

REDMAX

RM30ASC

**12/24V MPPT
Solar Charge Controller**



User Manual

WARNINGS

- Do not disassemble the controller.
- Batteries can be dangerous. Ensure no sparks or flames are present when working near batteries.
- Eye protection should always be used.
- Given sufficient light, solar panels always generate energy even when they are disconnected.
- Never short circuit the battery. Accidental 'shorting' of the terminals or wire can result in sparks, causing personal injury or a fire hazard. We recommend that you cover the solar panel(s) with a dark cloth or blanket during the installation. This will ensure that no damage is caused to the panel, battery or the controller if the wires are accidentally short circuited.
- Always install a fuse on each circuit, including the solar controller.
- Do not reverse connect the wires to the solar panel or battery.

MAINTENANCE

- Clean only using a damp cloth.
- Ensure terminals are not loose.
- Replace any damaged cables.

PRODUCT FEATURES

- 100V maximum Solar Panel input voltage
- Latest Maximum Power Point Tracking (MPPT) algorithm with 99.5% efficiency
- Selectable charge algorithms for:
 - Lithium**
 - LFP (Lithium Iron Phosphate)
 - LTO (Lithium Titanate)
 - LCO (Lithium Cobalt Oxide)
 - Lead**
 - Gel
 - AGM (Absorbent Glass Mat)
 - Wet (Conventional Flooded)
 - Calcium
 - Lead Crystal
- Protection against over/under charging, short circuit, reverse polarity and over temperature
- Automatically detects 12V and 24V DC systems
- LED status bar indicates solar and battery status
- LCD information display to view/edit parameters, view solar and battery status including fault codes
- Monitor & control via the **REDMAX Connect App**



RM30ASC SPECIFICATIONS

OPERATION

Case Material	Polycarbonate
Ingress Protection	IP43
Weight	1.2kg
Input Voltage Range	15 - 100V DC
Maximum Input Voltage	100V
Nominal Solar Panel (PV) Power Rating (12 / 24V)	440W / 880W
Minimum Operating Voltage	8V
Standby Current (i.e. at night)	10mA ± 0.5mA
Power Terminal Maximum Wire Size	12AWG
Operating Temperature	-25°C to 50°C
Storage Temperature	-40°C to 85°C
Operating Humidity	0 - 85% RH

PROTECTION

Reverse Polarity, Short Circuit, Over Voltage	Yes
Reverse Current Protection to Solar Panel	Yes
Over Temperature during charging	>65V°C

