

MCG Surge Protection

Models 120LS, 200LS, 300LS, 560LS Installation Instructions

Important Warranty Information

MCG surge protectors are designed to work at specific voltages and configurations, for example, at 120/208VAC, Wye. Installation of the surge protector improperly on a power system will automatically void the warranty.

1. Confirm Model with Power Service.

Measure Phase - Neutral, Phase - Phase, with voltmeter to confirm application voltage prior to installation.

120LS-, 200LS-, 300LS-	Power Service	Description	Wiring Diagram (pg. 2)
120S	120 VAC	1 ph, 2W+G Single phase	1
120T	120/240 VAC	1 ph, 3W+G Split phase	2
120Y	120/208 VAC	3 ph, 4W+G Wye	4
220Y	220/380 VAC	3 ph, 4W+G Wye	4
240Y	240/415 VAC	3 ph, 4W+G Wye	4
240DCT	240/120/120 VAC	3 ph, 4W+G High-leg Delta	3
277Y	277/480 VAC	3 ph, 4W+G Wye	4
347Y	347/600 VAC	3 ph, 4W+G Wye	4
240D	240 VAC	3 ph, 3W+G Delta	5
480D	480 VAC	3 ph, 3W+G Delta	5
600D	600 VAC	3 ph, 3W+G Delta	5

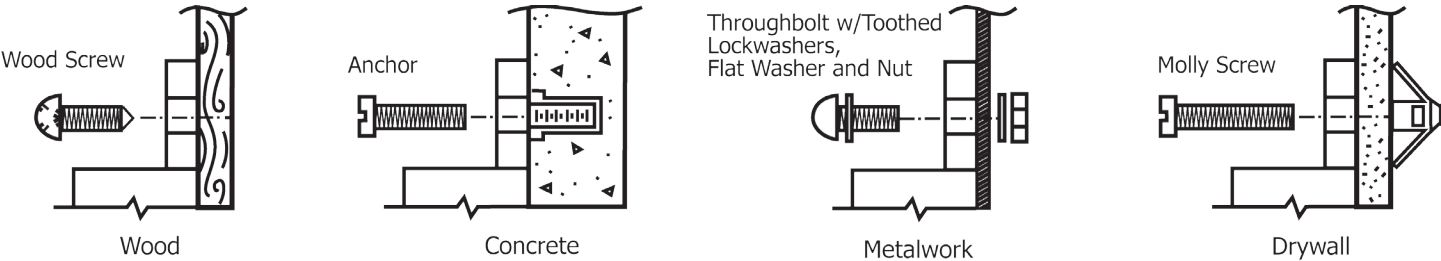
2. Disconnect Power Before Installation

All wiring to be done in accordance with National Electric Code and local codes by qualified electricians.

Note: This device features internal protection that will disconnect the surge protective component at the end of its useful life but will maintain power to the load - now unprotected. If this situation is undesirable for the application, follow the instructions for servicing the device.

3. Mounting

For best performance, mount protector as close to service panel as possible. Secure unit to mounting surface. Use proper fasteners as indicated. (Fasteners not supplied.)



