

MCG Surge Protection

Installation/Operating Instructions for MCG 500 Series

Important Warranty Information

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

1) Confirm Model with Power Service.

Measure Line-Neutral, Line-Ground, and/or Line to Line with voltmeter to confirm application voltage prior to installation.

NOTE: This device features an 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 manufacturer’s instructions for replacing the device.

NOTA: Cet appareil dispose d'une protection interne qui déconnectera l'élément de protection contre les surtensions à la fin de sa vie utile, mais maintiendra l'alimentation à la charge - sans protection. Si cette situation n'est pas souhaitable pour l'application, suivre les indications du fabricant pour remplacer cet appareil.

WARNING - RISK OF ELECTRIC SHOCK

Disconnect power before servicing. Service to be performed by qualified personnel only.

AVERTISSEMENT - RISQUE DE CHOC ÉLECTRIQUE

Coupez l'alimentation électrique avant de faire l'entretien. L'entretien doit être effectué uniquement par un personnel qualifié.

530P MODELS, WIRING DIAGRAM TABLE

Voltage Configuration	Power Service	Description	Wiring Diagram #
530P - 120V	120 VAC	1 ph, 2W+G Single phase	1
530P - 120/240V	120/240 VAC	1 ph, 3W+G Split phase	2
530P-240V-LLG	240 VAC	1 ph, 2W+G Single phase	3
530P -220V	220 VAC	1 ph, 2W+G Single phase	1
530P -240V	240 VAC	1 ph, 2W+G Single phase	1

530S MODELS, WIRING DIAGRAM TABLE

Voltage Configuration	Power Service	Description	Wiring Diagram #
530S - 120V	120 VAC	1 ph, 2W+G Single phase	4
530S - 120/240V	120/240 VAC	1 ph, 3W+G Split phase	5
530S-240V-LLG	240 VAC	1 ph, 2W+G Single phase	6
530S -220V	220 VAC	1 ph, 2W+G Single phase	4
530S -240V	240 VAC	1 ph, 2W+G Single phase	4

530P “-N” MODELS, WIRING DIAGRAM TABLE

Voltage Configuration	Power Service	Description	Wiring Diagram #
530P - 120V - N	120 VAC	1 ph, 2W+G Single phase	7
530P - 120/240V - N	120/240 VAC	1 ph, 3W+G Split phase	8
530P-240V-LLG - N	240 VAC	1 ph, 2W+G Single phase	9
530P -220V - N	220 VAC	1 ph, 2W+G Single phase	7
530P -240V - N	240 VAC	1 ph, 2W+G Single phase	7

2) For units without enclosure (-N models).

Install status board - Procedure:

- Locate plug-in status board inside shipping box. This is the small board with the LEDs on it.
- Plug status board in as shown in figure 3. Note: Board is polarized and will only plug in one way – with the longer side toward the main board.
- If necessary, use the nylon tie to secure the board. For example, if the unit is mounted upside down or in an environment with higher than normal shock and vibration, it is recommended that the supplied nylon tie is used.
- Thread tie through hole in main board and through corresponding hole near the bottom of the status board.
- Do not over tighten tie; just use enough tension so that board cannot back out of the connector. Clip off excess tie length.

MOUNTING

3A) Mounting (models with enclosure):

i) Mount supplied brackets to enclosure.

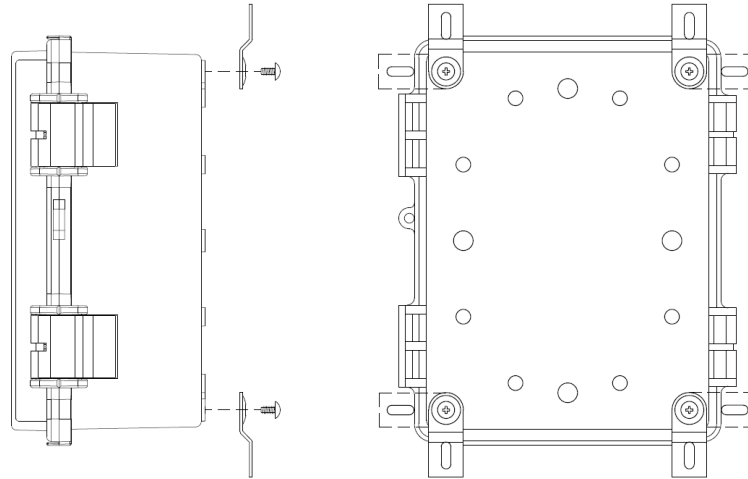


Figure 1: Mounting Bracket Detail

- Locate the four metal mounting brackets and four thread-cutting screws in bag.
- Turn enclosure upside down and locate the four plastic holes near the four corners.
- Place side of bracket with hole on top of mounting hole with recessed side toward enclosure and bracket perpendicular to the top or bottom of the enclosure.
- Tighten brackets in place. Note: Do not over tighten screw as the threads will strip.

ii) Mount protector to flat surface.

