CAIRE®

SERVICE BULLETIN

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RELEASE DATE: September 5, 2019
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MODEL: Onyx 5L and 10L (Ultra) Models

ISSUE: Onyx 5L and 10L (Ultra) Main Circuit Board Retrofit Instructions

NOTES: This instruction is intended to guide technicians through replacing circuit board item CB154 / CB160 (or older circuit boards) with circuit board CB200.

Table 1. Available Kit Options

Kit Part Number	Main Board Included in Kit	Model
KI611-4	CB200-4	Onyx 5L (220 V, 50Hz)
KI611-3	CB200-3	Onyx 5L (120V, 60Hz)
KI611-2	CB200-2	Onyx 10L (220V, 50Hz)
KI611-1	CB200-1	Onyx 10L (120V, 60Hz)

Tools Required:

- Flat-Head Screwdriver
- Phillips-Head Screwdriver
- ESD Electrostatic Protection
- Wire Cutters
- 5/16 wrench

Table 2. Parts Included with KI611

Part Number	Description	Qty
CB200-*	Main Circuit Baord, programmed (* see Table 1 for details)	1
WH147-1	Wire Harness Main New Life	1
WH146-1	Power Switch Wire Harness	1
WH097-1	Wire Harness, Power Switch/	1
TW001-4	Tie Wrap, 4”	2
21467120	Instruction Bulletin for Board Retrofit	1
CD004-1	Cord, Power, 3-Prong, 12ft	1
CD006-1	Cord, Power, Strain Relief	1
CN001-3	Connector, Push-On, Straight	2
CN049-5	Connector, Terminal Ring	1
CA007-11	Cabinet, Recepticle	1
CD007-1	Cord, Power, 2-Prong, 8ft	1

Procedure:

1. Turn off the unit and disconnect the power cord.
2. Remove the side panels with a flat head screwdriver.
3. Disconnect the main power 10-pin connector from the circuit board.
See Figure 1

Important Note: It is strongly recommended to use standard electrostatic discharge (ESD) protection when handling any circuit boards. Damage to boards may result if ESD procedures are not properly followed.

Note: If working on the Onyx 10L 220V unit, the 2-pin compressor connector will need to be disconnected as well. This is located directly to the left of the main power 10-pin connector. (Red & White Wires)

Figure 1. *Main board harness*

4. Cut the tie-wrap at the circuit board pressure transducer and disconnect the green tube from the transducer.
See Figure 2

Figure 2. *Pressure transducer zip tie*

5. Push in on the circuit board support tabs while you lift each area of the circuit board to remove the circuit board from the control panel.
See Figure 3

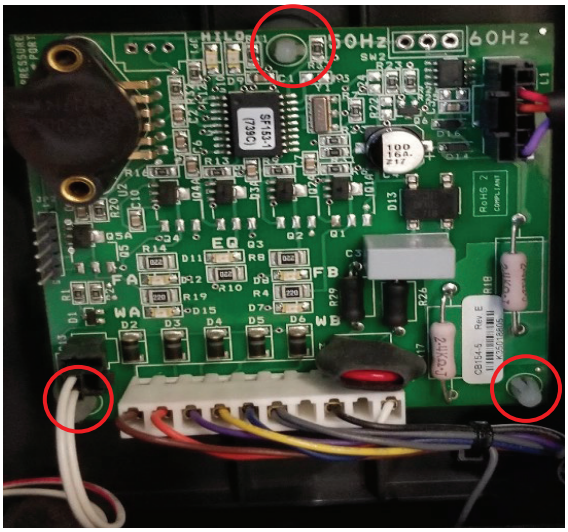

Figure 3. *Board supports*

6. Remove main wire harness from the main control board, terminal block, valve block, EQ valve, and fan.You will also need to disconnect the two white plugs and then cut the light blue and brown wire from the power cord to remove the harness from the Superstructure. Discard the wire harness.
See Figures 4 and 5.

