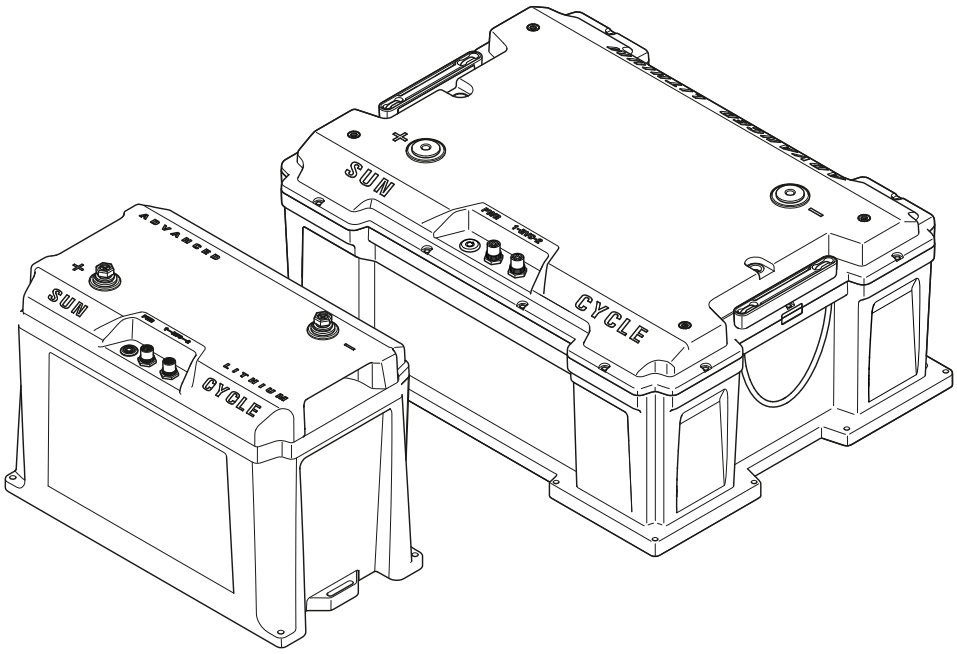
DOMETIC

MOBILE POWER SOLUTIONS

BATTERIES



LI112100 12V 100AH, LI112300 12V 300AH

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, could 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 situation that, if not avoided, can result in property damage.

NOTE Supplementary information for operating the product.

3 Safety instructions

WARNING! Risk of injury

- This battery may present a risk of fire or chemical burn if mistreated. Do not disassemble, heat above 60 °C(60 °C), or incinerate. Replace the battery with a Dometic battery of the same model only. The use of another battery may present a risk of fire or explosion.
- Do not connect the battery directly to AC power.
- In case of fire, only use dry powder fire extinguishers.
- If the battery system needs to be moved or repaired, remove all power sources to the battery and completely turn off all batteries.
- Keep out of reach of children.

CAUTION! Explosion hazard

- Do not place the battery in a location with ignition sources.
- Keep the battery away from heat sources.
- Do not connect the battery to a different type, age, size, or brand of battery.
- Do not connect the battery to a faulty or incompatible inverter.
- Only Dometic authorized technicians can open, repair, or disassemble the battery. If the factory seal is removed or broken, the warranty for the battery is void.

NOTICE! Damage hazard

- Keep the battery away from water and fire.
- This battery needs to be handled with care. Warranty is void if damaged due to any of the below conditions.
- Please read the operating manual carefully before using the battery.
- After unpacking check the product and packing list first. If the product is damaged or parts are missing, contact your dealer.
- Before installation ensure that all power sources are turned off and that all batteries are completely shut down.
- Ensure that the positive and negative cables are connect with the correct polarity and that there is no short-circuit or potential short-circuit with an external device,
- The battery's embedded battery management system is designed for a maximum of 4 series connected batteries. Do **not** connect more than 4 batteries in series.
- Ensure that the electrical parameters of the battery system are compatible with your electrical equipment and loads.
- If the battery is stored for a longer time, recharge every six months and ensure that the SOC is not less than 80%.
- The Battery needs to be recharged within 12 hours after full discharge.