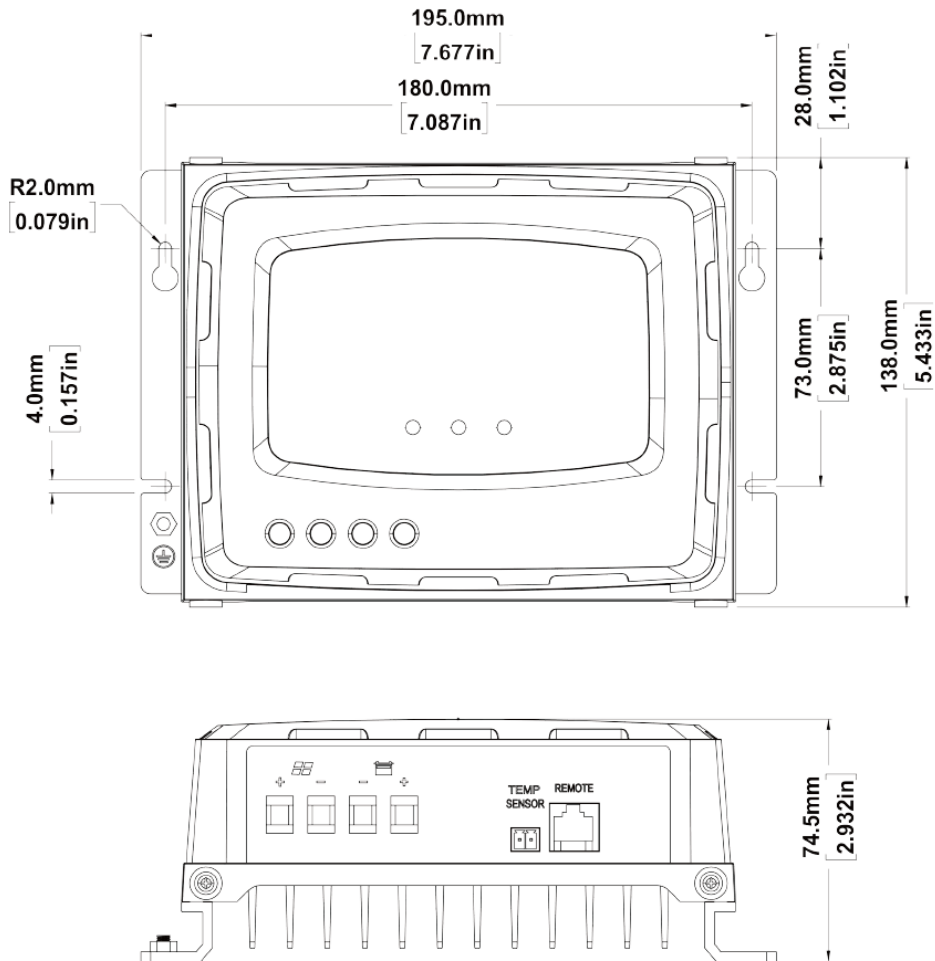
CHARGING

System Voltage		12V	24V
Maximum Current Output		30A	30A
Minimum Battery Voltage		5V	10V
Soft Start Voltage Range		5V - 10V	10V - 20V
Soft Start Charge Current (50% Duty Cycle)		15A	15A
Bulk - Maximum Current up to:		30A	30A
Absorption Voltage	LCO (CV1 / CV2)	12.3 - 12.6V	24.6 - 25.2V
	LTO (CV1 / CV2)	13.5 - 14.0V	27 - 28V
	LFP (CV1 / CV2)	14.0 - 14.2V	28 - 28.4V
	Gel	14.1V	28.2V
	AGM	14.4V	28.8V
Lead Crystal (CV1 / CV2)	Wet	14.7V	29.4V
	Calcium	14.9V	29.8V
	Custom	13.2 - 15.5V	26.4 - 31V
Maximum Absorption Charge Time (Gel, AGM, Wet, Crystal & Calcium)		4 Hours	
Maximum Absorption Charge Time (LCO, LTO & LFP)		4 Hours	
Equalise Voltage (Wet & Calcium only)		15.5V	31.0V
Equalise Voltage (Custom)		13.2 - 16.2V	26.4 - 32.4V
Equalise Time		Up to 2 Hours	
Float Voltage (LCO, LTO & LFP)		N/A	N/A
Float Voltage (Gel, AGM, Wet, Calcium & Crystal)		13.6V	27.2V
Float Voltage (Custom)		13.0 - 14.0V	26.0 - 28.0V
Restart Charge Voltage			
Gel, AGM, Wet, Calcium & Crystal		12.7V	25.4V
LCO		12.0V	24.0V
LTO		13.0V	26.0V
LFP		13.3V	26.6V
Custom		12.5 - 13.5V	25.0 - 27.0V
Battery Temperature Compensation Coefficient		-24mV / °C	
Battery Temperature Compensation Range		-20°C to 50°C	

MOUNTING THE CONTROLLER

The solar controller is designed to be mounted against a flat surface.

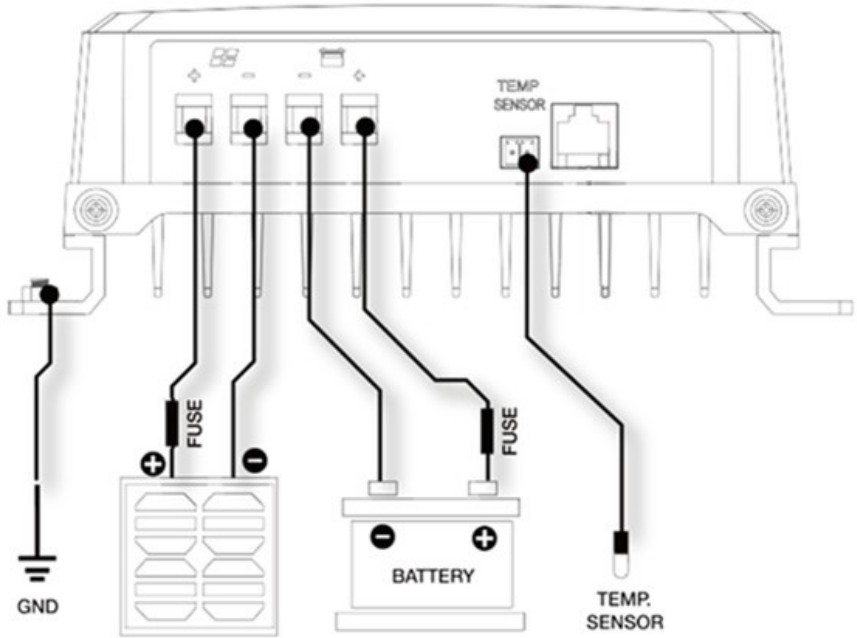
Mark mounting holes using a marker and attach unit to the wall or vertical surface using mounting holes and 4x fasteners.



