



POINT ZERO
ENERGY

Titan 240 SP User Manual



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IMPORTANT: CHARGE YOUR BATTERY



Your Titan lithium battery will arrive partially charged.

Before using or storing, charge your Titan solar generator until it is fully charged.

The Titan battery meter **WILL NOT READ THE CORRECT STATE OF CHARGE PERCENTAGE UNTIL** the battery meter is **CALIBRATED CORRECTLY** (see 'Initial Setup: Programming & Calibration').

SAFETY INSTRUCTIONS



To avoid personal injury or damage to the solar generator or any connected products, carefully read, understand, and comply with all instructions before use. Keep this manual for future reference.

Observe all Input/Output watt ratings: To avoid possible hazards, observe all ratings on unit, and products you intend to use; check manuals for more information.

Use in a well ventilated area: Ensure proper ventilation while in use and keep away from any combustible materials or gases. Do not stack anything on top of the unit in storage or in use. Inadequate ventilation and/or improper storing may cause damage to the unit.

DO NOT operate in wet conditions: In order to avoid short circuits or electric shock do not allow unit to get wet. Let unit dry completely before using.

Keep the unit clean and dry: Inspect the unit for dirt, dust, or moisture on a regular basis.

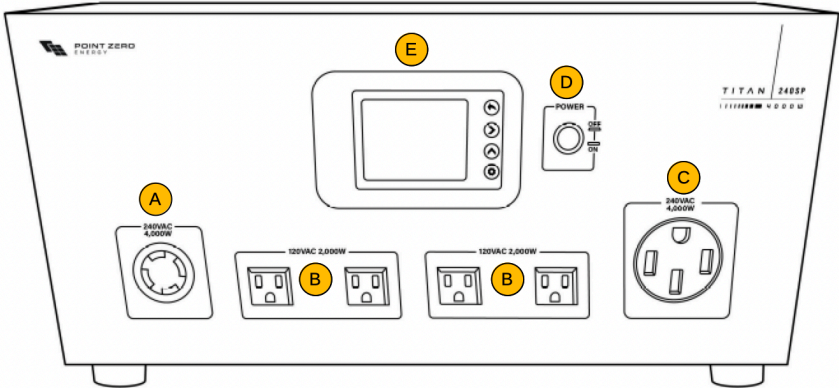
DO NOT insert foreign objects into outputs or ventilation holes.

DO NOT open the Titan solar generator; there are no user serviceable parts inside.

Any misuse, or manipulation to the unit or its components, will void all warranties.

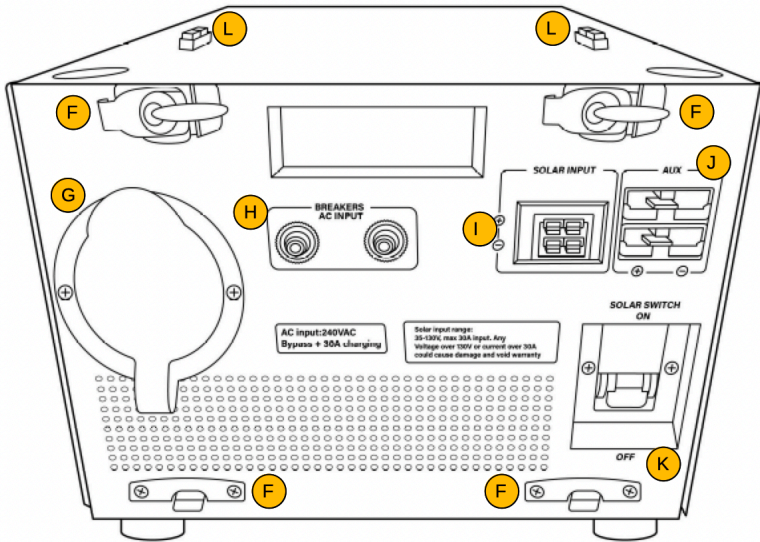
PRODUCT OVERVIEW

Front View



- A- 240v AC L14-30R (30A 4 prong twist lock outlet, 4,000 watts max)
- B- 120V AC sockets 15A per socket, 2000 watt total for each pair.
- C- 240V AC 14-50R (RV 50A outlet, 4,000 watts max)
- D- AC power switch (Pressed in turns the inverter on, out is off)
- E- Battery display