For best performance, mount protector as close to service panel (or input to equipment) as possible and cut back wires as short as possible. See figure 5 for mounting dimensions. Do not leave service loops. Secure unit to mounting surface. Use proper fasteners as indicated (Fasteners not supplied) in Figure 2.

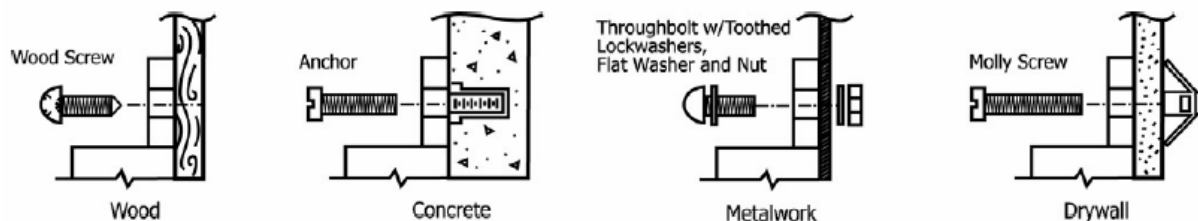


Figure 2 – Wall Mounting Detail

3B) Mounting (models without enclosure (“-N” models)): See figures 6 and 7 for mounting information.

Drill and tap four, 8-32 holes in mounting surface. Use supplied hardware to mount assembly. Or use similar means of mounting protection assembly.

4) Wiring Diagrams

Disconnect Power before Installation All wiring to be done in accordance with National Electric Code and local codes by qualified electricians. Note: For models with enclosure, there are two, 3/4” trade size holes in the bottom of the enclosure for wiring. Remove hole plug(s) and replace with suitable 3/4” connector(s).

530P Models: 530P models are parallel connected(they do not conduct load current) For best performance, tape conductors together for the entire run. Keep overall cable length to less than 2 feet long (the shorter the cable length, the better the performance so 6” would be great if possible). Use 10 Gauge Wire size and use included ring terminal(s) for protector Ground terminal connections.

Wiring Information:

Wire Type: UL1015

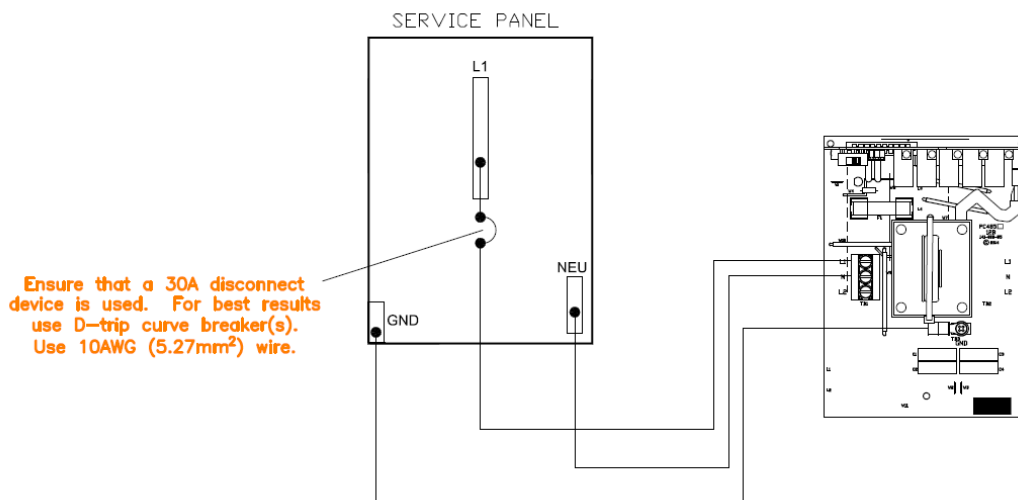
Wire Gauge: 10AWG

Wire Torque: 19lbs.-in.