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

Table 1: LI112100 12V 100AH

Description	Quantity
Battery	1
Mounting bracket	2
ST4.8 x 16 mm metal screw	4
ST4.8 x 25 mm metal screw	4
M8 x 18 mm metal screw	2
Terminal cap (red)	1
Terminal cap (black)	1
Installation and operation manual	1

Table 2: LI112300 12V 300AH

Description	Quantity
Battery	1
L shape mounting bracket	4
M6 x 12 mm metal screw	4
M8 x 18 mm metal screw	2
Terminal cap (red)	1
Terminal cap (black)	1
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 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 installation, 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 BLE and CANBUS connectivity. The battery is equipped with a Battery Management System (BMS) that 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. The battery has the following features:

Communication ports

The two connectors are for inter-battery communication for parallel and series connecting batteries.

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 allows transition between the following modes:

Mode	LED Function	Battery Function
ON	LED is lit	Battery charge and discharge paths are both enabled and BMS power is on (BLE and CANBUS both active)
OFF	LED is off	Battery charge and discharge paths are both disabled and BMS power is off (BLE and CANBUS both inactive)
Sleep	LED is slowly flashing	Battery charge path is enabled but discharge path is disabled and BMS power is on (BLE and CANBUS both active)
Reserve	LED is slowly flashing	Battery charge path is enabled but discharge path is disabled and BMS power is on (BLE and CANBUS 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 allows the battery to be charged at ambient temperatures as low as – 20 °C. The BMS implement three modes for heater control.

Mode	Heater function
Auto	The 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 a charging source, that is capable of fully powering the heater, is available and the battery's internal temperature is less than 2 °C.
ON	The heater always turns on when the battery's internal temperature is below 2 °C and it stays on until the battery internal temperature is above 7 °C.
OFF	The heater is always off.

Capacitor pre-charge

The pre-charge and pre-discharge circuit in the BMS allows large capacity banks to be charged prior to connecting the cells. This avoids damaging inrush currents.

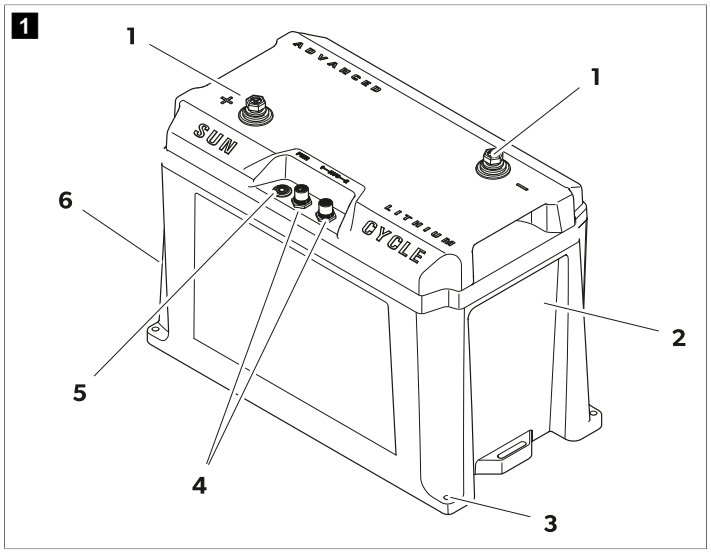
Fault recovery

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.

Components

The 100 Ah battery has the following components:



1	Battery Connections
2	Slanted sides prevent batteries from being installed without an air gap between them for cooling
3	Integrated screw holes for easy mounting. This works well for width limited enclosures
4	Communications ports (CANBUS)
5	Power button with status LED
6	Staggered terminals allow parallel/series connections without much wire interference

The 300 Ah battery has the following components:

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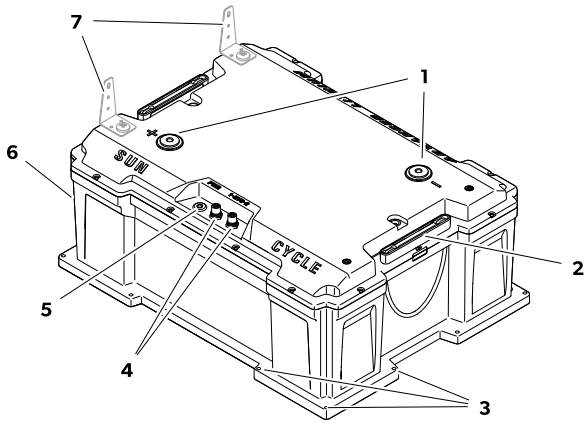

1	Battery Connections
2	Handle clips in to keep it from flopping around
3	Integrated screw holes for easy mounting Easy mounting works well for width limited enclosures.
4	Communication ports (CANBUS)
5	Power button with status LED
6	Staggered terminals allow parallel/series connections without much wire interference
7	Optional brackets for easy mounting to a wall

8 Installation

Mounting the battery

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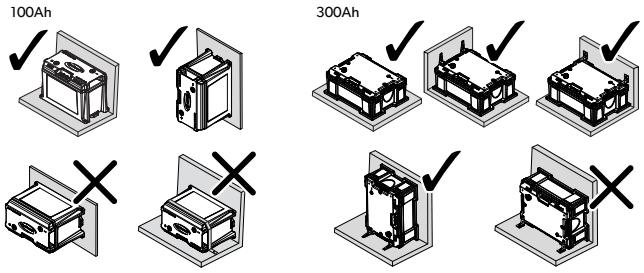

> Mount the battery either in vertical or upright position with the screws and the mounting bracket to a wall.
> Do **not** mount the battery on the wall without the mounting bracket.
> Do **not** mount the battery on the wall with mounting bracket in horizontal position.
> A maximum of 8 batteries can be connected in parallel.
> A maximum of 4 batteries can be connected in series.

Connecting multiple batteries

WARNING! Electrocution hazard
Do not hot-swap the battery pack connection unless necessary, it will cause surge current. If the battery pack needs replacement, 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.

NOTICE! Damage Hazard
The embedded BMS in the battery is designed for a of maximum 4 batteries in series. Do **not** connect more than 4 batteries in series. Ensure that the batteries are in power OFF mode before connecting.

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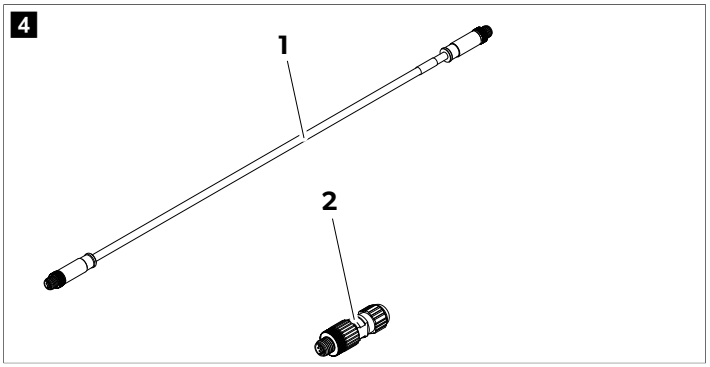

1	Inter-battery harness
2	Terminator

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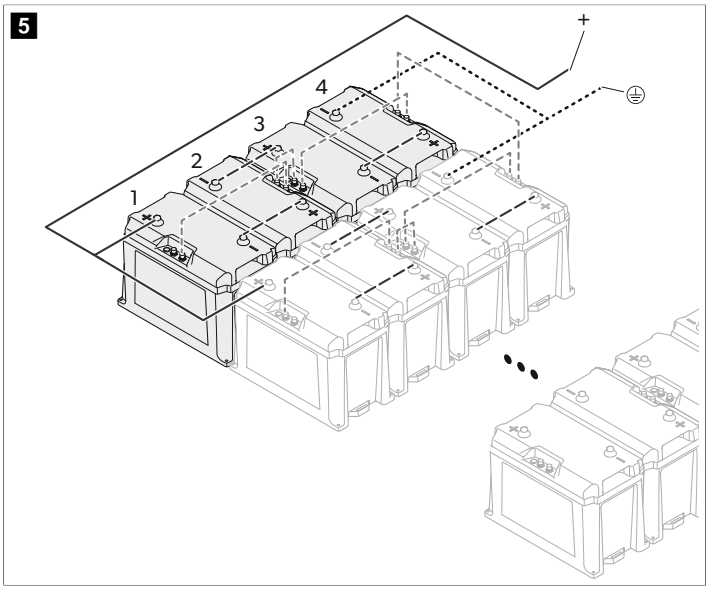

> To connect multiple batteries connect the batteries as shown.
✓ The master battery can now communicate with the secondary batteries.

Configuration

The batteries communicate with each other using the CANBUS ports to co-ordinate balancing. The master battery collects the information from the secondary batteries in the bank and relays the information on behalf of the entire bank of up to 32 batteries via BLE and CANBUS.

1. Using the Go Power! Connect app, configure the battery pack as follows:
   a) Hold down the power button for 3 s or charge to wake up each battery pack, battery enters power ON mode and LED is solid light.
   b) Fully charge each battery pack separately. Ensure the voltage difference between battery packs is within 1 V of each other.
   c) Assign each battery pack ID one by one via mobile app and setting a master battery pack which communicate with UPS/application system, other battery packs are set for slave.
   d) Press and hold power button for more than 10 s to shutdown battery pack. LED will turn off.
2. Press one of the battery buttons for 3 s or add a charger to wake up all battery packs.

9 Operation

- Batteries are in power off mode when unboxed. Press the power button for 3 s to turn on. If the battery doesn't turn on, charge the battery.
- All batteries need to be configured before they can be used.

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

Choose the power mode

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

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Preventing a surge current

2. Ensure that all batteries are in power off mode.
3. Press the power button on one of the battery packs for 3 seconds to wake up all battery packs from Power Off mode.

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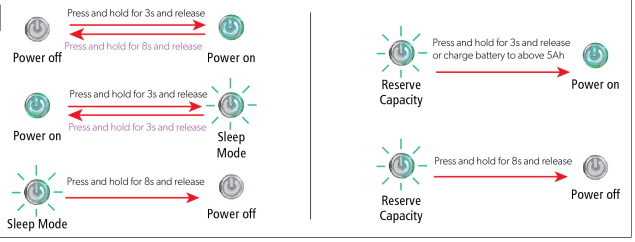

∨ The LED indicator turns on.

9.1 Using the Advanced Lithium app

1. Download the Go Power Connect! app.

2. Add a device for the GP-ADV-Lithium battery.

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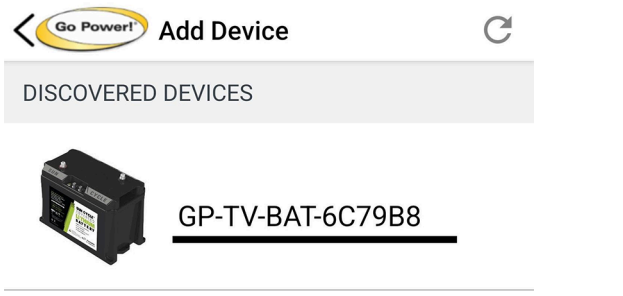

3. Setup one master battery by pressing and then configure each individual battery.
4. Press `Indicate` to blink the power LED for physical reference of the current battery configured.
5. Press `Setup` for each individual battery to configure it.
6. Press `Load System` when each battery is configured. Changing the DC Instance will change all the batteries to match for the battery bank.
7. Set the battery instance configuration through the change battery instance (master/secondary).
   a) Set the battery instance to assign different instances for each battery.
   b) Batteries in series must have the same series string value. Batteries wired in parallel must be different from each other.
   c) There must be only one master per DC source. All other batteries on the DC source must be in secondary.

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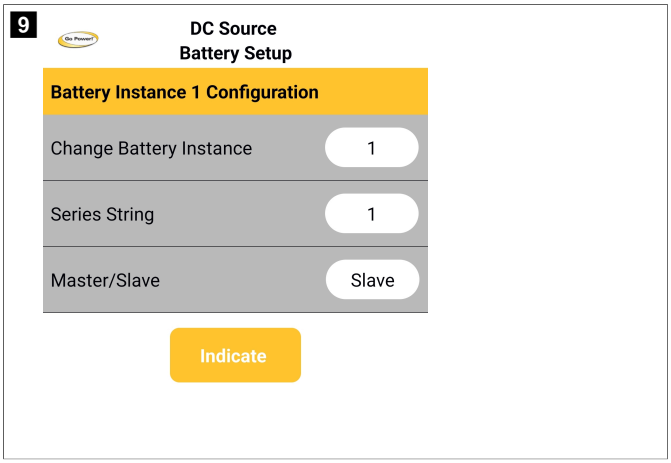

8. Press `Load` system to run the main functionalities.
9. Monitor the battery voltage, DC current, power, Ah remaining, time remaining, charge state, and battery temperature.

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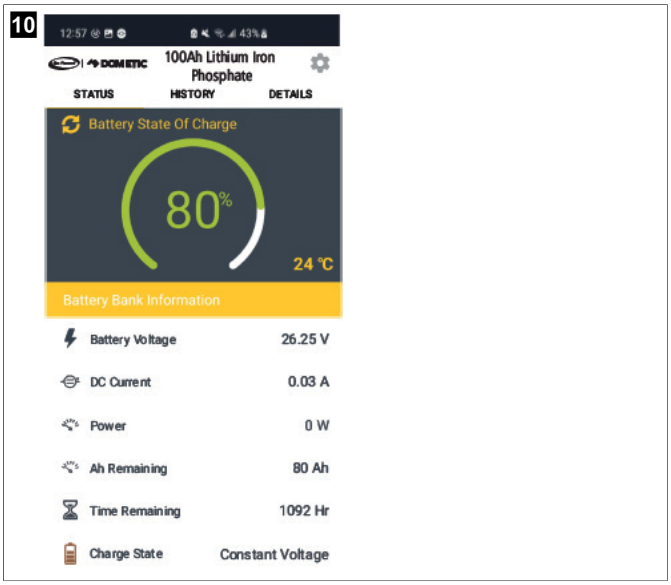

9.2 Charging

WARNING! Damage Hazard

- Do not hot-swap the battery pack connection 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 be charged within the charging temperature range.
- Reverse charging is prohibited.
- The battery should be connected correctly and the polarity should be confirmed to be correct before wiring.
- In case the battery is connected improperly, the battery cannot be charged.
- The reverse charging may cause damage to the battery which may lead to degradation of battery performance and safety, and could cause heat generation or leakage.

9.3 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 prevents the battery from discharging beyond the discharge voltage threshold.

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 ℃ (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.

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 > Boat discharge power is over load, decrease the discharge power. > Check the connection wire and try to charge the battery. > Shutdown the boat system and check the boat 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 the battery pack charge ambient temperature to 5 °C … 45 °C. If charged in freezing weather, wait until the battery pack is heated up to 5 °C by the inner heater. > Check the connection wire and try to charge the battery. > Check the boat system and the boat charger.
Mobile App cannot connect	Poor signal Battery pack is shutdown	> Approach the boat system and try to connect again. > Press the power button for 2 s to wake up the battery pack.
Boat read battery information fail	Boat system CAN1 120 Ω resistor is missed or damaged Cable 1, 2 and 3 poor connection Battery pack ID is not correct	> Check the cable 1 wire and the boat system CAN1 port 120 Ω resistor. > Check cable 1, 2 and 3 connection. > Check the battery ID setting and refer to the CANBUS protocol to correct battery pack IDs 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. Do not disassemble and do not dispose of in fire.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

Statement of Limited

We warrant to the original retail purchaser that Marine Canada Acquisition Inc. DBA Dometic (herein forward referred to as Dometic) products have been manufactured free from defects in materials and workmanship. This warranty is effective for two years from date of purchase, excepting that where Dometic products are used commercially or in any rental or income producing activity, then this warranty is limited to one year from the date of purchase.

We will provide replacement product without charge, for any Dometic product meeting this warranty, which is returned (freight prepaid) within the warranty period to the dealer from whom such product were purchased, or to us at the appropriate address. In such a case Dometic products found to be defective and covered by this warranty, will be replaced at Dometic' option, and returned to the customer.

The above quoted statement is an extract from the complete Dometic products warranty statement. A complete warranty policy is available in our Dometic products catalogue.

Return Good Procedure

Prior to returning product to Dometic under warranty, please obtain a Return Goods Authorization number (claim number).

Be sure to label the goods with:

a) the name and address of the sender, and

b) the return goods authorization number (claim number)

Please address the returned goods as follows:

From U.S.A.

RGA # ?
Dometic
c/o UPS-SCS
19308 70th Ave S.
Kent, WA 98032

From Canada

RGA # ?
Dometic
3831 No.6 Road
Richmond, B.C.
Canada V6V 1P6

Technical Support

Phone: 604-248-3858
Email: mailto:seastar@dometic.com
Hours: Monday to Friday 05:00 – 15:30 PST
Web: https://http://www.dometic.com

15 Technical data

NOTE In the table below all values are minimum performance values and "must have" unless indicated otherwise.

