

# CANS110N020 Information Guide

MAN0038.12

cangoee  
power

off-grid / on-grid / on-demand.



# Contents

Safety Precautions .....	2
Specifications .....	2
Quick Guide – CANS110N020 .....	3
Dimensions and Orientations.....	4
Mounting.....	4
Mounting Orientation:.....	5
Wiring Schematic: .....	5
MCP Pin Out:.....	6
Wiring Example Diagram.....	7
DCDC CHARGER.....	8
Recommended Wire Sizes and Gauges Chart .....	9
Battery Management System .....	10
Safety Tips.....	10
Longevity Tips.....	10
Tips for Use.....	10
Maintenance Tips.....	11

# Safety Precautions

## WARNING

- ❑ Avoid mechanical shock
- ❑ Do not expose the battery to fire
- ❑ Do not pierce the battery
- ❑ Do not disassemble
- ❑ Do not drill into the battery enclosure
- ❑ Do not short battery terminals
- ❑ Do not charge battery below 0°C
- ❑ Do not store below -20°C or above 60°C
- ❑ Risk of burns if misused
- ❑ Always follow safe working practices
- ❑ Installation of this device must only be carried out by appropriately qualified competent persons.
- ❑ All connections must be fused at recommended fuse ratings to avoid damage to components.
- ❑ All minimum cable gauges and maximum lengths must be followed.

# Specifications

<b>Cell Type</b>	Lithium Iron Phosphate
<b>Total Capacity</b>	110Ah
<b>Nominal Voltage</b>	12.8V
<b>Charge Voltage</b>	13.8 – 14.6V
<b>Float Voltage</b>	13.6V
<b>Charge Current</b>	100A Maximum
<b>Discharge Current</b>	100A Continuous 200A Surge
<b>DC-DC Charger</b>	20A
<b>Operating Temp</b>	0-45°C
<b>Dimensions (LxWxD)</b>	670mm x 264mm x 50mm
<b>Shunt - Victron Smart Shunt</b>	500A

# Quick Guide – CANS110N020

## 21 WAY MCP CONNECTOR

The MCP Connector is your access point to the internal features of the battery. Connection to the individual Lithium Cell voltages readings can be used for servicing the battery and fault finding.

### MCP PIN OUT:

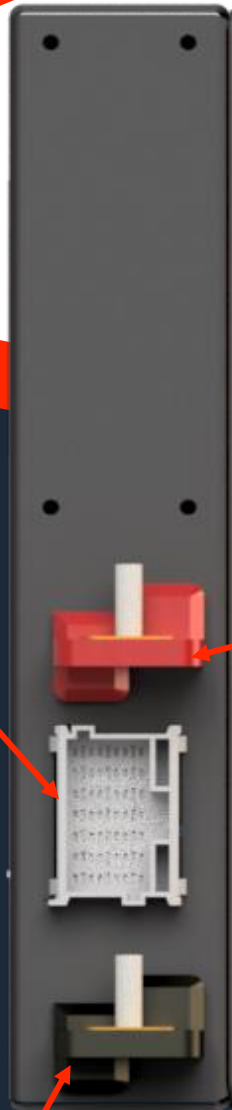
<b>PIN 15:</b>	CELL 1 -VE
<b>PIN 16:</b>	CELL 1 +VE
<b>PIN 17:</b>	CELL 2 +VE
<b>PIN 18:</b>	CELL 3 +VE
<b>PIN 19:</b>	DCDC +VE
<b>PIN 20:</b>	DCDC -VE
<b>PIN 21:</b>	IGNITION SENSE

## 12V POSITIVE STUD

M6 stud intended for 6mm lugs for load outputs and input channel to charge the battery using a lithium compatible battery charger.

