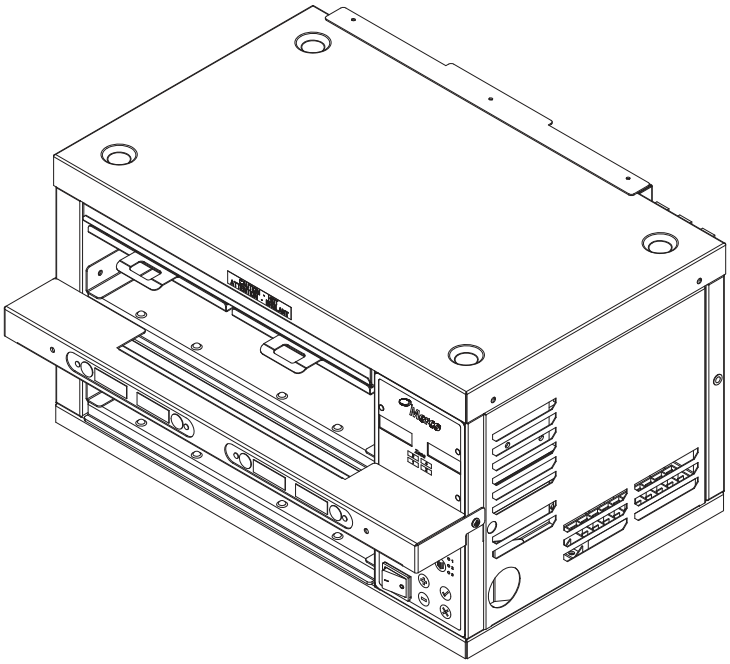
Forced Air Holding Cabinet
Original Instructions

Service Manual
This manual is updated as new information and models are released. Visit our website for the latest manual.



Part Number MHCFA_Service Manual 03/16

Safety Notices

⚠Warning

Read this manual thoroughly before operating, installing or performing maintenance on the equipment. Failure to follow instructions in this manual can cause property damage, injury or death.

⚠ DANGER

Do not install or operate equipment that has been misused, abused, neglected, damaged, or altered/ modified from that of original manufactured specifications.

⚠ DANGER

Keep power cord AWAY from HEATED surfaces. DO NOT immerse power cord or plug in water. DO NOT let power cord hang over edge of table or counter.

⚠ DANGER

To avoid pacemaker malfunction, consult physician or pacemaker manufacture about effects of microwave energy on pacemaker.

⚠Warning

Authorized Service Representatives are obligated to follow industry standard safety procedures, including, but not limited to, local/national regulations for disconnection / lock out / tag out procedures for all utilities including electric, gas, water and steam.

⚠Warning

Do Not Store Or Use Gasoline Or Other Flammable Vapors Or Liquids In The Vicinity Of This Or Any Other Appliance. Never use flammable oil soaked cloths or combustible cleaning solutions, for cleaning.

⚠Warning

This product contains chemicals known to the State of California to cause cancer and/or birth defects or other reproductive harm. Operation, installation, and servicing of this product could expose you to airborne particles of glasswool or ceramic fibers, crystalline silica, and/or carbon monoxide. Inhalation of airborne particles of glasswool or ceramic fibers is known to the State of California to cause cancer. Inhalation of carbon monoxide is known to the State of California to cause birth defects or other reproductive harm.

⚠Warning

Do not use electrical appliances or accessories other than those supplied by the manufacturer.

⚠Warning

Use caution when handling metal surface edges of all equipment.

⚠Warning

This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision concerning use of the appliance by a person responsible for their safety. Do not allow children to play with this appliance.

⚠Warning

DO NOT use this product near water – for example, near a kitchen sink, in a wet basement, near a swimming pool, or similar locations.

NOTE: Proper installation, care and maintenance are essential for maximum performance and trouble-free operation of your equipment. Visit our website www.mtwkitchencare.com for manual updates, translations, or contact information for service agents in your area.

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Section 1
General Information

Model Numbers

Domestic Models
MHCFA22
MHCFA23
MHCFA24
MHCFA34

Export Item/SKU	Export Models
MHCFA22EX	MHCFA22
MHCFA23EX	MHCFA23
MHCFA24EX	MHCFA24
MHCFA34EX	MHCFA34
MHCFA42EX	MHCFA42

Model Suffix							
Suffix	Control Box		Time Bar			Sided	
	Primary	Secondary	None	R/G Light	A/N	Single	Dual
BP1	X		X			X	
BP2	X		X				X
BS1		X	X			X	
BS2		X	X				X
BP1R	X			X		X	
BP2R	X			X			X
BS1R*		X		X		X	
BS2R*		X		X			X
BP1A	X				X	X	
BP2A	X				X		X
BS1A		X			X	X	
BS2A		X			X		X

NOTE: * Suffixes are not available for MHCFA34 and MHCFA34EX.

Serial Number Information

MHCFA holding cabinet serial and model numbers are located on the data plate. Data plates are located on the bottom and the right end of the unit.

Always have the serial number of your unit available when calling for parts or service.

For ICC time bar and kitchen minder connection questions and issues call - ICC Tech Division 631-673-5100 or 877-422-8788 (North America only).

Warranty Information

Visit http://www.mercoproducts.com/minisite/service/warranty_info to:

- Register your product for warranty.
- Verify warranty information.
- View and download a copy of your warranty.

Regulatory Certifications

Domestic Models are certified by:

- Underwriters Laboratories Sanitation
- Underwriters Laboratories (UL)
- Underwriters Laboratories of Canada (CUL)

Export Models are certified by:

- Underwriters Laboratories Sanitation
- European Conformity
- Technical Inspection Association

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Section 2
Installation

⚠ DANGER

Installation must comply with all applicable fire and health codes in your jurisdiction.

⚠ DANGER

Legs must be installed and the legs must be screwed in completely.

⚠ DANGER

Use appropriate safety equipment during installation and servicing.

⚠ Warning

Only trained and authorized service personnel or store manager should access the service screens. If changes to these settings are made incorrectly they will cause the unit to malfunction.

Location

⚠ Warning

This equipment must be positioned so that the plug is accessible unless other means for disconnection from the power supply (e.g., circuit breaker or disconnect switch) is provided.

⚠ Warning

Adequate means must be provided to limit the movement of this appliance without depending on or transmitting stress to the electrical conduit or gas lines.

⚠ Warning

To avoid instability the installation area must be capable of supporting the combined weight of the equipment and product. Additionally the equipment must be level side to side and front to back.

⚠ Warning

This equipment is intended for indoor use only. Do not install or operate this equipment in outdoor areas.

⚠ Caution

Do not position the air intake vent near steam or heat exhaust of another appliance.

The location selected for the equipment must meet the following criteria. If any of these criteria are not met, select another location.

- Holding cabinets are intended for indoor use only.
- The location MUST be level, stable and capable of supporting the weight of the equipment.
- The location MUST be free from and clear of combustible materials.
- Equipment MUST be level both front to back and side to side.
- Position the equipment so it will not tip or slide.
- Recommended air temperature is 41° - 86°F (5° - 30°C) .
- Proper air supply for ventilation is REQUIRED AND CRITICAL for safe and efficient operation. Refer to Clearance Requirements chart on page 8.
- Do not obstruct the flow of ventilation air. Make sure the air vents of the equipment are not blocked.

Weight of Equipment

Domestic Model	Export Item/SKU	Weight
MHCFA22	MHCFA22EX	40lbs/18kg
MHCFA23	MHCFA23EX	65lbs/29kg
MHCFA24	MHCFA24EX	85lbs/39kg
MHCFA34	MHCFA34EX	125lbs/57kg
	MHCFA42EX	85lbs/39kg

Clearance Requirements

⚠ DANGER

Minimum clearance requirements are the same for noncombustible locations as for combustible locations. The flooring under the appliance must be made of a noncombustible material.

⚠ DANGER

Risk of fire/shock. All minimum clearances must be maintained. Do not obstruct vents or openings.

Sides/Back
1.0" (25mm)

Dimensions

Domestic Model, Export Item/SKU	Length	Depth	Height
MHCFA22, MHCFA22EX	19.56" (497mm)	12.31" (313mm)	11.24" (285mm)
MHCFA23, MHCFA23EX	29.57" (751mm)	12.31" (313mm)	11.24" (285mm)
MHCFA24, MHCFA24EX	36.45" (926mm)	12.31" (313mm)	11.24" (285mm)
MHCFA34, MHCFA34EX	36.45" (926mm)	12.31" (313mm)	15.70" (399mm)
MHCFA42EX	19.56" (497mm)	12.31" (313mm)	20.32" (516mm)

Electrical Service

⚠ DANGER

Check all wiring connections, including factory terminals, before operation. Connections can become loose during shipment and installation.

⚠ DANGER

Copper wire suitable for at least 167°F (75°C) must be used for power connections.

⚠ Warning

This appliance must be grounded and all field wiring must conform to all applicable local and national codes. Refer to rating plate for proper voltage. It is the responsibility of the end user to provide the disconnect means to satisfy the authority having jurisdiction.

VOLTAGE, WATTS, RATED AMPERAGES & POWER CORD CHART

All electrical work, including wire routing and grounding, must conform to local, state and national electrical codes. The following precautions must be observed:

- The equipment must be grounded.
- A separate fuse/circuit breaker must be provided for each unit.
- A qualified electrician must determine proper wire size dependent upon location, materials used and length of run (minimum circuit ampacity can be used to help select the wire size).
- The maximum allowable voltage variation is ±10% of the rated voltage at equipment start-up (when the electrical load is highest).
- Check all green ground screws, cables and wire connections to verify they are tight before start-up.

Units with plugs are supplied with approximately 9ft cords, maximum 10ft.

Domestic Model	Voltage, Cycle, Phase	Watts	Amps	Plug
MHCFA22	120, 60, 1	1920	16.0	5-20P
MHCFA23	208-230, 60, 1	3174	13.8	6-20P
MHCFA24	208-230, 60, 1	3680	16.0	6-20P
MHCFA34	208, 60, 1	3120	15.0	6-20P

Export Item/SKU	Voltage, Cycle, Phase	Watts	Amps	Plug
MHCFA22EX	200-240, 50/60, 1	2472	9.9-10.3	Varies per destination
MHCFA23EX	200-240, 50/60, 1	2856	11.4-11.9	Varies per destination
MHCFA24EX	200-240, 50/60, 1	2784	9.8-11.6	16A pin/sleeve (IEC-60309 16A, 3-pin plug)
MHCFA34EX	200-240, 50/60, 1	3072	10.1-12.8	16A pin/sleeve (IEC-60309 16A, 3-pin plug)
MHCFA42EX	200-240, 50/60, 1	2784	9.8-11.6	16A pin/sleeve (IEC-60309 16A, 3-pin plug)

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Section 3
Operation

⚠ DANGER

The on-site supervisor is responsible for ensuring that operators are made aware of the inherent dangers of operating this equipment.

⚠ DANGER

Do not operate any appliance with a damaged cord or plug. All repairs must be performed by a qualified service company.

⚠ DANGER

Never stand on the unit! They are not designed to hold the weight of an adult, and may collapse or tip if misused in this manner.

⚠ Warning

Do not contact moving parts.

⚠ Warning

All covers and access panels must be in place and properly secured, before operating this equipment.

⚠ Warning

Liquids such as water, coffee, or tea can be overheated beyond the boiling point without appearing to be boiling due to surface tension of the liquid. Visible bubbling or boiling when the container is removed from the microwave oven is not always present. THIS COULD RESULT IN VERY HOT LIQUIDS SUDDENLY BOILING OVER WHEN A SPOON OR OTHER UTENSIL IS INSERTED INTO THE LIQUID. To reduce the risk of injury to persons: Do not overheat the liquid. Stir the liquid both before and halfway through heating it.

⚠ Warning

Do not heat sealed containers or plastic bags in oven. Food or liquid could expand quickly and cause container or bag to break. Pierce or open container or bag before heating.

⚠ Warning

Racks, utensils, rack guides, and oven surfaces may become hot during or after use. Use utensils or protective clothing, like pan grips or dry oven mitts, when necessary to avoid burns.

⚠ Warning

DO NOT use the cavity for storage. DO NOT leave paper products, cooking utensils, or food in the cavity when not in use.

⚠ Caution

Do not block the supply and return air grills or the air space around the air grills. Keep plastic wrappings, paper, labels, etc. from being airborne and lodging in the grills. Failure to keep the air grills clear will result in unsatisfactory operation of the system.

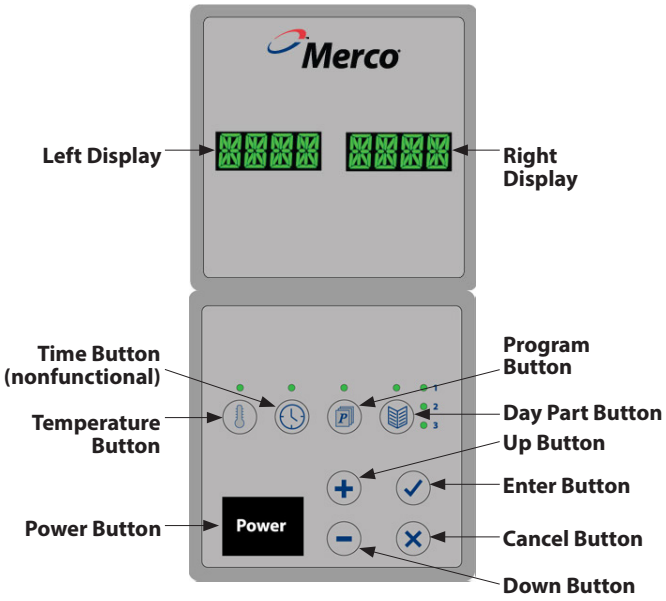
⚠ Caution

Some products such as whole eggs or sealed containers – for example, closed glass jars – are able to explode and SHOULD NOT be HEATED in this oven. Pressure may build up and erupt. Pierce yolk with fork or knife before cooking. Pierce skin of potatoes, tomatoes, and similar foods before cooking with microwave energy. When skin is pierced, steam escapes evenly.

⚠ Caution

DO NOT cover racks or any other part of the oven with metal foil. Airflow restriction will cause overheating of the oven.

Control Panel



Controls/Programming/Settings

The Merco Holding Cabinet has been designed to afford foodservice operators the ability to cook menu components in advance and then gently store that product in the holding bins until an order is received. Once that order has been placed, the crew can assemble the order using hot and fresh menu components from the holding bins. This allows for operators to serve to order, helping increase speed of service while maintaining high product quality standards.

The holding bin controller is, at all times, operating in one of the following modes. The indents indicate the sub-modes. Sub-modes are defined based on the navigation to the mode. I.e., to get to diagnostic mode you must be in active heating mode then enter programming mode.

- Pre-Heat Mode
- Active Heating Mode
  - Programming Mode
    - » Diagnostic Mode
  - Temperature View Mode
    - » Service Temperature Mode

PRE-HEAT MODE

The displays shall scroll the message Pre-Heating repeatedly during pre-heat mode. The LED corresponding to the active Day Part menu configuration will be on. Once a heater has reached 180°F (82°C), it will be regulated to the set point. The PRE-HEAT mode will be terminated when all of the heaters have reached 180°F (82°C) OR 15 minutes have passed.

During Pre-Heat mode, all button presses will be ignored except the check mark button. If the check mark button is pressed and held for (3) seconds, the displays will scroll the message, Cancel Pre-Heat? If the check mark button is pressed again, the unit will Cancel the Pre-Heat mode and enter Active Heating Mode. If the cancel (X) button is pressed, the unit shall return to Pre-Heat Mode.

ACTIVE HEATING MODE

This is the active heating mode of operation. In active heating mode the displays will be blank and the day part LED light will be ON.

Typical Operator Actions

Action	Instructions
Turn Unit On	Push Power button.
Load bin with product	Pull out tray, load product and reinsert tray.
Empty bin	Pull out tray and remove product. Reinsert tray.

When the unit is first powered ON, the software version will scroll across the display. It will then begin to preheat. Allow it to preheat for 15 minutes, the display will scroll Preheating.

During active heating mode, press enter to scroll the software version on the display.

PROGRAMMING MODE

Press the program button to enter the programming mode. Zone and temperature will display. The zone will flash, press the up or down button to reach the desired zone. Press the day part button until the desired day part LED is ON. Press the temperature button and both the zone and temperature will flash. Press the up or down button to reach the desired temperature. The program button LED light will flash, indicating a program change has occurred. Press enter or the temperature button to return to the zone selection, the zone will flash. Press the program button to exit.

DIAGNOSTIC MODE

From Programming mode, press the program button and hold for 3 seconds to enter Diagnostic Mode.

The software shall track the state of each thermocouple and the state of the thermocouple reading compared to the set point.

If the software finds an error, it will begin to time it. When the timer reaches 15 minutes, an error code(s) will display (flash) on the screen. This shall continue indefinitely.

Turning Off and On a unit will clear all TC State Display flags and reset all TC temp timer's to 0.

TC Display Codes			
Left Display	**Right Display**		
ZaEr	**b_cd**		
a	**b**	**c**	**d**
Zone Location with Error	**Section of Zone with Error**	**Thermocouple State**	**Thermocouple reading compared to Set point**
1 2 3 4 5 6 7 8	U=Upper L=Lower	0 = Ok 1 = Shorted 2 = Open	0 = Within Range 1 = Below Range 2 = Above Range

TEMPERATURE VIEW MODE

Enter the temperature view mode by pressing the temperature button. The average temperature in the first zone will be displayed. Press the up or down button to scroll through zones. Zones progress from left to right, top to bottom. Press the temperature button or the cancel button to exit.

TEMPERATURE SERVICE MODE

Press the temperature button or when already in the temperature view mode press and the hold temperature button to display the actual thermocouple temperature. This is called the temperature service mode. Press the up or down button to scroll through zones. U stands for upper, L for lower. Press the temperature button or the cancel button to exit.

During temperature service mode if the DOWN button is held for 3 seconds the temperature display shall be replaced with the word OFF, and the zone shall be considered OFF. If a zone is considered OFF, the triac outputs shall be set to off regardless of the thermocouple feedback for that zone. No alarms shall be initiated for a zone that is off.

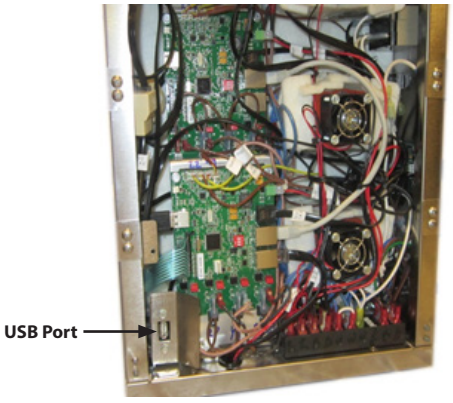
TIME BUTTON

The time button has no function currently. Time will be displayed on the Timer Bar.

LOAD NEW SOFTWARE VIA USB

Firmware file must be loaded onto the top level of USB instead of in a folder.

While the unit is OFF, insert the new software USB into the port. Turn the unit ON by pushing the power button. The unit will detect the software and begin installation. The display will scroll Updating Firmware, then Preheating. When Preheating is scrolling it is clear to remove the USB.



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Section 4
Maintenance

⚠ DANGER

All utility connections and fixtures must be maintained in accordance with Local and national codes.

⚠ DANGER

It is the responsibility of the equipment owner to perform a Personal Protective Equipment Hazard Assessment to ensure adequate protection during maintenance procedures.

⚠ DANGER

Failure to disconnect the power at the main power supply disconnect could result in serious injury or death. The power switch DOES NOT disconnect all incoming power.

⚠ DANGER

Always discharge the ht capacitors before working on the oven using a suitably insulated 10mo resistor.

⚠ DANGER

Disconnect electric power at the main power disconnect for all equipment being serviced. Observe correct polarity of incoming line voltage. Incorrect polarity can lead to erratic operation.

⚠ Warning

When using cleaning fluids or chemicals, rubber gloves and eye protection (and/or face shield) must be worn.

⚠ Caution

Maintenance and servicing work other than cleaning as described in this manual must be done by an authorized service personnel.

Cleaning and Sanitizing Procedures

GENERAL

You are responsible for maintaining the equipment in accordance with the instructions in this manual. Maintenance procedures are not covered by the warranty.

Maintenance	Daily	After Prolonged Shutdown	At Start-Up
Exterior	X	X	X
Interior	X	X	X
Holding Bin, Bin Lid & Jet Plate	X	X	X
Plastic Tray	X	X	X

EXTERIOR CLEANING

⚠ Warning

Never use a high-pressure water jet for cleaning or hose down or flood interior or exterior of units with water. Do not use power cleaning equipment, steel wool, scrapers or wire brushes on stainless steel or painted surfaces.

⚠ Caution

Never use an acid based cleaning solution on exterior panels! Many food products have an acidic content, which can deteriorate the finish. Be sure to clean the stainless steel surfaces of ALL food products.

The stainless steel outer case requires nothing more than a daily wiping with a damp cloth. If, however, an excessive amount of food particles/grease are allowed to collect, a non-abrasive cleaner (hot sudsy water) may be used. Wipe dry with a clean, soft cloth.

Always rub with the "grain" of the stainless steel to avoid marring the finish. Never use steel wool or abrasive pads for cleaning. Never use chlorinated, citrus based or abrasive cleaners.

Stainless steel exterior panels have a clear coating that is stain resistant and easy to clean. Products containing abrasives will damage the coating and scratch the panels. Daily cleaning may be followed by an application of stainless steel cleaner which will eliminate water spotting and fingerprints. Early signs of stainless steel breakdown are small pits and cracks. If this has begun, clean thoroughly and start to apply stainless steel cleaners in attempt to restore the steel.

INTERIOR CLEANING

⚠Caution

Do not use caustic cleaners on any part of the oven or oven cavity . Use mild, non abrasive soaps or detergents, applied with a sponge or soft cloth. Never use sharp implements or harsh abrasives on any part of the oven.

The product holding bin, bin lid and jet plate may be cleaned via dishwasher or with warm soapy water. Care must be taken to prevent water or cleaning compounds from getting on internal parts, especially the switches on the control panel.

PLASTIC TRAY CLEANING

⚠Caution

Environmental stress cracking can occur, proper dilution and rinsing per detergent manufacturers' directions are mandatory.

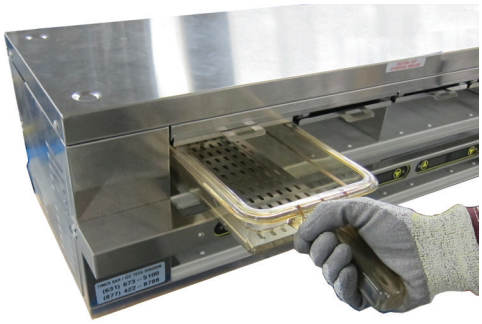
Food-approved detergents can be used if they are diluted per manufacturers' directions and adequately rinsed away prior to high temp drying cycle. Basic alcohols such as isopropyl are acceptable for hard-to-remove stains. Otherwise, do not use organic solvents.

DAILY CLEANING INSTRUCTIONS

Unit must be cool to touch and disconnected from power source.

1. Wipe the stainless steel outer case with a damp cloth, rubbing with the grain of the steel. If an excessive amount of food particles/grease has collected, hot sudsy water (non-abrasive) may be used.

2. Remove bins.

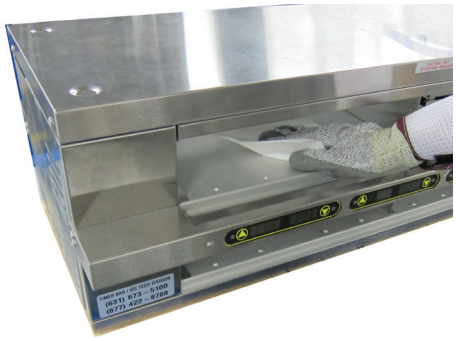


3. Twist each jet plate assembly lever counter clockwise into the horizontal unlocked position.

4. Remove jet plate assemblies.

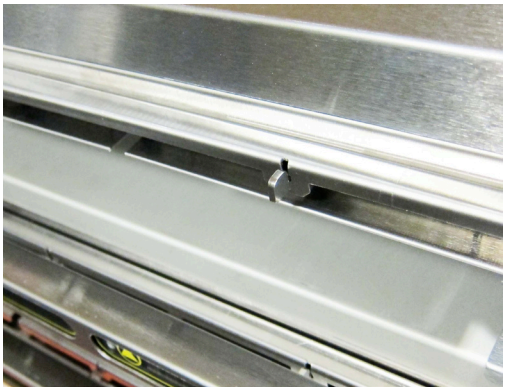
5. The product holding bins, bin lids and jet plates may be cleaned via dishwasher or with warm soapy water.

6. Wipe the interior bottom with a damp cloth. If, however, an excessive amount of food particles/grease has collected, hot sudsy water (non-abrasive) may be used.

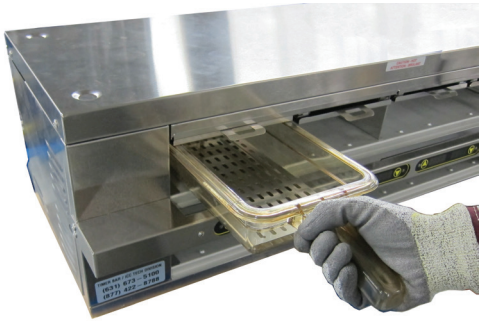


7. Reinstall the cleaned jet plate assemblies.

8. Twist each jet plate assembly lever clockwise into the vertical locked position.



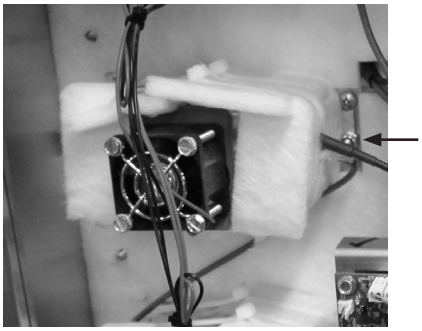
9. Reinstall the cleaned bins.



10. Plug the unit in.

INSTRUCTIONS FOR REPLACING AN AIR HEATER

1. Remove end panel.
2. Disconnect heater hot wire from I/O board and neutral wire from terminal block.
3. Remove the fasteners securing the air heater to the chassis.



