

# SolarPod<sup>o</sup>™ Standalone Manual

Dear SolarPod<sup>o</sup>™ Standalone Customer,

Thank you for choosing SolarPod<sup>o</sup>™ Standalone - and congratulations on your new, high-quality, high-tech SolarPod<sup>o</sup>™ Standalone product. SolarPod<sup>o</sup>™ Standalone is a patented (U.S. Patent 8,716,889) device and we are confident to serve your green energy needs through this scalable (add as you grow) product.

This introduction should provide you with general information about the equipment. Please read it carefully to learn about the SolarPod<sup>o</sup>™ Standalone product. This is the best way to get the most out of all the advantages that it has to offer.

Please also note the safety information and the safety precautions for the product installation location. Following all product instructions will ensure long-lasting quality and reliability. And these are the essential ingredients for outstanding results.

## Important Safety Instructions.

**General** This manual contains important instructions for the SolarPod<sup>o</sup>™ Standalone, that must be followed during installation and maintenance of the inverter. The SolarPod<sup>o</sup>™ Standalone is designed per NEC 2008 code, but as with all electrical and electronic equipment, certain precautions must be observed when installing and/or operating the SolarPod<sup>o</sup>™ Standalone. Only persons with electrical knowledge must install the SolarPod<sup>o</sup>™ Standalone.

To reduce the risk of personal injury and to ensure the safe installation and operation of the SolarPod<sup>o</sup>™ Standalone, you must carefully read and follow all instructions & safety instructions.

This manual covers four SolarPod<sup>o</sup>™ Standalone models – model #1003, model #1004, model # 1005. Go to the model instructions for your purchased model system.

### Safety Instructions

The following section “Safety Instructions” contains different Warnings. A Warning describes a hazard to equipment or personnel. It calls attention to a procedure or practice, which, if not correctly performed or adhered to, could result in damage to or destruction of part or all of the SolarPod<sup>o</sup>™ Standalone and/or other equipment connected to the SolarPod<sup>o</sup>™ Standalone or personal injury.

All electrical installations must be made in accordance with the National Electrical Code, ANSI/NFPA 70, and any other codes and regulations applicable to the installation site.

### General Information

The SolarPod<sup>o</sup>™ Standalone comes with attached solar panel data sheet and inverter data sheet. Please review the data sheets thoroughly before installation at site.

### WARRANTY

All manufactured items AND PRODUCTS provided OR installed as is. The implied warranties of merchantability, FITNESS FOR A PARTICULAR PURPOSE, AND NON-INFRINGEMENT ARE excluded. There are no warranties that extend beyond the description of the face hereof.

Company guarantees its workmanship against defects for 90 days from the date of sale to Customer (or Dealer), and will remedy problems created by Company workmanship at no further charge to Customer (or Dealer). In the event that a manufacturer's system component should be discovered defective and require replacement or repair, Company will arrange for the manufacturer to honor their warranty on the defective component part. In the event of any defect in workmanship, covered by the 90 day

workmanship warranty provided herein by Company to Customer (or Dealer), Company or its authorized agent shall be entitled to correct the faults at its own cost and expense. **Company Products are sold subject only to the applicable component manufacturer standard printed warranty in effect at the time of sale and such warranty shall supersede and be in lieu of all other warranties express or implied.** Dealer is not authorized to assume, on Company's behalf, any liabilities in connection with Dealer's sale of Product other than as set forth in such Company standard written warranty statement. Dealer shall indemnify and hold Company harmless with respect to any Dealer representation beyond those in such Company warranty.

