ePOWER EN4302030 Smart Automatic 12/24 Volt Pwm Solar Controller 4 Stage Charging Owner's Manual

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ePOWER EN4302030 Smart Automatic 12/24 Volt Pwm Solar Controller 4 Stage Charging

Enerdrive ePOWER Solar Charge Controller

The Enerdrive ePOWER Solar Charge Controller is a smart automatic 12/24 volt PWM solar controller with 4 stage charging. It comes in two models, the EN43020 with 20A capacity and the EN43030 with 30A capacity.

Product Features

- Built-in LCD display
- USB ports
- Multiple load control modes
- Automatic overload protection
- Low battery protection
- Overheating protection
- Built-in short circuit protection
- Professional level components for efficiency, reliability, and performance

Product Usage Instructions

Before using the Enerdrive ePOWER Solar Charge Controller, it is important to carefully read and follow all instructions and guidelines in the user manual provided with the product.

Step 1: Installation

Install the solar charge controller in a dry and ventilated location away from direct sunlight. Connect the solar panel(s) to the solar charge controller using the provided cable(s). Connect the battery to the solar charge controller using the provided cable(s). Make sure to connect the positive (+) cable to the positive (+) terminal and negative (-) cable to the negative (-) terminal.

Step 2: Power On

Press and hold the power button for three seconds to turn on the solar charge controller. The LCD display will show the charging status of the battery.

Step 3: Load Control Modes

The Enerdrive ePOWER Solar Charge Controller has multiple load control modes that enable it to be used in a variety of applications. Choose the appropriate load control mode according to your needs.

Step 4: Troubleshooting

If the solar charge controller displays an error message, consult the user manual for troubleshooting instructions. If the problem persists, contact Enerdrive customer support for assistance.

Step 5: Power Off

To turn off the solar charge controller, press and hold the power button for three seconds.

Following these usage instructions will ensure safe and optimum performance of the Enerdrive ePOWER Solar Charge Controller. Misuse may result in damage to the unit and/or cause harm or serious injury.

Please Keep This Manual For Future Reference
For safe and optimum performance, the Enerdrive ePOWER Solar Charge Controller must be used properly. Carefully read and follow all instructions and guidelines in this manual and give special attention to the CAUTION and WARNING statements.

Disclaimer
While every precaution has been taken to ensure the accuracy of the contents of this guide, Enerdrive assumes no responsibility for errors or omissions. Note as well that specifications and product functionality may change without notice.

Important
Please be sure to read and save the entire manual before using your Enerdrive ePOWER Solar Charge Controller. Misuse may result in damage to the unit and/or cause harm or serious injury. Read manual in its entirety before using the unit and save manual for future reference.

Notice of Copyright

merchantability or fitness for a particular purpose, regarding these Enerdrive products and makes such Enerdrive products available solely on an “as is” basis.
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Introduction

The ePOWER 20 & 30 Amp Solar Charge Controllers are common positive PWM charge controllers with built in LCD display and USB ports. The multiple load control modes enable them to be widely used on caravans, camper trailers, boats, portable solar panels, commercial street signs etc.
The ePOWER Solar Charge Controller range is built for the toughest Australian conditions using professional level components which have resulted in efficiency, increased reliability and performance.
Standard features of the ePOWER include automatic overload, low battery, overheating and built-in short circuit protection. The ePOWER Solar Charge Controller is well equipped to give you lasting trouble-free operation.

ePOWER Solar Charge Controller Features

- PWM Charging
- Battery Temperature Compensation Function
- High Reliability
- Informative Backlight LCD Display
- Multiple Load Control Modes
- Battery Type Selectable: Sealed, Gel and Flooded
- USB Output 2.4A
- Full Power Operation up to 55C

IMPORTANT SAFETY INFORMATION

This section contains important safety information for the Enerdrive ePOWER Solar Charge Controller. Each time, before using the Enerdrive ePOWER Solar Charge Controller, READ ALL instructions and cautionary markings on or provided with the controller, and all appropriate sections of this guide. The Enerdrive ePOWER Solar Charge Controller contains no user serviceable parts. Opening up the controller will void product warranty. See Warranty section for how to handle product issues.