Side View



F- Battery latch. Ensure battery is secure with all 4 latches before use

G- AC input - I14-30p (used for Charging batteries, and powering loads)

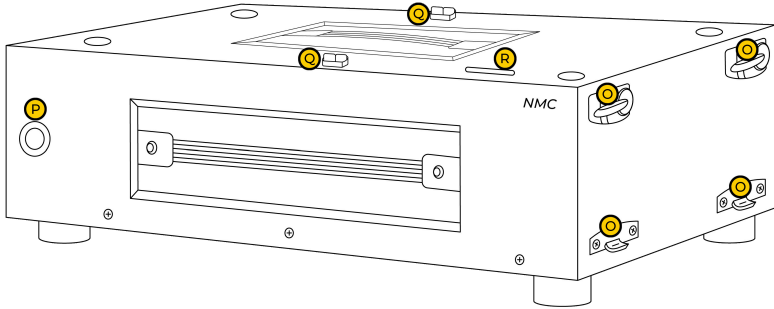
H- A0A Breakers for AC input

I- Solar input Max 130V (see more in solar charging)

J- Aux ports for connecting external AC chargers, MPPTs, and 24VDC loads

K- Solar switch used to turn on and off the solar input

L- SB50 ports for top battery



- O- Battery latch. Ensure battery is secure with all four latches closed before use
- P- Power button
- Q- SB50 battery connectors
- R- BMS port cover. Factory serviceable- DO NOT OPEN!

TECHNICAL SPECS

Power Module	
Weight	62 lbs
Dimensions	18.5 x 12 x 8.5
Solar Input	volts: up to 130VDC watts: up to 2400 w
Output Voltage	120V and 240V AC Pure sine wave
Continuous Power Output	4,000 watts
Peak Power Output	8,000 watts for 10 seconds
Outlets	(4) 120V 15A, (1) 240V 30A (1) 240V 50A
Warranty	5 year Limited Warranty
Battery	
Chemistry	24V Lithium Iron Phosphate
Capacity	2,500 watt-hours per battery pack
Life Cycle	3,500 cycles to 80% original capacity 6,500 cycles to 50% original capacity
Weight	48 lbs
Warranty	5 year Limited Warranty

CHARGING YOUR POWER STATION

There are two ways to charge your Titan power station: from solar, or using an AC power source.

If the Titan is connected to a 240V power source, it will use that source for charging, and bypass the inverter. It will also turn off the MPPT, and only use the AC source. However, if you use the 120V charging, it will simply charge with the AC source, leaving the MPPT function, and also use the inverter for the power output.

***IMPORTANT: ALL SOURCES OF CHARGING COMBINED SHOULD NOT EXCEED 1300 watts PER BATTERY.**

CHARGING FROM THE WALL (AC 240V POWER SOURCE)

1. Due to the large variations of 240V outlets, the Titan 240SP does not come with an AC charging cable. In order to use the internal AC charger/AC bypass function of the Titan, you will need a 240V Charging cable with the correct end for your 240V AC source.
2. With your AC charging cable, plug it into the Titan, and then into your 240V AC source (Home, gas generator, etc).
3. Once there is power provided to the AC input of the Titan, it will bypass (using your power source to power the outlets), and charge the Titan Batteries.
4. Your batteries are fully charged when the battery voltage reads AT LEAST 27.2V, or 100% if the meter has already been calibrated correctly.

CHARGING FROM THE WALL (AC 120V POWER SOURCE)

1. Plug the AC Battery Charger (must be purchased separately) into any wall outlet.
2. Connect the red Anderson plug end of the AC Battery Charger to the Titan Aux port.
3. Your batteries are fully charged when the battery voltage reads AT LEAST 27.2V, or 100% if the meter has already been calibrated correctly.

You can use up to 4 120v AC wall chargers by using SB50 splitters (two AC chargers per SB50 aux port). Each charger can charge up to 600 watts (depending on battery state of charge).

