



Service Manual

Commercial Back Bar Refrigeration

Self-Contained and Remote units
using hydrocarbon refrigerant R290



BBS60
(glass door option shown)



BBR96
(glass door and solid stainless steel door options shown)

ecofriendly
R290 Refrigerant

Product Series Covered in this Manual:

Self-Contained
BBS
BBSN
PTS
DZS
SDBS
SDPS
BBSLP
DDC
DDS

Remote
BBR
BBRN
PTR
SDBR
SDPR
BBRLP

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1.0 General Information

1.1 Use of Service Manual

This service manual is intended for use by a qualified service technician. It is provided as a guide to diagnose and repair service issues for the product models listed on the cover.

If you have any questions or require additional assistance, contact Perlick Customer Service during regular hours of operation.

1.2 Model Families

This manual contains specific instructions for servicing the Perlick Back Bar commercial refrigeration products, which include the following families:

SELF-CONTAINED

BBS
BBSN
PTS
DZS
SDBS
SDPS
BBSLP
DDC
DDS

REMOTE

BBR
BBRN
PTR
SDBR
SDPR
BBRLP

The model and serial numbers can be found on the left or right hand wall of the refrigerated space. See Figure 1-1 and Figure 1-2.

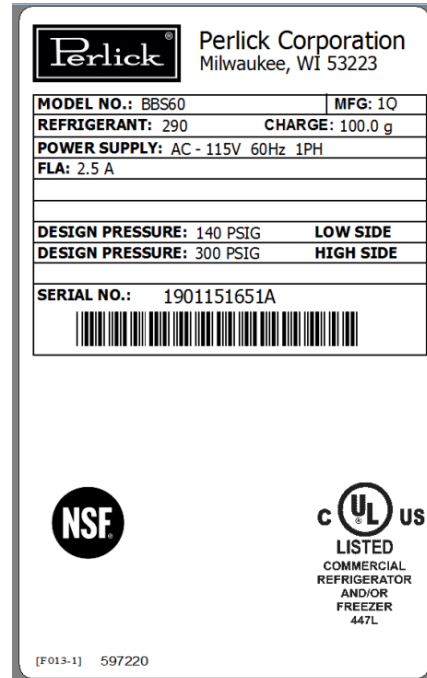


Figure 1-1.
Information Plate for Self-Contained Units

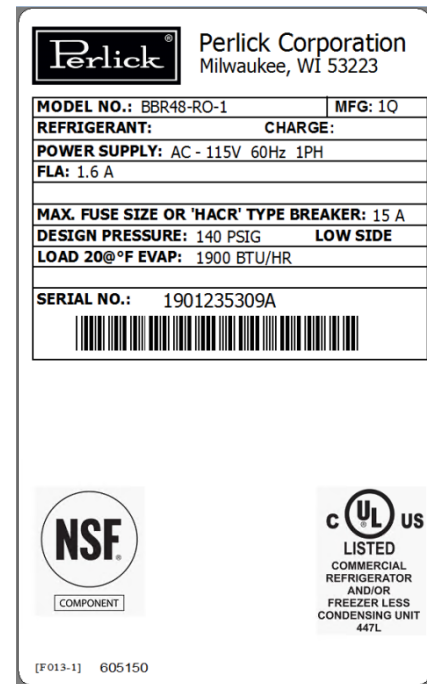


Figure 1-2.
Information Plate for Remote Units



2.0 Safety Information

2.1 Refrigerant HC-R290

All self-contained models covered in this service manual are manufactured using refrigerant HC-290 (Propane).

2.2 Servicing with R-290

R290 is a hydrocarbon. This refrigerant is flammable and is only allowed for use in appliances which fulfill the requirements of UL 471 (To cover potential risk originated from the use of flammable refrigerants). Consequently, R290 is only allowed to be used in refrigerating appliances which are designed for this refrigerant and fulfill the above-mentioned standard.

- R290 is heavier than air. The concentration will always be highest at floor level.

- The explosion limits are as follows:

Lower Limit: 1.7% by vol. (37 g/m³)

Upper Limit: 9.5% by vol. (177 g/m³)

Ignition Temperature: 470 °C

General

⚠ WARNING

Do not use near open fire. To Carry out service and repair on R290 systems the service personnel must be properly trained to be able to handle a flammable refrigerant. This includes knowledge on tools, transportation of compressors and refrigerant, and the relevant regulations and safety precaution when carrying out service and repair.

**CAUTION - RISK OF FIRE OR EXPLOSION.
DISPOSE OF PROPERLY IN ACCORDANCE WITH FEDERAL OR
LOCAL REGULATIONS. FLAMMABLE REFRIGERANT USED.**

**ATTENTION - RISQUE DE FEU OU D'EXPLOSION.
ÉLIMINER CONFORMÉMENT AUX RÈGLEMENTS FÉDÉRAUX OU
LOCAUX. LE FRIGORIGÈNE EST INFLAMMABLE.**

P/N: 1019364

**DANGER - RISK OF FIRE OR EXPLOSION. FLAMMABLE REFRIGERANT USED. DO NOT USE MECHANICAL DEVICES
TO DEFROST REFRIGERATOR. DO NOT PUNCTURE REFRIGERANT TUBING.**

**DANGER - RISQUE DE FEU OU D'EXPLOSION. LE FRIGORIGÈNE EST INFLAMMABLE. D'APPAREILS MÉCANIQUES
POUR DÉGIVRER LE RÉFRIGÉRATEUR. NE PAS PERFORER LA TUBULURE CONTENANT LE FRIGORIGÈNE**

P/N: 1019365

**DANGER - RISK OF FIRE OR EXPLOSION. FLAMMABLE REFRIGERANT USED.
TO BE REPAIRED ONLY BY TRAINED SERVICE PERSONNEL. DO NOT
PUNCTURE REFRIGERANT TUBING.**

**DANGER - RISQUE DE FEU OU D'EXPLOSION. LE FRIGORIGÈNE EST INFLAMMABLE.
CONFIR LES RÉPARATIONS À UN TECHNICIEN SPÉCIALISÉ NE PAS
PERFORER LA TUBULURE CONTENANT LE FRIGORIGÈNE**



**CAUTION: RISK OF FIRE OR EXPLOSION. CONSULT REPAIR MANUAL/OWNER'S GUIDE
BEFORE ATTEMPTING TO INSTALL OR SERVICE THIS PRODUCT. ALL SAFETY
PRECAUTIONS MUST BE FOLLOWED. FOLLOW HANDLING INSTRUCTIONS CAREFULLY.**

**ATTENTION - RISQUE DE FEU OU D'EXPLOSION. LE FRIGORIGÈNE EST INFLAMMABLE.
CONSULTER LE MANUEL DU PROPRIÉTAIRE/GUIDE DE RÉPARATION AVANT
MEASURES DE SÉCURITÉ DOIVENT ÊTRE RESPECTÉES.**



Pre-service Safety Check

It is strongly recommended that all service technicians receive training on the specific equipment, procedures, and handling of flammable refrigerants before conducting product service.

- **Use a combustible gas leak detector to perform a background check and monitoring around the appliance.**

CAUTION

To avoid a risk of injury, do NOT use leak detectors with an arc or spark module to check for leaks in and around appliances that use A2L or A3 refrigerants. The leak detector must be certified for use with the specific refrigerant class being serviced. If flammable refrigerant is detected, immediately ventilate the room, evacuate the area, and notify the owner or customer. Recheck with a combustible gas leak detector before proceeding.

- **Review the Safety Data Sheet (SDS)** for the refrigerant listed on the appliance's ID Plate. Because, some refrigerants and compressor oils may cause frostbite and others may cause chemical burns, use Personal Protective Equipment (PPE) such as, protective gloves, eyewear, etc.
- **Ensure a dry-powder fire extinguisher** rated for Class B fires is accessible on site. Technicians should be trained in the use of these fire extinguishers.
- **Utilize a tubing cutter, not a torch** or other heated surface tool due to flammable refrigerants.
- **Conduct all servicing in a well-ventilated area.** Whenever possible, open a window, door or other means to ventilate the area. Take extra care if the repair work is done in a confined space, including providing enhanced ventilation to prevent formation of flammable atmospheres.

Before repair work is performed, take these steps to ensure that no ignition sources are present:

- Check the area for obvious sources of sparking or open flames.

- Ensure the area is free of open flame or burning materials, including cigarettes, candles, or similar materials.
- Do not operate appliances that utilize open flames, igniters, or have hot surfaces (for example: electric or gas ranges, electric or gas dryers, toasters, and other small appliances) while servicing the appliance.
- Inform the owner/consumer that no open ignition sources should be present in or near the area, including cigarette smoking materials.
- Check the area and the appliance for abnormal signs of ignition or melting of components that might have occurred prior to the service call. If there are signs of these situations, stop and contact the manufacturer before conducting service.
- Maintain a safe zone around the appliance during service work to prevent introduction of ignition sources or entry by the customers.
- If the appliance is being moved to a service center, take care to prevent damage to the appliance, especially the refrigerant lines.
- Utilize vacuum pumps, recovery equipment, and other tools that are rated for and certified for use with A2L or A3 flammable refrigerants. Vacuum pumps must be certified for the refrigerant being used. Service companies/technicians should consider, where appropriate, the use of spark-proof tools as an additional measure of safety.

Leak Detection and Coolant-line Repair

- Never use potential sources of ignition, open flame, charging with flammable refrigerants, or hot surface tools to detect the presence of a leak. Use soap-bubble testing when charging with oxygen-free dry nitrogen (OFN/OFDN), and a certified and calibrated combustible gas leak detector to test for leaks if the system is charged with an A2L or A3 refrigerant.
- After repair, check for any vented refrigerants with a combustible gas leak detector. If a leak is detected or if the coolant lines must be repaired, replaced, or filled, strictly follow all instructions provided by the manufacturer.



- If the combustible gas leak detector signals a release of vented refrigerant, the technician should immediately ventilate the room, evacuate the area, notify the homeowner or customer and wait until the detection device reads a safe level before conducting the following steps.
- To reduce the risk of fire or explosion, never use compressed air or oxygen for flushing, pressure testing, if a repair is made to the coolant lines.
- **Purge refrigerant lines with oxygen-free dry nitrogen (OFDN), both before and after the repair. Technicians should be trained in the use of OFDN purging.**
- Direct purged gas discharged from the system away from ignition sources or air intakes.
- Use the combustible gas leak detector to determine the environment has no flammable refrigerant present.
- Do not use external heat from open flame or heating tools with glowing elements to accelerate the defrosting process. If necessary, a hand-held steam cleaner can be used to defrost the evaporator coils.

Recharging or Replacing Refrigerant

- **Recharge the appliance with the exact refrigerant specified by the manufacturer. Any time the sealed refrigerant system must be opened, including when the compressor must be replaced, the original exact refrigerant must be used. The entire system (e.g. fittings, valves, dryers, seals, tubes, etc.) was designed only for the refrigerant listed on the original compressor.**
- **DO NOT** use heat sources to open the coolant lines, especially those with open flames. Use mechanical means to cut, pierce or change valves. If brazing of the lines is necessary, strictly follow the instructions provided.
- Strictly follow specifications for the recharging or replacement of refrigerant.

Important Additional Safeguards

If an electrical fault exists that could compromise the refrigerant, repair the electrical fault first.

Before performing service, discharge all capacitors in the machine compartment and disconnect electricity to the appliance, preferably at the circuit breaker. No live electrical components or wiring should be exposed during servicing of the refrigerant lines. If electricity is necessary to conduct the service work on systems other than the refrigeration system, thoroughly test the refrigerant lines with the combustible gas leak detector before electricity is connected.

If the appliance has more than one refrigerant loop, ensure all leaks are repaired and checked.

Do not expose refrigerant lines to materials that might cause corrosion to the line or the seals such as chlorine bleach or ammonia.

Repair or replace all electrical components with the exact specified model and type required by the appliance manufacturer. Many electrical components are specifically engineered for use in appliances with flammable refrigerants and **must** be replaced accordingly.

Perform all service work in a manner to prevent damage to electrical components and insulation. In addition, return all wiring in such a way that the operation of the appliance will not be damaged by mechanical action.

Repair or replace all seals and sealing material to ensure that the areas of the appliance are returned to original condition.

When replacing refrigerant:

Ensure the refrigeration system is properly grounded if the appliance is being operated during charging.

Replace with the exact refrigerant and quantity found on the nameplate/rating plate on the unit. The refrigerant should be refrigerant-grade gas and should not be contaminated with other gas materials.

Recharge with the correct amount specified by the manufacturer. *Recharge accuracy is critical for flammable refrigerants.* Consult the service instructions for the manufacturer and product in question. Incorrect charge sizes could result in poor performance.



Refrigerant Removal

- In all cases, the removal of the refrigerant should be performed in a well-ventilated area.
- To minimize the generation of static electricity, ensure that proper grounding/bonding of the appliance is maintained during the removal process.
- Flammable refrigerants, which may be vented containing hydrocarbons such as R-290 (classified as A3), **may be vented into the external environment.** Follow manufacturer recommendations for this type of venting.
- If the manufacturer recommends removing the refrigerant to a temporary vessel to then release outside, follow all recommendations, including: *Carefully evacuate the gas to the outside, where it will be mixed with the external air, away from ignition sources or air intakes.*
- If a hose or tube is used to transfer the refrigerant outside the dwelling, use one of sufficient length to prevent the gas from re-entering the dwelling.

The hose should be of material compatible with the refrigerant.

Maintain hose discharge end above the ground surface for adequate gas mixing.

Ensure that no source of ignition is nearby the discharge end.

After Servicing

- Return or replace all labels, especially safety labels, to their original condition to ensure the next consumer or next servicer is aware of the presence of a flammable refrigerant.
- Ensure that the red marking for flammable refrigerant identification on the refrigerant tube or cap is visible following servicing.
- Ensure all ventilation features are returned to their original construction. Ventilation openings are critical to the function of the appliance during and after repair.

- Compressors may still contain residual refrigerant in the oil after refrigerant is removed. Take these precautions:

DO NOT use external heat sources to remove the compressor from the appliance or to seal off the tubes to/from the compressor.

Compressors should be plugged, capped, or pinched to allow all refrigerant gases to remain inside until the compressor is recycled or repaired.

NEVER heat compressors to extract the oil. The compressor oil should be safely disposed of in accordance with local requirements. See U.S. Code of Federal Regulations Chapter 40, Section 82.155 for instructions on the safe disposal of appliances, and section 4.16 of the Canadian Environmental Code of Practice for instructions on the disposal of refrigerants.

Disposal of Appliances containing Flammable Refrigerants

- The Service Organization should develop, maintain and monitor a written plan for disposition of scrap appliances containing alternative refrigerants.
- The Service Technician must comply with all federal, provincial, state and local requirements with regard to the recovery or venting of the refrigerants prior to disposal of the appliance. **The refrigerant must be recovered or removed prior to scrapping of the appliance.**
- Flammable hydrocarbon refrigerants, which may be vented to the external environment, such as R-290 (classified as A3), should be removed safely from the appliance in a well-ventilated area and may be vented to the outside environment, away from ignition sources or air intakes. In removing the refrigerant from the appliance, maintain proper grounding/bonding of the appliance.
- Appliances prepared for scrapping shall be marked with information required by local jurisdictions.



Storage of Flammable Refrigerant Cylinders

- Ensure that the storage facility has a fire suppression system approved for use with flammable refrigerants. At a minimum, a Dry-Powder Fire Extinguisher rated for Class B fires must be located near the storage area and the facility should have emergency action and fire prevention plans. Note that flammable gas fires should not be extinguished until the source of the burning gas has been shut off.
- Ensure the storage area is well-ventilated.
- Ensure the storage area is free of combustible or waste materials.
- Ensure all areas used for storage of flammable gas containers comply with all federal, provincial, state and local requirements.
- **NEVER** store refrigerant cylinders near sources of ignition.
- **NEVER** re-use or re-fill aftermarket service cylinders.
- Protect gas cylinders from impact, falling or being knocked over. Ensure that any accompanying protective caps/covers are in place.
- Keep refrigerant cylinders out of the sun and away from sources of heat. Cylinders should be stored in cool, dry areas where the temperature does not exceed 125 deg. F or 52 deg. C.
- Secure refrigerant cylinders to prevent theft or tampering.
- Never fill refrigerant recovery cylinders beyond the maximum capacity.
- Use appropriate markings and labeling on refrigerant recovery cylinders. This includes flammable material symbols and possible additional color markings.
- Storage facilities should consider installing combustible gas detection systems in accordance with federal, provincial, state and local requirements.

Transport of Flammable Refrigerant Cylinders

- Ensure that a Dry-Powder Fire Extinguisher rated for Class B fires is available on the vehicle.
- Transport of flammable refrigerant cylinders must be in accordance with federal, provincial, state and local requirements.
- **DO NOT** store flammable refrigerant cylinders near heat or a source of ignition.
- Store the cylinders for transport in accordance with US Department of Transportation and Transport Canada requirements. Mark flammable refrigerant cylinders with a red "FLAMMABLE GAS" graphic as prescribed by U.S. 49 CFR part 172.417.
- Prior to loading and transport, close the main cylinder valve and remove any regulator valve. Ensure that any accompanying protective caps/covers are also in place.
- Place cylinders with flammable refrigerant in a well-ventilated area. For enclosed vehicles, transport cylinders or canisters in accordance with US DOT and Transport Canada requirements. Service companies/technicians should consider, where appropriate, that storage cabinets be externally vented as an additional measure of safety.
- Secure flammable refrigerant cylinders to prevent theft, tampering, or movement during transport.



2.3 Service Manual Safety Labels

PLEASE READ all instructions completely before attempting to service the unit. Take particular note of the DANGER, WARNING and CAUTION information in this manual. The information is important for the safe and efficient service, operation and care of the Perlick unit.

⚠ DANGER

HAZARD!!

Indicates hazardous situation that will result in death or serious injury if not avoided.

⚠ WARNING

Indicates hazardous situation that may result in death or serious injury if not avoided.

⚠ CAUTION

Caution indicates hazardous situation that could result in minor or moderate injury and property damage.

CAUTION

Caution without symbol indicates unsafe practice situation that could result in property damage only.

⚠ WARNING

To avoid electrical shock, completely disconnect electrical power to referenced units before performing service work. Disconnect power to entire unit by unplugging the main power cord from the wall receptacle or disabling power to the circuit at the electrical circuit protection device, (i.e. circuit breaker).



3.0 Troubleshooting Guide – Refrigeration System

Use this diagnostic guide to identify issues and to locate applicable instructions within this service manual. This diagnostic guide can be used for any of Perlick’s Back Bar Refrigeration Products.

⚠ DANGER

ELECTROCUTION HAZARD!! Never attempt to repair or perform maintenance on the unit until the Main electrical power has been disconnected.

Unplugging the condensing unit plug from the molded receptacle shown in the photo IS NOT sufficient to avoid electrical shock hazard. Disconnect power to the main unit by unplugging the main power cord from the wall receptacle or disable power to entire electrical circuit.



PROBLEM	CAUSE	SOLUTION
Refrigerator does not run.	No power to the unit.	Check circuit protection devices. Fuses, breakers, GFI). Restore power to unit. Refer to information plate. See Section 1.0 and Table 7-1 .
	Incorrect control settings or faulty control.	Return to factory settings (see Sections 7.5.1 and 7.5.2) or replace control.
Refrigerator is too warm.	Power	
	No power to unit.	Restore power to unit. Refer to information plate. See Section 1.0 and Table 7-1 .
	Incorrectly wired internal wiring connections.	Verify wiring per wiring diagram. See Section 7.2 . Reconnect wires if needed.
	Fans	
	Evaporator fan is not running.	Refer to Evaporator fan is not running
	Coils	
	Evaporator coil has iced over.	Remove ice. See Section 6.5 .
	Condensing coil is not clean.	Clean with soft brush and vacuum.
	Fins are bent or damaged.	Straighten fins.
	Control	
	No power to control.	Refer to Control not functioning
	Control is not calling for cooling.	Refer to Control not functioning
	Probe failure.	Refer to Table 7-5 for resistance values. Replace probe if needed. See Section 7.5.4 .



PROBLEM	CAUSE	SOLUTION
	Probe is not connected to the control.	Reconnect probe. See Section 7.5.4 .
Refrigerator is too warm. (continued)	Air Infiltration	
	Sealing compound does not form a complete seal.	Refer to Section 1.1 .
	Door gasket is damaged or out of place.	Refer to Sections 1.1 and 8.6 .
	Condensate drain line/air trap is not positioned properly.	Reposition in loop. See Figure 6-3 .
Refrigerator is too cold.	Incorrect control settings.	Return to factory settings. See Sections 7.5.1 and 7.5.2 .
	Probe failure.	Refer to Table 7-5 for resistance values. Replace probe if needed. See Section 7.5.4 .
	Control failure.	Refer to Troubleshooting Guide – Electrical System
Refrigerator runs continuously.	Condensing coil is dirty.	Clean with soft brush and vacuum.
	Incorrect control settings.	Return to factory settings. See Sections 7.5.1 and 7.5.2 .
	Probe failure.	Refer to Table 7-5 for resistance values. Replace probe if needed. See Section 7.5.4 .
	Evaporator coil has iced over.	Remove ice per Section 6.5 .
	Sealing compound does not form a complete seal.	Refer to Section 1.1 .
	Door gasket is damaged or out of place.	Refer to Section 1.1 and 8.6 .
	Condensate drain line/air trap is not positioned properly.	Reposition in loop. See Figure 6-3 .
	Extreme ambient conditions.	Refer to Section 6.8 .
	Refrigeration/Charge level is too low.	Check for leaks, repair, and recharge per Section 6.13 .
Water on the floor outside of unit.	High ambient temperature and high ambient humidity conditions coupled with frequent door opening.	Ensure doors close completely.



PROBLEM	CAUSE	SOLUTION
	Condensate pan overflowing.	Remove excess water. Check for the following: <ul style="list-style-type: none"> • Air infiltration. See Section 6.1. • Doors close completely and seals are intact. See Section 8.6. • Ice buildup. See Section 6.5. • Unit is running properly. Repair if needed.
Water on the floor outside of unit. (continued)	Unit is not level.	Unit must be level front-to-back and side-to-side for water to drain properly.
	Sealing compound does not form a complete seal.	Refer to Section 1.1 .
	Door gasket is damaged.	Refer to Section 1.1 and 8.6 .
	Remote ONLY: Floor drain plumbed incorrectly.	Check to make sure drain path makes sense. Refer to installation manual.
	Evaporator coil has iced over.	Remove ice. Refer to Section 6.5 .
Water on the floor inside of unit.	Evaporator pan and/or drain line restricted.	Remove restriction.
	Unit is not level.	Unit must be level front-to-back and side-to-side for water to drain properly.
	Evaporator coil has iced over.	Remove ice. Refer to Section 6.5 .