WARNING!
Failure To Follow These Instructions May Result In Death Or Serious Injury

- This controller is designed for indoor use only
- Do not disassemble the controller. Please see a qualified person if the unit requires repairing Lead acid batteries can be dangerous. Ensure no sparks or flames are present when working near batteries
- Eye protection should always be used.
- Given suffhicient light, solar panels will always generate energy even when they are disconnected
- Accidental ‘shorting’ of the terminals or wiring can resuft in sparks causing personal injury or a fhre hazard. We recommend that you cover up the panel(s) to block all incoming light during the installation. This will ensure that no damage is caused to the Solar Panel or Battery if the wires are accidentaly short circuited
- Aways install a battery fuse or circuit breaker on each circuit including the solar controller

SHOCK HAZARD. KEEP AWAY FROM CHILDREN!

Avoid moisture ingress. Never expose the unit to snow, water, etc.

WARNING! EXPLOSION HAZARD!

- DO NOT use the Enerdrive ePOWER Solar Charge Controller in the vicinity of flammable fumes or gases (such as gas bottles or large engines).
- AVOID cOvering the ventilation openings. Always operate unit in an open and well ventilated area.
- Prolonged contact to high heat or freezing temperatures will decrease the working life of the unit.

FIRE AND/OR CHEMICAL BURN HAZARD

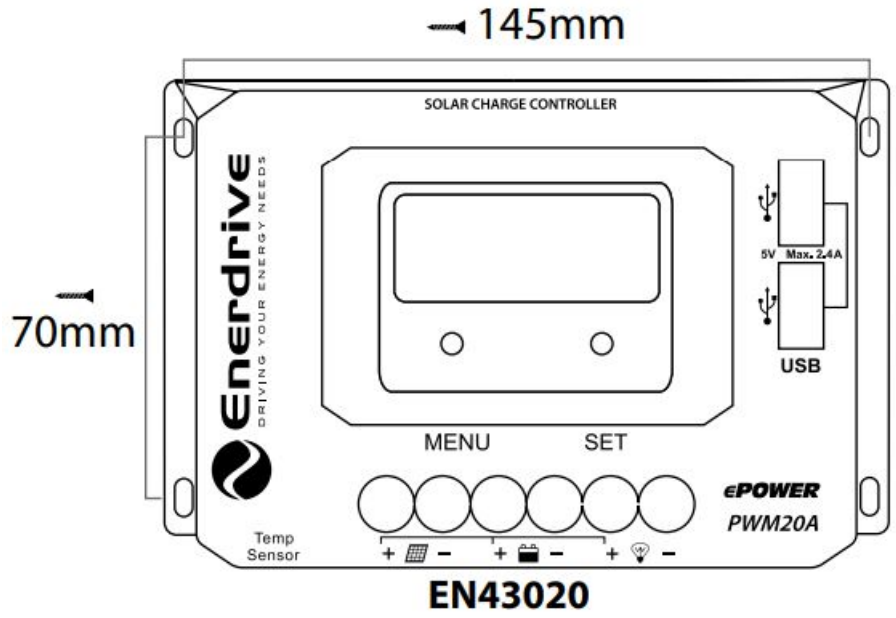
- When working with electrical equipment or lead acid batteries, have someone nearby in case of an emergency.
- Study and follow all the charger manufacturer's specific precautions when installing, using and servicing the controller.
- Keep unit away from moist or damp areas.
- Avoid dropping any metal tool or object on the controller. Doing so could create a spark or short circuit which goes through the controller or another electrical tool that may create an explosion.

