

R-SERIES 8K and 10K Power Module Replacement Procedures
April 26, 2012

Standalone Configuration

Routine Maintenance (no failure; Single UPS in Standalone Configuration)

- Single Power Module Removal
- Single Power Module Installation

Failed Power Module (Single UPS in Standalone Configuration)

- Single Power Module Removal
- Single Power Module Installation

Parallel Configuration

Routine Maintenance for Two Power Modules (no failure; Two UPSs in Parallel Configuration)

- Parallel Power Modules Removal
- Parallel Power Modules Installation

Routine Maintenance for Replacing One Power Module only (no failure; Two UPSs in Parallel Configuration)

- Parallel Power Module Removal (UPS with Load Less Than 50%)
- Parallel Power Module Installation (UPS with Load Less Than 50%)
- Parallel Power Module Removal (UPS with Load Greater Than 50%)
- Parallel Power Module Installation (UPS with Load Greater Than 50%)

Replacing one defective (failed) Power Module (Two UPSs in a Parallel Configuration)

- Parallel Power Module Removal (Defective Power Module, only)
- Parallel Power Module Installation (Replacement Power Module, only)

Power Module Electrical Test (Advanced troubleshooting)

- Power Module Electrical Test (Working Power Modules,)

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Routine Maintenance (no failure; Single UPS in Standalone Configuration)

❖ *Single Power Module Removal*

1. Disable PowerAlert and disconnect the SNMP, serial or USB communication cables from the UPS.
2. Press the OFF button of the Power Module.
3. LCD screen will display SWITCH TO BYPASS NO (ON) Y (OFF), Press the OFF button again to transfer to Bypass Mode.
4. The unit will transfer to "BYPASS MODE". I/P, AC/DC and O/P LEDS should be ON (solid green LEDs). The BYPASS LED (amber LED) should be blinking.
5. Confirm the BYPASS LED is blinking then proceed to the next step.
6. Rotate the Manual Bypass Switch (located on the Power Distribution Unit) **quickly** to the BYPASS position.
7. Loosen the Power Distribution Unit's screws. **Do not remove any of the screws from the Power Distribution Unit.**
8. Pull (separate) the Power Distribution Unit from the Power Module. *****WARNING! Be careful not to touch the rear terminals of the Power Distribution Unit, AC voltage is present...**
9. The UPS will begin a graceful shutdown. The LCD screen should become dark and the fans should turn off after a minute or two. **Do not proceed until the unit has shut off.**
10. Disconnect the Battery Cable from the Power module.
11. Power Module can safely be removed from the rack.
12. Proceed to "Single Power Module Installation" section.

❖ *Single Power Module Installation*

1. Set the Power Module on the mounting rails.
2. Connect the Battery Cable to the Power Module.
3. Insert the Power Distribution Unit to the Power Module. *****WARNING! Be careful not to touch the rear terminals of the Power Distribution Unit, AC voltage is present...**
4. Tighten the Power Distribution Unit screws.
5. The unit will display "BYPASS MODE". I/P, AC/DC and O/P LEDS should be ON (solid green LEDs). The BYPASS LED (amber LED) should be blinking. (NOTE: If the Power module comes up in ONLINE MODE, you will need to transfer the system back to BYPASS MODE by following steps 2 thru 5 of the "Single Power Module Removal" procedure before rotating the Manual Bypass Switch. *****WARNING! NEVER TURN THE ROTARY MANUAL BYPASS SWITCH TO ANY POSITION UNLESS THE UPS IS IN BYPASS MODE.**
6. Confirm the BYPASS LED is blinking and then proceed to the next step.
7. Rotate the Manual Bypass Switch **quickly** to the NORMAL position
8. Press the ON button of the Power module. After a brief self-test the UPSs should display ONLINE Mode.
9. Reinstall the SNMP, connect any serial or USB communication cables to the UPS; enable PowerAlert.

