

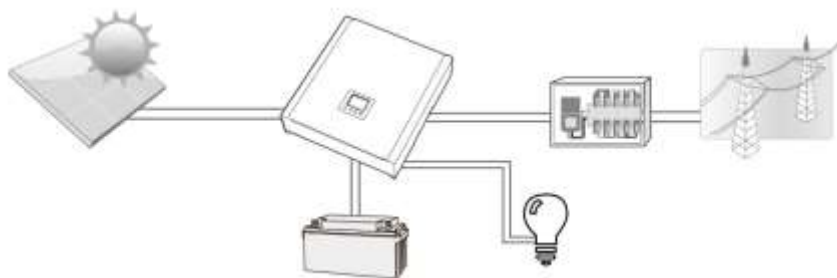
# **User Manual**

## **Hybrid 10KW PV Inverter**

**Version: 1.2**

# **Table Of Contents**

# 1. Introduction



**Figure 1 Basic hybrid PV System Overview**

## 2. Important Safety Warning

Before using the inverter, please read all instructions and cautionary markings on the unit and this manual. Store the manual where it can be accessed easily.

### General Precaution-

Conventions used:

**WARNING!**

**CAUTION!**



**WARNING!**



**WARNING!**



**WARNING!**



**CAUTION!**



**CAUTION!**



**CAUTION!**



**CAUTION!**



**CAUTION!**



**CAUTION!**



**CAUTION!**



**CAUTION!**

**Before working on this circuit**



**Risk of Voltage Backfeed**

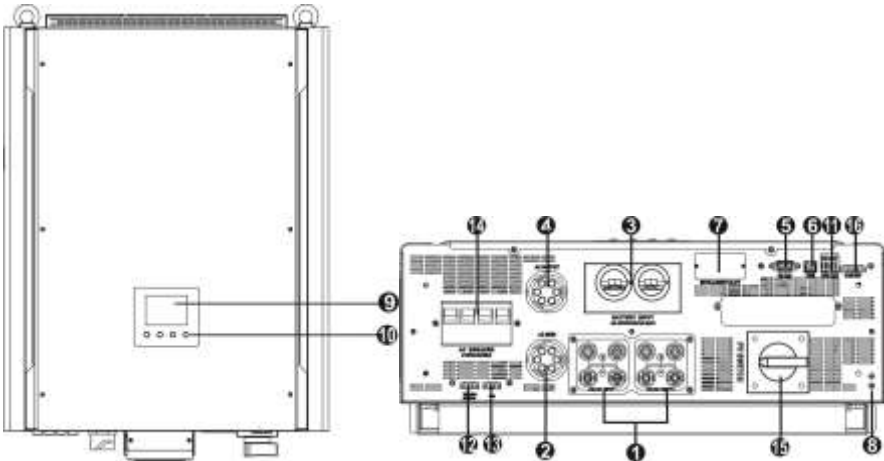
### **Symbols used in Equipment Markings**


# 3. Unpacking & Overview

## 3-1. Packing List



## 3-2. Product Overview



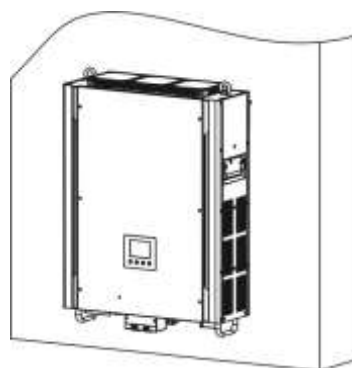
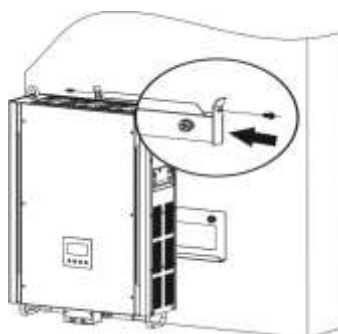
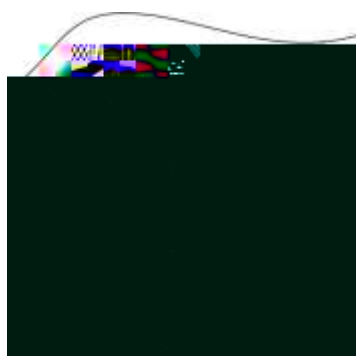
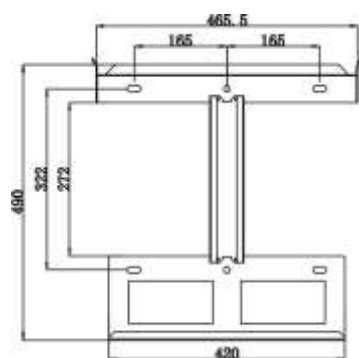
## 4. Installation

