

Tycon® RPMS24-360-650 Installation Instructions

Congratulations on your purchase of the Tycon Mobile Solar Pro™ portable power system. Please take a few minutes to review these instructions before startup of the power system.

Caution! Voltage from the solar panels can exceed 65VDC. When connected to grid power, the AC voltage input will carry 120VAC or 240VAC. Be extremely careful when modifying any wiring or working around the solar controller or AC/DC battery charger. High Voltage can cause serious injury.



Typical Application with Wireless radio, Cameras and Wind Turbine Option

Notes:

1. The basic trailer system comes complete with a battery control box outfitted with eight 6V 180Ah batteries, a 40A MPPT solar controller with 20A load output, a 900W AC/DC Battery Charger, a 24VDC to 56VDC 5A converter, a TPDIN-Monitor-WEB2 remote power monitor, a 17' pneumatic extension mast with 12V air-pump, a junction box at top of pole with a 5 Port Gigabit versatile PoE switch, and 650W of solar panels with travel cover.
2. When travelling, we recommend to always use the solar panel cover to help protect the solar panels from flying road debris. Make sure all bolts and nuts are tight. Also, the solar panels need to be set for 10° position (nearly horizontal) and secured with the included ratchet straps.
3. When parked, even for storage, we recommend to always extend the 4 stabilizers to prevent trailer damage from high winds.
4. There are multiple components included in the trailer system. Each component has its own user guide; therefore, this user guide will just touch on the system basics.



Procedures:

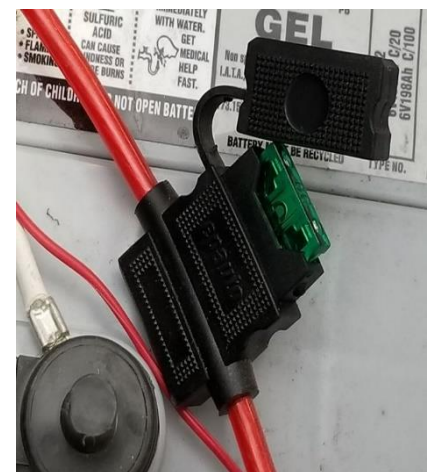
1) Trailer Startup

- a) Park the trailer in such a way that when deployed, the solar panels won't be shaded by the extension mast during peak sun. This usually means that the front of the trailer will be facing North. Solar panels need to be facing due South in the northern hemisphere.
- b) There are 4 outrigger stabilizers that can be extended 15" or 30". Extend these outriggers and use them to level the trailer.
- c) Don't remove the cover from the solar panels till after the system is energized. Set solar panels to face South and set the tilt angle. Tighten all the adjustment bolts. Optimum Solar panel tilt depends on latitude and time of year. There is a handy calculator on tyconsystems.com to help you determine the best tilt angle for your area.



2) Powering up the system

- a) The solar controller should be connected to the batteries before being supplied with solar power. For this reason, it's best not to remove the solar panel cover until after the system powerup.
- b) The system ships with two 30A fuses removed from the battery cables. Install both fuses to power up the system. The fuse may spark when inserted. This is normal.
- c) The MPPT solar controller has a load output which supplies power to the TPDIN-Monitor and the 24VDC to 56VDC converter. Press the red SET button on the MPPT solar controller to turn the load on and off.
- d) The TPDIN-Monitor-WEB2 controls the power going to the top of the extension pole through two of the on-board relays. Relay CH1 controls the 56V supply. Relay CH2 controls the 24V supply. By default, these relays are closed. The TPDIN-Monitor-WEB2 allows control of the relays using manual control or based on measured parameters or ping. To find out more about the TPDIN-Monitor-WEB2 features and use, refer to the individual product user guide. The unit ships with DHCP client enabled and fallback IP is 192.168.1.6



