# Service Bulletin

## Trouble Shooting Procedures for Power Boards and Control Panels

## Purpose

Use this bulletin to diagnose Norcold refrigerator control panels and power boards. Most problems can be linked to components controlled by the power board or voltage input to the power board. Sometimes the power board or control board will need to be replaced. Use this bulletin to determine the correct action.

## Background

The electronic control system controls the refrigerator's power board and control panel. Use the electronic control system diagnostic mode to identify problems with the power board and control panel.

The electronic controls work on 10.5 to 15.4 volts DC. The AC power cord that is attached to the power board conducts 120 volts AC power from the RV receptacle to the power board. It does not provide power to the electronic controls.

## Applicability

Before trying to fix or replace the control panel and power board, make sure these areas, which can be affected by the electronic controls, are working properly:

- Proper refrigerator installation
- Adequate ventilation
- Leveled operation
- AC heater(s)
- DC heater
- Burner and orifice assembly
- Fan(s)
- Heat deflector cap (flue cap)
- Flue baffle

**IMPORTANT!**

The power board and the control panel do not control the fans, ice maker, or the ice maker water valve.

## List of Procedures

**Procedure A**: Checking Power Board 628661 Diagnostics Inputs and Outputs on N41X/N41X.3/N51X/N51X.3/N62X/N82X Models.

**Procedure B**: Checking Power Board 628661 Diagnostics Inputs and Outputs on N64X/N64X.3/N84X/N84X.3/12XX Models.

**Procedure C**: Checking Power Board 621267/621268 Diagnostics Inputs and Outputs on N41X/N41X.3/N51X/N51X.3/N62X/N82X Models.

**Procedure D**: Checking Power Board 621269/621270/621271/621272 Diagnostics Inputs and Outputs on N64X/N64X.3/N84X/N84X.3/12XX Models.

**Procedure E**: Checking DC Power Input to the Power Board and Power Board DC power output to the Control Panel.

**Procedure F**: Checking DC Power Input at the Control Panel (applies to Power Boards 621267/62126/8621269/621270/621271/621272/621991).

**Procedure G**: Checking DC Power Input at the Control Panel (applies to Power Board 628661).

**Procedure H**: Checking Electronic Controls AUTO Operation (Except N61X/N8X Refrigerators).

**Procedure I**: Checking Electronic Controls Operation N61X/N8X Refrigerators.

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# Procedure A: Checking Power Board 628661 Diagnostics Inputs and Outputs – N41X / N41X.3 /N51X / N51X.3 /N62X / N82X Refrigerators

Turn ON Refrigerator and select the highest temperature setting.

**Accessing Diagnostics**

1. At the same time, press and hold the TEMP SET and MODE switch buttons.
2. Release both buttons when 1 shows on the screen.

Screen 1

**Screen [1] Action**

The 1 turns off. If no LEDs show on the screen after the [1] turns off, replace the control panel.

**Navigating and Exiting Diagnostics**

- To move to the next screen, press and release the MODE switch button.
- To return to a previous screen, press and hold the MODE switch button until you reach the desired screen.
- To exit Diagnostics, turn the refrigerator OFF and back ON.

Screen 2

**Screen [2] Action**

The 2 turns off. The On LED remains lit. If any LED segments show on this screen after the screen number turns off, replace the control panel.

Screen 3

**Screen [3] Action**

The 3 turns off. After a short pause the screen displays fin temperature.

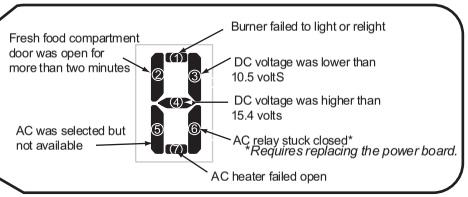
0 (Short pause) 0 *Indicates the thermistor circuit is open.*

8 (Short pause) 9 *Indicates the thermistor circuit is shorted.*

Screen 4

**Screen [4] Action**

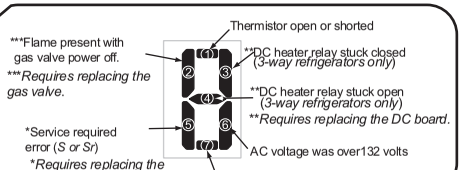
Screen 4 displays the fault history stored in non-volatile memory. After the screen number turns off, the fault history LEDs display. The position of the LEDs identify recent fault items.




**Screen [5] Action**

Screen 5

Screen 5 displays the fault history stored in non-volatile memory. After the screen number turns off, the fault history LEDs display. The position of the LEDs indentify recent fault items.




Screen 6

**Screen [6] Action**

Screen 6 is used to clear stored fault history. After the screen number turns off, the letters [E] and [r] show on the screen.