Wire Voltage Rating: 600VAC

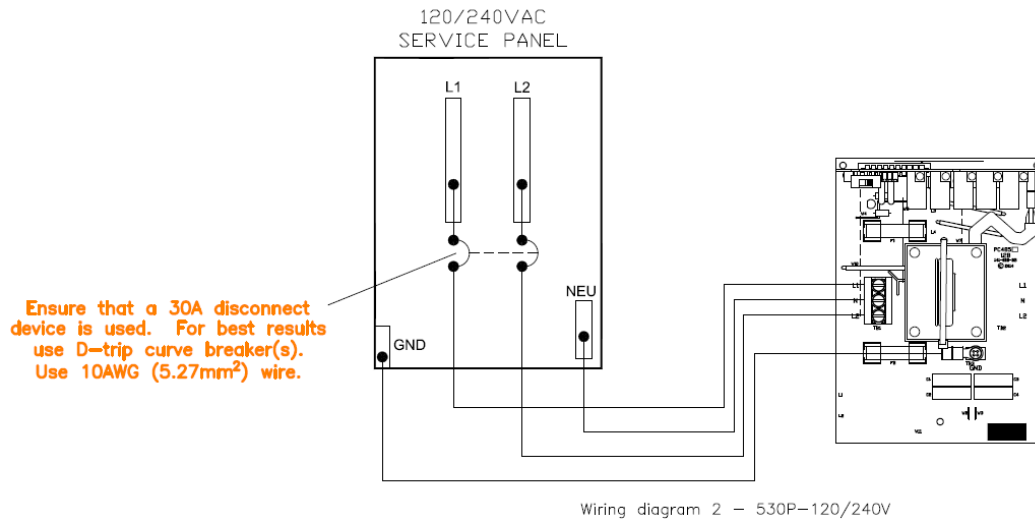
Wire Temp. Rating: 105°C

530P-120V, 530P-220V, & 530P-240V

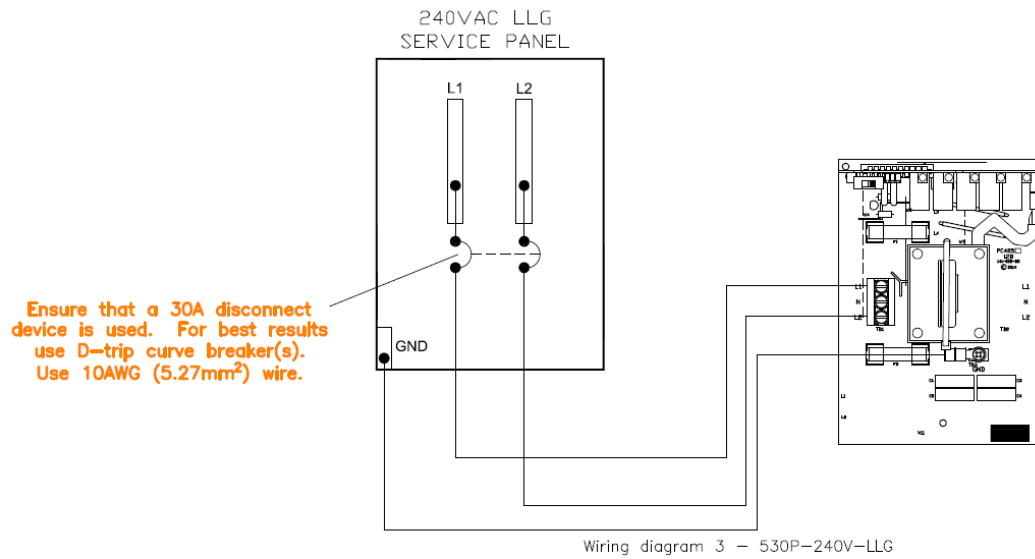


Wiring diagram 1 – 530P-120V, 530P-220V, & 530P-240V

530P-120/240V

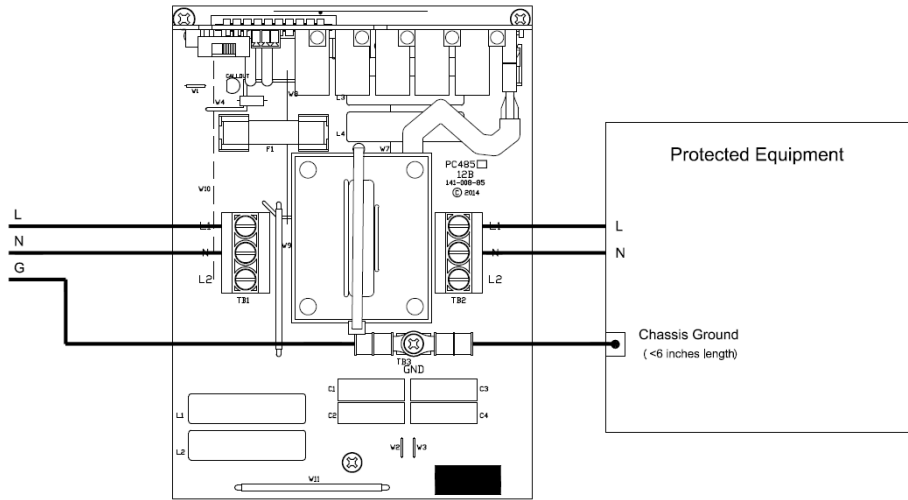


530P-240V-LLG



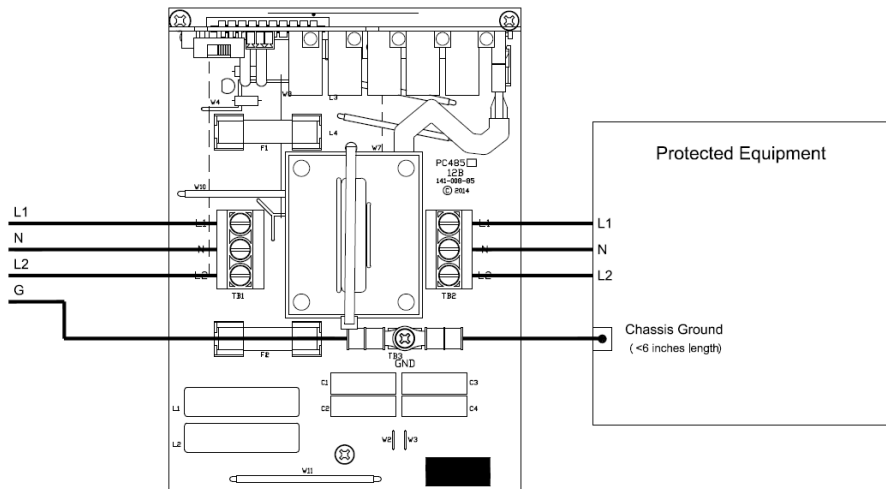