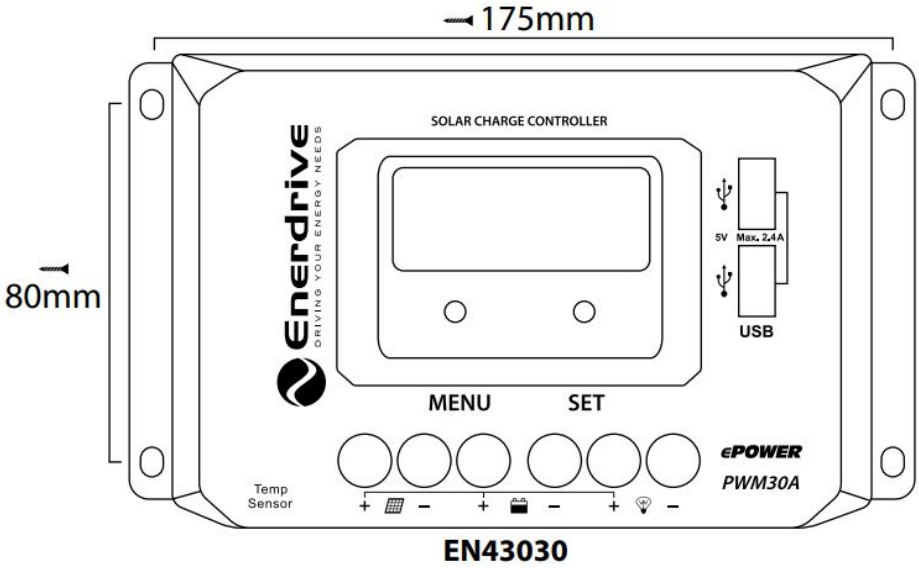
LIMITATIONS OF USE

- Do not use in connection with life support systerms or other medical equipment or devices.
- Controller is not to be used by persons with reduced physical or mental capabilities or lack of knowledge and experience. Not to be operated or used by children.
- Avoid dropping any metal tool or object on the controller. Doing so could create a spark or short circuit which goes through the controller or another electrical tool that may create an explosion.