To erase fault history:

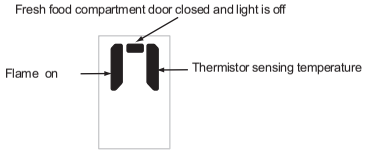
1. After the letters [E] and [r] display, press and hold the TEMP SET switch button until the letters [CL] show on the screen.

2. Allow the letters [C] and [L] to display for five seconds, then press and hold the TEMP SET switch button until the letters [E] and [r] show on the screen.

Screen 7

**Screen [7] Action**

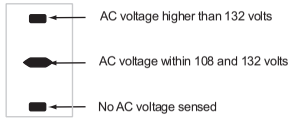
Screen 7 shows active inputs to the power board. After the screen number turns off, the power board input LEDs display. The position of the LEDs indicate active inputs to the power board.




Screen 0

**Screen [0] Action**

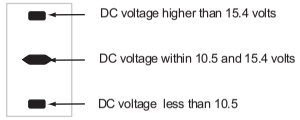
Screen 0 shows AC voltage input to the power board. After the screen number turns off, the LED segment that displays identifies the AC voltage input to the power board.




Screen 9

**Screen [9] Action**

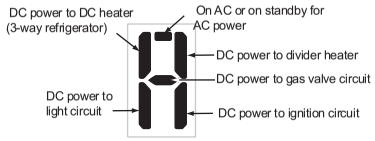
Screen 9 shows DC voltage input to the power board. After the screen number turns off, the LED segment that displays identifies the DC voltage input to the power board.




Screen 8

**Screen [8] Action**

Screen 8 shows active power board outputs. After the screen number turns off, the power board output LEDs display. The position of the LEDs indicate active outputs to the power board.



## Procedure B: Checking Power Board 628661 Diagnostics Inputs and Outputs N64X /N64X.3 /N84X / N84X.3 /N109X / 12XX Refrigerators

Turn ON Refrigerator and select the highest temperature setting.

### Accessing Diagnostics

1. At the same time, press and hold the TEMP SET and MODE switch buttons.
2. Release both buttons when 1 shows in the screen.

Screen 1

### Screen [1] Action

The 1 turns off. If no LEDs show on the screen after the [1] turns off, replace the control panel.

### Navigating and Exiting Diagnostics

- To move to the next screen, press and release the MODE switch button.
- To return to a previous screen, press and hold the MODE switch button until you reach the desired screen.
- To exit Diagnostics, turn the refrigerator OFF and back ON.

Screen 2

### Screen [2] Action

The 2 turns off. The On LED remains lit. If any LED segments show on this screen after the screen number turns off, replace the control panel.

Screen 3

### Screen [3] Action

The 3 turns off. After a short pause the screen displays fin temperature.

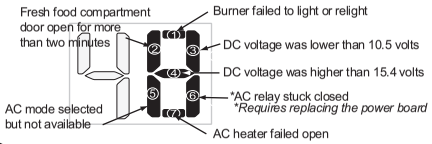
*Indicates the thermistor circuit is open.*

*Indicates the thermistor circuit is shorted.*

Screen 4

### Screen [4] Action

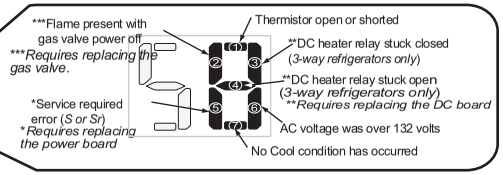
Screen 4 displays the fault history stored in non-volatile memory. After the screen number turns off, the fault history LEDs display. The position of the LEDs identify recent fault items.




Screen 5

### Screen [5] Action

Screen 5 displays the fault history stored in non-volatile memory. After the screen number turns off, the fault history LEDs display. The position of the LEDs indentify recent fault items.




Screen 6

### Screen [6] Action

Screen 6 is used to clear stored fault history. After the screen number turns off, the letters [Er] show on the screen.

To erase fault history:

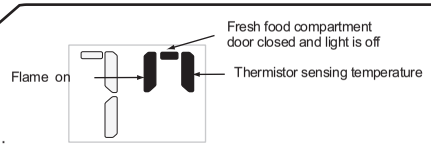
1. After the letters [Er] display, press and hold the TEMP SET switch button until the letters [CL] show on the screen.

2. Allow the letters [CL] to display for five seconds, then press and hold the TEMP SET switch button until the letters [Er] show in the screen.

Screen 7

### Screen [7] Action

Screen 7 shows active inputs to the power board. After the screen number turns off, the power board input LEDs display. The position of the LEDs indicate active inputs to the power board.