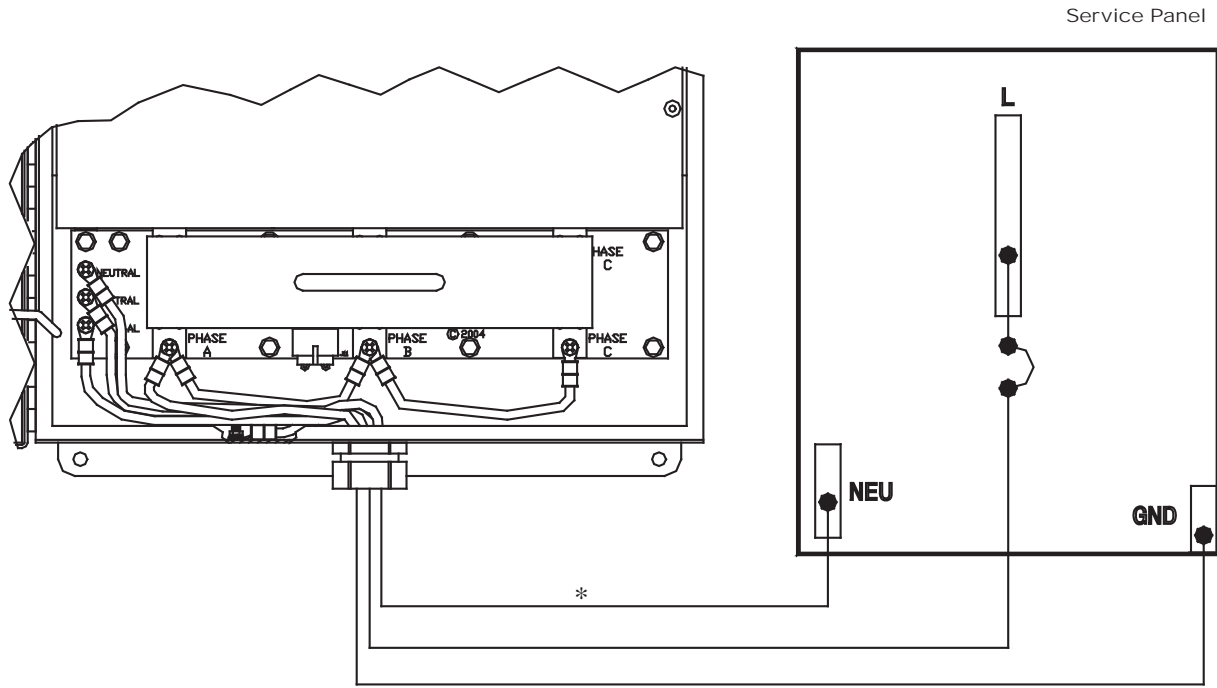
4. Wiring

CAUTION: Protector must be connected to an upstream overcurrent device sized for the protector's wires: For example, if 10 AWG wires are used, then a 30A thermal circuit breaker shall be used. If a breaker is not available, use a fused disconnect (with time-delay fuses) sized for the protector's wires.

Note: Internal views shown represent models with optional disconnect switch. For models without disconnect switch, connect phase wires to top terminals labelled Phase A, Phase B, and Phase C.

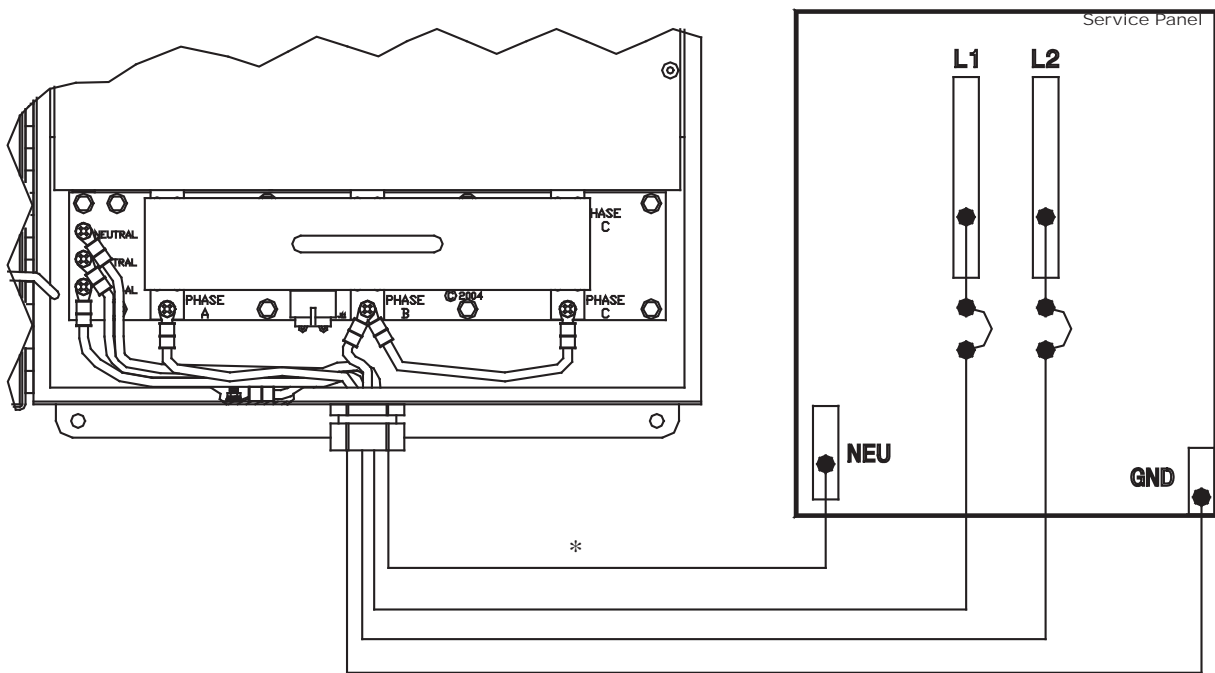
Wiring Diagram 1: For -120S Models

Note: All three phases are jumped together (Ph. A - Ph. B jumper, Ph. B - Ph. C jumper). Connect hot lead to Phase A terminal.