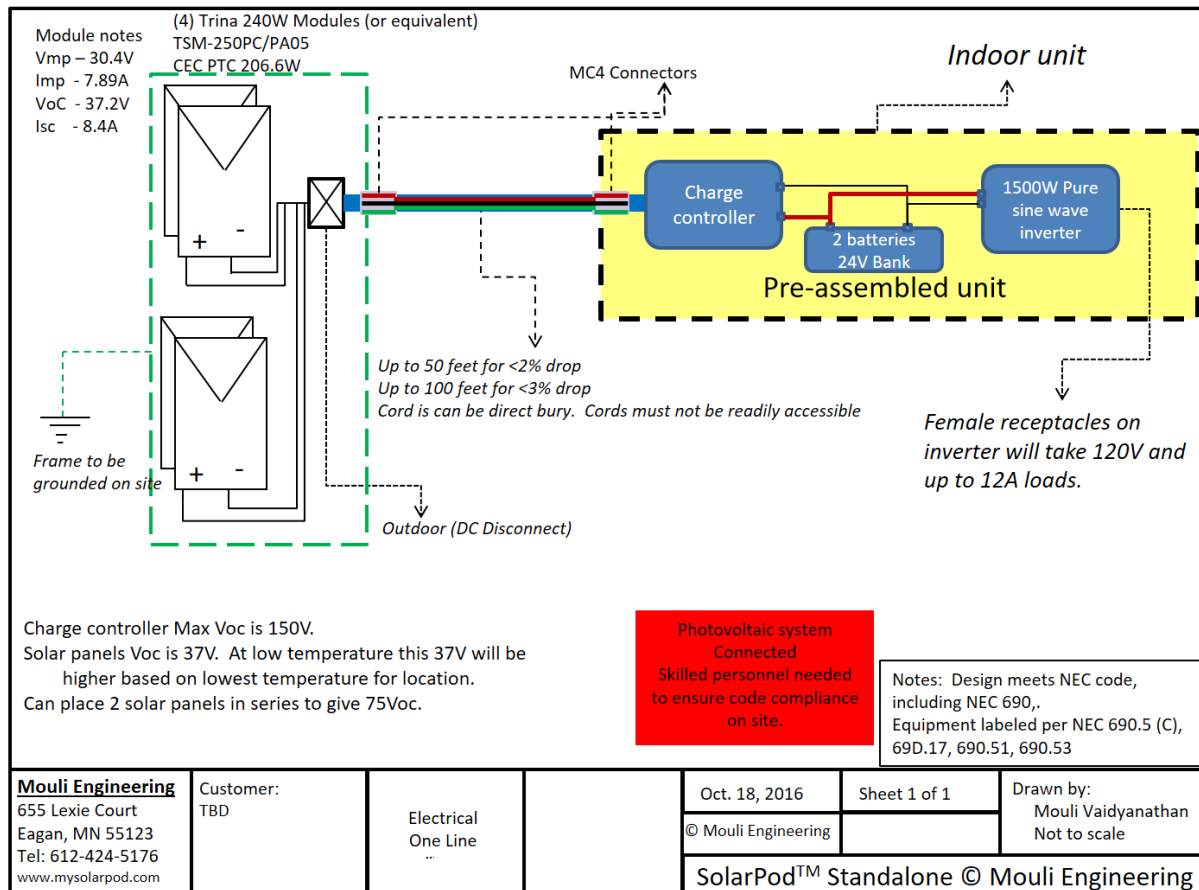
Mouli Engineering warrants its SolarPod<sup>®</sup>™ Standalone to be free of defects in workmanship, but makes no warranty as to the installation, site safety, appearance or color. Since methods of installation and on-site conditions are beyond our control and can affect performance, Mouli Engineering makes no other warranty, expressed or implied. Mouli Engineering's sole obligation shall be, at its option, to replace or refund the purchase of the SolarPod<sup>®</sup>™ Standalone proven to be defective on workmanship and Mouli Engineering shall not be liable for any loss or damage.

SolarPod<sup>®</sup>™ Standalone is pre-assembled for your convenience and safety. Some of the pre-assembled components may require you to complete warranty registration. Please complete them and send it directly to that specific components manufacturer.

### Wiring diagram

The wiring diagram for the SolarPod<sup>®</sup>™ Standalone is given below. Skilled personnel will be required to wire the system per local and national codes.