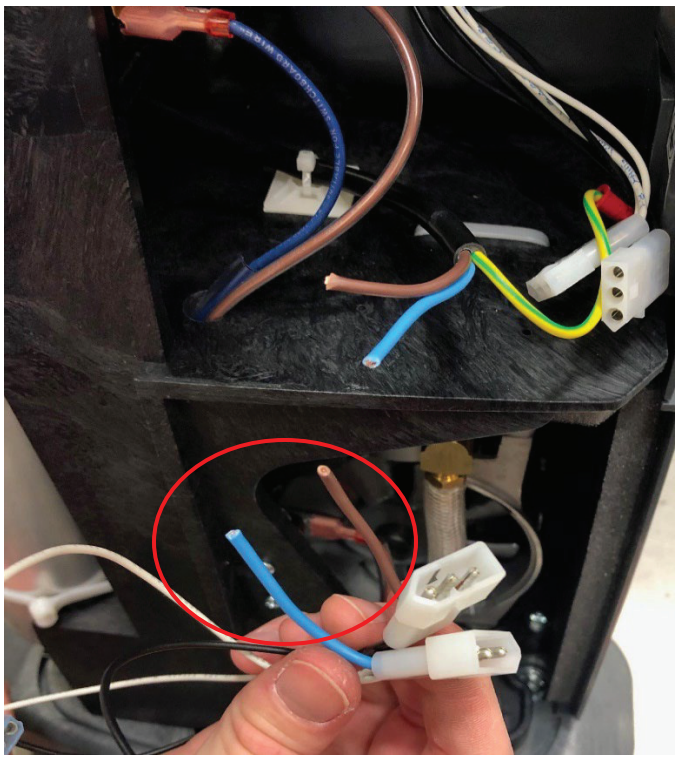

Figure 4. *Disconnected white plugs and cut light blue and brown wires from power cord.*

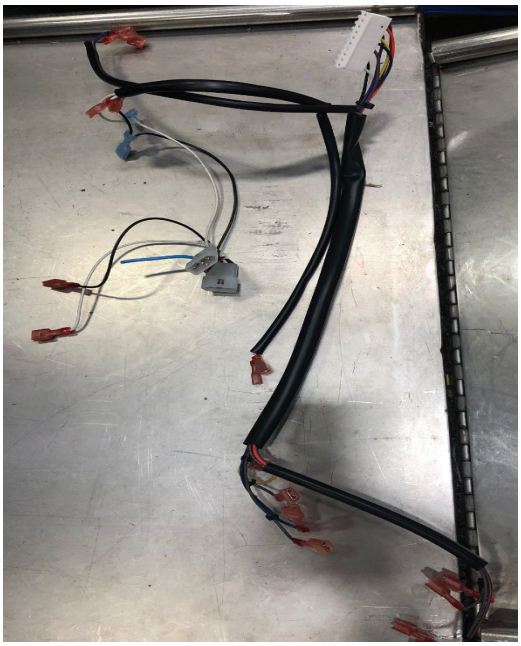

Figure 5. *Main wire harness removed from the unit.*

7. Leave only the brown and blue wires coming up from the compressor on the terminal block.
See Figure 6

Figure 6. *Terminal block with only blue and brown compressor wires.*

8. Remove the grounding wire from the front panel by removing the nut and pulling green wire off of screw.
See Figure 7

Figure 7. *Ground wire and nut is located.*

9. Cut the zip tie mounted on the unit that secures the power cord.
See Figure 8

Figure 8. *Zip tie holding the power cord*

10. Remove the power cord completely from the superstructure by untwisting two plastic ties that hold the cord, beside fan.
See Figure 9