4.0 Troubleshooting Guide – Electrical System

⚠ DANGER

Unplugging the condensing unit plug from the molded receptacle shown in the photo IS NOT sufficient to avoid electrical shock hazard. Disconnect power to the main unit by unplugging the main power cord from the wall receptacle or disable power to entire electrical circuit.



PROBLEM	CAUSE	SOLUTION
Compressor is not running.	No power to condensing unit.	Check condensing unit is plugged in. Check power at internal receptacle.
	No call for cooling from control.	Check control settings or for bad control.
	Incorrectly wired connections in condensing unit.	Verify wiring per wiring diagram, Section 7.2 . Reconnect wires if needed.
	Incorrect control settings.	Return to factory settings. See Sections 7.5.1 and 7.5.2 .
	No power to compressor.	Restore power to unit. Refer to information plate. See Section 1.2 and Table 7-1 .
	Faulty control.	Refer to Control not functioning
	Models manufactured before March 2017: Starting device is not operational (start relay/capacitor). Models manufactured after March 2017: Starting device is not operational.	Models manufactured before March 2017: Replace compressor electrical components. Models manufactured after March 2017: Check Compressor Diagnostic 6.9 .
	Faulty compressor.	Models manufactured before March 2017: Replace compressor per Section 6.12 . Models manufactured after March 2017: Replace compressor per Section 6.14-6.16 .
Condenser fan is not running	No power to fan.	Restore power to unit. Refer to information plate. See Section 1.0 and Table 7-1 .
	Incorrectly wired harness.	Verify wiring per wiring diagram, Section 7.2 . Reconnect wires if needed.
	Fan is obstructed.	Remove obstructions.
	Fan still does not run.	Replace condenser fan per Section 6.10 .
Evaporator fan is not running	No power to evaporator fan motor.	Restore power to unit. Refer to information plate. See Section 1.0 and Table 7-1 .
	Fan is obstructed.	Remove obstruction.
	Incorrectly wired harness.	Verify wiring per wiring diagram, Section 7.2 . Reconnect wires if needed.
	If Evaporator fan is still not running...	Replace evaporator fan per Section 6.13 .
	BBSLP series ONLY: No power to/from DC inverter/driver (12V).	If no power: restore power, replace. Refer to Section 1.1 .



PROBLEM	CAUSE	SOLUTION
Control not functioning	No power to unit.	Restore power to unit. Refer to information plate. See Section 1.0 and Table 7-1 .
	Incorrectly wired harness.	Verify wiring per wiring diagram, Section 7.2 . Reconnect wires if needed.
	No call for cooling.	Replace controller
Lights not functioning	Light switch in off position.	Turn on light switch.
	No power to DC driver.	See unit info plate for voltage. Check output of DC driver (12V).
	No power to light switch. (12V)	Check wiring back to DC driver, replace if needed.
	Incorrectly wired lighting switch.	Verify wiring per wiring diagram, Section 7.2 . Reconnect wires if needed.
	No power to LED strips? (12V)	Check wiring backwards to light switch.
	Faulty LED strip	Replace LED strip.
Light stays on when door is closed.	Manual switch is on.	Turn off manual switch.
Eliwell Control: LED Controller display is flashing "E1"	Probe 1 error. Reading out-of-range of operating values.	Check probe connections to control.
		Check probe resistance readings per Table 7-5 .
		Check probe wiring.
		Replace probe per Section 7.5.3 .
Eliwell Control: LED Controller display is flashing "AH1"	Probe 1 HIGH temperature alarm.	
	Control	
	Incorrect control settings.	Return to factory settings. See 7.5.1 and 7.5.2 .
	Power	
	Incorrectly wired harness.	Verify wiring per wiring diagram, Section 7.2 . Reconnect wires if needed.
	Fans	
	Evaporator fan is not running.	Refer to Evaporator fan is not running
	Coils	
	Evaporator coil has iced over.	Remove ice. See Section 6.5 .



PROBLEM	CAUSE	SOLUTION
Eliwell Control: LED Controller display is flashing "AH1" (continued)	Coils (continued)	
	Condensing coil is not clean.	Clean with soft brush and vacuum.
	Fins are bent or damaged.	Straighten fins.
	Probe	
	Probe is not connected to control.	Reconnect probe. See Section 7.5.3 .
	Air Infiltration	
	Sealing compound does not form a complete seal.	Refer to Section 1.1 .
	Door gasket is damaged or not seated properly.	Refer to Section 1.1 and 8.6 .
	Condensate drain line/air trap is not positioned properly.	Reposition in loop. Refer to Control not functioning
	Refrigeration/Charge level is too low.	Check for leaks, repair, and recharge. See Section 6.13 . This is a critically charged system, recharging should only be done when all other options have been thoroughly checked.
Eliwell Control: LED Controller display is flashing "AL1"	Probe 1 LOW temperature alarm.	
	Incorrect control settings.	Return to factory settings. See Sections 7.5.1 and 7.5.2 .
	Probe failure.	Refer to Table 7-5 for resistance values. Replace probe if needed. See Section 7.5.4 .
	Control failure.	Refer to Control not functioning
Dixell Control: LED Controller display is flashing "P1".	Probe failure.	Contact dealer.
	Probe disconnected from control.	Plug in probe connector.
Dixell Control: LED Controller display is flashing "HA". Maximum temperature alarm.	Internal compartment has exceeded the high temperature alarm preset value for over 30 minutes.	
	Control	
	Incorrect control settings.	Return to factory settings. See Sections 7.5.1 and 7.5.2 .



PROBLEM	CAUSE	SOLUTION
Dixell Control: LED Controller display is flashing "HA". Maximum temperature alarm. (continued)	Power	
	Incorrectly wired harness and/or internal wiring connections.	Verify wiring per wiring diagram, Section 7.2 . Reconnect wires if needed.
	Fans	
	Evaporator fan is not running.	Refer to Evaporator fan is not running
	Coils	
	Evaporator coil has iced over.	Remove ice per Section 6.5 .
	Condensing coil is not clean.	Clean with soft brush and vacuum.
	Fins are bent or damaged.	Straighten fins.
	Probe	
	Probe is not connected to the control.	Reconnect probe per Section 7.5.4 .
	Air Infiltration	
	Sealing compound does not form a complete seal.	Refer to Section 1.1 .
	Door gasket is damaged or out of place.	Refer to Section 1.1 and 8.6 .
	Condensate drain line/air trap is not positioned properly.	Reposition in loop. See Figure 6-3 .
	Refrigeration/Charge level is too low.	Check for leaks, repair, and recharge per See Section 6.13 . This is a critically charged system, recharging should only be done when all other options have been thoroughly checked.
Dixell Control: LED Controller display is flashing "LA". Minimum temperature alarm.	Internal compartment has exceeded the low temperature alarm preset value for over 30 minutes.	
	Incorrect control settings.	Return to factory settings. See Sections 7.5.1 and 7.5.2 .
	Probe failure.	Refer to Table 7-5 for resistance values. Replace probe if needed. See Section 7.5.4 .
	Control failure.	Refer to Control not functioning



5.0 Troubleshooting Guide – Doors, Drawers and Shelving

PROBLEM	CAUSE	SOLUTION
Key won't come out after door is locked.	Key not in proper position.	Rotate key to the proper position and remove.
Sliding doors not closing.	Replace spring and/or torpedo assembly.	Refer to Section 8.4.3 .
Hinge problems, door falling off.	Improper door mounting	Verify proper mounting. Refer to Section 8-4 .
	Excessive wear	Replace worn parts. Refer to Section 8-4 .
Door handles falling off	Improper handle mounting	Verify proper mounting. Refer to diagram.
	Excessive wear	Replace worn parts. Refer to diagram.
Condensation on glass doors.	High ambient temperature, high humidity and environmental conditions.	Refer to Section 6.7 .
	Frequent door/drawer opening.	Refer to Section 8.1 .
	Cabinet temperature too low.	Adjust temperature. Refer to Table 7-4 . Factory Temperature Settings.
Sliding doors dragging or binding	Debris in track.	Remove doors Clean tracks and lube with NSF approved food grade lube.

6.0 Refrigeration System Repair Instructions

6.1 Air Infiltration

⚠ DANGER

Unplugging the condensing unit plug from the molded receptacle shown in the photo **IS NOT** sufficient to avoid electrical shock hazard. Disconnect power to the main unit by unplugging the main power cord from the wall receptacle or disable power to entire electrical circuit.



STEP 1. Door Gaskets

Check door gaskets for rips, cracks, or other damage.

The door gasket should be pushed in firmly and lay flat.

Ensure gasket forms a complete seal around door.

STEP 2. Sealing Compound

Sealing compound is used to seal wiring and line set pass-through between the condenser and the evaporator compartments. See Figure 6-1.

Check for voids and ensure sealing compound completely fills the space.

Figure 6-1.
Sealing Compound at Wiring
Pass-through



STEP 3. Silicone Seal (RTV type)

Check for complete silicone seal of:

- Joint where rear wall meets ceiling
- Around evaporator coil compartment

STEP 4. Floor Drain

Check that interior floor drain plug is in place if not plumbed to external drain and completely tightened. Figure 6-2.

Check that the evaporator condensate trap is looped and full of water. Figure 6-3.



Figure 6-2. Floor Drain



Figure 6-3. Evaporator Condensate Trap



6.2 Slide Out the Refrigeration Deck

STEP 1.

Remove grille by removing 1 Phillips head screw at the top center grille and 2 at the bottom edge.

STEP 2.

Remove square bracket around the front of condensing unit by removing 6 Phillips screws and 2 hex head bolts. Figure 6-4

Pull the square bracket straight out.



Figure 6-4. Remove Condensing Unit Bracket

STEP 3.

The condensing unit/refrigeration deck can now be pulled straight out. Figure 6-5

Pull slowly and carefully to avoid damaging the copper line set.

- The copper line set is coiled with enough additional line to allow condensing unit to be removed from the cabinet.
- Do not place undue stress on copper lines when removing condensing unit.
- Damage/kinking of lines may occur if they are forcibly handled.

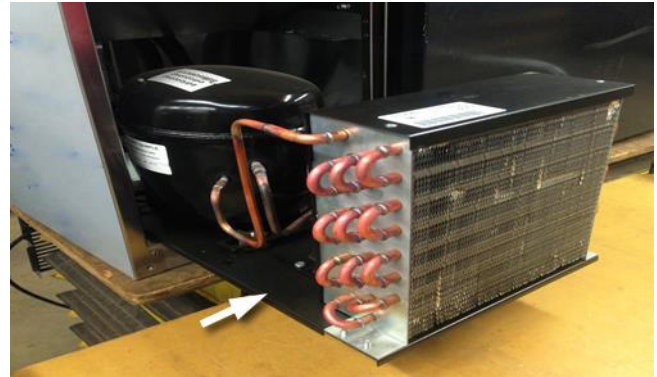


Figure 6-5. Removing Refrigeration Deck

6.3 Plumbing for Remote Drain

STEP 1.

Remove panel to gain access to the evaporator drip pan.

STEP 2.

Attach drain tube provided. See Figure 6-6.

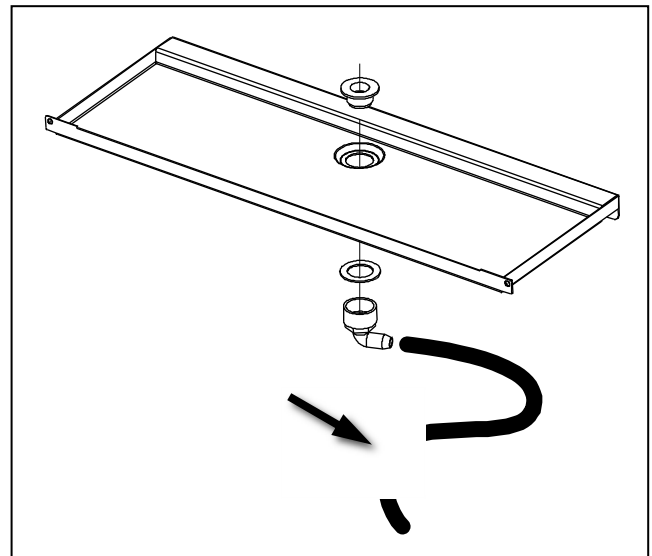


Figure 6-6. Remote Drain Tube

CAUTION

Must be hooked up to an external floor drain, not floor inside unit or floor under unit.



6.4 System Operating Pressures

Note: To check operating pressures, you must gain access to the process tubes and install piercing valves. See Section 6.4.4.

6.4.1 First Time Pull-Down

These products uses a standard reciprocating compressor, therefore first time pull-down is like a normal cycle ending with the thermostat, switching the compressor off.

6.4.2 Normal Cycling

Compressor and condenser fan motor are controlled by the thermostat and cycle according to the programming of the digital controller.

6.4.3 Stabilization

Values in Table 6-1 represent a range of normal pressures. The measured pressure can vary depending on ambient conditions and at the point at which unit is in the refrigeration cycle.

Table 6-1. System Operating Pressures

	RUNNING PRESSURE
Low Side	33-38 PSIG
High Side	130-230 PSIG

6.4.4 Service Valves

Recording Pressure

When installing gauges:

1. Initially purge manifold set with refrigerant type used in unit. This avoids introduction of air into system.
2. Install piercing valves on high and low side process ports and connect manifold line set to piercing valves (minimize refrigerant loss by using as short of line set as possible).
3. Allow unit to run for 10 minutes and stabilize before recording pressures.

When disconnecting hoses:

4. Initially close high side piercing valve.
5. Open manifold on gauges to place high side liquid back into system and equalize gauges.
6. Then close low side piercing valve and remove gauges.
7. Using pinch off pliers or similar tool seal of process tubes and remove piercing valves. Leak check process tubes thoroughly prior to brazing closed process tubes. Leak check again after brazing.

6.5 De-Ice Blocked Evaporator Coil – Self-Contained Models

STEP 1.

Remove shelves and pilaster from refrigerator section nearest the evaporator coil.

STEP 2.

Remove Evaporator Fan panel by removing 7 Phillips head screws from perimeter of panel. See Figure 6-8.

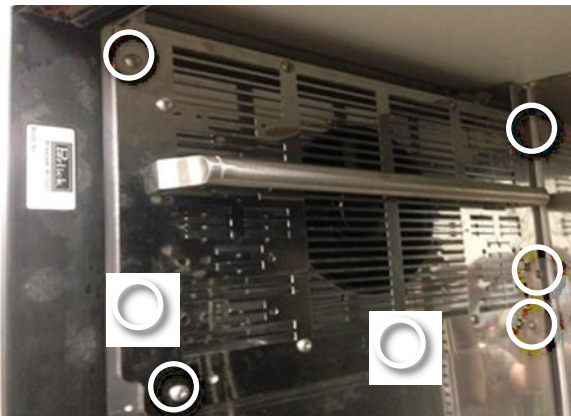


Figure 6-8. Removing Evaporator Fan Panel

STEP 3.

Pull the handle and panel straight out from inner wall. The panel and connected fan can be placed on floor of cabinet.

STEP 4.

Using a fan or heat gun to gently direct warm air over ice to remove.

CAUTION

DO NOT use any tools to chip at or physically remove ice!

STEP 5. When ice has been removed:

Check sealing compound. Re-forming, if necessary, to close any gaps around wire harness and piping.

Check for other potential sources of air infiltration. See Section 6.1.

STEP 6.

Reverse steps 1 through 3 to close the evaporator fan panel.

6.6 Air Flow Obstructions

The unit must have free air flow to front grille to operate properly.

Restricted air flow results in high head pressures and reduction in efficiency due to longer run times.

Proper air flow around condensing unit and evaporator is necessary for efficient operation.

- Never obstruct air flow in and out of condensing unit.
- The front grille must be free from obstructions, dust, and debris.
- Never obstruct air flow to Evaporator Fan.
- Make sure higher temperature ambient air from another unit is not directed to condenser coil (i.e. another condensing unit directly across from the unit).
- Never place items in the area behind Product Side Guard/Handle. See Figure 6-9.

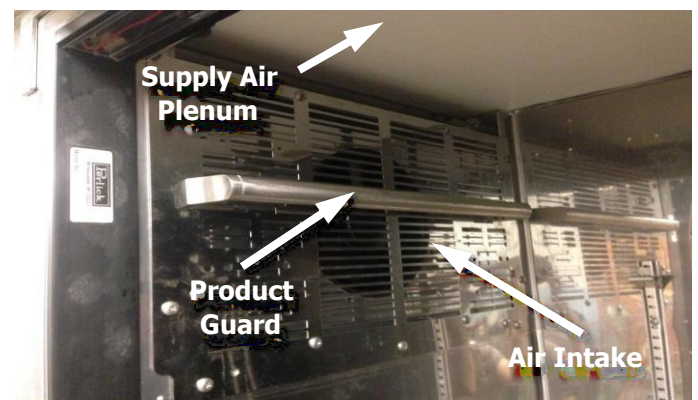


Figure 6-9. Check for Obstructions



6.7 Clean Condenser Coil

⚠ DANGER

ELECTROCUTION HAZARD!! Never attempt to repair or perform maintenance on the unit until the Main electrical power has been disconnected.

Perlick's warranty does not cover cleaning of condenser.

The condenser is located directly behind the front grille. See Figure 6-4.

Condenser coils that are covered with dust and debris restrict air flow. This results in high head pressures and lower efficiency due to longer run times.

Use soft brush and vacuum to clean coil every 90 days, or more often if conditions require.

6.8 Ambient Temperature

High ambient temperature and high humidity conditions may result in performance issues and/or refrigeration system failure.

The unit must be protected from precipitation.

Do not subject to direct solar load.

Under extreme temperature and/or relative humidity conditions the front face, gasket and/or glass door may show signs of condensation. When temperature and/or relative humidity conditions return to normal condensation will disappear.



6.9 Compressors and Condensing Unit

Table 6-2. Compressor Data

MODEL / FAMILY	HP	WIRING	START WINDING RESISTANCE Ω AT 77°F	RUN WINDING RESISTANCE Ω AT 77°F	RUN/START
BBS36	1/10	RSCR	7.80	7.10	14.90
BBS60	1/5	RSCR	6.72	5.08	11.80
BBS84	1/4	RSCR	6.40	2.74	9.14
BBS108	1/4	RSCR	6.40	2.74	9.14
BBSN32	1/10	RSCR	7.80	7.10	14.90
BBSN52	1/5	RSCR	6.72	5.08	11.80
BBSN72	1/4	RSCR	6.40	2.74	9.14
BBSN92	1/4	RSCR	6.40	2.74	9.14
PTS36	1/10	RSCR	7.80	7.10	14.90
PTS60	1/5	RSCR	6.72	5.08	11.80
PTS84	1/4	RSCR	6.40	2.74	9.14
DZS36	1/10	RSCR	7.80	7.10	14.90
DZS60	1/5	RSCR	6.72	5.08	11.80
SDBS60	1/5	RSCR	6.72	5.08	11.80
SDBS108	1/4	RSCR	6.40	2.74	9.14
SDPS60	1/5	RSCR	6.72	5.08	11.80
BBSLP36	1/10	RSCR	7.80	7.10	14.90
BBSLP60	1/5	RSCR	6.72	5.08	11.80
BBSLP84	1/4	RSCR	6.40	2.74	9.14
BBSLP108	1/4	RSCR	6.40	2.74	9.14
DDC68	1/5	RSCR	6.72	5.08	11.80
DDC92	1/4	RSCR	6.40	2.74	9.14
DDS36	1/10	RSCR	7.80	7.10	14.90
DDS60	1/5	RSCR	6.72	5.08	11.80
DDS84	1/4	RSCR	6.40	2.74	9.14
DDS108	1/4	RSCR	6.40	2.74	9.14

6.10 Replace Condenser Fan Motor

STEP 1.

Remove Refrigeration Deck. See Section 6.2.

STEP 2.

Unplug the fan power cord from beneath electrical box on compressor.

STEP 3.

Remove fan motor assembly by removing 4 Phillips head screws that hold the fan bracket.



Figure 6-9. Fan Mounting Hardware

STEP 4.

Install new fan motor assembly by attaching the bracket with 4 screws.

STEP 5.

Install refrigeration deck by reversing steps in section 6.2.

6.11 Replace Evaporator Fan Motor – Self-Contained Models

STEP 1.

Remove grille by removing 3 Phillips head screws, one at the top center and two at the bottom edge.

STEP 2.

Cut 2 zip ties holding wire harness to top of the refrigeration module.

STEP 3.

Disconnect evaporator fan wire leads from main wiring harness.

STEP 4.

Remove sealing compound from top and bottom of wire pass-through located inside evaporator box and inside of machine compartment.

STEP 5.

Remove shelving from unit, as well as shelf bracket on left wall.

STEP 6.

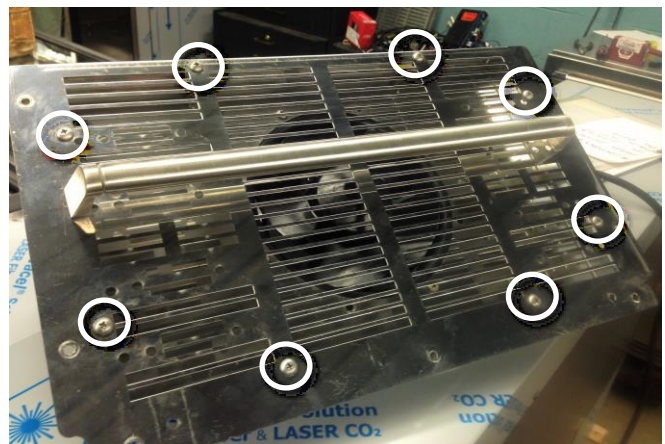
Remove 7 screws holding evaporator fan panel to unit. Figure 8-7

STEP 7.

Tip evaporator fan assembly down and remove from unit. Pull evaporator fan wires up through the top of the machine compartment.

STEP 8.

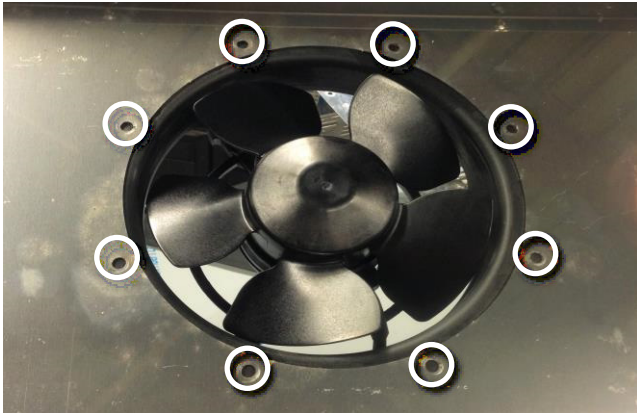
Remove 8 screws to separate front and back of evaporator fan panel.