530S Models: 530S models are series connected and conduct load current. Locate protector as close as possible to protected equipment. Do not bundle incoming and outgoing wires together to prevent coupling. Use 10 Gauge Wire size and use included ring terminal(s) for protector Ground terminal connections.

530S-120V, 530S-220V, & 530S-240V



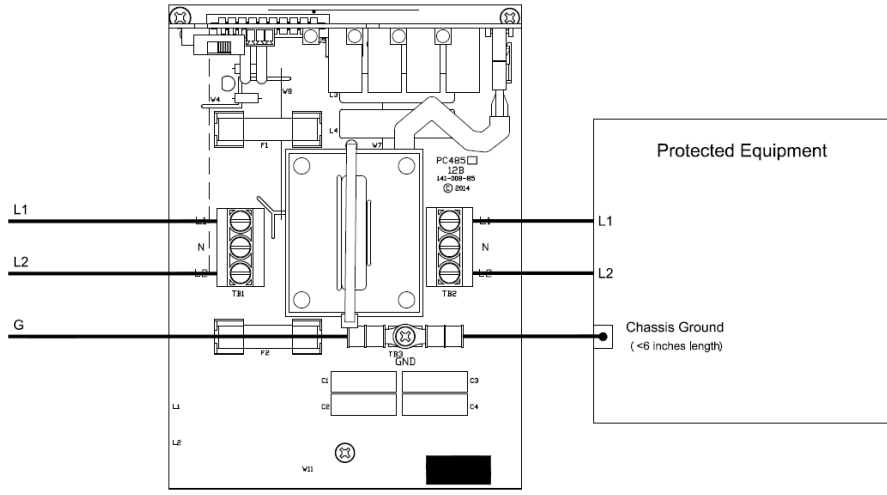
Wiring diagram 4 - 530S-120V, 530S-220V & 530S-240V

