

MidNite Solar CLASSIC 200-SL

MidNite Solar CLASSIC 200-SL MPPT Charge Controller User Manual

Model: CLASSIC 200-SL | Brand: MidNite Solar

1. INTRODUCTION

The MidNite Solar CLASSIC 200-SL MPPT Charge Controller is a simplified SOLAR ONLY version of the Classic 200, featuring streamlined menus. This charge controller includes a graphics panel and ground fault protection but does not have arc fault or Ethernet capabilities. It offers a maximum output current of 79 amps, operates at 200 volts, and is compatible with 12 to 72 volt battery systems. The CLASSIC 200-SL incorporates MidNite's exclusive HyperVOC technology, which extends VOC limits when necessary. Its streamlined menu design facilitates easy setup and installation for solar-only applications.

Key features include:

- 2 Aux Ports
- Follow-Me function
- Built-in DC-GFP (Ground Fault Protection)
- Optional Battery Sensor for temperature correction on battery charging



Image 1: Front view of the MidNite Solar CLASSIC 200-SL MPPT Charge Controller, showing the display and control buttons.

2. SETUP AND INSTALLATION

2.1 Removing and Installing the Front Cover

To access the wiring compartment, the front art deco cover of the Classic must be removed. Exercise caution as this cover is connected to the electronics via a cable. Avoid pulling hard or fast to prevent damage.

For installation, remove the 4 Phillips head screws with a #2 Phillips screwdriver. Lift the front half of the Classic casting off. Unplug the display cable, which functions similarly to a phone cable.

When reinstalling the cover, apply a small amount of Silicone grease (included in the parts bag) onto the metal pins of the male jacks on the Display cable before plugging them in. To re-install the front cover, plug in the display cable and carefully route it around the components on the circuit board to properly seat the cover. Do not force the cover if it does not seat into place easily; check for any cables or wires that may be interfering. Once seated, install the four Phillips screws with a #2 Phillips screwdriver.

Removing and installing the front cover on the Classic

Removing the front art deco cover is required to gain access to the wiring compartment.

Be aware if this is not the first removal of this cover there is a cable connecting the cover to the electronics. Do not pull hard or fast as damage could occur.

To remove the front cover of the Classic in preparation for installation, remove the 4 Phillips head screws with a #2 Phillips screwdriver. Lift the front half of the Classic casting off. You will need to unplug the display cable. It works the same as any phone cable.

When installing the cover for the final time, squeeze a small amount of Silicone grease (Included in the parts bag) onto the metal pins of the male jacks on the Display cable before plugging them in.

To re-install the front cover of the Classic you will need to plug in the display cable and carefully route it around the components on the circuit board as you set the cover in place. See Figure 2 Do not force the cover if it does not seat into place easily stop and look for any cables or wires that may be interfering. With the cover seated in place install the four Phillips screws with a #2 Phillips screwdriver.