Screen 0

### Screen [0] Action

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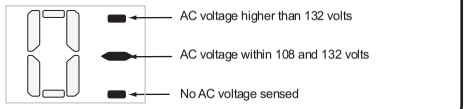
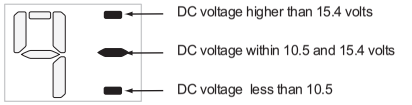



Screen 9

### Screen [9] Action

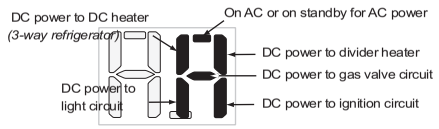
Screen 9 shows DC voltage input to the power board. After the screen number turns off, the LED segment that displays identifies the DC voltage input to the power board.




Screen 8

### Screen [8] Action

Screen 8 shows active power board outputs. After the screen number turns off, the power board output LEDs display. The position of the LEDs indicate active outputs to the power board.



# Procedure C: Checking Power Board 621267 / 621268 Diagnostics Inputs and Outputs – N41X / N41X.3 /N51X / N51X.3 /N62X / N82X Refrigerators

Turn ON Refrigerator and select the highest temperature setting.

## Accessing Diagnostics

1. At the same time, press and hold the TEMP SET and MODE switch buttons.
2. Release both buttons when 1 shows on the screen.

Screen 1

### Screen [1] Action

The 1 turns off. If no LEDs show on the screen after the [1] turns off, replace the control panel.



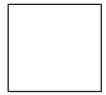
## Navigating and Exiting Diagnostics

- To move to the next screen, press and release the MODE switch button.
- To return to a previous screen, press and hold the MODE switch button until you reach the desired screen.
- To exit Diagnostics, turn the refrigerator OFF and back ON.

Screen 2

### Screen [2] Action

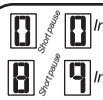
The 2 turns off. The On LED remains lit. If any LED segments show on this screen after the screen number turns off, replace the control panel.



Screen 3

### Screen [3] Action

The 3 turns off. After a short pause the screen displays fin temperature.



*Indicates the thermistor circuit is open.*

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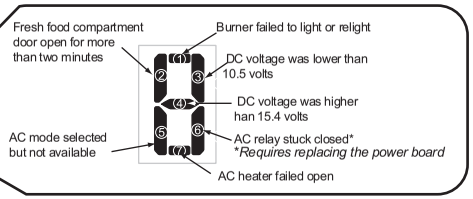
Screen 4

### Screen [4] Action

Screen 4 displays the fault history stored in non-volatile memory. After the screen number turns off, the fault history LEDs display. The position of the LEDs identify recent fault items.

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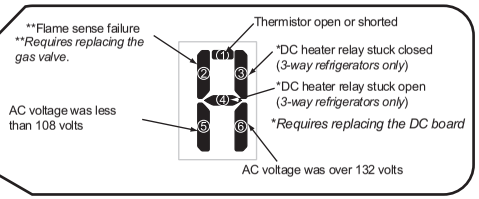


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### Screen [6] Action

Screen 6 is used to clear stored fault history. After the screen number turns off, the letters [E] and [r] show on the screen.

To erase fault history:

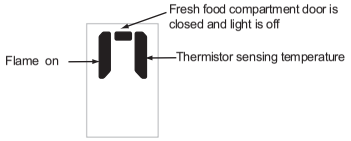
1. After the letters [E] and [r] display, press and hold the TEMP SET switch button until the letters [CL] show on the screen.

2. Allow the letters [C] and [L] to display for five seconds, then press and hold the TEMP SET switch button until the letters [E] and [r] show on the screen.

Screen 7

### Screen [7] Action

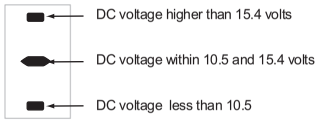
Screen 7 shows active inputs to the power board. After the screen number turns off, the power board input LEDs display. The position of the LEDs indicate active inputs to the power board.




Screen 9

### Screen [9] Action

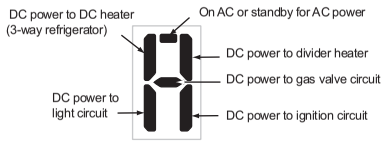
Screen 9 shows DC voltage input to the power board. After the screen number turns off, the LED segment that displays identifies the DC voltage input to the power board.




Screen 8

### Screen [8] Action

Screen 8 shows active power board outputs. After the screen number turns off, the power board output LEDs display. The position of the LEDs indicate active outputs to the power board.



## Procedure D: Checking Power Board 621269 / 621270 / 621271 / 621272 Diagnostics Inputs and Outputs

N64X / N64X.3 / N84X / N84X.3 / N109X / 12XX Refrigerators

Turn ON Refrigerator and select the highest temperature setting.

**Accessing Diagnostics**

1. At the same time, press and hold the TEMP SET and MODE switch buttons.
2. Release both buttons when 1 shows on the screen.

Screen 1

**Screen [1] Action**

The 1 turns off. If no LEDs show on the screen after the [1] turns off, replace the control panel.