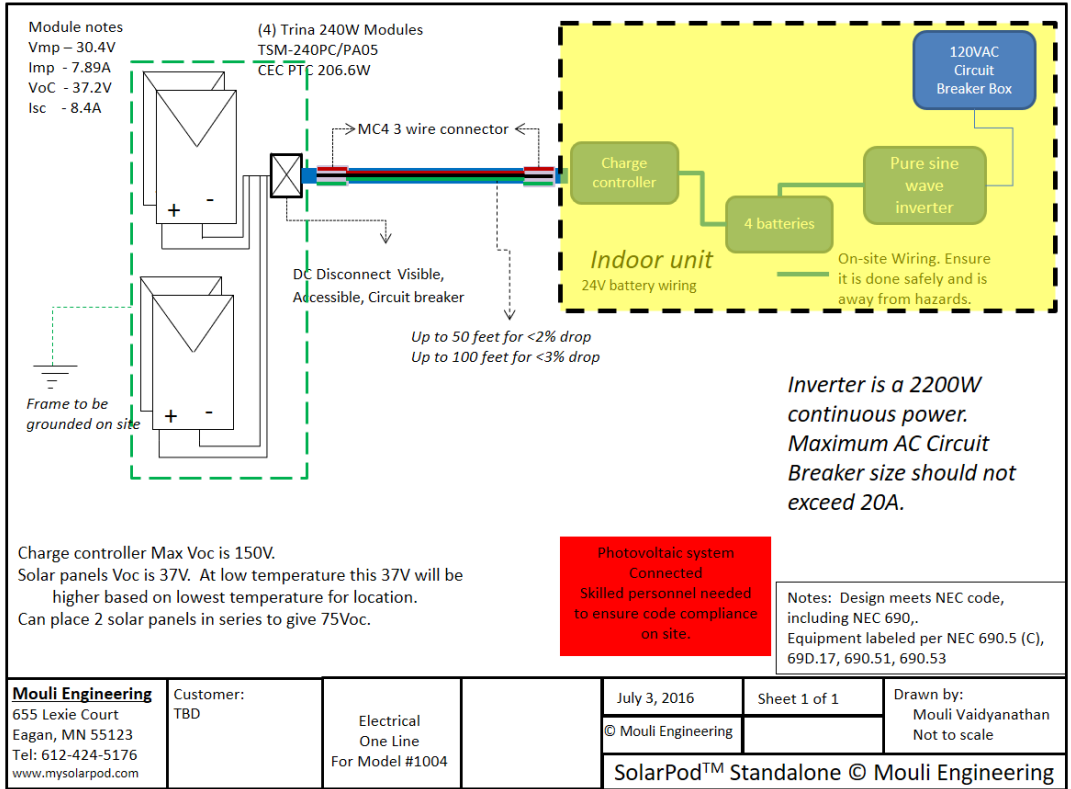
#### Model #1003



Mouli Engineering Inc. © 2013

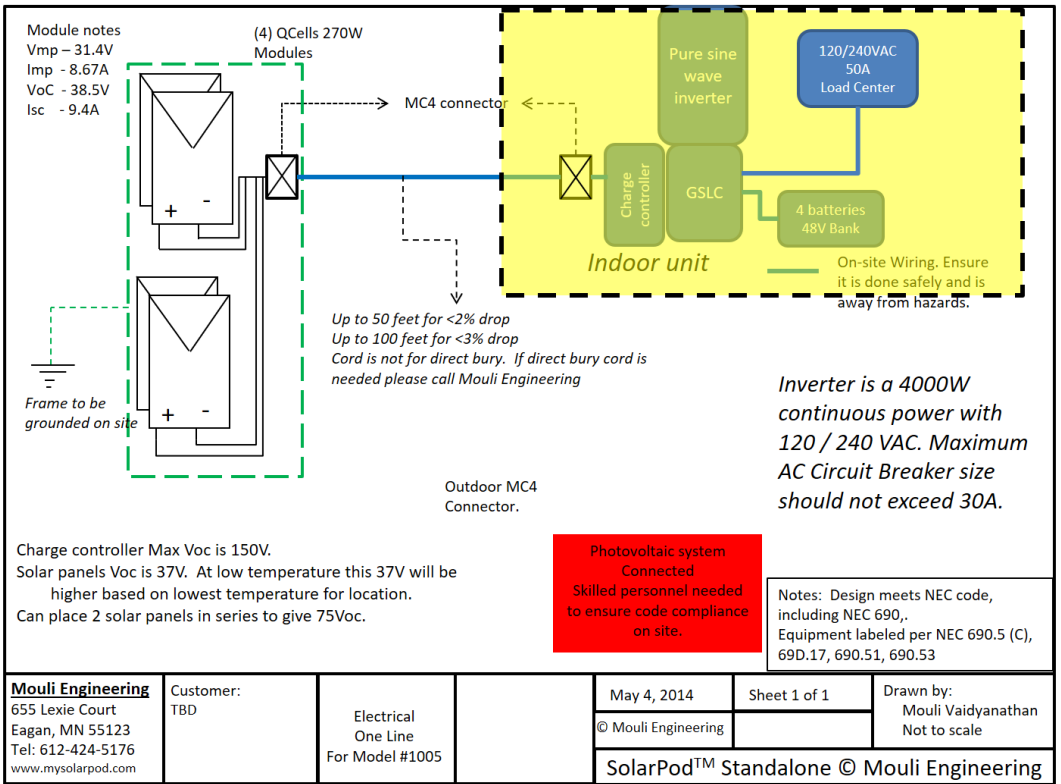


### Model #1004



Mouli Engineering Inc. © 2016

### Model #1005



Mouli Engineering Inc. © 2013



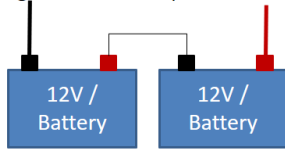
## Grounding:

The system must be grounded using ground rods and bonded using metal and a minimum of #6 Cu conductor.

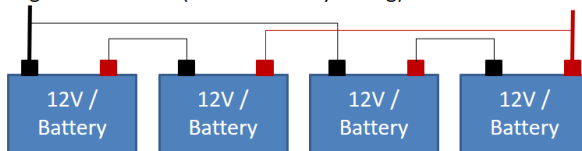
## Battery Wiring:

Series and parallel wiring for the different SolarPod<sup>®</sup>™ Standalone models.

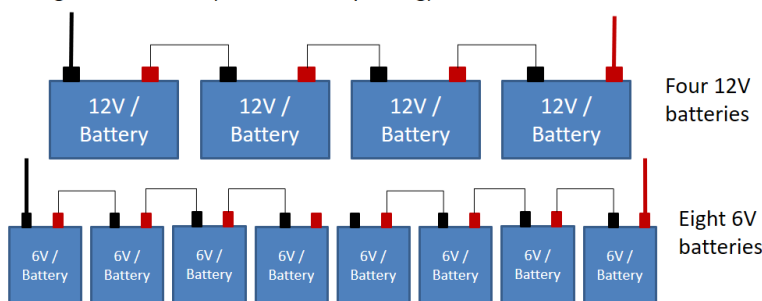
Series wiring – model 1003 (24V DC Battery wiring)



Parallel wiring – model 1004 (24V DC Battery wiring)



Series wiring – model 1005 (48V DC Battery wiring)



**Battery State of charge:** The battery state of charge can be monitored on the Power Hub inverter. The estimated voltage and the state of charge table is given below for one battery.

## Lead Acid battery state of charge

State of Charge	12 Volt battery	Volts per Cell
100%	12.7	2.12
90%	12.5	2.08
80%	12.42	2.07
70%	12.32	2.05
60%	12.20	2.03
50%	12.06	2.01
40%	11.9	1.98
30%	11.75	1.96
20%	11.58	1.93
10%	11.31	1.89
0	10.5	1.75

### **FM60-150 Settings (Model #1003):**

The following settings are programmed on the FM60-150 charge controller.

1. You may want to attach the battery temperature sensor. This is not connected and is placed in the "Warm" setting.
2. The battery supplied is a DM31 battery with 105Ah. The maximum charge current that this battery can take is 30% of 105Ah which is 31.5A. Since the inverter is a 24V inverter, the two batteries are placed in series. Hence a total current of 31.5A can be placed on the two batteries. Since the charge controller maximum current is 60A, the settings on the charge controller is left to the maximum charge current of 31A.
3. Battery voltage = 24V
4. Battery AH each = 105.
5. Battery temperature setting = Warm
6. Charge cycle = 3 stage.

### **FM60-150 Settings (Model #1004):**

The following settings are programmed on the FM60-150 charge controller.

