



# **PB-1000**

## **Instruction Manual**



# PB-1000 Instruction Manual



## 1. Main Specifications

MODEL	PB-1000-12	PB-1000-24	PB-1000-48	
OUTPUT	BOOST CHARGE VOLTAGE	14.4V	28.8V	57.6V
	FLOAT CHARGE VOLTAGE	13.8V	27.6V	55.2V
	OUTPUT CURRENT	60A	34.7A	17.4A
	RECOMMENDED BATTERY CAPACITY(AMP HOURS)(Note 3)	200 ~ 600Ah	120 ~ 350Ah	60 ~ 175Ah
	BATTERY TYPE	Open & Sealed Lead Acid		
	LEAKAGE CURRENT FROM BATTERY (Typ.)	<1mA		
INPUT	VOLTAGE RANGE	90 ~ 264VAC	127 ~ 370VDC	
	FREQUENCY RANGE	47 ~ 63Hz		
	EFFICIENCY (Typ.)	85%	88%	89%
	POWER FACTOR (Typ.)	0.95/230VAC	0.98/115VAC at full load	
	AC CURRENT (Typ.)	12A/115VAC	5.2A/230VAC	
	INRUSH CURRENT (Typ.)	25A/115VAC	50A/230VAC	
	LEAKAGE CURRENT	<3.5mA / 240VAC		
PROTECTION	OVER VOLTAGE	16 ~ 18V	32 ~ 35V	64.5 ~ 69.5V
		Protection type : Shut down o/p voltage, re-power on to recover		
	OVER TEMPERATURE	80°C ±5°C (12V), 85°C ±5°C (24V,48V) (TSW1: detect on heatsink of power transistor)		
		85°C ±5°C (12V), 75°C ±5°C (24V,48V) (TSW2 : detect on heatsink of o/p diode)		
		Protection type : Shut down o/p voltage, recovers automatically after temperature goes down		
SHORT CIRCUIT	YES, protected by internal circuit			
REVERSE POLARITY	YES, protected by internal circuit			
FUNCTION	REMOTE CONTROL	Open: Normal work Short: Stop Charging		
	BATTER BANKS	2 banks (A & B)		
	FAST CHARGE	2 / 8 stage selectable		
	CHARGER OK	Relay contact rating(max.): 30V/1A resistive ; "Short" when the unit is working properly, "Open" when the unit is failure or the protection function is activating		
	OUTPUT OK	Relay contact rating(max.): 30V/1A resistive ; "Short" when the battery is full, "Open" when the battery is still charging		
	TEMPERATURE COMPENSATION	By NTC, compensate both banks at the same time		
	ENVIRONMENT	WORKING TEMP.	-20 ~ +60°C (Refer to output load derating curve)	
WORKING HUMIDITY		20 ~ 90% RH non-condensing		
STORAGE TEMP., HUMIDITY		-40 ~ +85°C, 10 ~ 95% RH		
TEMP. COEFFICIENT		±0.05%/°C (0 ~ 50°C)		
VIBRATION		10 ~ 500Hz, 2G 10min./1cycle, 60min. each along X, Y, Z axes		
SAFETY & EMC (Note 2)	SAFETY STANDARDS	UL60950-1, TUV EN60950-1 approved		
	WITHSTAND VOLTAGE	I/P-O/P:3KVAC I/P-FG:1.5KVAC O/P-FG:0.5KVAC		
	ISOLATION RESISTANCE	I/P-O/P, I/P-FG, O/P-FG:100M Ohms/500VDC 25°C 70%RH		
	EMI CONDUCTION & RADIATION	Compliance to EN55022 (CISPR22)		
	HARMONIC CURRENT	Compliance to EN61000-3-2,-3		
	EMS IMMUNITY	Compliance to EN61000-4-2,3,4,5,6,8,11; ENV50204, EN55024, light industry level, criteria A		
OTHERS	MTBF	127.4Khrs min. MIL-HDBK-217F (25°C)		
	DIMENSION	300*184*70mm(L*W*H)		
	PACKING	3.5Kg; 4pcs/15Kg/1.83CUFT		
NOTE	<ol style="list-style-type: none"> <li>1. All parameters NOT specially mentioned are measured at 230VAC input, rated load and 25°C of ambient temperature.</li> <li>2. The power supply is considered a component which will be installed into a final equipment. The final equipment must be re-confirmed that it still meets EMC directives.</li> <li>3. This is Mean Well's suggested range. Please consult your battery manufacturer for their suggestions about maximum charging current limitation.</li> </ol>			