Wiring Diagram 2: For -120T Models

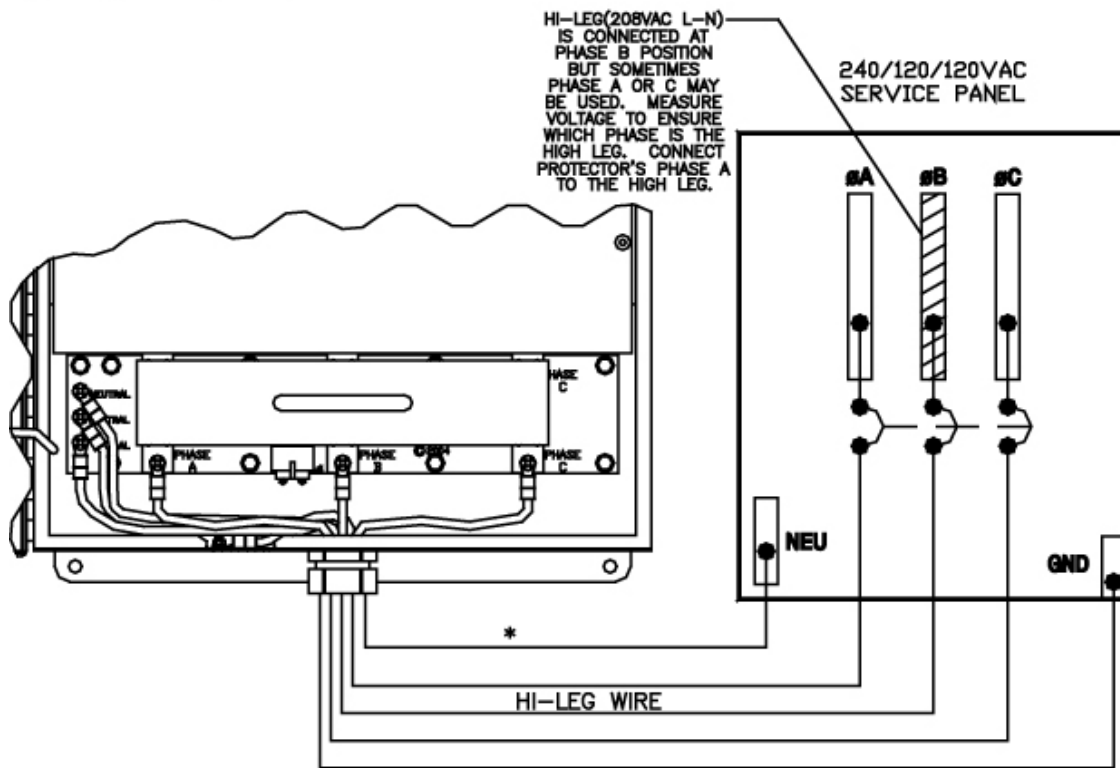
Note: Phase B and Phase C are jumped together. Connect L1 lead to Phase A terminal and L2 lead to Phase B terminal.