7. You may want to attach the battery temperature sensor. This is not connected and is placed in the "Warm" setting.
8. The battery supplied is a DM31 battery with 105Ah. The maximum charge current that this battery can take is 30% of 105Ah which is 31.5A. Since the inverter is a 24V inverter, the four batteries are placed in series/parallel. Since the solar PV is 1000W, the maximum current is  $1000 \div 24 = 42A$  max charge current. Since there are 2 battery banks (24V each), the maximum current to each bank is 21A.
9. Battery voltage = 24V
10. Battery AH = 105 (two batteries so total is 210AH).
11. Battery temperature setting = Warm
12. Charge cycle = 3 stage.

### **FM60-150 Settings (Model #1005):**

The following settings are programmed on the FM60-150 charge controller.

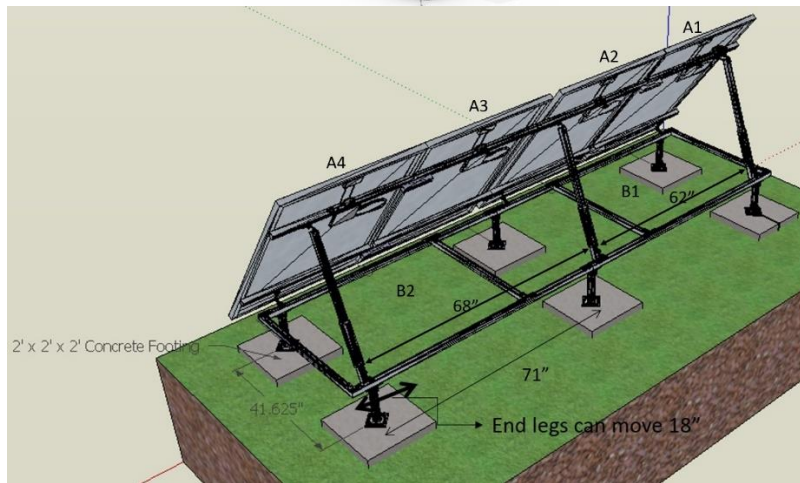
1. You may want to attach the battery temperature sensor. This is not connected and is placed in the "Warm" setting.
2. The battery supplied is a DM31 battery with 105Ah. The maximum charge current that this battery can take is 30% of 105Ah which is 31.5A. Since the inverter is a 48V inverter, the four batteries are placed in series.

The SolarPod™ is a 960W system for Model 1005. Hence the current at 48V will be 20A. This is below the battery max charging of 31.5A.

The SolarPod™ is a 1440W system for Model 1005. Hence the current at 48V will be 30A. This is below the battery max charging of 31.5A.

3. Battery voltage = 48V
4. Battery AH = 105 (two batteries so total is 210AH).
5. Battery temperature setting = Warm
6. Charge cycle = 3 stage.

## Structural requirements:



The center legs are fixed. The end legs can move 18" from each end.

At ground level, one can bolt the four legs of the SolarPod<sup>◊</sup> Standalone to the concrete slab. Anchoring legs to the concrete slab is the recommended method on the ground.

Another option is to place 700 lbs of ballast. Place ballast so as to place most of the weight on the steel members. Also insert 4 to 8 easy hook anchors to securely fasten the SolarPod<sup>◊</sup> Standalone to the hook anchors in the ground. The easy hook anchors typically come with a rod and the anchor. The rod is used to drive the anchors deep into the ground and then hooked to the SolarPod<sup>◊</sup> Standalone.



Photograph of an Easy hook anchor to the left. Installation of Easy hook Anchors is given at:

[http://www.shelterlogic.com/UserFiles/Documents/manuals/accessories/05\\_10035\\_10036\\_10038\\_0B\\_BI.pdf](http://www.shelterlogic.com/UserFiles/Documents/manuals/accessories/05_10035_10036_10038_0B_BI.pdf)

Another option is to place sufficient anchors to the SolarPod<sup>◊</sup> Standalone so as to stay firm under 90 mph wind loads. For other building height installations consult structural PE.

Other ways to structurally fasten the SolarPod<sup>o</sup>™ Standalone to the ground include the use of (1) Screw anchors, (2) Diamond Piers and (3) Concrete base.

1. Screw anchors example:  
[http://www.farmtek.com/farm/supplies/prod;10052;;cpcc6250\\_CC6252.html](http://www.farmtek.com/farm/supplies/prod;10052;;cpcc6250_CC6252.html)
2. Diamond Pier Example : <http://www.pinfoundations.com/videos.htm>

**Rebates:** Three rebates are possible, Utility, Federal and State rebates. Please contact your accountant for most accurate information.