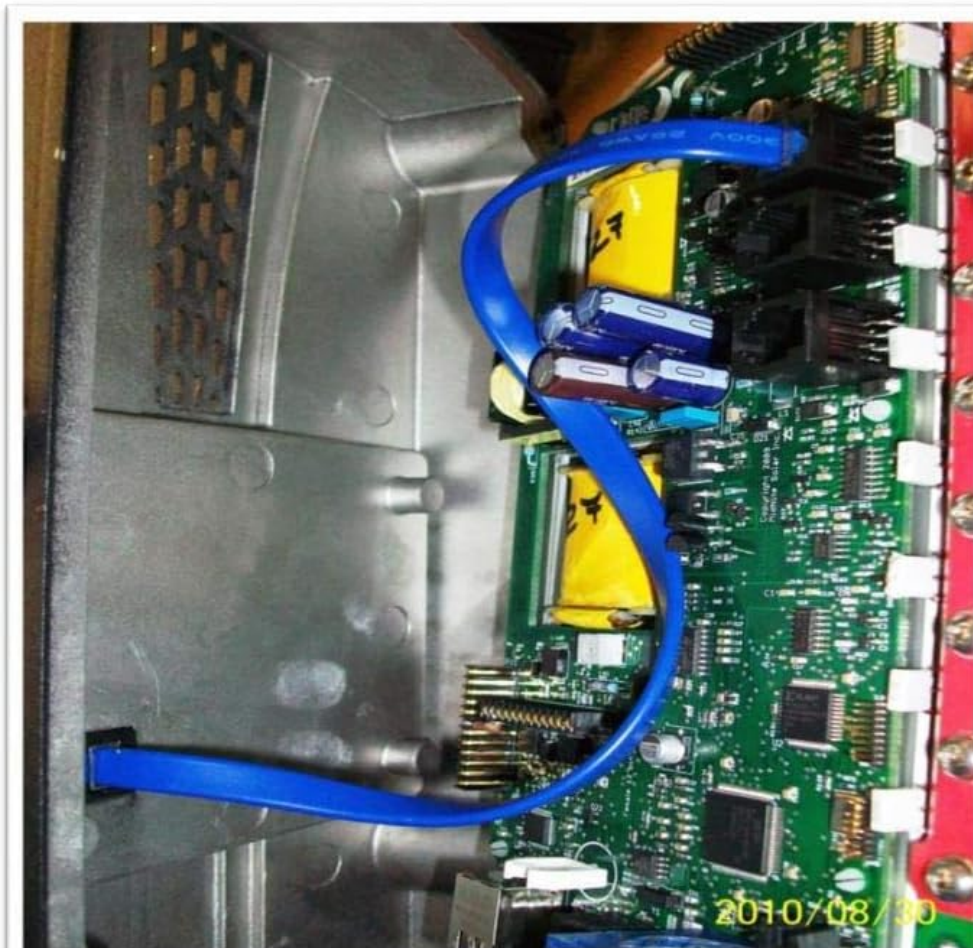


Figure 2

Image 2: Internal view of the Classic charge controller with the front cover removed, showing the display cable connection and circuit board.

2.2 Mounting the Classic

The following section covers typical mounting arrangements. For additional details, contact technical support. The Classic is designed for direct mounting onto the MidNite Solar E-Panel. Mount the unit in an upright position out of direct sunlight when possible. For convenience, the Classic has four one-inch knock-outs that

are pre-cast. The Classic has mounting locations and control locations similar to other brands of charge controllers, facilitating upgrades.

Mounting the Classic directly to the E-Panel:

- Remove the front cover of the Classic.
- Install the mounting bracket on the E-Panel and start the upper mounting screw into the bracket, leaving it about half way out so you can hang the Classic on this screw.
- Install the 1 inch close nipple into the E-Panel as shown in the E-Panel directions. The 1" close nipple, 3 locknuts and 2 plastic bushings are included with each E-Panel. One locknut acts as a spacer.
- Carefully hang the Classic on the screw in the bracket and slide it over the close nipple (see Image 4).
- Install the lock nut and bushing on the close nipple and tighten the screw in the mounting bracket.
- Do not install the front cover until you complete the wiring of the Classic.

Mounting the Classic

The following section covers typical mounting arrangements. If you require additional details that are not covered here please contact our technical support team. The Classic is designed to be directly mounted onto the MidNite Solar E-Panel. The Classic can accommodate other installation methods as well. Mount in an upright position out of direct sunlight when possible. For your convenience the Classic has four one inch knock outs that are pre cast. The Classic has mounting locations and conduit locations that are similar to other brands of charge controllers to facilitate ease of upgrading older technologies.

Mounting the Classic directly to the E Panel:

- *Remove the front cover of the Classic.
- *Install the mounting bracket on the E Panel and start the upper mounting screw into the bracket, leaving it about half way out so you can hang the Classic on this screw.
- *Install the 1 inch close nipple into the E Panel as shown in the E-Panel directions. The 1" close nipple, 3 locknuts and 2 plastic bushings are included with each E-Panel. One locknut acts as a spacer.
- *Carefully hang the Classic on the screw in the bracket and slide it over the close nipple (see figure 4).
- *Install the lock nut and bushing on the close nipple and tighten the screw in the mounting bracket.
- *Don't install the front cover until you complete the wiring of the Classic.