STEP 9.

Remove 8 fan mounting screws.



STEP 10.

Evaporator fan motor can now be replaced. Evaporator fan motor should only be replaced with Perlick OEM parts.

STEP 11.

Reverse steps 1-9 to close the unit.

6.12 Replace Compressor

To gain access to compressor, follow instructions in Section 6.2.

Compressor should only be replaced with Perlick OEM parts.

Always replace drier when replacing compressor.

6.13 Leak Detection

If during a check of operating system pressures, it is determined that refrigerant level is low, you must perform a leak test.

- Do not recharge a system without first determining where original refrigerant charge exited the sealed system!
- Placing a system that has lost refrigerant under a vacuum without first repairing the leak will draw contaminants into the system through the point of leak. Find source of the leak and correct it!

- The use of an electronic leak detector is highly encouraged.
- If the entire charge has leaked out of the unit, the sealed system should be pressurized with 200 lbs. of dry nitrogen and tracer refrigerant. Then use an ultrasonic leak detector or a soap and water solution to pinpoint the location of the leak.
- Be certain to check all brazed connections thoroughly for leaks. Look for spots where the sealed system components might have been worn through by structural or cabinet components.
- Check the service ports thoroughly for leaks as well.

6.14 Recharge Procedure

STEP 1.

Check that the system been properly installed, pressure tested, and evacuated.

STEP 2.

Condenser and evaporator must be clean. Evaporator fan and condenser fan blades must be able to move the correct amount of air.

STEP 3.

Before installing gauges, vent hoses and manifold with refrigerant type used in unit. This avoids introduction of air into system.

Continue to next page...

STEP 4.

Install piercing valves on high and low side process tube.

NOTE: Never leave piercing valves installed on process tubes as they tend to leak over time. Pinch off process tubes, remove piercing valves, leak check

STEP 5.

Charge level is listed on unit information plate.

CAUTION

Once charge level has been set, avoid installing gauges as part of regular service. System should be kept sealed.

Do not "top off" or add refrigerant to an unknown existing charge.

Completely reclaim existing refrigerant in accordance with EPA regulations and thoroughly evacuate the system.

After evacuating the system:

1. Break vacuum with refrigerant.
2. Purge system through the high side until a nominal amount of refrigerant is purged out of the low side.
3. Then "weigh in" the correct total charge into system.

6.15 Replace compressor starting device – Self-contained models

STEP 1.

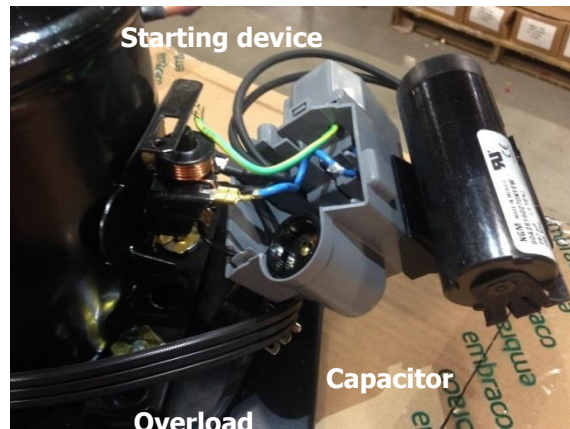
Completely slide out refrigeration deck. See Section 6.2.

STEP 2.

Pry open gray cover. Starting device is now accessible.



Overload device and capacitor are also accessible.





7.0 Electrical System Repair Instructions

Electrical Specifications

Verify adequate power is supplied.

To avoid electrical shock, completely disconnect electrical power to referenced units before performing service work. Disconnect power to entire unit by unplugging the main power cord from the wall receptacle or disabling power to the circuit at the electrical circuit protection device, (i.e. circuit breaker).



Table 7-1. Electrical Specifications

Unit Type	Model Number	Running Load Amps	Electrical Supply	Electrical Connection
Self-Contained	BBS36	1.8	120 VAC/60 Hz/1 Ph	Cord Connected
	BBS60	2.5		
	BBS84	4.2		
	BBS108	4.2		
	BBSLP36	1.8		
	BBSLP60	2.5		
	BBSLP84	4.2		
	BBSLP108	4.2		
	BBSN32	1.8		
	BBSN52	2.5		
	BBSN72	4.2		
	BBSN92	4.2		
	DDS36	1.8		
	DDS60	2.5		
	DDS84	4.2		
	DDS108	4.2		
	DDC68	2.5		
	DDC92	4.2		
	DZS36	1.8		
	DZS60	2.5		
PTS36	1.8			
PTS60	2.5			
PTS84	4.2			
SDBS60	2.5			
SDBS108	4.2			
SDPS60	2.5			
Remote	BBR24	1.1	120 VAC/60 Hz/1 Ph	Hard Wired
	BBR48	1.6		
	BBR72	2		
	BBR96	2.5		
	BBRLP48	1.6		
	BBRLP72	2		
	BBRLP96	2.5		
	BBRN40	1.6		
	BBRN60	2		
	BBRN80	2.5		
	PTR48	1.6		
	PTR72	2		
	SDBR48	1.6		
	SDBR96	2.5		
SDPR48	1.6			

7.2 Wiring Diagrams

Figure 7-1. BBR24, BBRN40 Wiring Diagram

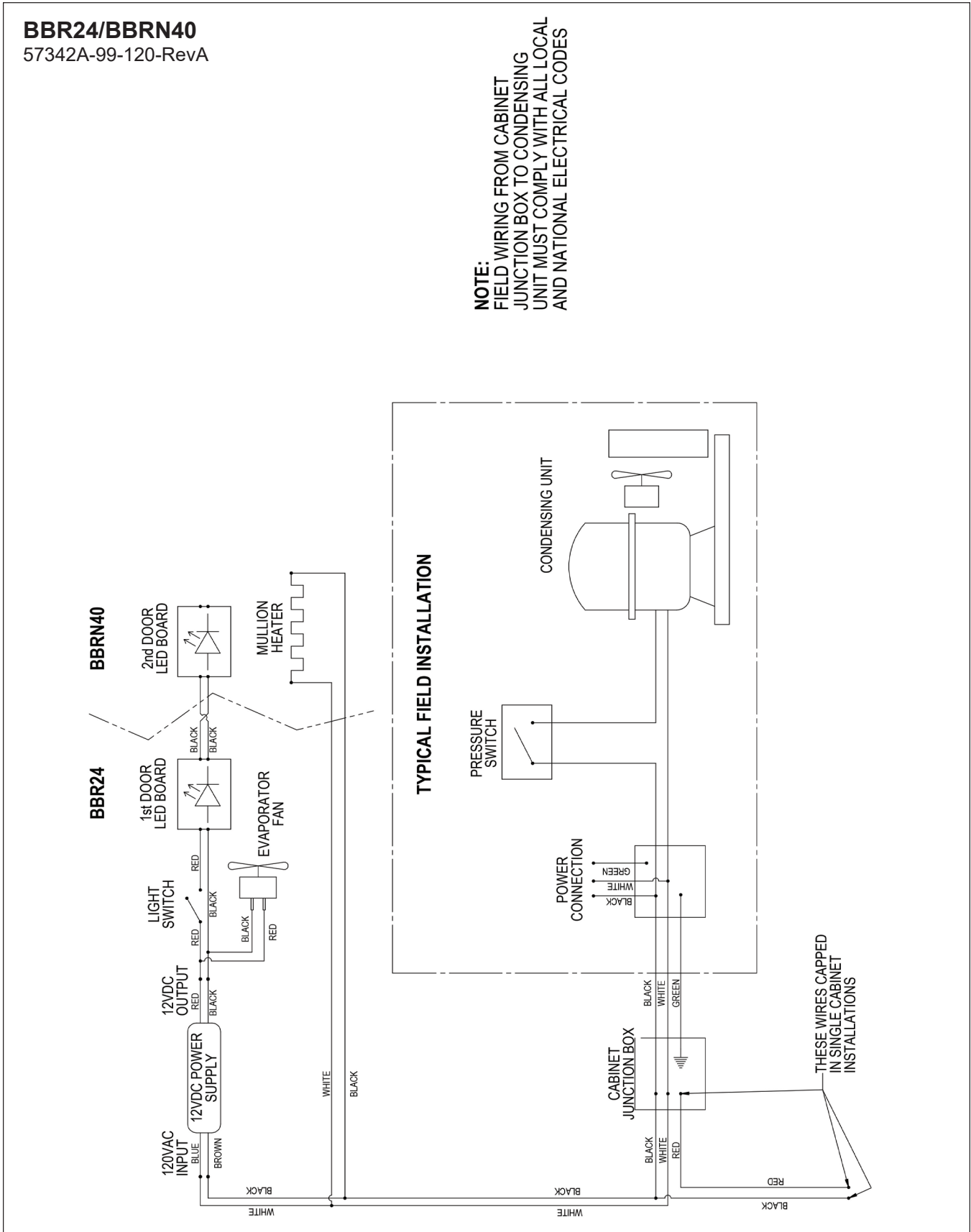




Figure 7-2. BBR48, BBR72, BBR96, BBRN60, BBRN80 Wiring Diagram

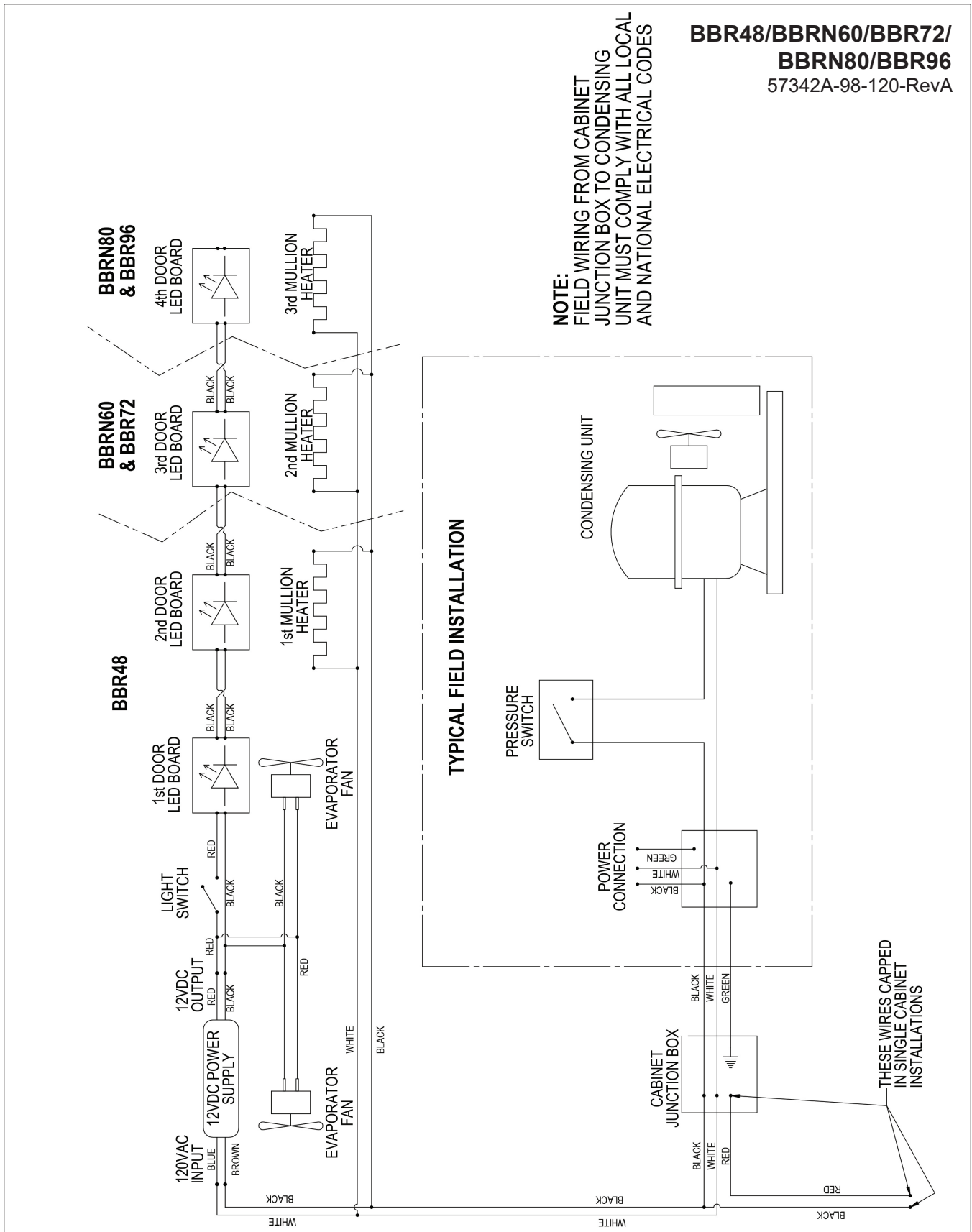


Figure 7-3. BBRLP48, BBRLP72, BBRLP96 Wiring Diagram.

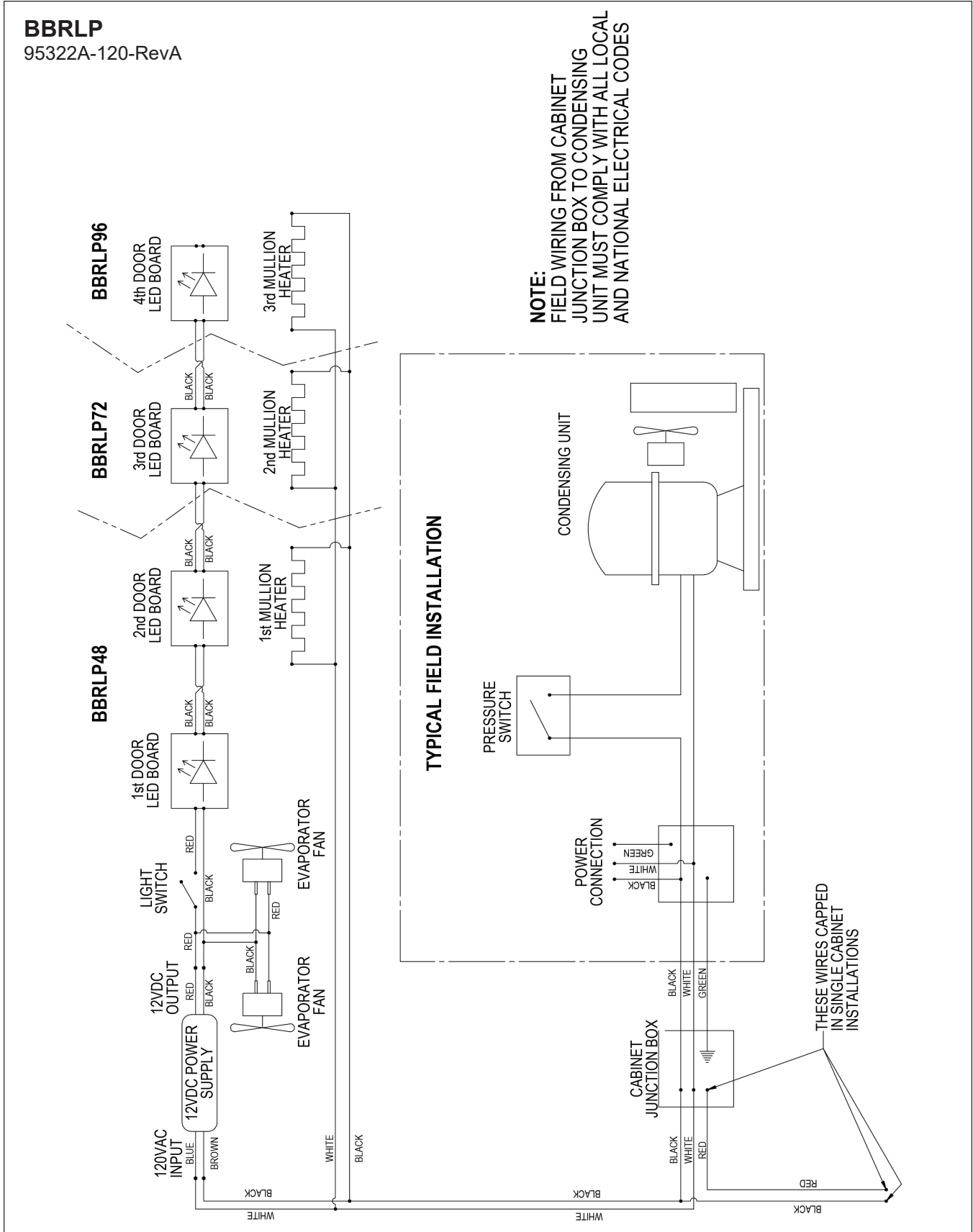




Figure 7-4. BBS36, BBS60, BBS84, BBS108, BBSN32, BBSN52, BBSN72, BBSN92 Wiring Diagram