**Navigating and Exiting Diagnostics**

- To move to the next screen, press and release the MODE switch button.
- To return to a previous screen, press and hold the MODE switch button until you reach the desired screen.
- To exit Diagnostics, turn the refrigerator OFF and back ON.

Screen 2

**Screen [2] Action**

The 2 turns off. The On LED remains lit. If any LED segments show on this screen after the screen number turns off, replace the control panel.

Screen 3

**Screen [3] Action**

The 3 turns off. After a short pause the screen displays fin temperature.

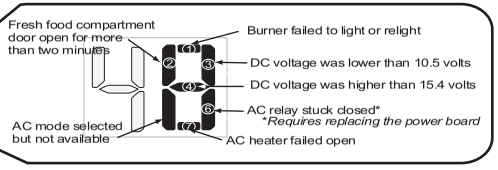
00 *Indicates the thermistor circuit is open.*

89 *Indicates the thermistor circuit is shorted.*

Screen 4

**Screen [4] Action**

Screen 4 displays the fault history stored in non-volatile memory. After the screen number turns off, the fault history LEDs display. The position of the LEDs identify recent fault items.




Screen 5

**Screen [5] Action**

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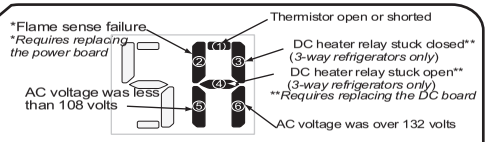


Screen 6

**Screen [6] Action**

Screen 6 is used to clear stored fault history. After the screen number turns off, the letters [Er] show on the screen.

To erase fault history:

1. After the letters [Er] display, press and hold the TEMP SET switch button until the letters [CL] show on the screen.

2. Allow the letters [CL] to display for five seconds, then press and hold the TEMP SET switch button until the letters [Er] show on the screen.

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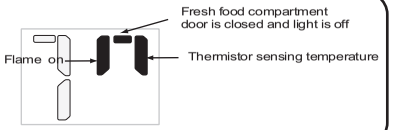
**Screen [7] Action**

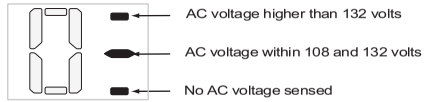
Screen 7 shows active inputs to the power board. After the screen number turns off, the power board input LEDs display. The position of the LEDs indicate active inputs to the power board.




Screen 0

**Screen [0] Action**

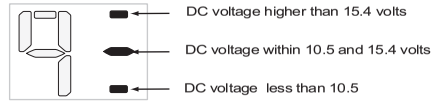
Screen 0 shows AC voltage input to the power board. After the screen number turns off, the LED segment that displays identifies the AC voltage input to the power board.




Screen 9

**Screen [9] Action**

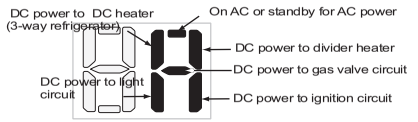
Screen 9 shows DC voltage input to the power board. After the screen number turns off, the LED segment that displays identifies the DC voltage input to the power board.