Failed Power Module (Single UPS in Standalone Configuration)

❖ *Single Power Module Removal*

1. Disable PowerAlert and disconnect the SNMP, serial or USB communication cables from the UPS.
2. Confirm the BYPASS LED is blinking then proceed to the next step. *****WARNING! NEVER TURN THE ROTARY MANUAL BYPASS SWITCH TO ANY POSITION UNLESS THE UPS IS IN BYPASS MODE.**
3. Rotate the Manual Bypass Switch (located on the Power Distribution Unit) **quickly** to the BYPASS position.
4. Loosen the Power Distribution Unit's screws. **Do not remove any of the screws from the Power Distribution Unit.**
5. Pull (separate) the Power Distribution Unit from the Power Module. *****WARNING! Be careful not to touch the rear terminals of the Power Distribution Unit, AC voltage is present...**
6. The UPS will begin a graceful shutdown. The LCD screen should become dark and the fans should turn off after a minute or two. **Do not proceed until the unit has shut off.**
7. Disconnect the Battery Cable from the Power Module.
8. Power Module can safely be removed from the rack.
9. Proceed to "Single Power Module Installation" section.

❖ *Single Power Module Installation*

1. Set the Power Module on the mounting rails.
2. Connect the Battery Cable to the Power Module.
3. Insert the Power Distribution Unit to the Power Module. *****WARNING! Be careful not to touch the rear terminals of the Power Distribution Unit, AC voltage is present...**
4. Tighten the Power Distribution Unit screws.
5. The unit will display "BYPASS MODE". I/P, AC/DC and O/P LEDs should be ON (solid green LEDs). The BYPASS LED (amber LED) should be blinking.

NOTE: If the Power module comes up in ONLINE MODE, you will need to transfer the system back to BYPASS Mode by pressing the OFF button of the Power Module; LCD screen will display SWITCH TO BYPASS NO (ON) Y (OFF), Press the OFF button again to transfer to Bypass Mode. The unit will transfer to "BYPASS MODE". I/P, AC/DC and O/P LEDs should be ON (solid green LEDs). The BYPASS LED (amber LED) should be blinking. *****WARNING! NEVER TURN THE ROTARY MANUAL BYPASS SWITCH TO ANY POSITION UNLESS THE UPS IS IN BYPASS MODE.**

6. Confirm the BYPASS LED is blinking then proceed to the next step.
7. Rotate the Manual Bypass Switch **quickly** to the NORMAL position.
8. Press the ON button of the Power module. After a brief self-test the UPSs should display ONLINE MODE.
9. Reinstall the SNMP, connect any serial or USB communication cables to the UPS; enable PowerAlert.

Routine Maintenance for Two Power Modules (no failure; Two UPSs in Parallel Configuration)

❖ Parallel Power Modules Removal

NOTE: The operation of two parallel configuration power modules will vary slightly depending on the amount of load (if it is less than or greater than 50% load).

1. Disable PowerAlert and disconnect the SNMP, serial or USB communication cables from both UPS. **Do NOT remove the parallel cables at this time!**
2. Press the OFF button of the first Power Module.
3. LCD screen will display SWITCH TO BYPASS NO (ON) Y (OFF), Press the OFF button again.

*Note: If the load is less than 50% load the single module will transfer to "STANDBY MODE". If load is greater than 50% both UPS will cycle and both transfer to BYPASS MODE. ***If unit transfers to "Standby Mode" proceed to step 4. ***If both UPS transfer to "BYPASS MODE" proceed to step 9.*