3) Pneumatic Extension Mast - Raising

a) The pneumatic extension mast is raised using a 12V automotive air pump. The 12V for the pump is supplied from the 24V batteries using a 24V to 12V DCDC converter. There is a pressure regulator with air valve used to raise or lower the mast. The mast has mechanical locks at 8', 11', 14' and 17' positions so the mast can be raised to any of these pre-defined heights. It takes about 1 minute to fully extend the mast using the air pump.

b) Near the top of the mast, there is a die cast aluminum enclosure housing a TP-SW5G-VERSA PoE gigabit switch. The input to the switch is 56VDC and the outputs are as follows: Port 1 60W High PoE; Port 2-4 802.3at 30W; Port 5 24V 12W Passive PoE. If it is necessary to connect a laptop or computer to the switch, connect to port 2,3 or 4 only. Connecting to port 1 or 5 could cause damage to your computer Ethernet port.

c) A wire terminal is included inside the housing to supply 24VDC 15A unregulated and 56VDC 5A regulated.

d) Turn off the voltage output from the MPPT solar controller by pressing the SET button. Mount equipment and connect the equipment to either the PoE switch or the wire terminal, as required. Power up the load by pressing the SET button on the MPPT solar controller. Once the equipment is connected and tested, the mast can be raised.

e) Raise the mast by turning the air flow valve to the "UP" position. Turn on the 12V air-pump using the toggle switch. Note: The pressure regulator at the airflow valve should be set to 30PSI.

f) You will hear the mechanical locks click into position as the mast is raised. You can turn off the 12V air-pump at an intermediate height or after the mast is fully extended. Once the mast is extended turn the airflow valve to the center position.



4) Pneumatic Extension Mast - Lowering

a) Lowering the mast is a little tricky. Don't relieve all the pressure then pull the mechanical lock rings. This will cause the mast to fall and bang against the lower section. This could damage your equipment which is mounted on the mast.

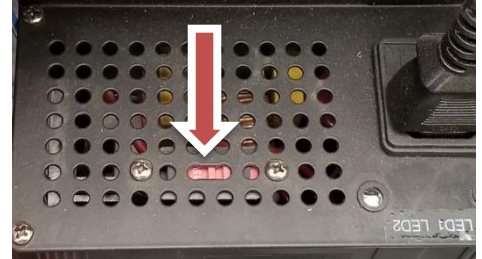
b) To lower the mast slowly:

- i) Turn the air flow valve to the "DOWN" position. Immediately pull the bottom lock ring. The mast will begin to collapse.
- ii) When the mast section is about half way down, pull the next lock ring. Repeat till all the lock rings are pulled and the mast has collapsed fully.



5) Charging the batteries from AC power

- a) The batteries can be charged using 115VAC or 230VAC grid power. This is useful if you want to fully charge the batteries before each deployment.
- b) **CAUTION:** Make sure to set the voltage switch on the TP-BC48-900 battery charger to the correct AC voltage. Default is 115VAC. Failure to set the correct voltage will damage the battery charger.
- c) Connect an extension cord to the weatherproof AC receptacle on the back of the battery/equipment box. Connect the extension cord to the proper 10A AC voltage outlet. The battery charging process will start within a few minutes. It should take about 5hrs minimum to fully charge the discharged batteries.



6) MPPT Solar Controller

- a) The advanced MPPT solar controller measures solar voltage and current, battery voltage, load current and temperature. You can scroll through the various readings on the display by pressing the up and down arrow keys on the controller. Please refer to the solar controller user guide for detailed info.
- b) There is a Bluetooth interface included so you can check status of the system using your smartphone without having to open the equipment enclosure. The range is about 15'. Please refer to the TP-SC-BT1 user guide for more info.