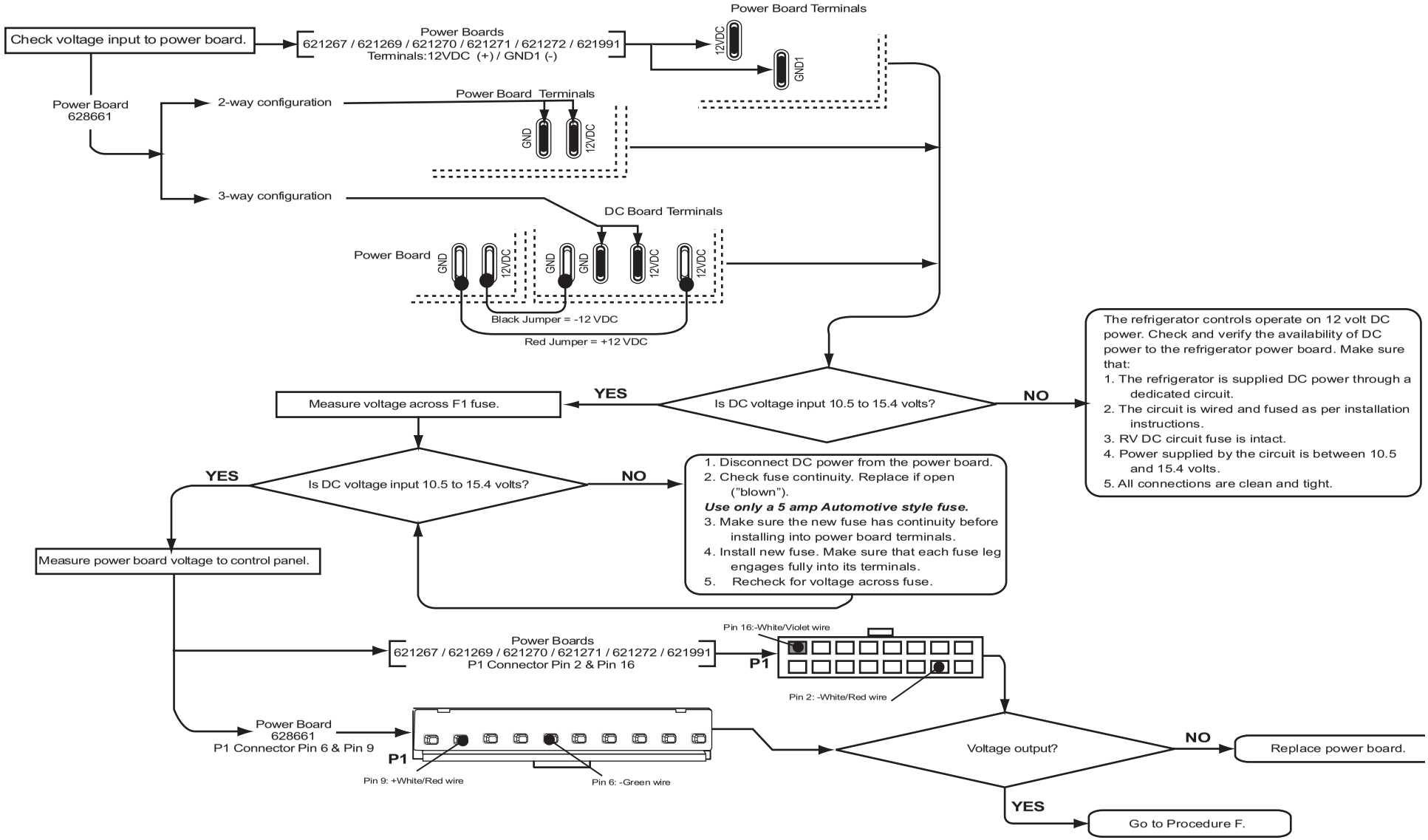

Screen 8

**Screen [8] Action**

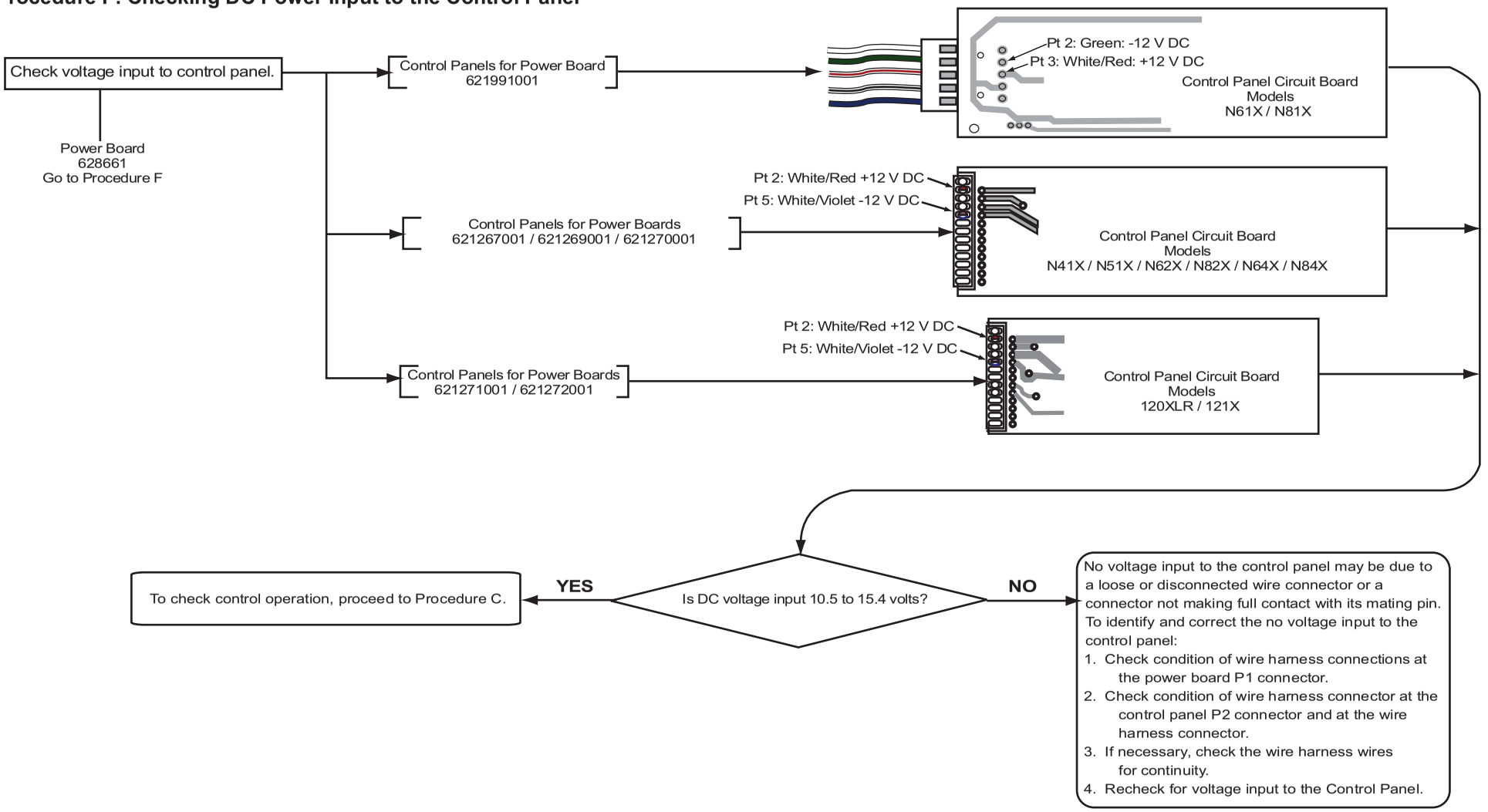
Screen 8 shows active power board outputs. After the screen number turns off, the power board output LEDs display. The position of the LEDs indicate active outputs to the power board.