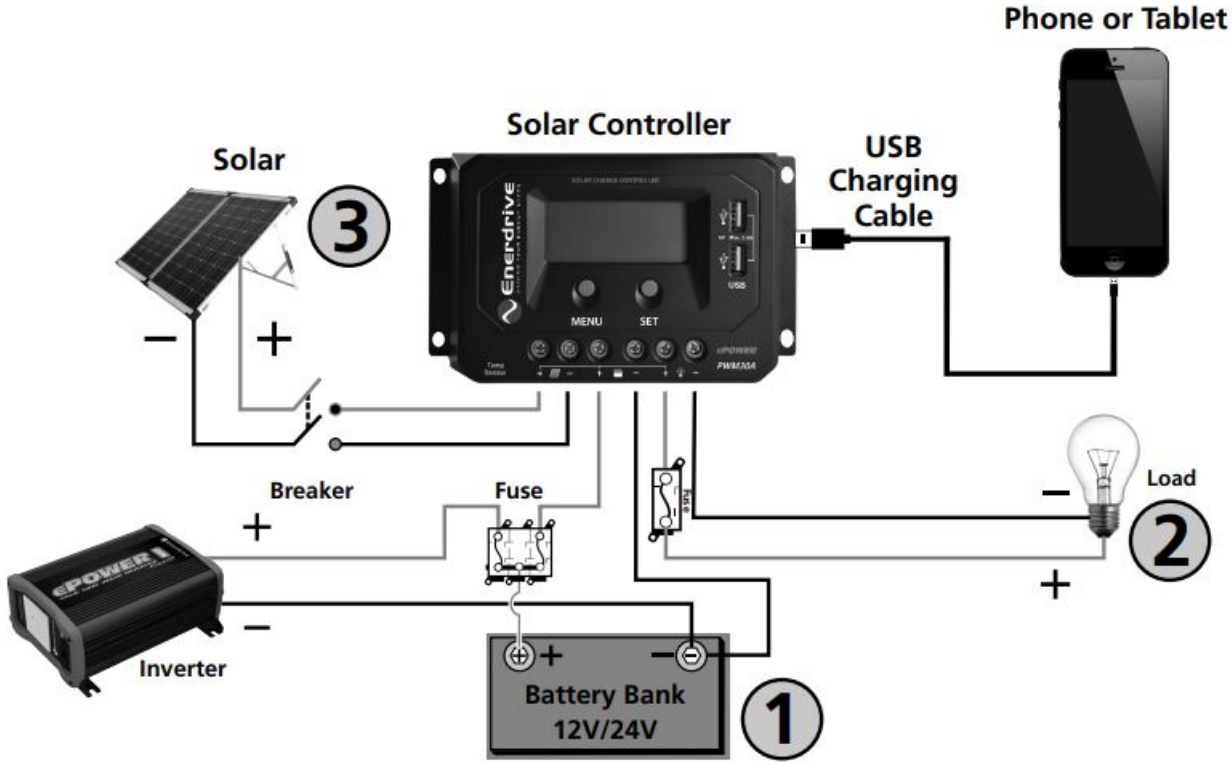
Mounting the Device

The Solar Controller is best mounted on a vertical surface for maximum cooling efficiency. To mount the unit, use self-tapping screws and mount the unit via the four screw holes supplied and affix to a flat surface.





Wiring Connections

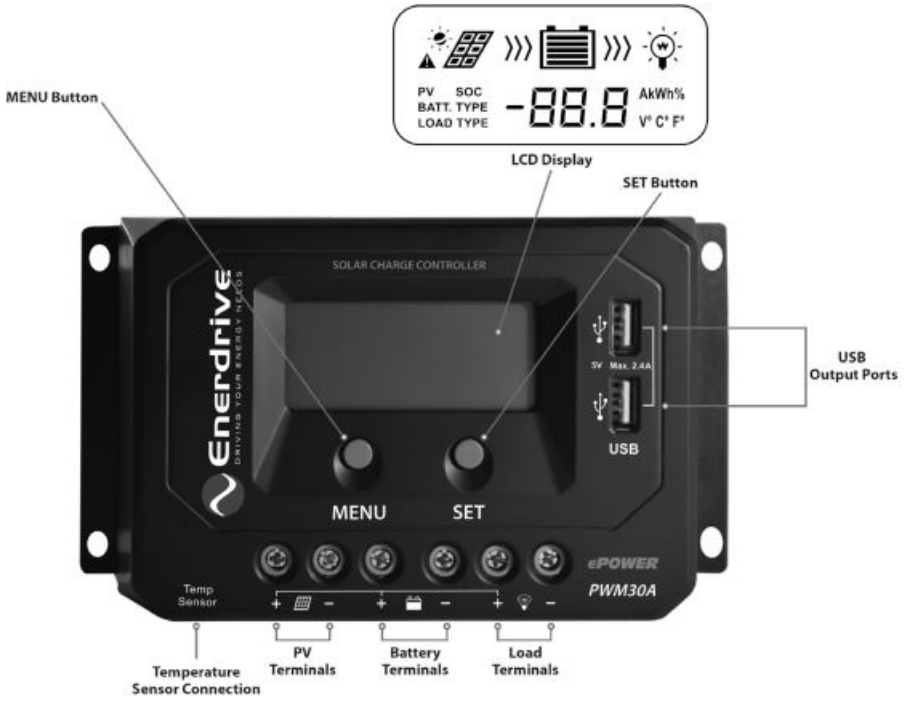


1. Connect components to the charge controller in the sequence as shown above (1,2,3) and pay particular attention to the “+” and “-”. Please don’t insert the fuse or turn on the breaker during the installation. When disconnecting the system, the order will be reversed, (3,2,1).
2. The battery fuse should be installed as close to the battery as possible. The suggested distance is within 150mm.
3. Always connect the battery first, in order to allow the controller to recognize the system voltage.
4. Power up the controller and confirm that the LCD screen turns on. If the screen does not power up, refer to page 14 TROUBLESHOOTING.
5. The ePOWER Solar Charge Controller is a common Positive Controller.