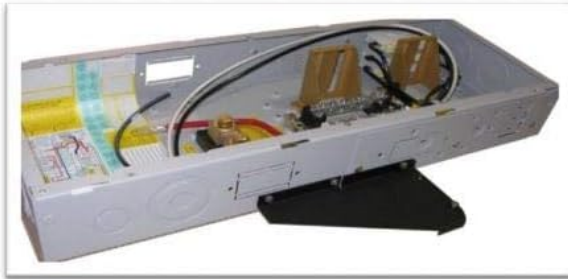


Figure 3

Classic Mounted to side of E-Panel



Figure 4

Classic mounted to the side of a MidNite Solar E-Panel

IMPORTANT!

Do not mount in a zero clearance compartment. Overheating may result. The Classic produces heat in normal operation. Airflow around the Classic is required to prevent overheating and shutdown. This is especially true in hot environments.

Figure 3 A Charge controller bracket mounted to the E-Panel. The bracket comes with every E-Panel

Nipple, locknuts and bushings that come with every E-Panel



Figure 5

Image 3: Charge controller bracket for E-Panel mounting.

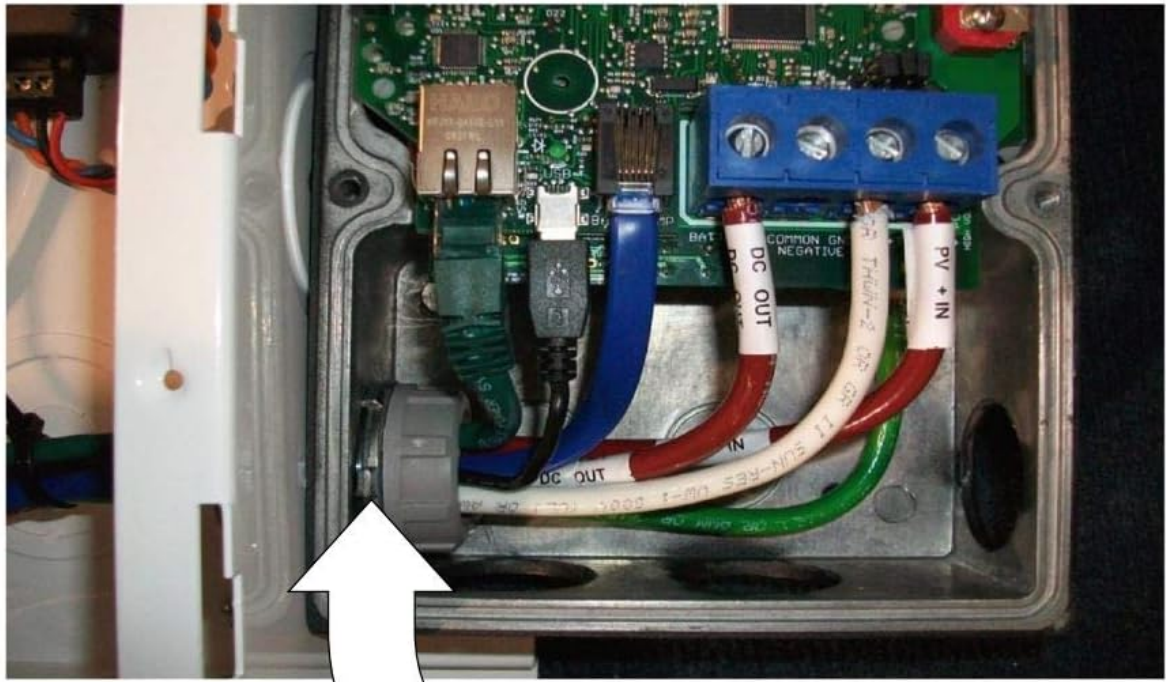


Figure 6

Install locknut here to act as a spacer.

