SolarPod○™ Grid Tied Manual

Dear SolarPod○™ Customer,

Thank you for choosing SolarPod○™ Grid Tied - and congratulations on your new, high-quality, high-tech SolarPod○™ Grid Tied product. SolarPod○™ Grid Tied is a patented (U.S. Patent No. 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○™ Grid Tied 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○™ Grid Tied, that must be followed during installation and maintenance of the inverter. The SolarPod○™ Grid Tied 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○™ Grid Tied. Only persons with electrical knowledge must install the SolarPod○™ Grid Tied.

To reduce the risk of personal injury and to ensure the safe installation and operation of the SolarPod○™ Grid Tied, you must carefully read and follow all instructions & safety instructions.

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○™ Grid Tied and/or other equipment connected to the SolarPod○™ Grid Tied 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○™ Grid Tied 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.

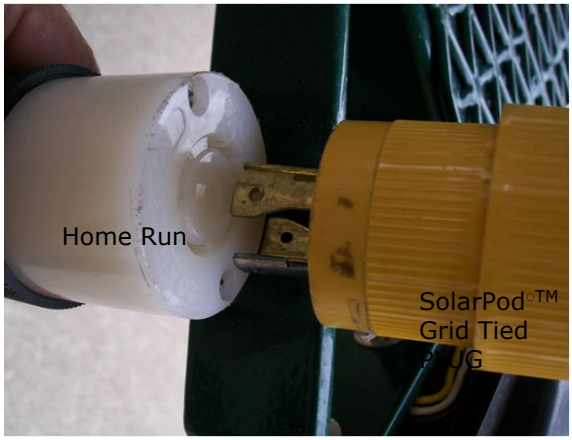
Mouli Engineering warrants its SolarPod$^{\circ TM}$ Grid Tied to be free of defects in workmanship, but makes no warranty as to the installation, site safety, appearance or color. Since methods of installation and on-site conditions are beyond our control and can affect performance, Mouli Engineering 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$^{\circ TM}$ Grid Tied proven to be defective on workmanship and Mouli Engineering shall not be liable for any loss or damage.

Wiring diagram

The SolarPod$^{\circ TM}$ Grid Tied output wire is a 240V four wire 20A plug. The type of plug is given in Figure 1 (male) and Figure 2 (Female).

Figure 1. Plug that comes with the SolarPod$^{\circ TM}$ Grid Tied

Figure 2. Female adapter to be installed at site.



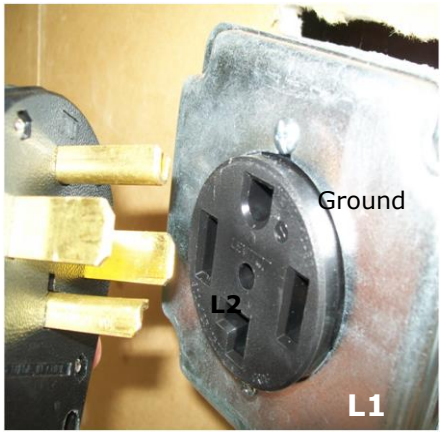


Figure 3: Illustration of how the plugs are connected.

The SolarPod◦TM Grid Tied comes with a male receptacle which is the direct connection to the circuit breaker. The female adapter must be installed at site. The circuit breaker should be a two pole 20A breaker. The wiring should be as given in the table below. No other circuit should be installed on this breaker circuit.

Power (DC)	1000 to 1200W @ STC (1000 W/m2 @ 25C)	
Voltage	240V	208V
AC Power	Split phase	3 phase
Wire	L1 & L2-hot; W-neutral; G-ground	L1, L2 & L3-hot; white-neutral; Green-ground
Breaker connection	20A	20A
Max # of SolarPod◦TM Grid Tied in series	4 For M215 and M250 3 For APSystems	6 For M215 and M250 3 For APSystems

The solar installation can be up to only 120% of the bus bar rating in the main breaker per NEC code 705.12.