WIRING CONNECTIONS

To protect the battery and the solar panel wiring, it is recommended that you place a **40A** inline fuse on the positive wire for both the solar and battery circuits. Each fuse should be located as close as possible to the battery/solar panel.

The solar charge controller has 4 terminals which are clearly marked 'Solar' and 'Battery'. There is a positive and negative terminal for each circuit. Refer to the wiring diagram as shown below.



WIRE SELECTION

To minimise any voltage drop, use the table below to choose the correct wire gauge for installation. Total wire length is the length of one wire measured from the solar panel to the charge controller to the battery.

Total Wire Length	Less than 3m	3m - 6m	6m - 9m	9m - 12m
Minimum Wire Gauge	12AWG	10AWG	8AWG	6AWG

CONNECTION

1. Loosen the 4 terminal screws on the solar controller
2. Remove the outer insulation from each wire and connect it to the correct terminal on the bottom of the solar controller. Tighten the terminal screws. Positive wires should be red and negative wires should be black.
3. If the wire size is too large to fit the terminal, use a ferrule connector.
4. When the connections are complete and the solar panel is exposed to the sun, the solar charge controller will begin operating automatically using the default settings.



Single Wire Ferrule Connector

OPERATION - LCD DISPLAY

As the controller powers on, the unit will complete the self-check process. The LCD will display the below items before beginning the charging process.

8888

Self-test starts, digital meter segments test

6002

Software version test

12V 30A

System battery voltage and current test

SETTING BATTERY VOLTAGE

Press and hold the **SET UP** button for 3 seconds to display the **System Battery Voltage** setting. Press **PV / +** or **BATT / -** to select your desired system battery voltage (12V, 24V or AUTO). Press the **SET UP** button again to confirm the setting.

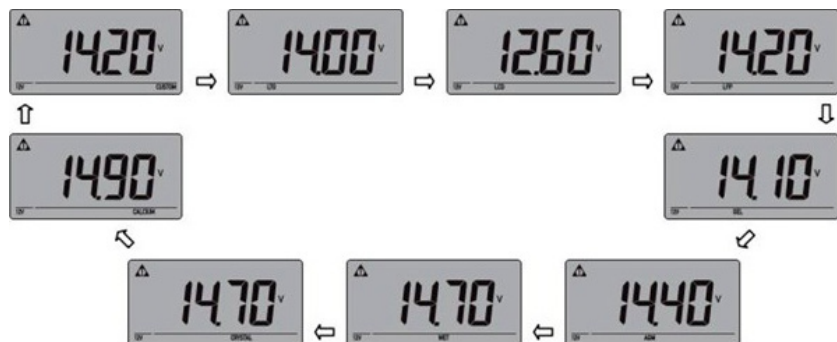
Display sequence shown below:



The controller will remember your chosen setting. If AUTO is selected, the controller automatically detects whether the connected battery is 12V or 24V.

SETTING BATTERY CHARGE PROFILE

Press the **SET UP** button to display the **Battery Type** screen, allowing you to change your battery type. The selected profile is displayed on the LCD (default: **AGM**). Press the **PV / +** or **BATT / -** buttons to navigate to the required profile then press the **SET UP** button to select your profile.



CUSTOM PROFILE SETTINGS

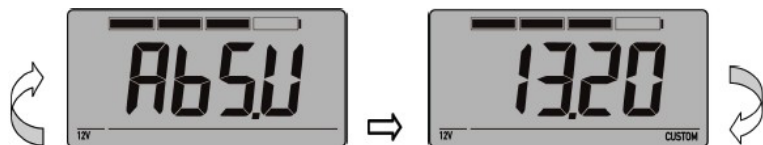
The solar controller has a **CUSTOM** charge profile that will allow you to customise the **Absorption** voltage and duration, **Equalisation** voltage, duration and cycle, as well as **Float** voltage and **Reset** voltage parameters.