4. Install new air heater with fasteners.
5. Reconnect electrical and reinstall end panel.

INSTRUCTIONS FOR REPLACING AN AIR HEATER PROBE

Air heater probes are located in the panel above the zone.

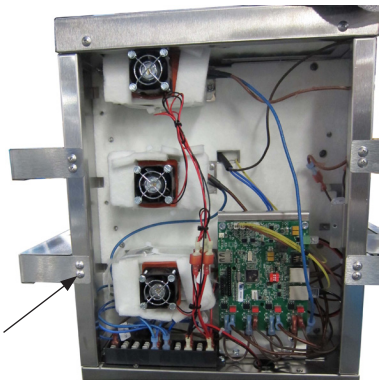
Top Zone Air Heater Probe Replacement

1. Remove the unit top.
2. Remove the insulation.
3. Remove probe, it will be thoroughly taped in place.
4. Tape a new probe in it's place and put the machine back together.

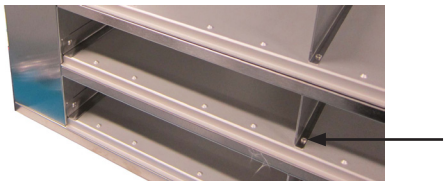
Lower Zone Air Heater Probe Replacement

These air heater probes are taped in the aluminum plate above the zone.

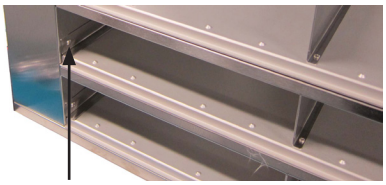
1. Remove the Timer Bar above the zone.



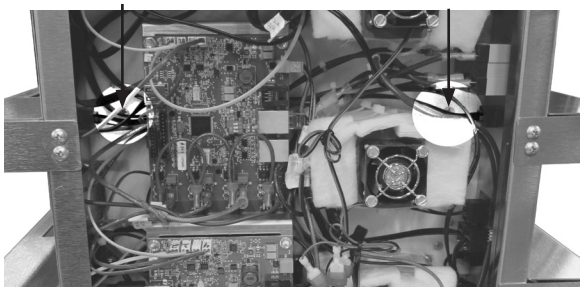
2. Remove center divider above the zone via two screws (US Models).



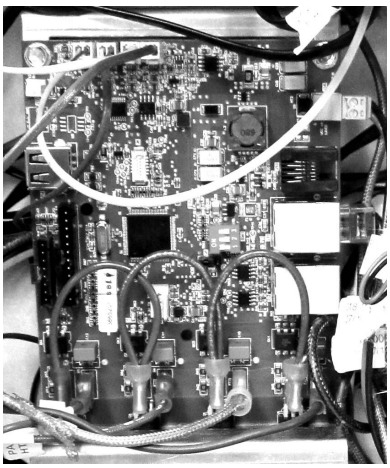
3. Remove both end clips above the zone via two screws.



4. Remove end panels.
5. From each side remove screws holding in aluminum plate above zone.



6. From both sides unplug heaters and probes associated with aluminum plate above zone. Hot wires are plugged into the I/O board and neutral wires are connected to the terminal block.

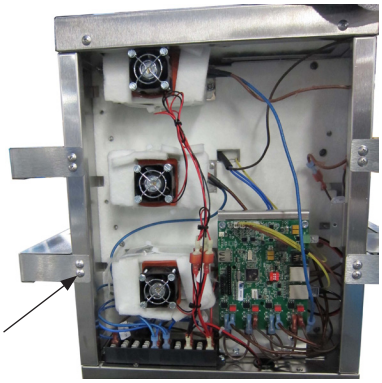


7. Raise aluminum plate and insulation to gain access to air heater probe below.
8. Remove and replace air heater probe.
9. Put unit back together.

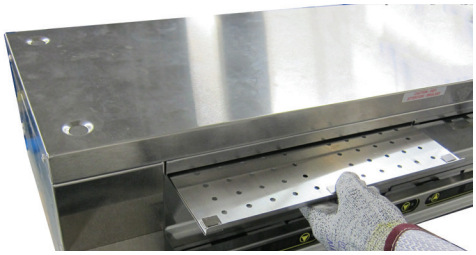
INSTRUCTIONS FOR REPLACING A HEATER PAD OR PAD HEATER PROBE

Pad heater probes are located in the pad heater assembly.

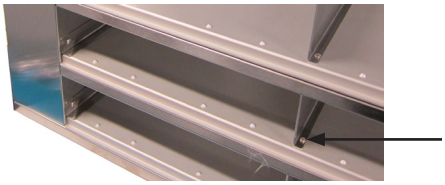
1. Remove the Timer Bar that is in front of the pad heater. It will be below the zone.



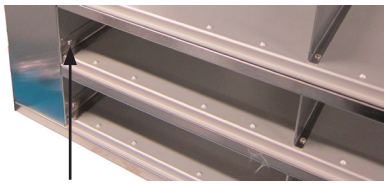
2. Remove jet plates above pad heater.



3. Remove center divider above heater pad via two screws (US Models).

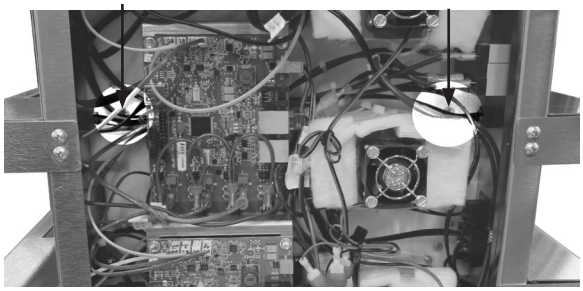


4. Remove both end clips above heater pad via two screws.

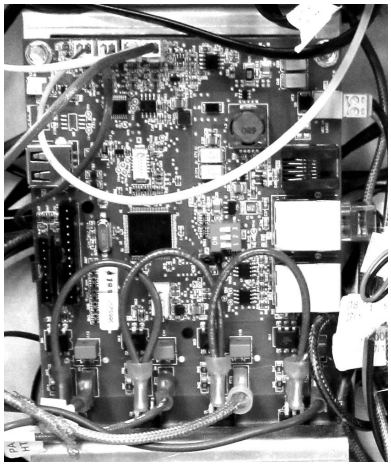


5. Remove end panels.

6. From each side remove screws holding in aluminum plates.

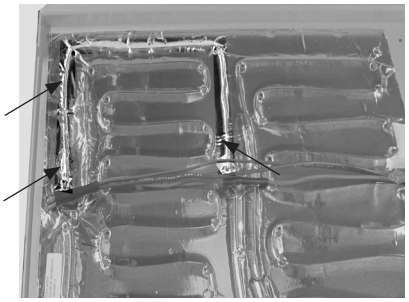


7. From both sides unplug heaters and probes associated with the heater pad. Hot wires are plugged into the I/O board and neutral wires are connected to the terminal block.



8. Pull the aluminum plate out carefully.

9. **Heater Probe Replacement**
   Flip the aluminum plate over. Peel the probe out of the heater pad. The probe has brown insulation. Tape a new probe in it's place



10. **Heater Pad Replacement**
    Flip the aluminum plate over. Peel the heater pad off and stick a new one on.

11. Put the machine back together.

Section 5
Troubleshooting

Troubleshooting Chart

Problem	Cause	Correction
Cabinet not running	Fuse blown or circuit breaker tripped.	Replace fuse or reset circuit breaker.
	Power cord unplugged.	Plug in power cord.
	Thermostat set too high.	Set thermostat to lower temperature.
	Main power switch turned off.	Turn main power switch on.
Cabinet temperature is too high	Thermostat set too high.	Set thermostat to lower temperature.
	Poor air circulation in cabinet.	Re-arrange product to allow proper air circulation.
	Exterior thermometer is out of calibration.	Re-calibrate thermometer.
Cabinet temperature is too low	Jet plate out of unit.	Reinstall jet plate.
	Pans out of unit.	Reinstall pans in unit.

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Control Troubleshooting

TC Display Codes			
Left Display	**Right Display**		
ZaEr	**b_cd**		
a	**b**	**c**	**d**
Zone Location with Error	Section of Zone with Error	Thermocouple State	Thermocouple reading compared to Set point
1 2 3 4 5 6 7 8	U=Upper L=Lower	0 = Ok 1 = Shorted 2 = Open	0 = Within Range 1 = Below Range 2 = Above Range

Upper Zone Thermocouple Shorted - Right Display Error Code U_1d

1. Remove the jet plate and inspect the air heater probe near the upper baffle.
2. If end of probe is touching metal, move it. If the error clears, repair the end by adding high temp heat tape rated at 392°F or silicone sleeve to the probe end.
3. If moving or taping probe end doesn't fix error code, short is some place else.
4. Remove side panel.
5. Inspect probe wire where it connects to I/O board.
6. Check probe continuity to chassis.
7. Check continuity through probe.
8. Swap probe with error with an error free probe. Thermocouple state checks every 5 seconds. If error location switches, replace probe.

Lower Zone Thermocouple Shorted - Right Display Error Code L_1d

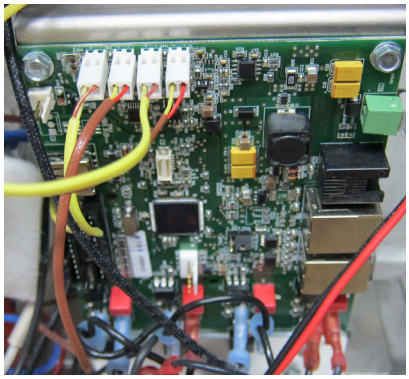
1. There is no physical inspection for the hot end of the pad heater probe.
2. Inspect probe wire where it connects to I/O board.
3. Check probe continuity to chassis. If probe is grounded to chassis replace probe.
4. Swap probe with error with an error free probe. Thermocouple state checks every 5 seconds. If error location switches, replace probe or pad.

Thermocouple Is Open - Right Display Error Code b_2d

1. Unplug the probe from the I/O board.
2. Check that end of probe has a ramp shape and there is no visible oxidation.
3. Plug probe back into I/O board, confirm connection snaps.
4. Check continuity through probe, if probe is open probe must be replaced.
5. Swap probe with error with an error free probe. Thermocouple state checks every 5 seconds. If error location switches, replace probe.

Thermocouple Reading is Below or Above Set Point - Right Display Error Code b_c1 or b_c2

1. Document all temperature readings for unit, each zone, upper and lower.
2. If the zone probes are switched, there will be two errors, one high and one low.
3. Check the I/O boards where the probes with errors plug in. There is yellow insulation jacket on the air probes and brown insulation jacket on the pad probes. Check that the probes alternate (yellow brown yellow brown) and are plugged in properly.



4. Heater outputs could be swapped, there will be two errors. Air heaters have yellow fiberglass wire. Pad heaters have brown silicone wire. Check that the wires alternate (fiberglass silicone fiberglass silicone).
5. The I/O board triac could be shorted or open. An orange LED is associated with each triac, it signals if the triac should be on or off.
6. Isolate each triac wire and check the amperage.
    - If the triac is supposed to be open and there is no current, the problem could be a heater. Check continuity through heating element.
    - If the triac light does not match the amperage, the triac is failing and the I/O board needs to be replaced.
    - Check input and output of triac, this could signal an I/O board failure.

Section 7
ICC Timer Bar and Kitchen Minder

For ICC Timer Bar and Kitchen Minder connection questions and issues call - ICC Tech Division 631-673-5100 or 877-422-8788.

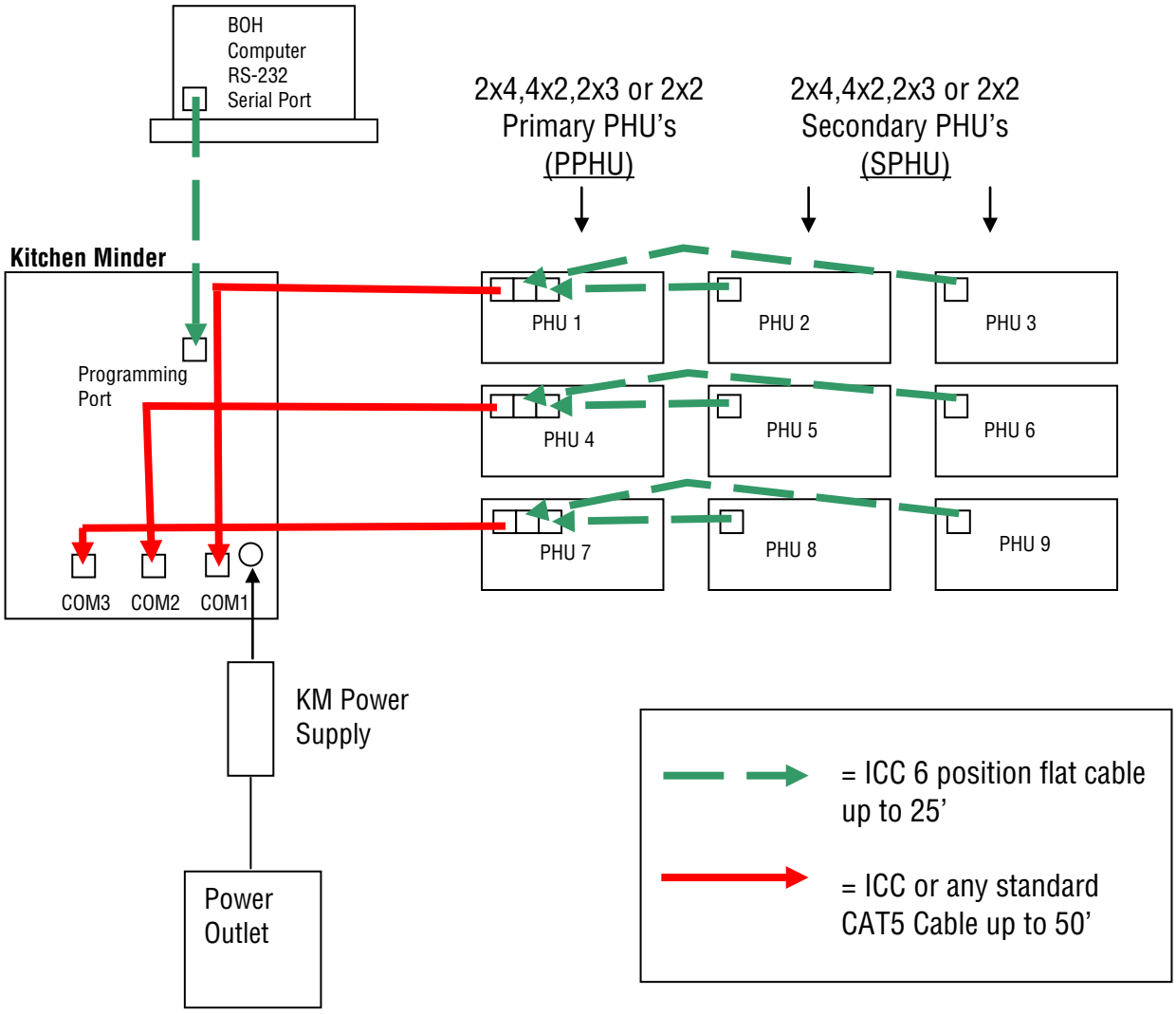
Connections

Merco PHU's with Alpha/Numeric Timer Bars to a Kitchen Minder system.

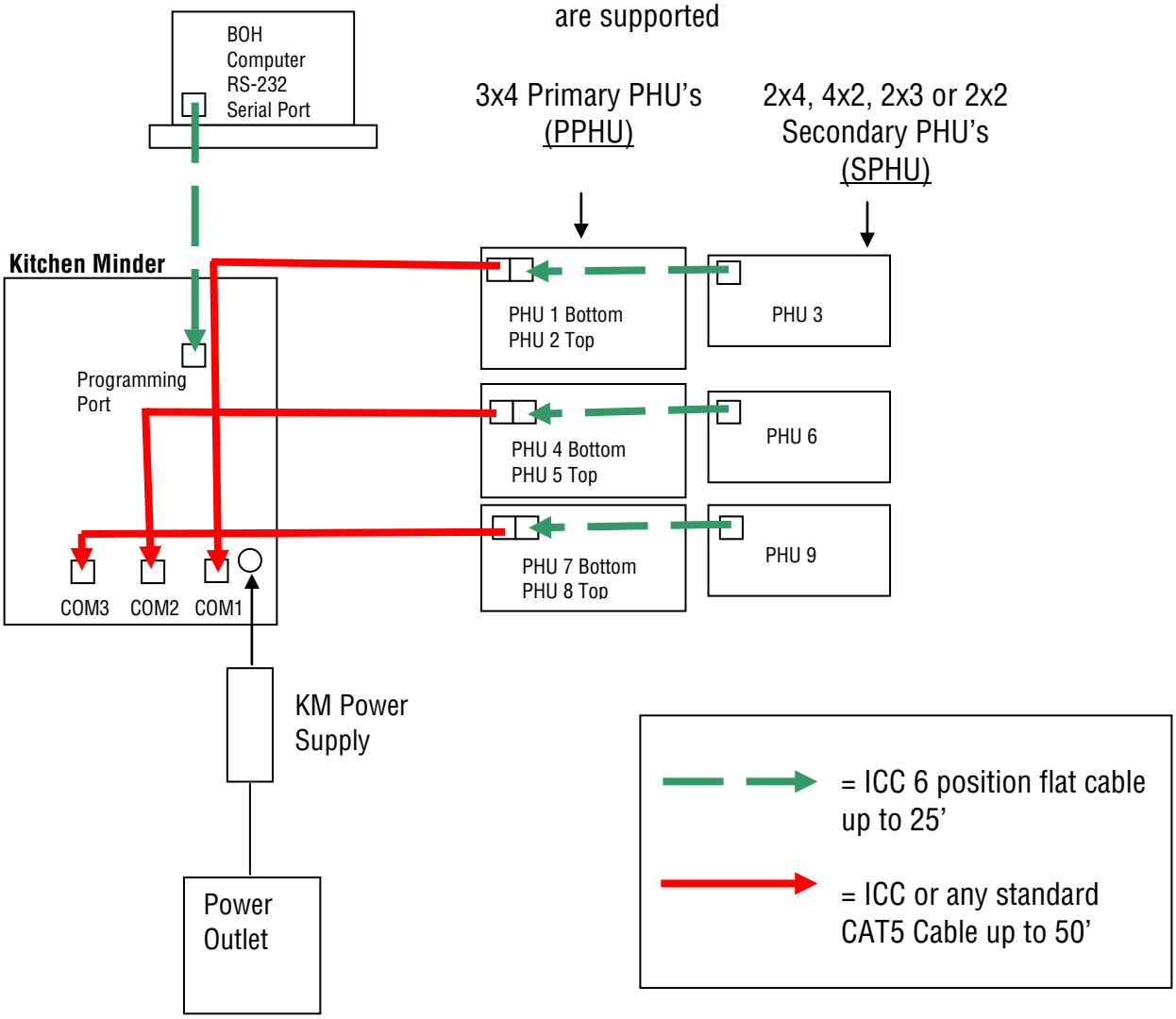
Use one of the following 3 diagrams that best fits your restaurant configuration.

It also is possible to mix and match from COM1, COM2 and COM 3 of the 3 diagrams. Any Secondary PHU may be left out and any full COM port can be left out but must be filled COM1 first, then 2, then 3.

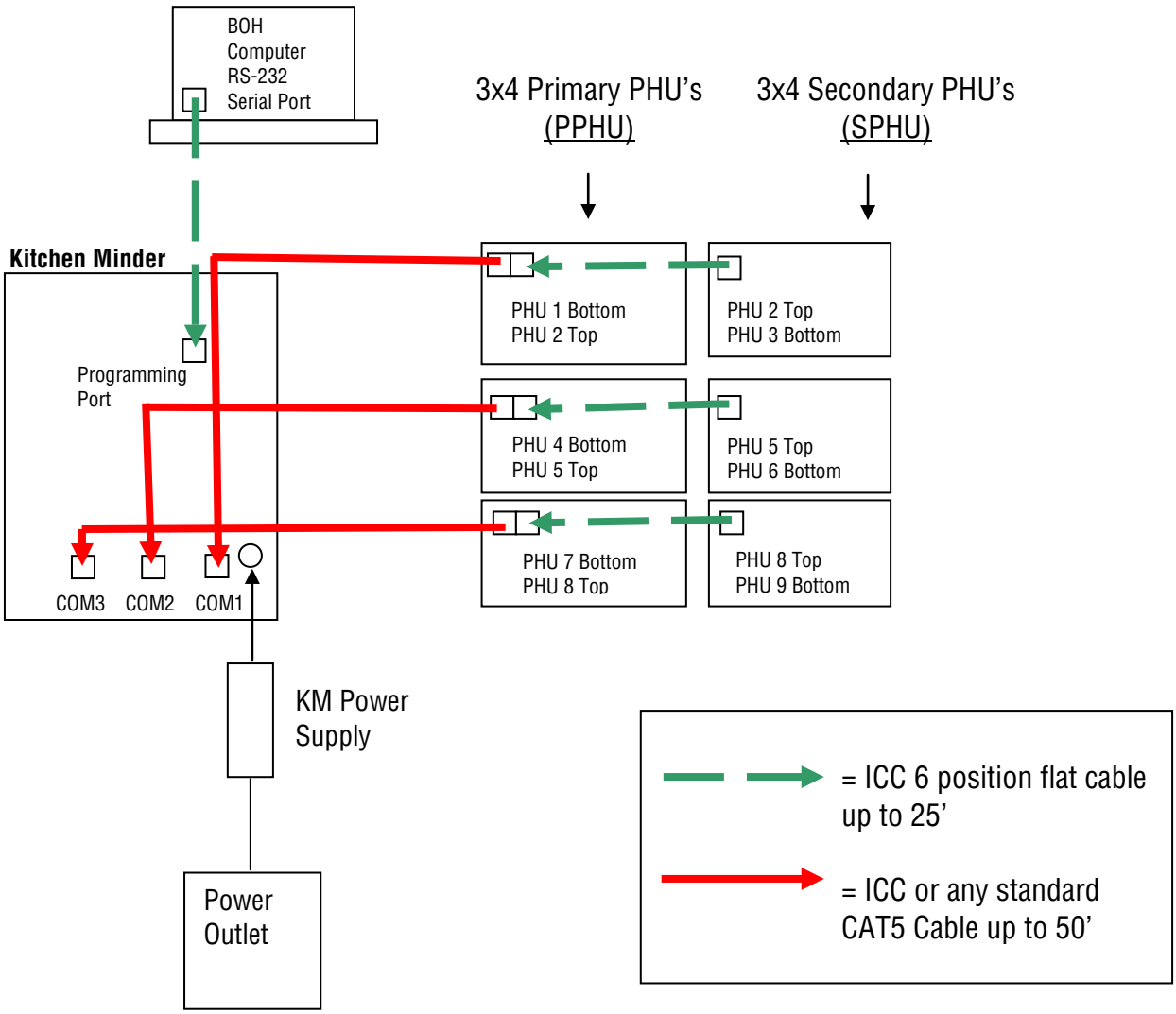
2x4, 4x2, 2x3 & 2x2 PPHU and SPHU mix and match connection diagram (rear perspective of devices) Up to 9 PHU's are supported



3x4 PPHU and 2x4, 4x2, 2x3, 2x2 SPHU mix and match connection diagram (rear perspective of devices) Up to 6 physical PHU's are supported



3x4 PPHU and 3x4 SPHU connection diagram (rear perspective of devices) Up to 6 physical PHU's are supported



KM1 Monochrome Unit Testing & Troubleshooting

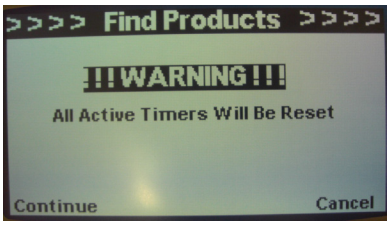
1.1 - Testing connections

1.1.1 - Product Location Test

1.1.2 - On the KM, press the Menu key

1.1.3 - Use the down arrow to highlight Product Location and press Select key

1.1.4 - The following screen will appear:



1.1.5 - Press the Continue soft key

1.1.6 - On the KM PHU1 will display 8 pans referenced from the front of the PPHU connected to COM1 of the KM

1.1.6.1 - The upper left corner on the KM screen will be highlighted

1.1.6.1.1 - All Timer Bar LED's will be unlit except:

1.1.6.1.2 - On a 2x4 or 4x2 PPHU, the top left pan will illuminate solid red

1.1.6.1.3 - On a 2x3 PPHU press the Select key once

1.1.6.1.3.1 - The pan on the KM will move one pan to the right

1.1.6.1.3.2 - The TB LED on the 2x3 PPHU top left pan will illuminate solid red

1.1.6.1.4 - On a 2x2 PPHU press the Select key twice

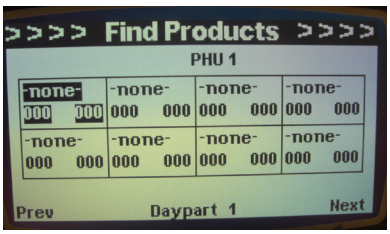
1.1.6.1.4.1 - The pan on the KM will move two pans to the right

1.1.6.1.4.2 - The Timer Bar LED on the 2x2 PPHU top left pan will illuminate solid red

1.1.6.1.5 - On a 3x4 PPHU, the middle left pan will illuminate solid red

1.1.6.1.5.1 - Press the Next soft key to advance to PHU2

1.1.6.1.5.2 - The top left pan of the 3x4 will illuminate solid red



1.1.7 - Continue in the same manner for all PHU's connected to the KM based on the diagrams above

1.1.8 - Press the Product Status key

1.1.9 - The KM will go to Product Status screen

1.1.10 - The restaurant manager should program PC Minder with the correct products for each PHU and transfer the data to the Kitchen Minder