Alternative Mounting

To mount the Classic to a plywood surface, use 1 1/2" wood screws in the top key hole slot hole and the holes in the wiring compartment. Taking care to make sure the Classic is Plumb and Level.

Dimensions

See page 68 for more details.

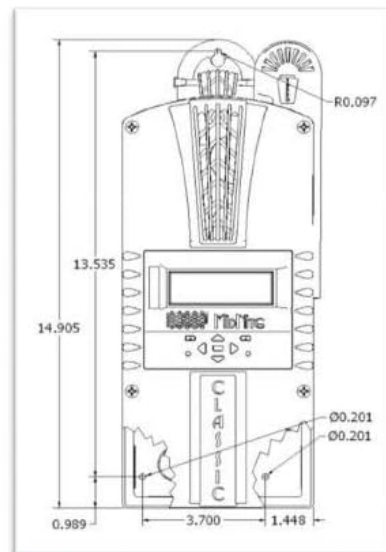


Figure 7

Image 4: Classic mounted to the side of a MidNite Solar E-Panel.



MidNite Solar Inc
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Why HyperVOC

The main question asked regarding MPPT solar controllers is "How many panels can I hook up in series?" Since we designed the OutBack MX60 a decade ago, we have answered this question thousands of times!

This is the scenario:

Consumer:

I have a 150V MPPT controller. How many panels can I put in series. I plan on using a panel with a VOC of 44.3V.

Technician:

How cold does it get where you live?

Consumer:

I live in Alberta, Canada. It gets mighty cold up here, Aye, -32°C in winter.

Technician:

The panels will output higher voltages in cold weather. The NEC says you must multiply the VOC of your solar panel by the correction factor based on your coldest conditions. In your case the correction factor is 1.23. Let's see what happens when we apply the 1.23 correction factor to 2 and 3 panels in series. Two in series looks like this: $44.3V \times 2 \times 1.23 = 108.98V$. Three in series looks like this: $44.3 \times 3 \times 1.23 = 163.46V$.

On a normal 150V controller you can put 2 panels in series. The highest voltage the controller will see is 108.98V. That is below the 150V max input voltage. If you put 3 panels in series on a standard 150V controller, it will see up to 163.46V on a cold morning. I suggest you read the directions and warranty information on your controller. Go to the section of the instructions for your normal (other than MidNite) controller that deals with PV input voltage. It will read something like this regarding voltages above 150V. "Voltage above 150VDC will cause the controller to explode into a huge ball of flames leaving a smoldering crater. This condition is not covered under warranty."

I might have paraphrased a bit but you get the message, they do not want you going over 150VDC on the input. Here is a little known fact about PV output voltage and charge controllers.