WARNING:

When setting a custom profile for the charger, please ensure you follow the battery manufacturer recommendations. Incorrect settings may result in irreparable damage to the battery and/or the charger.

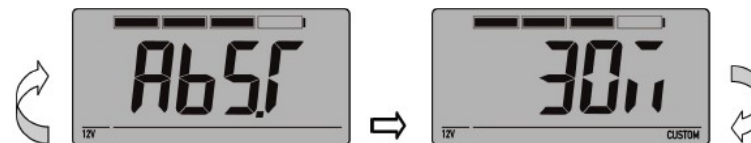
Maximum Absorption Voltage

To set the maximum charge voltage (Bulk & Absorption), scroll through the display to Absorption Voltage (**AbS.U**). Use the **PV / +** or **BATT / -** buttons to adjust the voltage in 0.05V increments between 13.20V and 15.50V. Press the **SET UP** button to confirm the voltage and move onto the **Absorption Duration** setting.



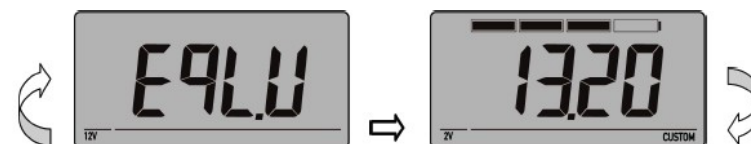
Maximum Absorption Duration

To set the maximum absorption time, scroll through the display to Absorption Duration (**AbS.T**). Use the **PV / +** or **BATT / -** buttons to adjust the voltage in 5-minute increments between 5 and 500 minutes. Press the **SET UP** button to confirm the voltage and move onto the **Equalisation Voltage** setting.



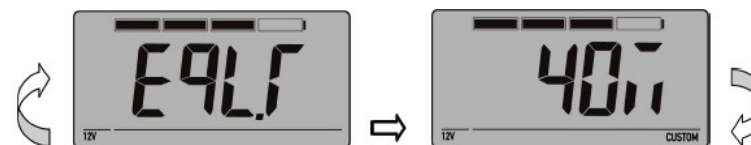
Maximum Equalisation Voltage

To set the maximum voltage that will be reached during Equalisation, scroll through the display to Equalisation Voltage (**EqL.U**). Use the **PV / +** or **BATT / -** buttons to adjust the voltage in 0.05V increments between 13.20V and 16.20V. Press the **SET UP** button to confirm the voltage and move onto the **Equalisation Time** setting.



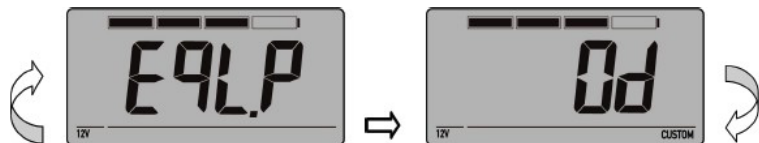
Maximum Equalisation Duration

To set the maximum Equalisation time, scroll through the display to Equalisation Time (**EqL.T**). Use the **PV / +** or **BATT / -** buttons to adjust the voltage in 5-minute increments between 5 and 500 minutes. Press the **SET UP** button to confirm the voltage and move onto the **Equalisation Cycle** setting.



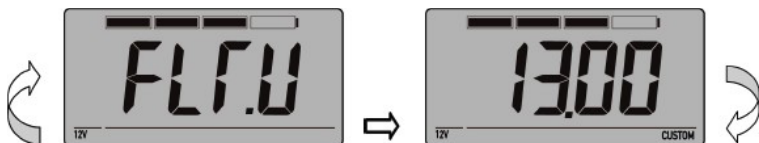
Equalisation Period

To set the delay period (days) before equalising the battery, scroll through the display to Equalisation Period (**EqL.P**). Use the **PV / +** or **BATT / -** buttons to adjust the voltage in **1-day** increments between **0** and **100 days**, where **0** equals **no Equalisation**. Press the **SET UP** button to confirm the voltage and move to the **Float Voltage** setting.