4. Wiring (con't)

Wiring Diagram 3: For -240DCT Models

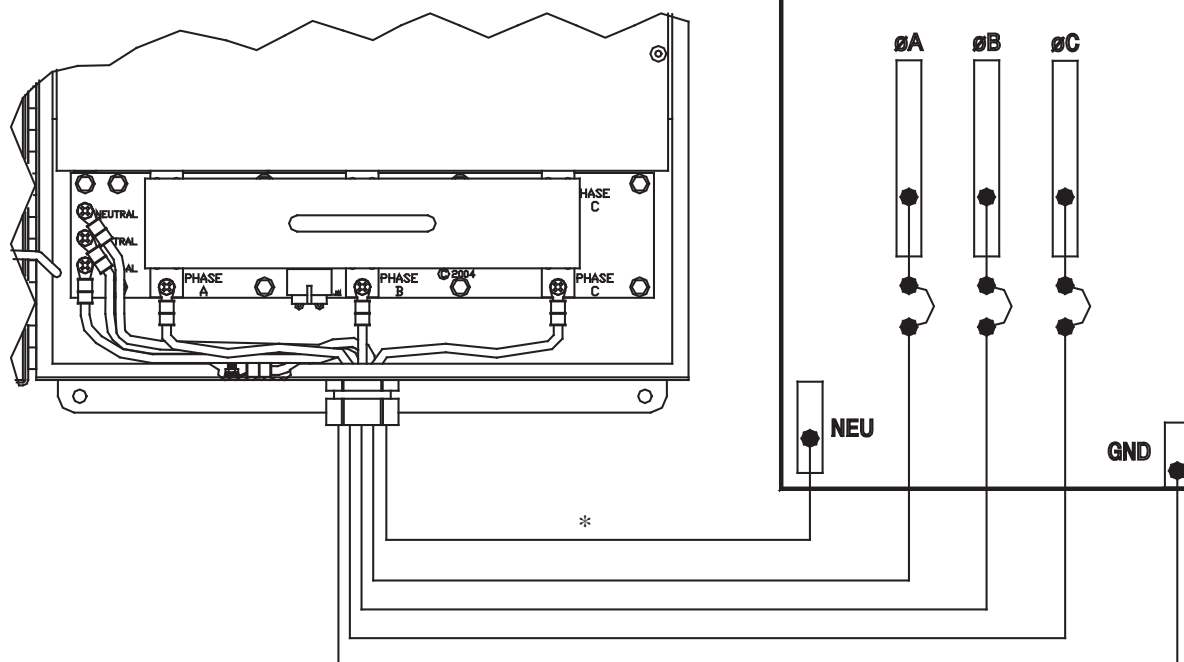
Important: Protector Phase A must be connected to Service Panel's High-Leg Phase. Use voltmeter to confirm High-Leg Phase (typically 208VAC L-N)



*For best performance, use three neutral wires

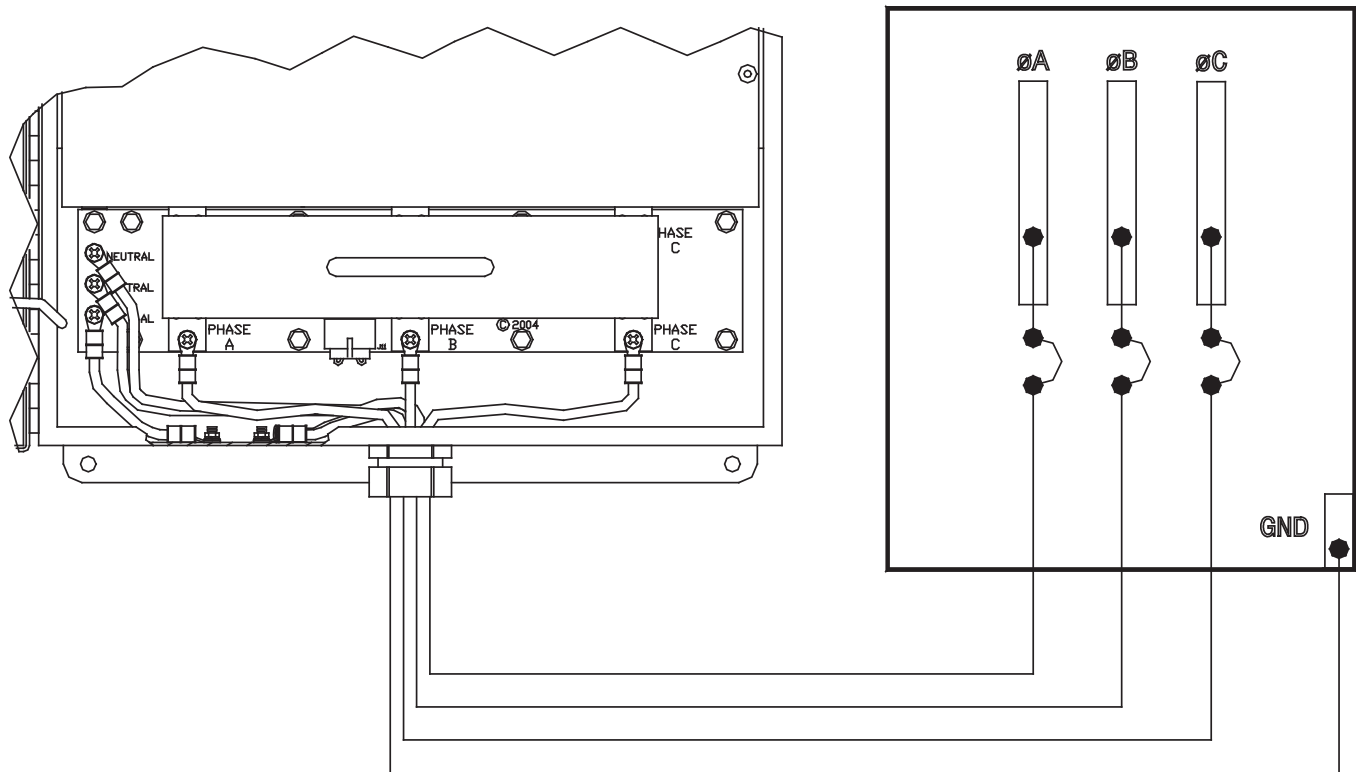
Wiring Diagram 4: For Models -120Y, -220Y, -240Y, 277Y, -347Y