## 2. Front and back panel

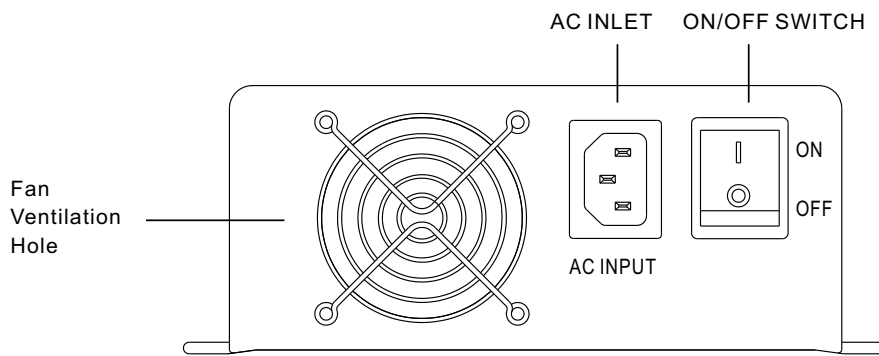


Figure 2.1 Front Panel

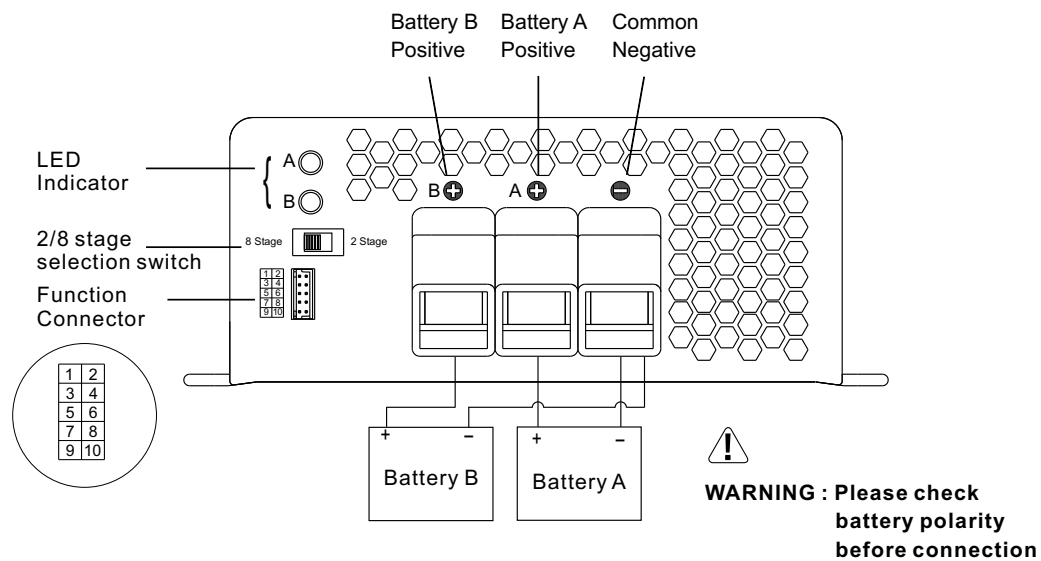


Figure 2.2 Back Panel

### Assembly Guidelines:

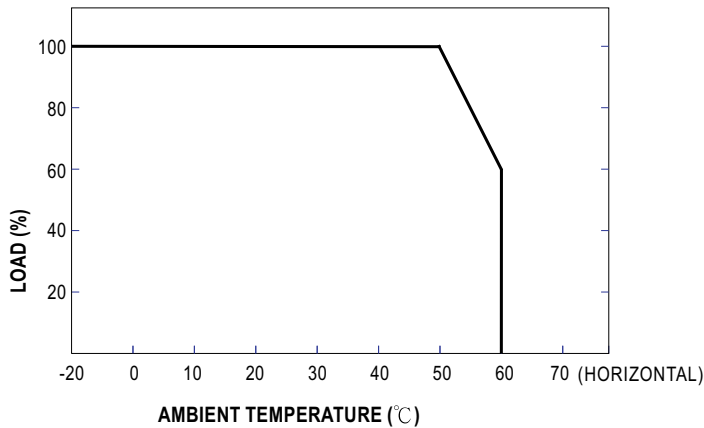
1. The charger should be turned OFF prior to battery connection. Suitable wire gauge should be chosen based on rated charging current of the PB-1000 unit. Double check battery polarity before making the battery connection. Positive terminal of the charger must be connected to "+" of the battery and negative terminal to "-" of the battery. Also, make sure the positive and negative terminals of the charger are not accidentally shorted together.
2. After connecting the output cables, flick the ON/OFF (0/-) switch to the ON (-) position. The indicator light on the switch will turn ON.