1.2 - Troubleshooting

1.2.1 - If a PPHU Timer Bar displays NOKM

1.2.1.1 - Check the CAT5 connection from the KM to the PPHU

1.2.1.2 - Test the CAT5 cable with a cable tester or use a known good cable

1.2.1.3 - If the connection and cable are OK, call Merco or ICC for support

1.2.2 - If a SPHU displays NOBB

1.2.2.1 - Check that the PPHU is powered on

1.2.2.2 - Check the 6 position data connection from the PPHU to the SPHU

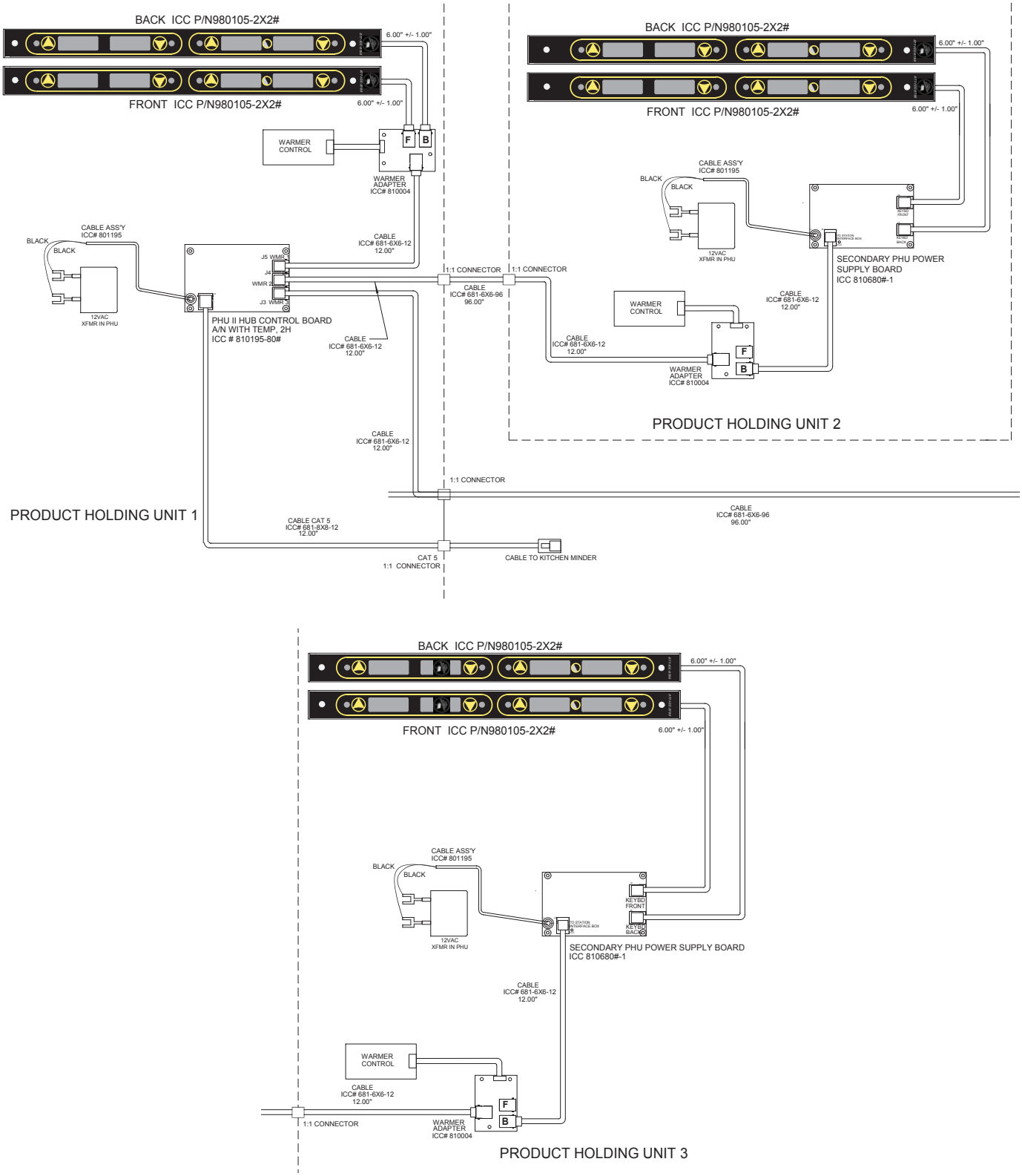
1.2.2.3 - Check the 6 position cable with a cable tester or use a known good cable

1.2.2.4 - If the PPHU is powered on, the connection and cable are OK, call Merco or ICC for support

1.3 - End of document

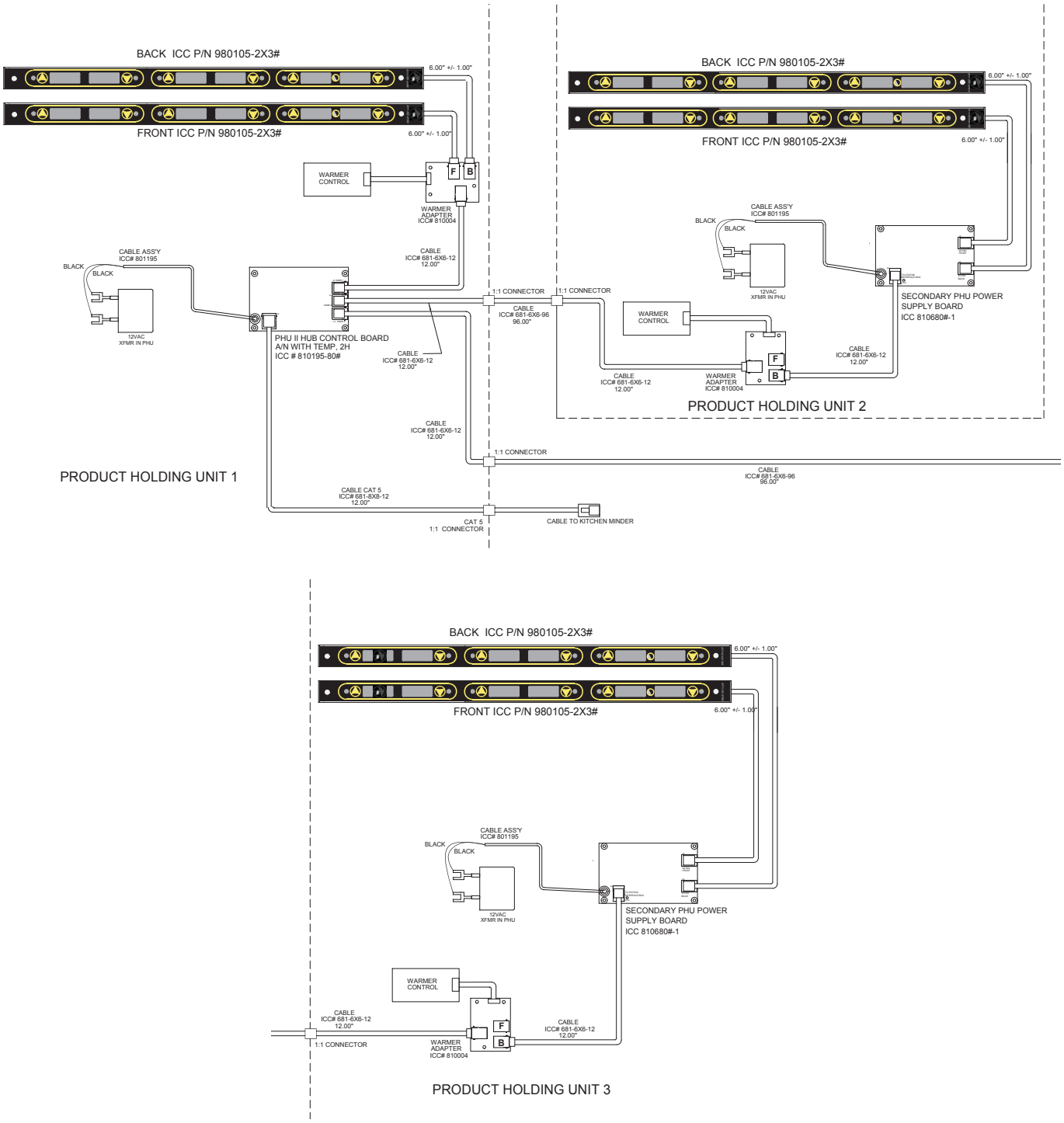
MHCFA22 Timer Bar Diagram

NOTE: "Warmer Control" on diagram is the I/O board.



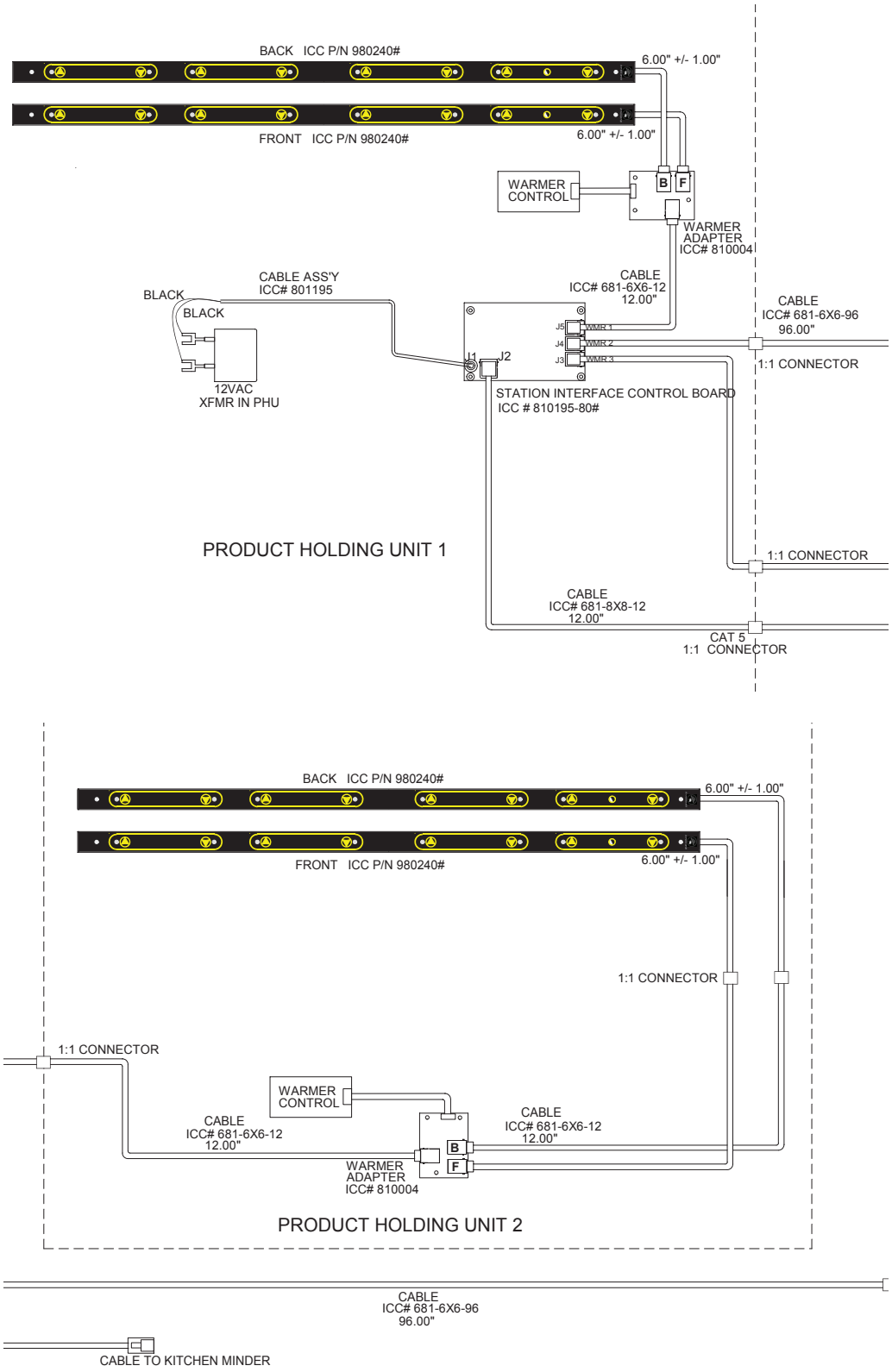
MHCFA23 Timer Bar Diagram

NOTE: "Warmer Control" on diagram is the I/O board.



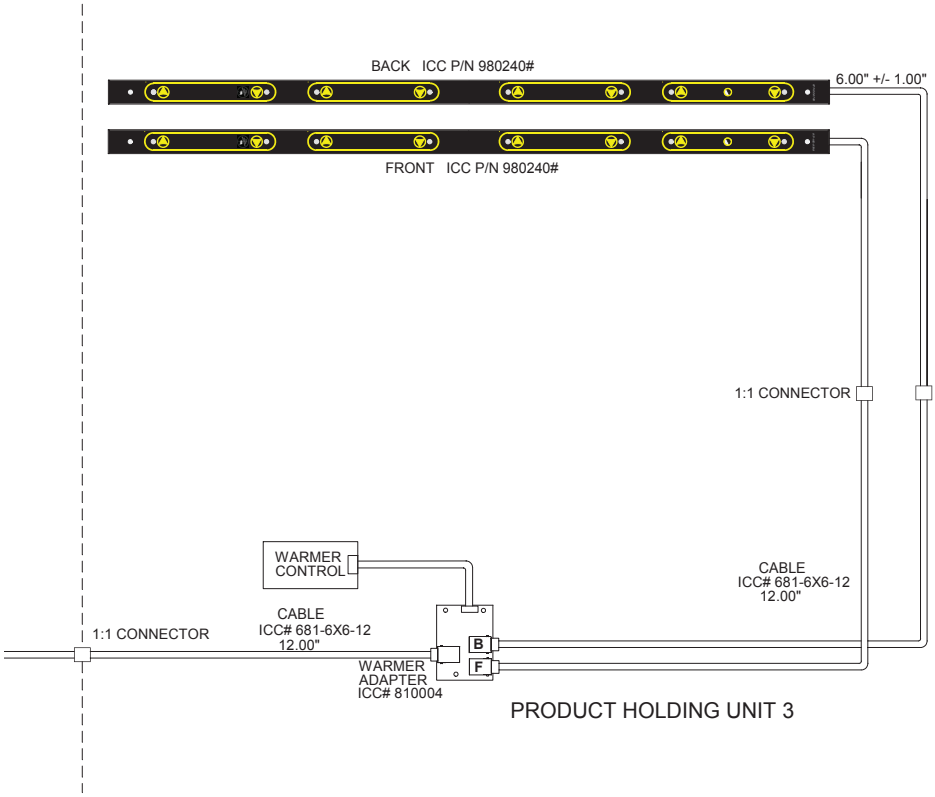
MHCFA24 Timer Bar Diagram

NOTE: "Warmer Control" on diagram is the I/O board.



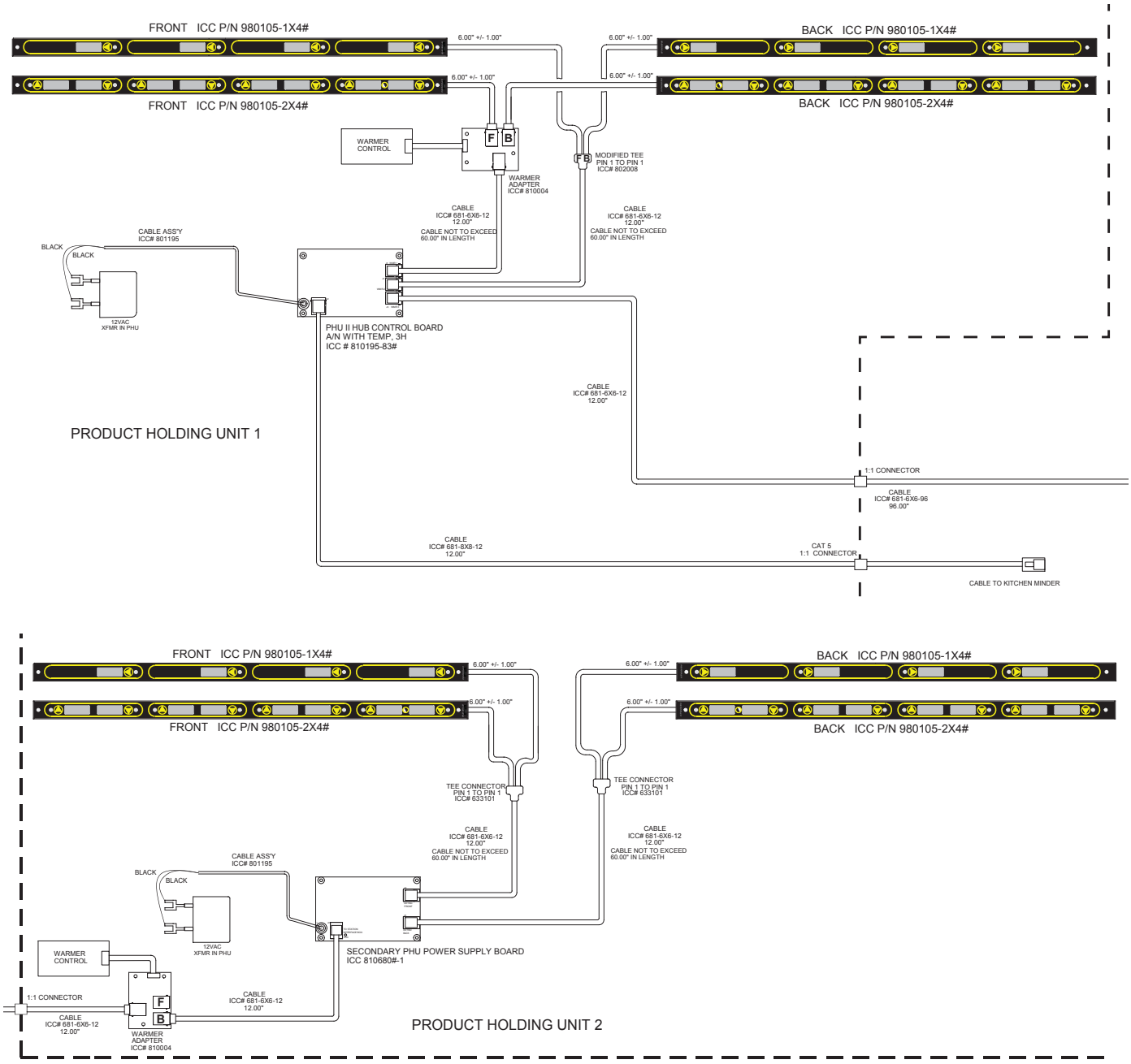
Continued MHCFA24 Timer Bar Diagram

NOTE: "Warmer Control" on diagram is the I/O board.



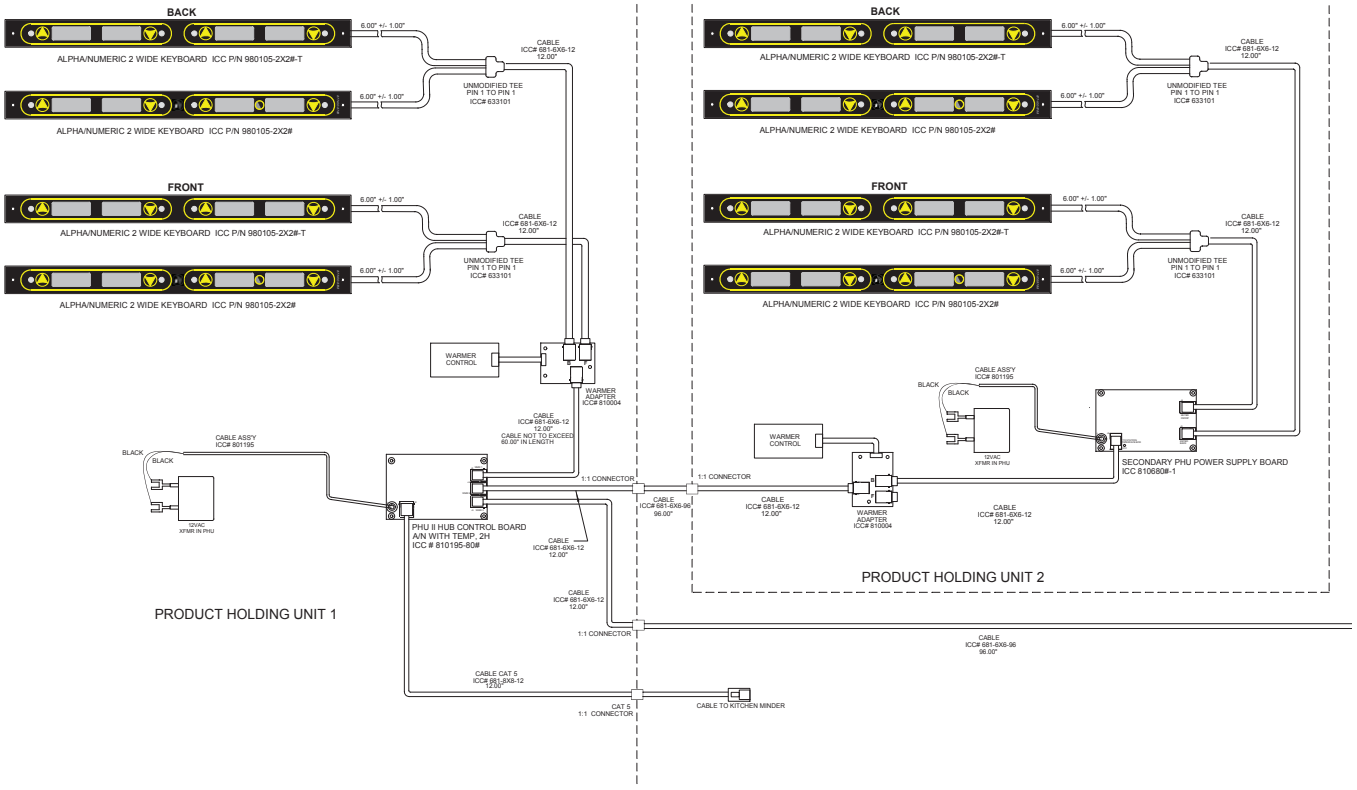
MHCFA34 Timer Bar Diagram

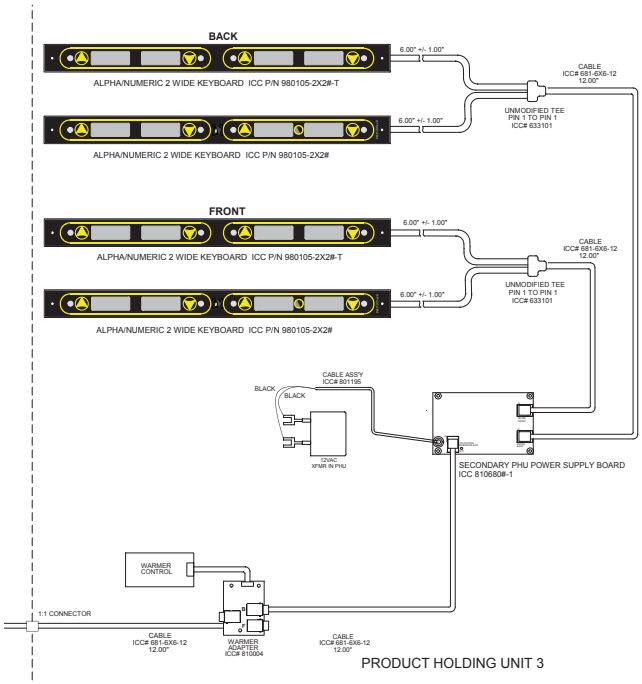
NOTE: "Warmer Control" on diagram is the I/O board.



MHCFA42 Timer Bar Diagram

NOTE: "Warmer Control" on diagram is the I/O board.





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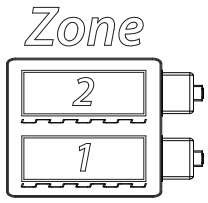
Section 8
Charts

Zone Diagrams & Heating Element Specifications

Key — Air Heater — Pad Heater

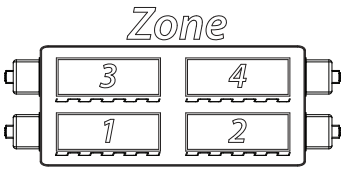
MHCFA22 & MHCFA22EX



Location	Heater	Model	Description	Resistance	Part Number
All Zones	Air Heater	MHCFA22	700W, 120V	18.9Ω +/- 5%	2195351
		MHCFA22EX	700W, 230V	18.9Ω +/- 5%	2195352
All Zones	Pad Heater	MHCFA22	330W, 120V	43.33Ω +/- 10%	2198616
		MHCFA22EX	330W, 230V	43.33Ω +/- 10%	2198629

There are two bins per zone.

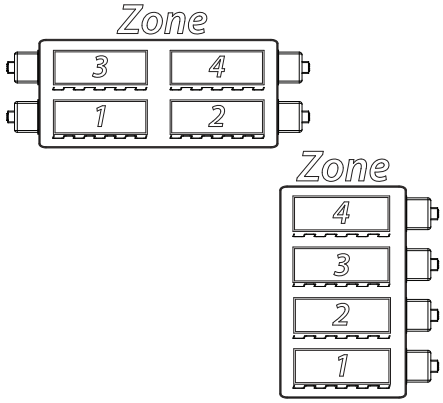
MHCFA23 & MHCFA23EX



Location	Part Description	Resistance	Part Number
Zones 2 & 4	Air Heater, 350W, 230V	143Ω +/- 5%	2195350
Zones 2 & 4	Pad Heater, 100W, 230V	529Ω +/- 10%	2198599
Zones 1 & 3	Air Heater, 700W, 230V	71.8Ω +/- 5%	2195352
Zones 1 & 3	Pad Heater, 200W, 230V	265.5Ω +/- 10%	2198598

In zones 1 & 3 there are two bins per zone.
In zones 2 & 4 there is one bin per zone.

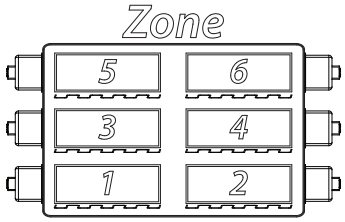
MHCFA24, MHCFA24EX & MHCFA42EX



Location	Heater	Model	Description	Resistance	Part Number
All Zones	Air Heater	MHCFA24	700W, 230V	71.8Ω +/- 5%	2195352
		MHCFA24EX, MHCFA42EX	450W, 230V	111.6Ω +/- 5%	2195358
All Zones	Pad Heater	All Models	200W, 230V	265.5Ω +/- 10%	2198598

There are two bins per zone.