## 4-1. Selecting Mounting Location

## 4-2. Mounting Unit

**WARNING!!**

**WARNING!!**





# 5. Grid (Utility) Connection

## 5-1. Preparation

NOTE:

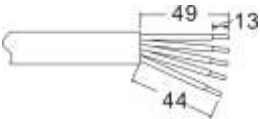
NOTE2:

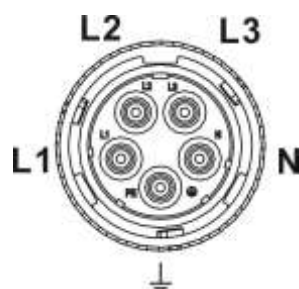
WARNING!


## 5-2. Connecting to the AC Utility



Component	Description





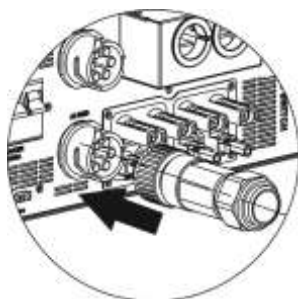
**L1→ LINE 1 (Black)**

**L2→ LINE 2 (Grey)**

**L→ LINE 3 (Brown)**

**○→ Ground (Yellow-Green)**

**N→ Neutral (Blue)**



**CAUTION:**

# 6. PV Module (DC) Connection

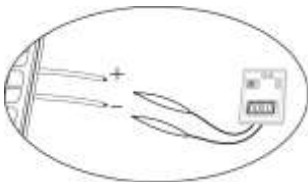
CAUTION: separately

NOTE1:

NOTE2:

**WARNING:**

**CAUTION:**



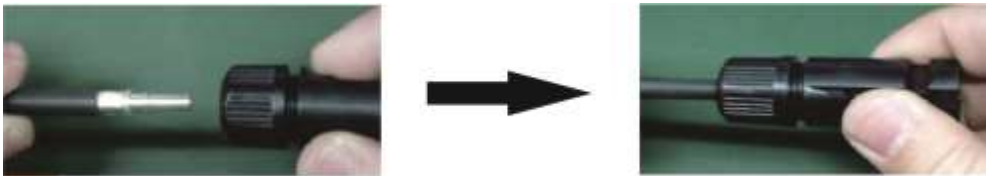
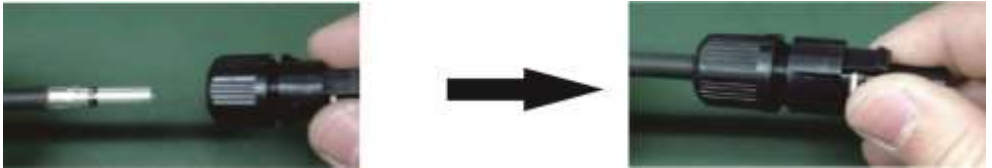
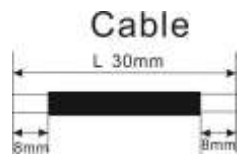
**CAUTION:**