It does not hurt to leave your AC wall charger connected even after the batteries are fully charged.

CHARGING FROM SOLAR

If you purchase solar panels from Point Zero Energy, follow the diagrams shown on your Quick Start Guide or on our website at <https://www.pointzeroenergy.com/learn/wiring-diagrams/>

If you purchase solar panels from another source, make sure your panels are configured to keep the open circuit voltage under 240V. This is not the rating of the solar panel but the **ACTUAL OPEN CIRCUIT VOLTAGE** (which will change depending on temperature and sun). **Solar panels can and do produce higher voltages than the rated VOC on the panel when they are cold.**

If you have questions regarding this, please contact us at 208-722-1342.

The Titan 240SP can be charged using solar via the internal MPPT, and/or external MPPT's. The internal MPPT is capable of up to 2400 watts with a solar input voltage range from 35 to 130VDC. You can also charge with up to 2 added external MPPT's. Each external MPPT is capable of 1,000 watts with a voltage input from 35 to 240V.

The internal MPPT will not be in use when there is a 240V AC input connected to the AC input plug of the Titan. When AC is connected to this port, it will bypass the inverter and internal MPPT, but will charge with the AC source. However, the external MPPT will continue to charge even when an AC source is plugged into the Titan.

CHARGING WITH THE INTERNAL MPPT

There are two sets of Anderson plugs on the side of the power module labeled “Solar Input” that are designed for solar charging (see Product Overview).

The Titan 240SP only has one internal MPPT charge controller. These two ports are designed to parallel two identical strings into the Titan. The Titan 240SP MPPT is capable of charging up to 2400 watts, with an input up to 130V. **DO NOT EXCEED 130V of SOLAR INPUT.**

1. Place your solar panels where they will get as much direct sunlight as possible.
2. Make sure the Solar switch is turned off (under the solar input ports)
3. Connect solar panels to the generator in the correct configuration.
4. Turn the solar switch on
5. Your batteries are fully charged when the battery voltage reads AT LEAST 27.2V, or 100%, if the meter has been calibrated correctly.

It does not hurt to leave your solar panels connect even after the batteries are fully charged. It does not hurt to leave your solar panels connect even after the batteries are fully charged.

SOLAR CHARGING WITH THE EXTERNAL MPPT

There are two sets of Anderson plugs on the side of the power module labeled “Solar Input” that are designed for solar charging (see “Side View” under **Technical Specs**).

Each solar set is capable of charging up to 1000 watts (240v max). You can connect more than 1000 watts per MPPT, however, the generator will limit charging to 1000 watts per set. This can be beneficial if you want to limit the charge rate of the battery and get more power in low sun conditions.

DO NOT EXCEED 240V of SOLAR INPUT PER MPPT.

SAFETY MODE

When the battery has been depleted below normal operating levels, the Titan battery will go into safety mode. During safety mode, the Titan will not turn on with the power switch. To take it out of safety mode, the battery must be charged.

To do this, simply connect a charging source (AC charger, or solar). As soon as it starts charging, the Batteries will go out of safety mode. It is recommended that you fully charge your batteries after being in safety mode.

OPERATING INSTRUCTIONS

Due to it's unique design, there is a specific way to initially setup the Titan power station so it can read correct charge/discharge information and function properly.

PLEASE FOLLOW INSTRUCTIONS CAREFULLY.

Setting up the Titan 240SP is easier by using the app but not necessary. You can install the app from these QR codes:



Android



Apple

INITIAL SETUP: PROGRAMMING & CALIBRATION

Battery Configuration

Battery packs on the 240SP need to be connected so that there is an equal number of batteries connected to the top as the bottom, it is ok to have one more on one or the other, when there is an odd number of batteries. For example, if you have 3 batteries you need two on the bottom, and one on the top, or two on the top and one on the bottom. However, if you wire the top to the bottom using an exterior wire then this will not be needed, and you can use any configuration. Usually, for this it is convenient to use a base/cap combination. Also, any external battery stacks need to be connected to both the top and bottom, or if it is connected to just one, it will need to follow the same rule where the number connected to the top and the bottom is equal or within one.

