LMP25

Master Power Unit

Version: A2.6

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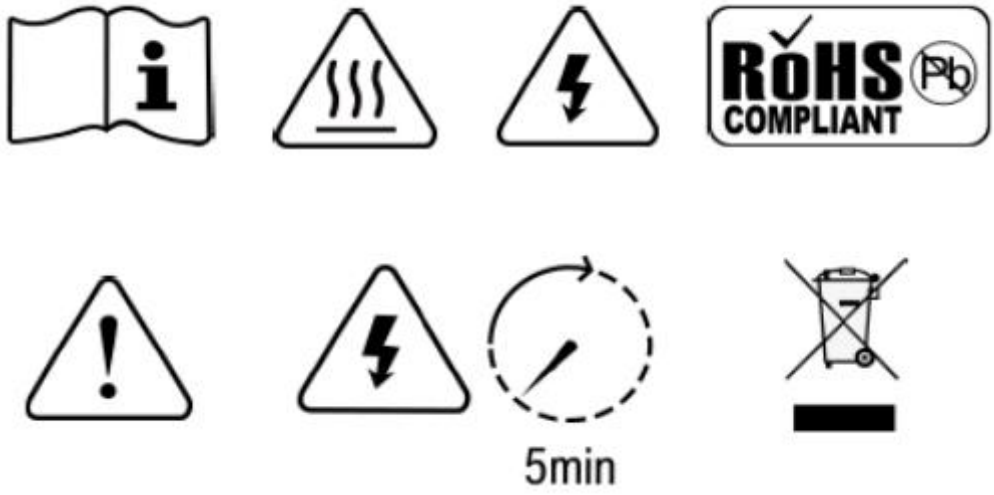

WARNING: HIGH VOLTAGE INSIDE

CAUTION: THE DC FUSE MUST HAVE BEENTURNED OFF BEFORE SERVICING

MADE IN CHINA

DISCLAIMER

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- TBB Power Co.,Ltd offers standard warranty with its products, taking no responsibility for direct or indirect loss due to equipment failure.

ABOUT THIS MANUAL

This manual describes our product features and provides procedure of installations. This manual is for anyone intending to install our equipment.

GENERAL INSTRUCTION

Thanks for choosing our products and this manual were suitable for LMP25 Master Power Unit.

This chapter contains important safety and operation instructions. Read and keep this User Guide well for later reference.

The LMP25 Master Power Unit needs to be installed by professionals and please pay attention to the following points prior to installation:

1) Please check the input voltage or voltage of battery is same to the nominal input voltage of this unit.
2) Please connect positive terminal “+” of battery to “+” input of this unit.
3) Please connect negative terminal “-” of battery to “-” input of this unit.
4) Please use the shortest cable to connect and ensure the secure connection.
5) While connecting, please secure the connection and avoid short cut between positive terminal and negative terminal of battery, which will cause damage of battery.
6) This unit will have high voltage inside. Only authorized electrician can open the case.
7) This unit WAS NOT designed to use in any life retaining equipment.

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1. GENERAL SAFETY INSTRUCTION

1.1 Safety Instruction

As dangerous voltages and high temperature exist within the LMP25 Master Power Unit, only qualified and authorized maintenance personnel are permitted to open and repair it. Please make sure the unit is turned off before open and repair it.

This manual contains information concerning the installation and operation of LMP25 Master Power Unit. All relevant parts of the manual should be read prior to commencing the installation. Please follow the local stipulation meantime.

Any operation against safety requirement or against design, manufacture, safety standard, and are out of the manufacturer warranty.

1.2 General Precaution

1) Do not expose to dust, rain, snow or liquids of any type，it is designed for indoor use. DO NOT block off ventilation, otherwise the LMP25 Master Power Unit would be overheating.
2) To avoid fire and electric shock，make sure all cables selected with right gauge and being connected well. Smaller diameter and broken cable are not allowed to use.
3) Please do not put any inflammable goods near to this unit.
4) Never place this unit directly above batteries, gases from a battery will corrode and damage LMP25 Master Power Unit.
5) Do not place battery over LMP25 Master Power Unit.