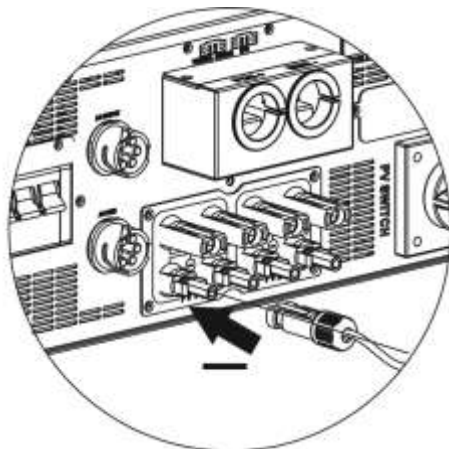
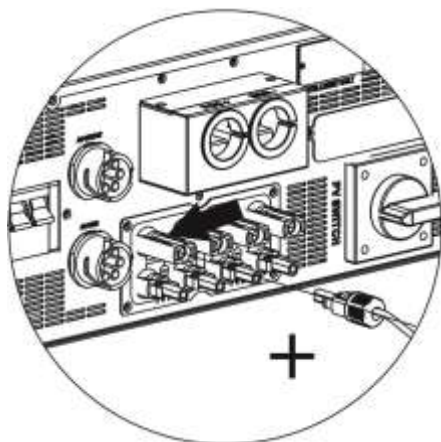
## Components for PV connectors and Tools:



**Cable preparation and connector assembly process:**





**WARNING!**


**CAUTION: Never**

**CAUTION:**

**Recommended Panel Configuration**

Solar Panel Spec. (reference)	SOLAR INPUT 1	SOLAR INPUT 2	Q'ty of panels	Total Input Power
	(Min in serial: 11pcs; Max. in serial: 18pcs)			

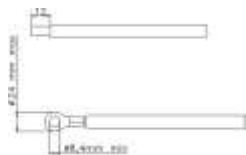
# 7. Battery Connection

CAUTION: separately

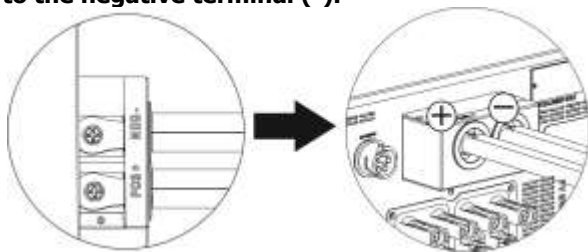
NOTE1:

NOTE2:

NOTE3:



RED cable to the positive terminal (+);  
BLACK cable to the negative terminal (-).



WARNING!

WARNING!


# 8. Load (AC Output) Connection

## 8-1. Preparation

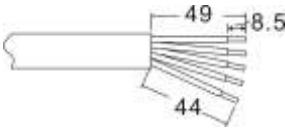
CAUTION:

WARNING!

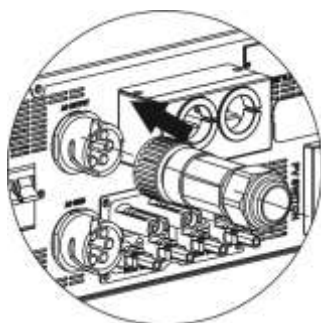
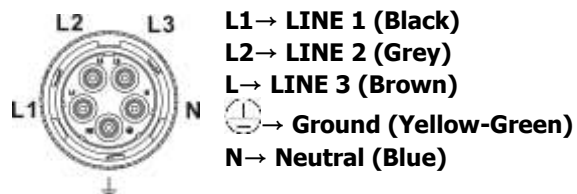