Recommended Wire lengths:

# of SolarPod™	Internal inverter cable			External cable length in ft **(AWG #10)** per SolarPod™	External cable length in ft **(AWG #8)** per SolarPod™	External cable length in ft **(AWG #6)** per SolarPod™
	Length (Ft)	V drop	% Drop	Less than 2% drop	Less than 2% drop	
1	22.8	0.21	0.09%	200	>200	>200
2	45.6	0.75	0.31%	170	>200	>200
3	68.4	1.64	0.68%	100	>200	>200
4	91.2	2.85	1.19%	60	95	200

Disconnect: The SolarPod◦TM Grid Tied comes with a twist lock plug disconnect.

Torque: The torque specifications for the fastening of the bolts are:

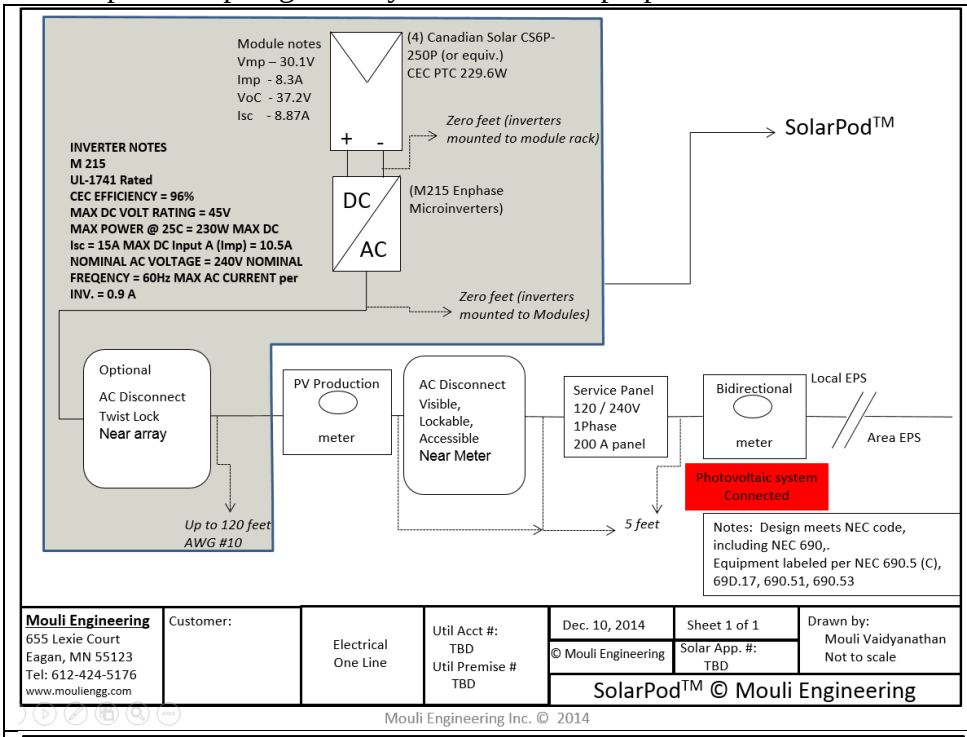
Mechanical Torque:

Size	**Torque**
¼" bolts and smaller	10 to 15 ft. lbs
3/8" bolts	20 to 25 ft. lbs
½" bolts	30 to 35 ft. lbs