530S-120/240V



Wiring diagram 5 - 530S-120/240V

530S-240V-LLG

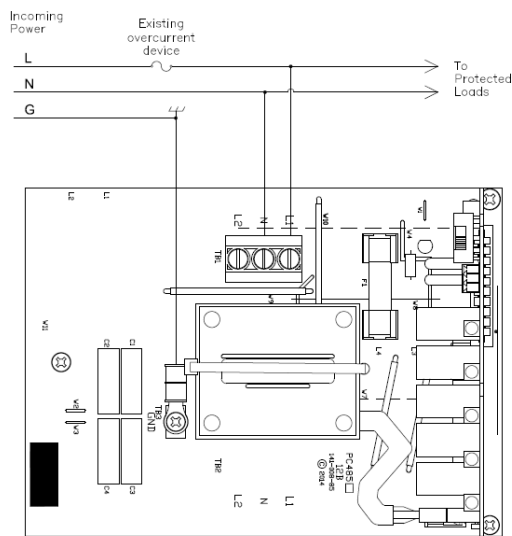


Wiring diagram 6 - 530S-240V-LLG

530P “-N” Models. 530P “-N” models are O.E.M. style protection assemblies designed to be mounted within a suitable electrical cabinet or inside the equipment they are protecting. The protector is typically mounted near the incoming power lines and “tapped” into the wiring powering the equipment to be protected. Keep protector’s cable length to less than 2 feet (the shorter the cable length, the better the performance so 6” would be great if possible). Use 10 Gauge Wire size and use included ring terminal(s) for protector Ground terminal connections.

530P-120V-N, 530P-220V-N, & 530P-240V-N

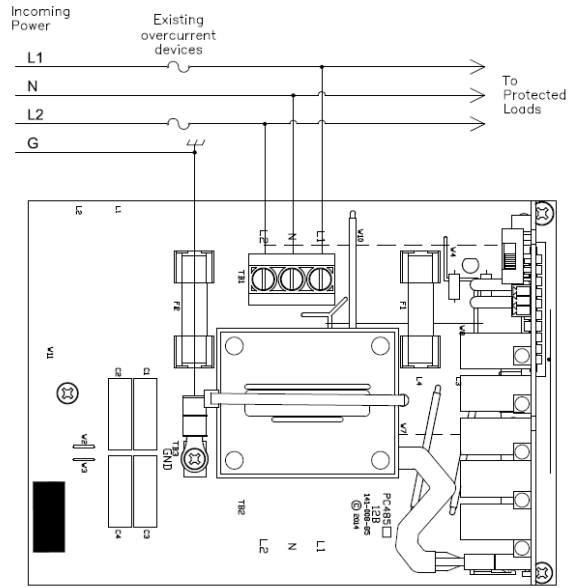
Dedicated Equipment/Control Cabinet Protection



Wiring diagram 7 - 530P-120V-N, 530P-220V-N & 530P-240V-N

530P-120/240V-N

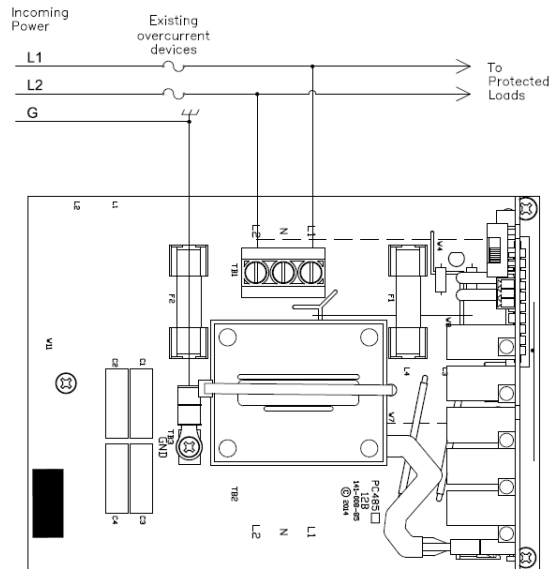
Dedicated Equipment/Control Cabinet Protection



Wiring diagram 8 - 530P-120/240V-N

530P-240V-LLG-N

Dedicated Equipment/Control Cabinet Protection



Wiring diagram 9 - 530P-240V-LLG-N

5) Powering up the Protector.

a) Check that all wiring is correct per the wiring diagrams and that all connections are secure.

b) Apply power and observe the following (See figure 3):

i) Green LED on motherboard illuminated. This LED is normally on and shows that power is present to the motherboard and the cartridge fuse(s) is (are) good. It is located right above F1.

ii) Blue LEDs on status illuminated. These LEDs are normally on and are directly tied into the protection module's metal oxide varistors. There is one LED per varistor. These LEDs monitor the state of the varistors' thermal fuses.

iii) On "-UFP" models, relay contacts in open circuit position. Note: If power is removed, relay contacts will be shorted out.

Note: LEDs are numbered DS1, 2, 3, 4, 5 from left to right on "-UFP" models

Standard models: LEDs are numbered DS5, 4, 3, 2, 1 from left to right.