1.3 Precaution regarding battery operation

1) Use plenty of fresh water to clean in case battery acid contacts skin, clothing, or eyes and consult with doctor as soon as possible.
2) The battery may generate flammable gas during charging. NEVER smoke or allow a spark or flame in vicinity of a battery.
3) Do not put the metal tool on the battery, spark and short circuit might lead to explosion.
4) REMOVE all personal metal items such as rings, bracelets, necklaces, and watches while working with batteries. Batteries can cause short-circuit current high enough to make metal melt, and could cause severe burns.

2. LMP25 INTRODUCTION

2.1 Features

- Smart battery charger 12V18A
  - Active PFC charging
- 9 Fused DC outputs, including water pump and lighting central control.
- Battery Low Voltage Protection
- Built in main switch to isolate the battery when in storage
- Support external remote main switch
- Control one water pump with two tank probes
- Solar charger controller (PWM), 15A

2.2 LED Display

Table 1 LED indication

NO.	LED	Color	Status	Description
1	CHG	Green	ON	Battery charged
			Flashing (flash once every second)	Battery charging
			OFF	Battery discharge
2	Dischg	Orange	ON	Battery discharging
			OFF	Battery charging
3	CHG/ Dischg	Green/Orange	Both ON	Power supply

3. KEY FEATURES AND FUNCTIONS

3.1 Multiple inputs

LMP master power unit may have multiple sources at one time. These sources include the Shore power and Solar panel, both of them can charge the batteries at the same time.

3.2 Battery Charger of Auxiliary Battery

The charger automatically starts when the appropriate qualified power is connected, either from grid, generator. With multiple charging stages (soft start-bulk absorption float-recycle), LMP25 is designed to fully charge battery quickly. To guarantee the optimal charging for batteries of different states, the LMP25 features Microprocessor-controlled charging algorithm. The Float and Recycle charging programs guarantees the battery being charged properly upon being connected for a longer period.

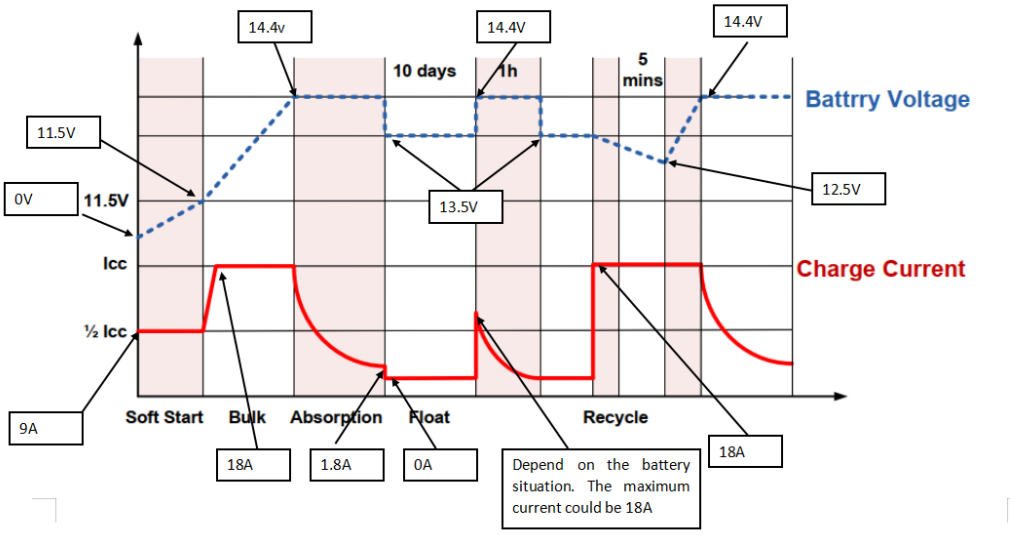

Figure 1 Charging algorithm for lead-acid battery

3.3Lithium battery charging

The LMP25 can be configured to charge Lithium battery.

3.4 PWM Solar charger controller

LMP has a built-in PWM charger for the service battery.