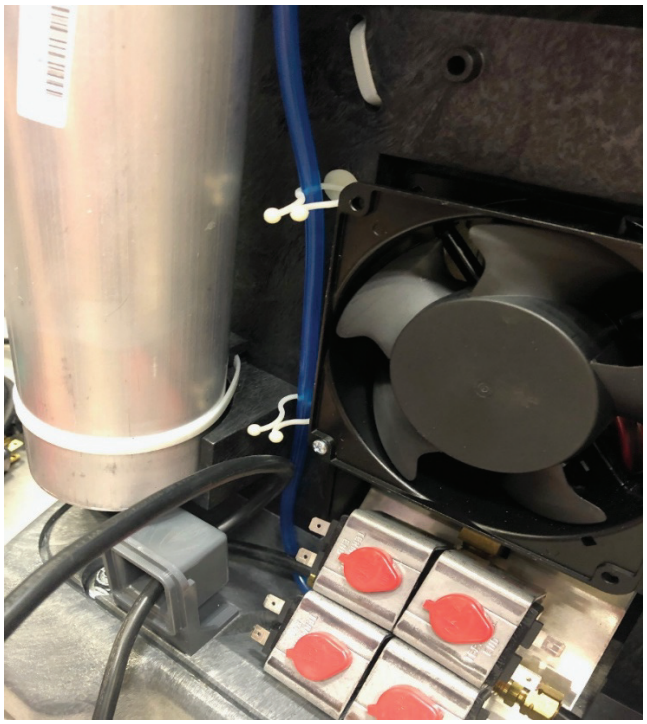

Figure 9. *Power cord removed from twist ties.*

11. Lay unit down horizontily with compressor side of the superstructer towards the table. Remove the power cord housing from the base of unit which is secured by 2 Philips head screws. Re-install your new power cord/power cord housing and feed power cord back up through twist ties.
See Figure 10

Figure 10. *Location of two Philips head screws on the bottom of the base of the unit.*

12. Remove the 4 nuts holding the front panel on the unit with a 5/16” wrench. These will be located at the top and bottom corners of the left and right sides of the front panel.
See Figure 11

Figure 11. *Shows the screw on the front panel once the nut is removed.*

13. Once the 4 nuts are taken off front panel screws, gently pull on the front panel to remove it from the front of the superstructure to expose wiring to hour meter, power switch, and circuit breaker.

See Figure 12

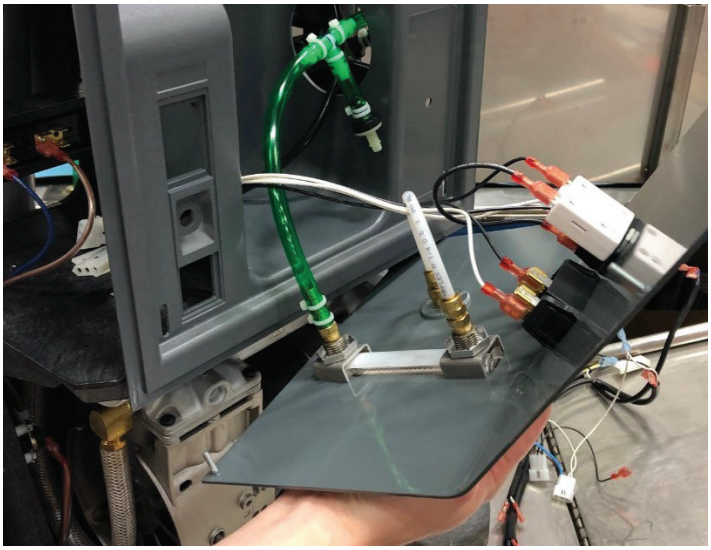

Figure 12. *Front panel disconnected from the front of the unt*

14. Once the backside of the front panel is exposed, take all wiring off of the hour meter, power switch and circuit breaker.

15. Place circuit board mounts into superstructure. Reconnect the pressure sensor tubing back onto boards top pressure sensor and secure with a zip tie.

See Figure 13

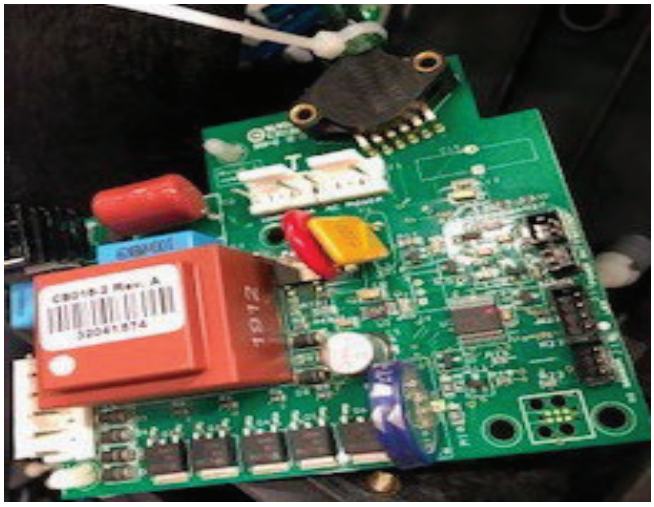

Figure 13. *Pressure sensor tubing reconnected to board with zip tie.*

16. Place the circuit board back onto circuit board mounts.

See Figure 14.