Service Panel



*For best performance, use three neutral wires

Wiring Diagram 5: For Models -240D, -480D, -600D



*For best performance, use four ground wires

5. Powering Up the Protector.

To prevent possible electrical hazard, door on protector **MUST** be closed before applying power.

Upon power up, the front panel will show the following:

For models without Upgraded Front Panel option (which includes a counter, beeper, relay)

- a. Green LED illuminated, Red LED extinguished.

If any other condition is observed, remove power and contact MCG at 1-800-851-1508 for assistance.

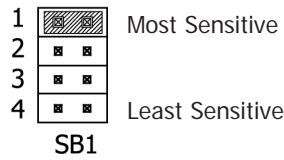
For models with Upgraded Front Panel option

- a. Green LED illuminated, Red LED extinguished.
- b. Counter will read "0" or a nonzero value.

If any other condition is observed, remove power and contact MCG at 1-800-851-1508 for assistance.

6. Counter Trigger Sensitivity (Models with Upgraded Front Panel option)

The event counter sensitivity is preset at the factory to its most sensitive position. If you observe too many counts on the front panel, you can decrease the sensitivity of the counter. Protection is not affected. See Appendix 2: Inside View (Page 9)



To access the counter's sensitivity adjustment:

- Remove power. Loosen clamps and open door – DO NOT TOUCH ANYTHING - HIGH VOLTAGE PRESENT.
- Observe circuit board mounted on back of door.
- Locate shorting block labeled SB1. Note: The shorting block is a small, black plastic jumper that connects two points together electrically. To remove it, simply pull it straight out.
- For the highest sensitivity, move the shorting block to the top-most position-Position 1.
- For the lowest sensitivity, move the shorting block to the bottom-most position-Position 4.
- Close door and secure clamps. Restore power.

7. Counter Reset Feature (Models with Upgraded Front Panel option)

This feature resets the surge counter back to zero. The counter reset feature is generally only exercised at time of installation, where power up may have caused an event. A monthly log is recommended to keep track of transient occurrences. See Appendix 2: Inside View (Page 9)

To reset event counter:

- Loosen clamps and open door – DO NOT TOUCH ANYTHING – HIGH VOLTAGE PRESENT.
- Observe circuit board mounted on back of door.
- Locate switch on board marked “SW2”.
- Press SW2 to reset counter back to zero.
- Close door and secure clamps.
- Observe that counter reads zero.



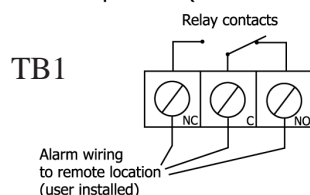
8. Remote Relay Feature (Models with Upgraded Front Panel option)

This feature enables you to operate a remote beeper/indicator light for monitoring the surge protector status from a remote location. It can also be connected to a building monitoring system as the relay provides a Normally Closed or a Normally Open contact. See Appendix 2: Inside View (Page 9)

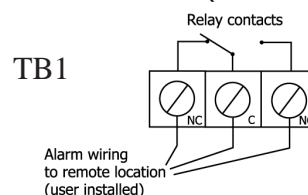
To access remote relay terminal block:

- Loosen clamps and open door – DO NOT TOUCH ANYTHING – HIGH VOLTAGE PRESENT.
- Observe circuit board mounted on back of door
- Locate TB1 on front panel
- There are three terminals, each labeled NC (Normally Closed), C (Common), and NO (Normally Open). These are 1 Form C contacts rated at 1A, 30VDC or 0.5A, 125VAC. Maximum switched power: 30W/60VA.
- Connect remote monitoring circuit (user supplied) to the appropriate terminals.
- Close door and secure clamps.