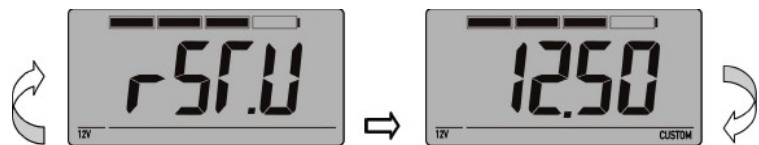
Float Voltage

To set the float voltage, scroll through the display to Float Voltage (**FLT.U**). Use the **PV / +** or **BATT / -** buttons to adjust the voltage in **0.05V** increments between **13.0V** and **14.0V**. Press the **SET UP** button to confirm the voltage and move to the **Restart Charge Voltage** setting.



Restart Voltage

To set the minimum voltage that is required to restart the charging process, scroll through the display to Restart Voltage (**rST.U**). Use the **PV / +** or **BATT / -** buttons to adjust the voltage in **0.05V** increments between **12.50V** and **13.50V**. Press the **SET UP** button to confirm the voltage and store all settings.

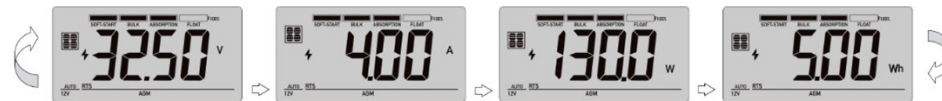


VIEW LIVE DATA

The following displays will allow you to view live data from the system, including PV/Battery Voltage, PV/Battery Charge Current, PV Power, PV kWh, Battery Charged Capacity and Battery Temperature.

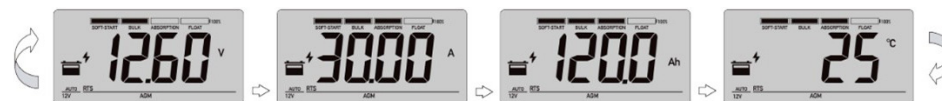
Solar Parameter Display

Press the **PV / +** button to cycle through the live solar parameters, including Panel Voltage, Current, Power and kWh.



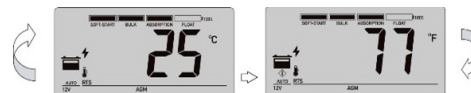
Battery Parameter Display

Press the **BATT / -** button to cycle through the live battery parameters, including Battery Voltage, Charging Current, Charged Capacity (Ah) and Battery Temperature (if external temperature sensor is connected).



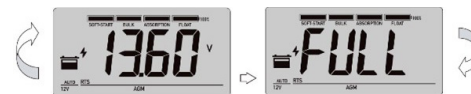
Alternate Temperature Scale

Press the **SET UP** button to change between Celsius (°C) and Fahrenheit (°F).



Fully Charged Battery

When the battery is fully charged, the LCD display will alternate between the **FUL** and the current **Battery Voltage**.



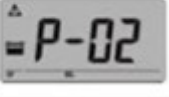
You can also monitor the charging status of the battery using the 4-bar scale at the top of the LCD display. This is set in 25% increments from 0% to 100%.

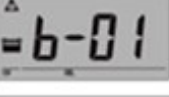
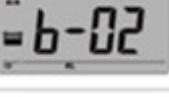
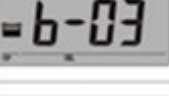
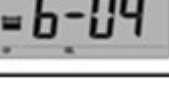


OPERATION - LED INDICATORS

LED indications						
LED Color	GREEN	BLUE	WHITE	WHITE	WHITE	WHITE
Soft-Start	ON	FLASH	FLASH	OFF	OFF	OFF
Bulk charge	ON	ON	ON	FLASH	OFF	OFF
Absorption / Equalization	ON	ON	ON	ON	ON	FLASH
Float charge	ON	OFF	ON	ON	ON	ON

OPERATION - ERRORS

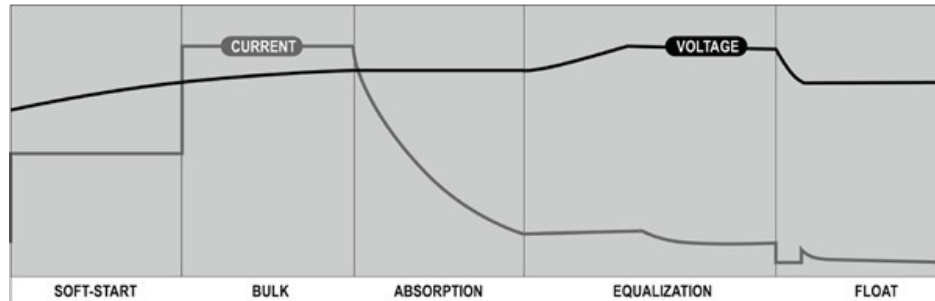
Solar panel abnormal mode	LCD display	LED indication	LCD backlight
Solar panel weak <15V		    	ON
		Flash ON	
Solar panel reverse connection		    	Flash
		Flash ON	
Solar panel over voltage (> 95V)		    	Flash
		Flash ON	