### Notes on Operation:

1. Designed for charging lead acid battery.
2. Must be installed in a dry and well ventilated area. It should not be exposed to rain or snow.
3. The cables between charger and battery should be kept as short as possible to prevent excessive line drop. Too much line drop will lead to longer charging period.
4. Please make sure charging voltage and current meets battery specification.
5. Refrain from connecting new and old batteries in series.
6. PB-1000 should be in the OFF mode before making battery connection or disconnection.
7. Three years warranty is provided under normal operating conditions. Failure resulting from improper operation will result in cancellation of warranty.

### 3. Derating Curves

#### 3.1 Charging current VS Temperature



### 4. Function Description of CN100

Pin No.	Function	Description
1,2	RY13	Relay contact rating(max.) : 30V/1A resistive. ; "Short" when the battery A is full, "Open" when the battery A is still charging.
3,4	RY14	Relay contact rating(max.) : 30V/1A resistive. ; "Short" when the battery B is full, "Open" when the battery B is still charging. If the temperature sensor is not used, the charger still works normally.
5,6	RY15	Relay contact rating(max.) : 30V/1A resistive. ; "Short" when the unit is working properly, "Open" when the unit is failure or the protection function is activating.
7,8	GND / RTH	Temperature sensor comes along with the charger can be connected to the unit to allow temperature compensation of the charging voltage. <b>If the temperature sensor is not used, the charger still works normally.</b>
9,10	RC- / RC+	Turn the output on and off by electrical or dry contact between pin 10 (RC+) and pin 9(RC-). Open : Normal work , Short : Stop charging.

### 5. LED Indication

Color of LED	Orange	Green	Red
Battery status	Charging	Battery full	Fail

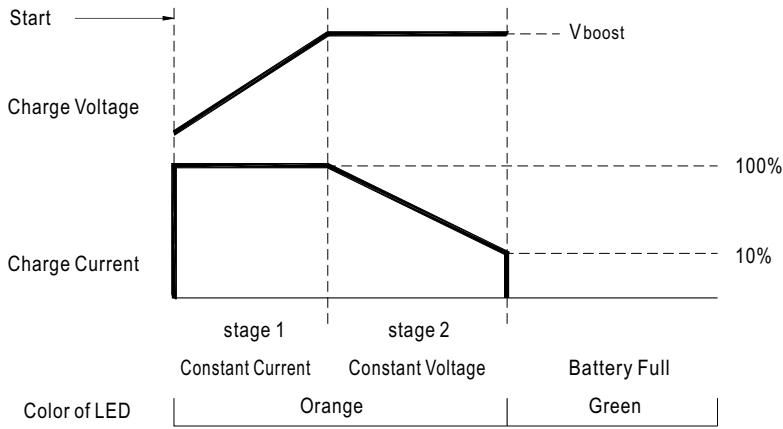
Types of failure: ① Battery disconnected    ② Damaged battery    ③ Reverse polarity  
 ④ Incorrect battery voltage (e.g. PB-1000-12 connected to 24V battery)  
 ⑤ Activation of protection function (e.g. OTP, OVP, and Short)

### 6. Explanation of Operation Logic (Charging stages):

8 stages charging differ from 2 stages with the addition of pulse, soft start, analysis, recond, float, and maintain stages. 2 stages provide simple and quick charging. On the other hand, 8 stages will allow charging to maximum capacity. User can select between 2 or 8 stages depending on actual requirement.

#### 6.1 "2" stage charging (Selection switch to "2" stage)

During initial charge (stage 1), charger will provide maximum current to the battery. The built-in fan will also turn ON. As the battery starts to get full, charging current will gradually decrease (stage 2). When charging current decrease to less than 10% of max. LED indicator will turn Green indicating a full charge.



State	PB-1000-12	PB-1000-24	PB-1000-48
Vboost	14.4V	28.8V	57.6V
Constant Current	60A	34.7A	17.4A

Figure 6.1 2 Stage Charging Curve

### 6.2 "8" stage charging (Selection switch to "8" stage)

Advantage of pulse stage: Use pulse current to revive aged battery.