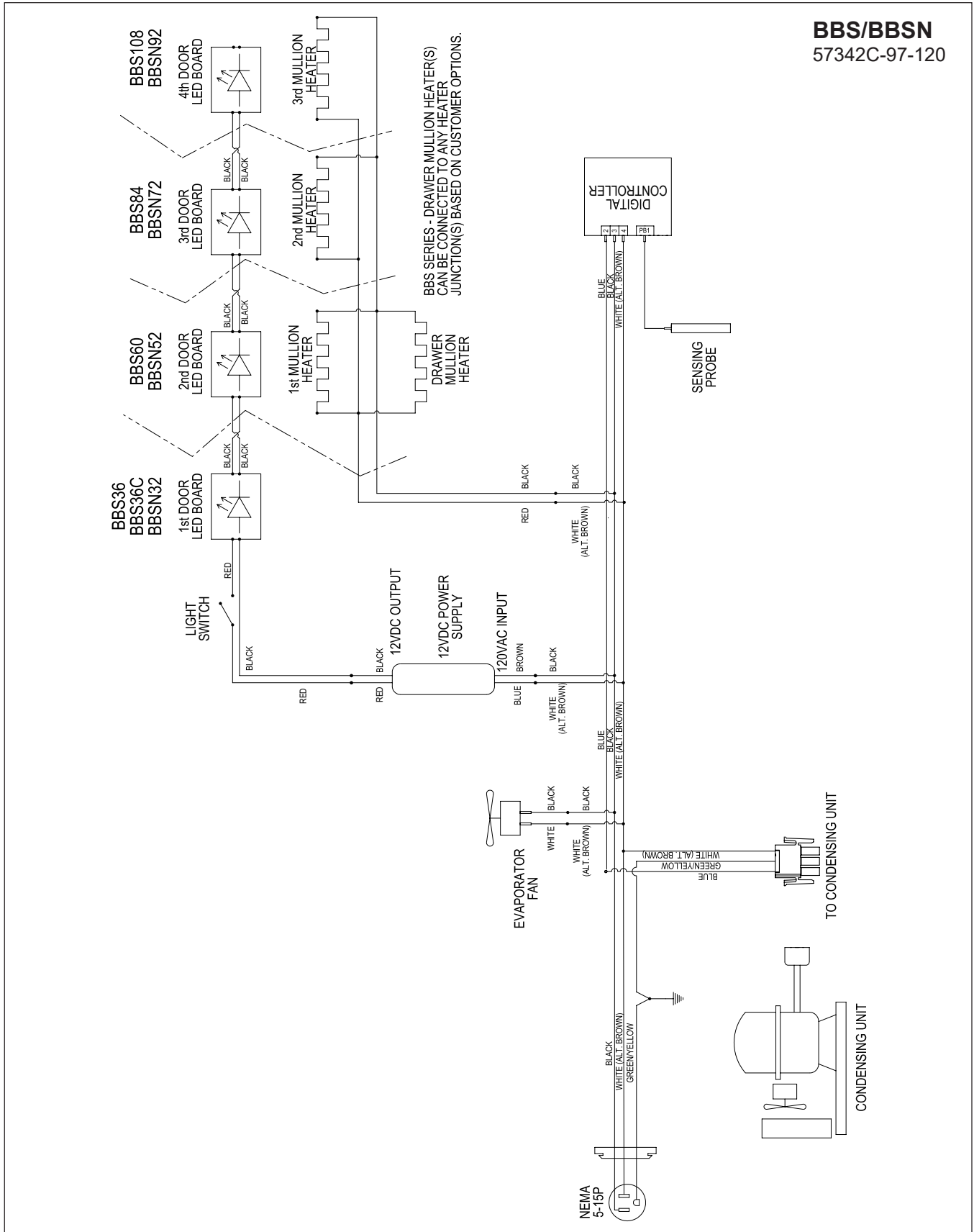


Figure 7-5. BBSLP Wiring Diagram

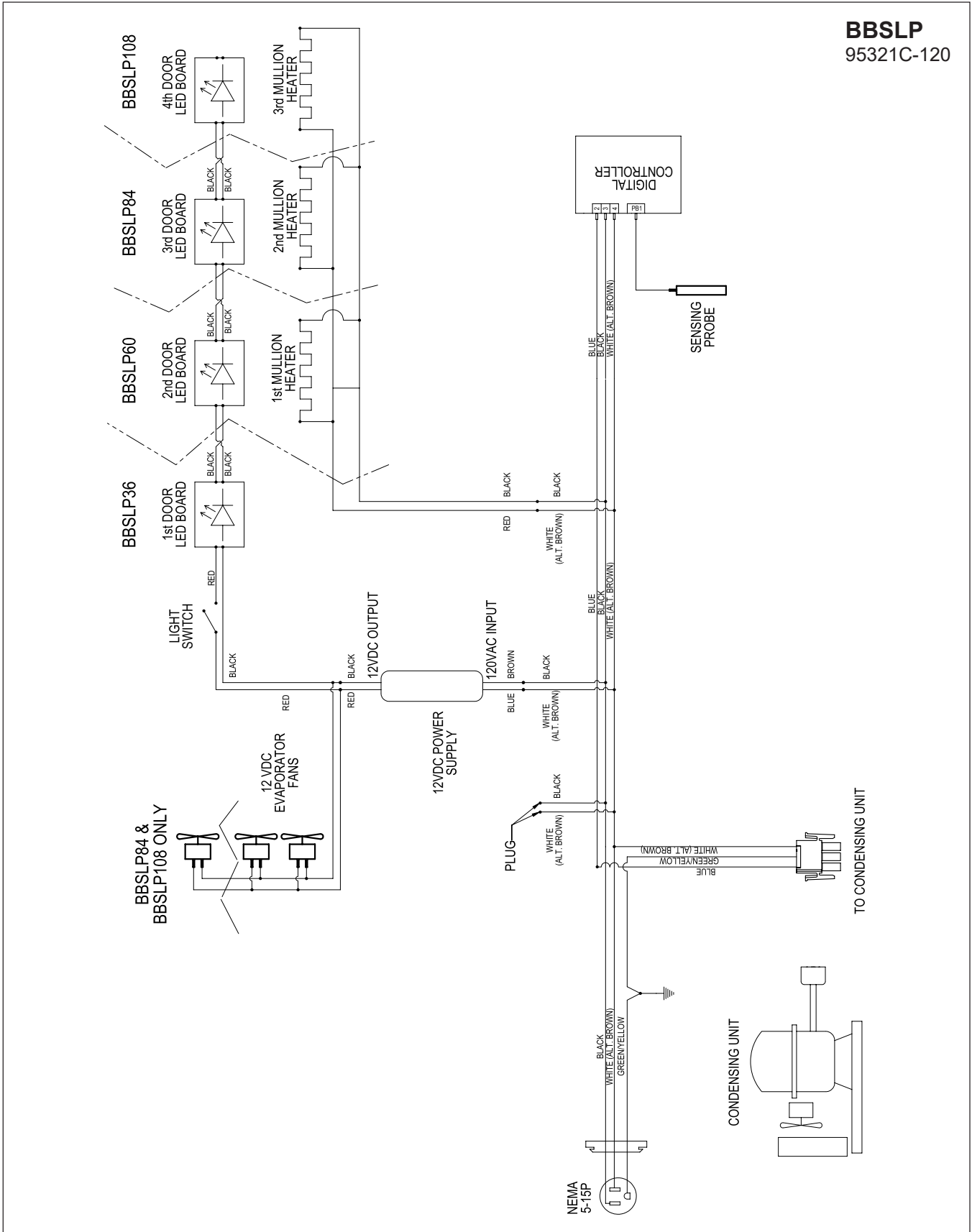


Figure 7-6. DDS/DDC Wiring Diagram

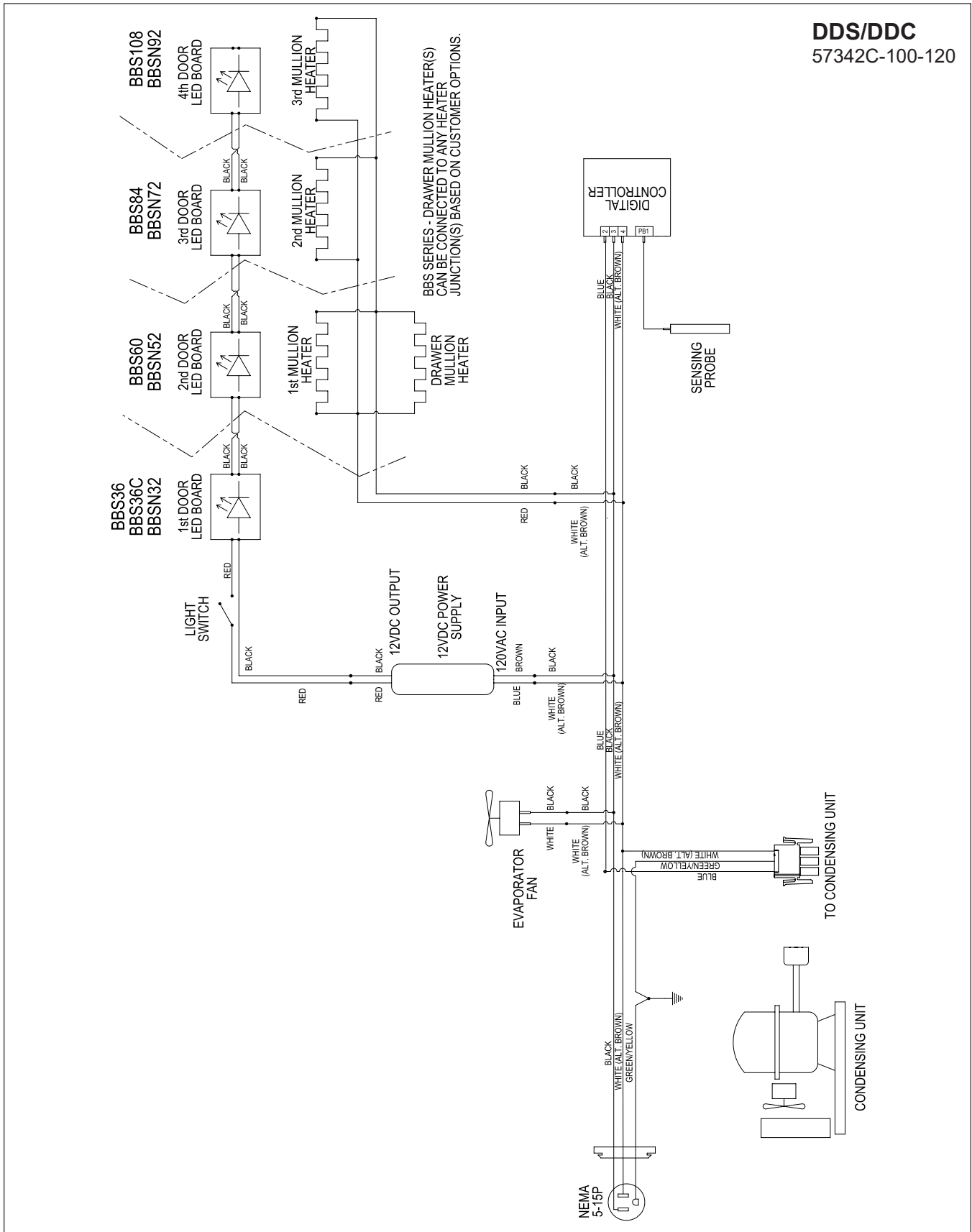


Figure 7-7. DZS36 Wiring Diagram

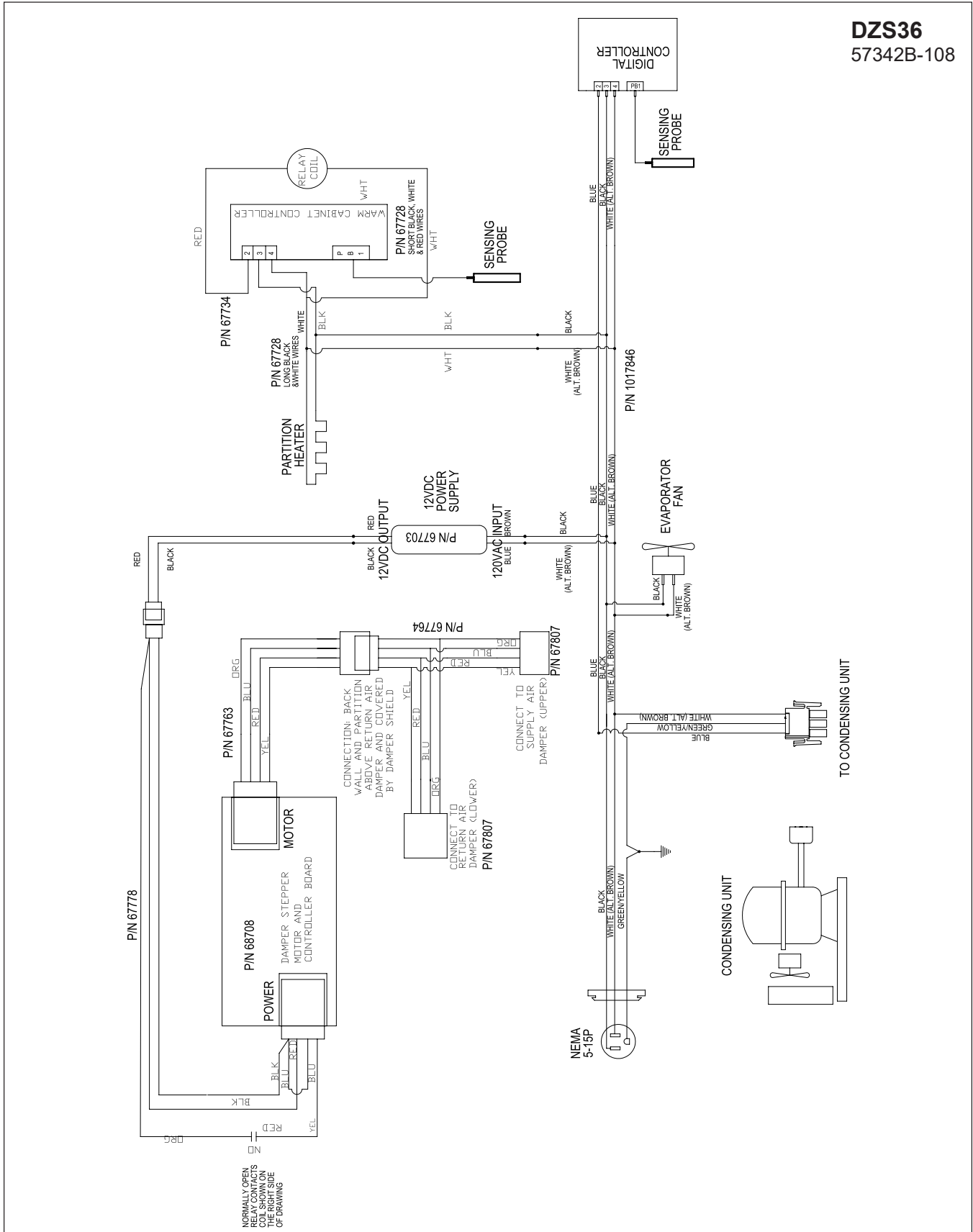




Figure 7-8. DZS60 Wiring Diagram

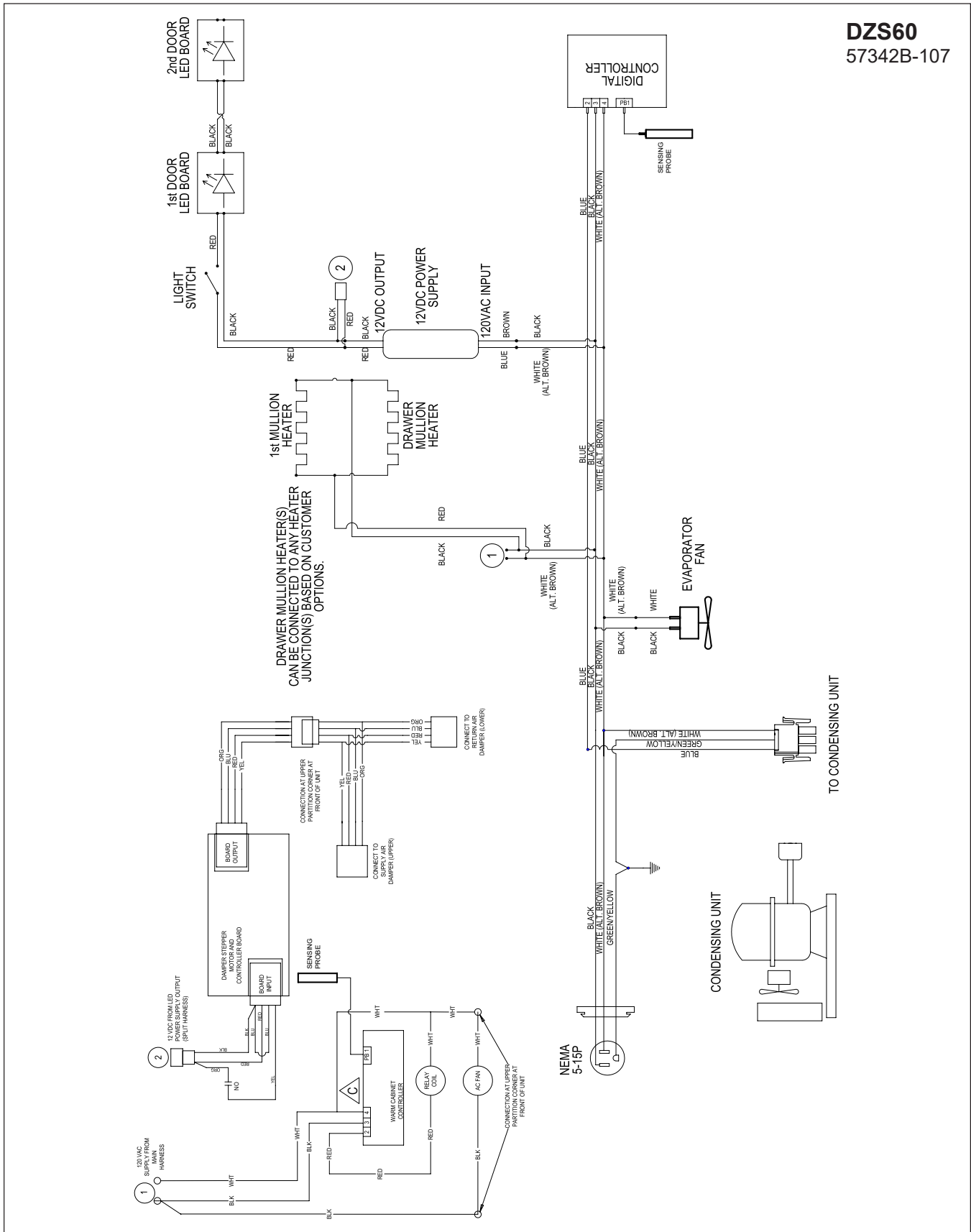


Figure 7-9. PTR Wiring Diagram

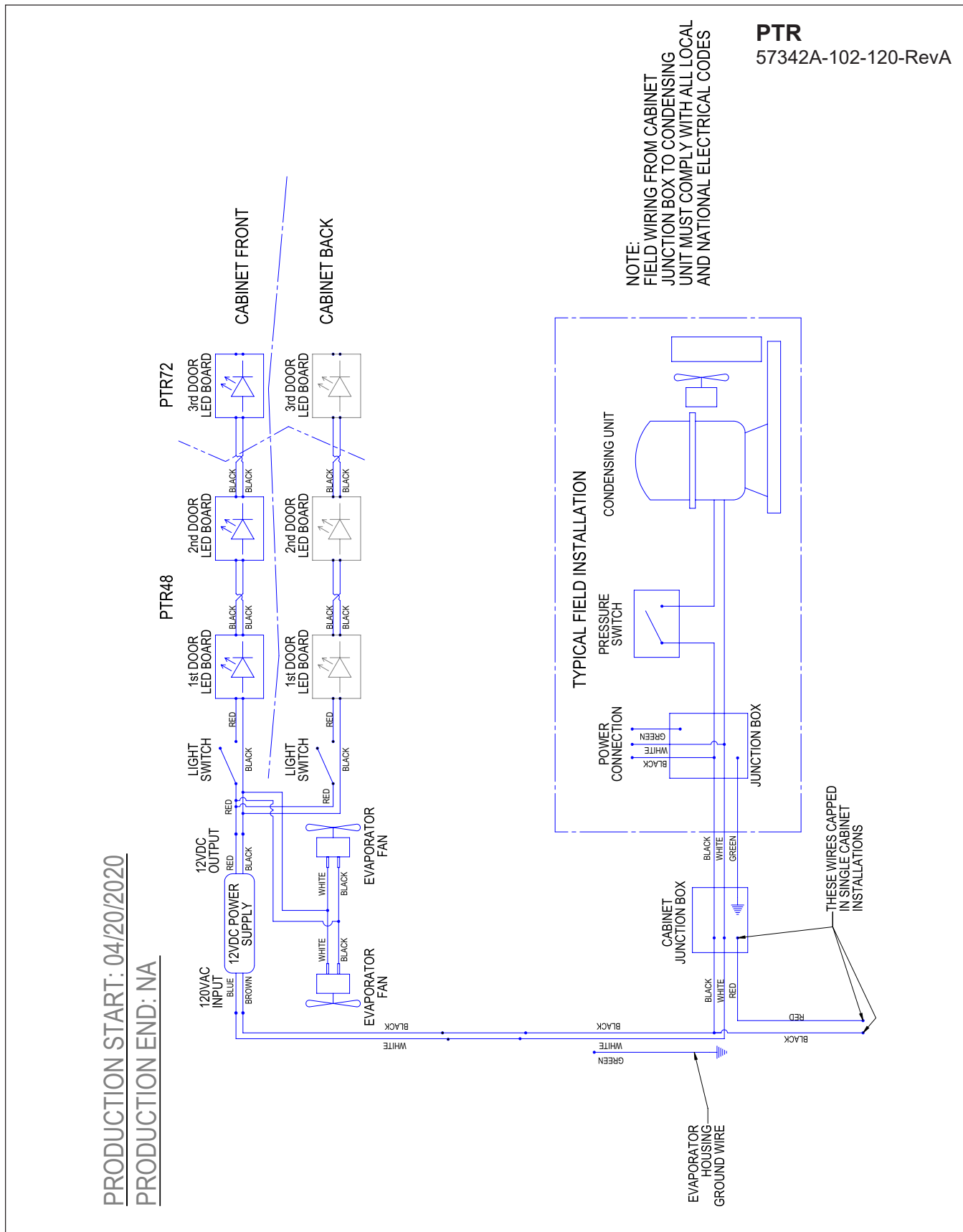


Figure 7-10. PTS Wiring Diagram

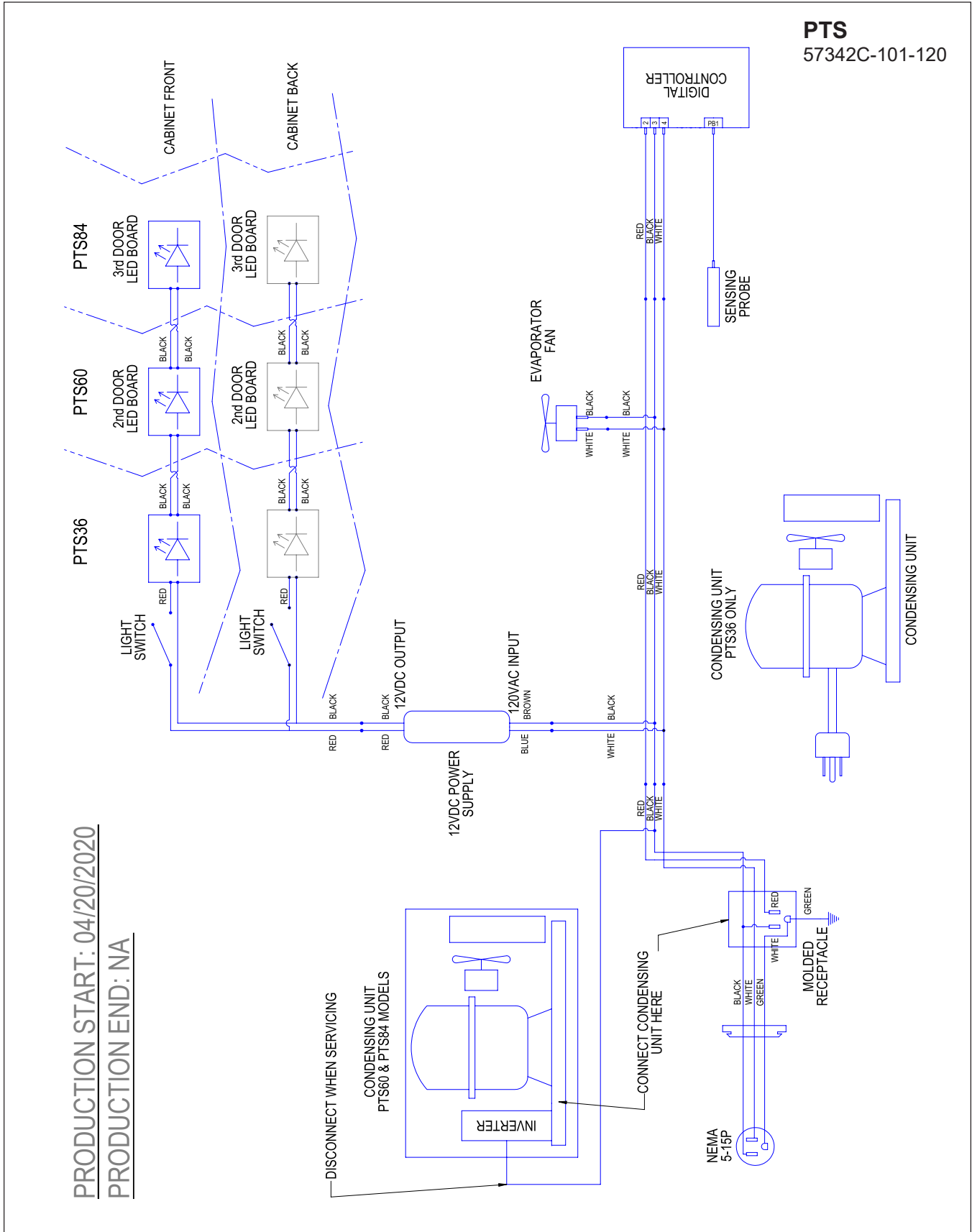


Figure 7-11. SDBR48/SDBR96 Wiring Diagram

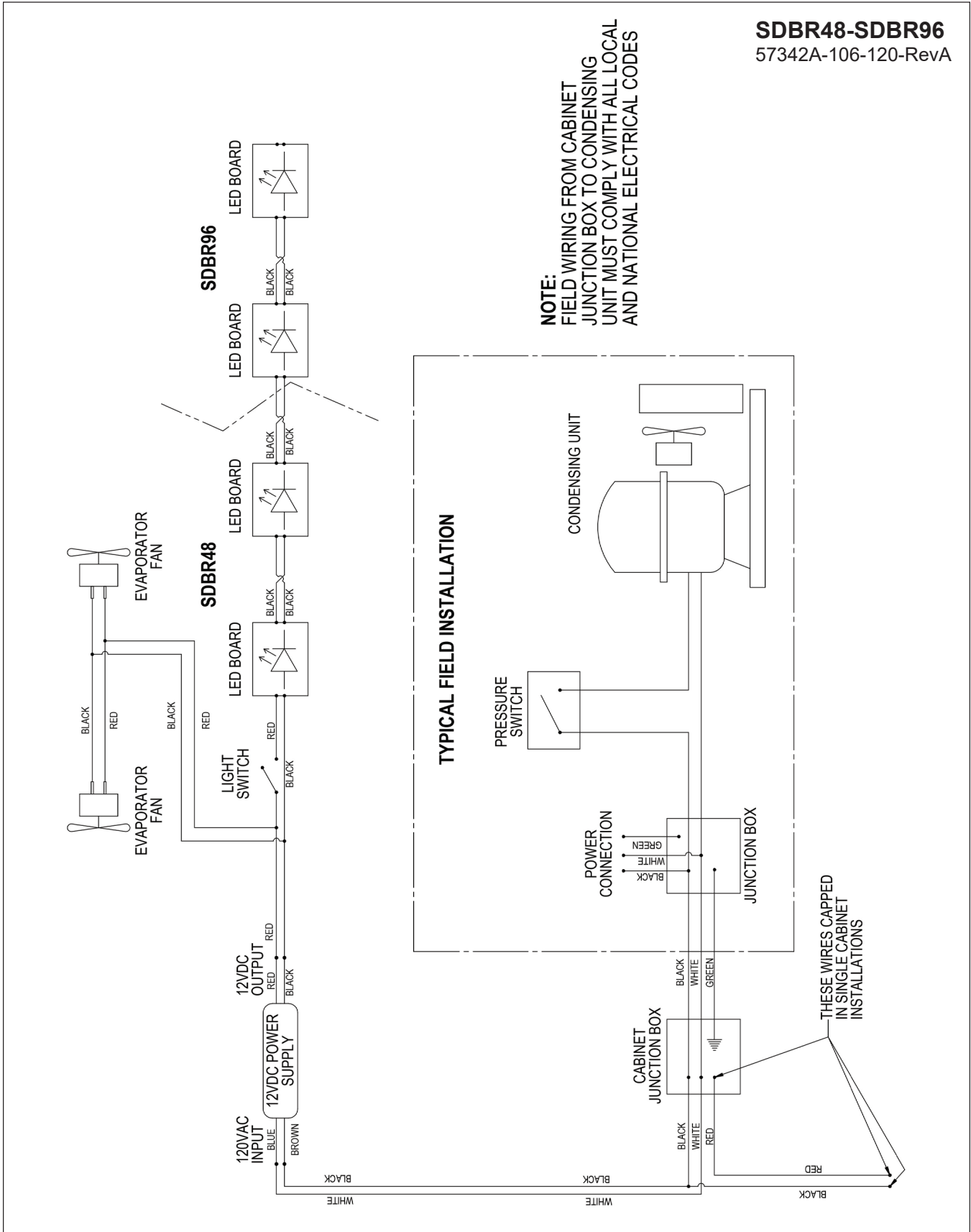
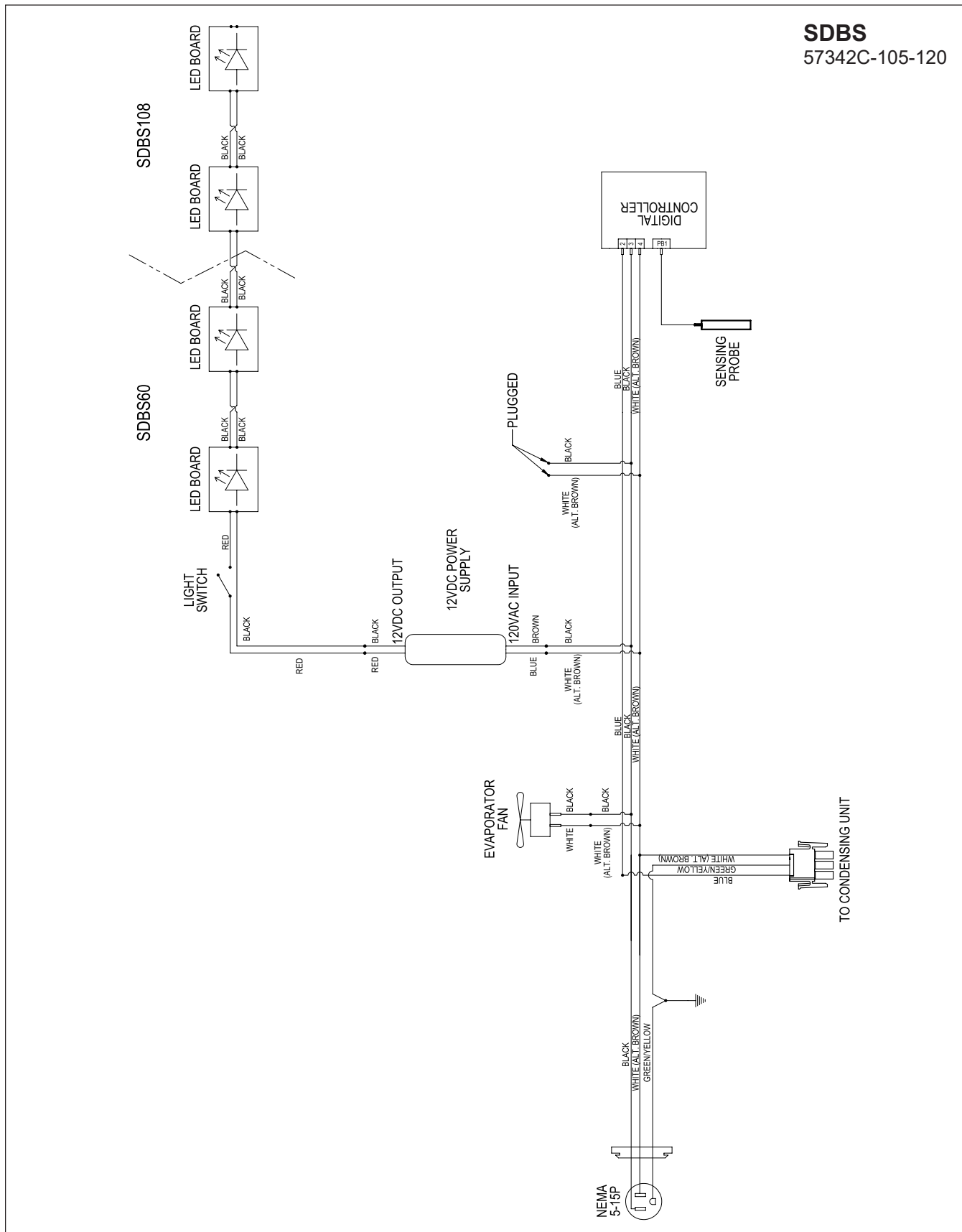




Figure 7-12. SDBS Wiring Diagram



SDBS
57342C-105-120

Figure 7-13. SDPR Wiring Diagram

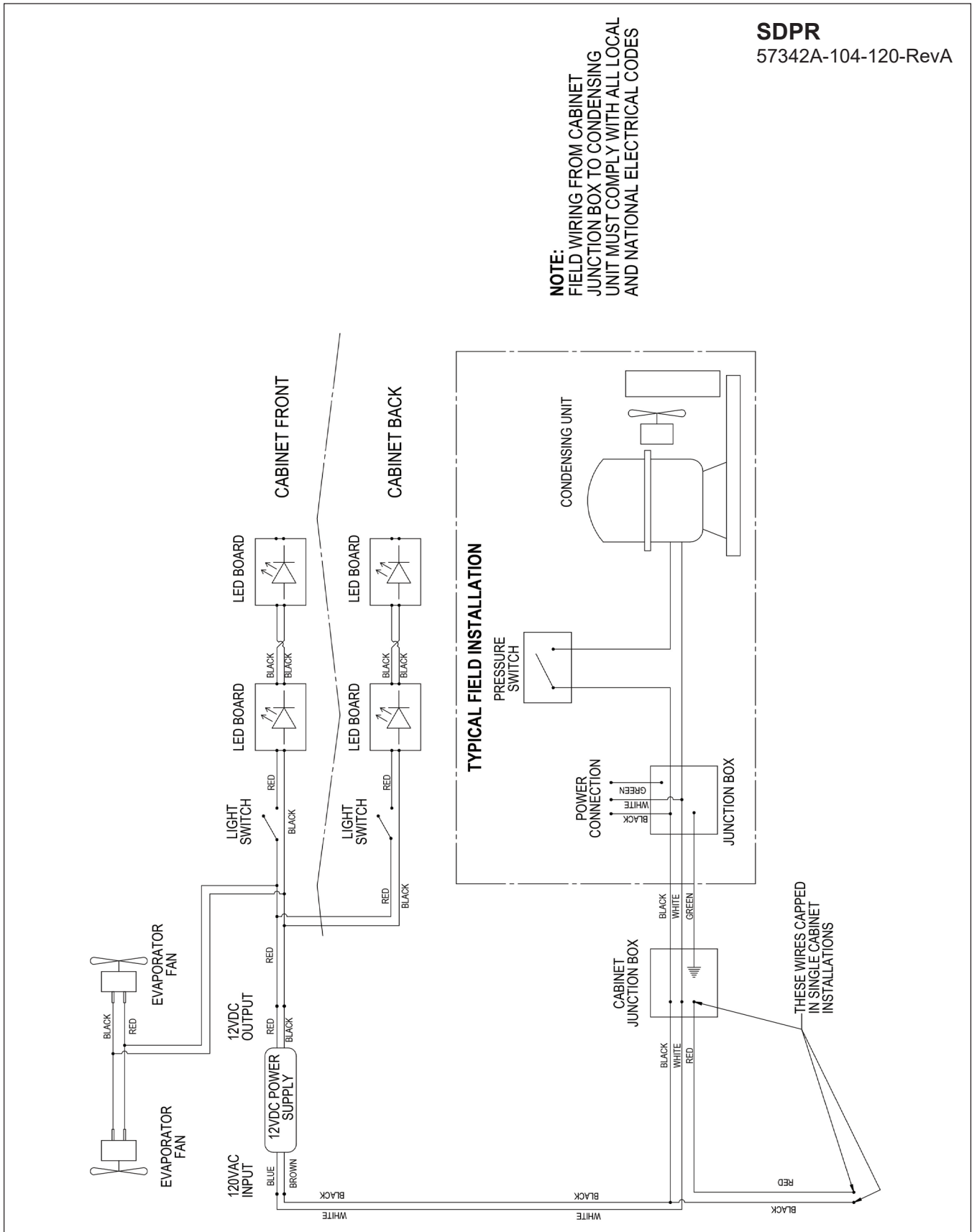
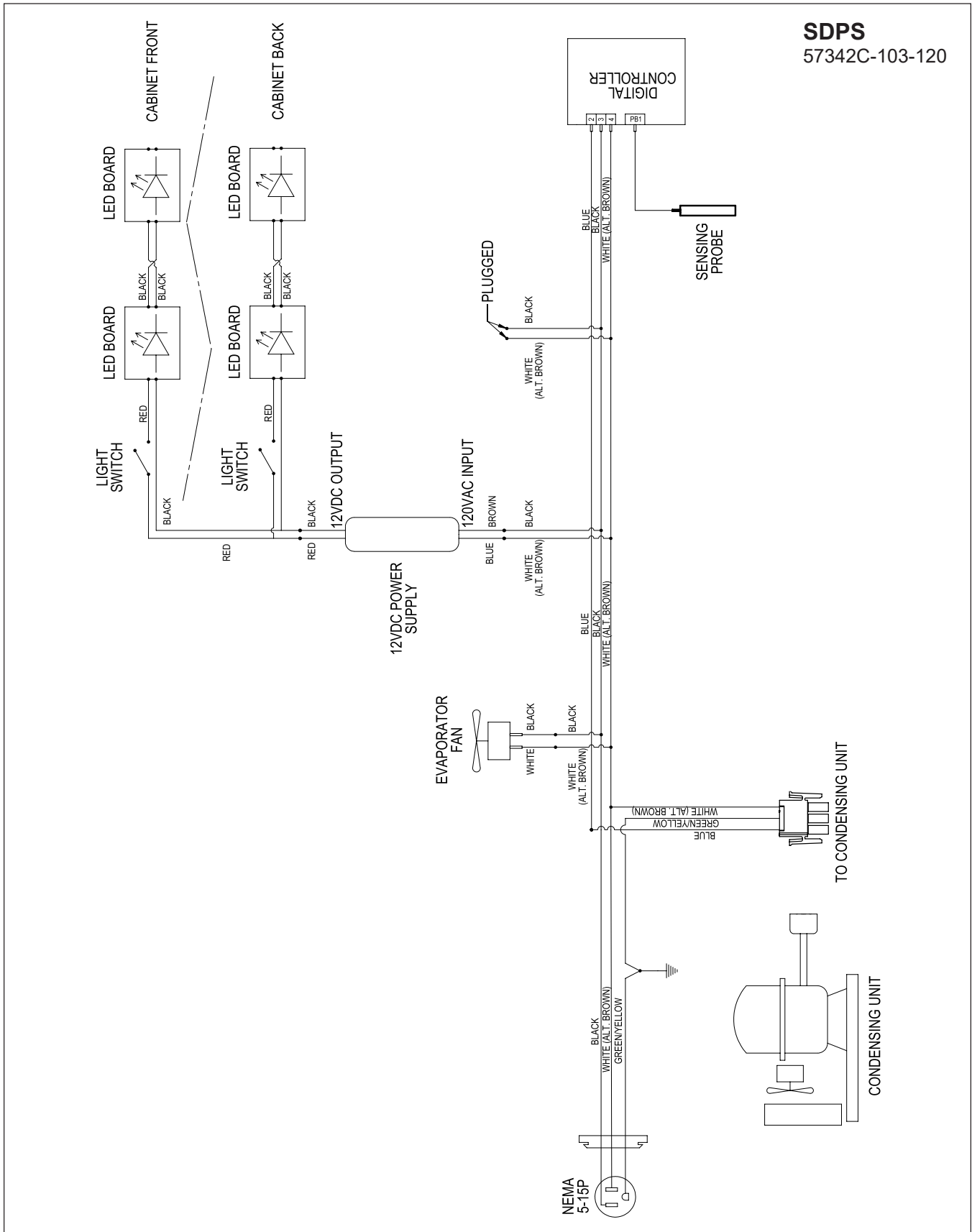






Figure 7-14. SDPS Wiring Diagram



7.3 Load Operation Modes

Table 7-2. Load Operation Modes

LOAD	COOLING MODE	OFF MODE	DEFROST MODE
Compressor	Energized	De-Energized	De-Energized
Condenser Fan	Energized	De-Energized	De-Energized
Evaporator Fan	Energized	Energized	Energized
Mullion Heaters	Energized	Energized	Energized
Eliwell Controller Display		No icon illuminated	
Dixell Controller Display		No icon illuminated	
Inverter (if applicable)	Energized	De-Energized	De-Energized

7.4 Electronic Controller

Note: The digital readout is monitoring true air temperature, not product temperature.

Table 7-3. Controller Where-Used Table

Controller Type	Build Date
Eliwell	Beginning 9/19/2016
Dixell	4/1/2013 to 9/16/2016

Eliwell Controller



Press and release controller set key to display 'Machine Status' menu and 'SET' label.

Press and release the set key again to display the current set point.

Refer to Table 7-4 for factory set point.

To adjust controller set point, press up and down arrow keys within 15 seconds.

Press set key once for controller to memorize new set point.

Be sure to allow 24 hours between temperature controller adjustments.

Dixell Controller



To view set point, press and release SET key.

Refer to Table 7-4 for factory set point.

To change set point value, press and hold SET key for at least 2 seconds. The set point value will be displayed along with a blinking "°C" or "°F" LED.

Release the SET key and then use up or down arrows within 10 seconds to change the set point.

The new set point will be memorized by either pressing SET key again or by waiting 10 seconds.



7.5 Factory Set Point

Table 7-4. Factory Temperature Settings

Model	Refrigerator °F (°C)	White Wine °F (°C)	Red Wine °F (°C)
BBS, BBSN PTS, DZS SDBS, SDPS BBSLP, DDC DDS	36 (2.2)	45 (7.2)	60 (15.5)

7.5.1 Dixell Controller: Reset Factory Parameter Settings

- Contact Perlick.

7.5.2 Eliwell Controller: Reset Factory Parameter Settings

LOADING DEFAULT APPLICATIONS

The procedure used to load one of the default applications is:

- When the instrument switches on, press and hold the **set** key: the label **AP1** will appear;
- Scroll through the various applications (**AP1-AP2-AP3**) using the **▲** **▼** keys;
- Select the desired application using the key (**AP3** in the example) or cancel the procedure by pressing the **⏻** key or alternatively wait for the timeout;
- If the operation is successful, the display will show **y**, otherwise **n** will appear;
- After a few seconds the instrument will return to the main display.

LOADING APPLICATIONS WHEN EXITING STAND-BY MODE

The procedure for loading one of the preset applications when exiting stand-by mode is:

- Set the instrument in stand-by mode by pressing the **⏻** button for time **H02**;
- Exit stand-by mode by pressing the **⏻** button for time H02;
- Within 10 seconds of exiting stand-by mode, press the **⏻** button for time **H02**: **AP1** label will appear;
- Scroll through the various applications (**AP1-AP2-AP3**) using the **▲** **▼** keys;
- Select the desired application using the **set** key (**AP3** in the example) or cancel the procedure by pressing the **⏻** key or alternatively wait for the timeout;
- If the operation is successful, the display will show **y**, otherwise **n** will appear;
- After a few seconds the instrument will return to the main display.

Single Zone Models	Dual Zone Models: Zone 1 Control	Dual Zone Models: Zone 2 Control
AP1 = Refrigerator settings (36°F)	AP1 = Refrigerator settings (36°F)	AP1 = Not Used
AP2 = White Wine settings (45°F)	AP2 = White Wine settings (45°F)	AP2 = White Wine settings (45°F)
AP3 = Red Wine settings (60°F)	AP3 = Not Used	AP3 = Red Wine settings (60°F)

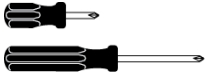




7.5.3 Replacing Control Module

7.5.3.1 Removing Dixell Controller

Tools required



STEP 1.

Remove the grille by removing 3 Phillips head screws, one at the top center and two at the bottom edge.

STEP 2.

Remove 2 screws holding control cradle to unit.

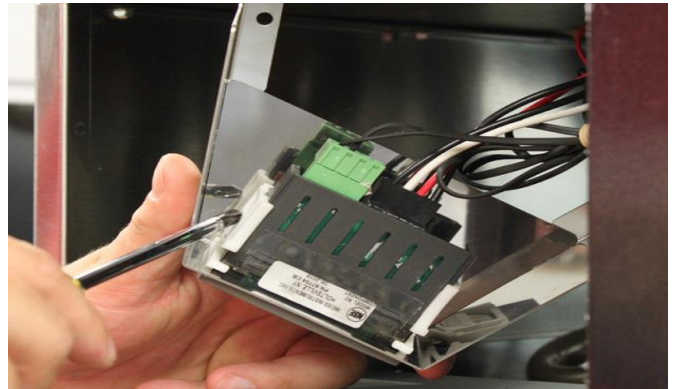


STEP 3.

Remove clips holding the controller to the cradle. Control cradle will slide freely from the controller.

CAUTION

Do not attempt to reuse the old wiring harness.



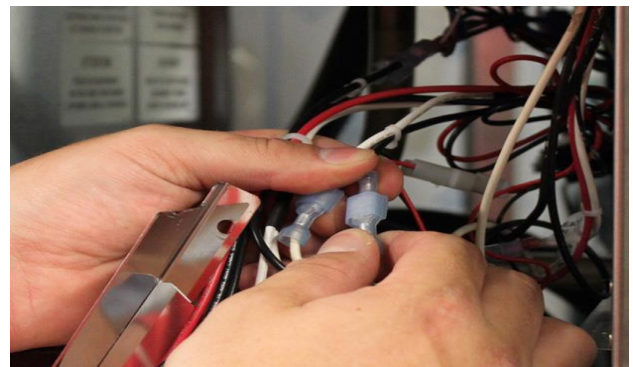
STEP 4.

Cut 2 zip ties holding wire harness to top of the refrigeration module.



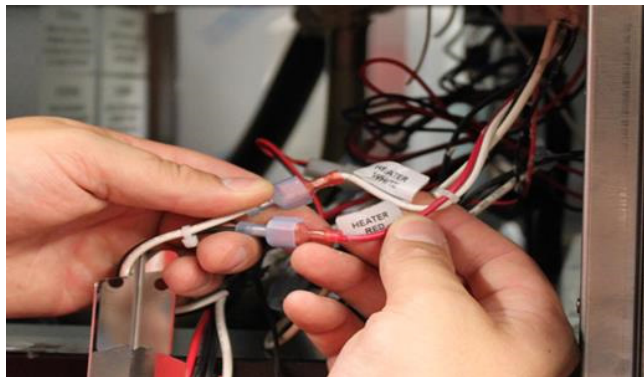
STEP 5.

Disconnect evaporator fan wire leads from the main wiring harness.



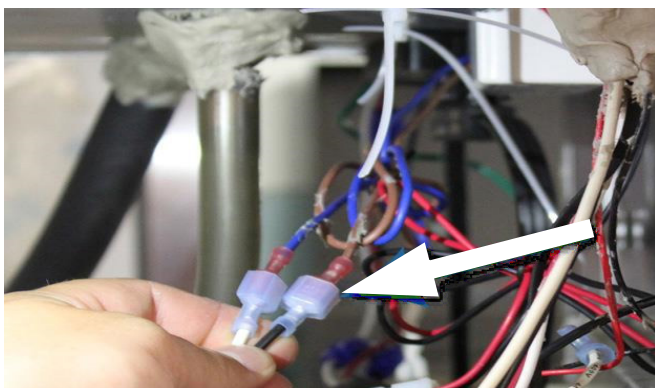
STEP 6.

Disconnect mullion heater wire leads from the main wiring harness.



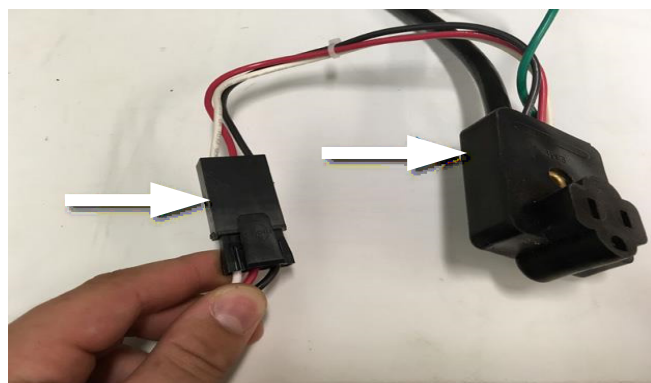
STEP 7.

Disconnect DC driver leads from the main wiring harness.



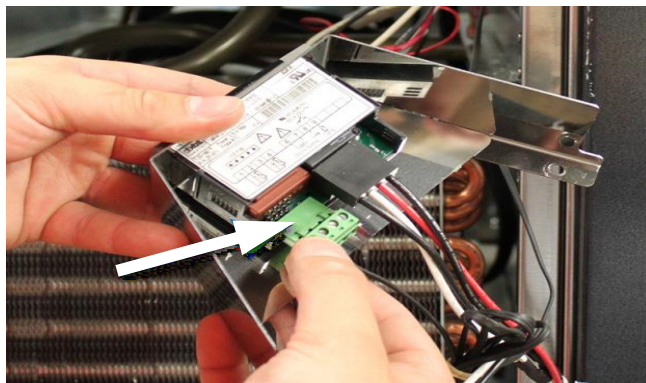
STEP 8.

Remove main wiring harness by disconnecting Molex connector from molded receptacle.