Programming & Calibration

1. CONNECT THE BATTERY PACK(S) TO THE TITAN POWER MODULE

1. Ensure the power button on the battery is OFF (in the out position) on all batteries being connected.
2. If you have multiple batteries, remove the protective plates from underneath all batteries, except the bottom battery. Stack the batteries.
3. Ensure the power switch on the Titan Power module is in the OFF position (in the out position).
4. Stack all batteries together ensuring the rubber feet are aligned on top of the circle indentations of the battery pack. When connected, all of the led lights on the batteries should be off.
5. Stack the Titan power module on top of the battery (or batteries), ensuring the rubber feet are aligned on top of the circle indentations of the battery pack.
6. Tighten the four metal latches on the sides of each battery, and the power module. You may need to press down on the generator to close the latch.
7. The battery (or batteries) are now connected.

2. PROGRAM THE METER

1. Turn on all batteries by ensuring the button on each battery is pressed in. The led lights on the batteries only indicate there is power at the terminals. This is a safety feature rather than an indicator the battery is on. Turning on one battery will light all buttons on all connected batteries, however only batteries with the button pressed in will be in use.
2. Turn the Titan Power Module to ON.
3. Program the meter to the combined AMP-HOURS of ALL battery packs that will be in use:
 - a) Determine the total amp hours of batteries connected. If using LiFePo4, each battery is 90ah, if using NMC, each battery is 74ah. For example if you have 3 LiFePo4 batteries, your total amp hours is $3 \times 90 = 270$ ah.
 - b) Open your app on your phone, and program the meter to the correct amp hours. You can see instructions on how to use the app in section
 - c) Alternately, you can program the meter by following the instructions in the battery meter section.

3. CALIBRATE THE METER (Step 2 must already be done)

1. If not already on, turn on all batteries and the Titan Power Module.
2. Check the battery voltage on the Titan display screen. If the battery voltage is over 26.0V, drain the battery to 26.0V or less (this must be done in order for the battery to calibrate correctly).
3. Charge your batteries using the provided AC charger or solar, following the previous instruction.
4. Fully charge the batteries until the Titan's meter display reads at least 27.2V and 100%.

Important: Do not unplug or stop the charger until it has fully charged. If you do, or for some reason the charging stops before the meter calibrates, you must drain the battery back down to 26.0V and charge again.

READING THE BATTERY METER

Both the built in display, and the app provide the same information, and can be used to program the display.

Note: Only the amps, volts, and watts will be accurate when the meter is not calibrated. The other readings need the meter to be calibrated for an accurate display.

The Battery display shows the status of the battery, including:
State of charge in a percentage: This is the percentage of the remaining battery ranging from 0% to 100%.

Ah: This is the remaining amp hours of the battery.

Remaining time: This is the time left until the battery will be empty (based on the current rate of discharge), or the time until the battery will be full (based on the current charge rate).

Amps: This is the amps coming out or going into the battery. Do not confuse this with AC amps being used by appliances. Because the battery has a lower voltage than the AC output, the battery amps will be much higher.

Volts: This is the current voltage of the battery.

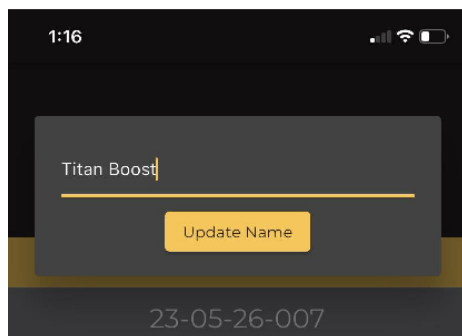
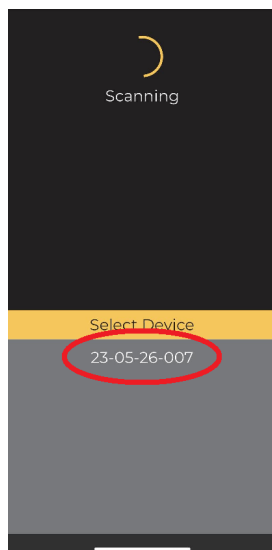
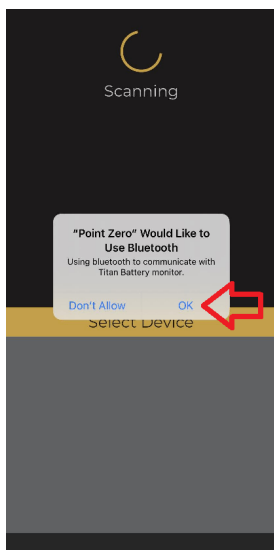
Watts: This is the current draw in watts from the battery.