4. The unit will transfer to "STAND BY MODE ". I/P and AC/DC LEDES should be ON (solid green LEDs). The unit will generate a few beeps every three seconds.
5. Confirm the LCD screen display "STANDBY MODE" and then proceed to the next step.
6. Press the OFF button of the second Power Module.
7. LCD screen will display SWITCH TO BYPASS NO (ON) Y (OFF), Press the OFF button again to transfer to Bypass Mode.
8. Both units will transfer to "BYPASS MODE". I/P, AC/DC and O/P LEDES should be ON (solid green LEDs). The BYPASS LED (amber LED) should be blinking.
9. Confirm the BYPASS LED is blinking on both units and then proceed to the next step.
10. Set the Maintenance Breaker Switch (located on the Power Distribution Unit) to the "ON" position. **Note: After setting the Maintenance Breaker to "ON" both units will generate an alarm for a few seconds.**
11. Both units LCD screen will display BYPASS MODE MANUAL SWITCH ON. I/P, AC/DC and O/P LEDES should be ON (solid green LEDs). The BYPASS LED (amber LED) should be blinking.
12. Confirm the LCD screen displays "BYPASS MODE MANUAL SWITCH ON" with the BYPASS LED (amber LED) blinking on both units and then proceed to the next step.
13. Loosen the Power Distribution Unit's screws on the first power module. **Do not remove any of the screws from the Power Distribution Unit.**
14. Pull (separate) the Power Module from the Power Distribution Unit. **Do NOT remove the parallel cable at this time!**
15. The UPS will begin a graceful shutdown. The LCD screen should become dark and the fans should turn off after a minute or two. **Do not proceed until the unit has shut off.**
16. Disconnect the Battery Cable from the Power Module
17. Disconnect the Parallel cable from the Power Module. **Do NOT remove the parallel cable from the second power module at this time!**
18. Power Module can safely be removed from the rack.
19. Confirm the LCD screen displays "BYPASS MODE MANUAL SWITCH ON" with BYPASS LED (amber LED) blinking on the second power module and then proceed to the next step.
20. Loosen the Power Distribution Unit's screws on the second power module. **Do not remove any of the screws from the Power Distribution Unit.**
21. Pull (separate) the Power Distribution Unit from the Power Module. **Do NOT remove the parallel cable at this time! ***WARNING! Be careful not to touch the rear terminals of the Power Distribution Unit, AC voltage is present...**
22. The UPS will begin a graceful shutdown. The LCD screen should become dark and the fans should turn off after a minute or two. **Do not proceed until the unit has shut off.**
23. Disconnect the Battery Cable from the Power Module
24. Disconnect the Parallel cable from the Power Module.

25. Power Module can safely be removed from the rack.
26. Proceed to “*Parallel Power Modules Installation*” section.

❖ *Parallel Power Modules Installation*

1. Set the first Power Module on the mounting rails.
2. Hold the Power Module in place by installing the ear bracket screws to the rack.
3. Connect the Parallel cable to the Power Module.
4. Connect the Battery cable to the Power Module.
5. Insert the Power Distribution Unit to the Power Module. *****WARNING! Be careful not to touch the rear terminals of the Power Distribution Unit, AC voltage is present...*****
6. Tighten the Power Distribution Unit screws to the first power module.
7. The unit will display "BYPASS MODE MANUAL SWITCH ON". I/P, AC/DC and O/P LEDES should be ON (solid green LEDs). The BYPASS LED (amber LED) should be blinking.
8. Confirm the LCD screen displays “BYPASS MODE MANUAL SWITCH ON” with the BYPASS LED (amber LED) blinking and then proceed to the next step.
9. Set the second Power Module on the mounting rails.
10. Connect the Parallel cable to the Power Module.
11. Connect the Battery cable to the Power Module.
12. Insert the Power Module to the Power Distribution Unit. *****WARNING! Be careful not to touch the rear terminals of the Power Distribution Unit, AC voltage is present...*****
13. Tighten the Power Distribution Unit screws to the second Power Module..
14. The unit will display "BYPASS MODE MANUAL SWITCH ON". I/P, AC/DC and O/P LEDES should be ON (solid green LEDs). The BYPASS LED (amber LED) should be blinking.
15. Confirm the LCD screen displays “BYPASS MODE MANUAL SWITCH ON” with the BYPASS LED (amber LED) blinking on both unit and then proceed to the next step.
16. Set the Maintenance Breaker Switch (located on the Power Distribution Unit) to the “**OFF**” position.
17. Both units LCD screen will display “BYPASS MODE”. I/P, AC/DC and O/P LEDES should be ON (solid green LEDs). The BYPASS LED (amber LED) should be blinking.
18. Confirm the BYPASS LED is blinking on both units and then proceed to the next step.
19. Press the ON button on the first Power module. After a brief self-test the LCD screen will display “**DIAGNOSIS OK WAITING FOR UPS2**”.
20. Press the ON button on the second Power Module. After a brief self-test both UPSs should display ONLINE MODE.
21. Reinstall the SNMP, connect any serial or USB communication cables to the UPS; enable PowerAlert.

Routine Maintenance for Replacing One Power Module only (no failure; Two UPSs in Parallel Configuration).

NOTE: The operation of two parallel configuration power modules will vary slightly depending on the amount of load (if it is less than or greater than 50% load).

1. Disable PowerAlert and disconnect the SNMP, serial or USB communication cables from the UPS. **Do NOT remove the parallel cables at this time!**
2. Press the OFF button of the Power Module.
3. LCD screen will display SWITCH TO BYPASS NO (ON) Y (OFF), press the OFF button again.