STEP 9.

Remove green probe connector from controller.



STEP 10.

Remove controller assembly from the unit.

STEP 11.

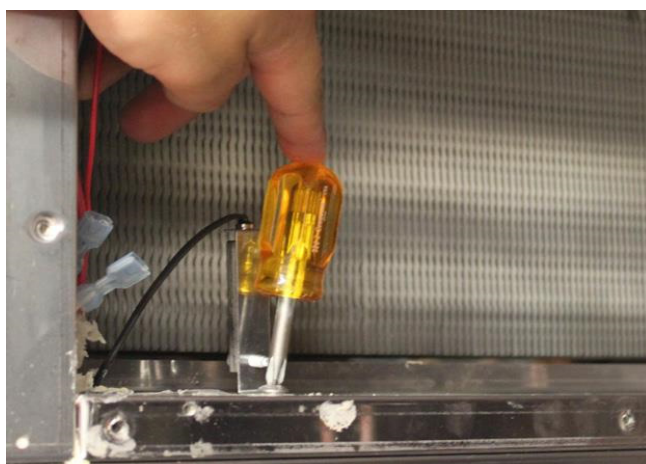
Remove shelving and pilaster from the unit wall.

STEP 12.

Remove evaporator fan panel. See Figure 6-8.

STEP 13.

Remove screw holding probe bracket to the unit.



STEP 14.

Remove screw holding probe "mass" to the probe bracket and remove the probe.



STEP 15.

Remove sealing compound from top of wire pass-through (inside evaporator box).

STEP 16.

Remove sealing compound from bottom of wire pass-through (inside condenser compartment).

STEP 17.

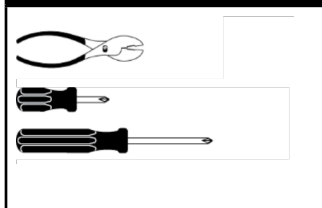
Pull probe out through the bottom of the evaporator box.

STEP 18.

Discard Dixell probe assembly.

7.5.3.2 Installing Eliwell Controller

Tools required

	<p>Sealing Compound Cable ties</p>
---	--

STEP 1.

Feed Eliwell probe through the bottom of the evaporator box.

STEP 2.

Attach probe and mass onto probe bracket with screw.

STEP 3.

Use pliers if needed to secure probe notch to sheet metal probe bracket. See Figure 7-2.

Crimp gently to avoid damaging the probe. The notch in the probe body should fit into the bracket slot to encapsulate the probe into stainless steel sleeve.



Figure 7-15. Attach Probe to Bracket

STEP 4.

Attach the bracket/probe assembly to the bottom of the evaporator box with screw.

STEP 5.

Replace sealing compound at top of wire pass-through (inside evaporator box). Verify a complete seal around the wire harness and pass-through hole.

STEP 6.

Replace the evaporator fan panel.

STEP 7.

Replace the sealing compound at bottom of wire pass-through (inside condenser compartment). Verify a complete seal around the wire harness and pass-through hole.

STEP 8.

Reverse this instruction to connect the replacement wire harness/controller/bracket assembly.



7.5.4 Temperature Probe

Each refrigerated zone has one 10K ohm NTC probe, which senses compartment temperature. Sensing probe is located behind evaporator fan panel.

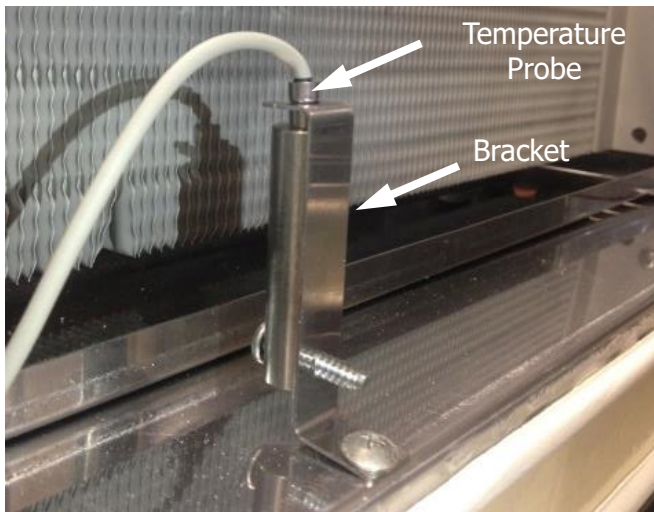


Figure 7-16. Temperature Probe and Bracket

- See Table 7-5 for temperature to resistance values when troubleshooting probe or temperature issues.

Table 7-5. Temperature – Resistance Values

TEMPERATURE (°C)	TEMPERATURE (°F)	RESISTANCE (OHMS)
-30	-22	111300
-25	-13	86430
-20	-4	67770
-15	5	53410
-10	14	42470
-5	23	33900
0	32	27280
5	41	22050
10	50	17960
15	59	14690
20	68	12090
25	77	10000
30	86	8313
35	95	6940
40	104	5827

TEMPERATURE (°C)	TEMPERATURE (°F)	RESISTANCE (OHMS)
45	113	4911
50	122	4160
55	131	3536

To replace temperature probe, refer to section 7.5.3.

7.6 LED Lighting

7.6.1 Replace LED Light Strip

⚠ DANGER

ELECTROCUTION HAZARD!! Never attempt to repair or perform maintenance on unit until main electrical power to the unit has been disconnected!

Tools required

STEP 1.

Open door or remove upper drawer. See Figure 8-13.

STEP 2.

Using a flat blade screwdriver, carefully pry off the lens cover. See Figure 7-4.

STEP 3.

Remove two screws securing LED light to housing.

STEP 4.

Unplug the LED from the wiring harness.

STEP 5.

Plug new LED into harness and secure to housing using screws removed in step 2.

STEP 6.

Snap LED cover into place.

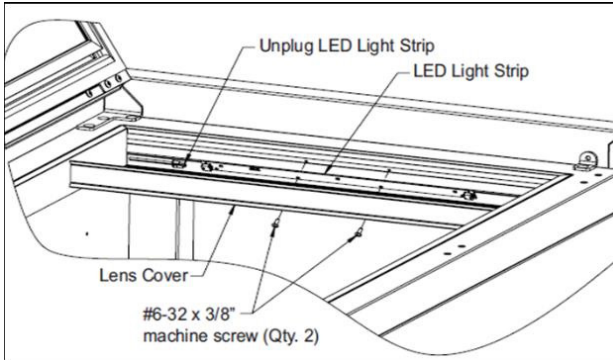


Figure 7-17. Interior LED Light

If not within range printed on the part, replace the part.

7.7 Replace DC Driver/Inverter

STEP 1.

Locate DC Driver/Inverter on ceiling of refrigeration compartment.

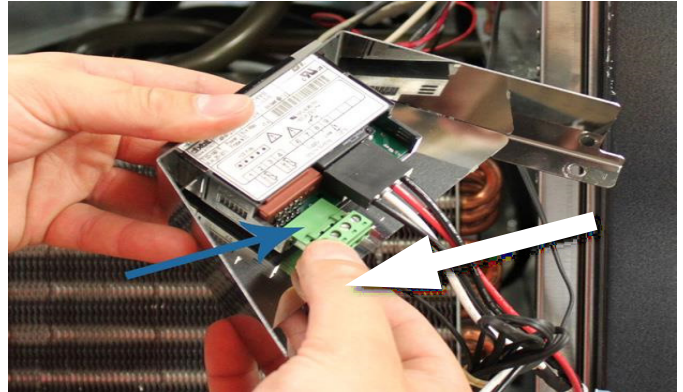


STEP 2.

Check voltage.

STEP 3.

Disconnect DC driver leads from the main wiring harness.



STEP 4.

Use reverse procedure to install replacement DC driver/Inverter.



8.0 Service Instructions - Doors, Drawers, and Shelving

8.1 Proper Door and Drawer Usage

Note: Improper use of doors and drawers can allow extra heat into unit causing extended compressor run times.

- Ensure door or drawers are closed completely and are not left open for a long duration of time. The door can bounce back open slightly and appear closed.
- Ensure the unit is level.
 - Ensure doors and drawers are sealing properly when closed.
 - No door adjustments should be necessary unless there is major structural damage to cabinet.

8.2 Reverse Door Swing

Note: Changing door swing direction is not advisable if door is not equipped with full length handle. Doing so may result in an undesirable handle position.

Table 8-1. Door Hinges

HINGE KIT - PART NUMBER	DESCRIPTION
67439R	Right Hinging
67439L	Left Hinging

Tools required	
	Perlick Hinge Kit

STEP 1.

Support the door in the open position as shown in Figure 8-1. Remove the hinge pin.

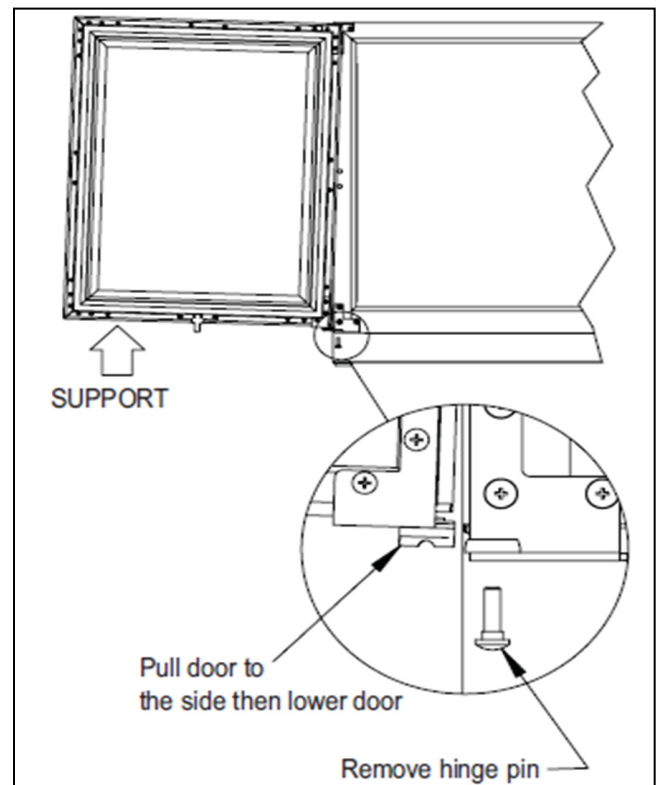


Figure 8-1. Door Removal

STEP 2.

Pull door to the side and then lower the door.

STEP 3.

Remove top and bottom hinge brackets. Retain screws for later use. See Figure 8-2.

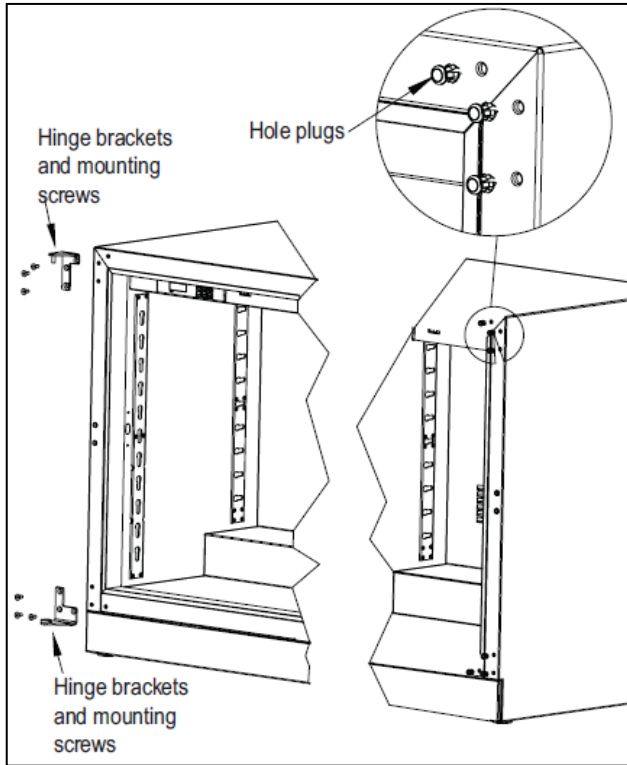


Figure 8-2. Hinge Removal

STEP 4.

Remove hole plugs from top and bottom hinge bracket mounting holes. See Figure 8-2.

Place plugs in holes on opposite side made vacant by removing hinges in step 3.

STEP 5.

Using screws removed in step 3, install top and bottom hinge brackets from kit. See Figure 8-3.

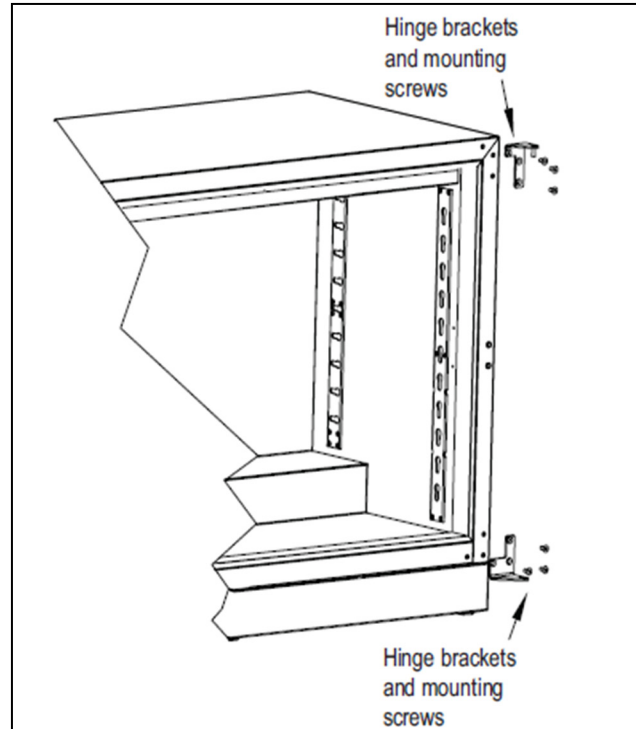


Figure 8-3. Hinge Installation

STEP 6.

Remove top and bottom hinge brackets from door (Figure 8-4). Retain screws for later use.

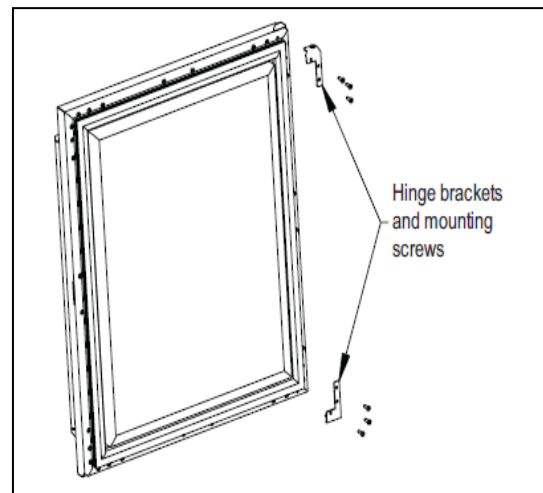


Figure 8-4. Door Brackets

STEP 7.

Remove front panel from door assembly by removing inner mounting screws (4 per side) from perimeter of door assembly. See Figure 8-5.

Rotate front panel 180° top to bottom. Reattach using same screw and mounting holes.

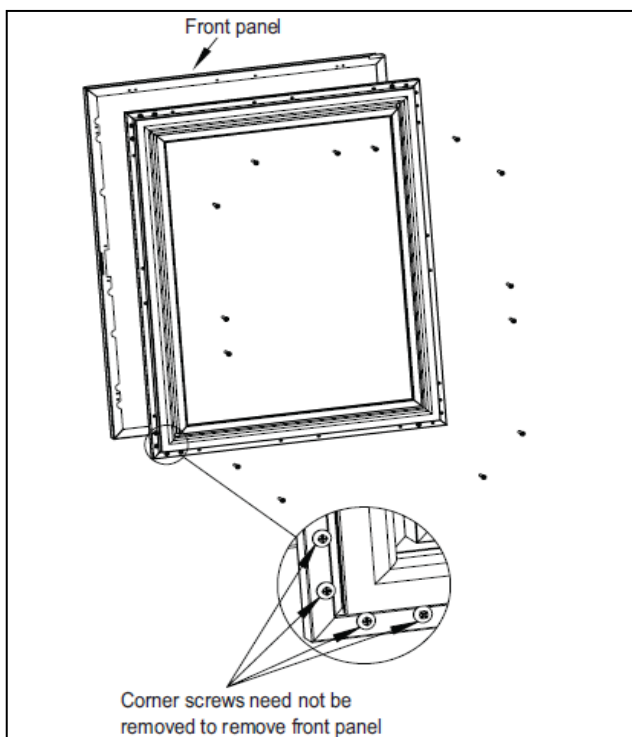


Figure 8-5. Removing Front Panel

STEP 8.

Insert bearing into door top hinge bracket. See Figure 8-6.

STEP 9.

Insert V-block into door bottom hinge bracket and attach with e-clip. See Figure 8-6. Note the orientation of V-block.

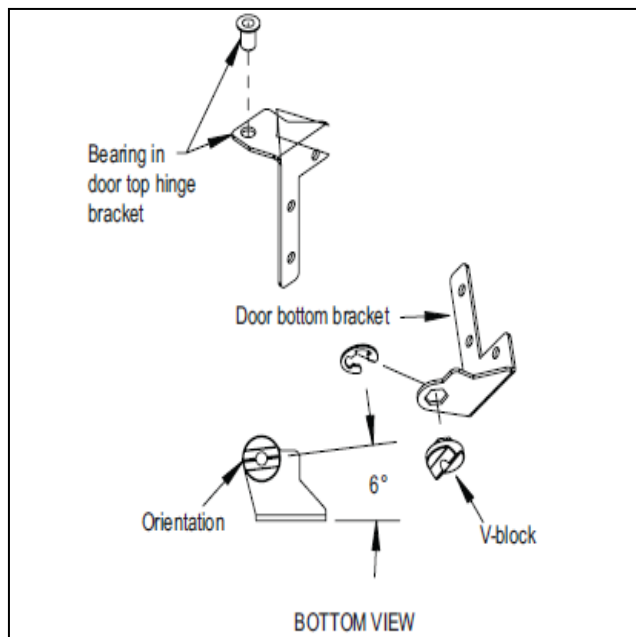


Figure 8-6. Bearing and V-Block

STEP 10.

Attach top and bottom door hinges using screws removed in STEP 6. See Figure 8-7.

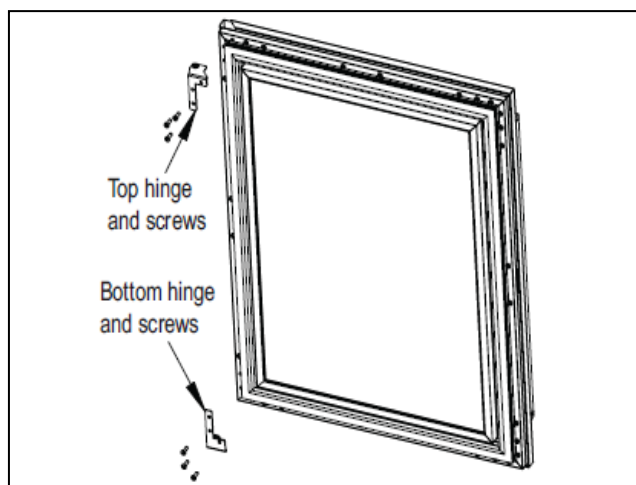


Figure 8-7. Door Hinges

STEP 11.

Place lower V-block into lower cabinet hinge with notch parallel to cabinet. See Figure 8-8.

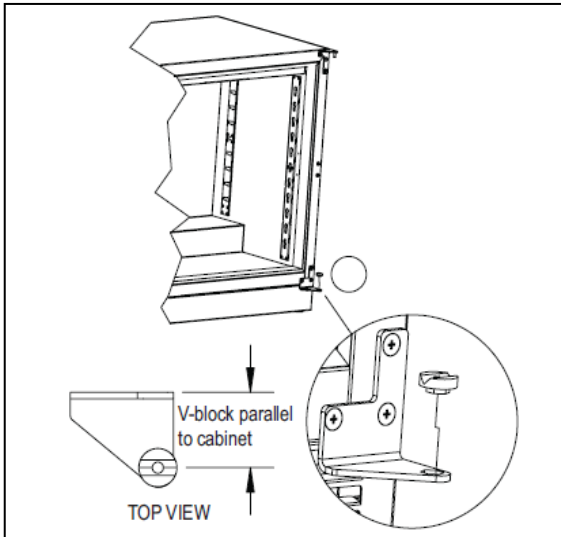


Figure 8-8. Installing V-Block

STEP 12.

Lift door assembly and insert top pin into bearing. Move door toward cabinet and align V-blocks. See Figure 8-8 and Figure 8-9.

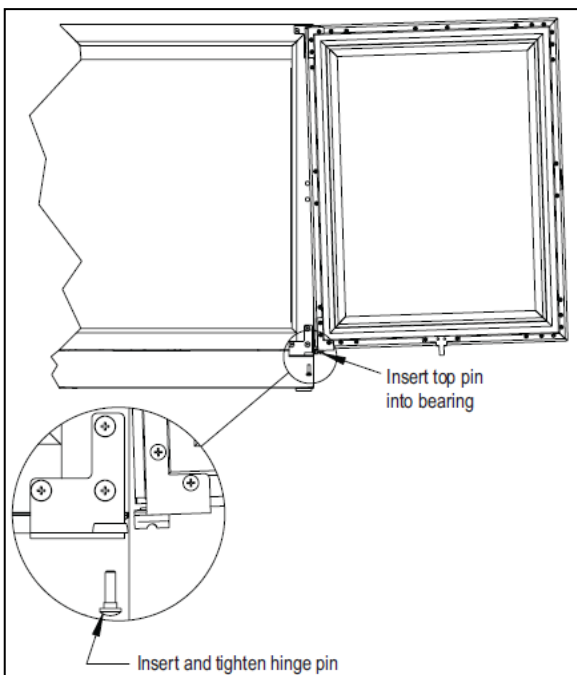


Figure 8-9. Installing Door

STEP 13.

Insert and tighten lower hinge pin to complete assembly.

8.3 Replace Door Hinge

See Section 8.2 for hinge replacement instructions.

8.4 Sliding Door Models

8.4.1 Removing/Installing Sliding Doors

STEP 1.

To remove sliding door, simply grasp door on each side and lift up off bottom track, then tilt outwards and pull down to remove from upper track.

STEP 2.

To reinstall sliding door, place door in upper track. Be sure to engage bracket. See Figure 8-10.

Lift door up into track and place into bottom track.