- ✧ Max open voltage is 30VDC
- ✧ Max supply current is 15A

3.5 Battery Low Voltage Protection (BLVP)

LMP25 master power unit has a built-in low voltage protection relay. The protection is decided by battery type lithium battery or lead acid battery. Below please find the protection and resume value:

Table 2 Low voltage protection and resume

Protection	Threshold value
Low voltage protection	AGM/GEL/WET: 11.2Vdc
	LFP: 11.8Vdc
Low voltage protection resume	AGM/GEL/WET: 11.8Vdc
	LFP: 12.2Vdc

Remarks:

a. There will be 60 seconds as time delay before above protection or resume

3.6 Schematic diagram

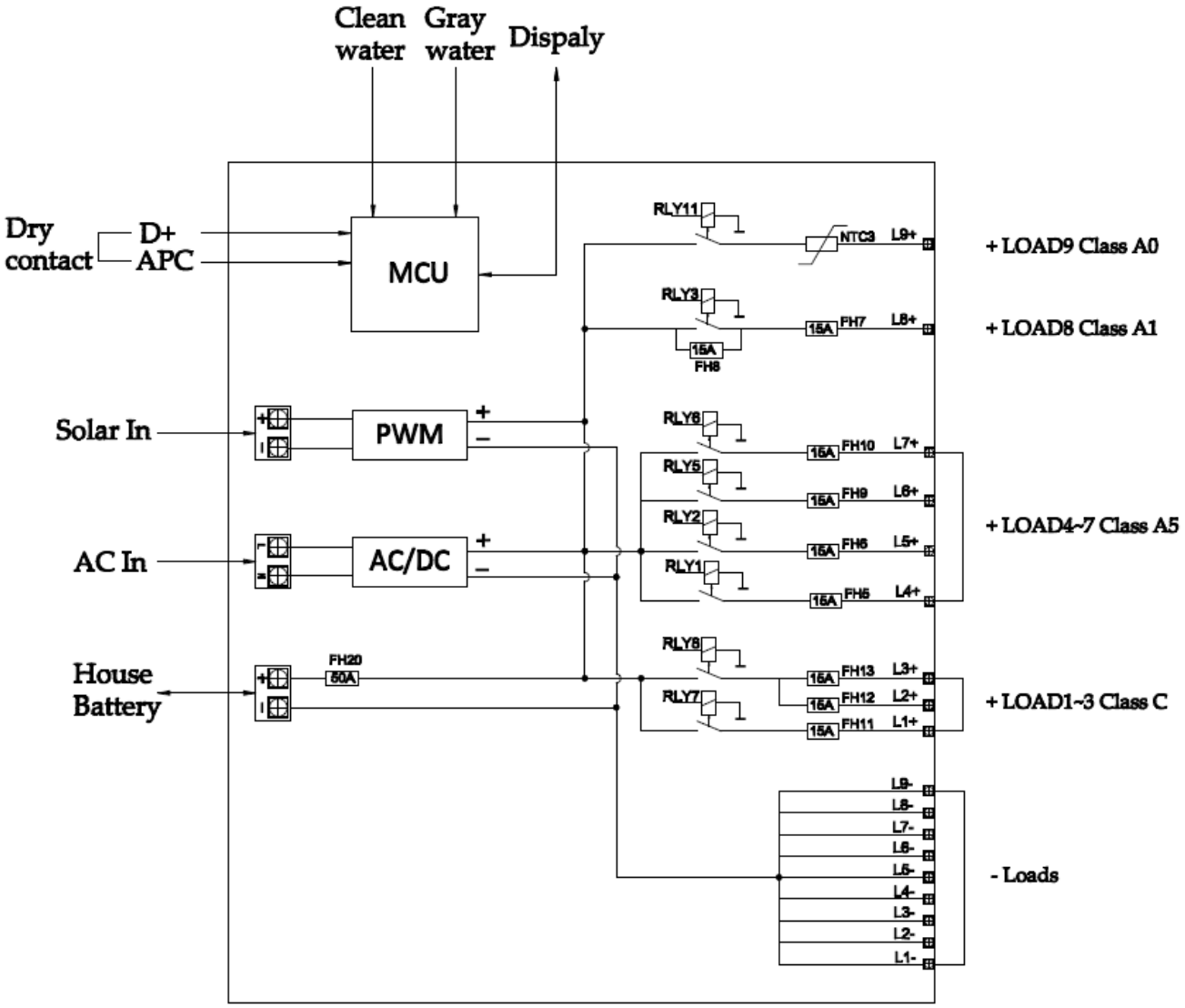

Figure 2 schematic diagram

4. STRUCTURE AND INSTALLATION

4.1 LMP25 Master Power Unit

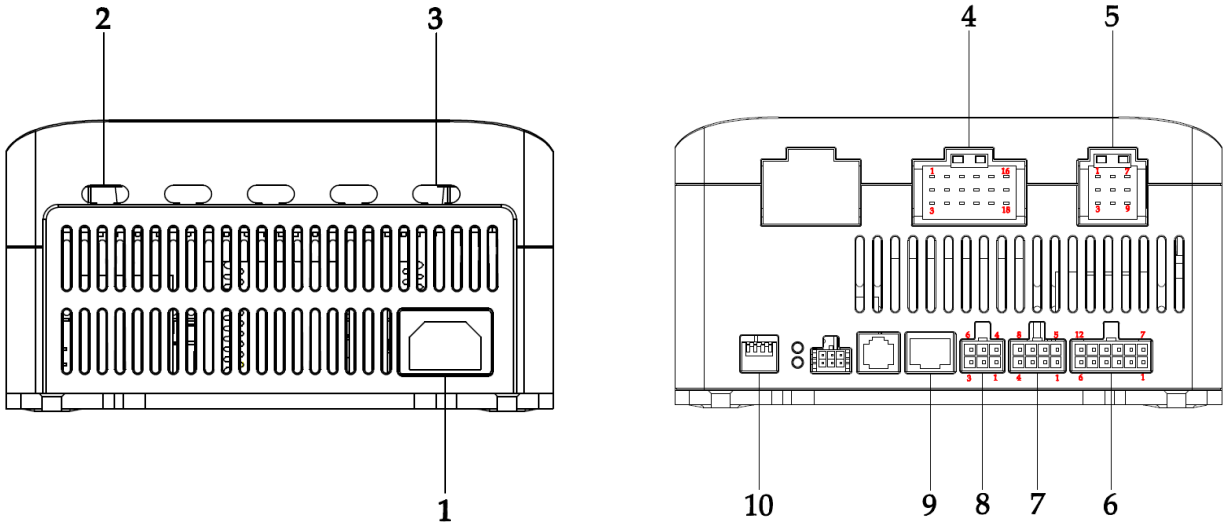

Figure 3 Connectors at front and back

Table 3 Connector description

No.	DEFINITION	LABEL	DESCRIPTION
1	AC input port	AC Input	AC input port
2	PV input port	PV	Connect to PV Panel
3	BAT input port	AUX BAT	Connect to AUX BAT