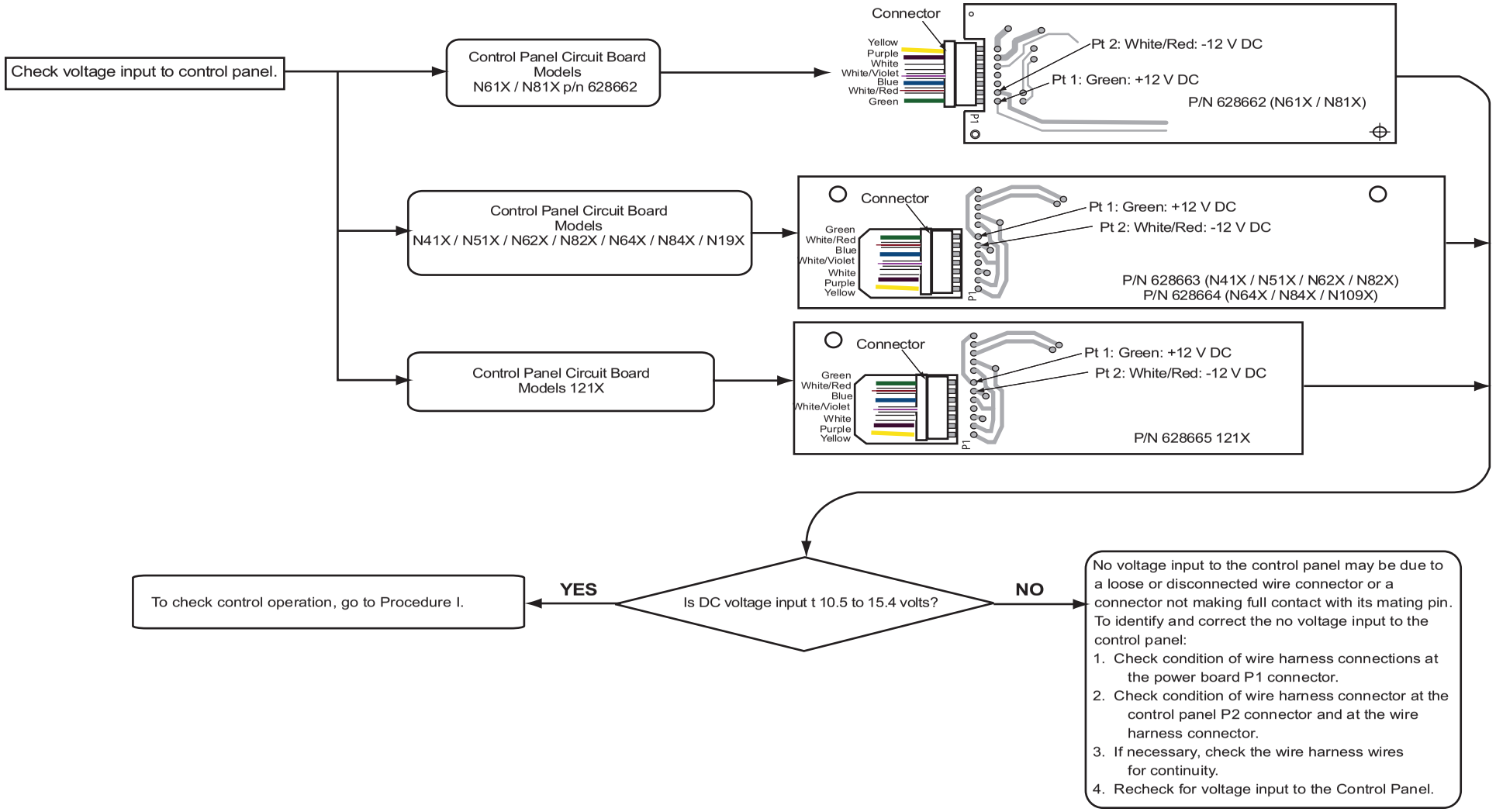
## Procedure E: Checking DC Power Input to the Power Board and Power Board DC Power Output to the Control Panel