USING THE APP

After downloading the app, open it to begin initial setup. When the app first opens, it will prompt you to enable BlueTooth when using the app. Select “ok” to enable BlueTooth. The app must have BlueTooth enabled in order to connect to the Titan Battery monitor.

After enabling BlueTooth, the app will scan for local Titan units to connect to. Once it successfully scans local units, the unit name will appear at the bottom. Note, in order for the app to successfully detect nearby Titan units, those units must be turned on.

The units listed will have a manufacturer’s device name, usually written in numbers. Select the device, and you will be prompted to rename it.

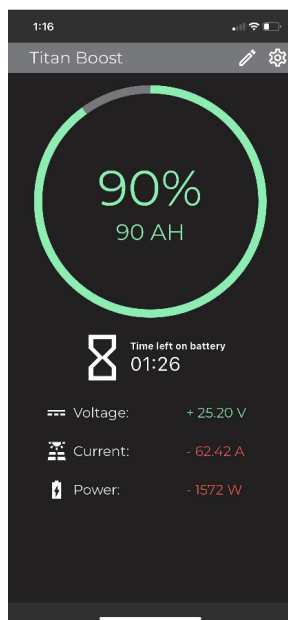


You will know which Titan you are connected to when the white Bluetooth icon appears on the Titan's display screen, on the upper right. If you'd like to, you can rename the device (this is especially helpful for customers with multiple Titan devices). After renaming the device, select "Update Name" this will lock in the new name on the device and bring you to the app's home screen.

Notice several things on the home screen:

1. In the middle of the screen you'll find the battery current state of charge shown as a percentage with the amp hours listed as well.
2. On the upper left is a gear icon. Select this to enter the settings menu and change the Titan's settings.
3. Further down, you'll find an hourglass symbol with an estimated time remaining for the battery. This estimated time is dependent on the load applied to the battery.
4. The remaining numbers in order from top to bottom are as follows:

- Voltage: which tells you the current voltage of the battery.
- Current: which tells you the DC load or charging rate being applied to the battery. In this example screenshot there is a load of 62.42 DC amps being drawn from the battery.
- Power: which tells you the rate in watts of how high the load or charge is. In the example screenshot there is a load of 1572 watts being drawn from the battery.

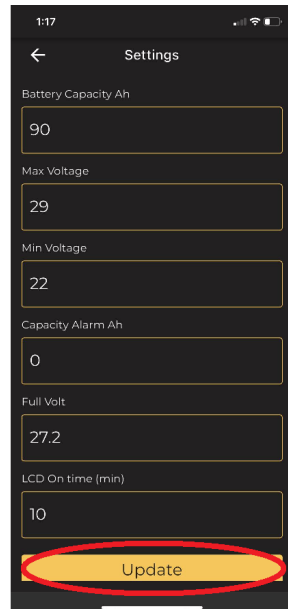


PROGRAMMING USING THE APP

Select the gear icon on the upper right of the home screen in order to enter the settings menu.