4	Loads port	[4]1	POS : Auxiliary
		[4]2	GND : Auxiliary
		[4]3	POS : USB Socket
		[4]4	POS : Water Pump
		[4]5	GND: Water Pump
		[4]6	GND: USB Socket
		[4]7	POS : Lighting 1
		[4]8	GND : Lighting 1
		[4]9	POS: Info D+
		[4]10	POS: Lighting 2
		[4]11	GND: Lighting 2
		[4]12	GND: Info D+
		[4]13	POS : Auxiliary
		[4]14	GND : Auxiliary
		[4]15	GND: Spare
		[4]16	POS: Heating system

		[4]17	GND: Heating system
		[4]18	POS: Spare
5	Dry contact output & Moto BAT input	[5]1	DRY1_COM
		[5]2	DRY1_NO
		[5]3	
		[5]4	
		[5]5	
		[5]6	
		[5]7	POS: Moto BAT
		[5]8	GND: Moto BAT
		[5]9	
6	Signal terminal	[6]1	D+ (active high +BAT)
		[6]2	Switch ON/OFF (COM)
		[6]3	D+ (active down GND)
		[6]4	
		[6]5	
		[6]6	+APC (active high +BAT)
		[6]7	
		[6]8	+APC (active down GND)
		[6]9	Switch ON/OFF (NO)
		[6]10	
		[6]11	
		[6]12	
7	Grey water tank	[7]1	CW-REF
		[7]2	CW-25%
		[7]3	CW-50%
		[7]4	
		[7]5	CW-75%
		[7]6	CW-100%
		[7]7	
		[7]8	
8	Fresh water tank	[8]1	CW-REF
		[8]2	CW-25%
		[8]3	CW-50%
		[8]4	CW-75%
		[8]5	CW-100%
		[8]6	

9	RS485 port	Display	Connect to Display
10	DIP Switch	1	Set the battery type
		2	
		3 Bat type	
		4 Bat type	

Above DC loads are for reference, they could be varied by specified case.

4.2 Installation

For good ventilation, ensure empty space of at least 5 cm on each side of the LMP25 unit.

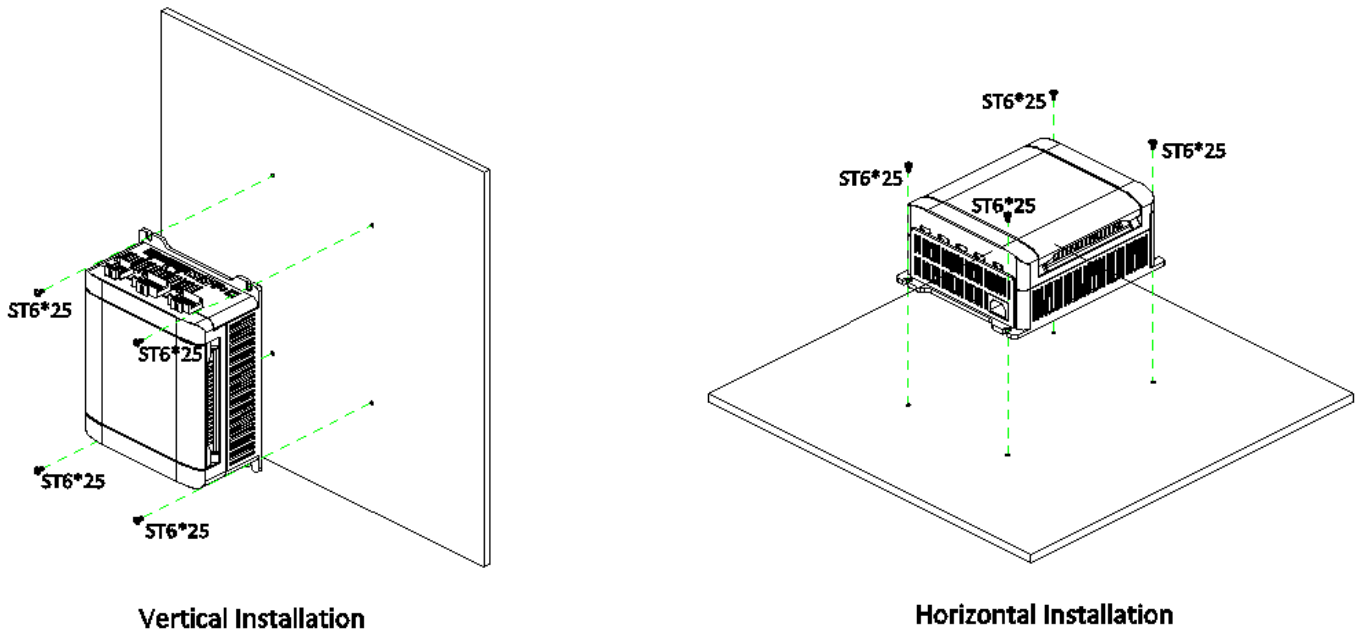

Figure 4 Installation

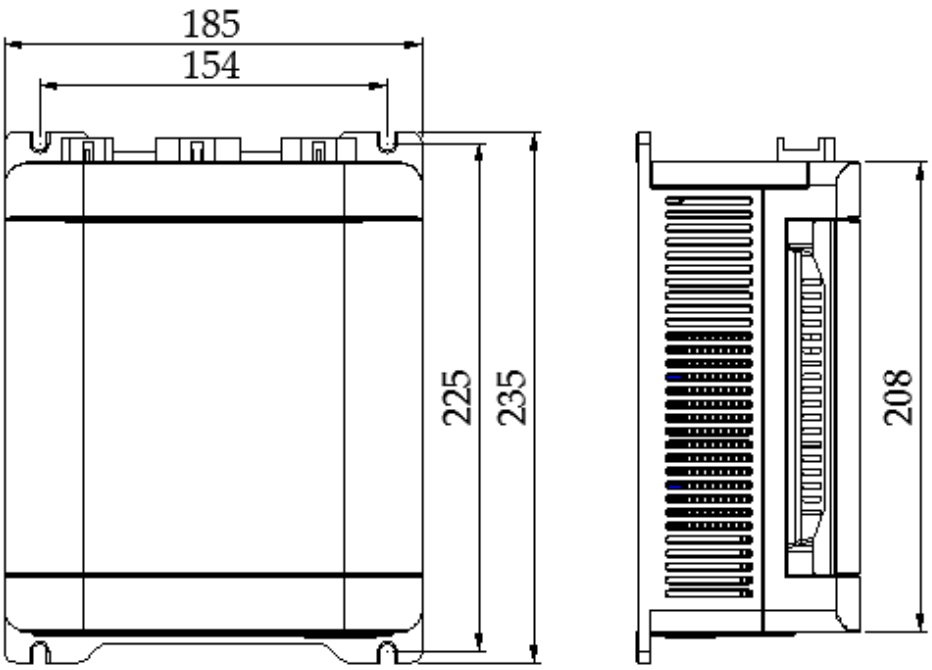

Figure 5 Dimensions of LMP25

4.3 Fuse specification

Here is a list for the fuses installed on LMP25. Please also take reference of Figure 2.

The fust list here is just for reference, it could be varied case by case. Please refer to actual list by the sticker of fuse onto LMP box.

Table 4 Fuse specification list

Fuse No.	DC loads	Specification
F5	USB Socket	15A
F6	Auxiliary	15A
F7	Water Pump	15A
F9	Lighting1	15A
F10	Lighting2	15A
F11	Auxiliary	15A
F12	Heating System	15A
F13	Spare	15A
F8	By-pass Pump	15A
F20	AUX BAT	50A
F15	Motor BAT	20A

Above list is an example for reference.

5. OPERATION

5.1 Configuration on LMP25

You need to set the battery type through LMP25 master power unit.

5.1.1 Dip switch setting

There are dip switches for you to set Battery type.

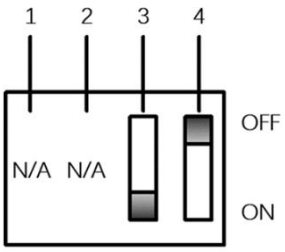

Figure 6 Dip switch (Example of LFP battery)

Table 5 Dip switch definition

DIP SWITCH	1	2	3	4
	Not active	Not active	Battery type	

5.1.1.1 Dip switch for battery setting

Table 6 Dip switch for battery type setting

Switch #3	Switch #4	Battery type
off	off	AGM
off	on	GEL
on	off	LFP
on	on	WET

5.1.2 Main switch

LMP25 offers an external Main switch, which allows user to turn on/off the LMP25 output remotely