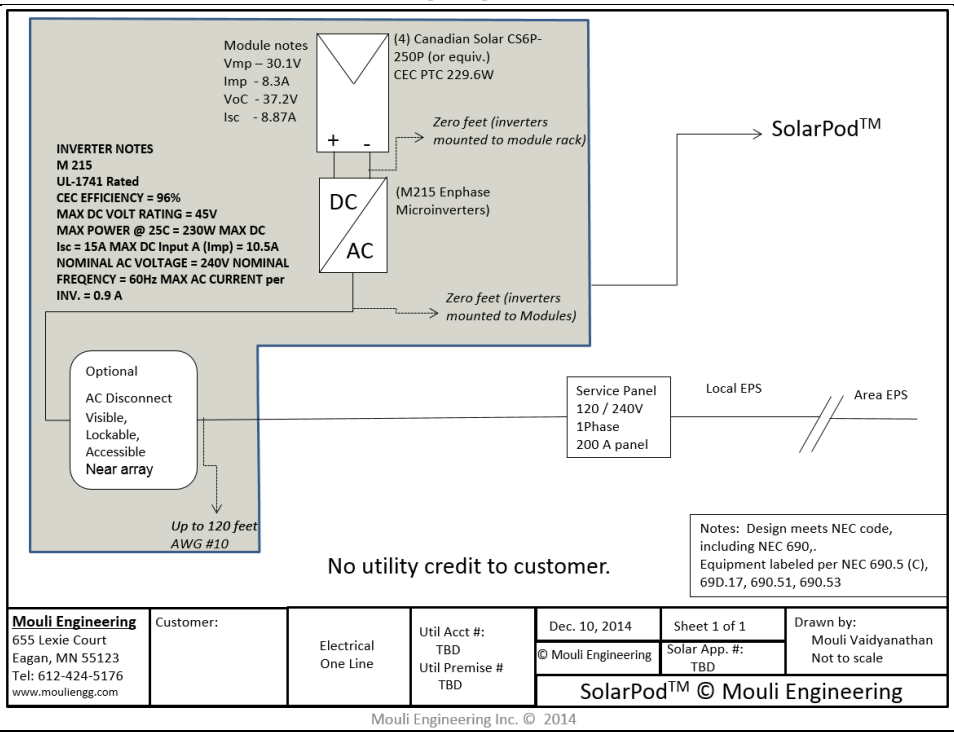
Electrical Torque (for Gound lugs):

Wire Range, AWG	Wire Type	Torque in-lbs
# 4	Stranded	45
# 14	Solid/Stranded	35

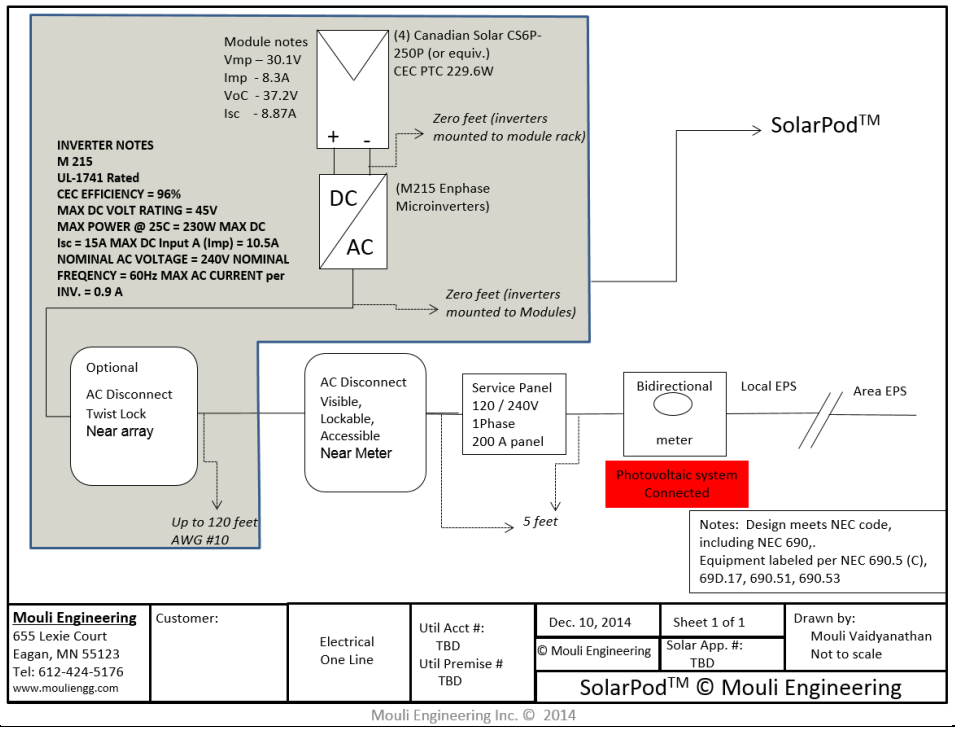
Line Diagram: Choose the appropriate line diagram for your application with consultation from your utility and the installer (master electrician). Panel brand used is only for illustrative purposes. The Service panel amperage is only for illustrative purposes.