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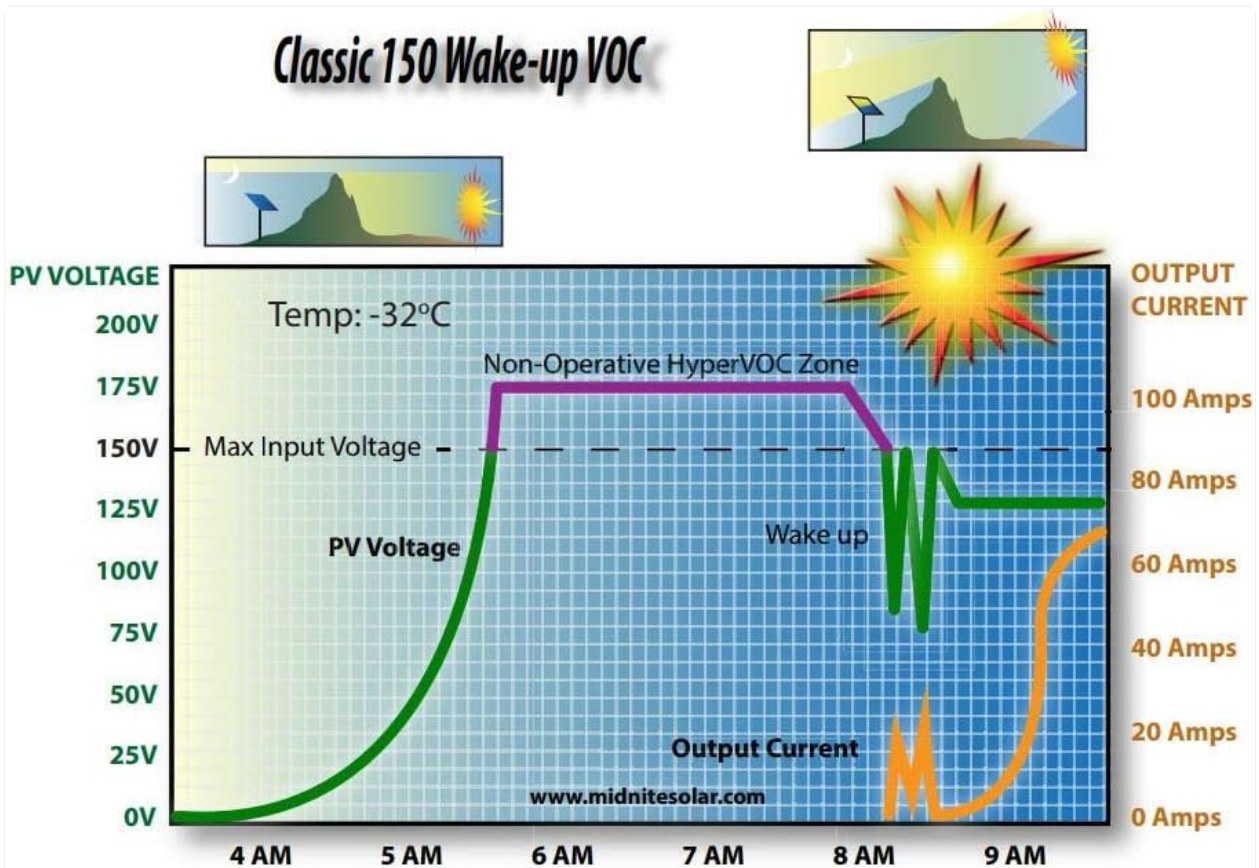
Image 5: Nipple, locknuts, and bushings included for E-Panel mounting.

IMPORTANT! Do not mount in a zero clearance compartment. Overheating may result. The Classic produces heat in normal operation. Airflow around the Classic is required to prevent overheating and shutdown. This is especially true in hot environments.

2.3 Alternative Mounting

To mount the Classic to a plywood surface, use 1 1/2" wood screws in the top key hole slot and the holes in

the wiring compartment. Ensure the Classic is plumb and level.



On cold mornings the PV panels will put out full voltage even before you can see the sun. Ambient light may not have much current behind it but it does have voltage exceeding the possible voltage limits that destroy the controller. The fact that there is no power behind the output voltage means that the controller will not be able to turn on and drag the panels down from VOC to max power voltage.

The controller requires a few watts of power coming in from the PV panels to overcome its internal power requirements. While the controller is waiting for enough power to wake up, the PV array is at its highest output voltage. This is very dangerous if the maximum operating voltage is exceeded.

The MidNite Solar controller gives you bonus headroom for those cold mornings that would potentially destroy any other controller. We have advised thousands of customers to play it safe in conditions like our example above. MidNite has a unique characteristic of the circuitry that allows it to go beyond the maximum operating voltage for these conditions, it's called HyperVOC.

Do not abuse the HyperVOC zone though. For example, let's take a 150V Classic configured with 4 modules in series that have 36.9 VOC, $4 \times 36.9 = 147.6$. In Alberta with a -32°C temperature, the max VOC will reach 181.54. This is well within the HyperVOC zone on a 48V battery bank.

Page 2

Image 6: Installation of a locknut to act as a spacer during mounting.