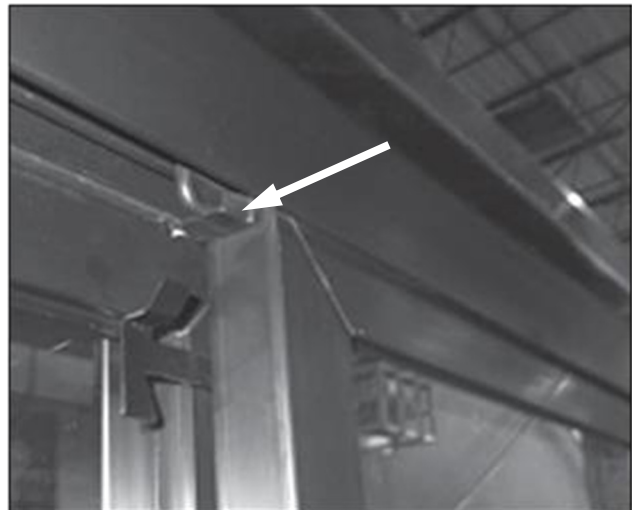


Figure 8-10. Removing/Installing Sliding Door

8.4.2 Adjusting Door Spring Tension

Tools required	
	

Tension spring is in upper track of each door.

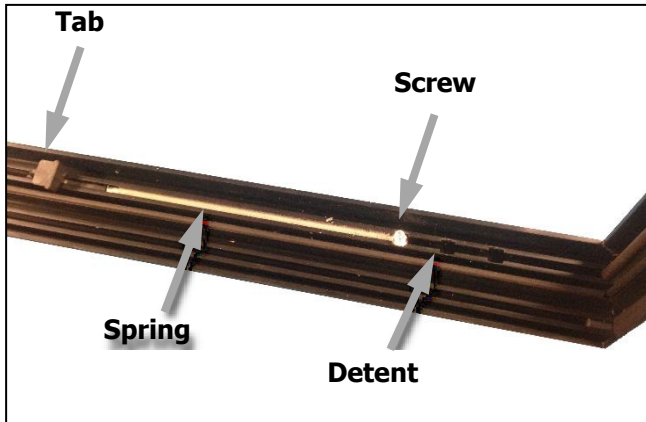


Figure 8-11. Door Track



To increase or decrease spring tension:

- Remove Phillips screw
- Position bracket in one of three detents
- Reinstall screw

Detent farthest from left provides the least amount of tension.

Units are shipped from factory with springs set at the weakest setting.

8.4.3 Torpedo Spring Adjustment

Tools required	
	

STEP 1.

Remove doors.

STEP 2.

Remove screw.

STEP 3.

Pull up spring and attached black tab.

STEP 4.

Feed into next notch to tighten/loosen.

STEP 5.

Tighten screw.

8.5 Drawer & Shelf Slides

8.5.1 Shelving Adjustment

CAUTION

Completely empty shelf or drawer before removing.

STEP 1.

Open door and slide shelf out.

STEP 2.

Press locking mechanism. Tilt shelf and remove from unit



Figure 8-12. Shelf Locking Mechanism

STEP 3.

Reposition each bracket separately. Grasp middle of bracket, pull front end up and out, then forward to remove.

STEP 4.

Place brackets at desired location and reinstall shelf(s).



8.5.2 Drawer Divider Adjustment

⚠ CAUTION

Completely empty shelf or drawer before removing.

STEP 1.

Lift divider straight up and move to desired position, engaging tabs in holes. Make sure divider tabs engage corresponding holes on both sides.

8.5.3 Cleaning/Lubricating Drawer Extenders

⚠ CAUTION

Completely empty shelf or drawer before removing.

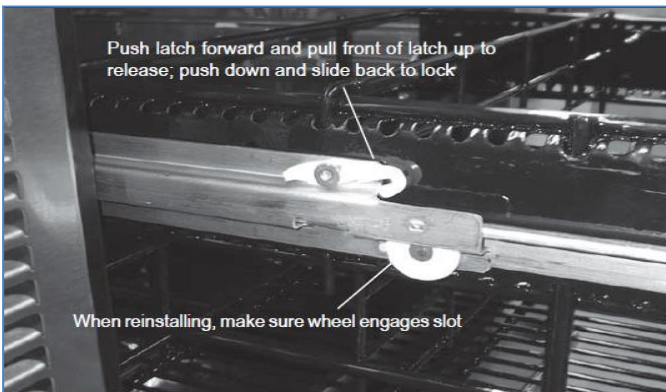


Figure 8-13. Removing/Installing Drawer

STEP 1.

Drawer must be removed to clean or lubricate the extenders.

STEP 2.

Pull the drawer out to its furthest position. Locate the latch in the middle of both extenders. Push each latch forward and lift front of latch up (unlocked position), then lift the front of the drawer and pull out.

STEP 3.

Use a food grade lubricant to lubricate the drawer extenders.

STEP 4.

Place drawer on to the extenders, making sure wheels engage the slots on each side.

STEP 5.

Push drawer all the way in, then pull drawer out and push the latch down and back to engage. Make sure front of latches are fully down and back, engaging the extenders.

8.6 Replace Door & Drawer Gasket

STEP 1.

Remove gasket by lifting at one corner and pulling gasket away from door. Work around the door until gasket is free.

STEP 2.

To replace, start at one corner and press firmly to seat the gasket dart in the channel of the door frame. Listen/feel for a click to indicate the dart is completely seated.

STEP 3.

Finish by going around the gasket once more to feel for any gaps and to ensure the gasket is flat and fully seated.



8.7 Replace Door Handle

Tools required	
 3/8"	

STEP 1.

Remove door gasket. See Section 8.6.

STEP 2.

Remove 16 screws underneath door gasket that hold door overlay panel to door frame.

STEP 3.

Remove 3 screws from each door hinge where it is attached to door frame.

STEP 4.

Separate door overlay panel from door frame.

STEP 5.

Door handle can now be removed, 4 X 3/8" hex head bolts.

STEP 6.

Reverse these steps to replace door hinges, overlay panel, and gasket.

8.8 Locks

Gain access to back side of the lock by following directions to remove door handle, Section 8.7.

Note position of door lock strike and reassemble in the same orientation.

8.9 Custom Overlay Panels

Tools required	
	

Remove front panel from door assembly by removing inner mounting screws (4 per side) from perimeter of door assembly. See Figure 8-14.

Reattach custom overlay panel using same screw and mounting holes.

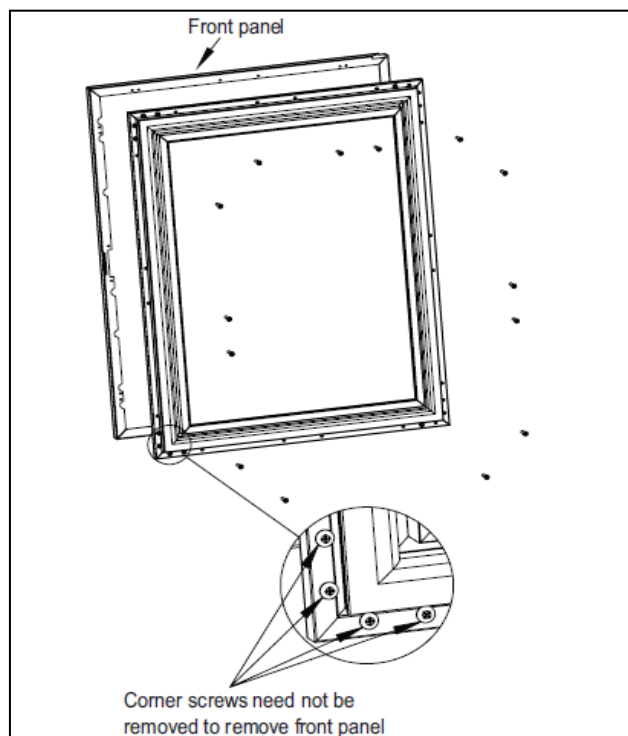
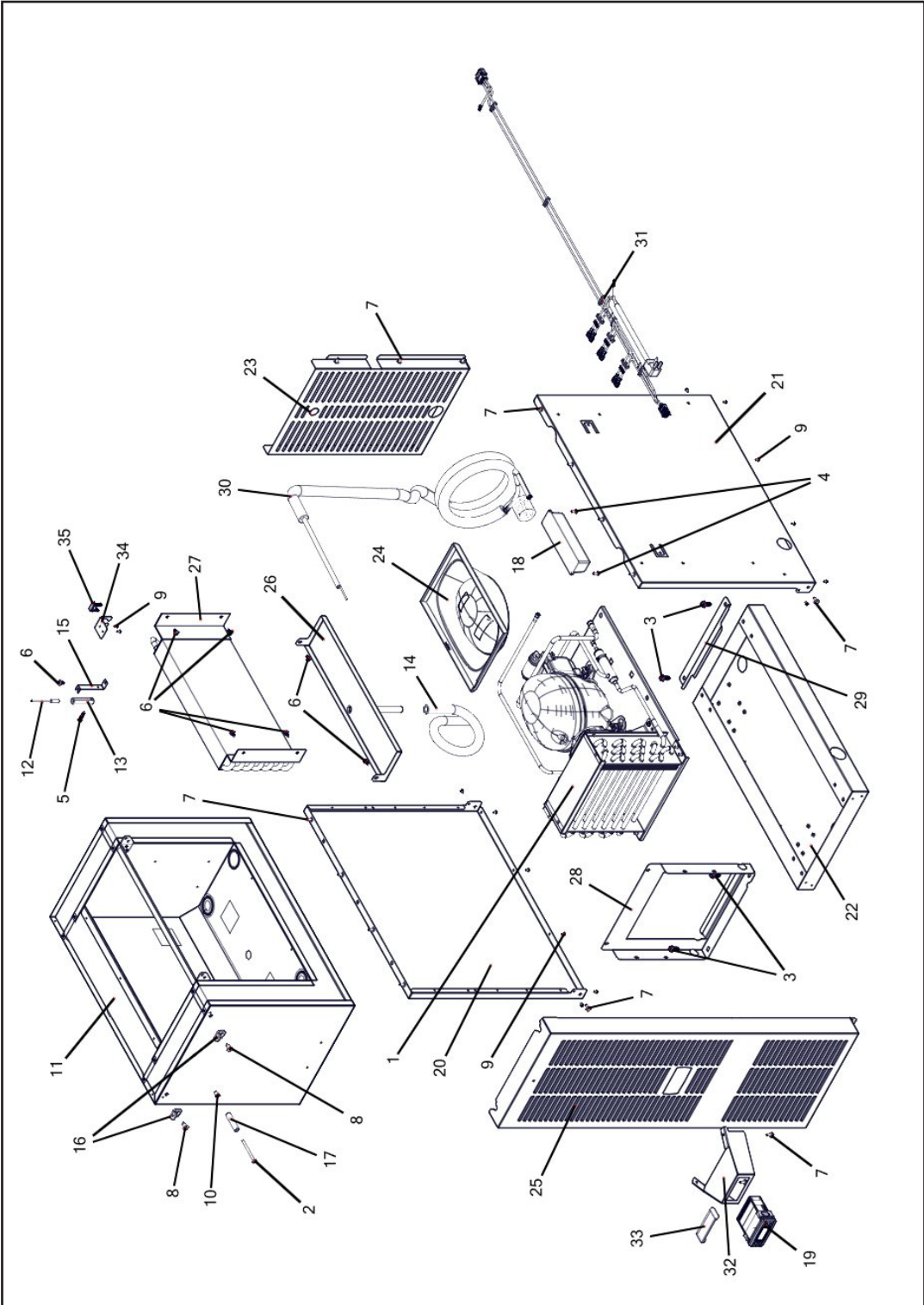


Figure 8-14. Custom Panel

9.0 Replacement Parts

For parts ordering call (844) 411-8050.

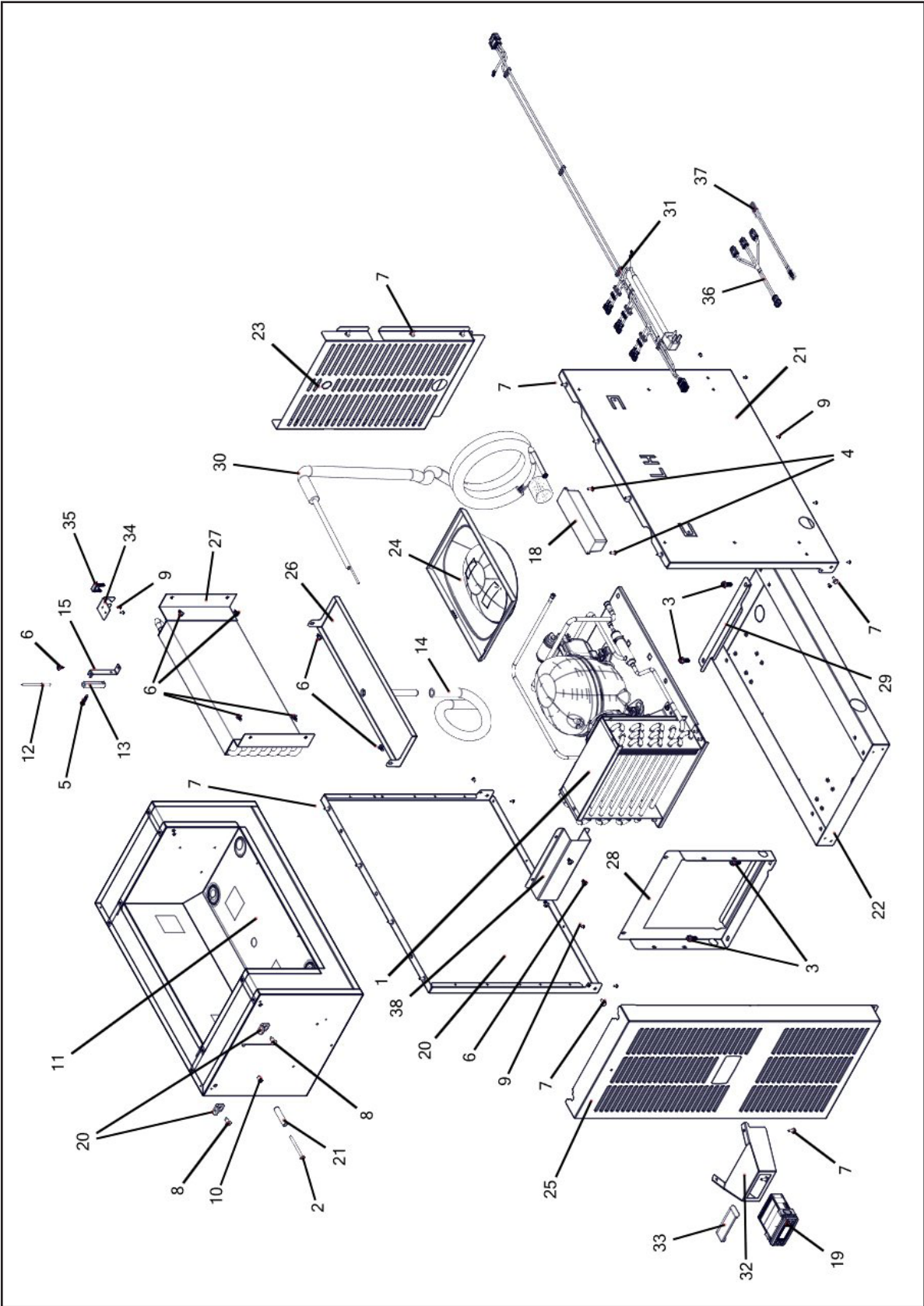
9.1 Refrigeration Module (BBS, BBSN, PTS, SDBS, SDPS, DDS, DDC Model Series)





BBS, BBSN, PTS, SDBS, SDPS, DDS, DDC MODELS				
ITEM NUMBER	DESCRIPTION	1-DOOR QTY.	2-DOOR QTY.	3&4-DOOR QTY.
01	Condensing Unit, 1/6 H.P. 115V	1	-	-
01	Condensing Unit, 1/5 H.P., 115V	-	1	-
01	Condensing Unit, 1/4 H.P. 115V	-	-	1
02	Screw, Phillips Truss Head Machine	1	1	1
03	Screw, Thread Cutter, Hex Washer Head	4	4	4
04	Screw, Phillips Truss Head Sheet Metal	2	2	2
05	Screw, Phillips Pan Head Sheet Metal	1	1	1
06	Screw, Phillips Head	7	7	7
07	Screw, Sheet Metal	18	18	18
08	Screw	2	2	2
09	Rivet, Pop	14	14	14
10	Rivnut, Insert	1	1	1
11	Low Side Foamed Assembly	1	1	-
12	Probe, Temperature	1	1	1
13	Sleeve, Sensor Insulating	1	1	1
14	Tube, Drain, Evaporator Pan to Condenser Pan	1	1	1
15	Bracket, Temperature Sensor	1	1	1
16	Bracket, Top Pull Down	2	2	2
17	Standoff, Grille	1	1	1
18	LED Driver	1	1	1
19	Controller	1	1	1
20	Panel, Outer Side, High Side	1	1	1
21	Panel, Inner Side, High Side	1	1	1
22	Base, High Side	1	1	1
23	Cover, Back, High Side	1	1	1
24	Pan, Condensate, High Side	1	1	1
25	Grille, Front	1	1	1
26	Pan, Evaporator	1	1	1
27	Evaporator Fin Coil	1	1	1
28	Baffle, Compressor	1	1	1
29	Bracket, Compressor	1	1	1
30	L & S Line, 1 Door	1	-	-
30	L & S Line, 2 Door	-	1	-
30	L & S Line, 3 & 4 Door	-	-	1
31	Wire Harness, Refrigeration Module	1	1	1
32	Bracket, Controller Mounting	1	1	1
33	Drip Guard, Control	1	1	1
34	Bracket, Ratcheting Strain Relief	1	1	1
35	Strain Relief	1	1	1

9.2 Refrigeration Module (BBSLP Model Series)



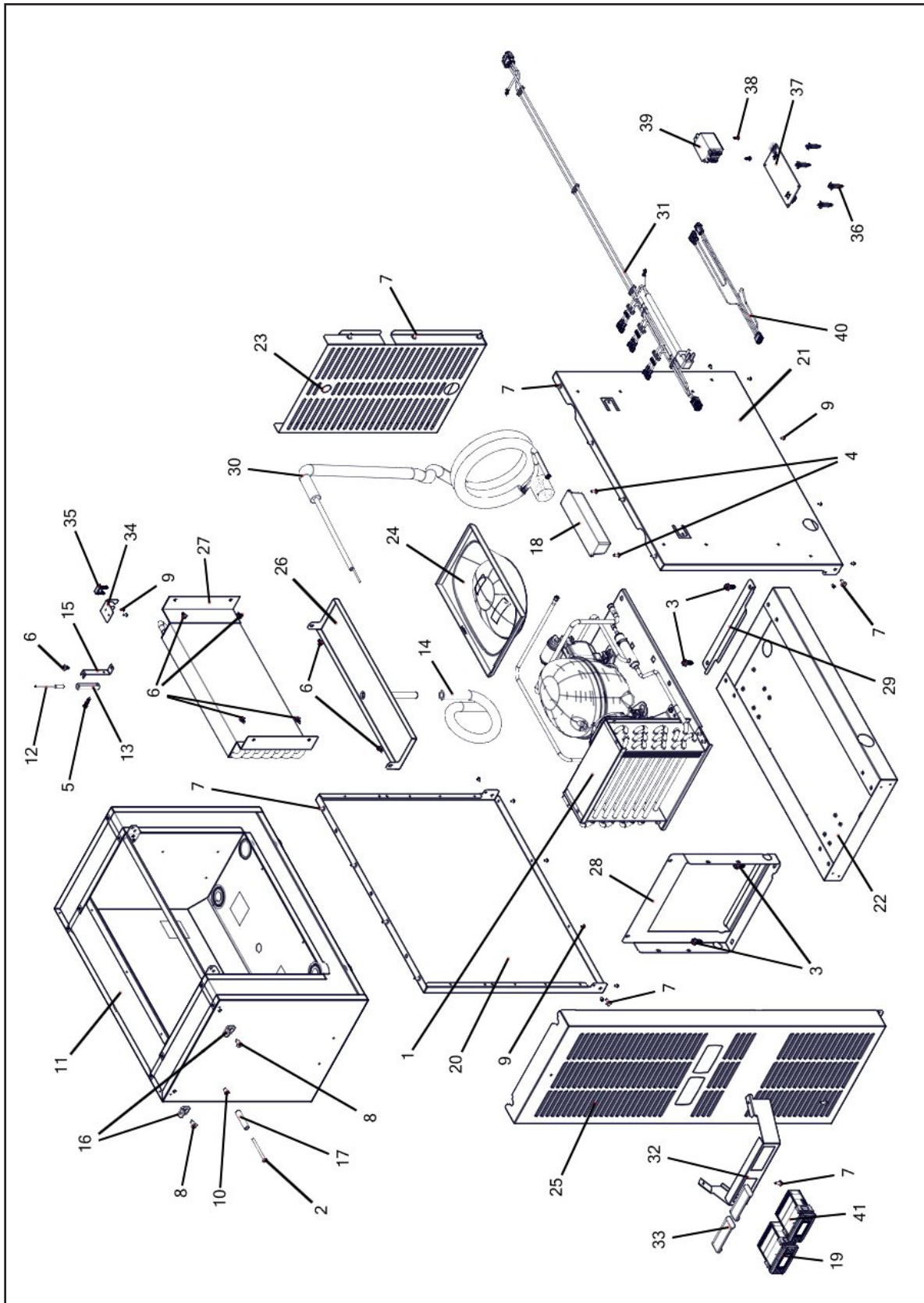


BBSLP MODELS				
ITEM NUMBER	DESCRIPTION	1-DOOR QTY.	2-DOOR QTY.	3&4-DOOR QTY.
01	Condensing Unit, 1/6 H.P. 115V	1	-	-
01	Condensing Unit, 1/5 H.P., 115V	-	1	-
01	Condensing Unit, 1/4 H.P. 115V	-	-	1
02	Screw, Phillips Truss Head Machine	1	1	1
03	Screw, Thread Cutter, Hex Washer Head	4	4	4
04	Screw, Phillips Truss Head Sheet Metal	2	2	2
05	Screw, Phillips Pan Head Sheet Metal	1	1	1
06	Screw, Phillips Head	7	7	7
07	Screw, Sheet Metal	18	18	18
08	Screw	2	2	2
09	Rivet, Pop	14	14	14
10	Rivnut, Insert	1	1	1
11	Low Side Foamed Assembly	1	1	-
12	Probe, Temperature	1	1	1
13	Sleeve, Sensor Insulating	1	1	1
14	Tube, Drain, Evaporator Pan to Condenser Pan	1	1	1
15	Bracket, Temperature Sensor	1	1	1
16	Bracket, Top Pull Down	2	2	2
17	Standoff, Grille	1	1	1
18	LED Driver	1	1	1
19	Controller	1	1	1
20	Panel, Outer Side, High Side	1	1	1
21	Panel, Inner Side, High Side	1	1	1
22	Base, High Side	1	1	1
23	Cover, Back, High Side	1	1	1
24	Pan, Condensate, High Side	1	1	1
25	Grille, Front	1	1	1
26	Pan, Evaporator	1	1	1
27	Evaporator Fin Coil	1	1	1
28	Baffle, Compressor	1	1	1
29	Bracket, Compressor	1	1	1
30	L & S Line, 1 Door	1	-	-
30	L & S Line, 2 Door	-	1	-
30	L & S Line, 3 & 4 Door	-	-	1
31	Wire Harness, Refrigeration Module	1	1	1
32	Bracket, Controller Mounting	1	1	1
33	Drip Guard, Control	1	1	1