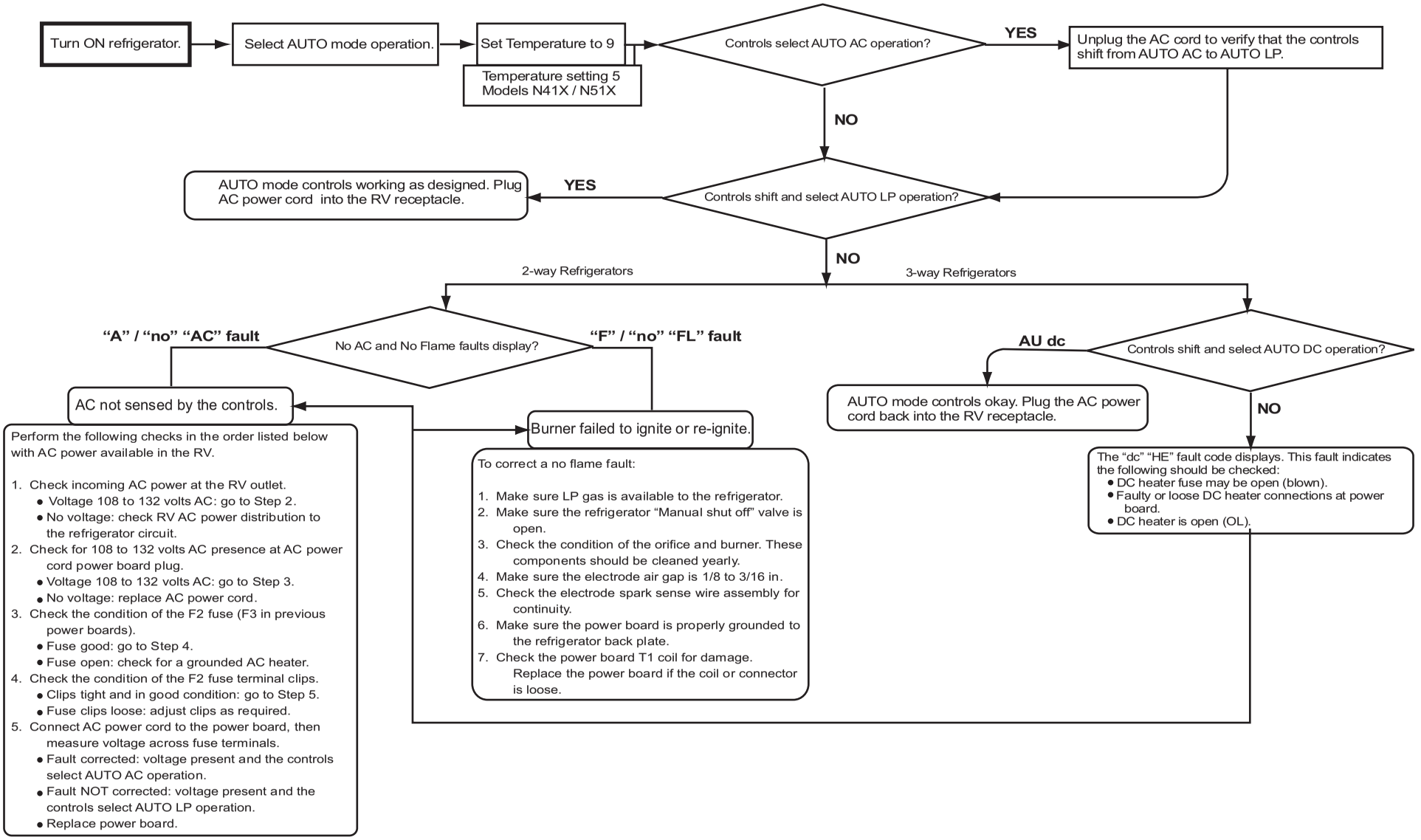
## Procedure F: Checking DC Power Input to the Control Panel