3. FEATURES

3.1 HyperVOC Technology

HyperVOC is a feature designed to extend the Voltage Open Circuit (VOC) limits of the charge controller, particularly beneficial in cold weather conditions. Solar panels can output higher voltages in cold weather. The

National Electrical Code (NEC) requires multiplying the VOC of your solar panel by a correction factor based on your coldest conditions. For example, if the correction factor is 1.23, and you have 3 panels in series with a VOC of 43.3V each, the total VOC would be $43.3V \times 3 \times 1.23 = 159.6V$. On a standard 150V controller, this would exceed the limit.

The MidNite Solar controller provides headroom for cold mornings that would otherwise damage other controllers. This unique characteristic allows it to operate safely beyond the maximum operating voltage for these conditions, a feature called HyperVOC.

Do not misuse the HyperVOC function. For instance, with a 150V Classic configured with 4 modules in series, where each has a VOC of 36.9V, the maximum VOC will reach 181.54V in Alberta with a -32°C temperature on a 48V battery bank.



Image 7: Detailed explanation of HyperVOC technology and its benefits in cold weather.

DC GFP (Ground Fault Protection)

The Classic has internal ground fault protection (GFP) built in. Since 2008, the NEC requires a DC-GFP on all PV systems in the USA. The built in DC-GFP eliminates the need to purchase and install an external DC-GFP. If the internal grounding jumper is installed in a Classic, the battery negative and DC source negative must not be connected to the system grounding conductor anywhere in the system. Grounding of these circuits will defeat the GFP function. In a network with multiple Classics connected in Follow Me, only one Classic should have its internal grounding jumper installed and all should have GFP enabled. The factory setting will make a DC negative to System Ground connection in the Classic charge controller. The GFP function will need to be disabled for Positive ground or an ungrounded DC system.

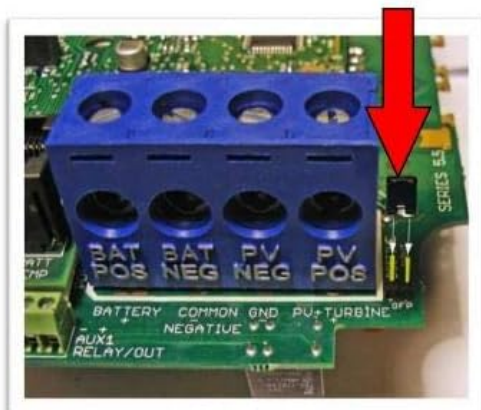


Figure 15



Figure 16

The Ground fault device is simple to understand and use. It detects a fault between battery/PV negative and earth ground just like the breaker DC-GFP system. The difference with the Classic is that it turns off the charge ability and sounds a loud warning when a ground fault is detected. The Classic's system consists of a PTC that is between the Negative and Ground internally in the Classic. A PTC is basically a self-healing fuse that will open when current exceeds its rating and reclose when current is dropped below its rating. The Classic will monitor this PTC and disable the charging when it senses it go open. When the fault is cleared the Classic will restore charging.

To disable the internal Ground Fault Protection function, the jumper labeled GFP needs to be removed and the GFP function needs to be disabled in the TWEAKS menu. See "Disabling GFP" for instructions.

To reset the internal GFP function after detection has occurred: fix the actual ground fault, then turn OFF the Classic and turn it back ON. Do this by turning the external battery breaker to OFF position and then to ON position.

Image 8: Graph showing PV voltage and output current behavior, including the non-operative HyperVOC zone and wake-up

phase.

3.2 DC-GFP (Ground Fault Protection)

The Classic includes internal ground fault protection (GFP) as a built-in feature. Since 2008, the NEC mandates DC-GFP on all PV systems in the USA. The integrated DC-GFP eliminates the need to purchase and install an external DC-GFP. If the internal grounding jumper is installed in a Classic, the battery negative and DC source negative must not be connected to the system ground conductor anywhere in the system. Grounding these circuits will defeat the GFP function. In a network with multiple Classics connected in Follow Me mode, only one Classic should have its internal grounding jumper installed, and all should have GFP enabled. The factory setting configures a DC negative to System Ground connection in the Classic charge controller. The GFP function needs to be disabled for Positive ground or an ungrounded DC system.