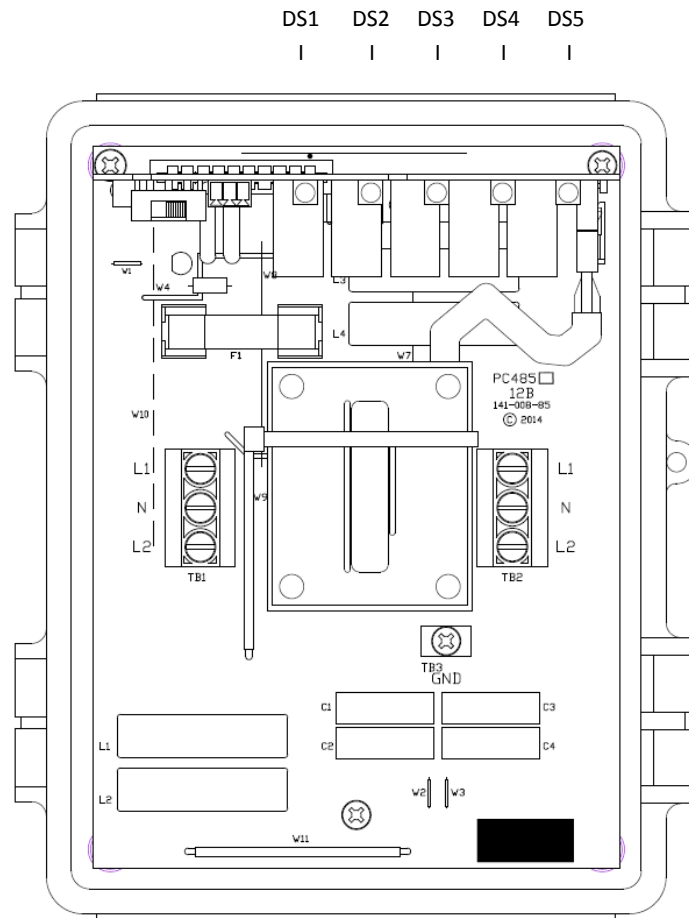


Figure 3: Front view with "-UFP" option

What are the LEDs telling you?

- 1) The green LED on the main board indicates that the cartridge fuse(s) is (are) functional when power is present. Refer to figure 3.

- 2) On the status board, there are 4 or 5 LEDs depending on model. On the **standard** status board, from left to right, these are numbered **DS5, DS4, DS3, DS2, and DS1**. On the **optional** status board (-UFP models), from left to right these are numbered **DS1, DS2, DS3, DS4, and DS5**. Refer to figure 3 above.

Blue LEDs monitor the following protection modes as follows:

- a) For “-120/240V” Models:
 - DS1 monitors Line 2 to Ground protection (varistor).
 - DS2 monitors Line 2 to Neutral protection (varistor).
 - DS3 monitors Line 1 to Ground protection (varistor).
 - DS4 monitors Line 1 to Neutral protection (varistor).
 - DS5 monitors Neutral to Ground protection (varistor).

- b) For “-120V”, “-220V”, “-240V” Models:
 - DS1 and DS3 monitor the two Line to Ground varistors.
 - DS2 and DS4 monitor one two Line to Neutral varistors.
 - DS5 monitors the Neutral to Ground varistor.

- c) For “-240V-LLG” Models:
 - DS1 and DS3 monitor the two Line to Line varistors.
 - DS2 monitors the Line 1 to Ground varistor.
 - DS4 monitors the Line 2 to Ground varistor.

6) Beeper with Mute Feature (-UFP models):

If there exists a reduced protection scenario in the protector (one or more lights extinguished), the beeper will sound. Beeper mode is shipped from the factory in “On” position. See figure 3. If you do not want the beeper to sound during a reduced protection situation, then remove power to protector, and slide the mute switch, located on the top edge of the status board, to the left position. Reapply power.

7) Remote Relay Feature (-UFP models)

To access remote relay terminal block:

The remote relay terminal block is located on the top edge of the status board, just to the right of the mute switch. See figure 3. **Only the outer two contacts (Common and Normally Closed) are used.** Do not use center port. See figure 3 below.

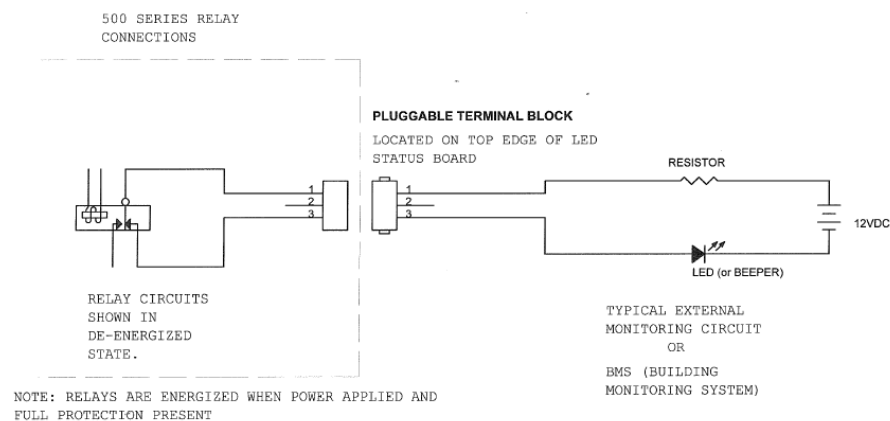


Figure 4: Relay Wiring Diagram

Remote Relay Contacts Operation: When power is applied to protector and protector has 100% protection, contacts are in an open circuit state.