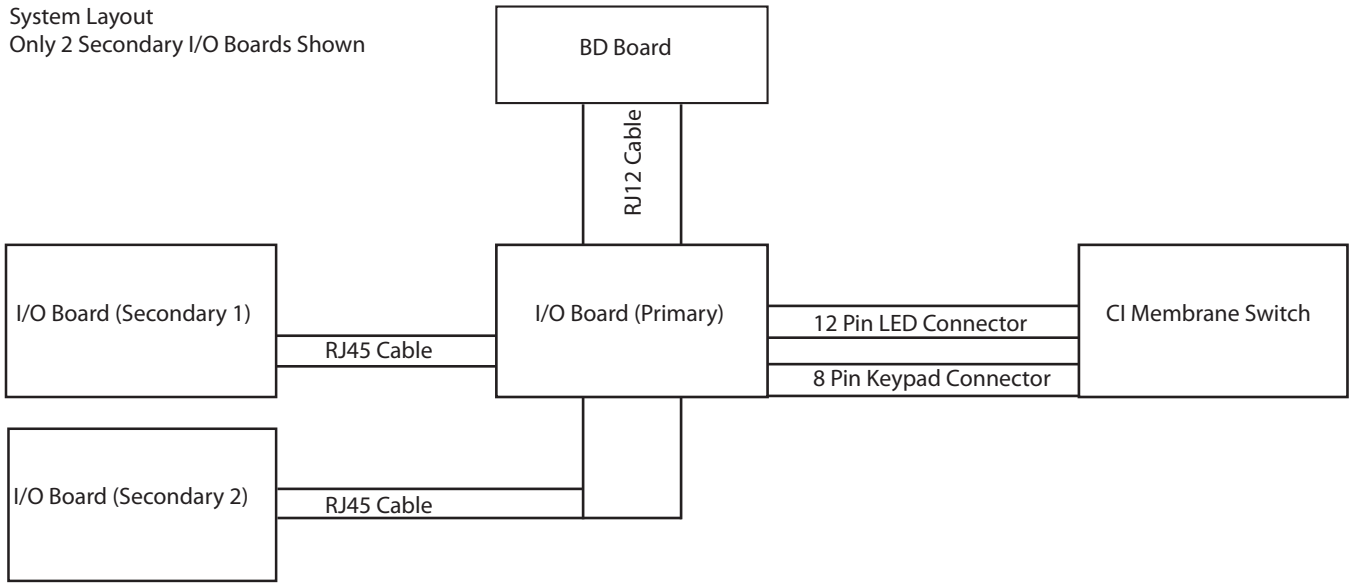
MHCFA34 & MHCFA34EX



Location	Heater	Model	Description	Resistance	Part Number
All Zones	Air Heater	MHCFA34	450W, 230V	111.6Ω +/- 5%	2195358
		MHCFA34EX	350W, 230V	143.6Ω +/- 5%	2195350
All Zones	Pad Heater	MHCFA34	200W, 230V	265.5Ω +/- 10%	2198598
		MHCFA34EX	100W, 230V	529Ω +/- 10%	2198628

There are two bins per zone.

System Layout



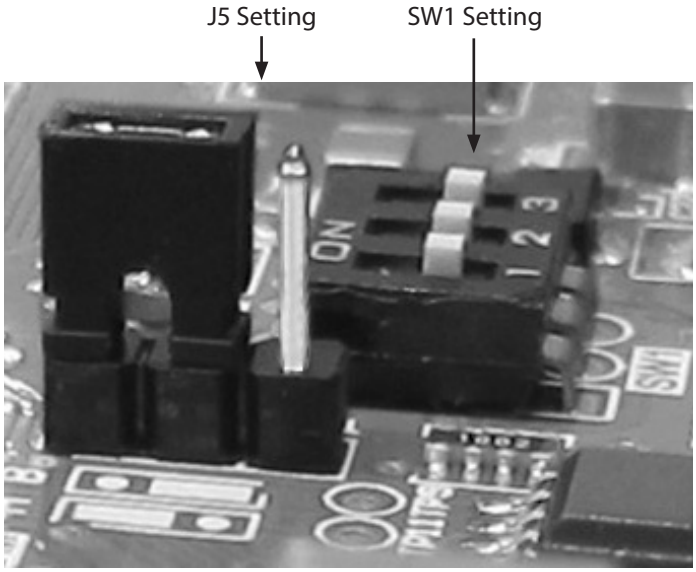
SW1 and J5 settings together define the system address.

Note how small J5 Jumper is compared to a dime.

⚠Caution

Ensure SW1 dip switches and J5 jumper match the old I/O Board upon replacement.
When the jumper is in the wrong position, zones will not display when checking temperature.

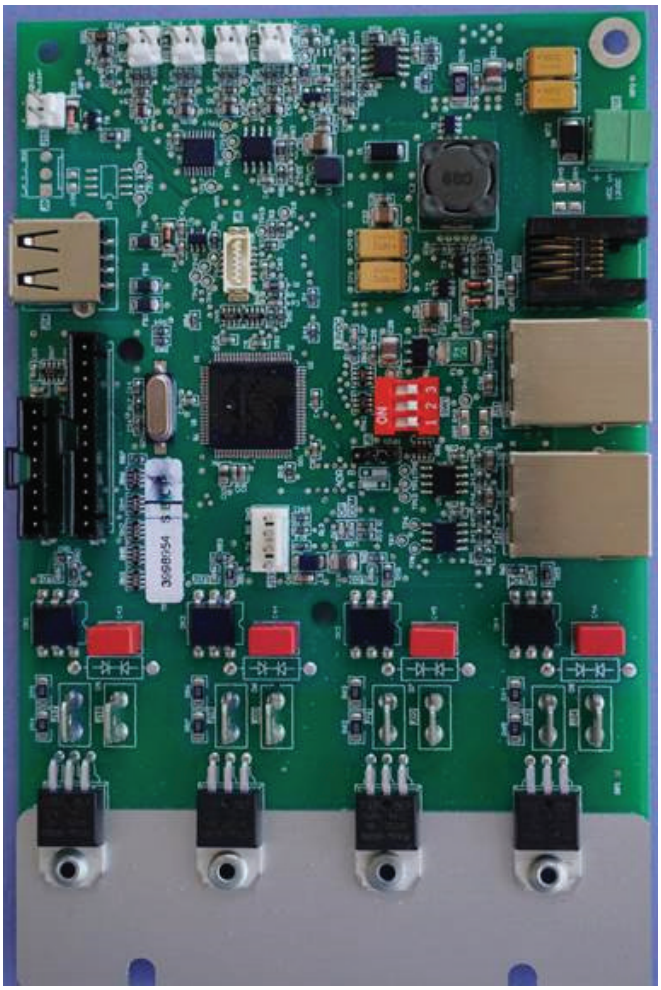
SW1 Setting	+	J5 Setting	=	System Address
ON 1 2 3		0A		0A [PRIMARY]
ON 1 2 3		0B		0B [SECONDARY]
ON 1 2 3		0A		1A [SECONDARY]



I/O Board

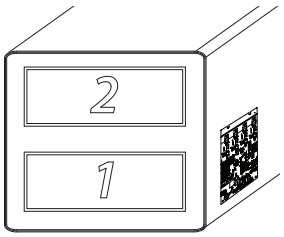
⚠ Caution

I/O Board must be loaded with software. Starting March 2016, factory will mark the backside with an orange sticker when software is loaded.



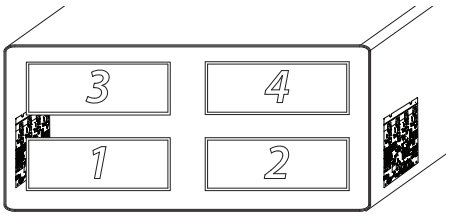
I/O Board Connections

MHCFA22 & MHCFA22EX



Primary 0A I/O Board			
Zone	Heater Type	Heater Connect to:	Probe Connect to:
2	Air	J22	J3
	Pad	J24	J4
1	Air	J18	J1
	Pad	J20	J2

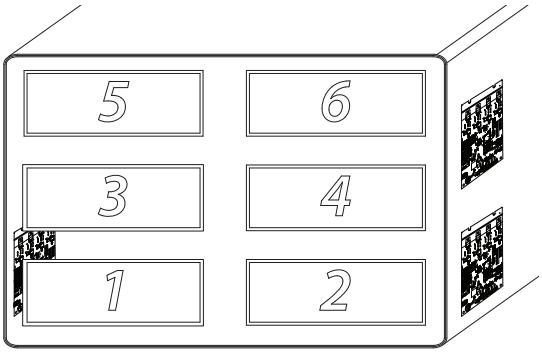
MCFA23, MHCFA23EX, MHCFA24 & MHCFA24EX



Primary 0A I/O Board			
Zone	Heater Type	Heater Connect to:	Probe Connect to:
4	Air	J22	J3
	Pad	J24	J4
2	Air	J18	J1
	Pad	J20	J2

Secondary 0B I/O Board			
Zone	Heater Type	Heater Connect to:	Probe Connect to:
3	Air	J22	J3
	Pad	J24	J4
1	Air	J18	J1
	Pad	J20	J2

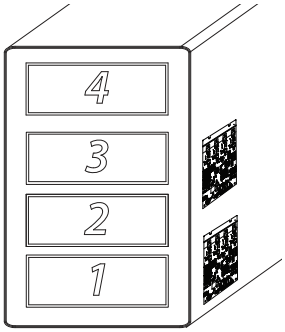
MHCFA34 & MHCFA34EX



Secondary 1A I/O Board			
Zone	Heater Type	Heater Connect to:	Probe Connect to:
6	Air	J22	J3
	Pad	J24	J4
5	Air	J18	J1
	Pad	J20	J2
Primary 0A I/O Board			
4	Air	J22	J3
	Pad	J24	J4
2	Air	J18	J1
	Pad	J20	J2

Secondary 0B I/O Board			
Zone	Heater Type	Heater Connect to:	Probe Connect to:
3	Air	J22	J3
	Pad	J24	J4
1	Air	J18	J1
	Pad	J20	J2

MHCFA42EX



Secondary 0B I/O Board			
Zone	**Heater Type**	**Heater Connect to:**	**Probe Connect to:**
3	Air	J22	J3
	Pad	J24	J4
1	Air	J18	J1
	Pad	J20	J2
Primary 0A I/O Board			
Zone	**Heater Type**	**Heater Connect to:**	**Probe Connect to:**
4	Air	J22	J3
	Pad	J24	J4
2	Air	J18	J1
	Pad	J20	J2

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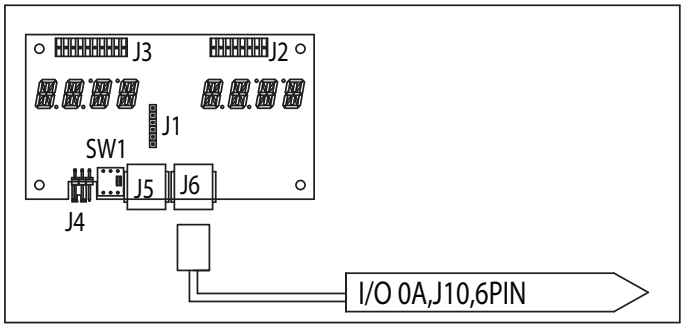
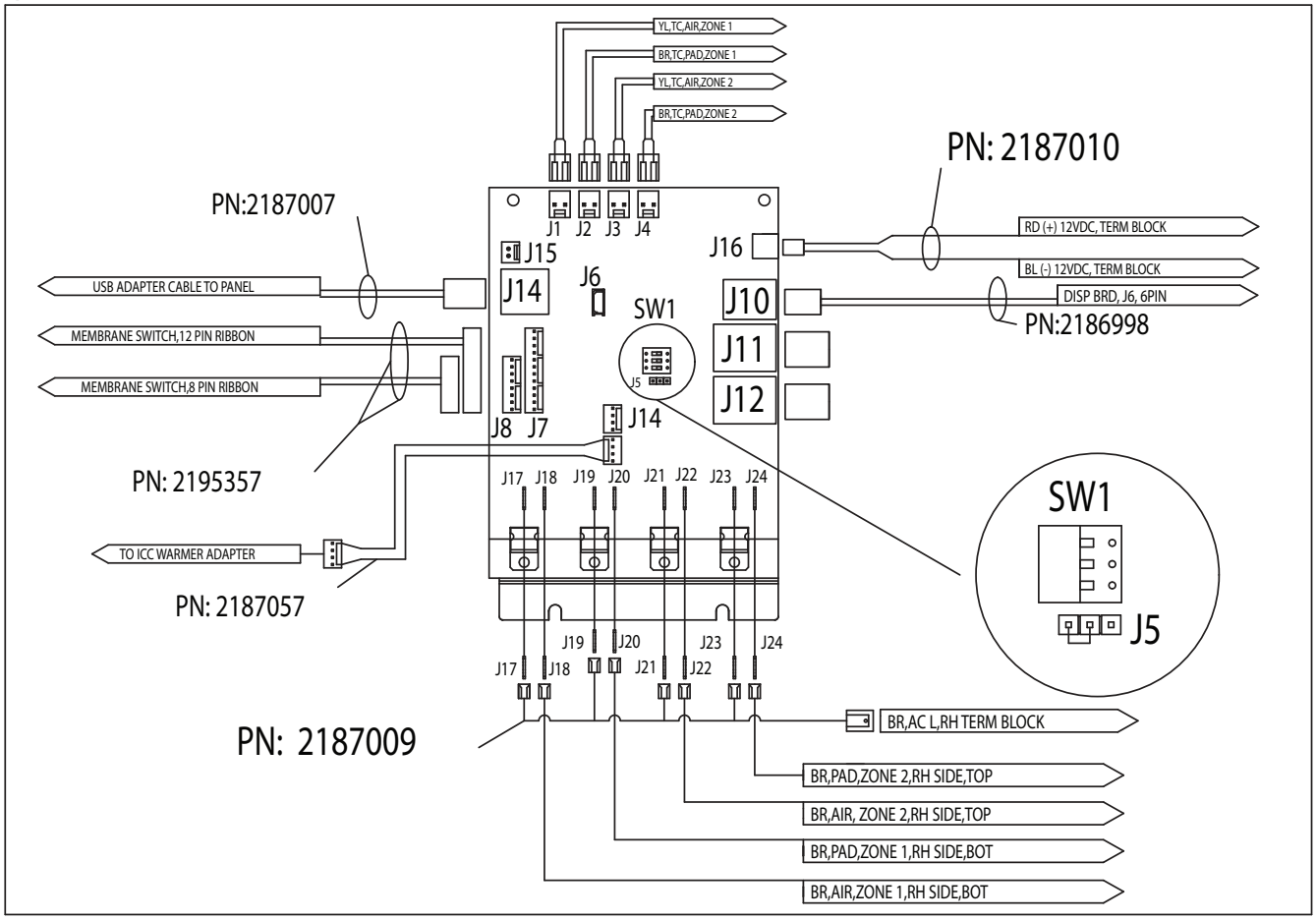
Section 9
Wiring Diagrams

