

## Tycon® RPMS24 Installation Instructions

Congratulations on your purchase of the Tycon MobileSolarPro® 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.



## Notes:

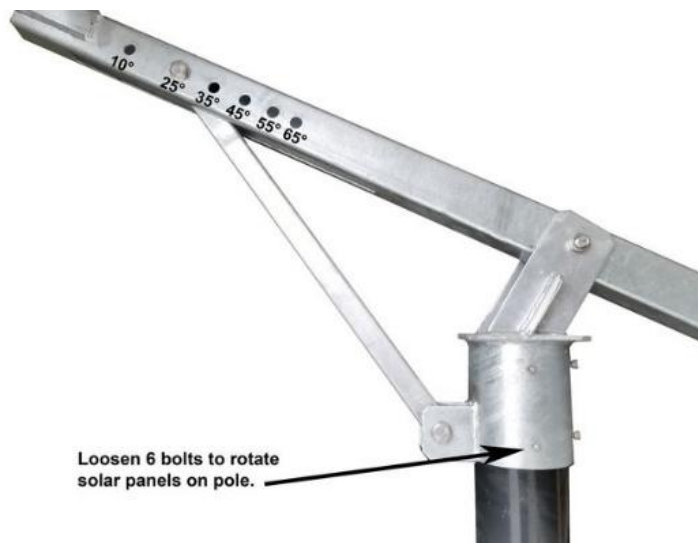
1. The basic trailer system comes complete with a battery control box outfitted with two to eight 12V 180Ah batteries, a 60A MPPT solar controller with 30A load output, a 600W-900W AC/DC Battery Charger, a 24VDC to 56VDC 5A 250W voltage converter, a TPDIN-Monitor-WEB3 remote power monitor, an 18' pneumatic extension mast with 12V air-pump, a junction box at top of pole with a 5 Port Gigabit versatile PoE switch, and 360-1440W 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:

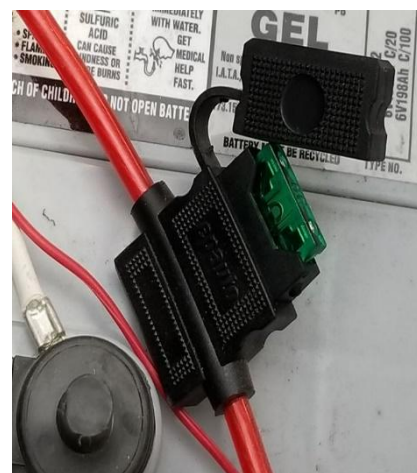
### 1) Trailer Setup

- 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 up to 33". Extend the outriggers to level the trailer.
- c) 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 tilt calculator at <https://calculators.tyconsystems.com> to help you determine the best tilt angle for your area.



### 2) Powering up the System

- a) Note: The solar controller should always be connected to the batteries before being supplied with solar power.
- b) The system ships with two 40A fuses installed in the battery cables.
- c) Switch the PV/Battery breaker to ON, then switch the three-position switch to SOLAR. The MPPT solar controller will power up. The MPPT solar controller has a load output which supplies power to the 24VDC to 56VDC converter and the 24VDC to 12VDC converter.
- d) The TPDIN-Monitor-WEB3 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-WEB3 allows control of the relays using manual control or based on measured parameters or ping. To find out more about the TPDIN-Monitor-WEB3 features and use, refer to the individual product user guide included in the customer packet. 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 9', 12', 15' and 18' positions so the mast can be raised to any of these pre-defined heights. It takes about 120 seconds to fully extend the mast using the air pump.

- b) On a stock MobileSolarPro®, there is a die cast aluminum enclosure housing a TP-SW5G-VERSABT unmanaged PoE gigabit switch. The input to the switch is 56VDC and the outputs are as follows: Port 1 90W 4 pair 801.3bt PoE; Ports 2-4 48V 30W 802.3at Mode B; 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, 56VDC 5A regulated and 12VDC 15A Max regulated.
- d) Before connecting your equipment. Disconnect the Solar input by switching the three-position switch to OFF then disconnect the Battery using the breaker. Mount equipment and connect the equipment to either the PoE switch or the wire terminal, as required. Once the equipment is connected and tested, the mast can be raised, and power can be turned on. Connect battery first, then connect solar. Load will turn on automatically.

- e) Raise the mast by turning the air flow valve to the “UP” position. Turn on the 12V air-pump using the rocker 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

*Note: If mast has been extended for a long time it may have depressurized and will need to be pressurized first using the air pump before attempting to lower it.*

- a) Lowering the mast requires careful handling. 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 and possibly damage equipment 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 and the mast will begin to collapse.
  - ii) When the mast section is about halfway down, pull the next lock ring. Repeat until all the lock rings have been pulled and the mast has fully collapsed.