a) Remove power to protector. While holding status board in, pull out the pluggable terminal block. Connect remote monitoring circuit (user supplied) wires to the outer two terminals using a small flathead screwdriver.

Under normal operating conditions (power on and full protection present), the NC – C contacts will present an open circuit to the user’s external monitoring equipment.

- b) Plug in terminal block and power up unit.
- c) Observe that external circuit is functioning properly.

Contact Ratings:

1A, 30VDC. 1A, 24VAC

Maximum switched power: 30W/60VA.

Note 1: Class 2 Wiring Only. 16-28 AWG.

Note 2: Recommended screw torque: 2 in-lbs.

Nota 1: Câblage de Classe 2 seulement. 16-28 AWG.

Nota 2: Couple de serrage recommandé: 0,2 J (2 in-lb)

8) Troubleshooting and Maintenance

Your MCG protector is designed to provide decades of protection without any required maintenance. However, if you observe a reduced protection scenario (one light or more extinguished), then the protector may require service. Contact MCG at 1-800-851-1508 or support@mcgsurge.com for assistance.

Protection module replacement:

If the protection module is damaged, it will need to be replaced along with the fuses on the main board. Refer to figure 3.

To replace the module/fuse(s):

- a. Remove power from protector. Note: even if all the LEDs are off, power may still be present to protector. Use a DMM to confirm that power is removed.
- b. Unplug the module's wire harness from the status monitoring board by pressing rear part of locking tab and pulling out connector. Note: Support monitoring board when pulling out connector.
- c. If there is a nylon tie wrap holding in the module, cut it off and discard it.
- d. Pull out protection module from motherboard.
- e. Thread a new tie wrap through the slot in the tie wrap mount on the main board.
- f. Make sure replacement module's label matches original module's label information.

- g. Line up new module's banana plugs with the banana jacks in the main board.
- h. Press down on module firmly until the module stops.
- i. Cinch tie wrap snug against module and cut excess.
- j. Plug module's harness into status monitoring board. Note: Support monitoring board when plugging in harness.
- k. Replace the cartridge fuses on the mother board with same type and ratings. Pull fuses out of fuse clips by using a fuse puller or other means.
- l. Reapply power. Observe full protection present.

How to replace/upgrade your status monitoring board:

The status board is designed to last for decades, but should it fail or if the user wants to upgrade from the standard monitoring board to the upgraded one with remote relay contacts and beeper, then the below procedure may be followed:

- a. Remove power from protector. Note: even if all the LEDs are off, power may still be present to protector. Use a DMM to confirm that power is removed.
- b. Cut and discard the nylon tie that holds it into the connector (where used).
- c. Unplug the protection module's harness from the status monitoring board by pressing the rear part of the locking tab and pulling out connector. Note: Support monitoring board when pulling out connector.
- d. If replacing with the same assembly, confirm that replacement status monitoring board's part number (383-xxx-xxx) matches new board's part number. This number is located on the component side of the board in a white or yellow silkscreen box. If replacing with the upgraded assembly, you may contact factory at 1-800-851-1508 (or email support@mcgsurge.com) to confirm that you have the correct part.
- e. Plug status board in as shown in figure 3. Note: Board is polarized and will only plug in one way – with the longer side toward the main board.
- f. If desired, install nylon tie wrap into hole in motherboard and corresponding hole near bottom of monitoring board and secure. Do not over tighten tie; just use enough tension so that board cannot back out of the connector. Clip off excess tie length.
- g. Plug module's harness into status monitoring board. Note: Support monitoring board when plugging in harness.
- h. If you are using the status monitoring board with the remote relay contacts, refer to **section 7** for wiring information.
- i. Reapply power. Observe full protection present.