1. Without the proper amp hours set, the app will not properly track the state of charge.
2. Max voltage: This tells the display screen what the maximum voltage of the batteries should be. For both the Titan NMC and LiFePo4 batteries, go ahead and leave this at 29.
3. Min Voltage: This will tell the Titan display screen when to calibrate to 0%.
4. Capacity Alarm Ah: This will allow you to receive an alarm when the battery amp hours have dropped to a certain number. For example, if you have 1 LiFePo4 Battery (90ah) and want to be alerted when the battery has depleted to half, set this to 45. At 45 amp hours the Titan will make a chirping noise to alert you.
5. Full Volt: This will tell the display screen when the voltage of the battery is full and the screen should calibrate. Leave this set to 27.2 for both the Titan NMC and LiFePo4 batteries.
6. LCD On time (min): This tells the display screen how long to stay on (in minutes) for example, if you want your display screen to stay on for 10 minutes then set this to 10.

After inputting the appropriate settings for your unit, select “Update” this will lock in the settings and bring you back to the home screen where you can then monitor your Titan unit.



PROGRAMMING USING THE DISPLAY SCREEN

1. Enter the display screen settings by pressing the gear button located on the bottom right of the display screen.
2. Once you are in the settings menu, press the gear button again to access the settings.



You'll notice 6 different settings.

The top 3 settings will already be properly set from Point Zero Energy. You should not need to adjust these settings unless otherwise stated from a Point Zero Energy support agent.

The bottom 3 settings are as follows:

CAPACITY: The total combined number of amp hours from your batteries. Titan LiFePo4 batteries are 90 amp hours each and Titan NMC batteries are 74 amp hours each. For example, if you have 3 Titan LiFePo4 batteries you will want to change this setting to 270 (90*3)

ALARM: This will tell the unit to alert you when your batteries have depleted to a certain level. For example, if you have 1 LiFePo4 battery (90ah) and want to be alerted when your batteries are at half, set this to 45.

LCD ON (MIN): How long you would like to keep the display screen on (in minutes) before the display screens goes into sleep mode.

3. After you've pressed the gear button again, you'll notice that the first number will flash in red. This will let you know that you are now in programming mode for the settings. The number flashing red will be the current number you are on and have access to change.
4. Press the RIGHT arrow button to move between selections. Note that when you press this button, the adjacent number will flash. Continue pressing this button to move to the number you'd like to change.



5. Continue pressing the RIGHT arrow button until you reach the capacity setting. Use the UP arrow button to change the capacity setting to the proper number. Remember, Titan LiFePo4 batteries are 90 amp hours each and Titan NMC batteries are 74 amp hours each.
6. After you've set the proper capacity setting, set the Alarm and LCD On to the desired number.
7. After finishing your new settings, press the gear button to save the settings. You'll know it is saved when no more numbers are flashing red.
8. Press the BACK arrow button to exit the programming menu and return the home screen. Now your unit should be properly set to calibrate and measure the state of charge of the batteries correctly.

USING YOUR TITAN POWER STATION

The Titan power station can power various appliances such as refrigerators, freezers, microwave ovens, and cooking appliances. Its pure sine wave power output will safely run power tools, electronics, and medical equipment such as CPAP machines.

The Titan 240SP has two 240V outlets, one 50A RV outlet, and one 30A twist lock outlet. Each one of these can handle up to the full 4,000 watts of the inverter. It also contains four 120V outlets. Each outlet can handle 15A (about 1800 watts). However, the two on the left have a maximum of 2,000 watts combined, and the two on the right have a maximum of 2,000 watts combined. So, if you have two large load appliances that combined are over 2,000 watts, you would want to plug one into the one of the two on the left, and the other into one of the two on the right.

When deciding on what to power, you will need to calculate the continuous and peak loads of each appliance you want to run simultaneously to determine if the total amount of watts is within the capacity of the generator. Remember, run times will vary depending on the number of batteries and solar panels. When using large amounts of AC power when the battery is low, the inverter may turn off earlier than normal with useable battery capacity still remaining. If this happens, turn the Titan solar generator off and back on again. Try reducing the amount of power being used via AC.

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Inductive loads

Inverters have a rated watts based on a resistive load (heaters, lights, etc). However they can also run inductive loads such as microwaves, motors, etc. Inductive loads create a larger load on the inverter (actually feeding back power, and then producing it again). So even though the total output of an inductive load, and the power pulled from the battery may be within the inverter rating, it may overload it. If the Titan overloads on an inductive load when pulling less than the rated output (3,000 watts), this is normal, and it means you need to reduce the load in order to run it. This is not just the Titan, but all inverters.