## 8-2. Connecting to the AC output



Component	Description

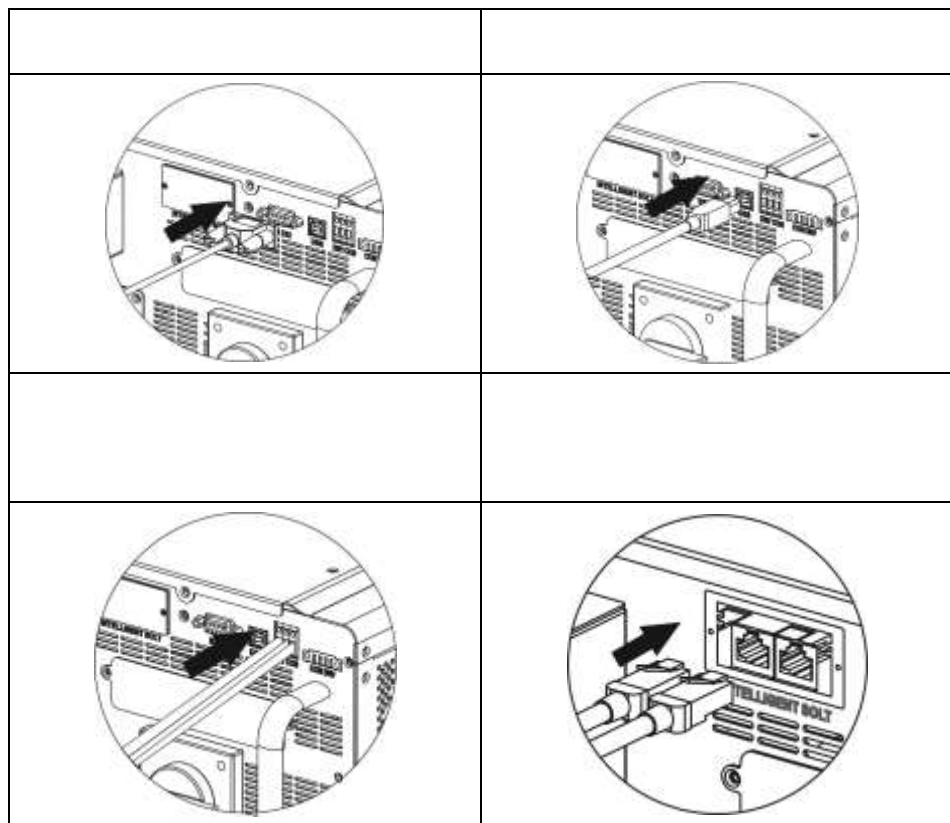






**CAUTION:**


## 9. Communication



10. Dry Contact Signal

10-1. Electric Parameter


10-2. Function Description

**Parameters setting**

Min. grid-connected voltage: 184 V	Apply	The waiting time before grid-connection: 60 Sec.	Apply
Max. grid-connected voltage: 284.5 V	Apply	Max. grid-connected average voltage: 253 V	Apply
Min. grid-connected frequency: 47.45 Hz	Apply	Max. feed-in grid power: 10,000 W	Apply
Max. grid-connected frequency: 51.5 Hz	Apply		

Min. PV input voltage: 300 V	Apply	Floating charging voltage: 54 V	Apply
Max. PV input voltage: 600 V	Apply	Battery cut-off discharging voltage when Grid is available: 48 V	Apply
Min. MPV voltage: 350 V	Apply	Battery re-discharging voltage when Grid is available: 54 V	Apply
Max. MPV voltage: 650 V	Apply	Battery cut-off discharging voltage when Grid is unavailable: 42 V	Apply
Max. charging current: 80 A	Apply	Battery re-discharging voltage when Grid is unavailable: 48 V	Apply
Max. AC charging current: 60 A	Apply	Battery temperature compensation: 0 mV	Apply
Bulk charging voltage(C.V. voltage): 58 V	Apply	Feeding grid power calibration: 0 W	Apply
Start LCD screen-saver after: None	Set	Max. battery discharge current in hybrid mode: 10 A	Apply

Mute Buzzer alarm: <input type="radio"/> Enable <input checked="" type="radio"/> Disable	Apply	Generator as AC source: <input type="radio"/> Enable <input checked="" type="radio"/> Disable	Apply
Mute the buzzer in the Standby mode: <input type="radio"/> Enable <input checked="" type="radio"/> Disable	Apply	Activate LiFe safety while commissioning: <input type="radio"/> Yes <input checked="" type="radio"/> No	Apply
Mute alarm in battery mode: <input type="radio"/> Enable <input checked="" type="radio"/> Disable	Apply	Wide AC input range: <input type="radio"/> Enable <input checked="" type="radio"/> Disable	Apply

When float charging current is less than X(A) and continued T(Min),then charger off; when battery voltage is less than Y(V),then charger on again.