**Charge Current:**  
100A MAX

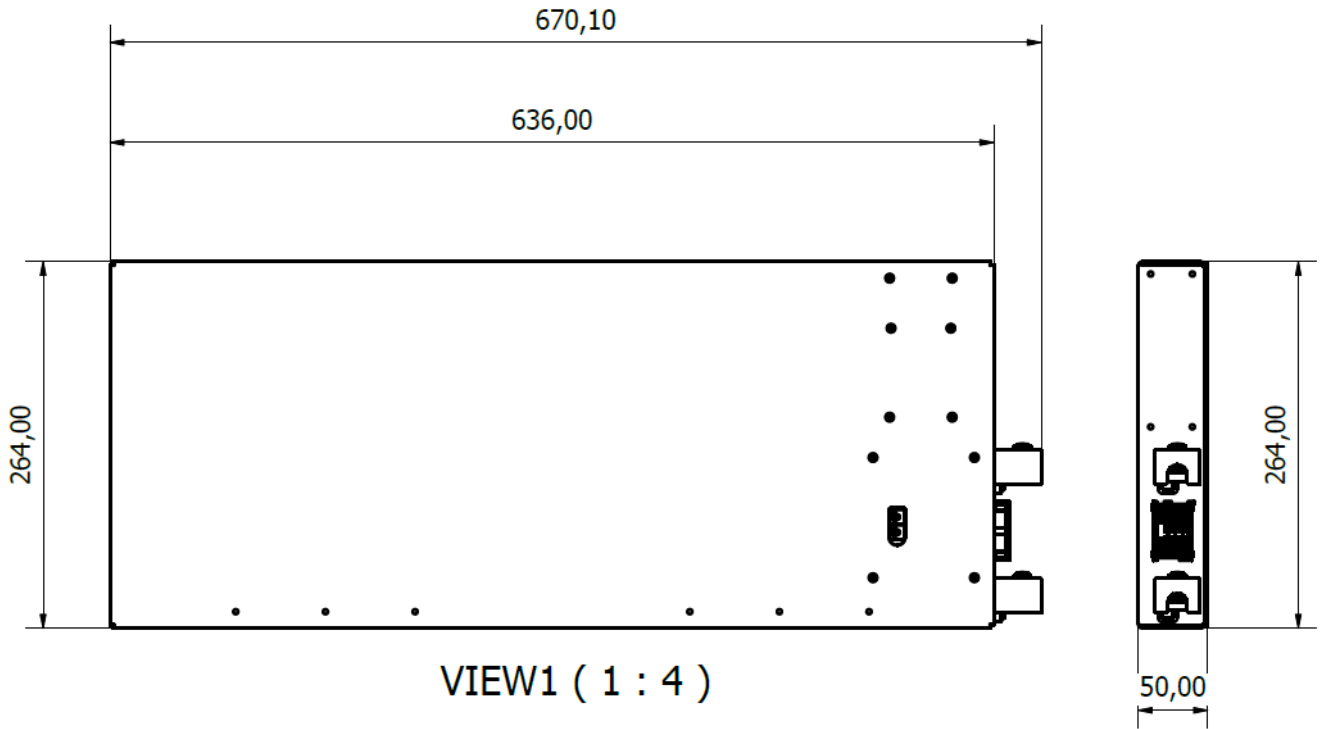
**Discharge Current:**  
100A continuous  
200A surge (1 secs @  
25 Degrees Ambient)



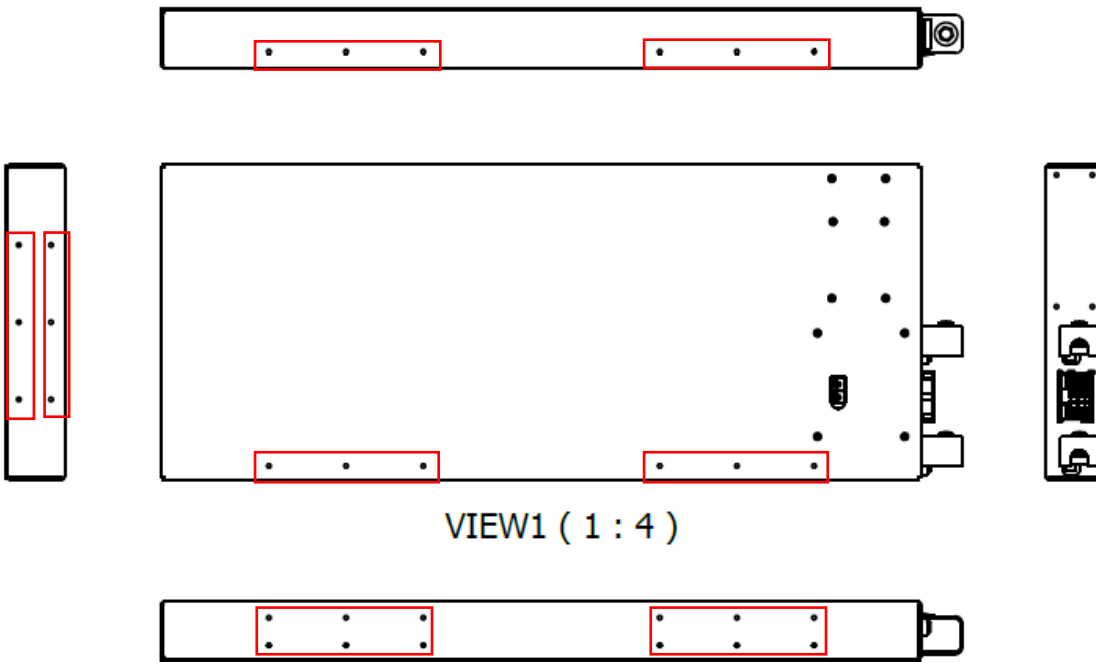
## 12V NEGATIVE STUD

M6 stud intended for 6mm lugs for load and input negatives.

# Dimensions and Orientations

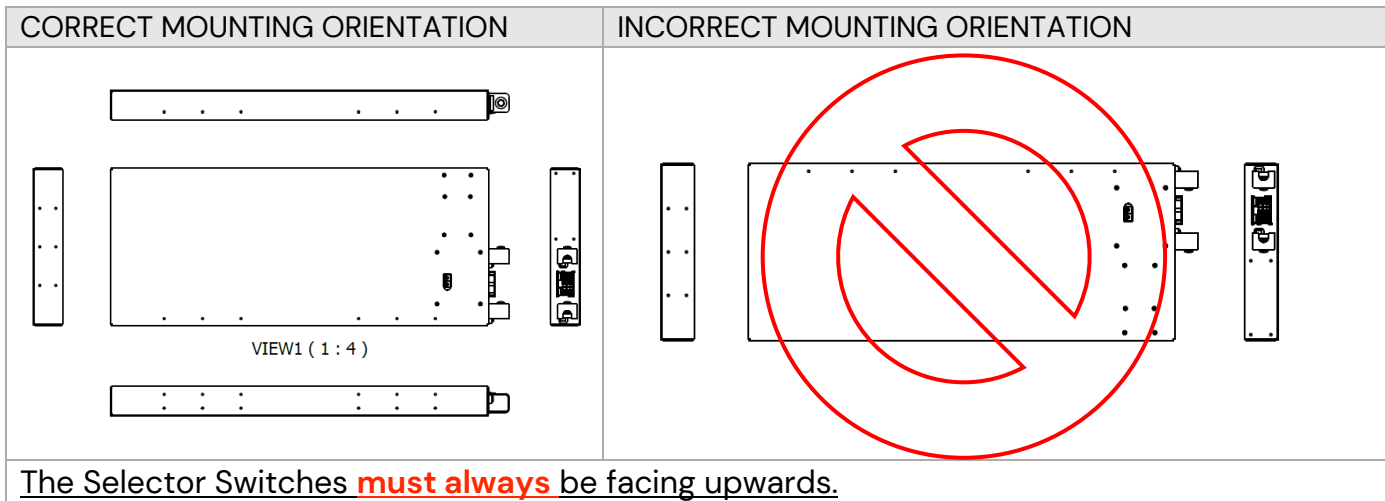


## Mounting



**Please Note:**  
The red rectangles  
represent areas for  
mounting

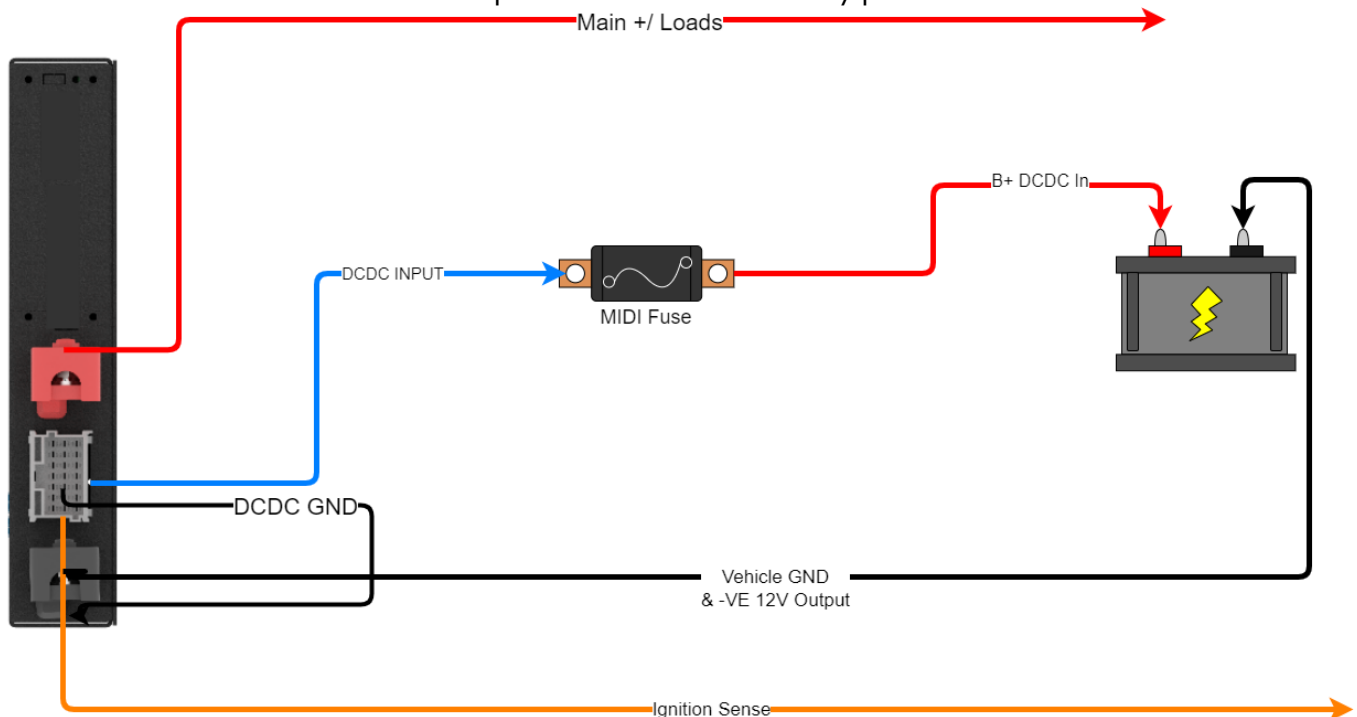
## Mounting Orientation:



## Wiring Schematic:

This is the wiring schematic for the CAN110NO20, please carefully view this schematic to gain an understanding of the correct wiring of the battery.

Please Note: No external shunt is required as a shunt is already pre built-in.

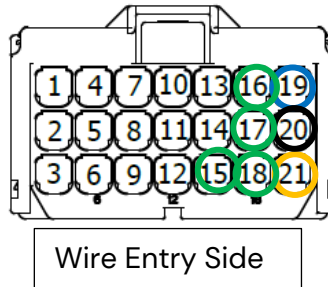


## MCP Pin Out:

This shows the 21 pin MCP Pin outs.

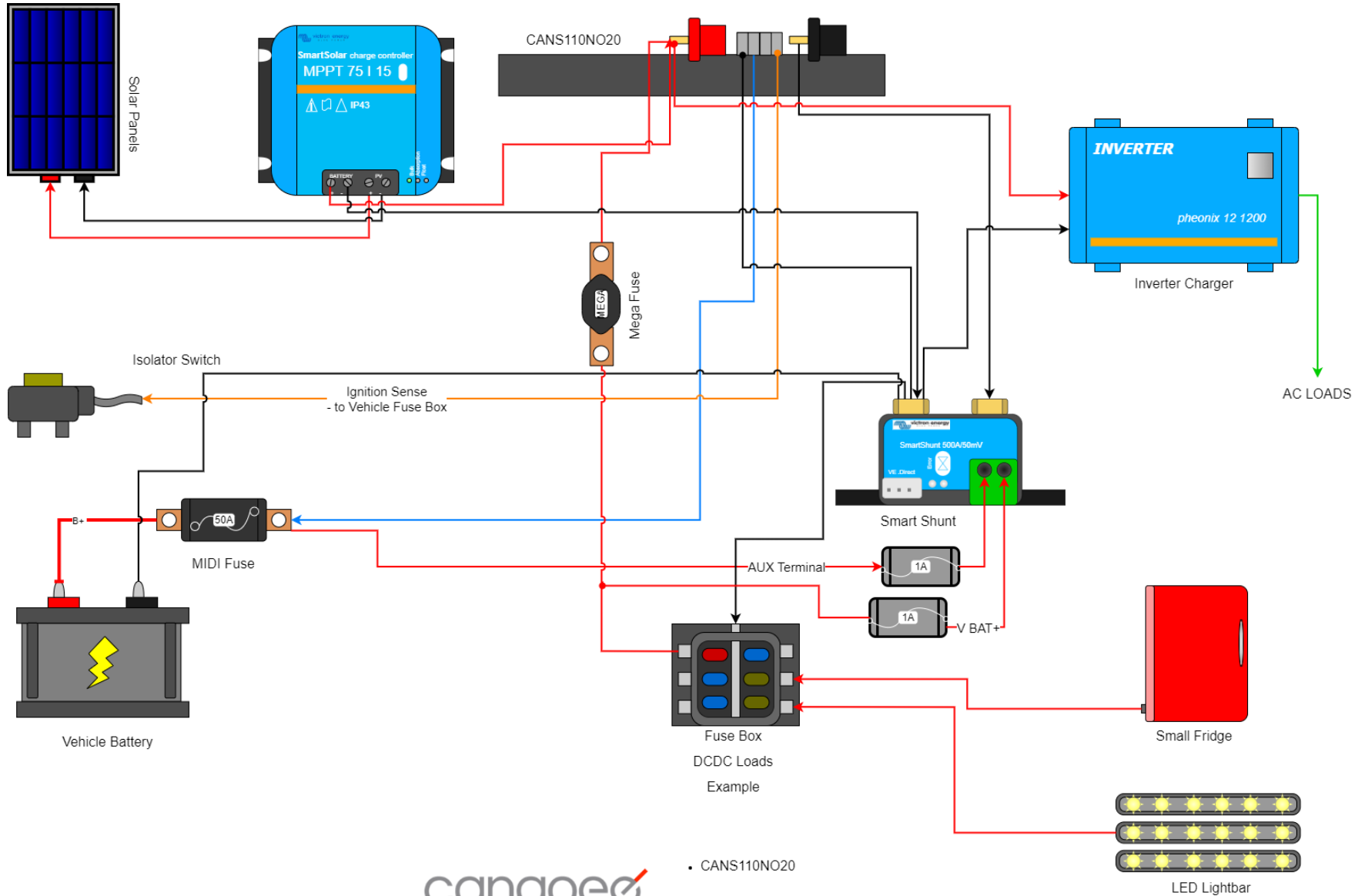
Please carefully view the below table and diagram for the correct pin out of this battery.

MCP PIN OUT:	
-PIN 15:	CELL 1 -VE
-PIN 16:	CELL 1 +VE
-PIN 17:	CELL 2 +VE
-PIN 18:	CELL 3 +VE
-PIN 19:	DCDC +VE
-PIN 20:	DCDC -VE
-PIN 21:	IGNITION SENSE



# Wiring Example Diagram

\*\*\* PLEASE NOTE – THESE IMAGES ARE FOR ILLUSTRATION PURPOSES ONLY and NOT intended as a guide



• CANS110N020

• Example Wiring Schematic

# DCDC CHARGER

The DC-DC charger in the CAN battery allows the battery to charge from a vehicle engine/alternator/start battery. However, to avoid draining the start battery, charging is only desired while the engine is running.

In some applications it can be difficult to determine when the engine is running. Therefore, the DC-DC charger reads several inputs to determine when to turn ON (charge) and turn OFF (stop charging) to achieve:

- Charging when the engine is running, to maximize charging of the Cangoee Battery
- Not charging when the engine is not running, to avoid discharging the vehicle start/cranking battery.

Logic to determine when to turn the DC-DC charger ON and OFF will be implemented using software running on a microcontroller to allow advanced control combining several inputs:

- Start battery voltage
- Ignition signal voltage
- Timing delays
- 2 x 7-position (0-6) rotary switches: user-accessible from outside the battery

The tables below denote the selector switch modes:

Please choose carefully as switches may not easily be accessible after installation.

Delay Switch Position	Delay Off Time	Application
0	0 Sec	Trad Alt, or Ignition Relay
1	30 Sec	Smart Alternator
2	1 Min	Smart Alternator
3	1.5 Min	Smart Alternator
4	3 Min	Smart Alternator
5	3.5 Min	Smart Alternator
6	0 Sec	Ignition Signal Control



Switch Position	On Level (V)	Off Level (V)
0	11	10
1	12	11
2	13	12
3	13.3	12.3
4	13.5	12.5
5	13.7	12.7
6	14	13



These tables demonstrate the selection modes. The first table denotes the off delay, and the second table is your voltage levels for the DC-DC charger. This works by turning off the DC-DC charger when the voltage decreases to not drain the vehicle battery or cause unexpected surges. (E.g. if set to 6 and 0 the battery will cut out immediately once the voltage reduces due to the ignition sense, if set to 1 and 4, the battery will cut out after 30 seconds if the voltage goes below 12.5 Volts.)

# Recommended Wire Sizes and Gauges Chart

The below table represents the recommended wire sizes/ gauges, for battery installation into vehicles.

DCDC Capacity / Cable	Recommended Wire Size/ Gauge Figure 8 Cable	Recommended Wire Length
DC-DC 20A	8 B&S (7.71mm <sup>2</sup> )	1m- Up to/ Maximum 5m
DC-DC 40A	6 B&S (13.5mm <sup>2</sup> )	1m – Up to/ Maximum 5m
Ignition Sense Cable	2-4mm Auto Wire (Running a max of 1-2 Amps)	1m – Up to/ Maximum 6m
Main Positive +	6 B&S (13.5mm <sup>2</sup> ) 80A – 120A	1m – Up to/ Maximum 4m
Main GND -	6 B&S (13.5mm <sup>2</sup> ) 80A – 120A	1m – Up to/ Maximum 4m

**Please Note:** these wire gauges are suggested to mitigate the voltage drop along the cable. It is recommended that you check the voltage at the Cangoee battery DC-DC input and alter charger selector switches accordingly (**Please Note:** these selector modes and conditions are shown on page 8)

# Battery Management System

The Battery Node includes a Battery Management System (BMS) that is mounted internally. The BMS is an electronic solid-state circuit board that manages the cells and protects the battery, including overcharge and over-discharge protection. The BMS will also activate during low voltage at 10.5V, overcurrent at 100A, and short-circuit situations. Unlike lead-acid batteries, overcharging or over-discharging a lithium battery may lead to a hazardous scenario. Therefore, the BMS is essential to the lithium battery. Also, the BMS ensures that the Power Node cells are equalized throughout its operation.

## Safety Tips

The battery contains lithium iron phosphate (LiFePO<sub>4</sub>) cells, considered to be the safest of all lithium-ion chemistries. The battery consists of a large amount of stored energy. Please follow these safety tips for use and operation:

- ❑ Ensure the battery is secured safely before travel.
- ❑ Do not drill into the enclosure. Doing so may inadvertently puncture one of the internal cells.
- ❑ Do not short-circuit the battery. Be careful not to drop a metallic object across the two exposed terminals. Always keep the terminal caps on the POS and NEG posts during operation.
- ❑ Do not mount the battery upside down. The battery can also be mounted on its side if mounting upright is not an option.
- ❑ Do not connect multiple batteries in series to raise the voltage. The BMS is not designed to accommodate higher voltages.
- ❑ If the battery is in contact with the skin, please immediately seek medical advice.

## Longevity Tips

Factors that mainly affect the lifespan of the battery are depth of discharge and operating temperature. To ensure longevity and use of the battery:

- ❑ Do not fully discharge the battery to zero. Each time the battery is discharged to zero, either intentionally or unintentionally, reduces the lifespan of the battery.
- ❑ Do not discharge the battery below 80% depth of discharge (i.e., 20% full).
- ❑ Do not charge the battery outside the range 0°C – 45°C to maximize the life of the battery and avoid damage to the cells.
- ❑ Do not operate the battery in direct sunlight, mount the battery in a compartment or undercover.

The cells are designed to last 2,000 cycles at 80% DOD (Depth of Discharge) and 5,000 cycles at 50% DOD.

## Tips for Use

- ❑ Batteries of the same voltage may be placed in parallel to increase storage capacity. However, each battery should be independently fused, and the battery must be from **CANGOEE**.
- ❑ If the battery is frozen it is essential to wait for the battery to be defrosted and wait for an appropriate room temperature before connecting power to the battery.
- ❑ The battery is splash-proof and water resistant but not waterproof, **DO NOT** directly submerge the battery in water.
- ❑ The battery is designed to be housed in a dry, enclosed compartment, not in direct sunlight or exposed to outside weather conditions for an extended period.

## Maintenance Tips

If not using the battery for a prolonged period (months at a time), then store the battery as follows:

- ❑ Disconnect all loads from the battery as there is no external current draw.
- ❑ Store the battery close to full capacity (the battery does not need to be at 100%).
- ❑ There is no need to keep the battery on trickle charge. The battery will self-discharge over time slowly.
- ❑ Within every two months, give the battery a quick recharge to ensure battery longevity.