Note: If the load is less than 50% the single module will transfer to "STANDBY MODE". Proceed to "Parallel Power Module Removal (UPS with Load Less Than 50% Load) section".

Note: If load is greater than 50% both UPS will cycle and both transfer to BYPASS MODE. Proceed to "Parallel Power Module Removal (UPS with Load Greater Than 50% Load) section".

❖ Parallel Power Module Removal (UPS with Load Less Than 50%)

1. The unit will transfer to "STAND BY MODE ". I/P and AC/DC LEDS should be ON (solid green LEDS). The unit will generate a few beeps every three seconds.
2. Confirm the LCD screen display "STANDBY MODE" and then proceed to the next step
3. Loosen the Power Distribution Unit's screws. **Do not remove any of the screws from the Power Distribution Unit.**
4. Pull (separate) the Power Module from the Power Distribution Unit. **Do NOT remove the parallel cable at this time! ***WARNING! Be careful not to touch the rear terminals of the Power Distribution Unit, AC voltage is present...**
5. The UPS will begin a graceful shutdown. The LCD screen should become dark and the fans should turn off after a minute or two. Do not proceed until the unit has shut off.
6. Disconnect the Battery Cable from the Power Module
7. Disconnect the Parallel cable from the Power Module. Do NOT remove the parallel cable from the second power module!
8. Power Module can safely be removed from the rack.
9. Proceed to "Parallel Power Module Installation (UPS with Load Less Than 50%)"

❖ Parallel Power Module Installation (UPS with Load Less Than 50%)

1. Set the Power Module on the mounting rails. *****WARNING! Be careful not to touch the rear terminals of the Power Distribution Unit, AC voltage is present...**
2. Connect the Parallel cable to the Power Module.
3. Connect the Battery Cable to the Power Module.
4. Insert the Power Distribution Unit to the Power Module. *****WARNING! Be careful not to touch the rear terminals of the Power Distribution Unit, AC voltage is present...**
5. Tighten the Power Distribution Unit screws.
6. The unit will transfer to "STAND BY MODE ". I/P and AC/DC LEDS should be ON (solid green LEDS). The unit will generate a few beeps every three seconds.
7. Confirm the LCD screen display "STANDBY MODE" and then proceed to the next step.
8. Press the ON button on the Power Module. After a brief self-test both UPSs should display ONLINE MODE.

9. Reinstall the SNMP, connect any serial or USB communication cables to the UPS; enable PowerAlert.

Note: If the second power module requires replacement (no failure), repeat “Parallel Power Module Removal (UPS with Load Less Than 50%)” steps over again.

❖ **Parallel Power Module Removal (UPS with Load Greater Than 50%)**

1. Both units LCD screen will display “BYPASS MODE”. I/P, AC/DC and O/P LEDES should be ON (solid green LEDES). The BYPASS LED (amber LED) should be blinking.
2. Confirm the BYPASS LED is blinking on both units and then proceed to the next step.
3. Set the Maintenance Breaker Switch (located on the Power Distribution Unit) to the “ON” position. **Note: After setting the Maintenance Breaker to “ON” both units will generate an alarm for a few seconds.**
4. Both units LCD screen will display BYPASS MODE MANUAL SWITCH ON. I/P, AC/DC and O/P LEDES should be ON (solid green LEDES). The BYPASS LED (amber LED) should be blinking.
5. Confirm the LCD screen displays “BYPASS MODE MANUAL SWITCH ON” with the BYPASS LED (amber LED) blinking on both units and then proceed to the next step.
6. Loosen the Power Distribution Unit’s screws of the Power Module. **Do not remove any of the screws from the Power Distribution Unit.**
7. Pull (separate) the Power Module from the Power Distribution Unit. **Do NOT remove the parallel cable at this time! ***WARNING! Be careful not to touch the rear terminals of the Power Distribution Unit, AC voltage is present...**
8. The UPS will begin a graceful shutdown. The LCD screen should become dark and the fans should turn off after a minute or two. **Do not proceed until the unit has shut off.**
9. Disconnect the Battery Cable from the Power Module.
10. Disconnect the Parallel cable from the Power Module. **Do NOT remove the parallel cable from the second power module at this time!**
11. Power Module can safely be removed from the rack
12. Proceed to “Parallel Power Module Installation (UPS with Load Greater Than 50%)”