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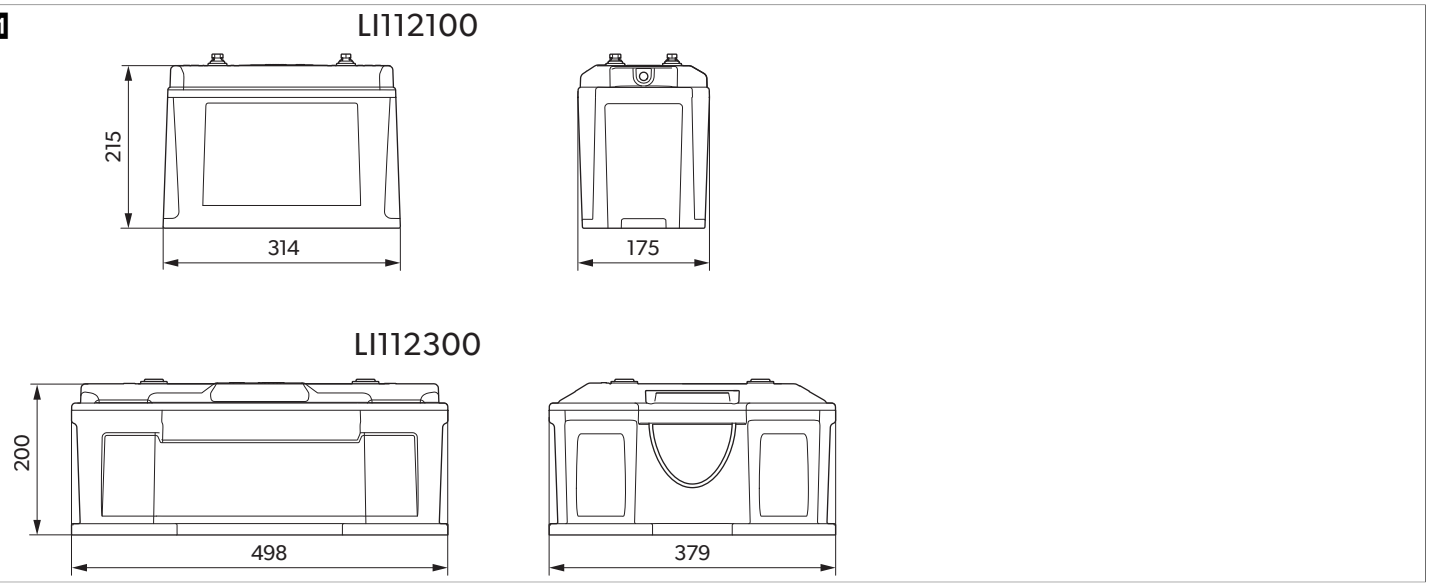

		100 Ah	300 Ah
Nominal voltage		12.8 V	
Nominal capacity		100 Ah	300 Ah
Cycle life		3000-5000 cycles	
Charge			
Charging temperature range		– 20 °C … 55 °C	
Charging voltage		14.4 V Recommended (14.6 V max.)	
Recommended float charging voltage		14.1 V	
Recommended charging current		50 A	120 A
Allowed 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	200 A
Surge discharge current		120 A for 30 min	400 A for 3 s
Pulse discharge current		200 A for 5 s	300 A for 10 min
		400 A for 3 s	400 A for 3 s
Low voltage end-of-discharge voltage		9.2 V ± 0.1 V	
Mechanical Characteristics			
Dimensions		Length: 314 mm	Length: 498 mm
		Width: 175 mm	Width: 379 mm
		Height: 215 mm	Height: 200 mm
Weight		11 kg	35 kg
Ingress protection		IP67	
Storage			
Storage temperature and 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	

		100 Ah	300 Ah
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 and discharge cycle every six months.		

BMS		**100 Ah**	**300 Ah**
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	
	Max charge/discharge current	100 A/100 A	200 A/200 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 ≤ 2250 mV	
	Shutdown time	Delay 120 s	
	Recovery	Charging or press button	
Charge over current protection	Charge over current protection current	120 A ± 5 A	250 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	300 A ± 5 A
	Discharge over current protection delay (1)	10 s	10 min
	Over current release	Auto recover after waiting 30 s	
	Discharge over current protection current (2)	250 A ± 5 A	350 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	> 115 ± 5 °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 °C or MOSFET temp ≥ 105 °C	
	Charge mode	Cell max temp ≥ 57 °C or MOSFET temp ≥ 105 °C	
High temperature alarm clear		Cell max temp ≤ 55 °C or 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	> 320 A
Discharge current alarm clear		Discharge current	< 100 A	< 290 A
Low SOC alarm		Remaining capacity < 7 Ah OR 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 BLE	Protocol: CANBUS with baud rate 250 kB/s	
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	
	Enabled	ON	If cell temperature T < 2 °C	
		OFF	If cell temperature T > 7 °C	
	Disabled	Always OFF		

DOMETIC

dometic.com

YOUR LOCAL DEALER	YOUR LOCAL SUPPORT	YOUR LOCAL SALES OFFICE
dometic.com/dealer	**dometic.com/contact**	**dometic.com/sales-offices**

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