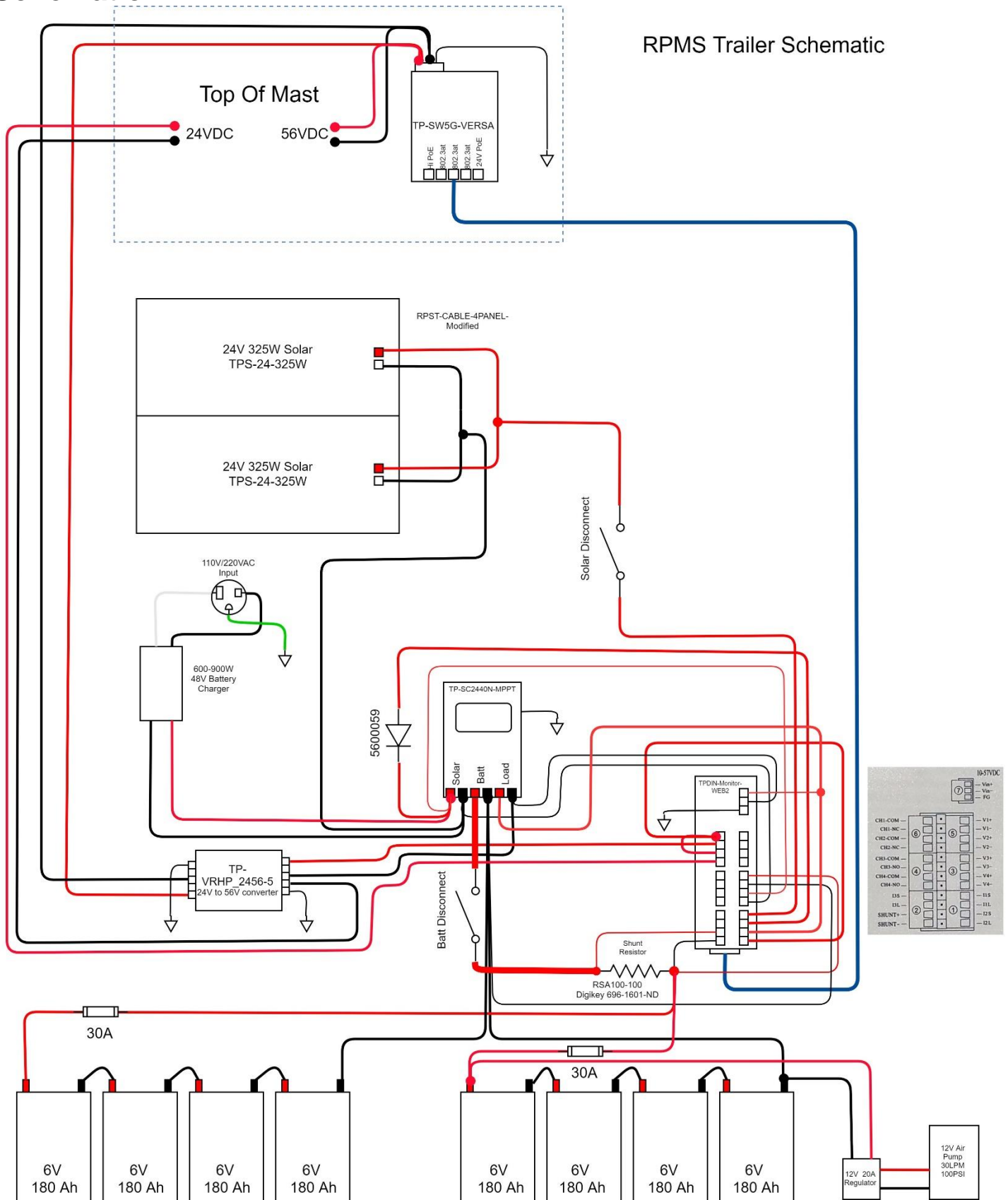


7) Misc. Information

- a) The enclosure includes a thermostatically controlled fan. The fan will turn on automatically if the temperature inside the enclosure exceeds 45C.
- b) The batteries used in the system are GEL type sealed lead acid batteries. They are maintenance free and should last at least 5 years. **Caution:** Never store the batteries in a discharged state, especially in cold temperatures or else the battery life will be reduced. Always store the batteries fully charged.
- c) A second locking enclosure can be added to the trailer platform in order to store user equipment.
- d) A wind turbine option is available to add a second source of power to the system. The wind turbine mounts to a separate foldable mast system which is included in the optional kit.
- e) Replacement fuses:
 - i) Battery Cables: ATC/ATO (.75") Automotive Fuse 30A
 - ii) AC/DC Battery Charger: 6x30mm 25A glass fuse