X: 0 A      T: 60 Min      Y: 53 V

Any schedule charge will affect the power generated and shall be conservatively made.

System time: 2014-10-27

14:03:21

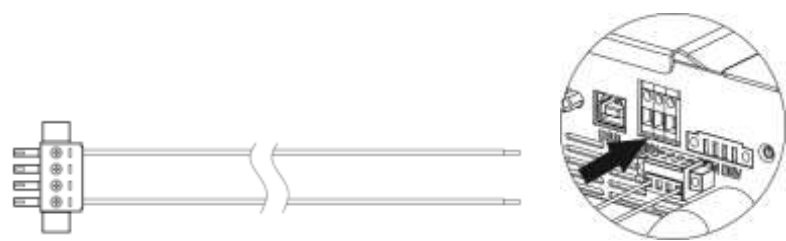
Apply

Close

# 11. Relay Control Port

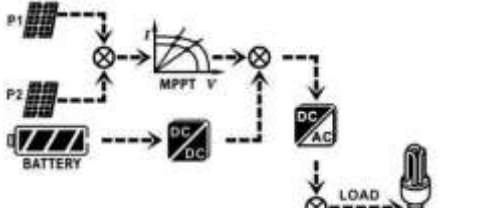
## Grid-tie with backup II

### 11-1. Interface Configuration

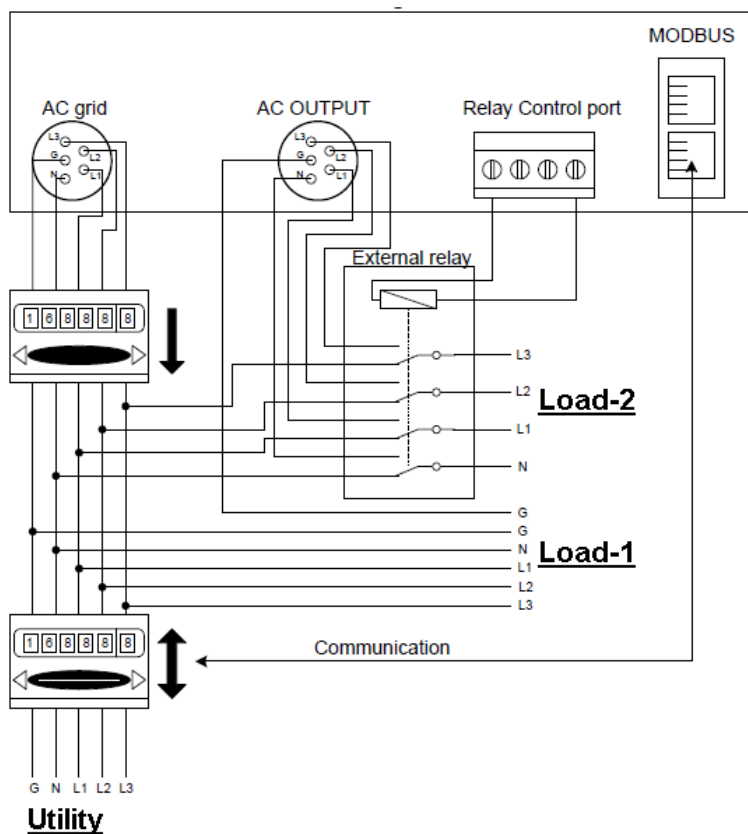


### 11-2. Function Description

	<div><p><b>Condition 1:</b></p><p><b>Condition 2:</b></p></div>	

