the Case temperature remains at the temperature setpoint +/- the cut-in/cut-out settings.

Troubleshooting

1. Issue – The compressor will not turn on or will turn on briefly and turn off by low pressure (LP switch).
 - A. Probable gas leak exists.
 - i. Put a pressure gauge on the Schrader port to read the actual pressure – if it is less than 4 psi then there is probably a gas leak.
 - ii. Find the leak, fix the leak, and recharge the Case (see separate instructions on the charging process).
 - a. All charging to be done by a licensed service professional.
2. Issue – Case is not pulling down while in refrigeration mode
 - A. Solenoid valves may be the incorrect type.

ADDENDUM: SEQUENCE OF OPERATIONS - R-290 CASE START-UP

- i. Make sure that the solenoid positioned in between the compressor to condenser is Normally Open. Make sure that the two remaining solenoids are Normally Closed.
- B. Check valve may be installed backwards.
 - i. Confirm the valve is installed in the correct orientation.
- 3. Issue – Case is taking too long to pull down.
 - A. The wrong TXV may be installed.
 - B. The wrong orifice may be installed on the distributor.
- 4. Issue – Incorrect temperature reading or rE / E1 / E2 errors on the display.



- A. Probes may be wired incorrectly or terminated insufficiently.
- B. The wrong type of probe may be installed.
- 5. Issue - Case component is not turning on when intended.
 - A. Use Applica to check the following:
 - i. There are no duplicate assignment (1-4) to output parameters DOA, DOG, DOE, DOI, DOP.
 - a. DOA - CDU
 - b. DOG - Defrost
 - c. DOE - Lights
 - d. DOI - Fans
 - e. DOP - Drain Heater
 - ii. Fans output polarity parameter rol is set correctly.
 - a. rol = 1 - for R-290
 - b. rol = 0 - for HFC
 - iii. The controller relay outputs NO1-NO4 are functional.
 - a. Using a multimeter, check the voltage on the relay outputs. If the reading of the multimeter is ~120VAC, then the relay is CLOSED. If the reading is ~0V, then the relay is OPEN. Use this to confirm that the relay will open/close when expected.
- 6. Issue – The compressor is not running when expected.
 - A. Check that there are no problems with the discharge air probe, per Issue # 4 above.
 - B. Check that there are no problems with the controller programming or relays, per Issue # 5 above.
 - C. Check that the high and low pressure switches are both CLOSED.
 - i. Using a multimeter, check the voltage at the output wiring of the pressure switches. If the reading is 120VAC, then the switches are CLOSED. If the reading is 0V, then one of the switches is OPEN and thus keeping the compressor from running.

- 7. Case turns on and after compressor start, Case shuts down.
 - A. Using a DMM check for proper incoming voltage on each phase of supply to Case. If one or more phases show low or zero voltage check the following:
 - i. Check panel breaker to see if it is tripped. If tripped check to see that breaker is sufficient for Case load based on MOP on Case data tag. If not, contact electrical contractor.
 - ii. If panel breaker is sufficient for Case load, discuss with the electrical contractor to see what other loads are on the circuit. If circuit is overloaded, then second supply will be needed.
 - B. If building supply is correct, compare Case wiring to supplied wiring diagram and correct any issues.
 - C. If no wiring issues are found, disconnect wires to compressor and start Case. If panel breaker does not trip and other Case loads function correctly, the compressor may be defective.
- 8. Case runs but light(s) do not come on.
 - A. If Case has separate building power feed for lights, make sure it is connected and there is power from the feed to the Case.
 - B. Check that lights are wired correctly by comparing to wiring diagram.
 - C. If lights are wired to controller and controller has N.O. and N.C. contacts for lights, check that lights are on the correct set of contacts. If wired correctly, check if program is correct in controller.
 - D. Remove the wires from the controller connection at the controller and connect together. If lights come on, the controller maybe defective.
 - E. If Case has motion sensor for lights, check that it is wired correctly and provide motion in front of sensor. If lights do not turn on, disconnect the wires from the motion sensor and connect together. If lights turn on, motion sensor might be defective.
 - F. Apply power directly to the input of the LED driver. If lights do not come on, check for 24VDC at the output of the LED driver. If output of LED driver is zero, then driver is defective. If output is 24VDC, then check wiring from driver to LEDs
- 9. Case runs but evaporator fans do not come on.
 - A. If fans are on separate building power feed, check that there is power to the field connection point of the fans.
 - B. If fans have building power and are wired directly to building power, then check for power at the fans. If no power at fans, verify that fan wiring is correct.
 - C. If fan wiring is correct and fans do not run, apply power directly to fan. If it does not run, fan maybe defective.
 - D. If fans are wired through controller and controller has N.O and N.C. contacts for the fans, verify that fans are wired to correct contacts.
 - E. If fans are wired to correct contacts, then check that controller program is correct.
 - F. If controller program is correct, then remove the fan wires from the controller and connect together. If fans come on, controller maybe defective.