Advantage of recond stage: Allow full charge of battery.

Advantage of Float and Maintain stage: After LED turns green, maintenance charge is provided so the battery is always in a full state. User will have access to a full battery whenever it is disconnected from the charger.

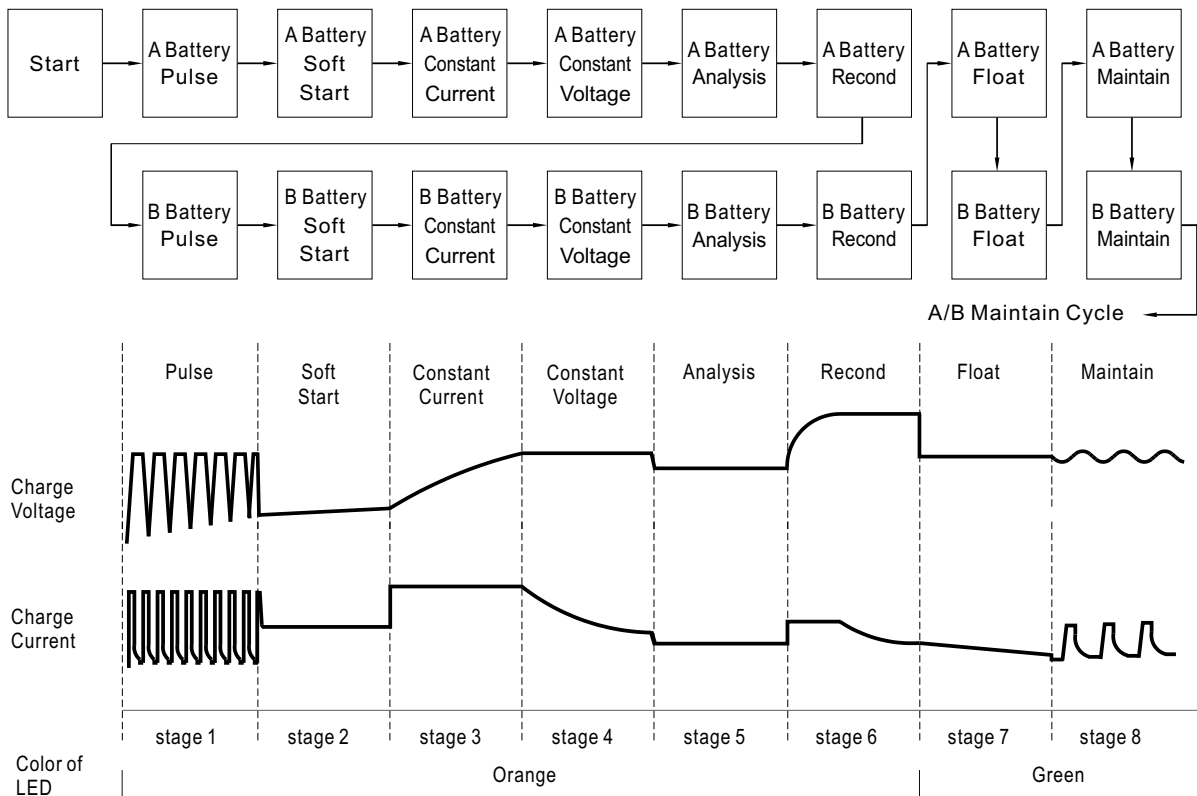


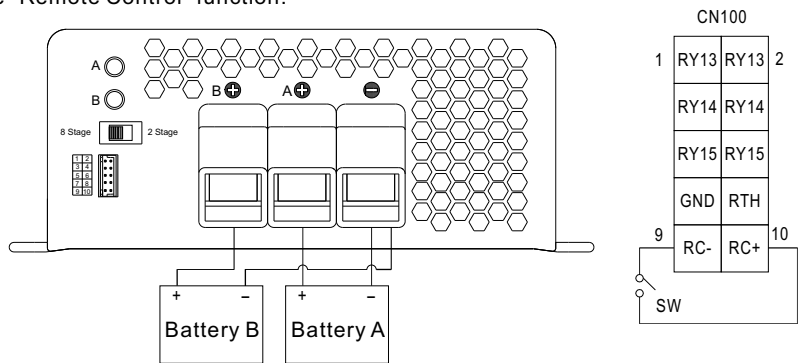
Figure 6.2 8 Stage Charging Curve

## 7. Function description

### 7.1 Remote Control

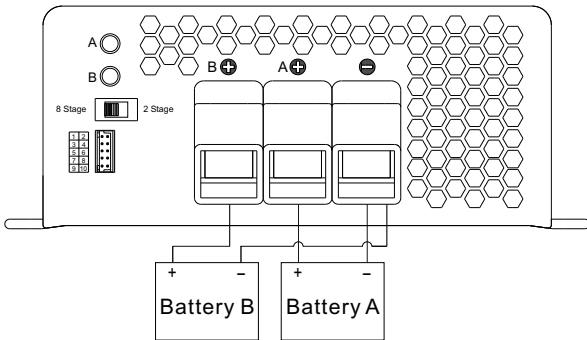
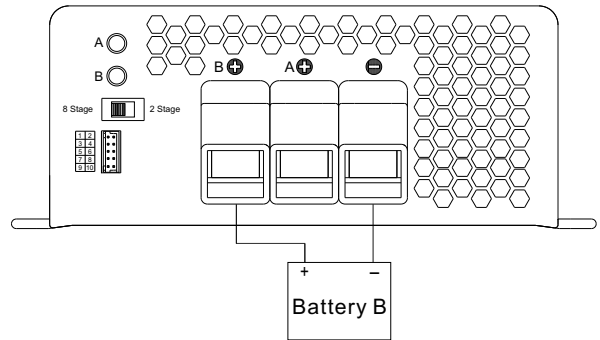
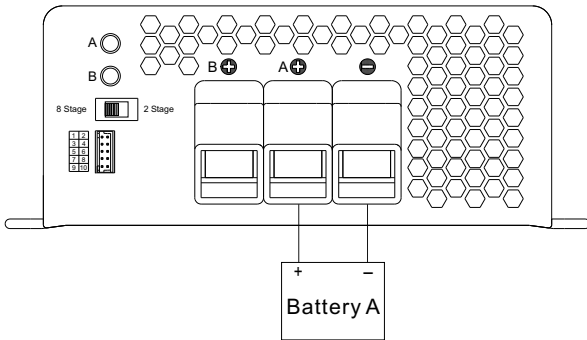
The charger can be turned ON/OFF by using the "Remote Control" function.

Between RC+(pin10) and RC-(pin9)	Charger
SW Open	ON
SW Short	OFF



### 7.2 Two Battery Banks

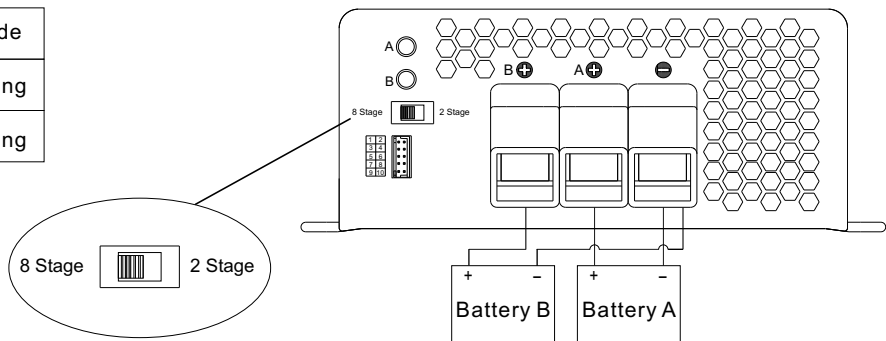
The charger may be hooked up two battery banks (A and/or B). Connect the battery bank(s) as below. If you are connecting 2 battery banks in the same time, keep in mind that they must share a common ground.



### 7.3 2 or 8 stage Charging mode Select

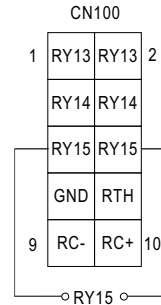
The charger features user selectable 2 or 8 stage charging. The charging profile is selected by moving the slide switch on the back panel.