MHCFA22 - Domestic 2x2

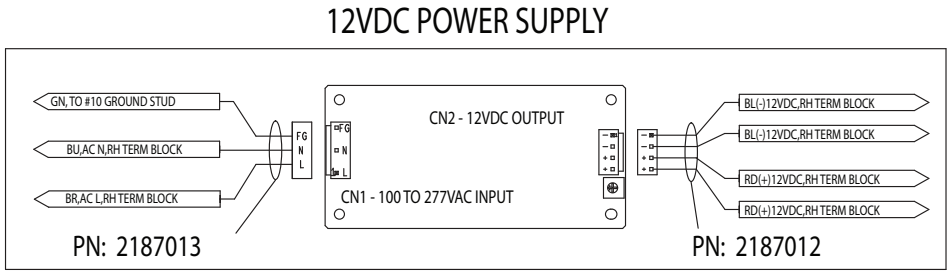
DISPLAY B0ARD

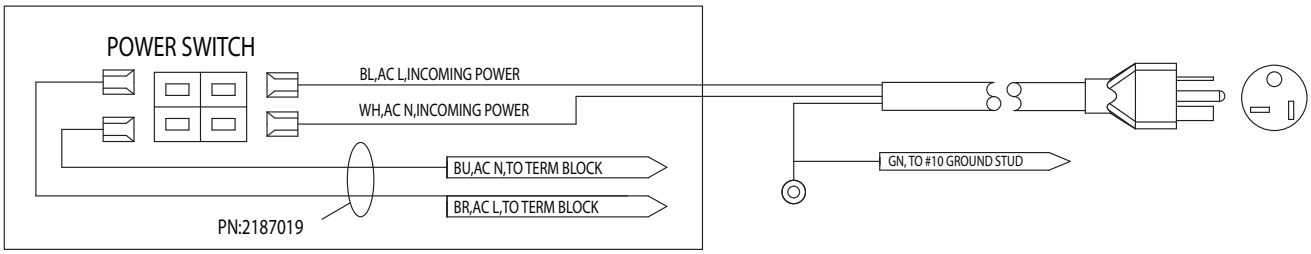


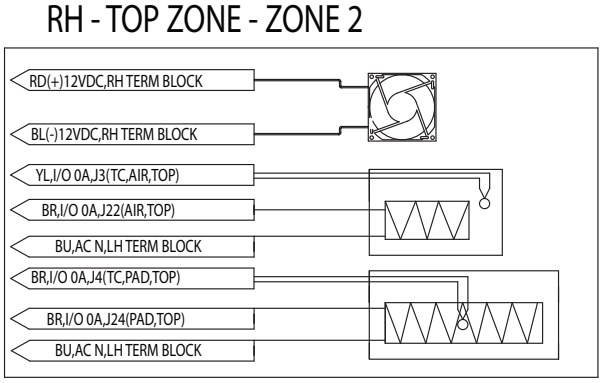
I/O 0A B0ARD - ZONES 1 AND 2

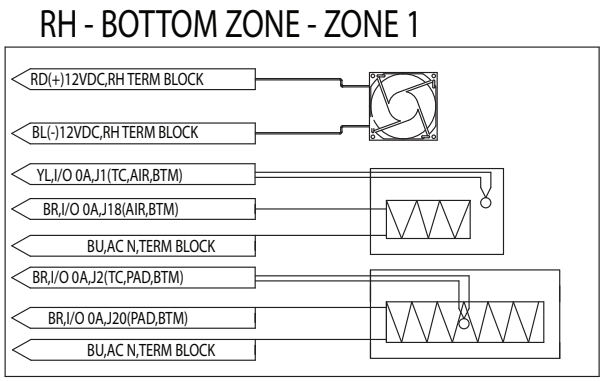


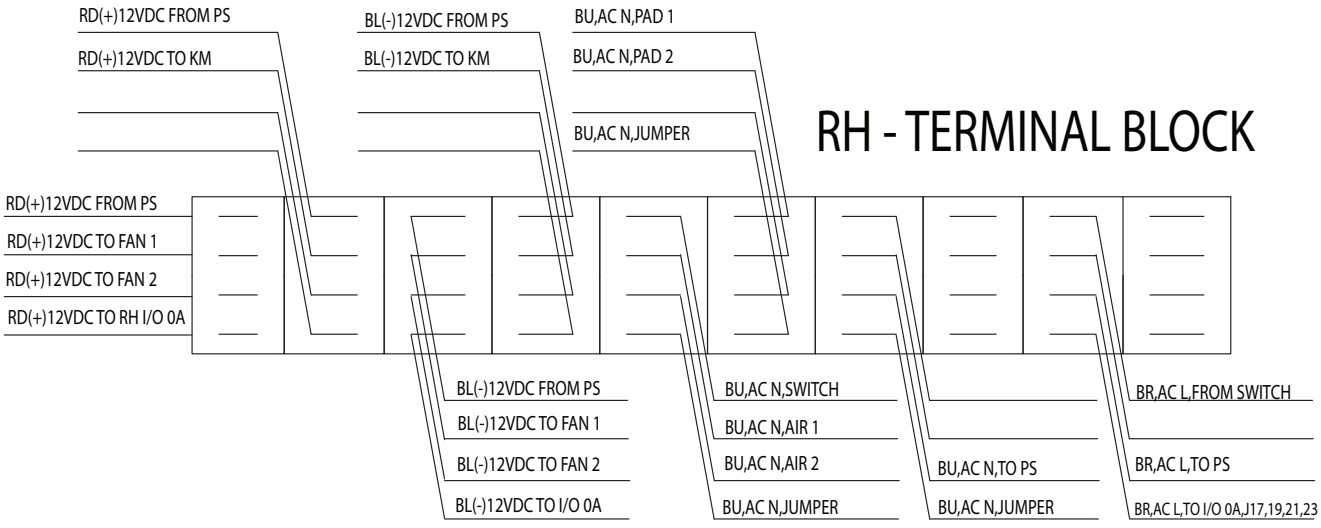
MHCFA22 - Domestic 2x2



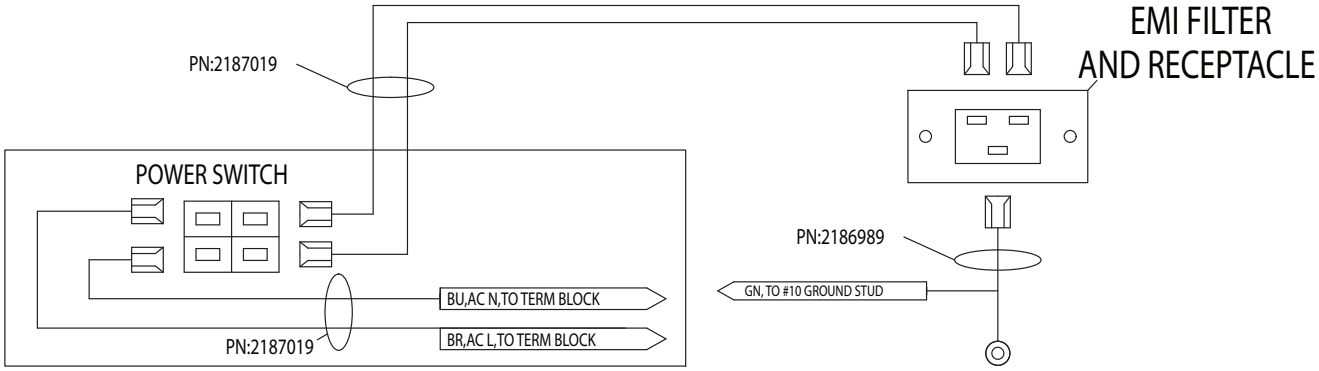


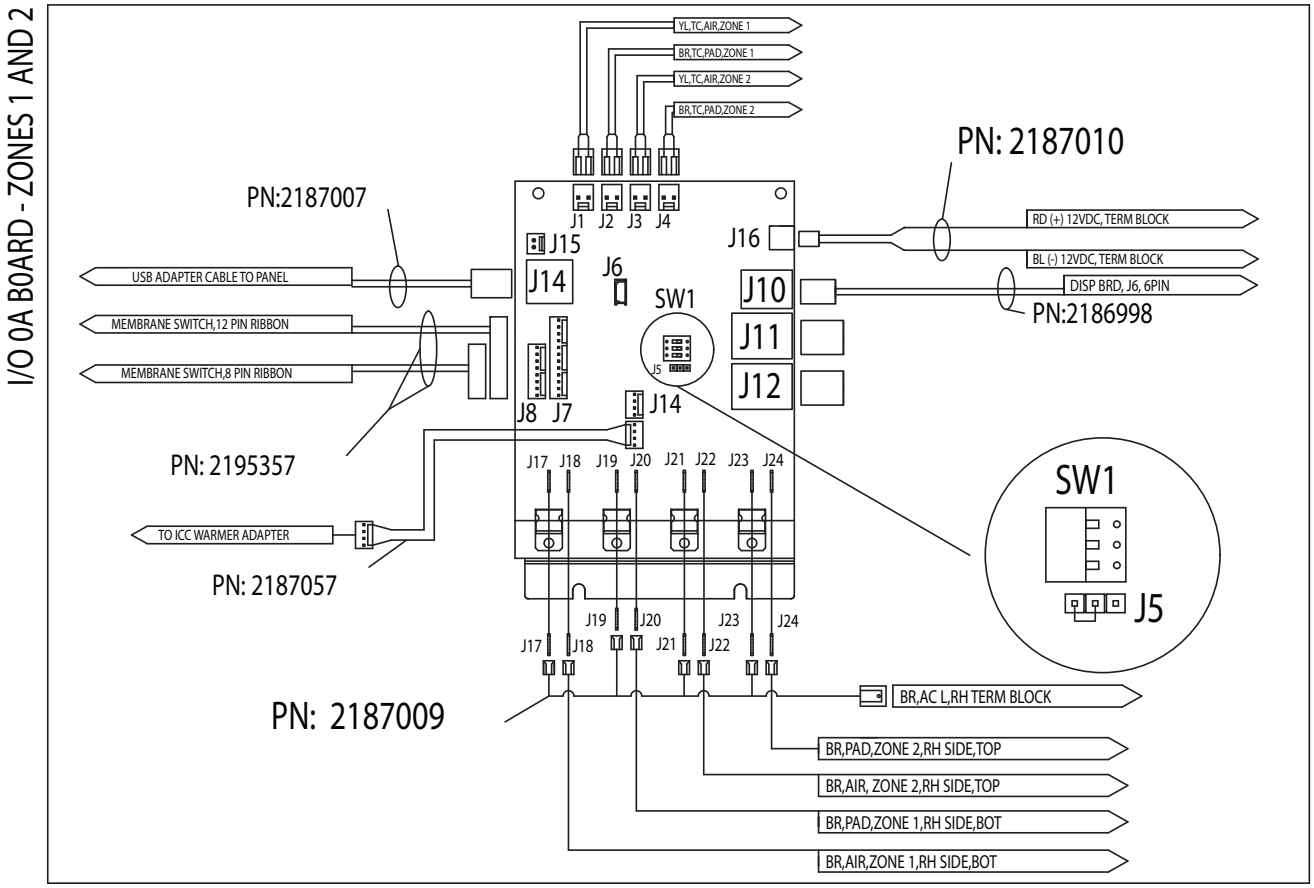






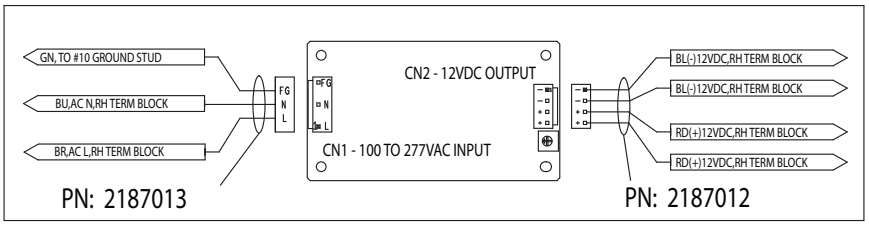
MHCFA22EX - Export 2x2



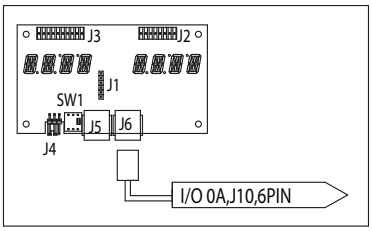


MHCFA22EX - Export 2x2

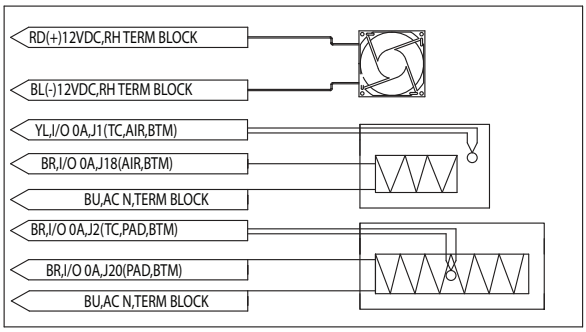
12VDC POWER SUPPLY



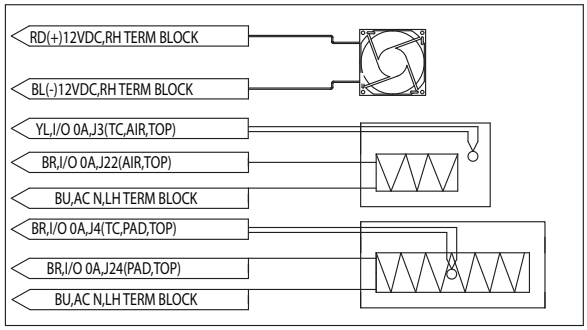
DISPLAY B0ARD



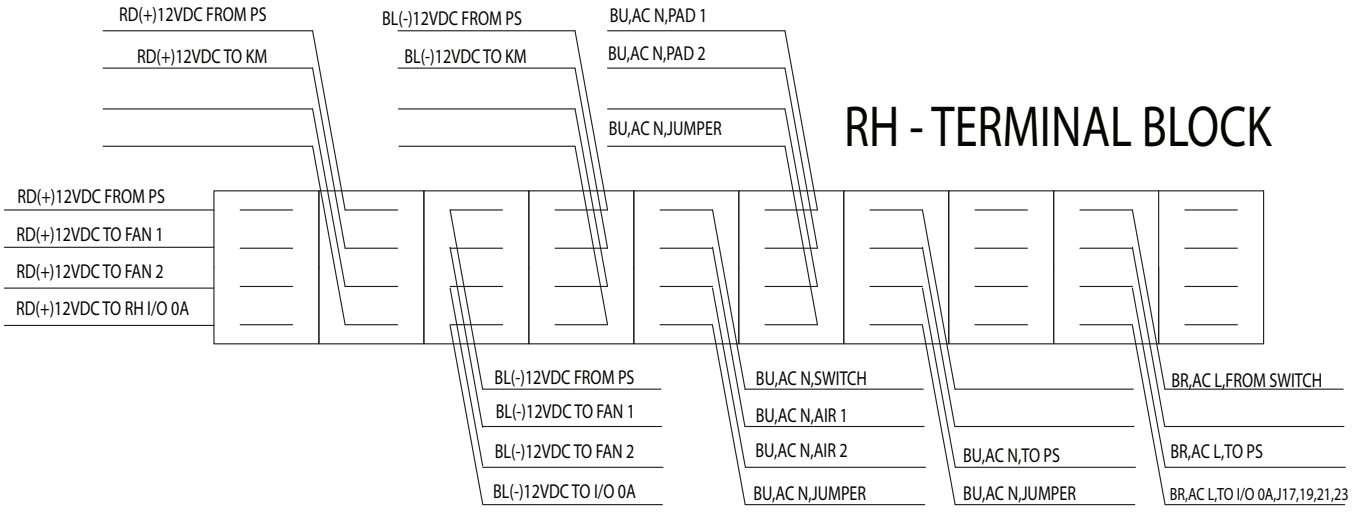
RH - BOTTOM ZONE - ZONE 1



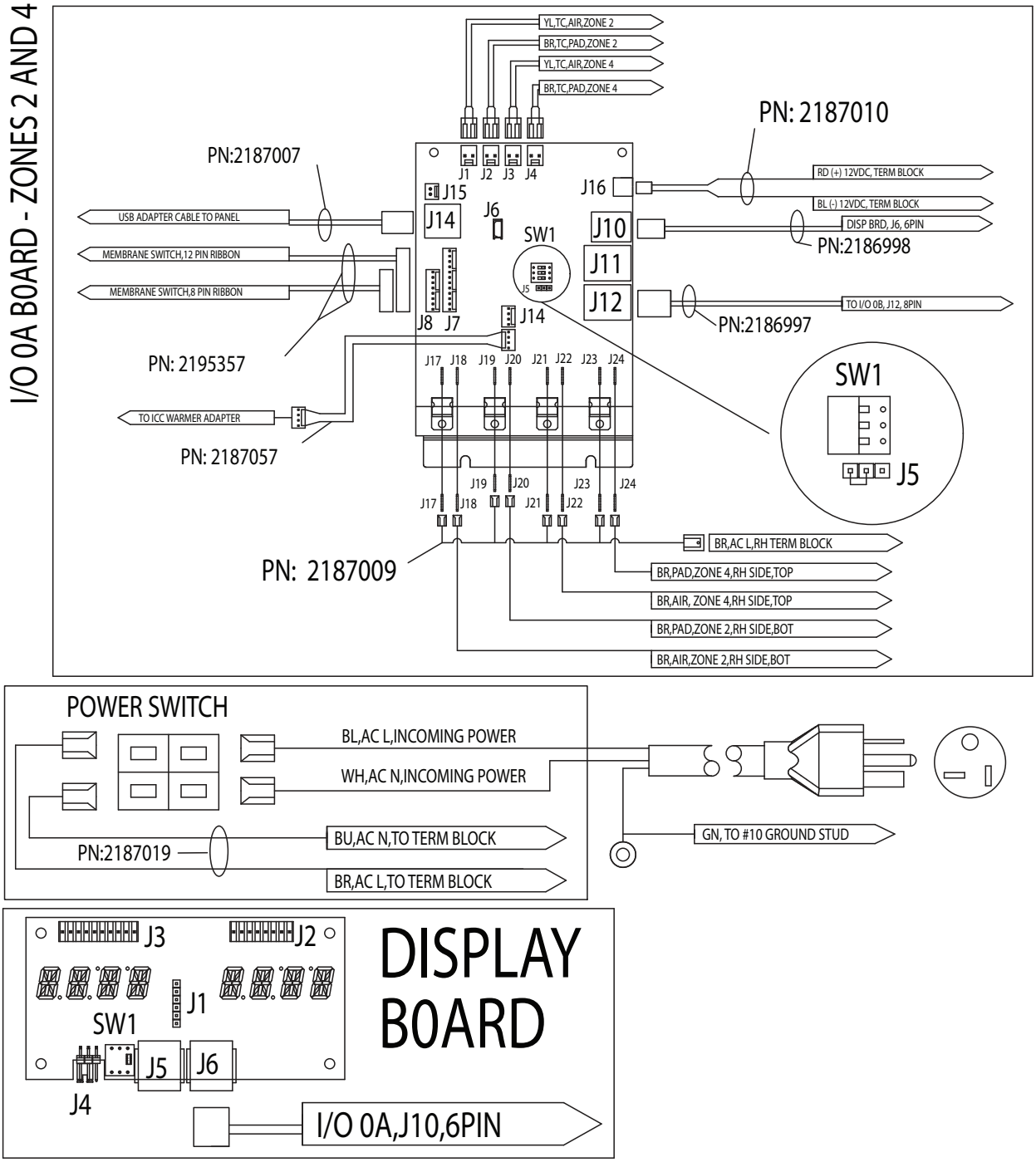
RH - TOP ZONE - ZONE 2



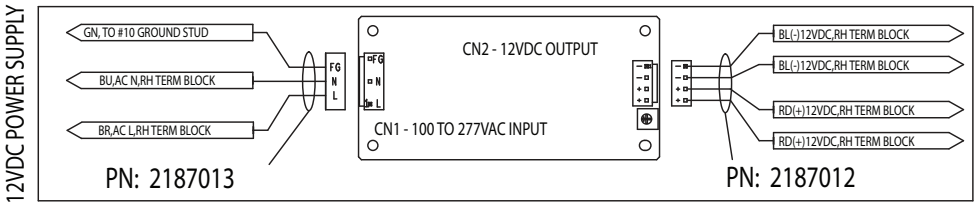
RH - TERMINAL BLOCK

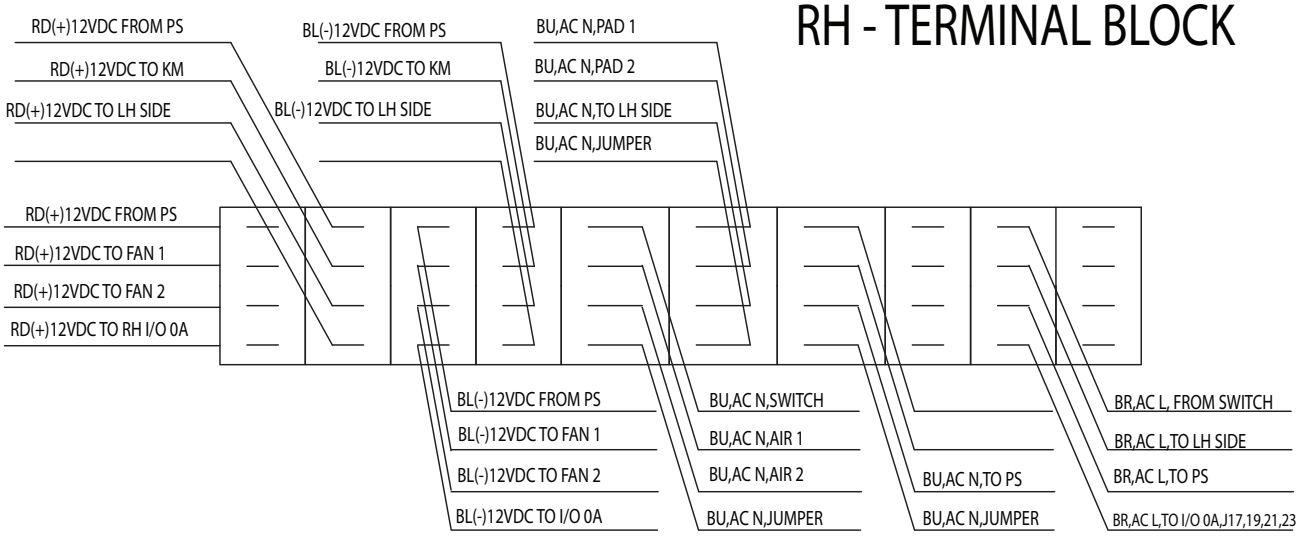


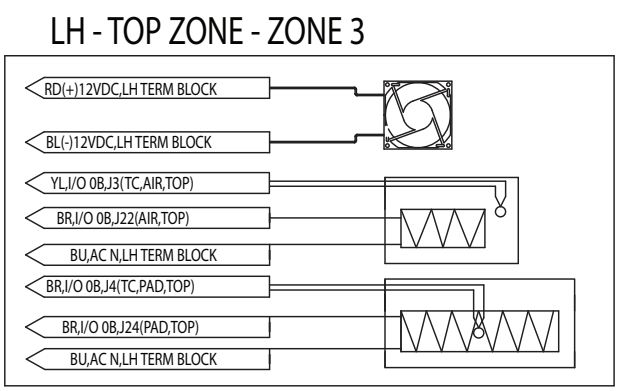
MHCFA23 & MHCFA24 - Domestic 2x3 & 2x4

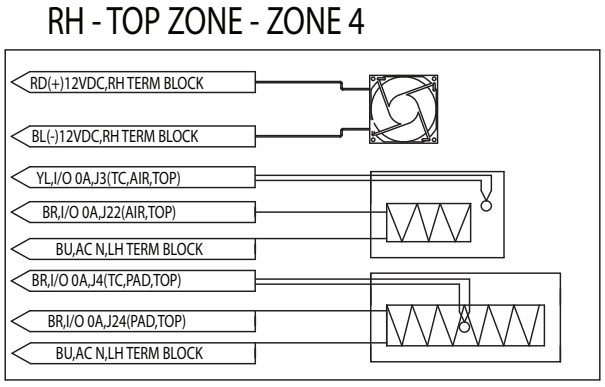


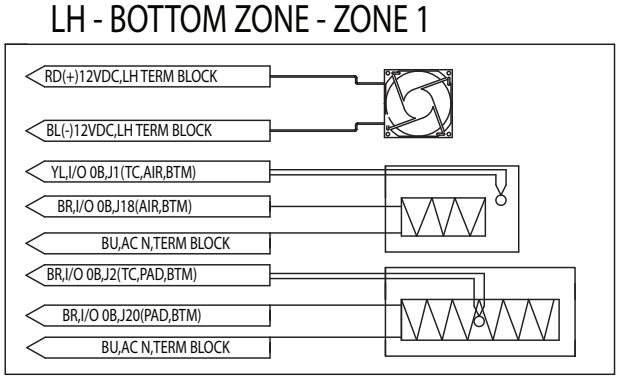
MHCFA23 & MHCFA24 - Domestic 2x3 & 2x4

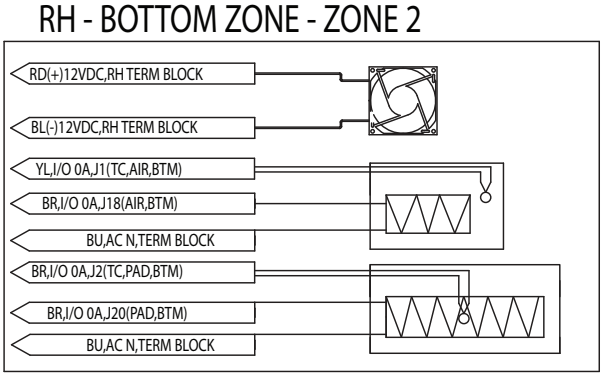




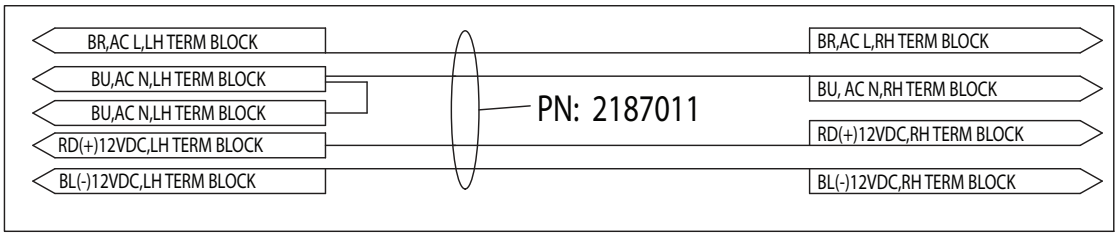


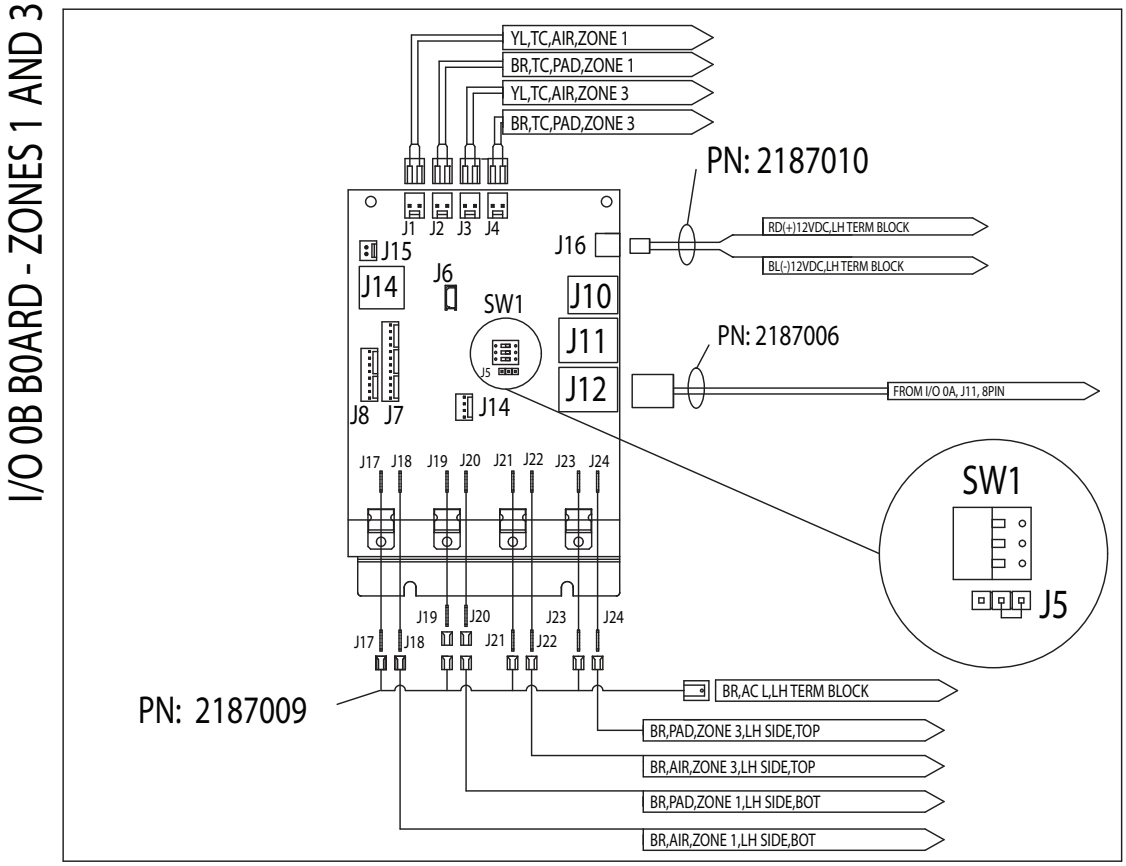


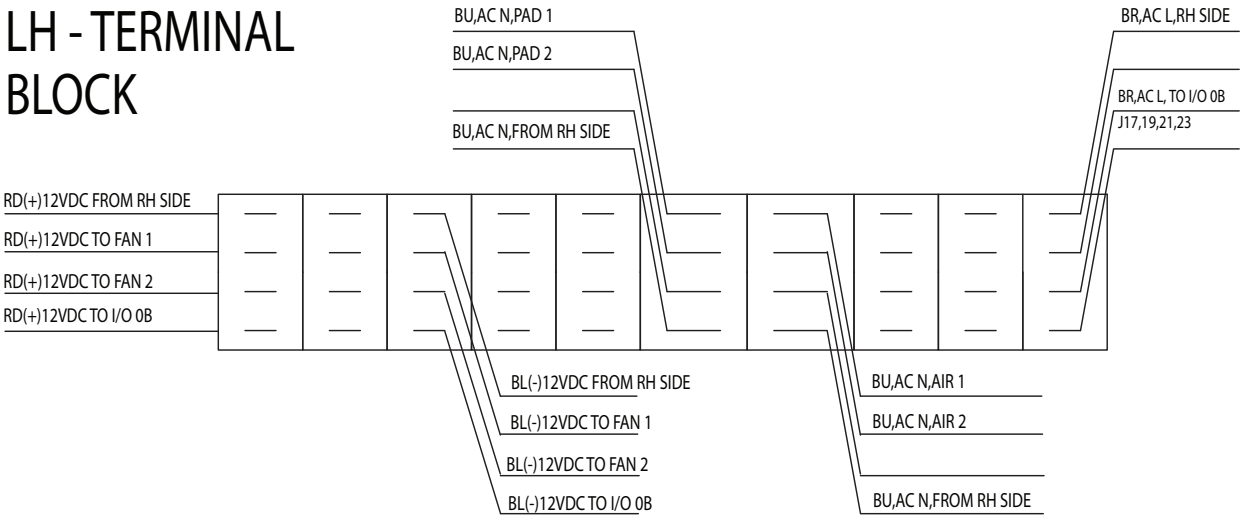




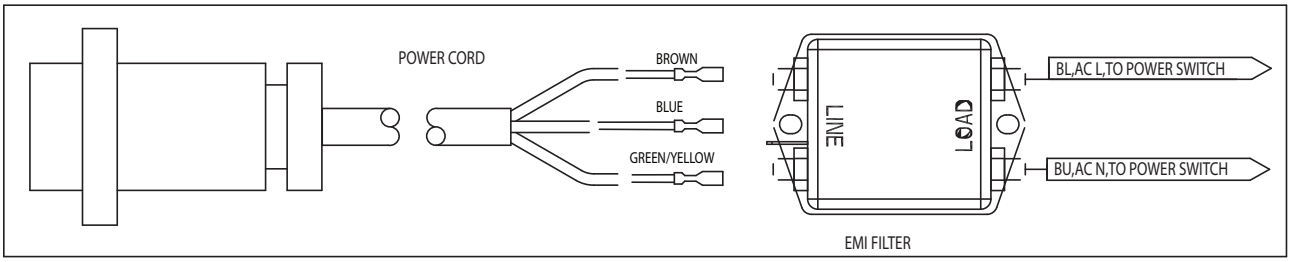
MHCFA23 & MHCFA24 - Domestic 2x3 & 2x4

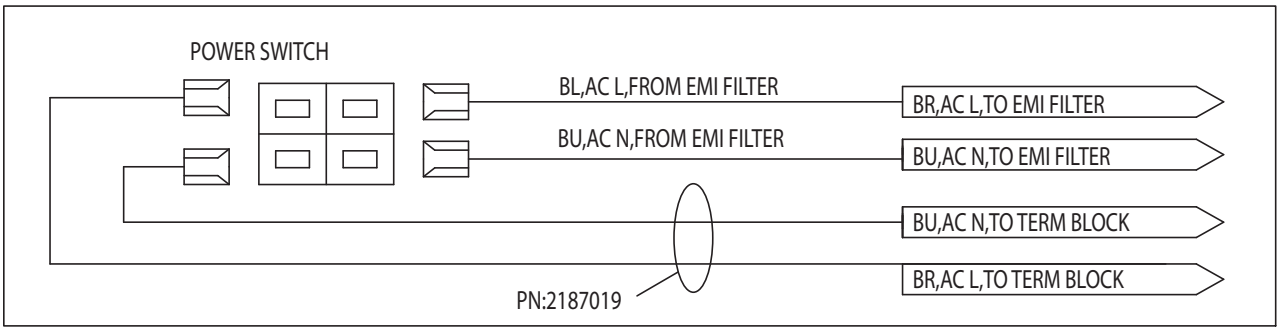


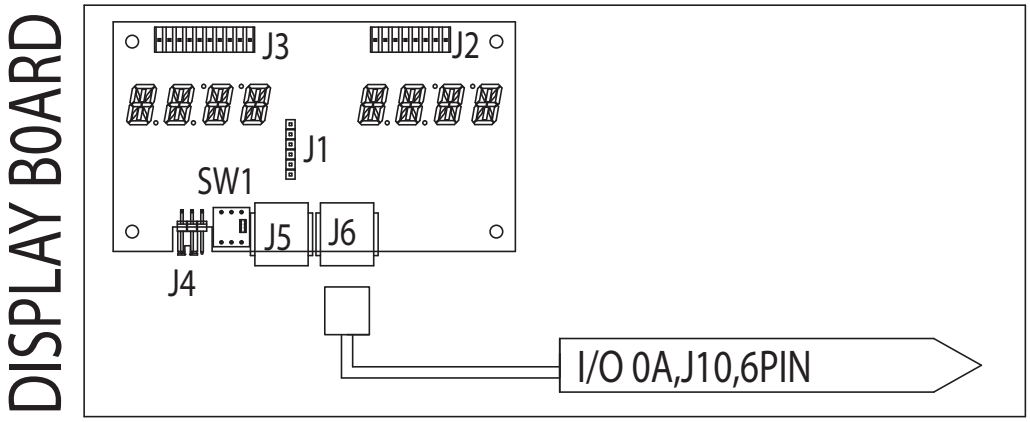




MHCFA23EX & MHCFA24EX - Export 2x3 & 2x4

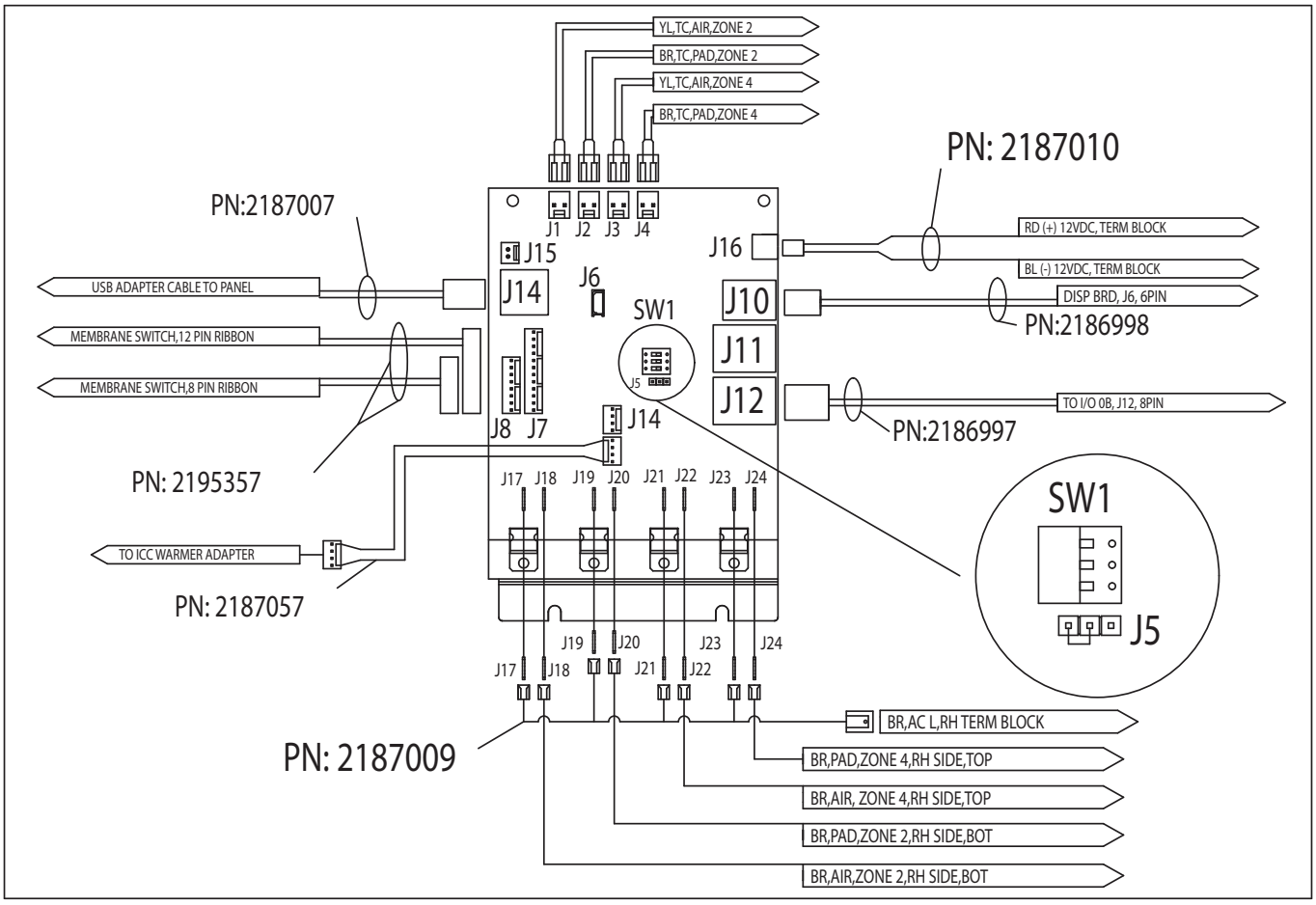


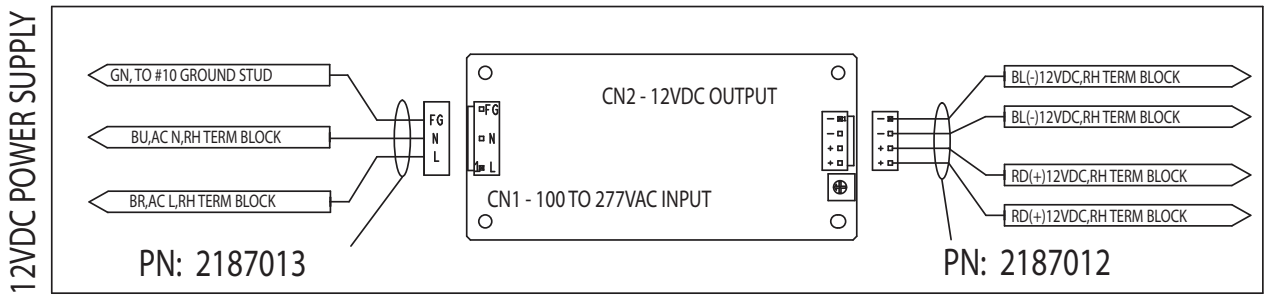




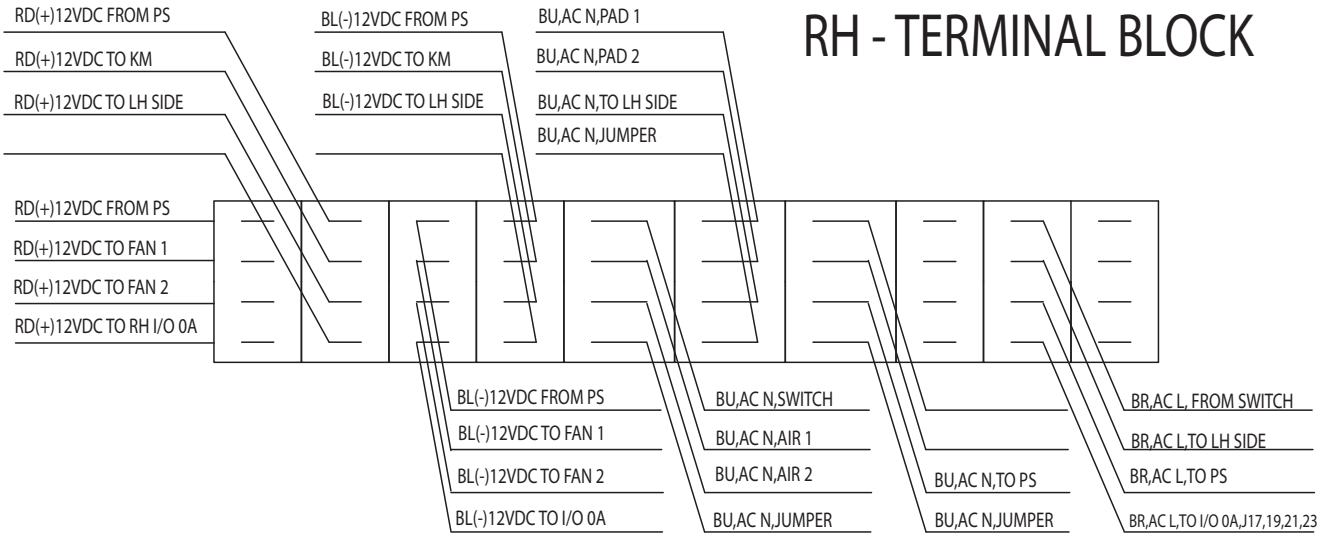
MHCFA23EX & MHCFA24EX - Export 2x3 & 2x4

I/O 0A B0ARD - ZONES 2 AND 4

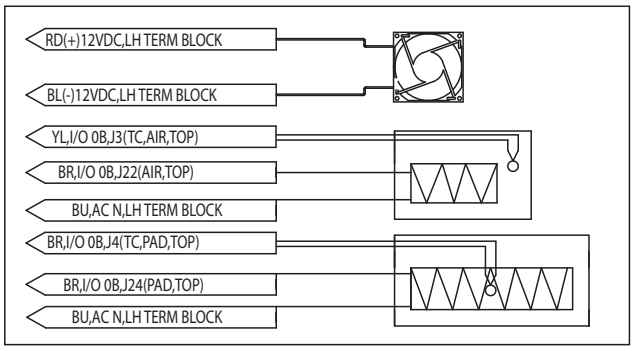




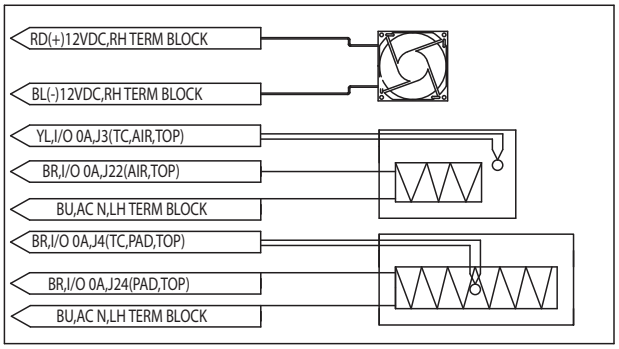
MHCFA23EX & MHCFA24EX - Export 2x3 & 2x4