## Charging the Batteries from AC Power

- c) 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.
- d) **CAUTION:** Make sure to set the voltage switch on the TP-BC battery charger to the correct AC voltage. Default is 115VAC. Failure to set the correct voltage will damage the battery charger.
- e) 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. Turn on the PV/Battery breaker, turn the three-position switch to AC Charge, and the battery charging process will start. The lights on top of the battery charger indicate its status, Red/Red=Charging, and Red/Green=Battery Full. It may take 5hrs minimum to fully charge the discharged batteries.

## 5) 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 touching the buttons on the controller face. Please refer to the solar controller user guide for detailed information included in the customer packet.



## 6) Additional 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 AGM 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 wind turbine option is available to add a second source of power to the system. The wind turbine mounts to the solar assembly which is included in the optional kits (RP-WTKit-2 and RP-WTKit-3).
- d) Replacement fuses:
  - i) Battery Cables: ATC-Maxi (1.14") Automotive Fuse 40A
  - ii) AC/DC Battery Charger: 5x20mm 5A Glass Fuse
  - iii) TPDIN-Monitor-WEB3: ATM Mini Blade 2A Fuse

## 7) MobileSolarPro® Maintenance

### a) Pneumatic Mast Maintenance

#### i) Lubrication:

It is recommended to oil the mast each time the MobileSolarPro® unit is deployed, or the pneumatic mast is drained. Recommended oils are: 3-in-1 multipurpose oil or AW ISO 32 hydraulic oil. Use a spout capped bottle and insert into the oil holes in each section of the pneumatic mast applying about a 0.5oz. each time.



#### ii) Pneumatic Mast Draining:

- (1) Raise the mast until fully extended, as the mast extends water between the sections will squirt out of the oil holes.
- (2) Remove the security plates at the base of the mast by removing the four 10mm fasteners.
- (3) Open the valve quarter to halfway and immediately pull the lock ring on the first section and each following section until it fully collapses, and any remaining water will drain from the valve at the base.
- (4) Close the valve and oil the mast as it extends, then repeat steps 1-3 to ensure the pneumatic mast is fully drained.
- (5) **Caution:** Raising the mast if there is a possibility of ice inside can cause damage to the harness coil inside.



#### iii) Pneumatic Mast Torque Specifications:

- (1) Mast C Clamp Bolts – 15ft.-lbs.
- (2) Mast Bracket to Support Arm Bolts – 44ft.-lbs.
- (3) Mast Base Flange to Frame Bolts – 44ft.-lbs.

### b) Solar Assembly Maintenance

- i) Before deployment and retrieval of MobileSolarPro® unit, it is recommended to check all bolts, nuts, and clamps are tight to ensure no damage in transit.
- ii) For optimal output performance from the solar panels, it is recommended that the solar panels are regularly cleaned before deployment and during deployment depending on the duration.

## c) Trailer Maintenance

- i) Front Tongue Jack – Check once a year and add grease under black cap as needed.
- ii) Stabilizer Jacks – Check once a year, grease at grease fittings as needed, and spray the bracket swivel joint with silicone spray as needed.
- iii) Enclosure Hinges – Check once a year and grease at grease fittings as needed.
- iv) Wheel Bearings – Industry standard is annually repacking the bearings.
- v) Tires – Industry Standards for Replacement, Installation, & Air Pressure:
  - (1) 3-7 Years Average Life
  - (2) Tread Depth: < 4/32" - Replace
  - (3) Uneven Wear - Replace
  - (4) Damage: Cracks, Bulges, Cuts - Replace
  - (5) Tire Pressure: 65PSI
  - (6) Lug Nut Torque: 100ft.-lbs.

## Specifications

Model #	Frame Type	Solar Panel Output	Solar Array Size	Battery Capacity	Continuous Power Generation*	Reserve Time	Grid Charge Time*	Trailer Weight	Tongue Weight
RPMS24-360-360	Mini	360W	39 x 77"	360Ah	78W	28hr	4hr	1340lb	139lb
RPMS24-1440-BEAST	Standard	1440W	79 x 154"	1440Ah	315W	27hr	14hr	2400lb	
RPMS24-720-MINI	Mini	720W	79 x 77"	720Ah	157W	27hr	7hr	1650lb	140lb
RPMS24-720-MINI-3P	Mini	1080W	119 x 77"	720Ah	180W	24hr	7hr	1700lb	107lb
RPMS24-1440-MINI	Mini	720W	79 x 77"	1440Ah	157W	55hr	14hr	2160lb	135lb
RPMS24-1440-MINI-3P	Mini	1080W	119 x 77"	1440Ah	236W	36hr	14hr	2210lb	114lb

\*@50%  
discharge

# RPMS-24 Typical Schematic:

