POWER & CONTROL

BATTERIES

GP-ADV-LIFEPO4-100, GP-ADV-LIFEPO4-300

EN **Battery**
Installation and Operating manual..... 3

Copyright

English

1 Important notes

Please read these instructions carefully and follow all instructions, guidelines, and warnings included in this product manual in order to ensure that you install, use, and maintain the product properly at all times. These instructions MUST stay with this product.

By using the product, you hereby confirm that you have read all instructions, guidelines, and warnings carefully and that you understand and agree to abide by the terms and conditions as set forth herein. You agree to use this product only for the intended purpose and application and in accordance with the instructions, guidelines, and warnings as set forth in this product manual as well as in accordance with all applicable laws and regulations. A failure to read and follow the instructions and warnings set forth herein may result in an injury to yourself and others, damage to your product or damage to other property in the vicinity. This product manual, including the instructions, guidelines, and warnings, and related documentation, may be subject to changes and updates. For up-to-date product information, please visit documents.dometic.com.

2 Explanation of symbols

WARNING!
Indicates a hazardous situation that, if not avoided, will result in death or serious injury.

CAUTION!
Indicates a hazardous situation that, if not avoided, could result in minor or moderate injury.

NOTICE!
Indicates a hazardous situation that, if not avoided, could result in minor or moderate injury.

Note Supplementary information for operating the product.

3 Safety instructions

WARNING! Risk of injury

- Batteries contain aggressive and caustic acids. Avoid battery fluid coming into contact with your body. If your skin does come into contact with battery fluid, wash that part of your body thoroughly with water. If you sustain any injuries from acids, contact a doctor immediately.
- When working on batteries, do not wear any metal objects such as watches or rings. Lead acid batteries can cause short circuits which can cause serious injuries.
- Only use insulated tools.
- Do not place any metal parts on the battery.
- Wear goggles and protective clothing when working on batteries. Do not touch your eyes when working on batteries.

- Do not use defective batteries.

WARNING! Health hazard
Keep the battery out of the reach of children.

CAUTION! Electrocution hazard

- Keep the battery away from water.
- Avoid short circuits.
- Avoid clothing rubbing against the battery.
- Wear antistatic clothing when handling the battery.

CAUTION! Explosion hazard

- Do not place the battery in a area with flammable liquids or gases.
- Never attempt to charge a frozen or defective battery. Place the battery in a frost-free area and wait until the battery has acclimatised to the ambient temperature. Then start the charging process.
- Do not smoke, use an open flame, or cause sparking near the engine or a battery.
- Keep the battery away from heat sources.

NOTICE! Damage hazard

- Only use rechargeable batteries.
- Prevent any metal parts from falling on the battery. This can cause sparks or short-circuit the battery and other electrical parts.
- Ensure that the polarity is correct when connecting the battery.
- Follow the instructions of the battery manufacturer and those of the manufacturer of the system or vehicle in which the battery is used.
- If the battery has to be removed, first disconnect the ground connection. Disconnect all connections and all consumers from the battery before removing it.
- Only store fully charged batteries. Recharge stored batteries regularly.
- Do not carry the battery by its terminals.

Safety precautions when handling lithium batteries

CAUTION! Risk of injury
Only use batteries with integrated battery management system and cell balancing.

NOTICE! Damage hazard

- Only install the battery in environments with an ambient temperature of at least 0 °C.
- Avoid deep discharge of the batteries.

4 Scope of delivery

Description	Quantity
Battery	1
Mounting brackets	2
#10 x 1-1/4" Sheet metal screw	14
M6x 14 mmMachine screw	2
Installation and operation manual	1

5 Target Group

The electrical power supply must be connected by a qualified electrician who has demonstrated skill and knowledge related to the construction and operation of electrical equipment and installations, and who is familiar with the applicable regulations of the country in which the equipment is to be installed and/or used, and has received safety training to identify and avoid the hazards involved.

6 Intended use

The device is intended to be used as a storage of electrical power for motorhomes, RVs, camping and marine applications.

This product is only suitable for the intended purpose and application in accordance with these instructions.

This manual provides information that is necessary for proper installation and/or operation of the product. Poor installation and/or improper operating or maintenance will result in unsatisfactory performance and a possible failure.

The manufacturer accepts no liability for any injury or damage to the product resulting from:

- Incorrect assembly or connection, including excess voltage
- Incorrect maintenance or use of spare parts other than original spare parts provided by the manufacturer
- Alterations to the product without express permission from the manufacturer
- Use for purposes other than those described in this manual

Dometic reserves the right to change product appearance and product specifications.

7 Technical description

The advanced LiFePO4 battery offers the desired features like charging below freezing, series connected batteries as well as bluetooth and RV-C connectivity. The batteries are equipped with a Battery Management System (BMS) which is built in the battery housing. The battery management system is a non-power consuming, passive electronic device, that protects the battery against deep discharging, overcharging, over-temperature and ensures cellbalancing of all serial switched blocks during charging. This battery has the following features:

RV-C terminal

The two connectors are for inter-battery communication via the RV-C protocol for parallel and series connecting batteries. It connects to RV-C network on an RV.

Reserve Capacity

Reserve capacity of 5 % is provided to allow users to perform emergency actions with the battery even when it is completely discharged. This is accomplished by disconnecting the battery before the battery is completely discharged.

Power Button

Button with LED for indicating and controlling the power mode of the battery.

This button will allow transition between the following modes:

Mode	LED Function	Battery Function
ON	LED is solid on	battery charge and discharge paths are both enabled and BMS power is on (Bluetooth and RV-C both active)
OFF	LED is solid off	battery charge and discharge paths are both disabled and BMS power is off (Bluetooth and RV-C both inactive)
Sleep	LED is slow flashing	battery charge path is enabled but discharge path is disabled and BMS power is on (Bluetooth and RV-C both active)
Reserve	LED is slow flashing	battery charge path is enabled but discharge path is disabled and BMS power is on (Bluetooth and RV-C both active)

Heater

There is a heater inside the battery on the bottom side of the cells. This heater is controlled by the BMS and allow the battery to be charged in ambient temperatures as low as -20 °C. The BMS implement three modes for heater control.

Mode	Heater Function
Auto	Heater is always on when battery is in sleep mode and always off when battery is in OFF mode. When battery is in ON mode the heater will only turn on when there is a charging source available that is capable of fully powering the heater.
ON	Heater always turns on when the battery internal temperature is below 2C and it stays on until the battery internal temperature is above 7C.
OFF	Heater is always off.

Real Time Clock

Real time clock is implemented on the BMS. The battery support RV-C real time clock messages for configuration of the time and date. It is broadcasted via RV-C standard messages and priority.

Capacitor Pre-Charge

Pre-charge and pre-discharge circuit in the BMS allows large capacitor banks to be charged prior to connecting the cells. This avoid damaging inrush currents.

Fault Recovery

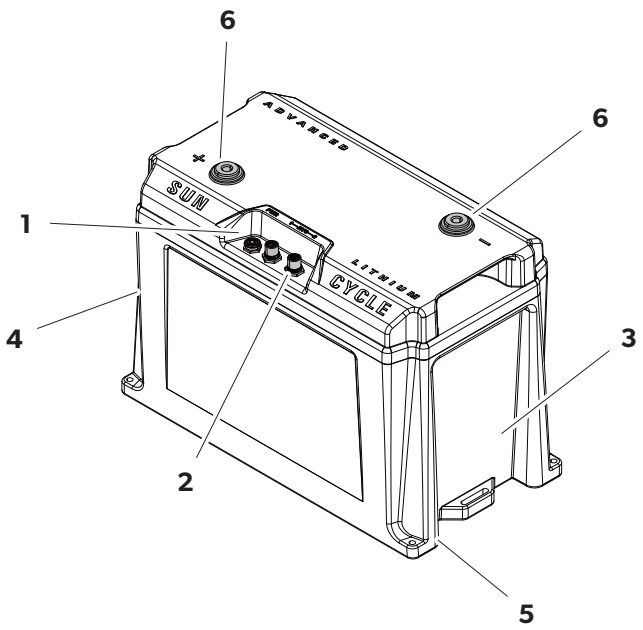
If the BMS disconnects the battery due to a fault it will reset automatically when the conditions return to normal.

For low voltage disconnect the BMS shall allow up to 10 A of current to be drawn from the battery.

8 Installation

› The 100 Ah battery has the following components:

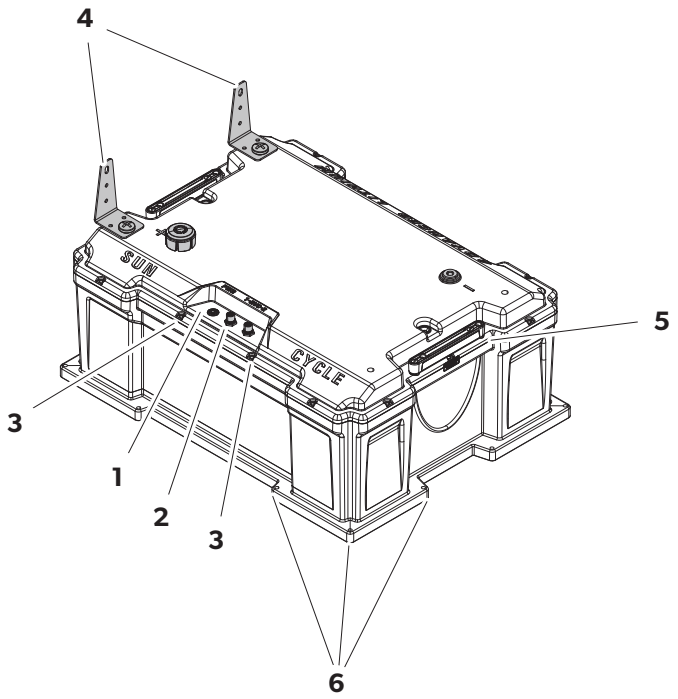
1



- 1 (power button with status LED)
- 2 (RV-C Ports)
- 3 (integrated heater for low temperature charging)
- 4 (slanted sides prevent batteries from being installed without an air gap between them for cooling)
- 5 (integrated screw holes for easy mounting. This works well for width limited enclosures)
- 6 (staggered terminals allow parallel/series connections without much wire interference)

> The 300 Ah battery has the following components:

2

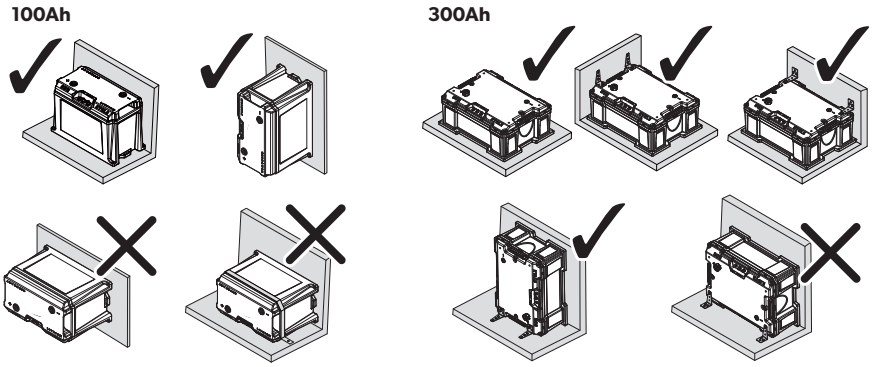


- 1 (power button with status LED)
- 2 (RV-C Ports)
- 3 (removable top lid for serviceability)
- 4 (optional brackets for easy mounting to a wall)
- 5 (handle clips in to keep it from flopping around)
- 6 ((integrated screw holes for easy mounting. This works well for width limited enclosures.)

> The batteries to be mounted as per the instructions given in the next paragraph.

Mounting Instructions

3



- Mount the battery on wall either in vertical or standing position with the screws and the mounting bracket.
- Do not mount the battery on the wall without the mounting bracket.
- Do not mount the battery on the wall with mounting bracket in horizontal position.
- Maximum of 8 batteries can be connected in parallel.
- Maximum of 4 batteries can be connected in series.

9 Configuration

- **Note Damage Hazard**
  The embedded BMS in the battery is designed for maximum 4 pieces in serial use. Do not connect more than 4 pieces of battery in series.

The batteries communicate with each other using the RV-C ports to co-ordinate balancing. Master battery total the information from the secondary batteries in a bank and relay information on behalf of the entire bank of up to 32 batteries via Bluetooth and RV-C.

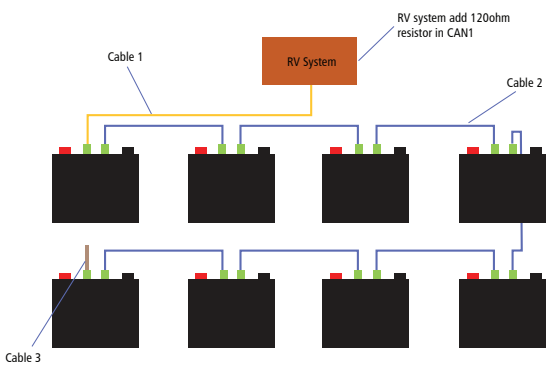
4

Cable 1 | Cable 2 | Terminating Resistor

- Inter-battery communication is handled using the three cable types.

- To connect and configure multiple batteries: - connect the RV-C wires between the batteries as shown in the below diagram
  - configure the batteries using the Go Power! Connect app
  - the master battery totals the information relayed from the secondary battery/batteries.

5



9.1 App Configuration

› Download the Go Power Connect! app.

› Add device for the GP-ADV-Lithium battery.

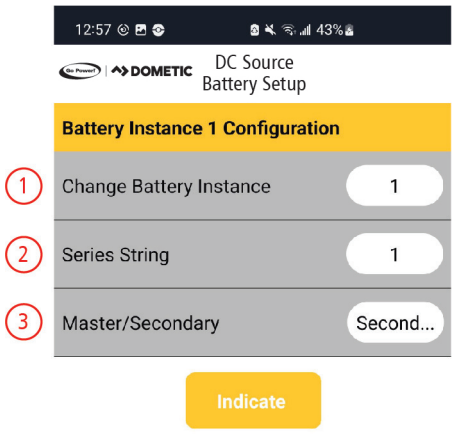
› Setup one master battery by pressing and then configure each individual battery.

› Press Indicate to blink the power LED for physical reference of the current battery configured.

› Press Setup for each individual battery to configure in series or parallel, priority, and battery instance.

› Press the Load System once each battery is configured. Changing the DC Instance will change all the batteries to match for the battery bank.

› **Note** Set the battery instance configuration through the change battery instance (master/secondary).



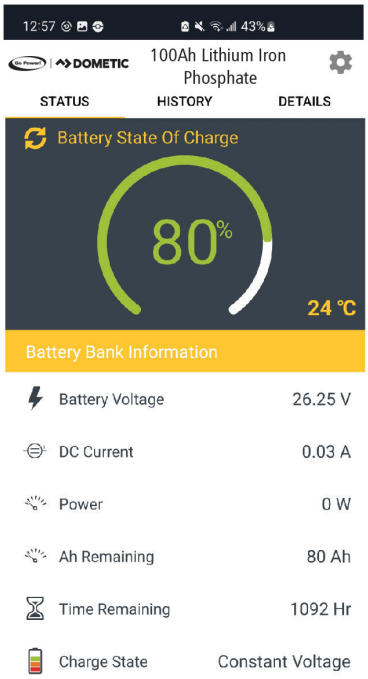
Note

1. Set the battery instance to assign different instances for each battery.
2. Batteries in series must have the same series string value. Batteries wired in parallel must be different from each other.
3. There must be only one master per DC source. All other batteries on the DC source must be in secondary.

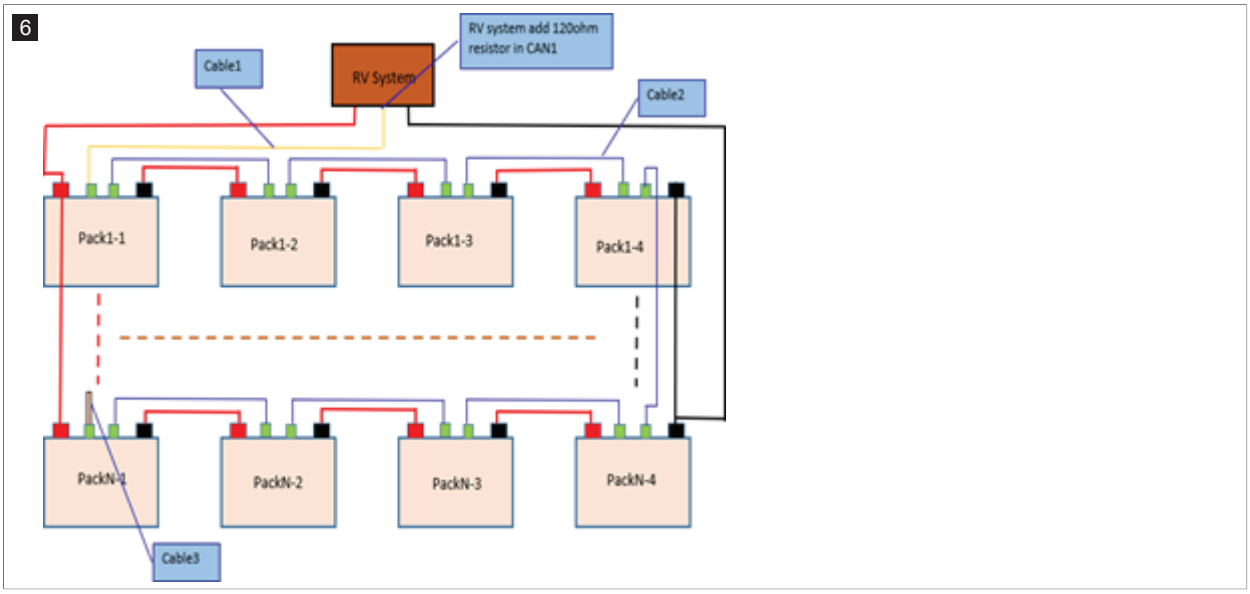
› All batteries MUST have unique battery instances. The max number of batteries in a Series can be 4, while the max number of batteries in Parallel can be 8.

› Press Load system to run the main functionalities.

› Monitor the battery voltage, DC current, power, Ah remaining, time remaining, charge state and battery temperature.



9.2 Wiring



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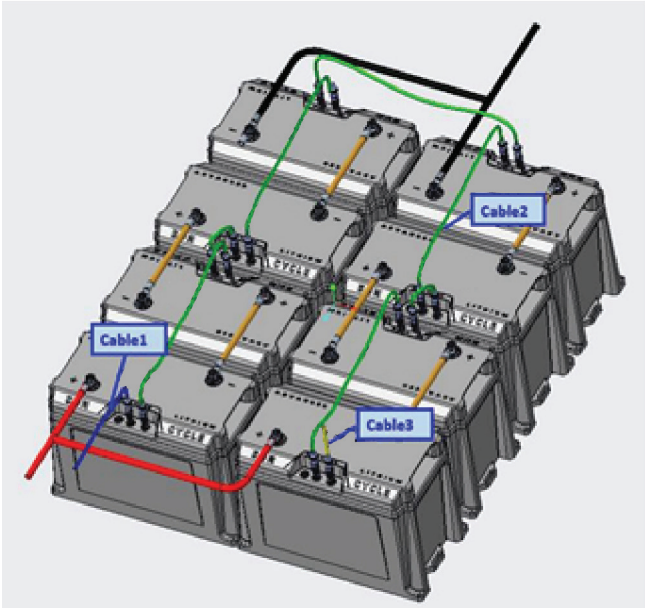


› **Note Damage Hazard**
Make sure that the batteries are in power OFF mode before connecting.

Configure the battery pack as follows:

1. Press the button 2 seconds or charge to wake up each battery pack, battery enters power ON mode and LED is solid light.
2. Fully charge each battery pack separately or the max difference voltage between battery packs is within 1 V.
3. Assign each battery pack ID one by one via CAN1 port and setting a master battery pack which communicate with UPS/ application system, other battery packs are set for secondary. Cable 2 must be installed for each battery pack followed by a Cable 3 cable on the last battery.
4. Press button on hold for more than 15 seconds to shutdown battery pack. LED will turn off.

› **WARNING! Damage hazard**
Do not hot-swap the battery pack connection with RV system unless necessary, it will cause surge current. If battery pack to be replaced, it is necessary to turn off all the battery packs by pressing the physical button of one battery pack until the LED lights of all the battery packs are off.

Refer the connection diagram to connect battery pack in serials and in parallel. Battery pack terminals and connection cable to be correctly installed and connected well with UPS/RV system.

› Then press one of the battery buttons for 2 seconds or add a charger to wake up all battery packs.

Charging

› **WARNING! Damage Hazard**

- Do not hot-swap the battery pack connection with RV system unless necessary, it will cause surge current.
- Do not charge with higher current than recommended value. It will damage the battery electrical, mechanical and safety performance and could lead to heat generation or leakage.

› Charging current should be less than maximum charging current.
› Charging voltage should be less than 14.6 V. Charging beyond this absolute maximum voltage is strictly prohibited.
› The battery should charged within the charging temperature range.
› Reverse charging is prohibited.
› The battery should be connected correctly and the polarity to be confirmed before wiring.
› In case the battery is connected improperly, the battery cannot be charged.
› The reverse charging may cause damaging to the battery which may lead to degradation of battery performance and damage the battery safety and could cause heat generation or leakage.

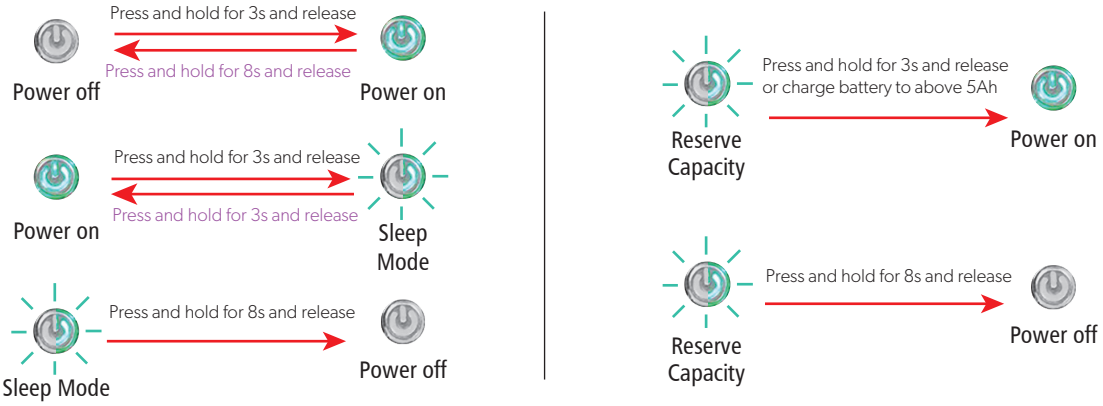
Discharging

- The battery should be discharged at less than the maximum discharge current. High discharging current may reduce the discharging capacity significantly or cause over-heat.
- The battery should be discharged within the discharging temperature range.
- To prevent over-discharging, the battery should be charged periodically to keep about 60% charge.
- Over-discharging may cause loss of battery performance, characteristics or battery functions.
- The charger prevent the battery to be further discharged beyond the end-of-discharge voltage.

9.3 Operation

Various Power Modes

Press button for more than 3 seconds and release. The battery will enter sleep mode. The LED will blink. Power off mode should only be used for long term storage or to reset the BMS. Use sleep mode to disable output power of batteries.



- **CAUTION! Electrocution hazard**

To prevent a surge current, perform a "pre-discharge" as outlined in the steps below.

Step 1 - Ensure all batteries are in Power Off mode.

Step 2 - Connect batteries following the series or parallel connection diagrams found at gopowersolar.com/advanced-lithium-wiring. Cable 2 must be installed for each battery pack followed by a Cable 3 cable on the last battery.

Step 3 - Ensure battery pack terminals are correctly installed and connected to the inverter system.

Step 4 - Press the power button on one of the battery packs for 3 seconds to wake up all battery packs from Power Off mode. The LED indicator will turn on.

Note

Batteries are in Power Off mode when unboxed. Press the Power button for 3 seconds to turn on. If it doesn't turn on, you will need to charge the battery.

The batteries need to be configured before they can be used. Please see battery manual for instructions on battery configuration.

10 Cleaning

The lithium batteries are maintenance-free. Occasionally clean the product with a damp cloth.

11 Storage

Battery is shipped in shutdown mode, and SOC is about 30% by air shipment, about 50 % SOC by sea shipment. The storage environment requirement is as follows:

Storage Temperature range °C (At 50 % SOC in shutdown mode and specified temp, recoverable capacity in % vs time/30 %)	-20 °C~25 °C ＜18 months	Max. 80 % RH
	25 °C~45 °C ＜3 months	Max. 80 % RH
	45 °C~60 °C ＜1 month	Max. 80 % RH
	20±5 °C is the recommended storage temperature	

Do a cycle test when the storage reaches 12 months in the warehouse (Based on the date of manufacture on the label). After that, the battery voltage to be checked every three months. Battery Pack Voltage ≤12 V, need to do second cycle test. And after another year,do a cycle test. Recommended battery state of charge (SOC) for storage of 100%.

12 Troubleshooting

Problem	Possible cause	Suggested remedy
Battery cannot discharge	Protection against over-temperature (cell temperature is higher than 80 °C) Protection against under voltage protection Protection against over current protection Battery output terminal is short circuit System failure	> Regulate battery pack discharge ambient temperature lower than 55 °C > Charge battery > RV discharge power is over load, should decrease discharge power. > Check the connection wire and try charge battery > Shutdown system and check the RV system function
Battery cannot charge	Protection against over voltage protection Protection against over current protection Protection against over-temperature or under- temperature (cell temperature is lower than 0 °C or higher than 60 °C) Battery output terminal is short circuit System failure	> Disconnect the charger and load discharge current for few minutes.Try again to charge the battery. > Charge is abnormal and the output current is over value. > Regulate battery pack charge ambient temperature to 5 °C … 45 °C. If charged in freezing weather, need to wait until it is heated up to 5 °C by inner heater. > Check the connection wire and try charge the battery. > Check RV system and RV charger.
Bluetooth cannot connect	Poor signal Battery pack is shutdown	> Approach RV system and try connect again. > Press physical button for 2 seconds to wake up battery pack.
RV read battery information fail	RV system CAN1 120 ohm resistor is missed or damaged Cable 1, 2 and 3 poor connection Battery pack ID is not correct	> Check the Cable1 wire and RV system CAN1 port 120 ohm resistor. > Check cable 1,2 and 3 connection. > Check the battery ID setting and refer RV-C protocol to correct battery pack ID one by one.

13 Disposal

Recycling products with batteries, rechargeable batteries and light sources: Remove any batteries, rechargeable batteries, and light sources before recycling the product. Return defective or used batteries to your retailer or dispose of them at collection points. Do not dispose of any batteries, rechargeable batteries, and light sources with general household waste. If you wish to finally dispose of the product, ask your local recycling center or specialist dealer for details about how to do this in accordance with the applicable disposal regulations. The product can be disposed free of charge.

Recycling packaging material: Place the packaging material in the appropriate recycling waste bins wherever possible.

14 Warranty

Go Power! warrants the GP-ADV-LIFEPO4-100 for a a pro-rated period of ten (10) years from the date of shipment from its factory. Please visit our knowledge base online for the pro-rates. This warranty is valid against defects in materials and workmanship for the ten (10) year warranty period. It is not valid against defects resulting from, but not limited to:

- Misuse and/or abuse, neglect or accident
- Exceeding the unit's design limits
- Improper installation, including, but not limited to, improper environmental protection and improper hook-up
- Acts of God, including lightning, floods, earthquakes, fire, and high winds
- Damage in handling, including damage encountered during shipment

This warranty shall be considered void if the warranted product is in any way opened or altered. The warranty will be void if any eyelet, rivets, or other fasteners used to seal the unit are removed or altered, or if the unit's serial number is in any way removed, altered, replaced, defaced, or rendered illegible.

Repair And Return Information

Visit www.gopowersolar.com to read the "frequently asked questions" section of our website to troubleshoot the problem. If trouble persists:

- Fill out our online Contact Us form or live chat with us
- Email techsupport@gopowersolar.com
- Return defective product to place of purchase

15 Technical data

For the below table, all items are minimum performance values and “must have” UNLESS indicated otherwise.

		100 Ah	300 Ah
Nominal voltage		12.8 V	
Nominal capacity			
Cycle life		3000-5000 cycles	
Charge		100 Ah	300 Ah
Charging temperature range		-20 °C … 55 °C	
Charging voltage		14.4 V Recommended (14.6 V max.)	
Recommended float charging voltage		14.1 V	
Recommended charging current		50 A	120 A
Allowed max charging current		100 A	200 A
Discharge			
Discharging temperature range		-20 °C … 55 °C	
Output voltage range		10 V … 14.6 V	
Max continuous discharge current		100 A max starting temp of77 °F(25 °C)	200 A starting temp of 77 °F(25 °C)
Surge discharge current		120 Afor 30m starting temp of 77 °F(25 °C)	400 A for 10m starting temp of 77 °F(25 °C)
Pulse discharge current		200 A for 5s starting temp of 77 °F(25 °C)	1000 A for 1s starting temp of 77 °F(25 °C)
Pulse discharge current		400 A for 3s starting temp of 77 °F(25 °C)	-
Low voltage end-of-discharge voltage		9.2 V± 0.1 V	
Mechanical Characteristics			
Dimensions		length: 313.9 mm	length: 498 mm
		width: 174.1 mm	width: 379 mm
		height: 221 mm	height: 206 mm
Weight		11 kg	33.1 kg
Ingress protection		IP67	
Storage			
Storage temperature & humidity range	1 Week	-20 °C … 50 °C, 45 % … 85 % RH	
	1 Month	-20 °C … 45 °C, 45 % … 85 % RH	
	6 Months	-20 °C … 40 °C, 45 % … 85 % RH	
Long term storage	If the battery needs to be stored for > 3 months the voltage should be 13.2 V(50 %SOC), and stored at the storage specifications shown above. Additionally, the battery needs at least one charge & discharge cycle every six months.		
BMS			
Balancing		balance start voltage	cell≥ 3380 mV
		balance start voltage difference	≥ 50 mV
		balance off voltage difference	≤ 30 mV
Current		charge balance current for single cell	40 mA … 50 mA
		self-discharge current (active mode)	≤ 40 mA
		self-discharge current (shutdown mode)	≤ 20 μA

	100 Ah	300 Ah
	max charge/discharge current	100 A/100 A
Over charge protection	over charge protection voltage	3.8 V±0.02 V/cell
	over charge protection delay time	2 s
	over charge release voltage	3.6 V±0.02 V/cell
Over discharge protection	over discharge protection voltage	2.3 V±0.1 V/cell
	over discharge protection delay	2 s
	over discharge release voltage	min cell voltage recover to 2.8 V±0.1 V and charging
BMS shutdown	shutdown voltage	min cell voltage <=2250mV
	shutdown time	delay 120 s
	recovery	charging or press button
Charge over current protection	charge over current protection current	120 A±5 A
	charge over current protection delay	2 s
	over charging current protection release	auto recover after waiting 30 s
Discharge over current protection	discharge over current protection current (1)	150 A±5 A
	discharge over current protection delay (1)	10 s
	over current release	auto recover after waiting 30 s
	discharge over current protection current (2)	250 A±5 A
	discharge over current protection delay (2)	5 s
	over current release	auto recover after waiting 30 s
	discharge over current protection current (3)	450 A±5 A
	discharge over current protection delay (3)	500 ms
	over current release	auto recover after waiting 30 s
Charge over temperature protection	charge high temperature protection	>60±3 °C
	charge high temperature release	<55±3 °C
	charge low temperature protection	<0±3 °C
	charge low temperature release	>5±3 °C
Discharge over temperature protection	discharge high temperature protection	>80±3 °C
	discharge high temperature release	<61±3 °C
FET over temperature protection	FET high temperature protection	>110±3 °C
	FET high temperature release	<90±3 °C
Single cell high voltage alarm	cell high voltage alarm when	max cell >=3750 mV
	alarm clear when	max cell <=3600 mV
Single cell low voltage alarm	cell low voltage alarm when	min cell <=2500 mV
	alarm clear when	min cell >=2800 mV
High temperature alarm	discharge mode:	cell max temp>=75 °Cor MOSFET temp>=105 °C
	charge mode:	cell max temp>=57 °Cor MOSFET temp>=105 °C
High temperature alarm clear		cell max temp<=55 °Cor

		100 Ah	300 Ah
			MOSFET temp<=90 °C
Low temperature alarm		min cell temp<3 °C	
Low temperature alarm clear		min cell temp>=5 °C	
Discharge current alarm		discharge current>130 A	
Discharge current alarm clear		discharge current<100 A	
Low SOC alarm		remaining capacity <7 AhOR min cell voltage<=2500 mV	
Low SOC alarm clear		remaining capacity >=7 Ah OR min cell voltage>=2800 mV	
LED		power ON mode	LED solid
		sleep mode	LED blink
		power OFF mode	LED off
Reserve mode		enter reserve mode	battery remain capacity < 5 Ah OR min cell voltage <2.5 V
		exit reserve mode	pack SOC>5 Ah AND min cell voltage >=2.5 V AND charging OR button pressed for 3 s
Communication		CANbus and bluetooth	protocol: RV-C with baud rate 250Kbs
Capacitor pre-charge		battery pack has a pre-charge function to charge bulk capacitors in inverters to avoid surge current	
Heater control	auto	ON	1) If cell temperature 0 °C<T<2 °C, battery is in power ON mode and pack terminal voltage >=13.8 V or charging current >10 A 2) If cell temperature T<0 °C, battery is in power ON mode and pack terminal voltage >=13.8 V 3) If cell temperature T<2 °C and battery is in sleep mode, heater always ON
		OFF	1) If cell temperature T<2 °C, battery is in power ON mode and pack terminal voltage <=13.5 V or discharge current for 10 s 2) If cell temperature T>=7 °C and battery is in power ON mode or sleep mode
	en-abled	ON	If cell T<2 °C
		OFF	If cell T>7 °C
	dis-abled	always OFF	

DOMETIC

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YOUR LOCAL SUPPORT

gopowersolar.com/contact-go-power

A complete list of Dometic companies, which comprise the Dometic Group, can be found in the public filings of:
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