BBSLP MODELS				
ITEM NUMBER	DESCRIPTION	1-DOOR QTY.	2-DOOR QTY.	3&4-DOOR QTY.
34	Bracket, Ratcheting Strain Relief	1	1	1
35	Strain Relief	1	1	1
36	Harness, Fan Motors, Low height	-	-	1
37	Harness, 12VDC Splitter	1	1	1
38	Cover, 60W Driver, Low height	1	1	1

9.3 Refrigeration Module (DZS Model Series)



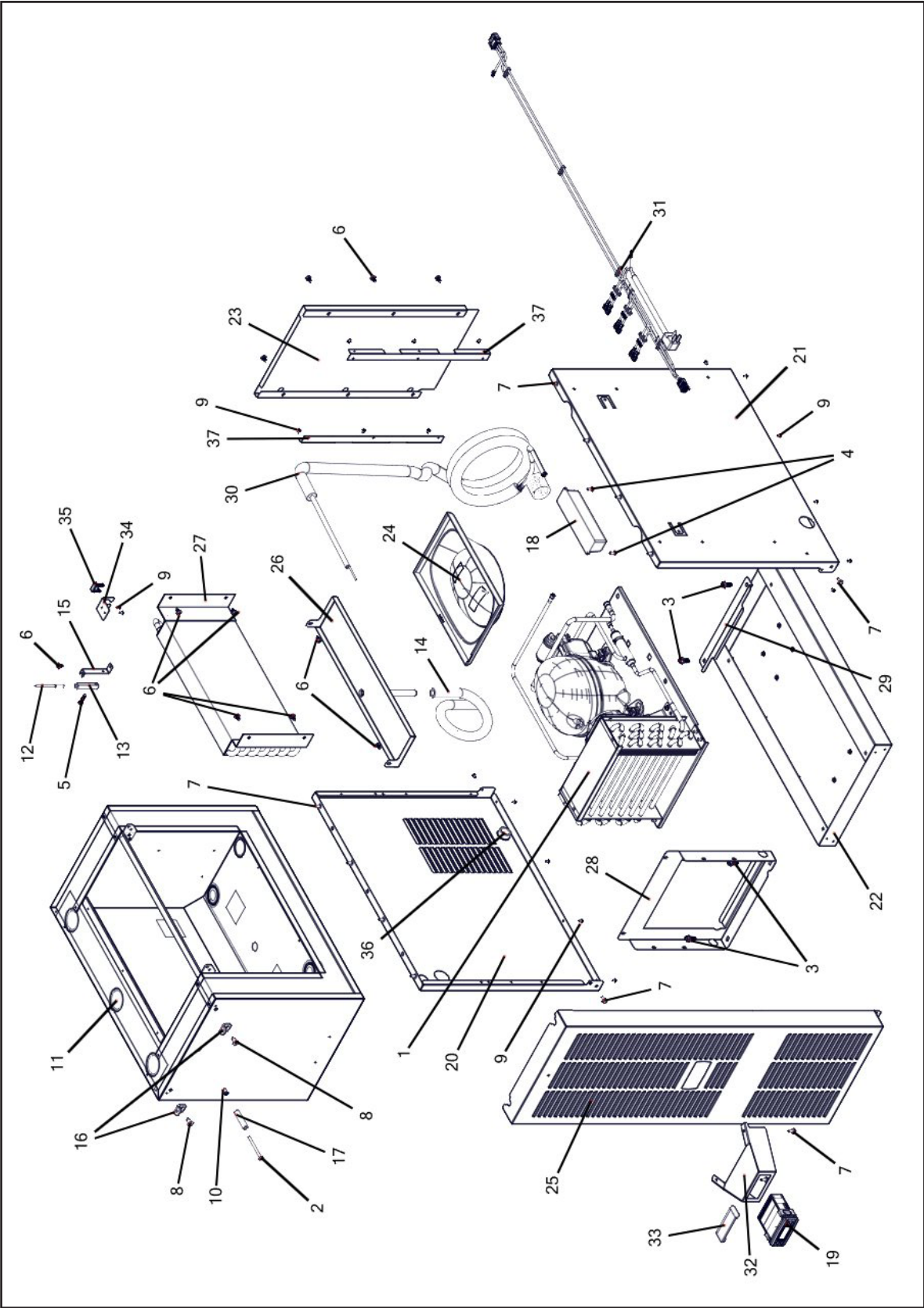


DZS MODELS				
ITEM NUMBER	DESCRIPTION	QTY.	2-DOOR QTY.	3&4-DOOR QTY.
01	Condensing Unit, 1/6 H.P. 115V	1	-	-
01	Condensing Unit, 1/5 H.P., 115V	-	1	-
02	Screw, Phillips Truss Head Machine	1	1	1
03	Screw, Thread Cutter, Hex Washer Head	4	4	4
04	Screw, Phillips Truss Head Sheet Metal	2	2	2
05	Screw, Phillips Pan Head Sheet Metal	1	1	1
06	Screw, Phillips Head	7	7	7
07	Screw, Sheet Metal	18	18	18
08	Screw	2	2	2
09	Rivet, Pop	14	14	14
10	Rivnut, Insert	1	1	1
11	Low Side Foamed Assembly	1	1	-
12	Probe, Temperature	1	1	1
13	Sleeve, Sensor Insulating	1	1	1
14	Tube, Drain, Evaporator Pan to Condenser Pan	1	1	1
15	Bracket, Temperature Sensor	1	1	1
16	Bracket, Top Pull Down	2	2	2
17	Standoff, Grille	1	1	1
18	LED Driver	1	1	1
19	Controller	1	1	1
20	Panel, Outer Side, High Side	1	1	1
21	Panel, Inner Side, High Side	1	1	1
22	Base, High Side	1	1	1
23	Cover, Back, High Side	1	1	1
24	Pan, Condensate, High Side	1	1	1
25	Grille, Front	1	1	1
26	Pan, Evaporator	1	1	1
27	Evaporator Fin Coil	1	1	1
28	Baffle, Compressor	1	1	1
29	Bracket, Compressor	1	1	1
30	L & S Line, 1 Door	1	-	-
30	L & S Line, 2 Door	-	1	-
30	L & S Line, 3 & 4 Door	-	-	1
31	Wire Harness, Refrigeration Module	1	1	1
32	Bracket, Controller Mounting	1	1	1
33	Drip Guard, Control	1	1	1
34	Bracket, Ratcheting Strain Relief	1	1	1



DZS MODELS				
ITEM NUMBER	DESCRIPTION	QTY.	2-DOOR QTY.	3&4-DOOR QTY.
35	Strain Relief	1	1	1
36	Nylon, Standoff	4	4	4
37	Controller Board, Damper, Dual Zone	1	1	1
38	Screw, Sheet metal, 6 x 1/2", "a"	2	2	2
39	Relay, Pump	1	1	1
40	Harness Controller Board, Input Damper	1	1	1
41	Control, Red Display	1	1	1

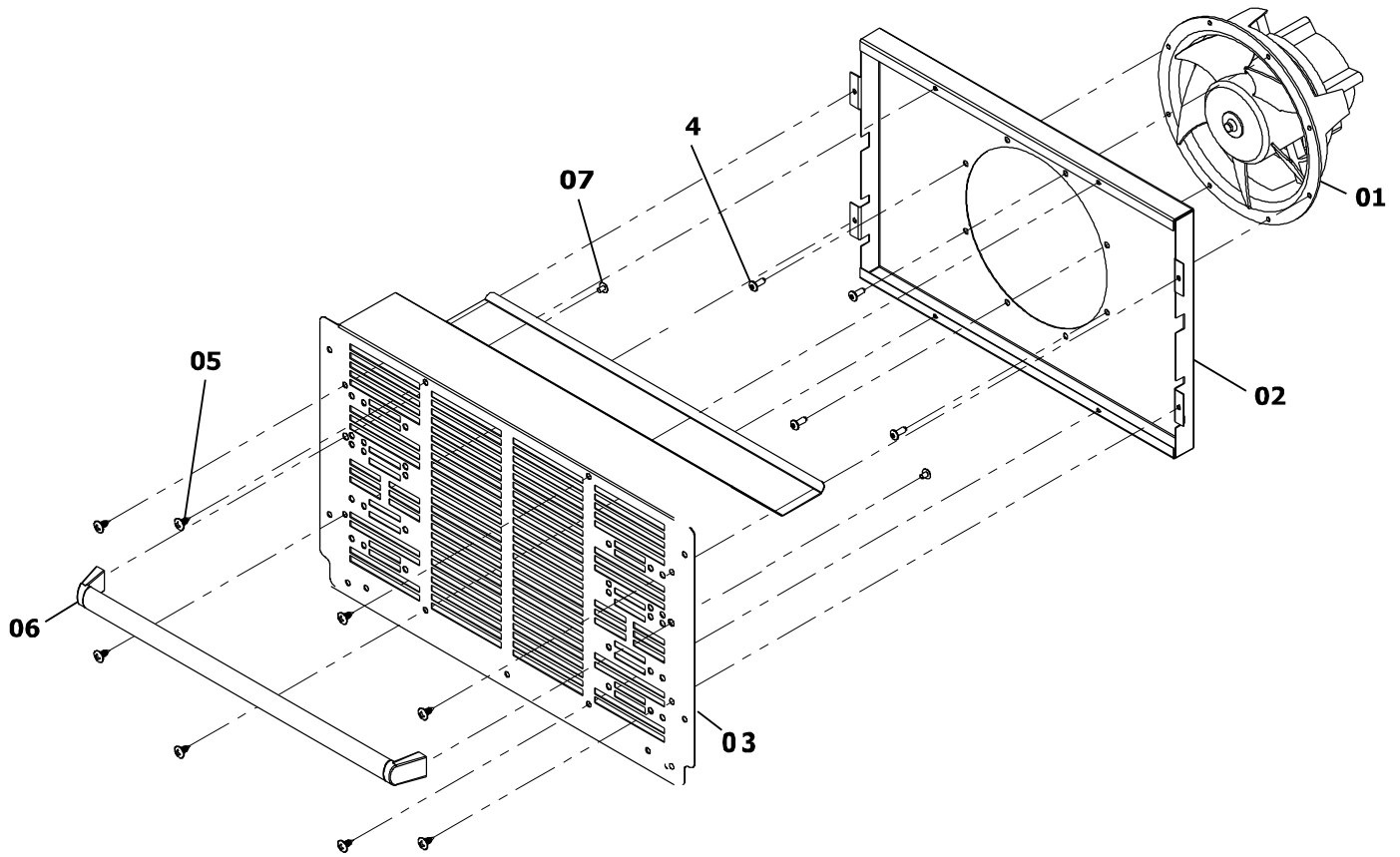
9.4 Refrigeration Module (DDS-IR Model Series)





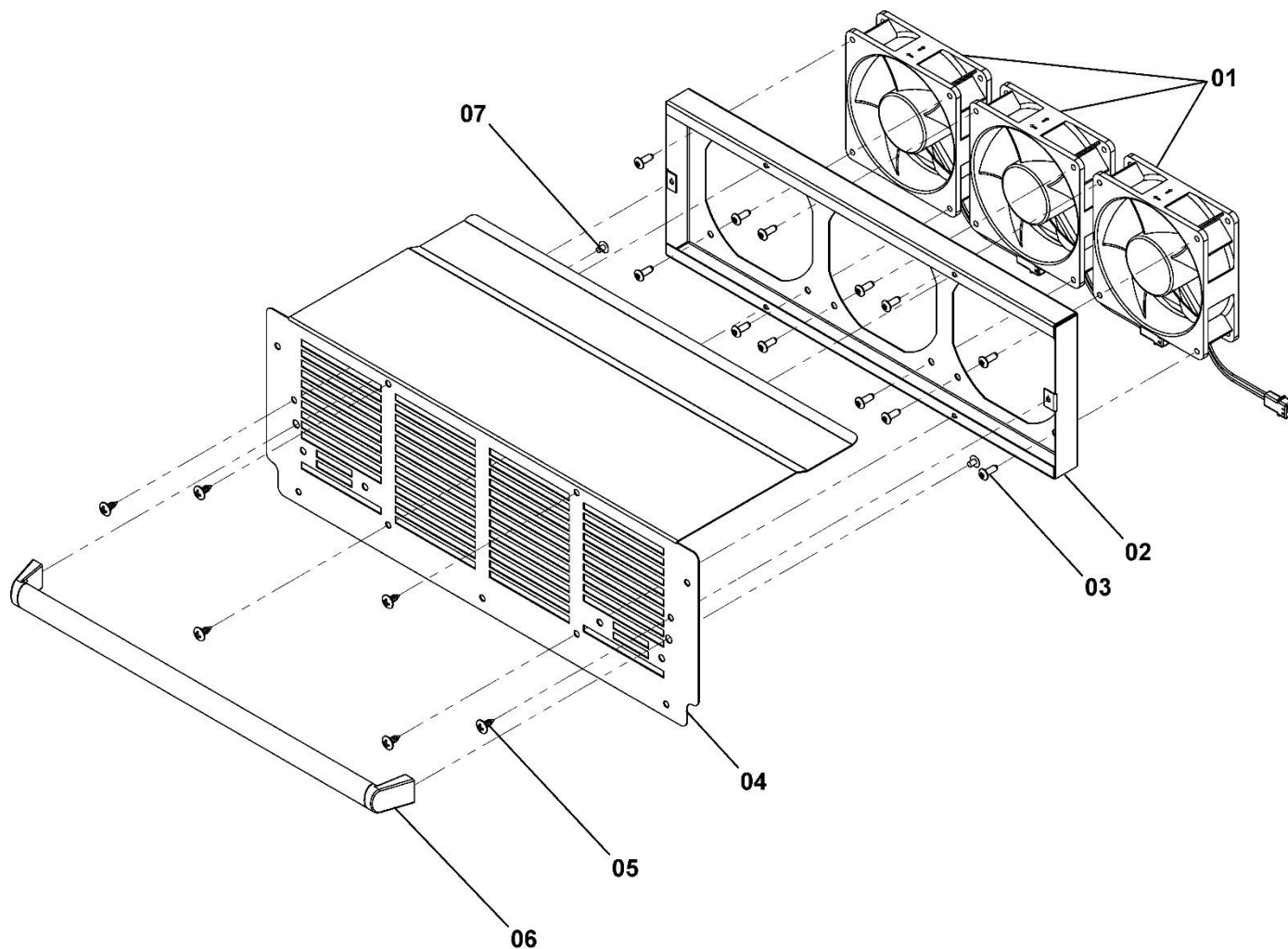
DDS-IR MODELS			
ITEM NUMBER	DESCRIPTION	2-DOOR QTY.	3&4-DOOR QTY.
01	Condensing Unit, 1/5 H.P., 115V	1	-
01	Condensing Unit, 1/4 H.P. 115V	-	1
02	Screw, Phillips Truss Head Machine	1	1
03	Screw, Thread Cutter, Hex Washer Head	4	4
04	Screw, Phillips Truss Head Sheet Metal	2	2
05	Screw, Phillips Pan Head Sheet Metal	1	1
06	Screw, Phillips Head	19	19
07	Screw, Sheet Metal	12	12
08	Screw	2	2
09	Rivet, Pop	14	14
10	Rivnut, Insert	1	1
11	Low Side Foamed Assembly	1	-
12	Probe, Temperature	1	1
13	Sleeve, Sensor Insulating	1	1
14	Tube, Drain, Evaporator Pan to Condenser Pan	1	1
15	Bracket, Temperature Sensor	1	1
16	Bracket, Top Pull Down	2	2
17	Standoff, Grille	1	1
18	LED Driver	1	1
19	Controller	1	1
20	Panel, Outer Side, High Side	1	1
21	Panel, Inner Side, High Side	1	1
22	Base, High Side	1	1
23	Cover, Back, High Side	1	1
24	Pan, Condensate, High Side	1	1
25	Grille, Front	1	1
26	Pan, Evaporator	1	1
27	Evaporator Fin Coil	1	1
28	Baffle, Compressor	1	1
29	Bracket, Compressor	1	1
30	L & S Line, 2 Door	1	-
30	L & S Line, 3 & 4 Door	-	1
31	Wire Harness, Refrigeration Module	1	1
32	Bracket, Controller Mounting	1	1
33	Drip Guard, Control	1	1
34	Bracket, Ratcheting Strain Relief	1	1
35	Strain Relief	1	1
36	Snap Bushing, 1"	1	1
37	Bracket, Mounting, Back Panel	2	2

9.5 Fan Motor Assembly Parts (Self-Contained Model Series)



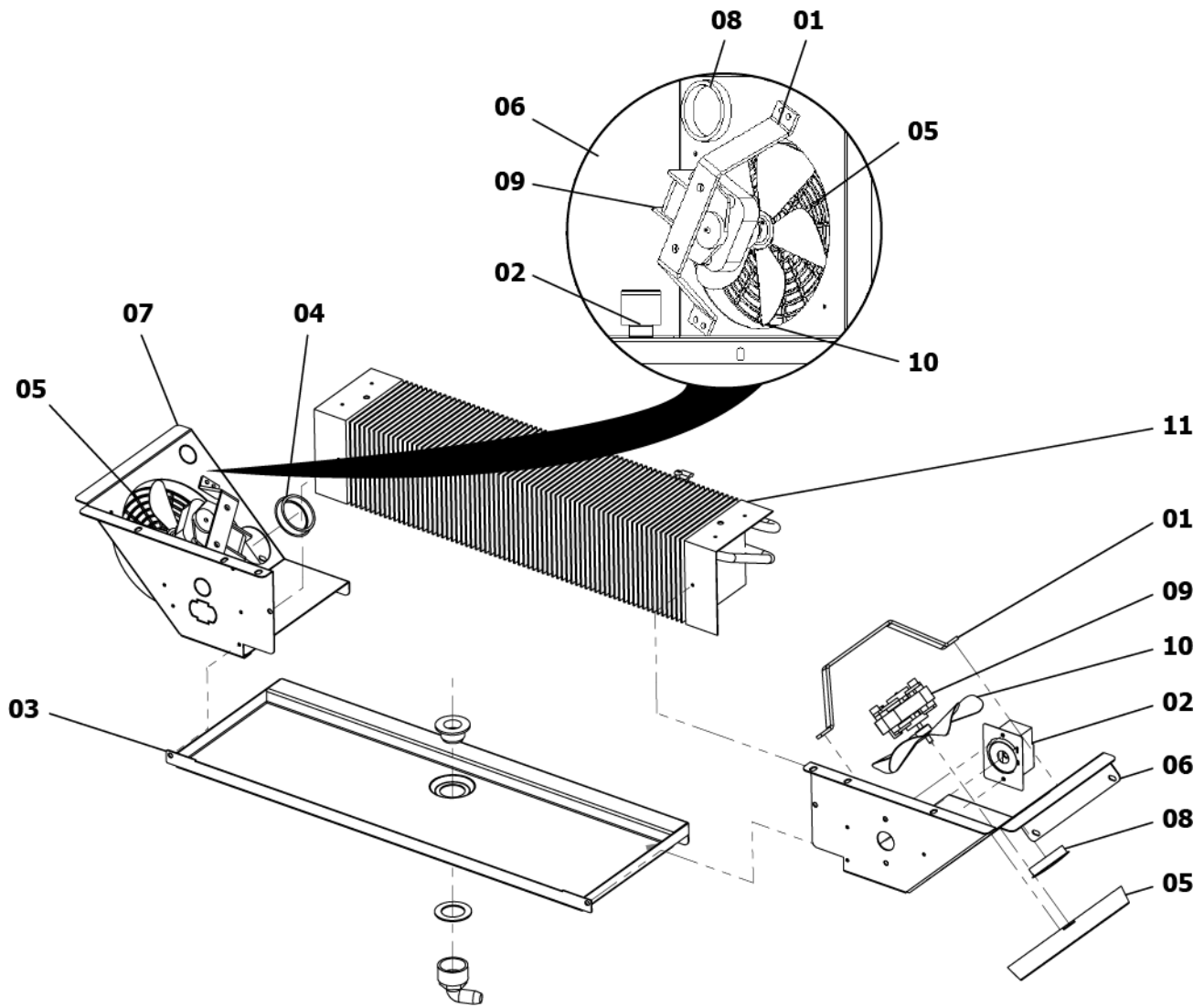
SELF-CONTAINED MODELS		
ITEM NUMBER	DESCRIPTION	QTY.
01	Motor, Fan	1
02	Panel, Fan Mounting	1
03	Panel, Inner Grille	1
04	Screw, Motor Mounting	4
05	Screw, Grille Mounting	8
06	Guard, Product	1
07	Screw, Guard Mounting	2

9.6 Low Profile Evaporator Parts (BBSLP Model Series)



LOW PROFILE MODELS		
ITEM NUMBER	DESCRIPTION	QTY.
01	Fan, Evaporator	3
02	Panel, Fan Mounting	1
03	Screw, Fan Mounting	12
04	Grille	1
05	Screw, Grille Mounting	2
06	Handle, Guard	6
07	Screw, Guard Handle Mounting	2

9.7 Remote Evaporator Parts (BBR, BBRN, PTR, SDBR & BBRLP Model Series)



REMOTE MODELS		
ITEM NUMBER	DESCRIPTION	QTY.
01	Motor, Fan	1
02	Panel, Fan Mounting	1
01	Bracket, Fan	2
02	Control, Temperature	1
03	Pan, Evaporator	1
04	Bushing, 1.75" I.D.	1
05	Guard, Plastic Fan	2



REMOTE MODELS		
ITEM NUMBER	DESCRIPTION	QTY.
06	Fan Panel, Evaporator (Right)	1
07	Fan Panel, Evaporator (Left)	1
08	Plug, Dome	1
09	Motor, Fan	2
10	Blade, Fan	2
11	Evaporator Assembly	1
	Coil, 21" Fin	1
	Tube, Evaporator Outlet	1
	Tube, Evaporator Inlet	1
	Clamp, Control Bulb	1
12	Silicone	-



NOTES



NOTES



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