ADDENDUM: SEQUENCE OF OPERATIONS - R-290 CASE START-UP

Table 1. QUICK REFERENCE OF EXPECTED OPERATION OF EACH COMPONENT

	2-5DR Medium Temp		2 DR Low Temp		3-5DR Low Temp	
	<150g R290 Charge MT		<150g R290 Charge LT		>150g R290 Charge LT	
Component	During Normal Op	During Time-Off DEF	During Normal Op	During Hot-Gas DEF	During Normal Op	During Hot-Gas DEF
Condenser Fan	will cycle	OFF	will cycle	ON	ON	ON
Evaporator Fan	ON	ON	ON	OFF	ON	OFF
AUX Fan	N/A	N/A	N/A	N/A	N	Y
Compressor	will cycle	OFF	will cycle	ON	will cycle	ON
Cond LL Sol NO	N/A	N/A	open	closed	open	closed
Cond HG Sol NC	N/A	N/A	closed	open	closed	open
TXV bypass Sol NC	N/A	N/A	closed	open	closed	open
Lights*	ON	ON	ON	ON	ON	ON
120V Tank-assist Htr	N/A	N/A	OFF	ON	OFF	ON

Warning Maintenance & Case Care

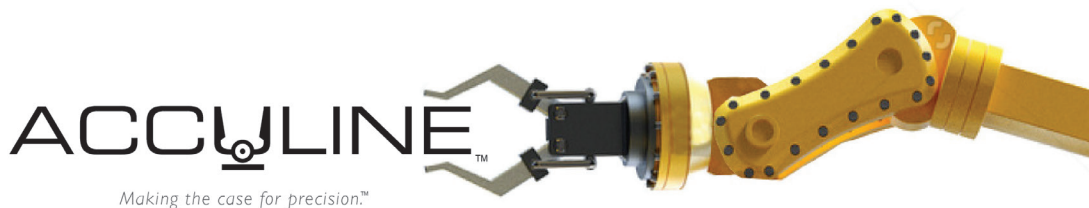
When cleaning cases the following must be performed PRIOR to cleaning:

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.



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Due to our commitment to continuous improvement, all specifications are subject to change without notice.
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Visit our website at www.hillphoenix.com



A DOVER COMPANY

LIMITED & GENERAL WARRANTY TERMS

Hill Phoenix, Inc.'s. (hereinafter "Hillphoenix") products are warranted to be free from defects in materials and workmanship under normal use and maintenance for a period of 14 months from date and place of shipment from Hillphoenix (the "Base Warranty Period"), provided that the installation and maintenance of such products have been performed strictly in accordance with Hillphoenix's designated specifications.

Anthony products supplied as original equipment on Hillphoenix products receive Hillphoenix warranty.

All warranty repairs must be approved in advance before services are started. In the event of a qualifying warranty claim, the extent of Hillphoenix's liability under the Warranty is limited to the repair or replacement, at Hillphoenix's option, of any non-conforming products without charge. If required, a new or rebuilt part to replace any defective part will be provided without charge and will be shipped via standard ground freight, with shipping charges being covered by Hillphoenix during the base warranty period. The replacement part is covered under this warranty for the remainder of the applicable Base Warranty Period. In order to be eligible for warranty coverage, customer must: (i) notify Hillphoenix in writing within twenty-four hours upon discovery of a warrant defect, and (ii) comply with the warranty claim procedures provided by Hillphoenix from time to time. These warranty terms are incorporated into and governed by the Hill Phoenix Terms and Conditions of Sale.

This equipment warranty does not include labor or other costs incurred for diagnosing, repairing, removing, installing, shipping, servicing, or handling of either defective parts or replacement parts. Unauthorized modifications to set-points, parameters, and controls may result in deteriorated performance and/or equipment failure. Any unauthorized modifications could result in the warranty being voided.

The warranty shall not apply:

1. To any unit or any part thereof which has been subject to an accident, alteration, negligence, misuse or abuse, or which has not been operated in accordance with the manufacturer's recommendations, or in conditions outside of Manufacturer's specifications, or if the serial number of the unit has been altered, defaced, or removed.
2. When the unit, or any part thereof, is damaged by fire, flood, or other act of God.
3. To products that are impaired or damaged due to improper installation.
4. When installation and startup forms are not properly completed or returned within two weeks after startup.
5. If the defective part is not returned to the Manufacturer.
6. To service, maintenance or wear and tear parts (such as lights, starters and ballasts).
7. To cosmetic damage (e.g., scratches, dents, chips, and other damage to appliance finishes), unless such damage results from defects in materials and workmanship and is reported to Hillphoenix within 30 days from date of purchase.
8. To shipping damage.
9. To use in a non-commercial application.
10. Corrosion, discoloration, oxidation, or rust due to exposure to predisposed corrosive environments/atmospheres or contact with product damaging material/chemicals.
11. To service trips where no problem is diagnosed or found in the discretion of Hillphoenix.
12. To Removal/reinstallation of product for repair if installed in an inaccessible location.
13. To use of non-OEM parts for warrantable repair unless directed by Hillphoenix.
14. To repair/service tools/items.
15. To service trips to teach customer how to use product.
16. To product pick-up or delivery for repair purposes; repairs should take place on the customer's site unless directed by Hillphoenix.
17. To misdiagnosis or misrepair, including subsequent labor/component repair or replacement.
18. To stolen components.
19. To replacement service parts lost or misplaced on arrival by receiving personnel.
20. To service events on non-DFR products.
21. To excess repair time.
22. To excess required consumables charges, at the discretion of Hillphoenix.
23. If a service contractor takes longer than 120 days from the date of repair completion to submit a warranty invoice/claim.
24. To component/equipment failures, equipment shutdowns, operational performance degradation due to deviations and unauthorized changes to required and/or recommended set-points, parameters, and controls.

Examples of non-warrantable situations include, but are not limited to:

- Non-factory electrical connection or component issues
- Product is operated on low or improper voltages
- Use of extension cords to power the product

- Lack of basic preventative maintenance as outlined by product manuals
- Installation into a mobile application
- Failures or symptoms that result from site mechanical or electrical failures
- Loading of food or other content that prevents the product from operating properly
- 'Yellowing' of lighting products
- Any physical modifications or changes to product(s) will invalidate the warranty

MODIFICATIONS TO GENERAL WARRANTY

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

DISPLAY CASE AND SPECIALTY PRODUCTS CLEARVOYANT® LED LIGHTING

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

NO WARRANTY FOR NON-STANDARD PRODUCTS

A " Non-Standard Product" is any product that is different in any manner from any Hillphoenix product that has been previously designed and manufactured by Hillphoenix in accordance with its standard specifications. A Non-Standard Product also includes any standard Hillphoenix product that has been specially designed or modified to meet a particular Buyer specification, or that contains any additional or substituted product, part, accessory, equipment, fixture, component or material, or that has been assembled, manufactured, produced, or installed by any method or process, which is different from Hillphoenix' s standard specifications for such product. Hillphoenix expressly disclaims and makes no warranties, express or implied, as to the condition, design, utility, quality, adequacy, or capacity with respect to any standard or Non-Standard Product, including, without limitation, any warranty of merchantability or fitness of such product for a particular purpose or intended use, whether or not such product has been designated by Hillphoenix as a Non-Standard Product. All Non-Standard Products, whether sold separately, or incorporated and/or attached to standard Hillphoenix products, and all services relating to such products, are sold to and accepted by Buyer " as is" and "with all faults". Without limiting any other provision of this purchase order, Hillphoenix shall have no liability to Buyer for any claim, loss, damage, consequential damages or expenses associated with any Non-Standard Product and/or its use or operation, or any other equipment or property of Buyer caused by or alleged by to be caused by any such product or its use or operation, whether directly, indirectly, incidentally or consequentially, or by any inadequacy thereof or deficiency or defect therein. The foregoing exclusion of warranty cannot be modified or waived except as expressly set forth in a writing signed by an officer of Hillphoenix authorized to make such modification or waiver.

REMEDY LIMITATION/DAMAGES EXCLUSION

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

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THE ABOVE WARRANTY IS GIVEN IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. HILLPHOENIX SHALL NOT BE RESPONSIBLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES INCLUDING BUT NOT LIMITED TO INJURY TO PERSONS OR PROPERTY. NOTWITHSTANDING ANYTHING TO THE CONTRARY, HILLPHOENIX'S ENTIRE LIABILITY, AND BUYER'S EXCLUSIVE REMEDY, IN LAW AND EQUITY OR OTHERWISE, WITH RESPECT TO ANY PRODUCTS PROVIDED BY HILLPHOENIX IS SOLELY LIMITED TO THE AMOUNT PAID BY BUYER FOR THE PRODUCTS TO WHICH THE APPLICABLE CLAIM RELATES.

THIS DOCUMENT DOES NOT GOVERN EXTENDED WARRANTIES AND ANY EXTENDED WARRANTIES PROVIDED BY HILLPHOENIX SHALL BE GOVERNED BY A SEPARATE DOCUMENT AGREED UPON BY HILLPHOENIX

Submit warranty claims to: hpx-warranty-wa-invoices@doverfoodretail.com

For warranty service, please contact Hill Phoenix at: Phone: 1-833-280-5714