Peak power

The Titan 240SP can run 2X the continuous load for up to 5 seconds. This allows it to start appliances with a large load better than most generators. However, if the load stays over 4,000 watts for more than 10 seconds it will turn off due for overload protection. If this happens, you must turn the unit off, and then back on.

Low battery turn off and restart

When the battery gets low (around 21V) it will beep a single beep every few seconds letting you know the battery is extremely low. If the battery is drained more (down to around 20v), it will beep twice every few seconds, and turn the inverter off. The inverter will stay off until the battery voltage is raised to around 25V (around 15%). At that point the unit will stop beeping, and turn back on.

If the battery is drained even further (the AC will be off, but DC can still use the battery, plus there is a small no load power draw), the battery will go into safety mode turning everything off. If solar is connected, it will charge once there is sun, turning the whole system back on. If no solar is available, it will need to be charged by another source to get it out of safety mode.

UPS (UNINTERRUPTED POWER SUPPLY)

The Titan 240SP has two forms of ups, depending on which type you need.

1- Standby or battery backup

This type of backup will run completely off of the source power but when the power goes down it switches over to battery backup power. The benefit of this type of backup is that it keeps your batteries full and ready at all times and is very efficient. The weakness is that there is a short downtime while it switches over. The Titan 240SP will switch over in less than 10ms, so the downtime is extremely short and most of the time you will not even notice the switch. However, if you have some sensitive electronics it may cause them to malfunction in that short switch time.

2- Double conversion

This type of backup produces clean power, and has no switch time. The input power keeps the batteries charged, and the output comes from the inverter converting dc power from the batteries to AC power. The negative to this system is that it is not as efficient. It has to convert AC power to DC to charge the batteries, and then convert the DC power from the batteries back to AC power. The benefit is that there is zero switch time, and guaranteed clean power (any power glitches in the source AC will not be seen by the appliances).

BATTERY CHARGING

The battery has automatic charge limiting. This limiting current is triggered when its charging current goes over 50A (about 1300 watts). It is best to have enough batteries to be able to charge at your full potential (if you have 2,000 watts of solar connected have at least 2 batteries). If the charging limit is reached, and the battery goes into limiting charge current, the display screen may reach maximum voltage and automatically calibrate to 100%. If this happens you need to reduce your charging, or increase the number of batteries, and recalibrate your meter following the steps

in the initial setup section. Alternatively, you can allow it to charge slowly until the battery is full (stays at 27.2v even when the charging is removed). Remember that until the battery is completely charged, the meter will not show an accurate state of charge.

When using large amounts of AC power when the battery is low, the inverter may turn off earlier than normal with useable battery capacity still remaining. If this happens, turn the Titan solar generator off and back on again. Try reducing the amount of power being used or charge the batteries.

TEMPERATURE RANGE

You should not use your Titan power station in temperatures below 32 deg F, or above 100 degF. You may store your system at lower temperatures, but it must be warmed up and dried out before using.

STORING YOUR POWER STATION

The Titan solar generator will retain a charge for up to 5 years. However, for optimal battery life, you should use 10% of the battery once per year. Make sure each battery pack is charged to at least 50% capacity and the POWER SWITCH on both the Titan power module and all batteries are **turned to OFF before storing**.

Store your Titan solar generator in cool, dry environments and away from any combustible materials or gases.

If stored in a location under 32 deg F, you must allow the Titan to warm up, and any condensation to fully dry. We suggest leaving it in a warm location for at least 3-6 hours before use.

***FAILURE TO STORE AND MAINTAIN YOUR TITAN SOLAR GENERATOR PROPERLY WILL VOID THE PRODUCT WARRANTY.**

TROUBLESHOOTING

For troubleshooting issues, please visit our knowledge base on our website at <https://www.pointzeroenergy.com/support/knowledge-base/>

WARRANTY & RETURNS

For information on product warranty, visit our website at <https://www.pointzeroenergy.com/warranty-returns/>