Switch	Charging mode
Turn right	2 stage charging
Turn left	8 stage charging



### 7.4 Charger OK Relay(RY15)

Charger	Between pin5 and pin6
Normal work	ON (Short)
Failure or the protection function is activating	OFF(Open)



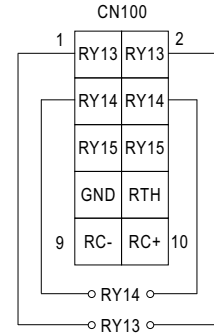
### 7.5 Output OK Relay(RY13 & RY14)

#### 1. Bank A OK (RY13)

Bank A	Between pin1 and pin2	Color of LED A
Battery A Full	ON (Short)	Green
Charging	OFF(Open)	Orange

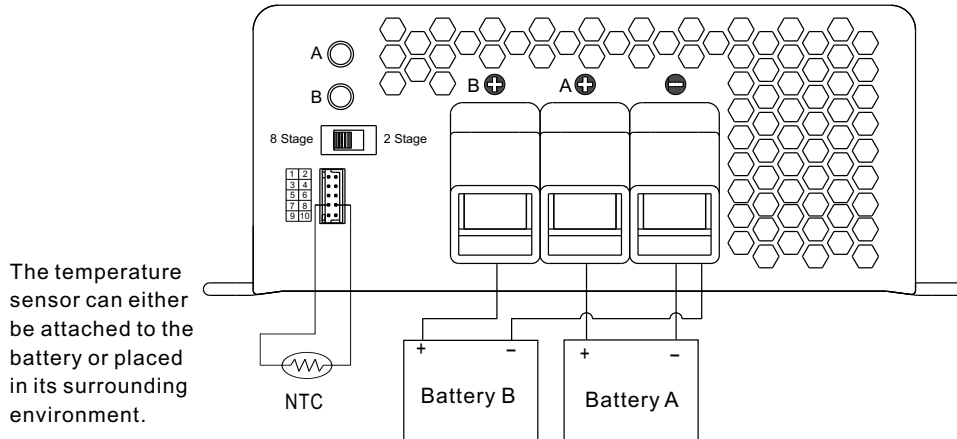
#### 2. Bank B OK(RY14)

Bank B	Between pin3 and pin4	Color of LED B
Battery B Full	ON (Short)	Green
Charging	OFF(Open)	Orange



### 7.6 Temperature Compensation

Temperature sensor comes along with the charger can be connected to the unit to allow temperature compensation of the charging voltage. **If the temperature sensor is not used, the charger still works normally.**



### 8. Wiring for battery

Select suitable wire gauge based on rated charging current. Refer to the following table for minimum wire gauge. We highly recommend using RED wire for + connection and BLACK wire for - connection:

AWG	CROSS SECTION(mm <sup>2</sup> )	Max. Current(A) UL1015(600V 105°C)
14	2.1	12
12	3.3	22
10	5.3	35
7	10	46
6	16	60
4	25	80

## 9.Suggested battery capacity

Model	Battery capacity
PB-1000-12	200-600AH
PB-1000-24	120-350AH
PB-1000-48	60-175AH

Note:1.Using battery capacity larger than the suggested value will not lead to damage of battery. The only drawback is it may take longer to fully charge the battery.

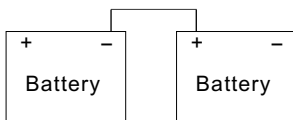
2.If you're unsure about max allowable charging current of the battery, please refer to the battery's technical specification or consult its manufacturer.

## 10.Series and parallel connection of batteries

### 1.Batteries in series

Voltage can be doubled when 2 batteries are connected in series. However, the capacity (AH) will remain the same.

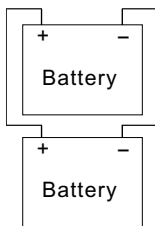
For example, 2 x 12V 100AH batteries connected in series = 24V 100AH.



### 2.Batteries in parallel

When 2 batteries are connected in parallel, voltage remains the same and the capacity (AH) doubles.

For example, 2 x 12V 100AH batteries connected in parallel = 12V 200AH.



## 11.Failure correction notes

Status	Possible Reasons	Ways to Eliminate
Unable to charge the battery	ON/OFF switch in the OFF position	Switch to the ON position
	Battery reverse polarity	Switch to the ON position
	Battery with higher voltage is connected	Use battery with the correct voltage
	Input AC voltage is too low	Make sure input source is between 90~264VAC
LED indicator does not turn Green after a long charging period	Battery exceed lifespan or damaged	Replace with a new battery
	Output cables are too thin	Replace with suitable wire gauge

**If you are not able to clear the failure condition, please contact Mean Well or any of our distributors for repair service.**

**WARNING :** This is a class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.