The Ground Fault Protection device is designed for simplicity and ease of understanding. It detects a fault between the battery/PV negative and earth ground, similar to a breaker DC-GFP system. The key difference with the Classic is that it turns off the charge ability and emits a loud warning when a ground fault is detected. The Classic's system consists of a PTC (Positive Temperature Coefficient) that is located between the Negative and Ground internally. This PTC is a self-healing fuse that opens when current exceeds its rating and recloses when current drops below its rating. The Classic monitors this PTC and disables charging if it senses an open circuit. Once the fault is cleared, the Classic will restore charging.

To disable the internal Ground Fault Protection function, the jumper labeled GFP needs to be removed. The GFP function must then be disabled in the TWEAKS menu. Refer to the "Disabling GFP" instructions in the full manual.

To reset the internal GFP function after a detection has occurred: first, clear the actual ground fault, then turn OFF the Classic and turn it back ON. This is achieved by turning the external battery breaker to the OFF position and then to the ON position.



Image 9: Internal view highlighting the GFP jumper for ground fault protection.

4. SPECIFICATIONS

- **Operating Voltage:** 200 Volts
- **Maximum Current Output:** 79 amps
- **Battery System Voltage:** 12-72V
- **Environmental Rating:** Type 1
- **Terminal Rating:** 75°C
- **Display Type:** Graphics Panel
- **Item Weight:** 11.38 pounds
- **Package Dimensions:** 18.9 x 8.8 x 6.1 inches
- **Certifications:** ETL listed to UL1741 and CSA, CE Certified, FCC Class B Listed
- **Origin:** Made in the USA

4.1 Dimensions

Detailed dimensions are provided for planning installation space.