❖ **Parallel Power Module Installation (UPS with Load Greater Than 50%)**

1. Set the Power Module on the mounting rails. *****WARNING! Be careful not to touch the rear terminals of the Power Distribution Unit, AC voltage is present...**
2. Connect the Parallel cable to the Power Module.
3. Connect the Battery Cable to the Power Module.
4. Confirm the other Power Module displays "BYPASS MODE MANUAL SWITCH ON". I/P, AC/DC and O/P LEDES should be ON (solid green LEDES). The BYPASS LED (amber LED) should be blinking then proceed to the next step.
5. Insert the Power Module to the Power Distribution Unit. *****WARNING! Be careful not to touch the rear terminals of the Power Distribution Unit, AC voltage is present...**
6. Tighten the Power Distribution Unit screws.
7. The unit will display "BYPASS MODE MANUAL SWITCH ON". I/P, AC/DC and O/P LEDES should be ON (solid green LEDES). The BYPASS LED (amber LED) should be blinking.
8. Confirm the LCD screen displays “BYPASS MODE MANUAL SWITCH ON” with the BYPASS LED (amber LED) blinking on both unit and then proceed to the next step.

9. Set the Maintenance Breaker Switch (located on the Power Distribution Unit) to the **“OFF”** position.
10. Both units LCD screen will display “BYPASS MODE”. I/P, AC/DC and O/P LEDs should be ON (solid green LEDs). The BYPASS LED (amber LED) should be blinking. *NOTE: if one of the Power Modules displays WAITING FOR UPS2, then go to step 13.*
11. Confirm the BYPASS LED is blinking on both units and then proceed to the next step.
12. Press the ON button on the first Power module. After a brief self-test the LCD screen will display **“DIAGNOSIS OK WAITING FOR UPS2”**.
13. Press the ON button on the second Power Module. After a brief self-test both UPSs should display ONLINE MODE.
14. Reinstall the SNMP, connect any serial or USB communication cables to the UPS; enable PowerAlert.

Replacing one defective (failed) Power Module (Two UPSs in a Parallel Configuration)

❖ *Parallel Power Module Removal (Defective Power Module, only)*

1. Disable PowerAlert and disconnect the SNMP, serial or USB communication cables from the UPS. **Do NOT remove the parallel cables at this time!**
2. Confirm the BYPASS LED is blinking on the working Power Module if not, press the OFF button of the working Power Module. LCD screen will display SWITCH TO BYPASS NO (ON) Y (OFF), press the OFF button again to transfer to Bypass Mode.
3. The unit will transfer to "BYPASS MODE". I/P, AC/DC and O/P LEDs should be ON (solid green LEDs). The BYPASS LED (amber LED) should be blinking.
4. Confirm the BYPASS LED is blinking on the working unit and then proceed to the next step.
5. Confirm the BYPASS LED is blinking on the defective units and then proceed to the next step.
6. Set the Maintenance Breaker Switch (located on the Power Distribution Unit) to the **“ON”** position. (Note: both units will generate an alarm for a few seconds)
7. Both units LCD screen will display BYPASS MODE MANUAL SWITCH ON.
8. The BYPASS LED (amber LED) on both units should be blinking.
9. Confirm the LCD screen displays “BYPASS MODE MANUAL SWITCH ON” with the BYPASS LED (amber LED) blinking on both units and then proceed to the next step.
10. Loosen the Power Distribution Unit’s screws of the defective Power Module. **Do not remove any of the screws from the Power Distribution Unit.**
11. Pull (separate) the Power Module from the Power Distribution Unit. **Do NOT remove the parallel cable at this time! ***WARNING! Be careful not to touch the rear terminals of the Power Distribution Unit, AC voltage is present...**
12. The UPS will begin a graceful shutdown. The LCD screen should become dark and the fans should turn off after a minute or two. **Do not proceed until the unit has shut off.**
13. Disconnect the Battery Cable from the Power Module
14. Disconnect the Parallel cable from the Power Module. **Do NOT remove the parallel cable from the second power module!**
15. Defective Power Module can safely be removed from the rack.
16. Proceed to “Parallel Power Module Installation (Replacement Power Module, only)” section.