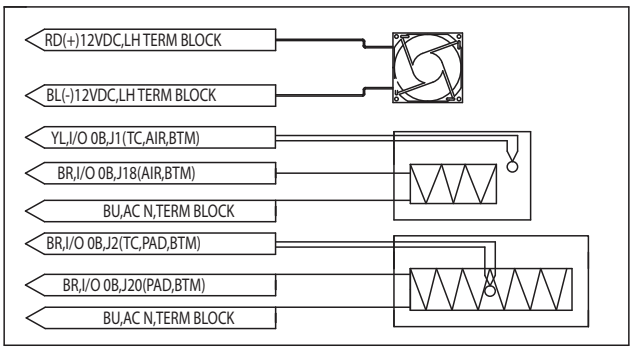
LH - TOP ZONE - ZONE 3



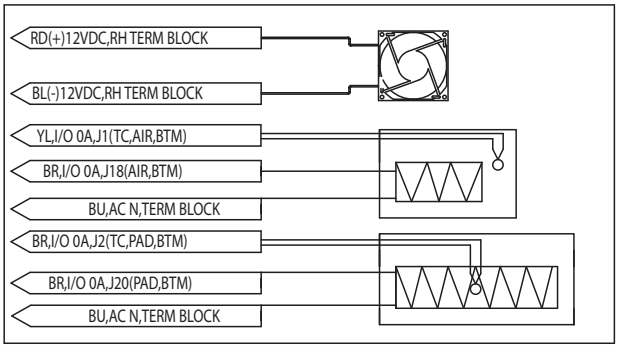
RH - TOP ZONE - ZONE 4

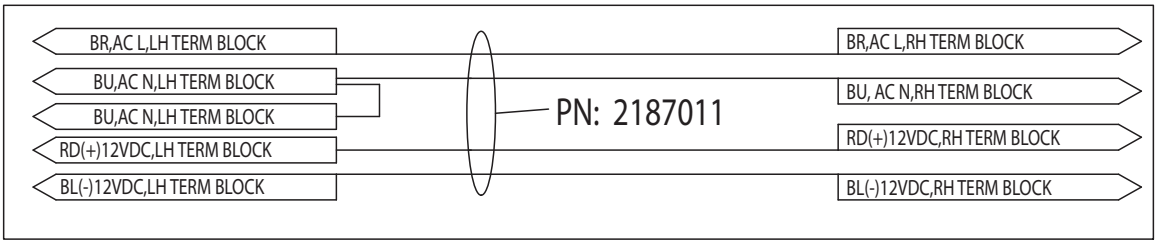


LH - BOTTOM ZONE - ZONE 1

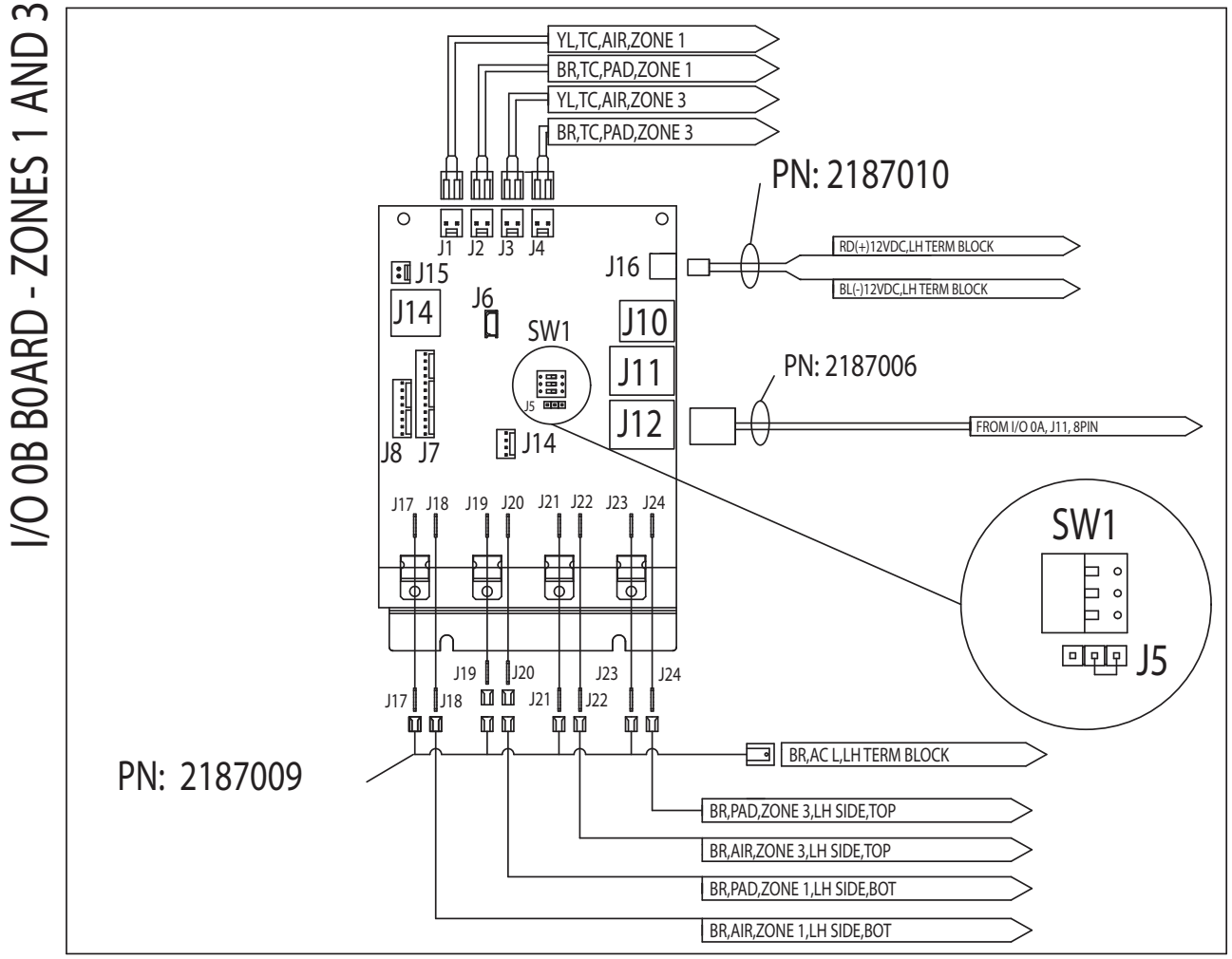


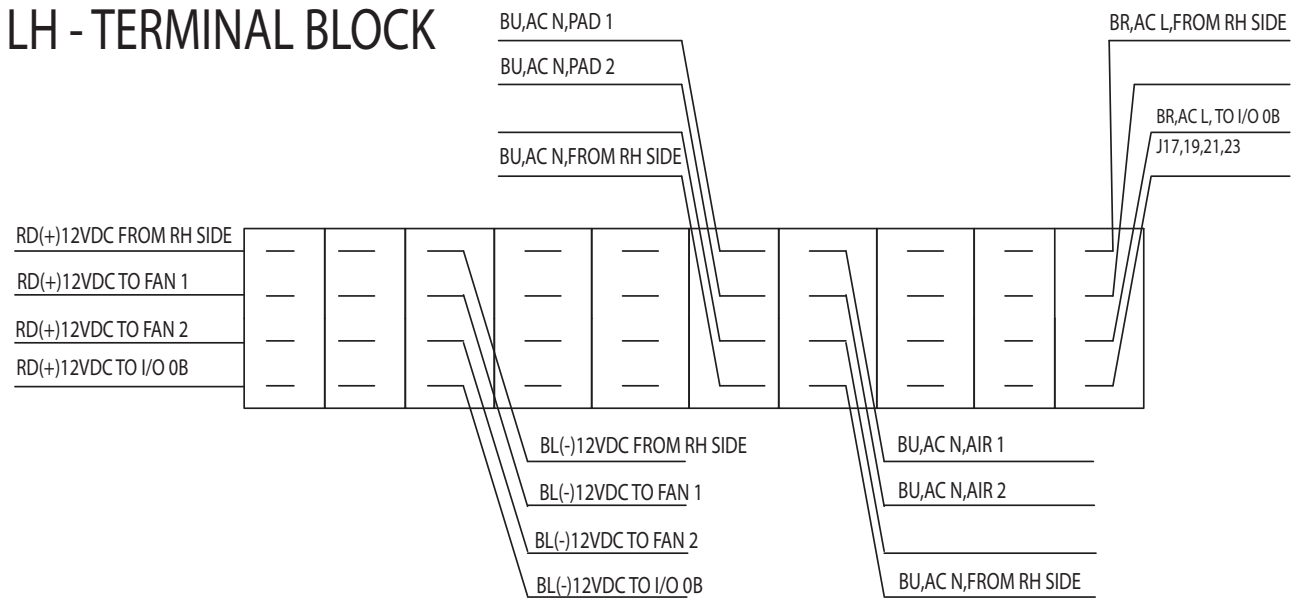
RH - BOTTOM ZONE - ZONE 2



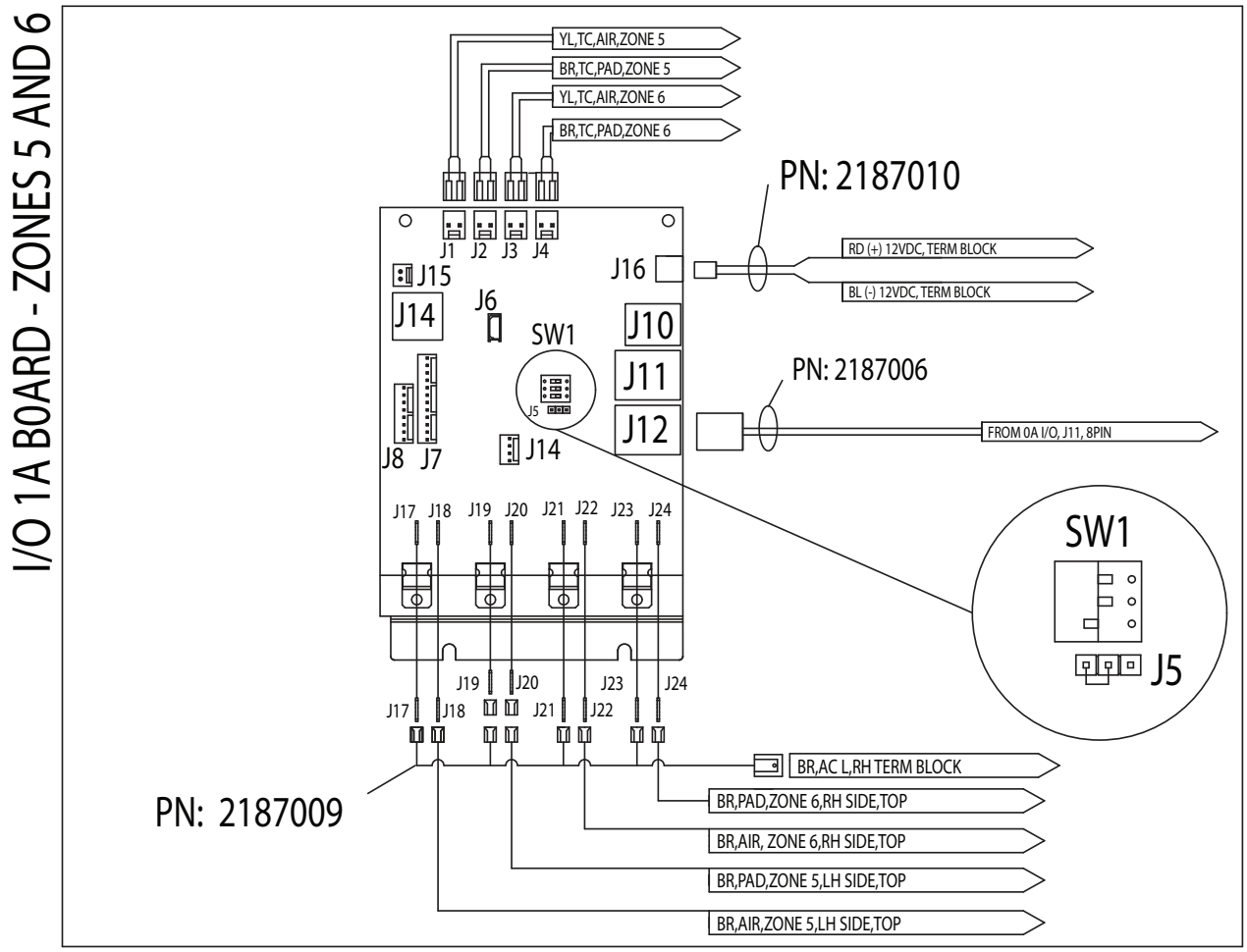


MHCFA23EX & MHCFA24EX - Export 2x3 & 2x4

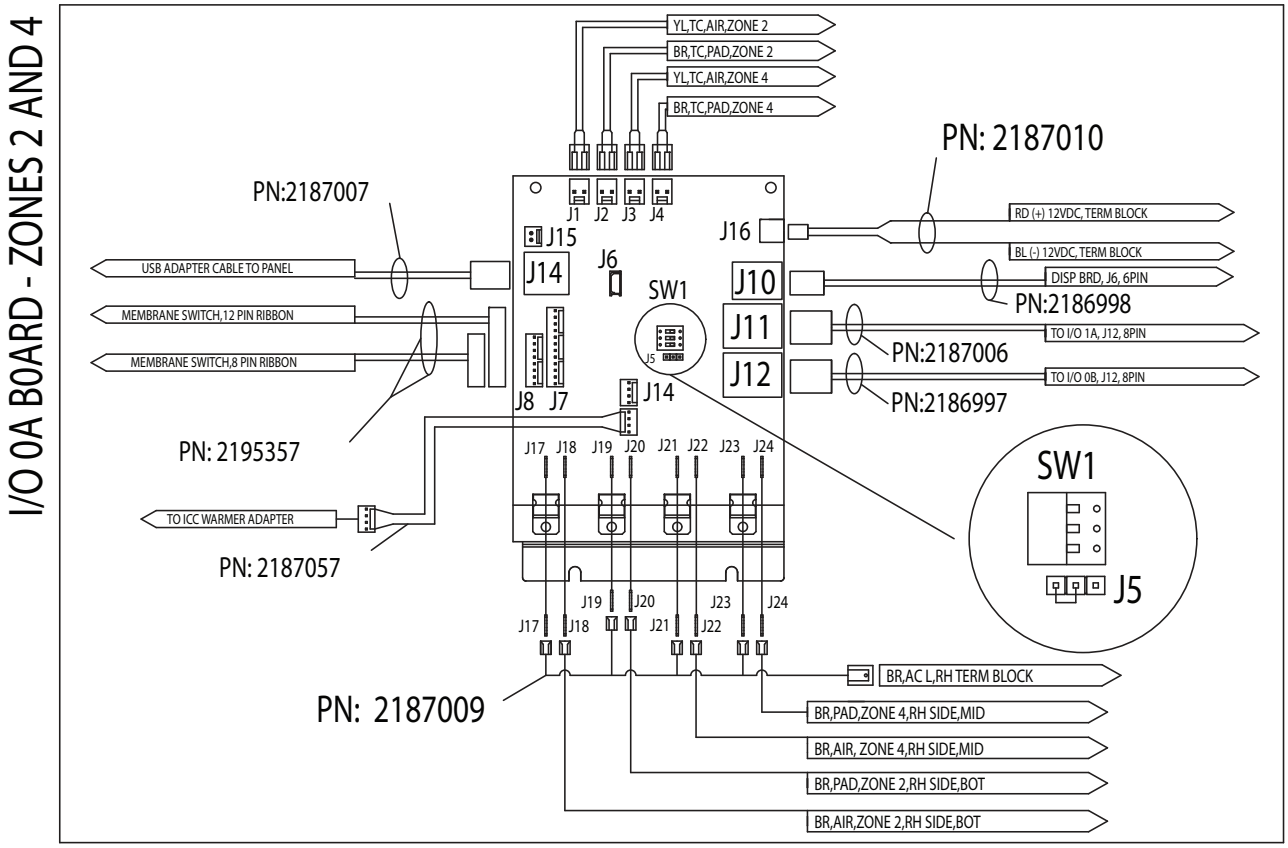




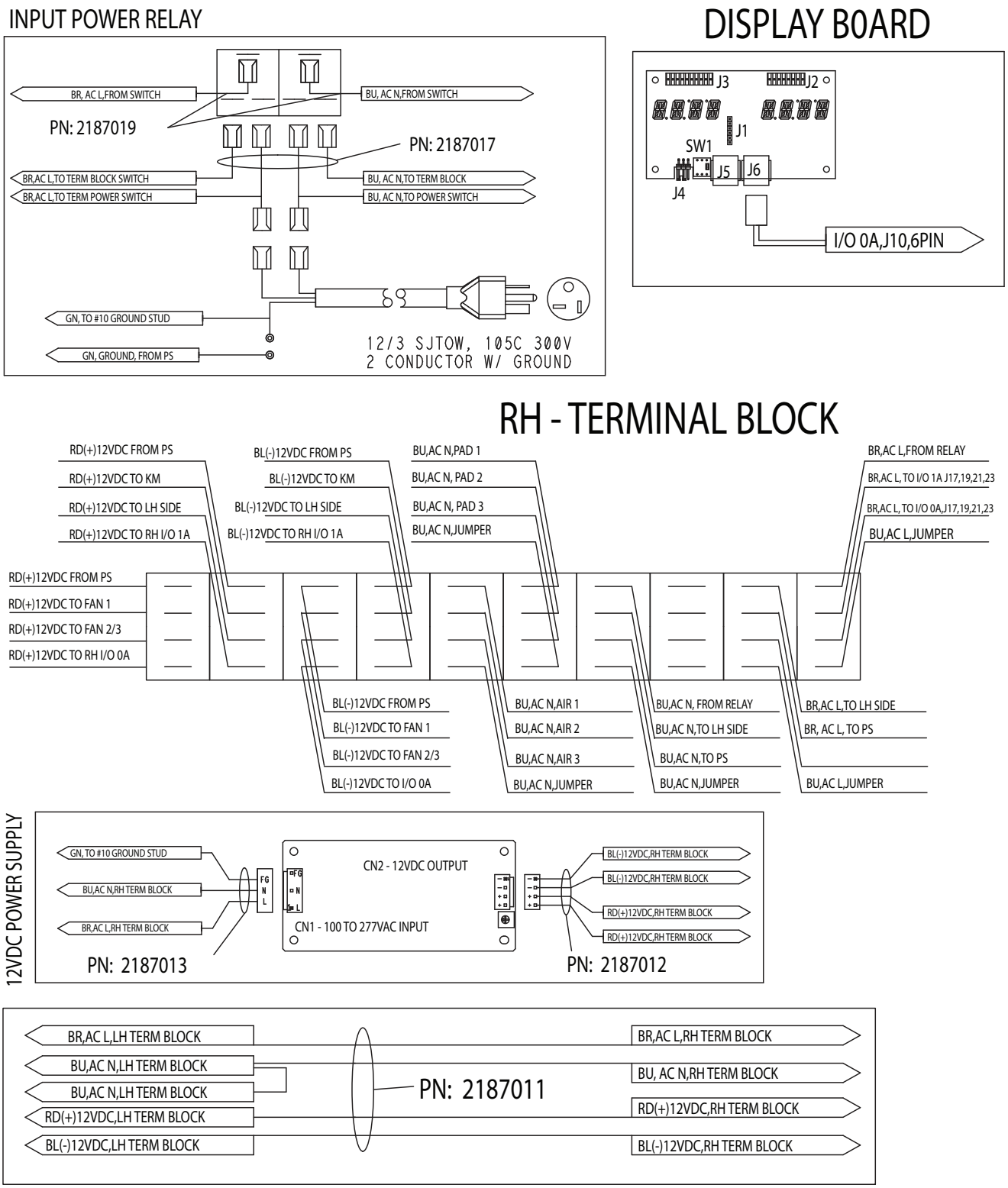
MHCFA34 - Domestic 3x4



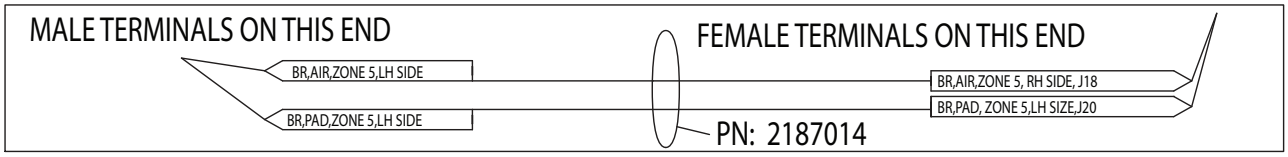
MHCFA34 - Domestic 3x4



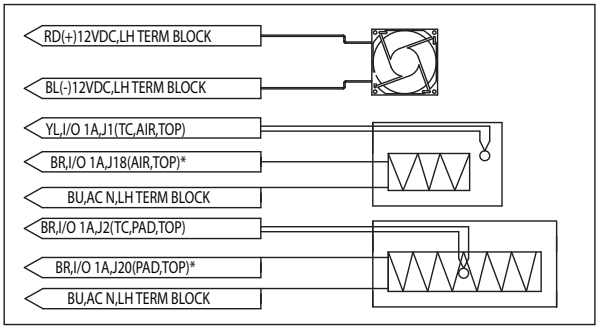
MHCFA34 - Domestic 3x4



MHCFA34 - Domestic 3x4

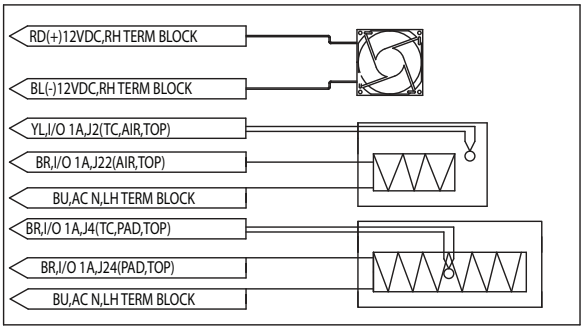


LH - TOP ZONE - ZONE 5

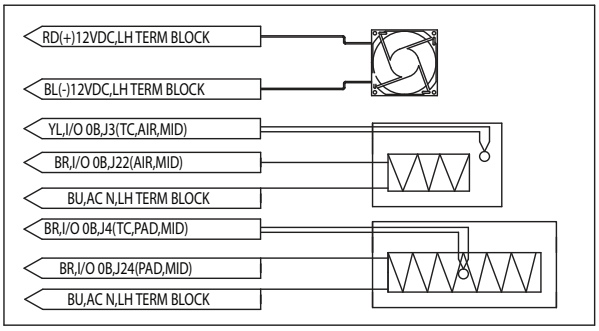


*CONNECT AC LINE (BROWN) LEADS
TO PROPER TERMINALS ON HARNESS 2187014

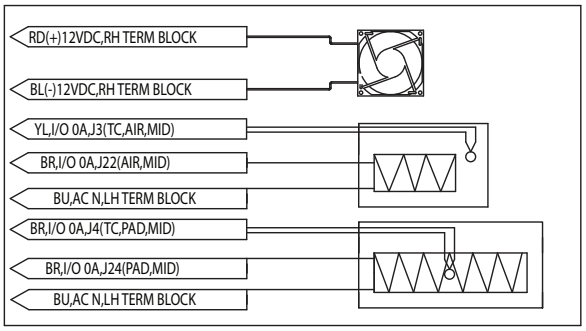
RH - TOP ZONE - ZONE 6



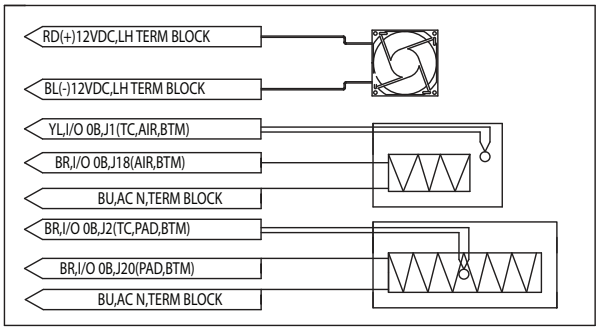
LH - MIDDLE ZONE - ZONE 3



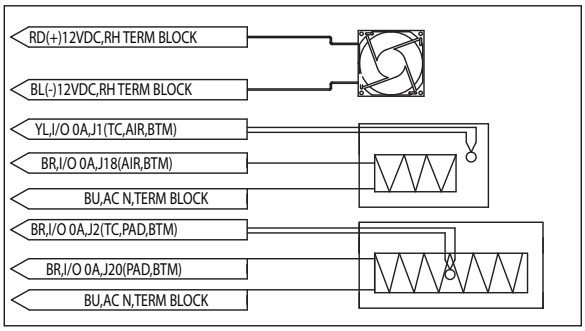