The Line diagram to the left is when the utility requires a production meter and a bidirectional meter installed. Typically this is required by the utility when the utility gives solar rebates and also when the utility takes the renewable energy credits.



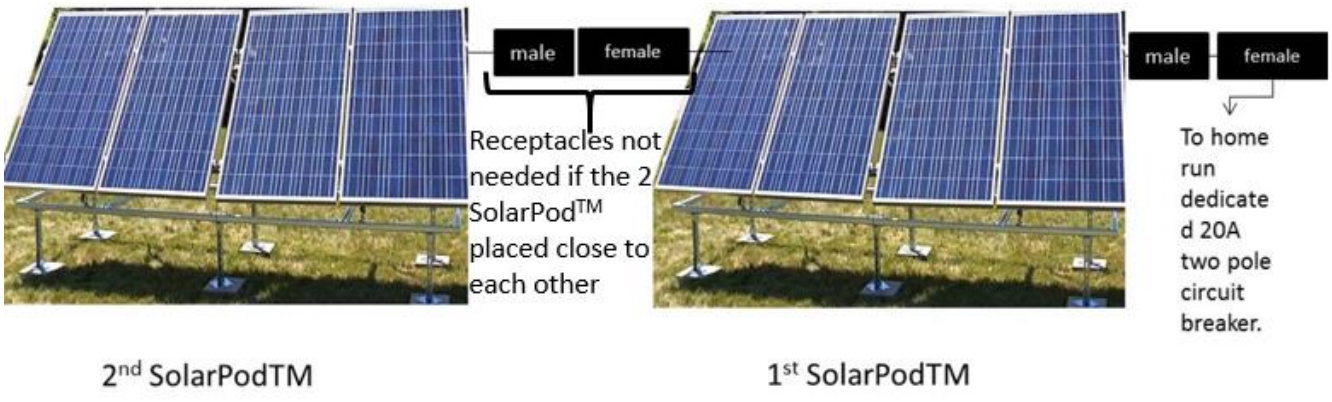
The Line diagram to the left is when the customer wishes to get no credits from the utility.



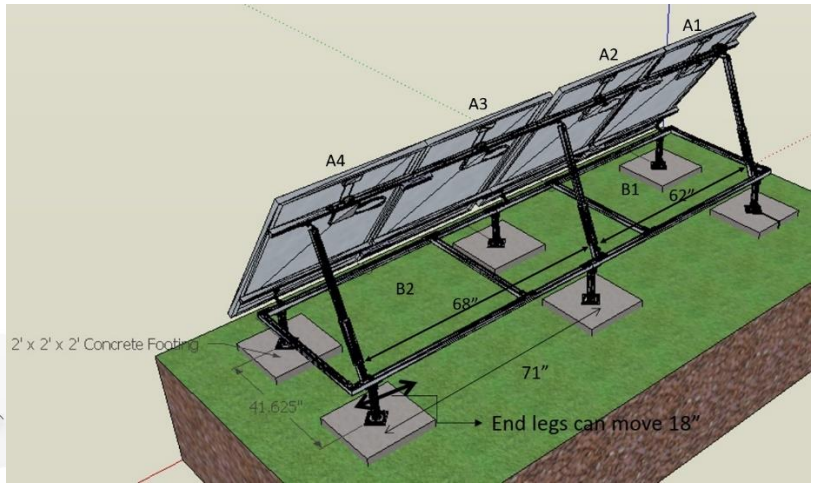
The Line diagram to the left is when the utility requires a bidirectional meter installed to obtain net meter benefit.