Figure 14. *Board reinstalled onto superstructure.*

17. Plug main wire harness and AC power into the board.

See Figure 15

Figure 15. *Showing AC power and main wire harness on board.*

18. Plug the purple and grey wires into the EQ valve. **See Figure 16**

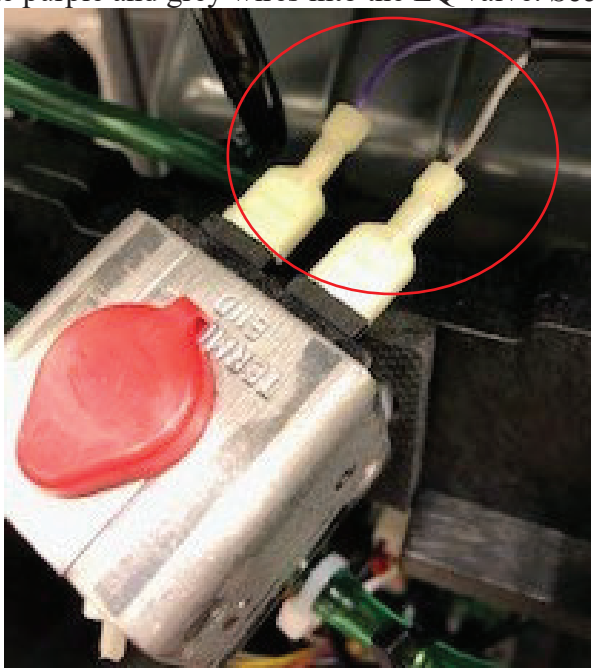

Figure 16. *Purple and grey wires connected to the EQ valve.*

19. Plug in valve block wire harness.

Note: On each side, the wires that connect to the valves on top will be a shorter in length than the ones that connect to the valves on the bottom of the block.

See Figure 17

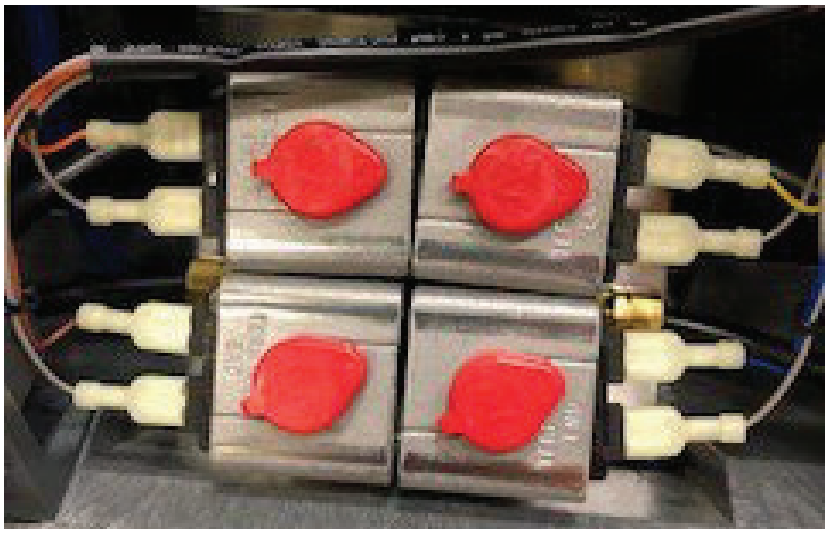

Figure 17. *Valve block wire harness connections*

20. Install Fan Wire into the Circuit Board. The Circuit Board is marked “Fan” on the lower right side where this connection goes.
See Figures 18