RH - MIDDLE ZONE - ZONE 4

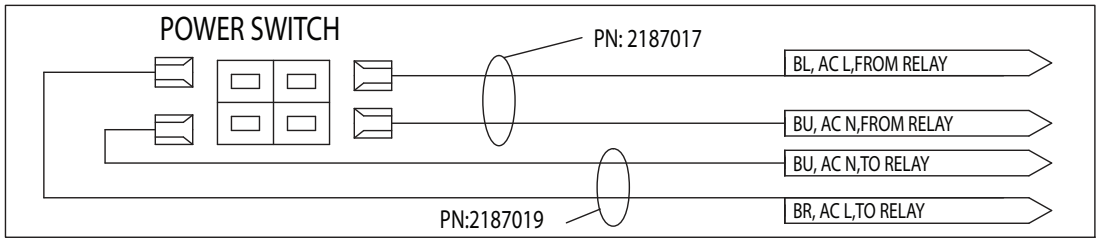


LH - BOTTOM ZONE - ZONE 1



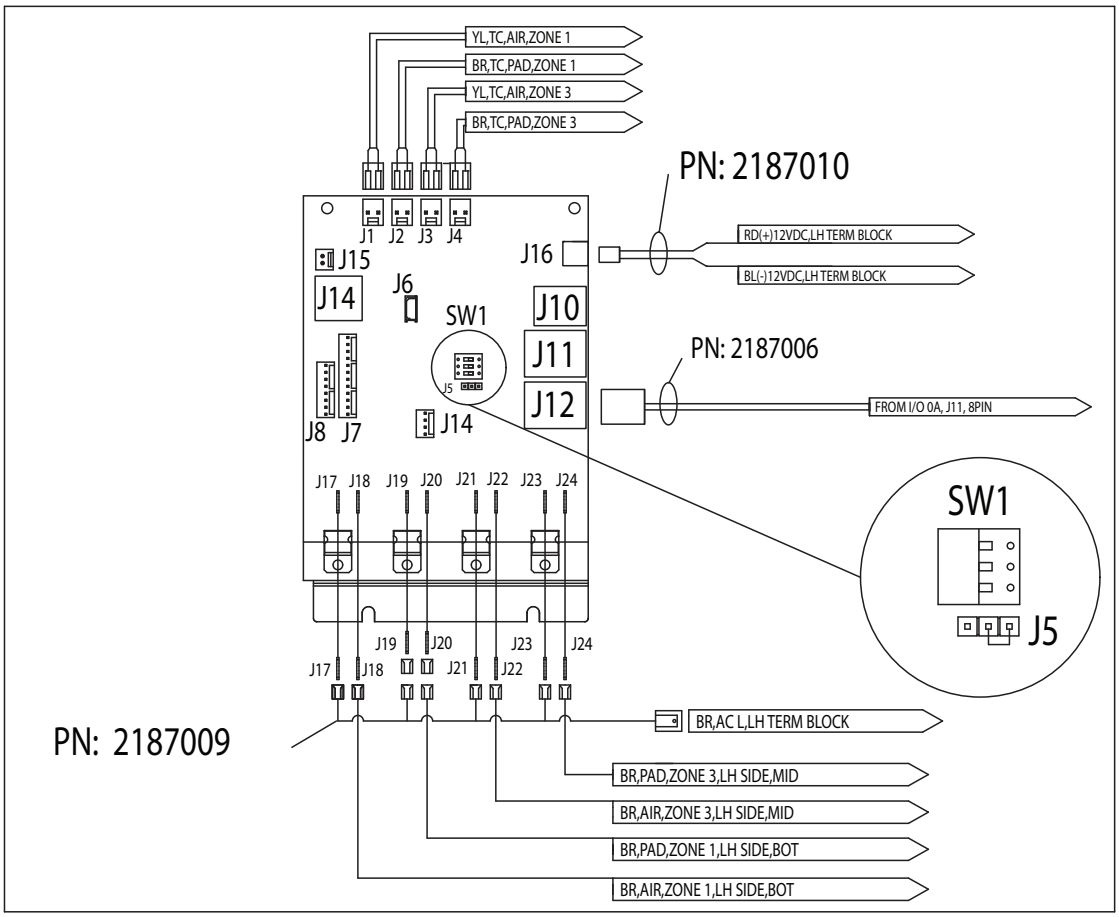
RH - BOTTOM ZONE - ZONE 2



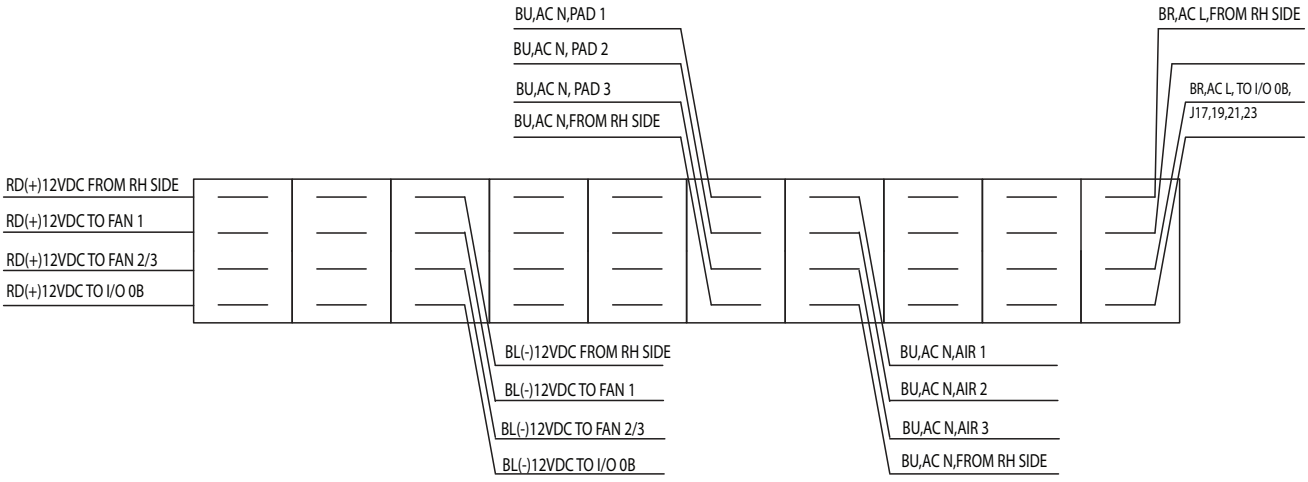


MHCFA34 - Domestic 3x4

I/O 0B B0ARD - ZONES 1 AND 3

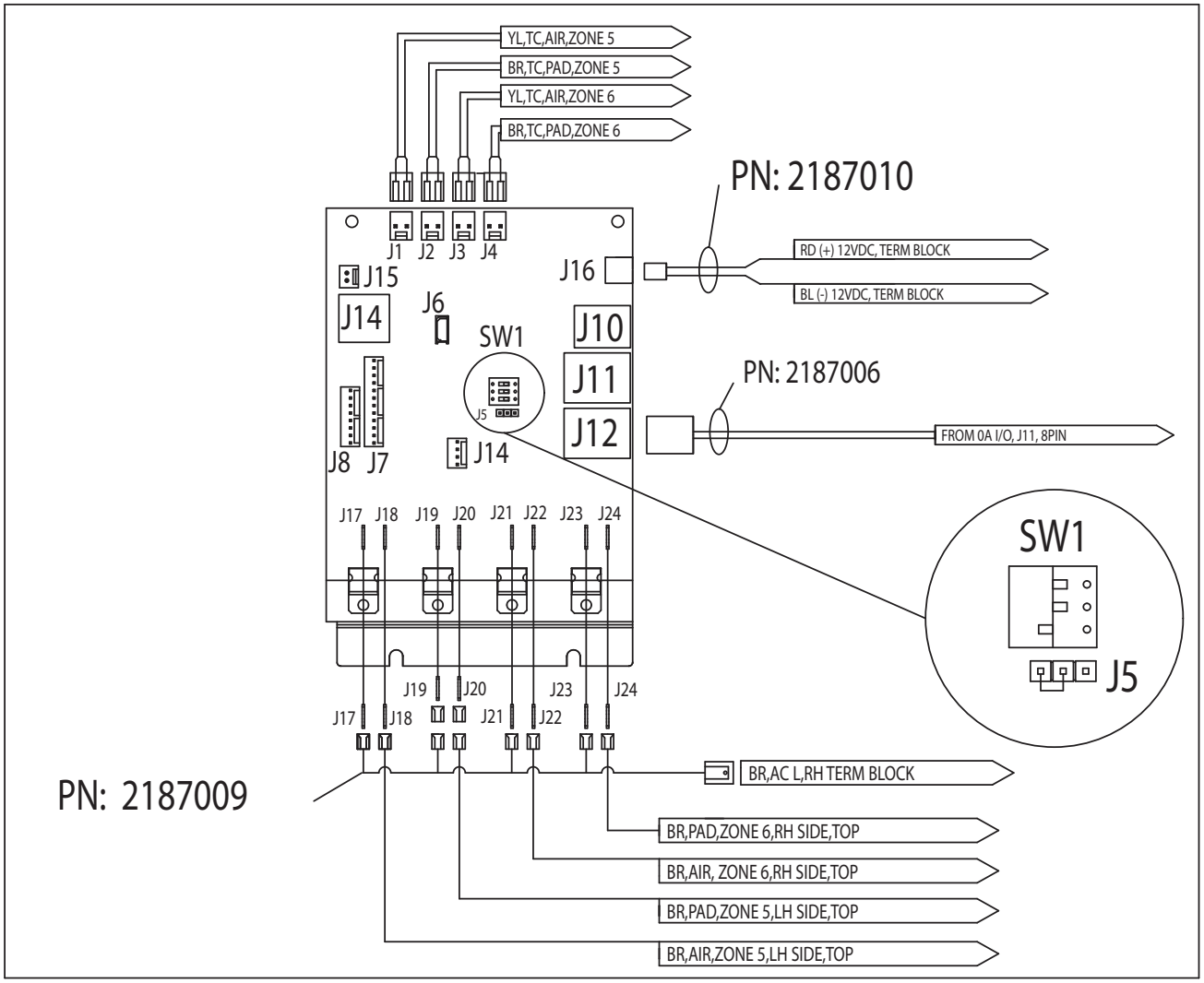


LH - TERMINAL BLOCK

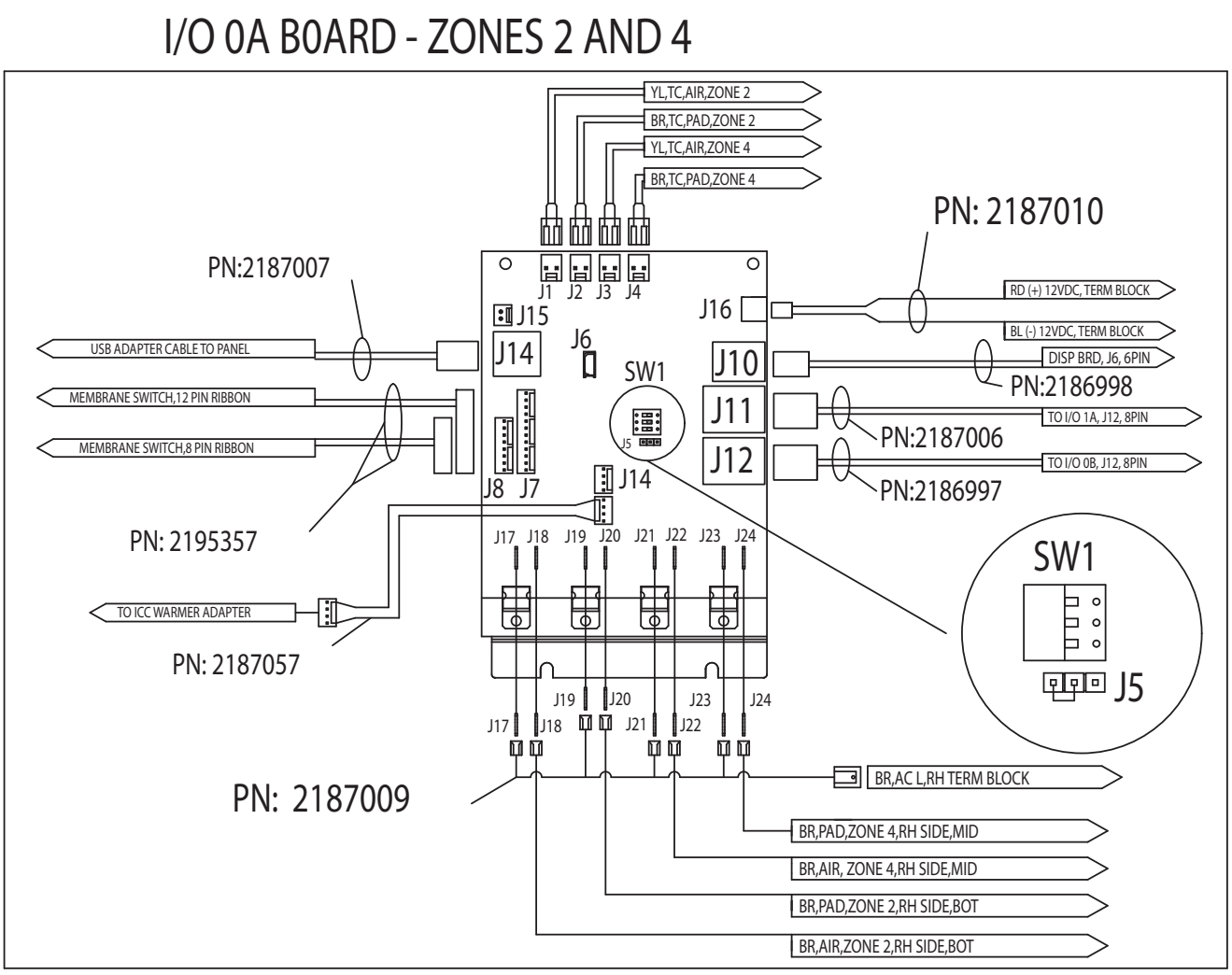


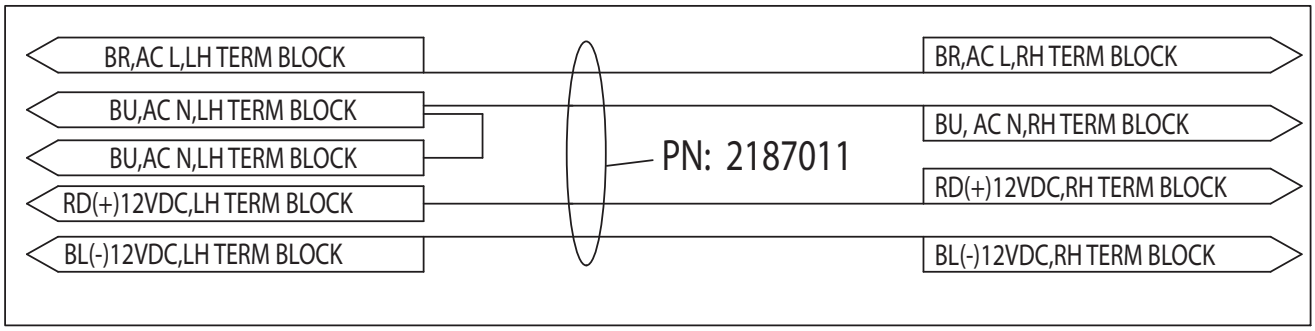
MHCFA34EX - Export 3x4

I/O 1A B0ARD - ZONES 5 AND 6

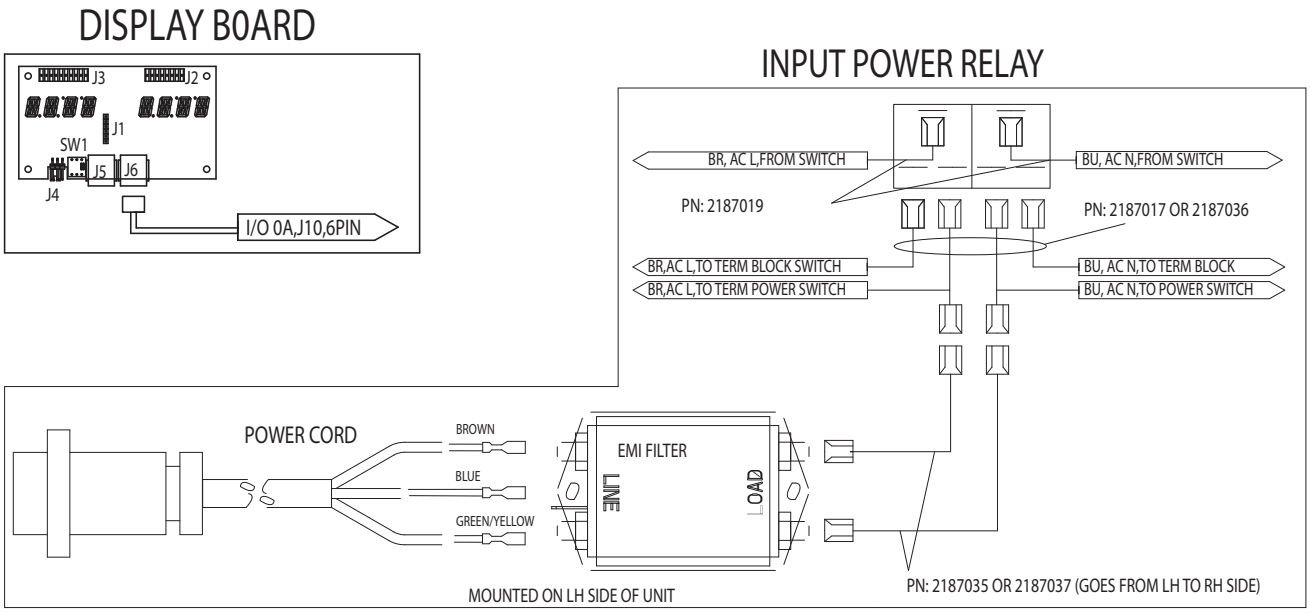


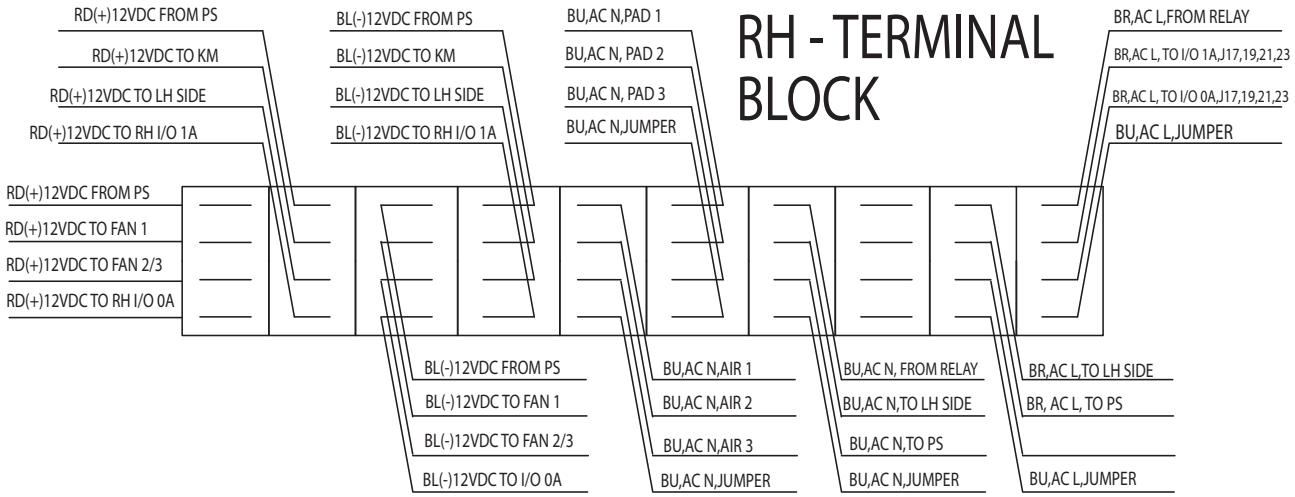
MHCFA34EX - Export 3x4

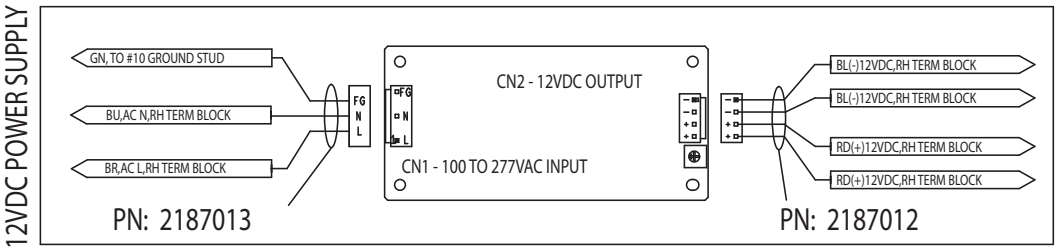




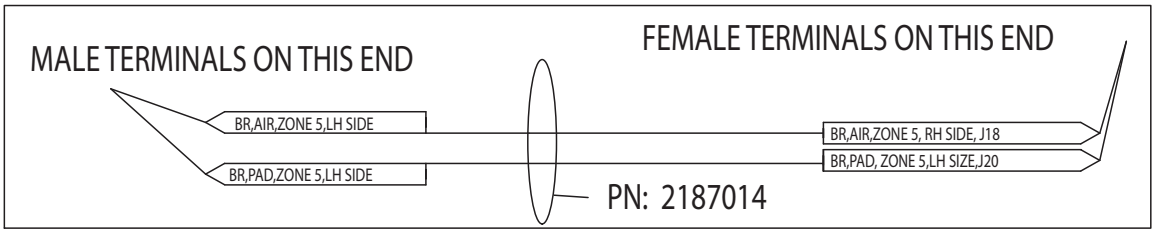
MHCFA34EX - Export 3x4



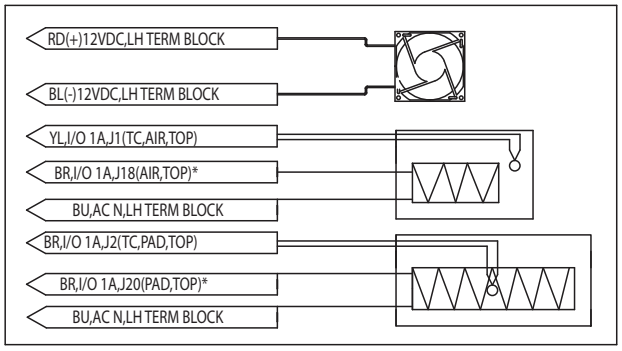




MHCFA34EX - Export 3x4

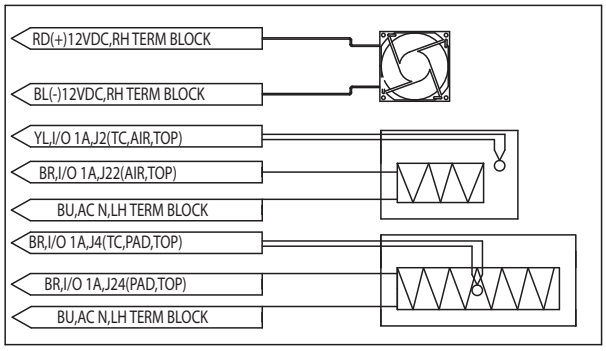


LH - TOP ZONE - ZONE 5

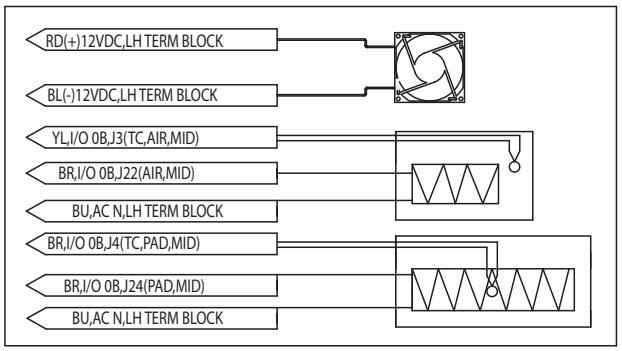


*CONNECT AC LINE (BROWN) LEADS
TO PROPER TERMINALS ON HARNESS 2187014

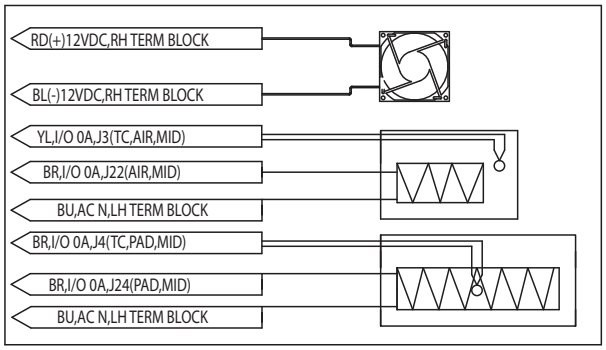
RH - TOP ZONE - ZONE 6



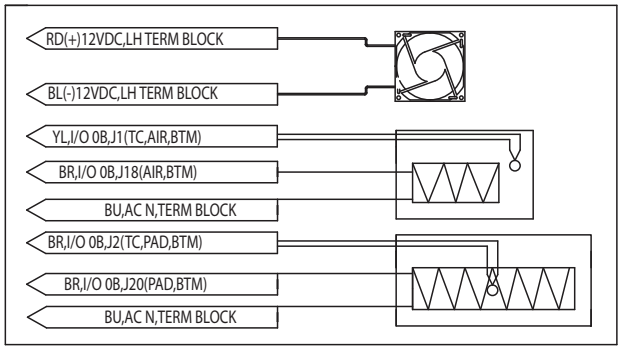