Battery abnormal mode	LCD display	LED indication	LCD backlight
Solar panel is connected, battery disconnected		   	Flash
		Flash	
Battery reverse connection		   	Flash
		Flash	
Battery over voltage than > 17V		   	Flash
		Flash Flash Flash Flash	
Battery temperature over 65℃		   	Flash
		Flash Flash Flash Flash	

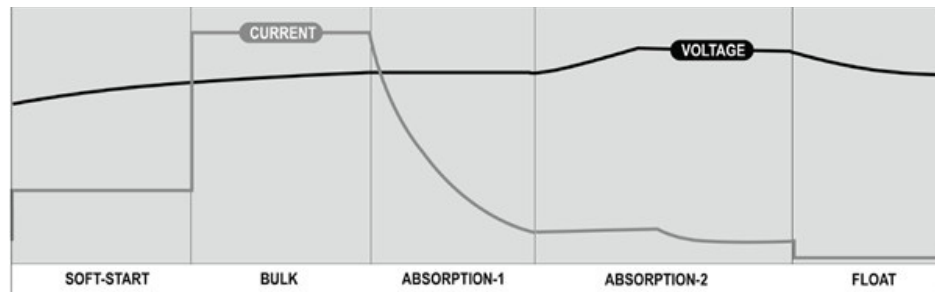
The controller over temperature protection		   	Flash
		On	

CHARGING STAGES

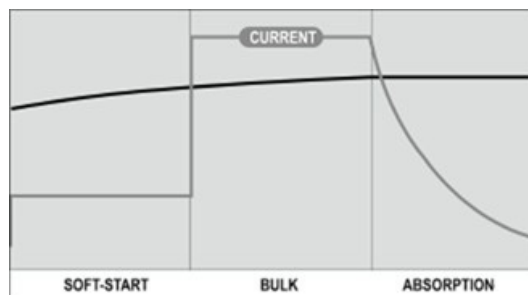
Lead Acid Batteries (Wet, Calcium, AGM & Gel)



Lead Crystal Batteries (Crystal)



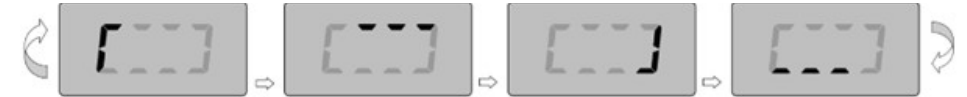
Lithium Batteries (LCO, LFP & LTO)



Soft Start

If the battery has been over-discharged, the controller will apply a small current to increase the voltage up to 10V.

Lithium: The controller checks the initial battery voltage to determine whether it starts a Soft Charge or Bulk Charge. The controller will pulse a signal to the battery to activate the BMS. IF the battery has been over discharged, you can override this by pressing the **BATT / -** button for 3 seconds. During this activation the LCD display will display as below:



Bulk Charge

Charges at maximum current until the battery reaches the Maximum Absorption Voltage for the selected battery type.

Absorption

Constant voltage charging with reducing current until the battery is charged for Lead Acid batteries, or close to fully charged with Lithium batteries.

Lead Crystal: The controller will use a two-step Absorption charge. The first stage will increase the voltage to 14.4V. The second stage will increase the voltage to 14.7V at 10% of the bulk charge rate.

Equalisation

Only for Wet and Calcium batteries. When the battery has been discharged below 10V or every 28 days, the controller will automatically run the equalisation stage. This helps restore battery function by removing stratification.

Float or Restart

Battery is fully charged and maintained at a safe level.

For **Lead Acid** batteries (**Crystal, Gel, AGM, WET & Calcium**) if the voltage drops below 12.7V, the charger will restart the bulk charge stage.

Stop

Lithium batteries (**LCO, LTO & LFP**) will stop charging after the absorption charge has finished. The charger will restart the bulk charge stage if the battery drops below **12.0V (LCO), 13.0V (LTO) or 13.3V (LFP)**.



For more information on REDMAX products, contact
your nearest R&J Batteries branch or distributor

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