Normal Operation (100% Protection)



Reduced Protection (or Power Off)



9. Disconnect Switch (Models with Disconnect Switch option)

This feature allows the user to locally remove power. Once this is done, the unit can be serviced and the protection module(s) requiring replacement can now be removed without shutting off the upstream overcurrent disconnect. This feature does not take the place of the upstream overcurrent device (i.e. circuit breaker). See Appendix 2: Inside View (Page 9)

To remove power to protection modules via the internal disconnect switch:

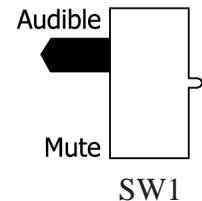
- a. Loosen clamps and open door – DO NOT TOUCH ANYTHING – HIGH VOLTAGE PRESENT.
- b. Observe disconnect switch (white plastic enclosure with black handle) at bottom of unit located directly above power terminals
- c. Grasp handle and firmly pull on handle straight towards you. Observe all lights out on front panel as well as all internal lights. CAUTION: LINE SIDE OF SWITCH TERMINALS REMAIN ENERGIZED EVEN WHILE SWITCH IS OUT. For module replacement, see next section (Section 12. Troubleshooting and maintenance).
- d. To reapply power, line up cylindrical contacts of switch with fuse clips (DO NOT TOUCH CLIPS), seat switch by pressing firmly on handle and/or white enclosure.
- e. Observe internal and external green lights illuminated.

10. Beeper Mute Feature (Models with Upgraded Front Panel option)

The audible alarm will sound if a fault exists and SW1 on front panel circuit board is set to the “Audible” position. Note: The beeper Mute switch is factory set to the “Audible” position.

To access the mute switch:

- a. Loosen clamps and open door – DO NOT TOUCH ANYTHING – HIGH VOLTAGE PRESENT.
- b. Observe circuit board mounted on back of front door.
- c. Locate slide switch labeled “SW1” (Audible/Mute).
- d. Move switch to the desired position. Switch is factory set to AUDIBLE position.
- e. Close door and secure clamps.



11. Remote Dialer Operation (Protectors with remote dialer option)

The remote dialer is typically employed in remote locations where protector status cannot be viewed by personnel. The dialer will dial out to user programmed phone numbers and play a user recorded message in the even of a protector fault. A standard phone line is required. See separate dialer instructions (document # 299-600-97) for installation and operation instructions.

12. Troubleshooting and Maintenance

MCG surge protectors do not require any periodic maintenance. However, if the red “Protection Reduced” light on the front panel is illuminated, a fault condition exists. See Appendix 2: Inside View (Page 9). When this occurs, follow the procedure below:

- a. Loosen clamps and open door – DO NOT TOUCH ANYTHING.
- b. Observe status lights next to modules – they are labeled (DS1, DS2, DS3, and DS4). These lights are green when the module protection circuits are 100% operational but change to red when there is a reduced protection condition. *Note: DS5 is not a module status light, it is the power supply monitoring light and it is always illuminated as long as DC power exists, even during a fault.*
- c. Make a note which lights are red.
- d. Remove power by shutting off upstream disconnect (or on models with internal disconnect option, see step 9 to remove power via internal disconnect switch, if desired).
- e. Confirm that power is removed by measuring Phase to Phase and Phase to Neutral (where applicable) voltages in protector with a DMM and by observing all lights extinguished.
- f. Locate the modules (*Note: the modules contain the fuses and varistors*). Three modules reside underneath the green barrier. This barrier must be removed first to gain access to these modules. Remove the two thumb screws and pull out the barrier. The fourth module (non-Delta models only) is located at the top-right section of the motherboard.
- g. The modules are removed by first unplugging the RJ cable (grey) from the module. Then use a 5/16” nut driver to loosen the mounting bolts from the module – five pieces typical.
- h. **IMPORTANT: CONFIRM THAT REPLACEMENT MODULE VOLTAGE MATCHES VOLTAGE OF ORIGINAL MODULES.** Install new module(s) and make sure that mounting bolts are tightened securely.
- i. Plug in RJ cable.
- j. Install barrier (where applicable) and tighten thumb screws.
- k. If your model has an internal disconnect switch, reapply power by lining up cylindrical contacts of switch with fuse clips (**DO NOT TOUCH CLIPS**), seat switch by pressing firmly on handle and/or white enclosure. Observe all green lights near modules illuminated – 100% protection restored.
- l. If your model does not have an internal disconnect switch, close door and secure clamps. Reapply power to surge protector by turning on dedicated circuit breaker (or fused disconnect). Observe on front panel green light illuminated, red light extinguished – 100% protection restored.