**1. Utility rebates:**

Most utility companies give an incentive towards solar photovoltaic. The best website that will give all the rebate information is: <http://www.dsireusa.org/>. You can then click on the state and find your utility company servicing your area for more accurate up to date information.

**Wisconsin customers:**

Utilities participating in solar rebate program (Focus on Energy):

[http://www.focusonenergy.com/files/Document\\_Management\\_System/Misc/participatingutilities\\_list.pdf](http://www.focusonenergy.com/files/Document_Management_System/Misc/participatingutilities_list.pdf)

Focus on Energy application form:

[http://www.focusonenergy.com/files/Document\\_Management\\_System/Renewables/renewableressolarelectric\\_applicationform.pdf](http://www.focusonenergy.com/files/Document_Management_System/Renewables/renewableressolarelectric_applicationform.pdf)

**Minnesota customers:**

**Xcel Energy customers:**

[http://www.xcelenergy.com/Save\\_Money\\_&\\_Energy/For\\_Your\\_Home/Solar\\_Rewards/Solar\\_Rewards\\_-\\_MN](http://www.xcelenergy.com/Save_Money_&_Energy/For_Your_Home/Solar_Rewards/Solar_Rewards_-_MN)

**2. Federal Tax rebates:**

**Residential owners:** <http://www.irs.gov/pub/irs-pdf/f5695.pdf>

Taxes on a Form 1040, Schedule C, and Form 5695

**Business owners:** <http://www.irs.gov/pub/irs-pdf/f3468.pdf>

For example single owner LLCs and Sole Proprietors use the same forms as individuals, because they can file taxes on a Form 1040, Schedule C, and Form 5695, same as individuals. And Sub-S corporations also use an IRS Form 1040 for individuals, because the owners of a Sub-S corp pay the taxes for the Sub-S corporation on their personal tax return. So then the same Form 5695 applies to these owners of Sub-S corp, LLCs, and sole proprietorships. Some partnerships and professional associations will also work this way, but these questions should be referred to a tax professional advisor.

Here's some business energy incentive tax information from the IRS website:

<http://www.irs.gov/newsroom/article/0,,id=205018,00.html>

<http://www.irs.gov/newsroom/article/0,,id=209564,00.html>

<http://www.irs.gov/newsroom/article/0,,id=208318,00.html>

**3. State rebate:**

State rebates can be found at <http://www.dsireusa.org/>

The above is for information. Please consult your accountant and tax advisor for most up to date information. We do try to keep this above page current and will attempt to provide you with the most general information.

Label as follows: More labeling than below to meet and exceed install workmanship.

**1. Verify Label Installed on Inverter Panel:**

*THIS SERVICE PANEL IS ENERGIZED FROM Solar Photovoltaic source.  
ONLY AUTHORIZED PERSONS WHO ARE FAMILIAR WITH THIS SYSTEM SHOULD  
ATTEMPT TO DO SERVICE WORK ON IT.*

**2. Verify Label Installed near the PV System AC Disconnect**

**(Model #1003):**

OPERATING AC VOLTAGE =   120V  

MAXIMUM AC OUTPUT OPERATING CURRENT =   12A  

**(Model #1004):**

OPERATING AC VOLTAGE =   120V  

MAXIMUM AC OUTPUT OPERATING CURRENT =   17A  

**(Model #1005):**

OPERATING AC VOLTAGE =   120V/240V  

MAXIMUM AC OUTPUT OPERATING CURRENT =   34A

## Frequently asked questions

Do I need a foundation to set it on?

Not necessary. The easy hook anchors (4 of them) have to be placed on four legs. Each will should be able to give at least 500 lbs of pull out force. If you think the soil is not tight and the pull out force is below 500 lbs, you can place ballast weights.

Do I need to anchor it so the wind won't blow it over?

A total of 2000 lbs down force will be needed per SolarPod<sup>o</sup>™ Standalone.

Do I need a ground rod for it?

Yes. The ground lug on the frame has to be connected to the ground rod.

Do I need to have a disconnect for it or is one on the unit.

A twist lock is also a disconnect mechanism.