LH - MIDDLE ZONE - ZONE 3



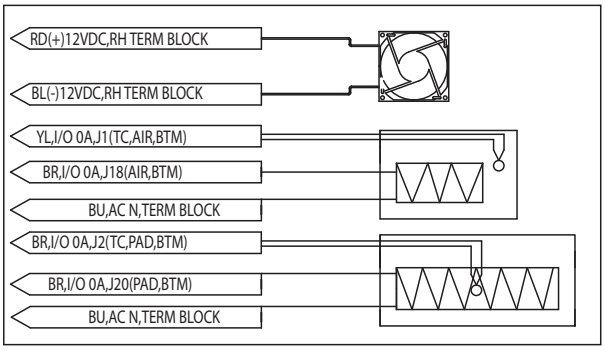
RH - MIDDLE ZONE - ZONE 4



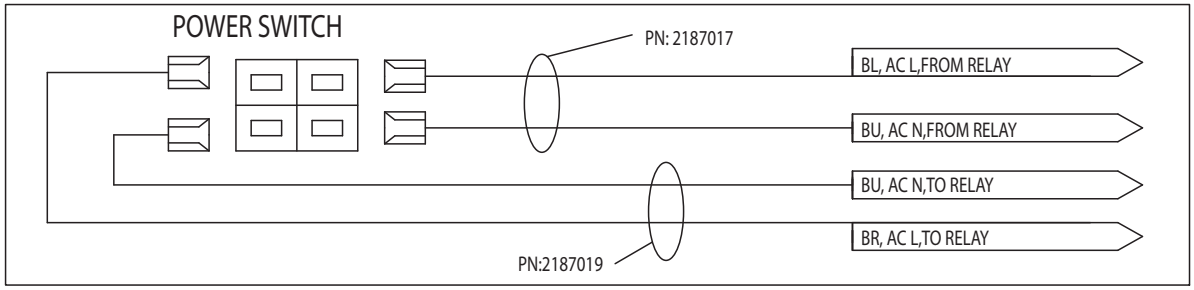
LH - BOTTOM ZONE - ZONE 1

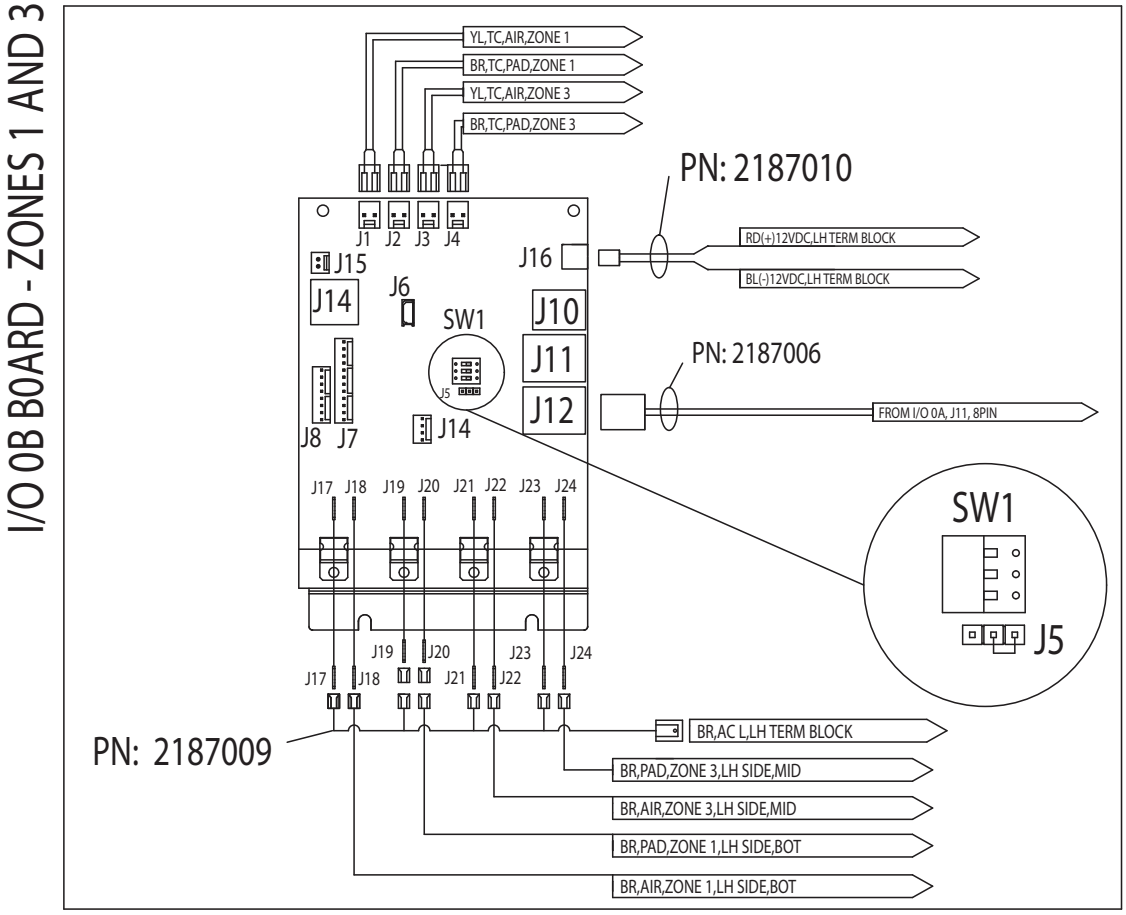


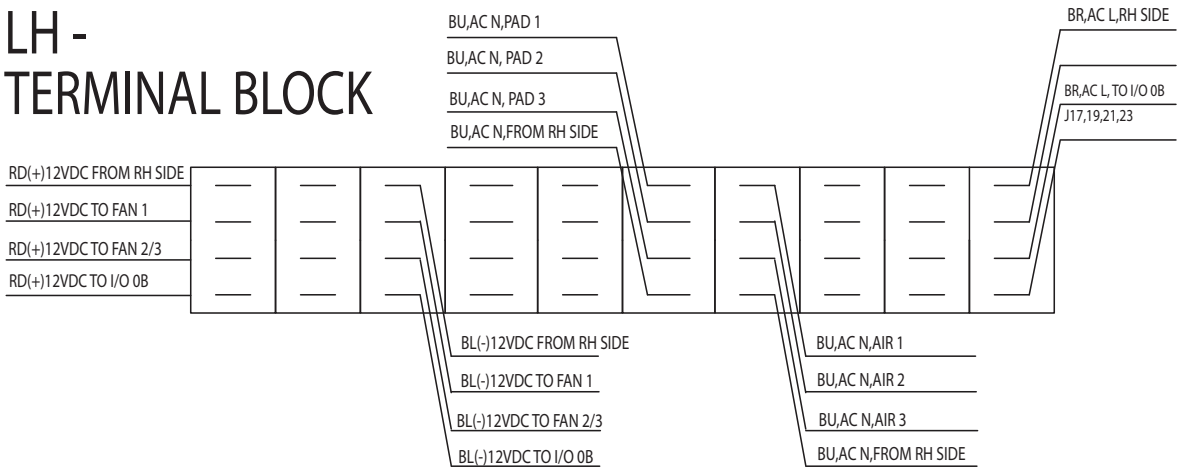
RH - BOTTOM ZONE - ZONE 2



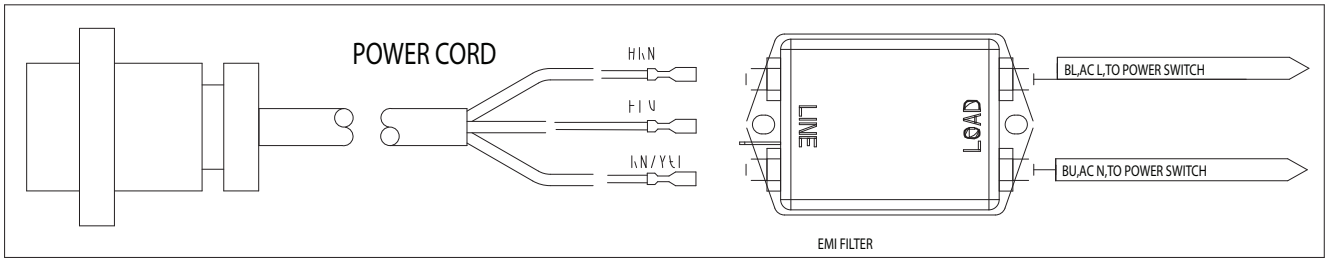
MHCFA34EX - Export 3x4

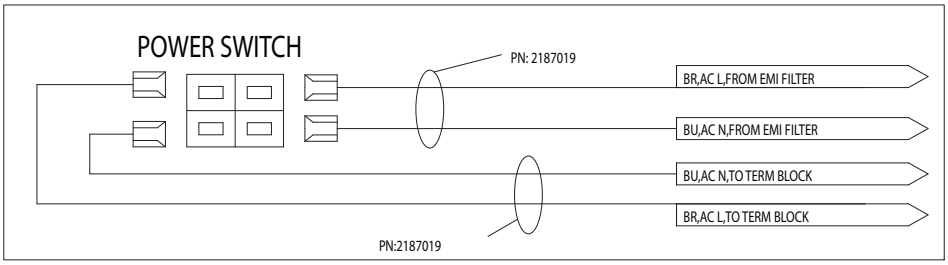


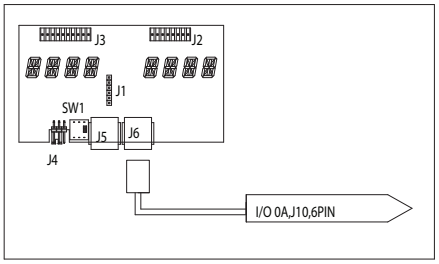


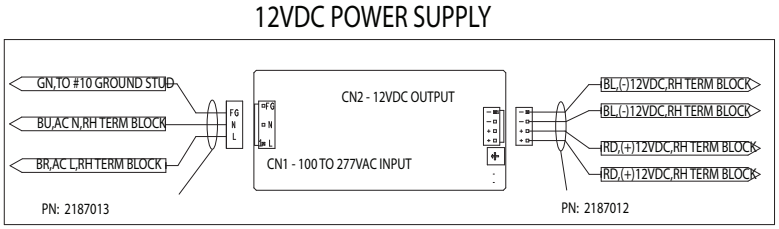


MHCFA42EX - Export 4x2



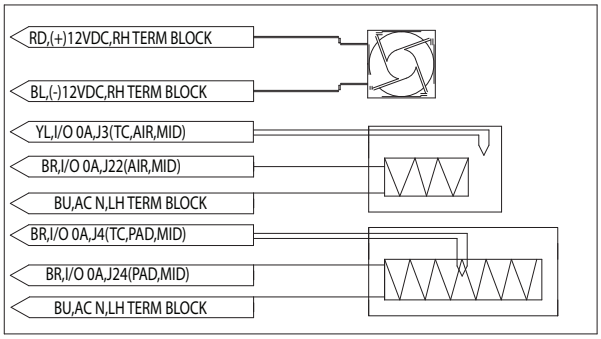




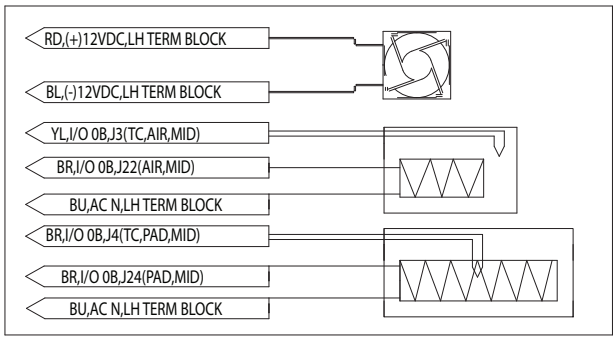


MHCFA42EX - Export 4x2

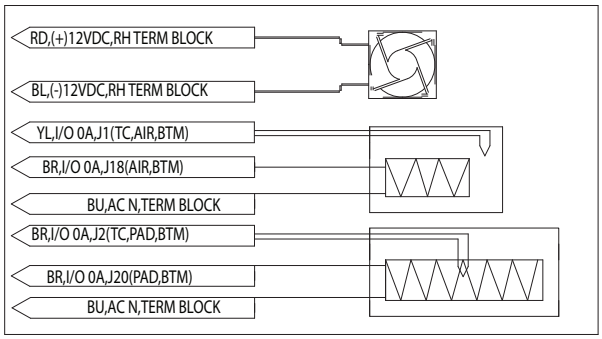
ROW 4 (TOP) - ZONE 4



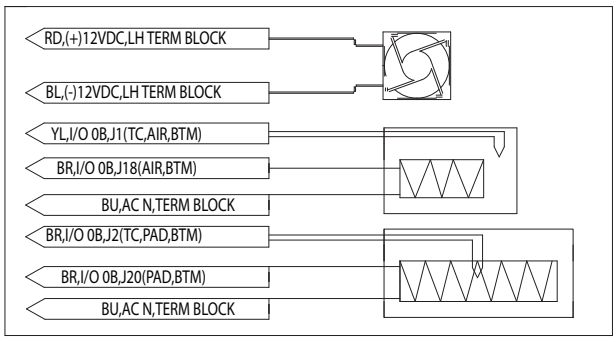
ROW 3 - ZONE 3



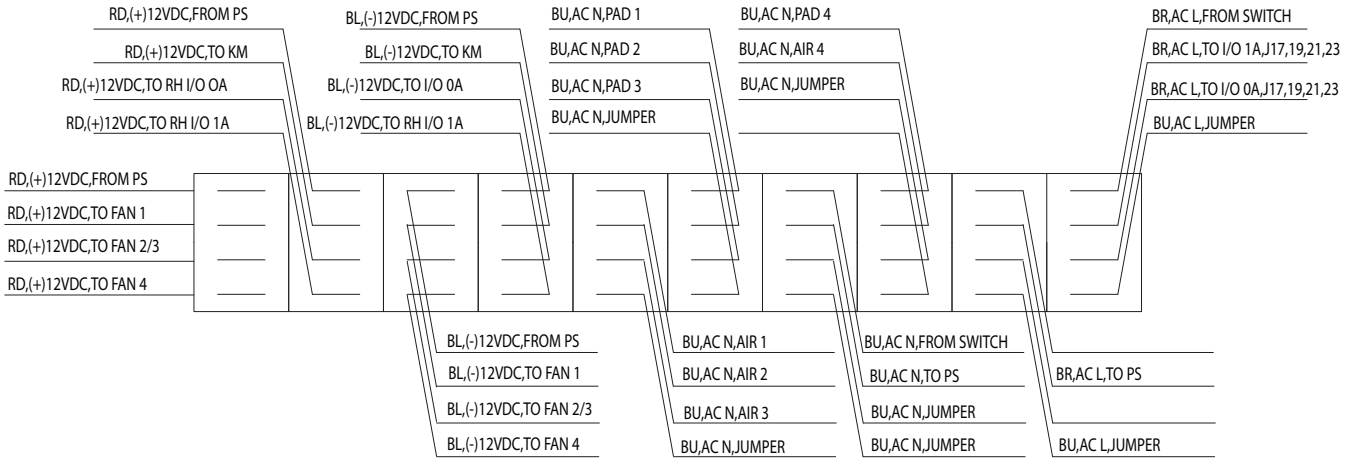
ROW 2 - ZONE 2



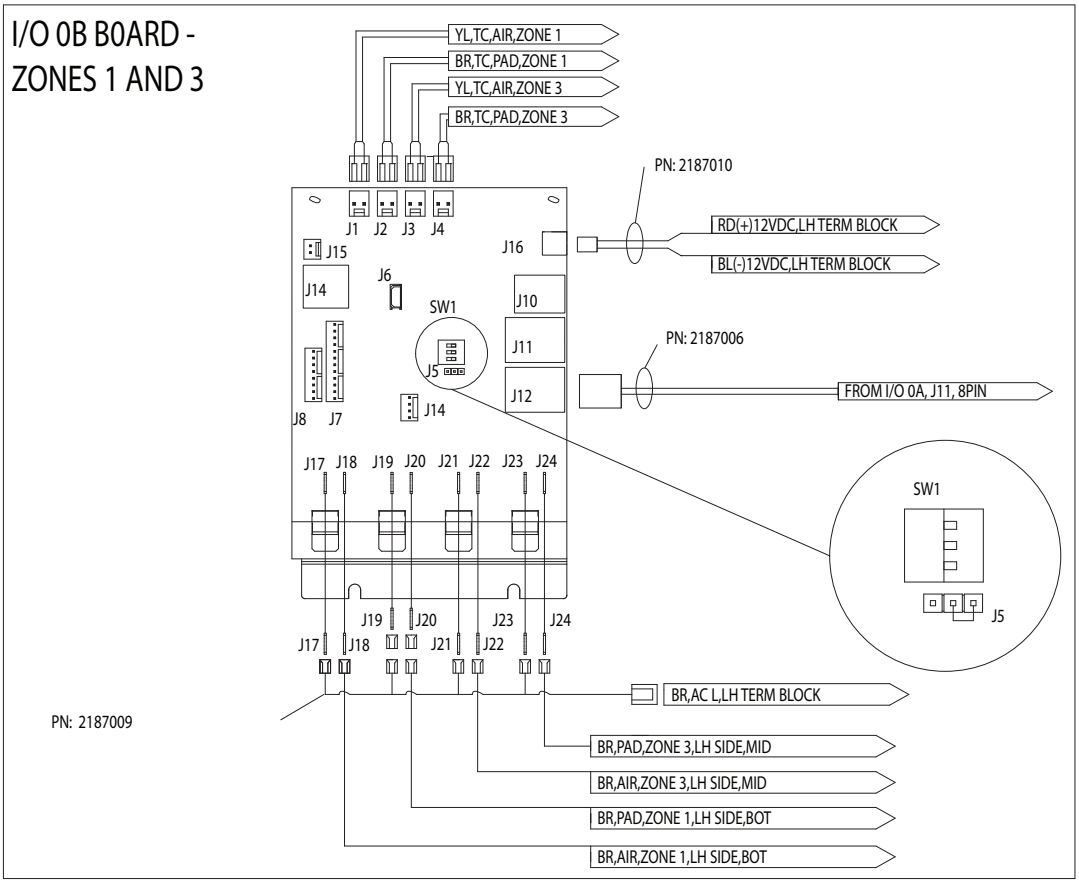
ROW 1 (BOTTOM) - ZONE 1

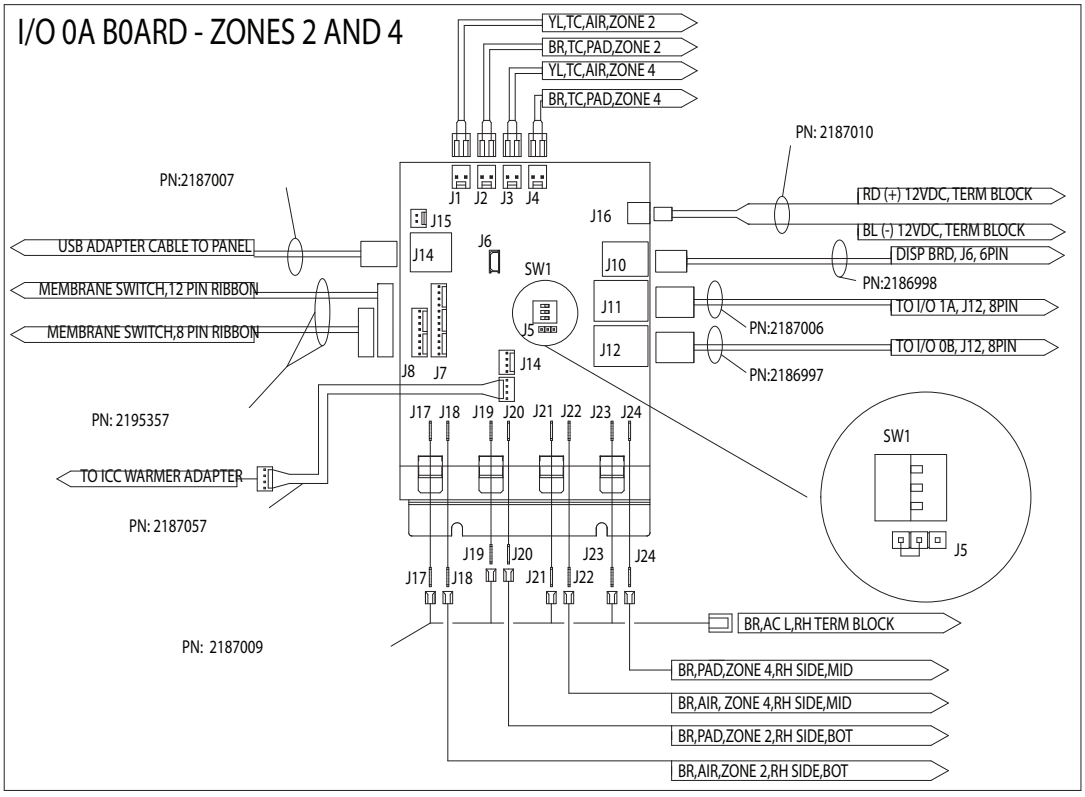


RH - TERMINAL BLOCK



MHCFA42EX - Export 4x2





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