NOTE: If using an inverter, or have a load larger than the load output of the solar controller, connect the inverter and/or large load/s directly to the battery.

Features

- 4 Stage charging ensures the battery is charged to the optimum level (Bulk, Absorption, Equalisation and Float)
- Advanced MCU control pulse width modulated (PWM) technology
- Programmable for Gel, AGM and Conventional Flooded batteries
- Built in regulator to prevent your battery from being overcharged. Overcharging occurs when the charge voltage is unregulated. This can result in premature battery failure
- In built regulator prevents your battery from being under charged. In the solar energy field, battery undercharging often occurs, especially on some conventional Lead Acid batteries. This unit provides an automatic equalization feature for deeply drained conventional Lead Acid and AGM batteries, as well as providing a cycling automatic equalizing feature every 28 days
- The Solar Controller can be connected to the battery permanently to keep the battery fully charged by using a process called “floating”. This means the controller will stop charging when the battery is full and will automatically start charging the battery as required. This process will also reduce water loss and help prevent the battery from ‘drying out’
- Protects the battery from discharge at night. Under low light or no light conditions the solar panel voltage could be less than the battery voltage. The unit contains a special circuit which prevents current flowing back from the battery and into the solar panel
- LCD display design, dynamically displays device’s operating data and working condition including solar/battery/load information
- Dual USB ports (5VDC/2.4A combined Max output) allow power supply charge for electronic equipment
- Remote Temperature Sensor (RTS) port built-in. Optional sensor probe available PN# EN43-TEMP (Temp compensation will be fixed at 25°c without the RTS installed).
- Multiple protections against reverse polarity, short circuit, over temperature, over voltage, etc.
- IP Rating: IP30