9) Dimensions

Figure 5: Dimensions, models with enclosure

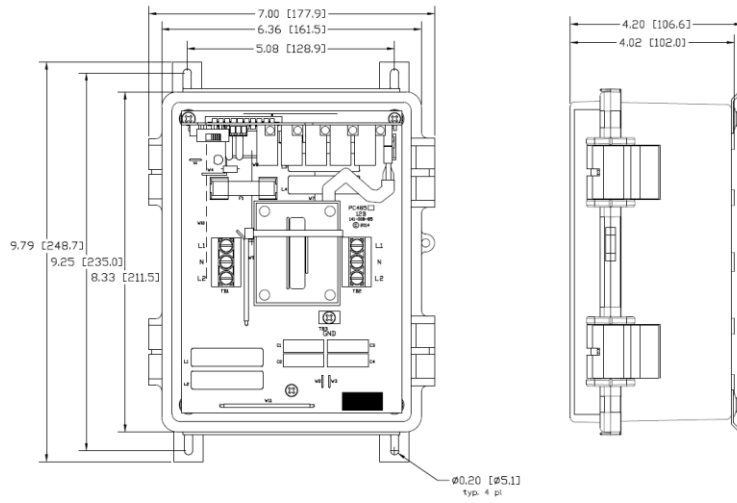


Figure 6: Dimensions, models without enclosure (-N models)

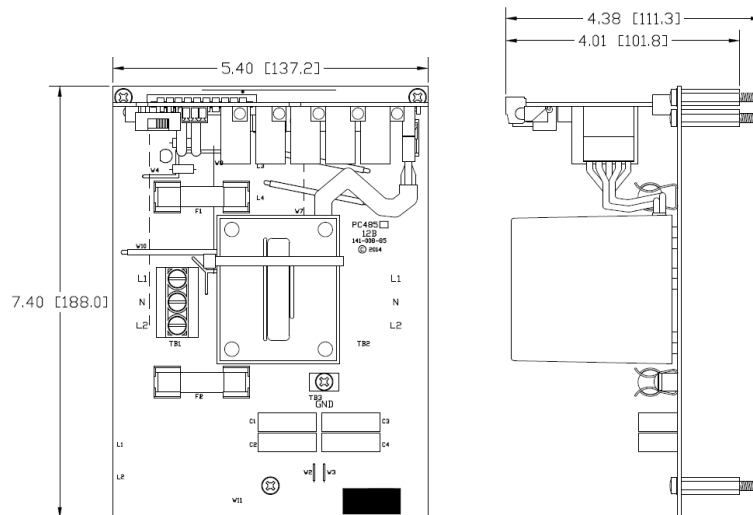
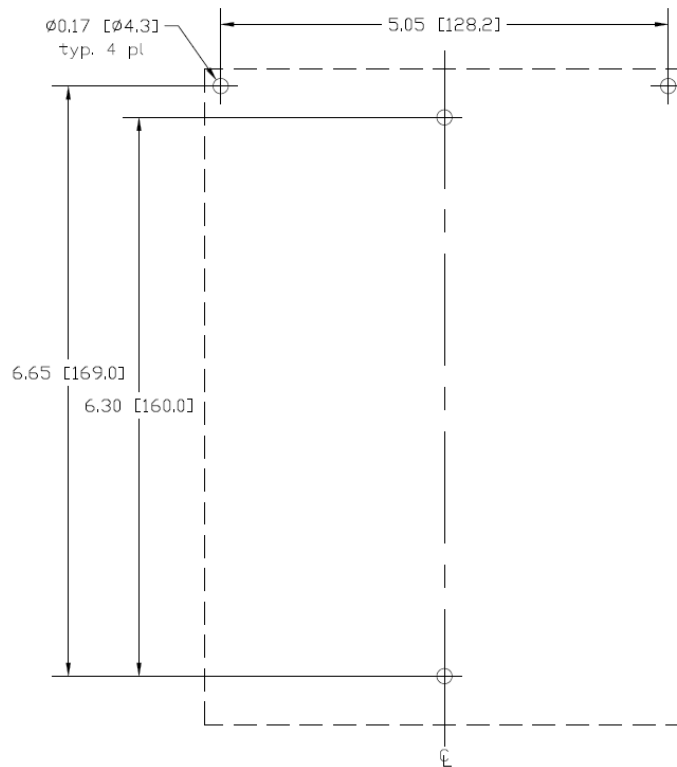


Figure 7 - Circuit Board Mounting Hole Locations for models without enclosure (-N models)



Note: OEM Units supplied with #8 hardware.

Note 1: Not To Scale

Note 2: For increased circuit board support, two additional ***insulated*** standoffs (user supplied) and ***insulated*** hardware (user supplied) may be used in the two 0.187" ***unused*** holes near the bottom/middle of the board, not shown above. Standoffs/Hardware must be insulated as these two holes are located near live circuits.