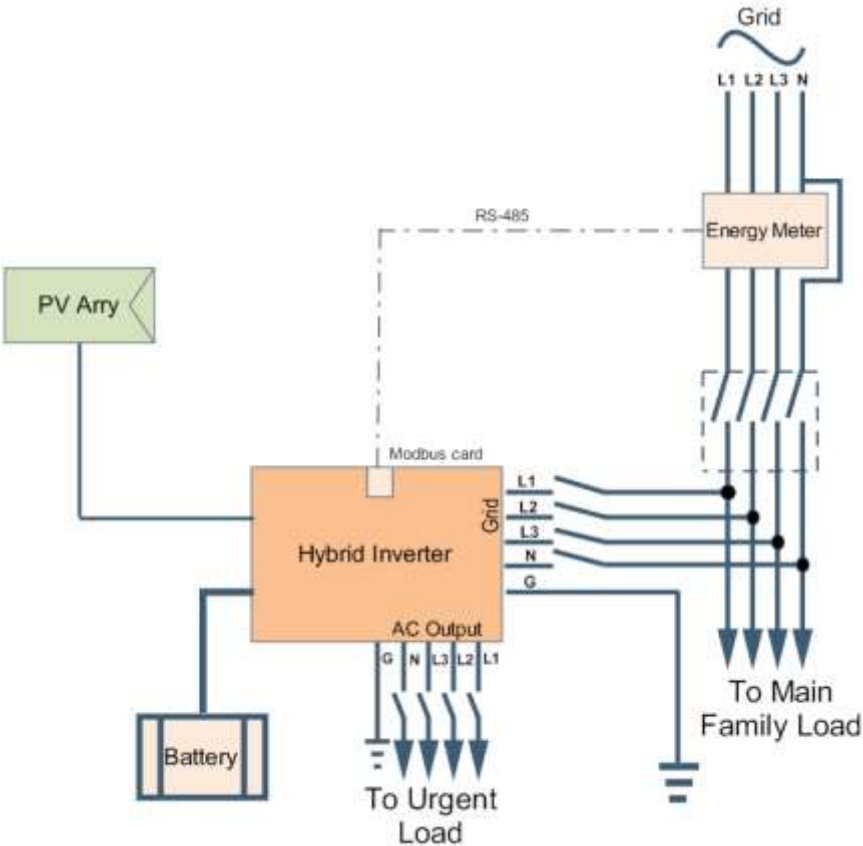
Power on	<p><b>Condition 3:</b></p> 	230V
	When the unit is not working at inverter mode or grid is available.	0V

### 11-3. Application



# 12. Application with Energy Meter

**Note:** Grid-Tie with Backup II



**13.   Commissioning**

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- 

**NOTE:**

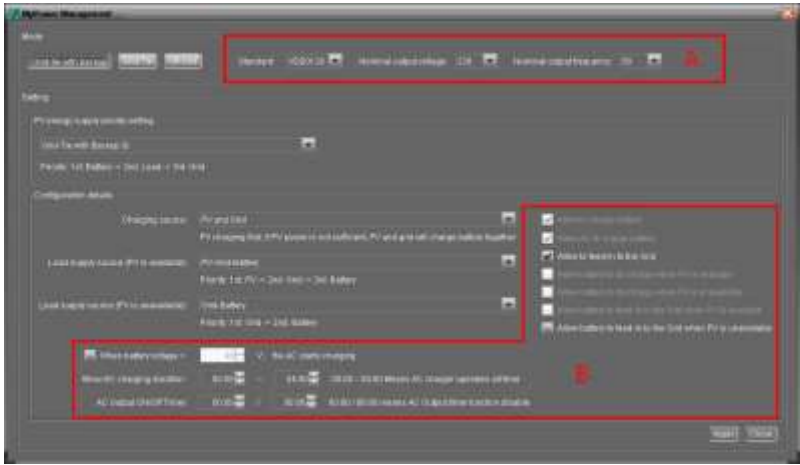


# 14. Initial Setup

Step 1:

Step 2:

Step 3:



Mode

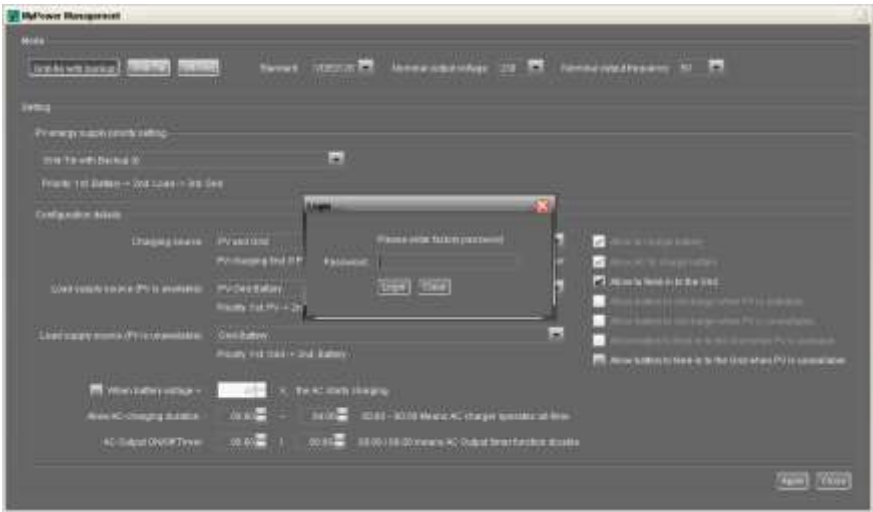
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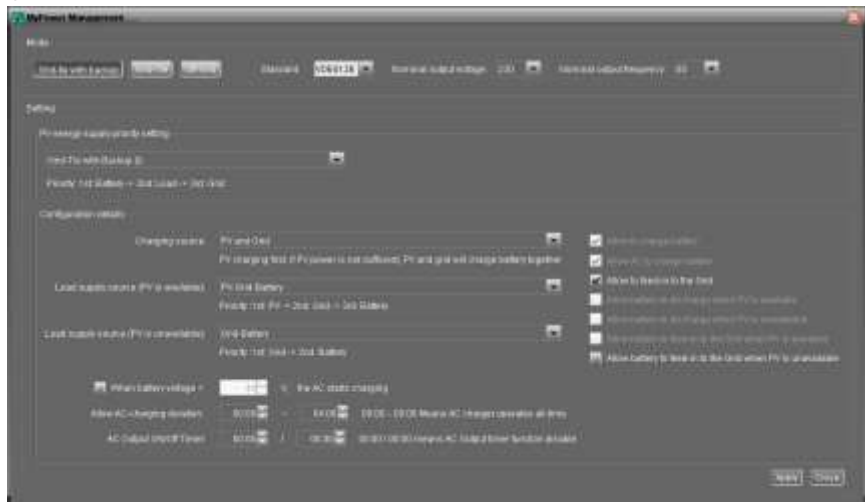
**SECTION A:**