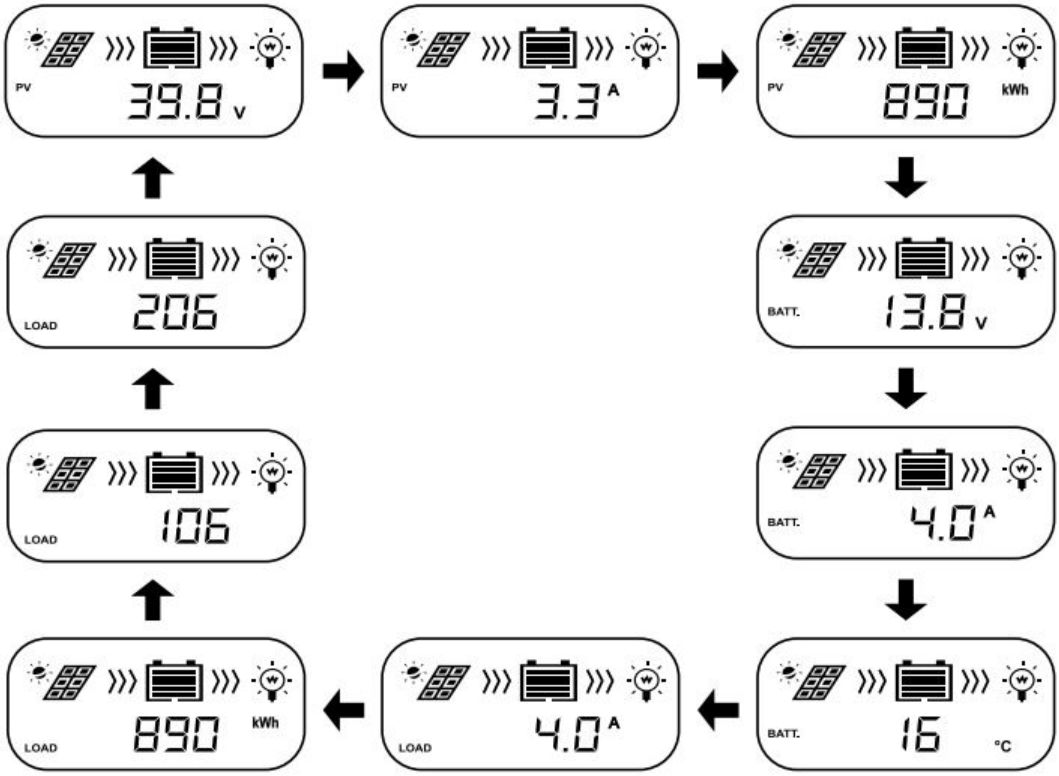
Operation: Battery Function

Button	Function
MENU Button	Browse through screens Setting parameter
SET Button	Load ON/OFF Clear error Enter into SET Mode Save data

Status Display

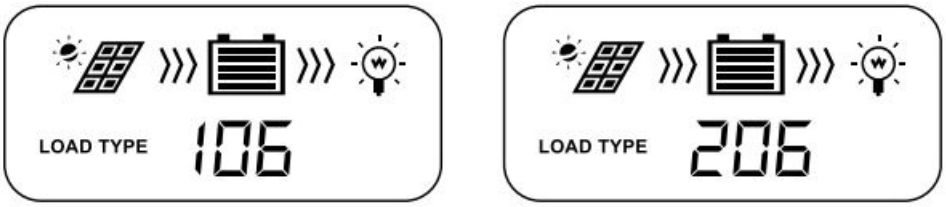
Item	Icon	Status
PV Array		Day
		Night
		Not Charging
		Charging
	PV	PV Voltage, Current, Power
Battery		Battery Capacity, In Charging
	BATT.	Battery Voltage. Current, Temperature
	BATT. TYPE	Battery Type
Load		Load ON
		Load OFF
	LOAD	Load Voltage, Current, Load Mode

Browse Interface



NOTE

1. When the unit is powered up with no solar input, the screen will automatically cycle, but the following two screens will not display.



2. Accumulative power zero clearing: Under the PV power screen, press the SET button and hold for 5 seconds and the value will blink. Press the SET button again to clear the value.
3. Setting temperature on the controller: Under the battery temperature screen, press the SET button and hold on for 5 seconds to switch between Fahrenheit or Celsius.

Fault Indication

Status	Icon	Description
Battery over discharge		Battery level shows empty, battery fr ame blink, fault icon blink
Battery over voltage		Battery level shows full, battery fram e blink, fault icon blink
Battery overheating		Battery level shows current value, ba ttery frame blink, fault icon blink
Load failure		Load overload, Load short circuit

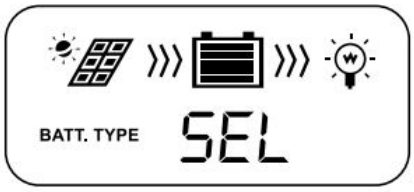
1. When the load current reaches 1.02–1.05 times 1.05–1.25 times, 1.25–1.35 times and 1.35–1.5 times more than the nominal value, the controller will automatically turn off the loads in 50s, 30s,10s and 2s respectively.

LOAD MODE SETTING Operating Steps:
Under the load mode setting screen, press the SET button and hold on for 5 seconds until the number begins flashing, then press the MENU button to set the parameter, then press the SET button to confirm.

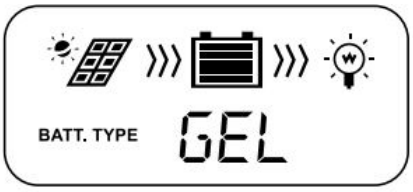
1**	Timer 1	2**	Timer 2
100	Light ON/OFF	2 n	Disabled
101	Load will be on for 1 hour after sunset	201	Load will be on for 1 hour before sunrise
102	Load will be on for 2 hours after sunset	202	Load will be on for 2 hours before sunrise
103-113	Load will be on for 3-13 hours after sunset	202 - 213	Load will be on for 3-13 hours before sunrise
114	Load will be on for 14 hours after sunset	214	Load will be on for 14 hours before sunrise
115	Load will be on for 15 hours after sunset	215	Load will be on for 15 hours before sunrise
116	Test mode	2 n	Disabled
117	Manual mode (default load on)	2 n	Disabled

NOTE: Please set the Light ON/OFF, Test mode and Manual mode via Timer 1. Timer 2 will be disabled and display “2 n”.