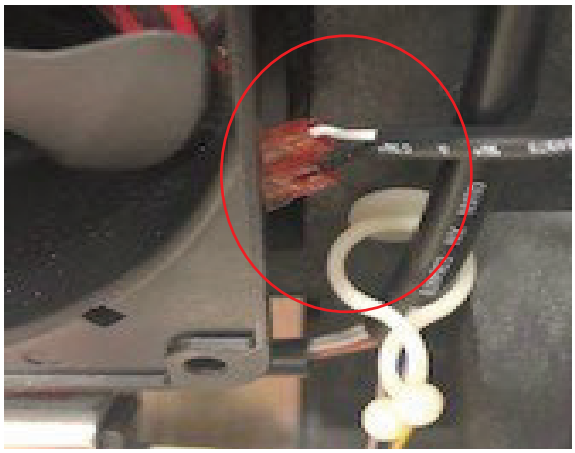

Figure 18. *Terminals connected to fan.*

21. For 120V: Begin plugging wires into the terminal block of the superstructure. There is a left side and a right side to this terminal block.

Left Side of Terminal Block-

Top Left: Empty **Top Right:** Double white (Fan**),**

Bottom Left: Blue (Compressor) **Bottom Right**: Single White (AC Power)

Right Side of Terminal Block-

Top Left: Empty **Top Right**: Double Black (Fan)

Bottom Left: Brown (Compressor) **Bottom Right:** Single black (AC)

See Figure 19.

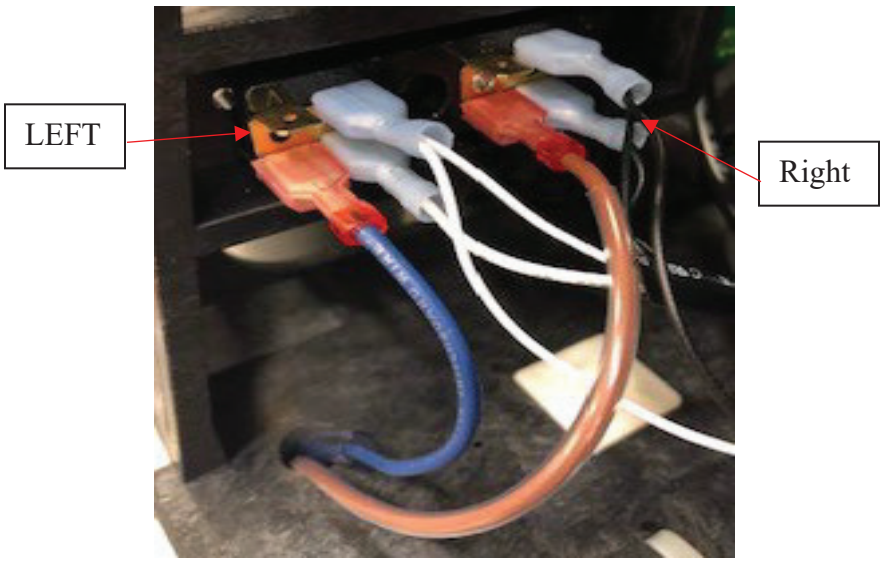

Figure 19. *120V terminal block connections.*

22. For 220V: Begin plugging wires into the terminal block of the superstructure. There is a left side and a righ side to this terminal block.

Figure 20

Left Side of Terminal Block-

Top Left: Light Blue (Power Cord)

Top Right: Double white (Hour Meter & AC**),**

Bottom Left: Dark Blue (Compressor) **Bottom Right**: Single White (AC)

Right Side of Terminal Block-

Top Left: Single Black (Power Switch)

Top Right: Double Black (Hour meter & AC)

Bottom Left: Brown (Compressor) **Bottom Right:** Single black (AC)