❖ *Parallel Power Module Installation (Replacement Power Module, only)*

1. Set the Power Module on the mounting rails. *****WARNING! Be careful not to touch the rear terminals of the Power Distribution Unit, AC voltage is present...**
2. Connect the Parallel cable to the Power Module.
3. Connect the Battery Cable to the Power Module.
4. Insert the Power Module to the Power Distribution Unit. *****WARNING! Be careful not to touch the rear terminals of the Power Distribution Unit, AC voltage is present...**

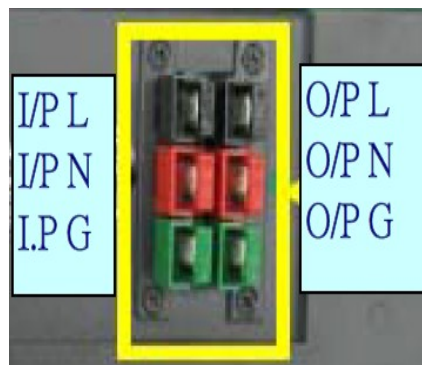
5. Tighten the Power Distribution Unit screws.
6. The unit will display "BYPASS MODE MANUAL SWITCH ON". I/P, AC/DC and O/P LEDS should be ON (solid green LEDs). The BYPASS LED (amber LED) should be blinking.
7. Confirm the LCD screen displays "BYPASS MODE MANUAL SWITCH ON" with the BYPASS LED (amber LED) blinking on both unit and then proceed to the next step.
8. Set the Maintenance Breaker Switch (located on the Power Distribution Unit) to the "OFF" position. *NOTE: if one of the Power Modules displays WAITING FOR UPS2, then go to step 12.*
9. Both units LCD screen will display "BYPASS MODE". I/P, AC/DC and O/P LEDS should be ON (solid green LEDs). The BYPASS LED (amber LED) should be blinking.
10. Confirm the BYPASS LED is blinking on both units and then proceed to the next step.
11. Press the ON button on the first Power module. After a brief self-test the LCD screen will display DIAGNOSIS OK WAITING FOR UPS2.
12. Press the ON button on the second Power Module. After a brief self-test both UPSs should display ONLINE MODE.
13. Reinstall the SNMP, connect any serial or USB communication cables to the UPS; enable PowerAlert.

Power Module Electrical Test (Working Power Module, only)

Power Module Electrical Test (Working Power Module, only)

****Note: This procedure only apply to a working Power Module that has been gracefully shutdown and separated from the Power Distribution Unit. Refer to an applicable "Routine Maintenance" (Standalone or Parallel Configuration) procedure within this document.*

1. Connect the Battery Cable to the Power Module *****WARNING! Be careful not to touch the rear terminals of the Power Distribution Unit, AC voltage is present...**
2. Press the ON button of the Power Module to cold-start the UPS.
3. UPS system's inverter will begin to operate.
4. UPS system will perform a brief self-test. The unit will power "ON BATTERY MODE".
5. LCD screen will display "REMAINING TIME XXX MINUTES". The BATTERY, AC/DC, DCAC and O/P LEDS should be ON (solid green LEDs).
6. Use the SCROLL UP/SELECT BUTTON on the LCD DISPLAY. Confirm there are no failure messages being reported. **(Note: If the UPS reports any type of failure messages do not proceed with the next step. The power module requires a replacement).**
7. Measure the output voltage and frequency between O/P L and O/P N. Meter should read between 208vac +/- 3% and 60Hz +/- 1%. (see photo below)



8. Press and hold the OFF button on the Power Module until the unit beep and then release the OFF Button.
9. LCD screen will display "SURE?" ON (NO) OFF (YES), Press the OFF button again to power the unit off.

10. The UPS will begin a graceful shutdown. The LCD screen should become dark and the fans should turn off after a minute or two. Do not proceed until the unit has shut off.
11. Connect the parallel cable back to the Power Module.
12. Insert the Power Module to the Power Distribution Unit.
13. Tighten the Power Distribution Unit screws.
14. The unit will display "BYPASS MODE MANUAL SWITCH ON". The I/P, AC/DC and O/P LEDs should be ON (solid green LEDs). The BYPASS LED (amber LED) should be blinking.
15. Confirm the LCD screen displays "BYPASS MODE MANUAL SWITCH ON" with the BYPASS LED (amber LED) blinking and then proceed to the next step.
16. Proceed to "*Parallel Power Module Installation (Replacement Power Module, only)*" section.