Figure 7 Main switch

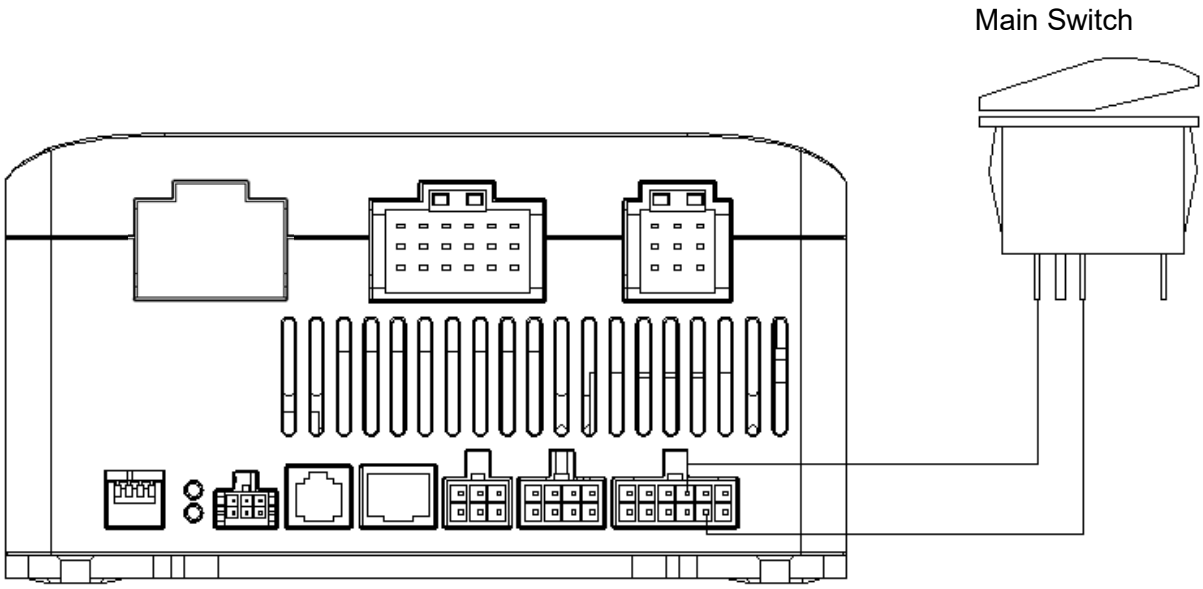

Figure 8 Wiring diagram of Main switch

5.2 Daily Maintenance

- Check the nominal battery voltage is 12Vdc.
- When replacing the existing battery with a new one, please have the new battery fully charged by Grid for the first time.

6. TROUBLE SHOOTING

6.1 LED display on LMP Unit

Table 7 Error LED indicator of LMP

NO.	LED	Color	Status	Description
1	CHG / DISCHG	Green / Orange	Flash once per cycle	Service battery voltage low
2			Flash twice per cycle	Service battery voltage high
3			Flash 3 times per cycle	LMP unit Over temp
4			Flash 4 times per cycle	Bulk charge timeout

7. SPECIFICATION

Table 8 Specification of LMP

Model		LMP25
Electrical Specifications		
Grid	Nominal input voltage (V)	230±10%VAC 50/60Hz
	Power factor	0.98
	Input current at full load	1.3A
Battery	Service battery	12Vdc
	Service battery voltage range	11.2-16.2Vdc
PV	Charger type	PWM
	Open circuit voltage	30Vdc
	Max supply current	15A
Charger mode	Charge Algorithms	TBB premium II - 5steps
	Battery type	AGM/GEL/LFP/WET
	Bulk current	18A(Max)
	Absorption voltage	(14.4/14.1/14.4/14.7) ±0.2Vdc
	Float voltage	(13.5/13.5/13.5/13.7) ±0.2Vdc
Power supply mode	Nominal output voltage	12.8±0.2Vdc
	Rated output current	18A(Continuous)
Efficiency (Max)		88%
Working temperature		-20℃~+55℃ (Charger derating at over 40 degrees)

Others			
Battery Disconnect (LVD)	Disconnect voltage	AGM/GEL/WET	11.2Vdc(default)
		LFP	11.8 Vdc(default)
	Delay off time	60sec	
	Reconnect voltage	AGM/GEL/WET	11.8Vdc(default)
		LFP	12.2 Vdc(default)
Protection	Short circuit on output	Fuse blown	
	Reverse Polarity	Fuse blown	
	Overload protection	Derate the output until overload is removed	
	Battery charger over temperature	Shut down LMP	
	Battery over voltage limits	Battery charger disconnect, loads disconnect	
Physical Specifications			
Dimensions (L*W*H)		235 × 185 × 98.5 mm	
Weight (kg)		1.8kgs	
Enclosure		Plastic case	
Cooling		Free cooling	
Protection category		IP20	
Approvals			
EMC		UN R10	

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