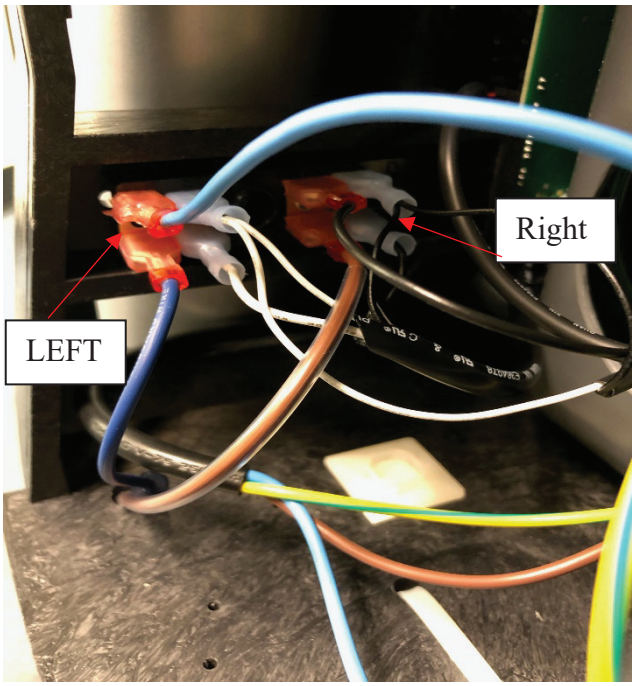

Figure 20. *5L 220V terminal block connections*

***Note**: If you are working on a 10L 220V unit, the Compressor wires hook directly to the board and the terminal block will not have the brown and blue wires, only a light blue wire coming from the power cord on the top left side of the terminal block.*

See Figure 21 and 22

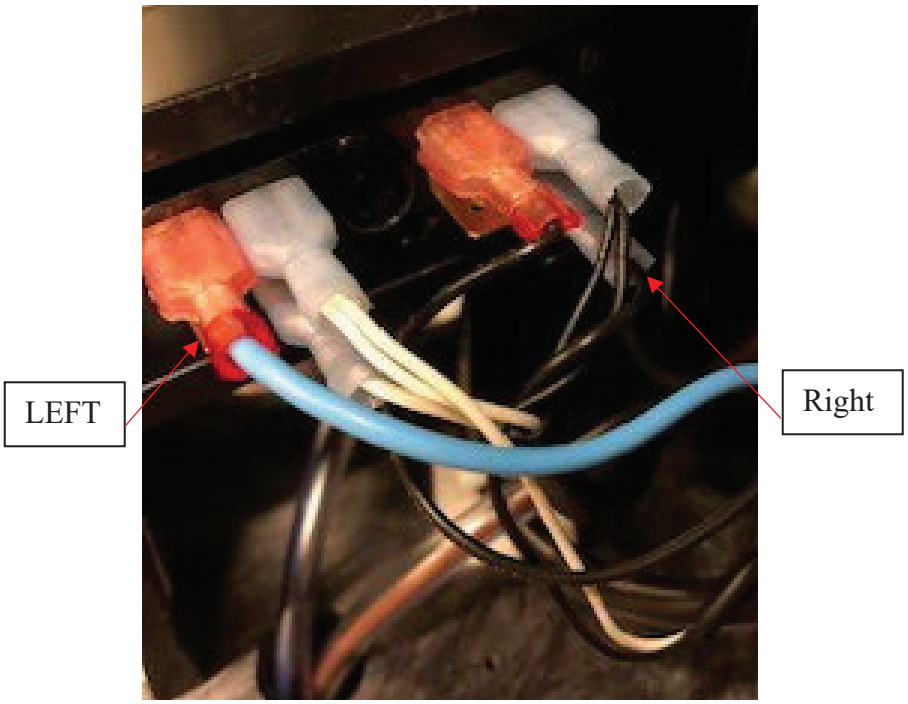

Figure 21. *Onyx 10L (Ultra) 220V unit's terminal block will be wired up without the compressor wires.*