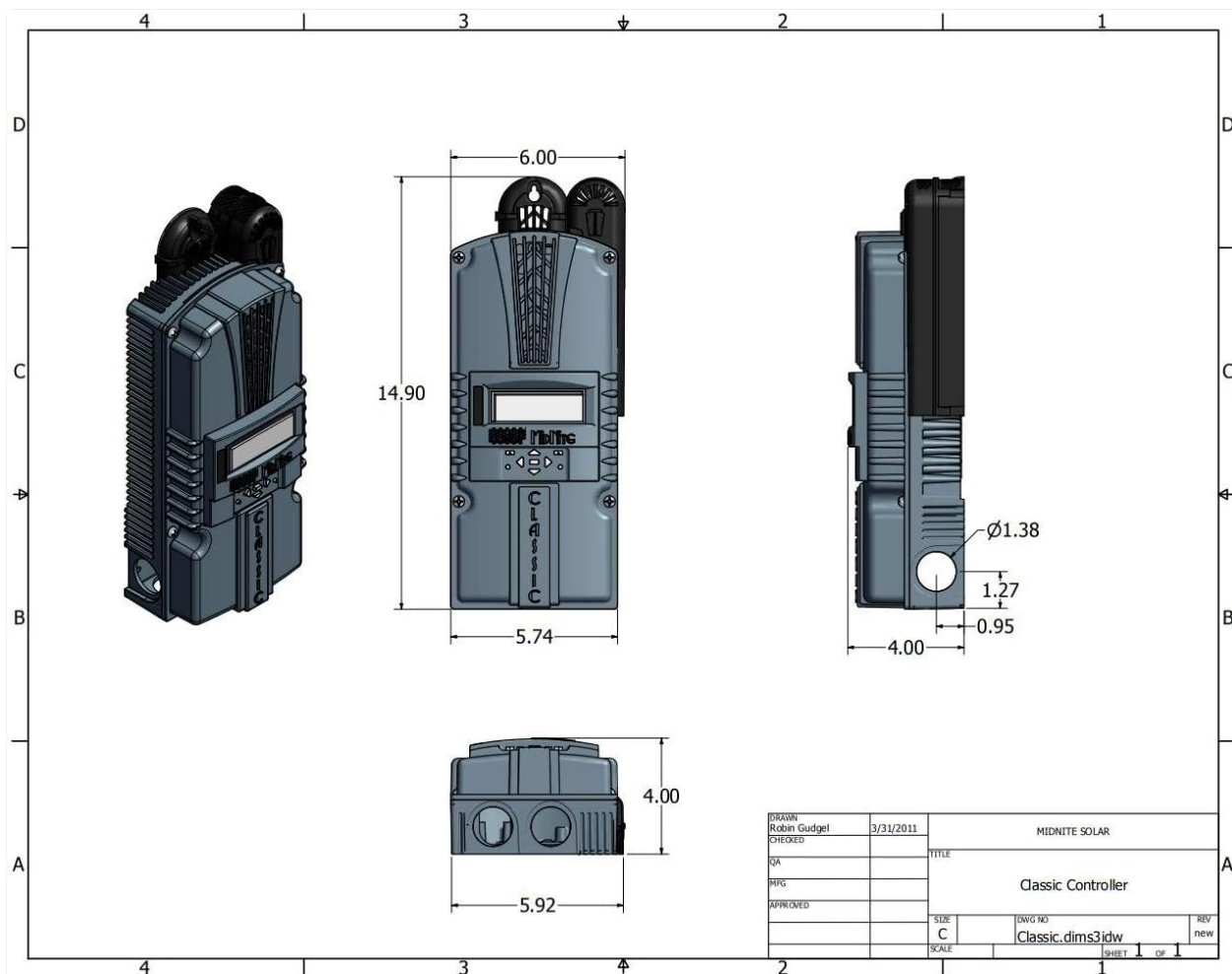


Image 10: Technical drawing showing the dimensions of the Classic charge controller.

5. MAINTENANCE AND WARRANTY

5.1 Warranty Information

The MidNite Solar CLASSIC 200-SL MPPT Charge Controller comes with a 5-year warranty.

MidNite Solar offers an extended warranty program. Six months prior to the end of the initial warranty period, customers can ship their Classic back to MidNite Solar with a payment of \$147 plus shipping. MidNite Solar will then replace any wearable parts and perform a general tune-up. This service extends the warranty by an additional 2 years.

Related Documents - CLASSIC 200-SL



[MidNite Solar DIY Manual: Guide to Solar System Design and Installation](#)

A comprehensive DIY manual from MidNite Solar detailing solar system design, including load analysis, battery bank sizing, PV module configuration, charge controller selection, inverter sizing, wiring, and circuit protection.



[MidNite Solar Barcelona MPPT Charge Controller Owner's Manual](#)

Comprehensive owner's manual for the MidNite Solar Barcelona MPPT charge controller, detailing installation, operation, safety, and troubleshooting for 48VDC battery systems. Features 200A charging, dual MPPT, and broad battery compatibility.



[MidNite Solar Barcelona MNBLNA MPPT Charge Controller Owner's Manual](#)

Comprehensive owner's manual for the MidNite Solar Barcelona MNBLNA MPPT charge controller, covering installation, operation, safety, programming, and troubleshooting.



[MidNite Solar The KID MPPT Solar Charge Controller Instruction Manual](#)

This instruction manual provides comprehensive details on the MidNite Solar The KID MPPT solar charge controller, covering product features, safety guidelines, installation procedures, and operational parameters for solar energy systems.



[MidNite Solar Clipper Instructions: Installation & Operation Guide](#)

Comprehensive guide for the MidNite Solar Clipper, detailing installation, operation, setup, and troubleshooting for wind turbine systems integrated with the MidNite Solar Classic MPPT Charge Controller.



[MidNite Solar Rosie 3-Phase Inverter/Charger Wiring and Configuration Guide](#)

Detailed instructions for wiring and configuring MidNite Solar Rosie MNROSIE7048RE Inverter/Chargers in a 3-Phase system, including AC and DC wiring diagrams, communication setup, and configuration steps using the MNGP2 remote.