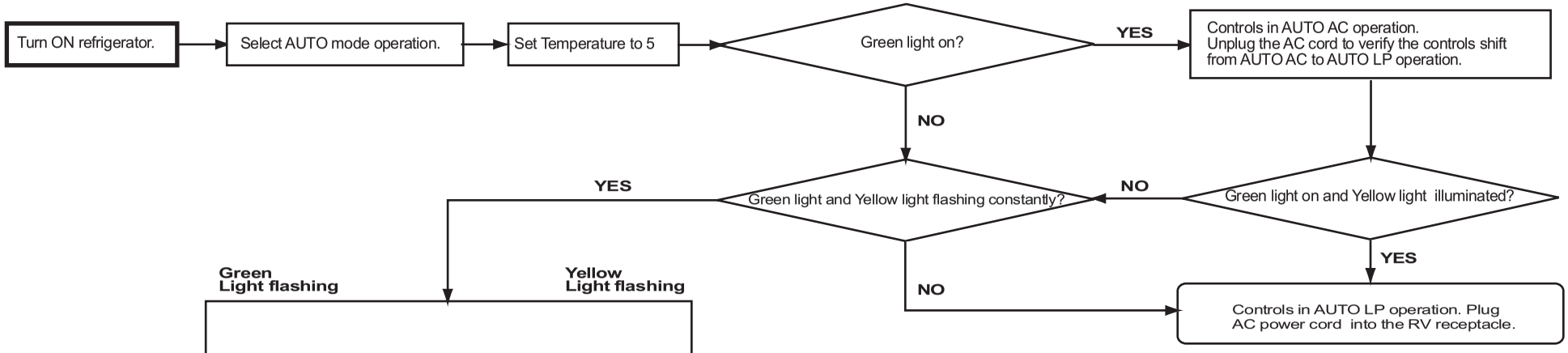
## Procedure G: Power Board 628661 – Checking DC Power Input at the Control Panel



## Procedure H: Checking Electronic Controls AUTO Operation (Except N61X and N81X Refrigerators)



## Procedure I: Checking Electronic Controls AUTO Operation N61X and N81X Refrigerators




**AC not sensed by the controls.**

Perform the following checks in the order listed below with AC power available in the RV.

1. Check incoming AC power at the RV outlet.
   - Voltage 108 to 132 volts AC: go to Step 2.
   - No voltage: check RV AC power distribution to the refrigerator circuit.
2. Check for 108 to 132 volts AC presence at AC power cord power board plug.
   - Voltage 108 to 132 volts AC: go to Step 3.
   - No voltage: replace AC power cord.
3. Check the condition of the F2 fuse (F3 in previous power boards).
   - Fuse good: go to Step 4.
   - Fuse open: check for a grounded AC heater.
4. Check the condition of the F2 fuse terminal clips.
   - Clips tight and in good condition: go to Step 5.
   - Fuse clips loose: adjust clips as required.
5. Connect AC power cord to the power board, then measure voltage across fuse terminals.
   - Fault corrected: voltage present and the controls select AUTO AC operation.
   - Fault NOT corrected: voltage present and the controls select AUTO LP operation.
   - Replace power board.

**Burner failed to ignite or re-ignite.**

To correct a no flame fault:

1. Make sure LP gas is available to the refrigerator.
2. Make sure the refrigerator "Manual shut off" valve is open.
3. Check the condition of the orifice and burner. These components should be cleaned yearly.
4. Make sure the electrode air gap is 1/8 to 3/16 in.
5. Check the electrode spark sense wire assembly for continuity.
6. Make sure the power board is properly grounded to the refrigerator back plate.
7. Check the power board T1 coil for damage. A loose coil or connector will require power board replacement.

Fault Codes displayed by N61X and N81X Control Panel LEDs

**Green "ON" lignt flashes 1 time every 3 seconds.** Thermistor or its circuit is open or shorted. The controls are in Backup Operating Mode.
***(1) Check thermistor connections.***
***(2) Measure thermistor resistance. Do not replace the power board or the control panel.***

**Green "ON" lignt flashes 2 times every 3 seconds.** Mode switch in control panel faulty.
***Replace the control panel.***

**Green "ON" lignt flashes 3 times every 3 seconds.** AC heater or its circuit is open. Check AC heater connections and continuity.
***Do not replace the power board or the control panel.***

**Green "ON" light flashes 4 times every 3 seconds. The Yellow light (LP operation) is off.** Flame sensing circuit fault.
***Replace the power board.***

**Green "ON" light flashes 5 times every 3 seconds. The Yellow light (LP operation) is off.** The controls have detected a No cooling condition.
(1) First occurance - ***reset and then turn the refrigerator Off and back On.***
(2) Second occurance - ***the Power Board has to be hardwire reset. Do not replace the power board or the control panel.***

**Green "ON" light flashes 6 times every 3 seconds. The Yellow light (LP operation) is off.** Probable causes:
(1)The open limit switch in the cooling unit canister has tripped. It may be due to poor ventilation, exceeding off-level operation limits, or a dirty burner.
(2) The switch connections or jumper wire is disconnected (units without the high temperature limit switch) . ***Do not replace the power board or the control panel.***