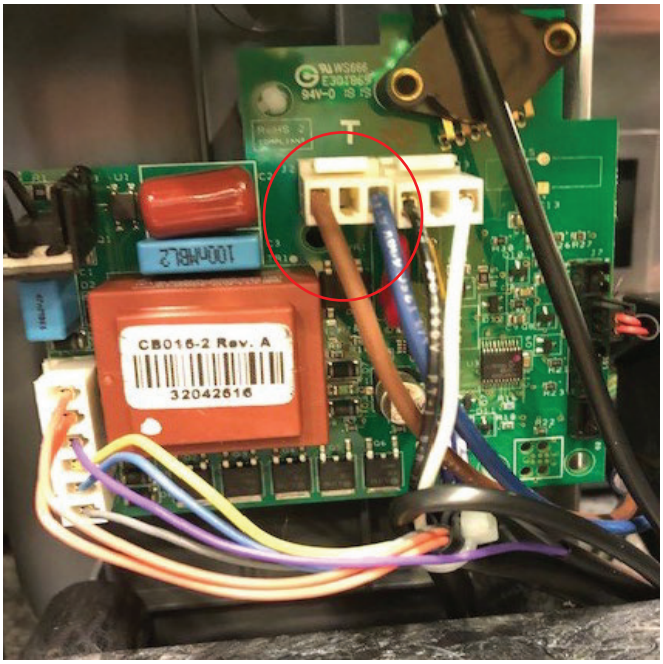

Figure 22. *Blue and brown compressor wires connect directly to the board on a 10L (Ultra) 220V unit.*

22. Install Circuit Breaker and Power Switch harness.

Circuit Breaker-
Left: Brown (from Power Cord),
Right: Black (from Power Switch Wire Harness)
See Figure 23 and 24

Power Switch-
Top Left: Black (from Circuit Breaker),
Top Right: Red (from board)
Bottom Left: Black (from Terminal Block),
Bottom Right: Red (from board)
See Figure 23 and 24

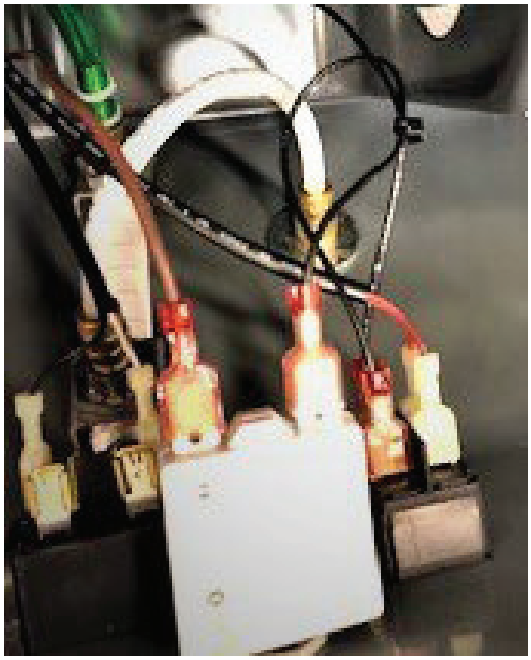

Figure 23. *Showing how the front panel is wired up.*

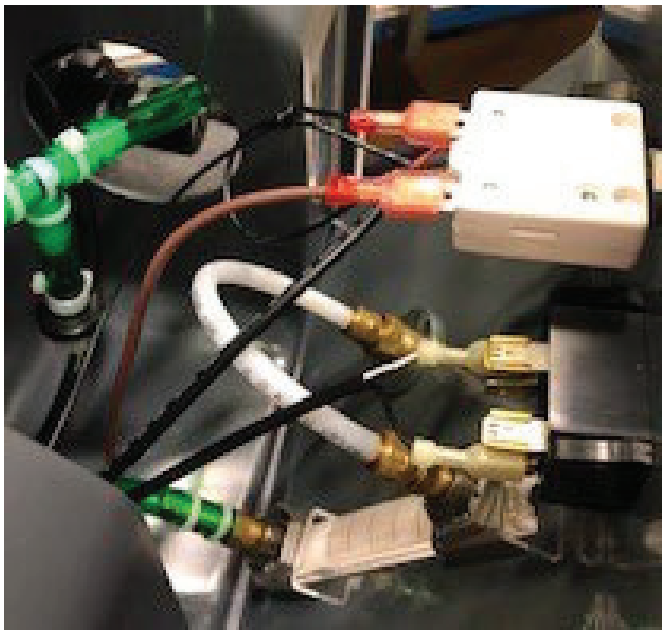

Figure 24. *Showing a different angle of how front panel is wired up.*

23. Reinstall the ground wire and 4 nuts that hold the front panel in place with the 5/16” wrench.

See Figure 25

Figure 25. *Showing ground wire and nut re installed.*

24. Re-attach case panels and test to ensure purity / flow meets manufacturing specifications.

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