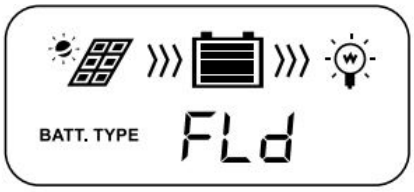
BATTERY TYPE Operating Steps:
Under the Battery Voltage screen, press the SET button and hold for 5 seconds to enter the Battery Type Menu. Choose the battery type by pressing the MENU button, and then press the SET button to select the chosen battery type.



1. Sealed (AGM)



2. GEL



3. FLOODED (default)

NOTE: Please refer to the battery voltage parameters table for the different battery type.

Protection

Protection	Conditions	Status
PV Reverse Polarity	When the battery is connected correctly, the PV Polarity can be reversed.	The controller is not damaged
Battery Reverse Polarity	When the battery is not connecting, the Battery Polarity can be reversed.	The controller is not damaged
Battery Over Voltage	The battery voltage is above the OVD	Stop charging
Battery Over Discharge	The battery voltage is below the LVD	Stop discharging
Battery Over Heating	Temperature sensor is higher than 65˚C	Output is OFF
	Temperature sensor is higher than 55˚C	Output is ON
Controller Over Heating	Temperature sensor is higher than 85˚C	Output is OFF
	Temperature sensor is higher than 75˚C	Output is ON
Load Short Circuit	Load current 2.5 times the rated current one short circuit, the output is OFF 5s; Two short circuit, the output is OFF 10s; Three short circuit, the output is OFF 15s; Four short circuit, the output is OFF 20s; Five short circuit, the output is OFF 25s; Six short circuit, the output is OFF	Output is OFF. Clear the fault: REST ART the controller or wait for one night-cycle (night time>3 hours)
Load Overload	Load current 2.5 times rated current 1.02-1.05 times, 50s, 1.05-1.25 times, 30s, 1.25-1.35 times, 10s, 1.35-1.5 times 2s	Output is OFF. Clear the fault: REST ART the controller or wait for one night-cycle
Damaged RTS (Temp Sensor)	If the RTS is either short circuited or damaged	Controller will operate at a standard 25˚C

Troubleshooting

Faults	Possible Reasons PV array disconnection	Troubleshooting
Cable connection is correct, LCD Screen not displayed	1). Battery voltage is lower than 9V	1). Please check the voltage of battery At least 9V is required to activate the controller 2). Check the PV input voltage which should be higher than the battery voltage
Icon blinking 	Battery over voltage	Check if the battery voltage is higher than the OVD (over voltage disconnect voltage) point, and disconnect the PV
Icon blinking 	Battery over discharged	When the battery voltage is restored to or above LVR (low voltage reconnect voltage) point, the load will recover
Icon blinking 	Battery over heating	
Icon blinking 	Over load or short circuit	Reduce the output loads and/or check load terminal connections

Specifications

Item	EN43020	EN43030
Nominal system voltage	12/24 VDC	12/24 VDC
Battery input voltage range	9V ~ 32V	9V ~ 32V
Rated charge/discharge current	20A@55˚C	30A@55˚C
Max. PV open circuit voltage	12V – 25VOC/24V – 50VOC	
Battery type	Sealed (Default) / Gel/ Flooded	
Bulk/Absorption Charging Voltage	Sealed: 14.4V/ Gel:14.2V/ Flooded 14.6V	
Equalize Charging Voltage	Sealed: 14.4V/ Gel:14.2V/ Flooded 14.8V	
Float Charging Voltage	Sealed/ Gel/ Flooded: 13.8V	
Low Voltage Reconnect	Sealed/ Gel/ Flooded:12.6V	
Low Voltage Disconnect	Sealed/ Gel/ Flooded:11.1V	
Self consumption	12V; 18mA/24 V; 14.5mA	
	-18mV/°C >25°C@12V / -36mV/°C >25°C@24V	
Charge circuit voltage drop	0.29V	
Discharge circuit voltage drop	0.16V	
LCD temperature range	-20˚C+70˚C	
Working environment temperature (Controller will produce 100% output at 55˚C)	-25˚C+55˚C	
Relative humidity	95% N.C.	
Enclosure	IP30	
Grounding	Common Positive	
USB output	5VDC/2.4A (Total)	
Overall dimension	160 x 95 x 50mm	181 x 101 x 60mm
Mounting dimension	148 x 70mm	172 x 80mm
Mounting hole size	Ø4.5mm	Ø5.0mm
Terminals		
Net weight	0.35kg	0.55kg