Run #6 ground wire through each inverter and frame (lug nuts provided) and use a ground rod appropriately distanced from the original. Ensure the ground wires are well connected in each of the inverter.

Multiple SolarPod°™ Grid Tied wiring: Four SolarPod°™ Grid Tied can be wired in series to one dedicated 20A two pole circuit breaker. Each SolarPod°™ Grid Tied comes with male receptacle on one end and an end terminator on the other end. Only a female receptacle can be placed instead of the end terminator. Please see below diagram to understand the serial male/female receptacle connections. Connector receptacles (male and female) may not be needed if they are placed adjacent to each other.



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$^{\circ TM}$ Grid Tied to the concrete slab.

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$^{\circ TM}$ Grid Tied 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$^{\circ TM}$ Grid Tied.

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

Another option is to place sufficient anchors to the SolarPod$^{\circ TM}$ Grid Tied 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$^{\circ TM}$ Grid Tied 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
2. Diamond Pier Example : http://www.pinfoundations.com/videos.htm

Rebates: SolarPodTM will qualify for all rebates as long as they are fair and reasonable. We will help with any paperwork requirements for rebate. The responsibility to obtain the rebate is with the customer.

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

1. Verify Label Installed on Main Service Panel:

WARNING
DUAL POWER SOURCE
SOURCES : UTILITY GRID AND
PV SOLAR ELECTRIC SYSTEM

2. Verify Label Installed near the Main Service Panel PV System Circuit Breaker:

WARNING
INVERTER OUTPUT CONNECTION
DO NOT RELOCATE
THIS OVERCRRENT DEVICE

3. Verify Label Installed near the Utility PV System Disconnect:

PV SYSTEM DISCONNECT
FOR UTILITY OPERATION

4. Verify Label Installed near the PV System AC Disconnect:

PHOTOVOLTAIC SYSTEM DISCONNECT

5. Verify Label Installed near the PV System AC Disconnect:

PHOTOVOLTAIC SYSTEM
AC DISCONNECT
OPERATING AC VOLTAGE = _____
MAXIMUM AC OUTPUT OPERATING CURRENT = _____

Testing of system on site:

1. Close the Backfed PV System Circuit Breaker in the Service Panel
2. Close the PV System AC Disconnects.
3. After the PV system is in normal operation, verify the voltages at the Utility Disconnect are within 5% of the combined Inverter AC output ratings.
4. Open the Utility Disconnect to simulate a Utility power outage.
5. Verify the voltage at the Inverter (load) side of the Utility Disconnect has dropped to near zero.
6. Verify Inverter LED's, alarms and/or LCD codes are appropriate for loss of utility.
7. Close the Utility Disconnect and verify system returns to normal operation after 5 minute delay.

Frequently asked questions

Do I need a foundation to set it on?

Not necessarily but recommended based on location. If you use anchors like what has been provided and the soil is well compacted, it should be safe if the wind speeds are below 60 mph. Each SolarPod◦™ Grid Tied requires a total of 2000 lbs of structural force to hold it up to 90 mph winds. However each landscape is different hence your discretion is important in the appropriate foundation method.

Do I need a ground rod for it?

The ground lugs are provided on each SolarPod◦™ Grid Tied. Use the lug to connect to the ground rod. Ensure it is per local codes and AHJ.

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

The twist lock is also a disconnect mechanism near the solar array (near SolarPod™).

Your circuit breaker will be a disconnect since the power out of the solar unit is AC.

If you wish to place an AC disconnect there is no harm.

Consult with local AHJ and also local skilled tradesman for placement of disconnects.

Where do I install the circuit breaker on the main panel.

For an installation with less than or equal to 4 SolarPod◦™ Grid Tied, the work required by the master electrician is to isolate one 20A two pole breaker from your main panel. This breaker should not have any other circuit. This 20A two pole breaker should also be positioned at the opposite (load) end from the input feeder location or main circuit location as described in NEC code 705.12(D)(7) (pg 70-606 of the NEC 2008 code book).

Each two pole 20A breaker can hold up to 4 SolarPods™ in series.