Schematic:

RPMS Trailer Schematic



Specifications

General Power Capabilities	
Continuous Power at (Hrs Peak Sun)	160W Max (6hrs), 80W Max (3hrs)
Max Instantaneous Load	20A Max
Autonomy at 100W	48hrs Typ
Batteries	
12V Battery Capacity	720Ah (360Ah @ 24V)
Battery Voltage	24VDC
Battery Type	Maintenance Free Non-Spillable Valve Regulated Sealed Lead Acid AGM
Battery Life	5+years
Solar Panels	
Type	24VDC 650W, Polycrystalline 72 Cell Modules, 25year Life
Array Size	77" x 78" (1956 x 1984mm)
Solar Controller	
Type	MPPT – Temperature Compensated, 40A Solar Input, 20A Load Output
Self Consumption	<1W
Overcharge Protect	32V
Equalize Charge	29.2V
Bulk Charge	28.8V
Float Charge	27.6V
Over-discharge protect	22V
Over-discharge recover	24V
Remote Access	Bluetooth 4.0, 50' (15m) max range
AC Charging	
Input	110VAC, 50/60Hz, 10A
Recharge Time	50% discharged, 5 hrs typ
Remote Monitoring	
Type	Web Based, SNMP, 4 Channel
Parameters Monitored	Solar Panel Volts and Current, Battery Volts and Current, Load Current, Temperature
Controls	Connect / Disconnect Load Output, manually or automated based on programmable rules.
Alerts	Email alerts based on programmable rules

Extension Mast	
Type	Pneumatic Locking Aluminum
Lock Positions (4)	8', 11', 14', 17' (2.4, 3.4, 4.3, 5.2m)
Time to full extension	1 Minute Typ (using included integrated air pump)
Top Mounting Area	36" x 2.1" diameter (914 x 53mm)
Top of Mast Enclosure	
Type	Aluminum Die Cast
Interior Size	10 x 7.75 x 3" (254 x 197 x 76mm)
Voltages Available (16AWG Wire)	56VDC 5A Regulated 24VDC 15A Unregulated
PoE Ports	5 Port Layer 2 Gigabit PoE Switch Port 1 = 60W High PoE Port 2-4 = 802.3at 30W PoE+ Port 5 = 24VDC 12W Passive PoE
Equipment Enclosure	
Type	Vented Locking Aluminum Diamond Plate
Internal Size	64.5" x 17.5" x 19.5" (1638 x 444 x 495mm)
Mobile Trailer	
Construction	Welded Tubular Steel, Powder Coat Painted. Aluminum diamond plate decking.
Overall Size (LxW)	126" x 82.5" (3200 x 2096mm)
Deck Size (LxW)	82" x 65" (2083 x 1651mm)
Tongue length	44" (1118mm)
Ball Size	2" (50.8mm)
Ground Clearance	13" (330mm)
Solar Panel Height	63" above deck (1600mm)
Wheels	16" (406mm) Chrome
Suspension	Leaf Spring
Stabilizing Lifts (4)	2000lb (907kg), 3 Position Extension: 0", 15" 30" (0, 381, 762mm)
Tongue Weight	300lbs (136kg)
Misc	
Total System Weight	1640lbs (744kg)
Operating Temp	-22°F to 140°F (-30°C to +60°C)
Wind Speed Rating	90 MPH (40 m/sec)
Warranty	3 Years