Warranty Statement

2 Year Limited Warranty
Our goods come with guarantees that cannot be excluded under the Australian Consumer Law. You are entitled to a replacement or refund for a major failure and for compensation for any other reasonably foreseeable loss or damage. You are also entitled to have the goods repaired or replaced if the goods fail to be of acceptable quality and the failure does not amount to a major failure.

The limited warranty program is the warranty that applies to all Enerdrive products, and it sets forth all the responsibilities of Enerdrive. There is no other warranty, other than those described herein. Any implied warranty of merchantability of of this warranty.
This Enerdrive product is warranted, to the original purchaser only (proof of purchase is required), to be free of defects in materials and workmanship for two years from the date of purchase* without additional charge. The warranty does not extend to subsequent purchasers or users other than OEM applications.
This Enerdrive product is not intended for commercial use. This warranty does not apply to damage to units from misuse or incorrect installation/connection. Misuse includes wiring or connecting to improper polarity power sources.

3 Year Pro Rata Support Program
years of support with our pro-rata service program. In the event of an out of warranty product issue we can upgrade you with a new product for a fraction of the new price. With repair on many products becoming harder and harder these days, this program provides our customers with the greatest peace of mind possible.

Return and/or Repair Policy
If you are experiencing any problems with your unit, please contact our customer service department at **support@enerdrive.com.au** or Phone 1300 851 535 before returning product to retail store. After speaking to a customer service representative, if products are deemed non-working or malfunctioning, the product may be returned to the purchasing store within 30 days of original purchase. Any defective unit that is returned to Enerdrive within 30 days of the date of purchase will be replaced free of charge.
If such a unit is returned more than 30 days but less than two years from the purchase date, Enerdrive will repair the unit or, at its option, replace it, free of charge. If the unit is repaired, new or reconditioned replacement parts may be used, at manufacturer's option. A unit may be replaced with a new or reconditioned unit of the same or c omparable design. The repaired or replaced unit will then be warranted under these terms for the remainder of the warranty period. The customer is responsible for the shipping charges on all returned items back to Enerdrive.

Limitations
This warranty does not cover accessories, such as adapters and batteries, damage or defects result from normal wear and tear (including chips, scratches, abrasions, discolouration or fading due to usage or exposure to sunlight), accidents, damage during shipping to our service facility, alterations, unauthorized use or repair, neglect, misuse, abuse, failure to If your problem is not covered by this warranty, contact our Support Team at s**upport@enerdrive.com.au** or phone 1300 851 535 for general information if applicable.

Service Contact Information
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Fax: 07 3390 6911
Email: **support@enerdrive.com.au**
www.enerdrive.com.au

Documents / Resources

	**ePOWER EN4302030 Smart Automatic 12/24 Volt Pwm Solar Controller 4 Stage Charging** [pdf] Owner's Manual EN4302030 Smart Automatic 12 24 Volt Pwm Solar Controller 4 Stage Charging, EN4302030, Smart Automatic 12 24 Volt Pwm Solar Controller 4 Stage Charging, Controller 4 Stage Chargin g

References

- Enerdrive Independent Power Solutions - Enerdrive Independent Power Solutions