**CAUTION:**

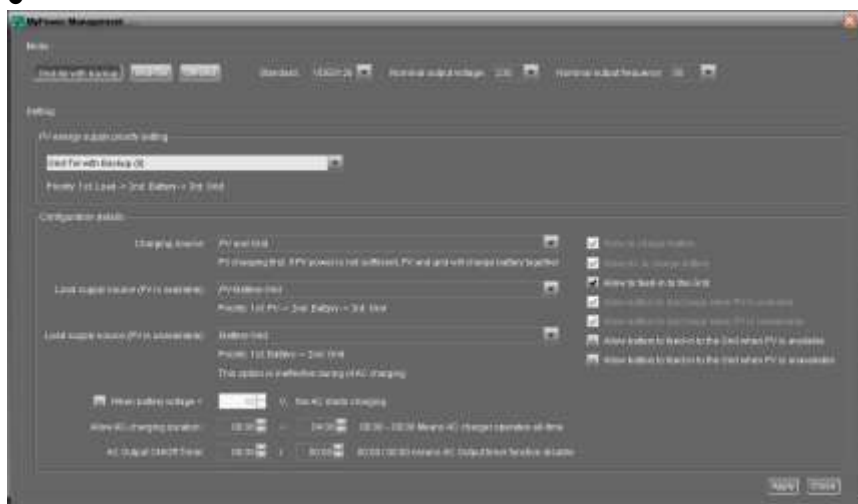


**SECTION B:**

## Grid-tie with backup



## NOTE:

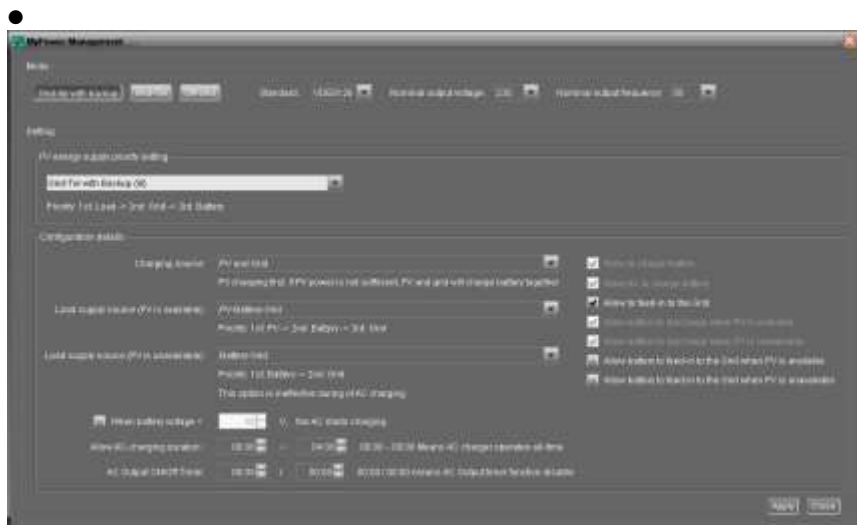


[Redacted]

[Redacted]

[Redacted]

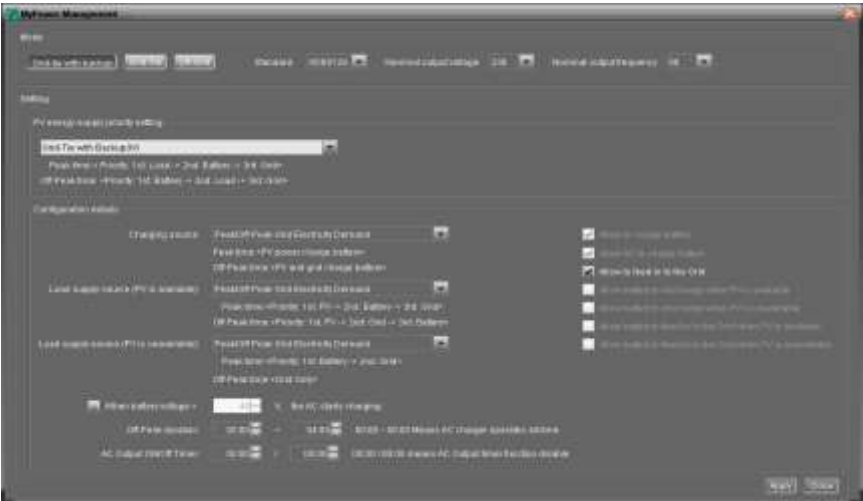
**NOTE:**



**NOTE:**

**NOTE:**

●

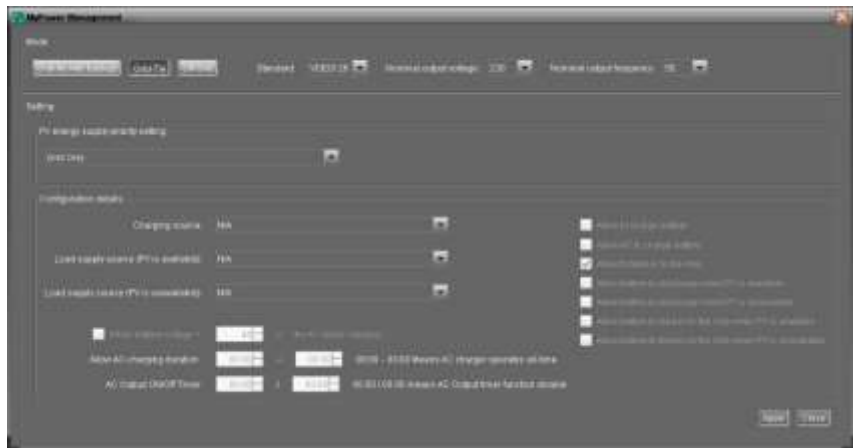


**Working logic under peak time:**

**Working logic under off-peak time:**

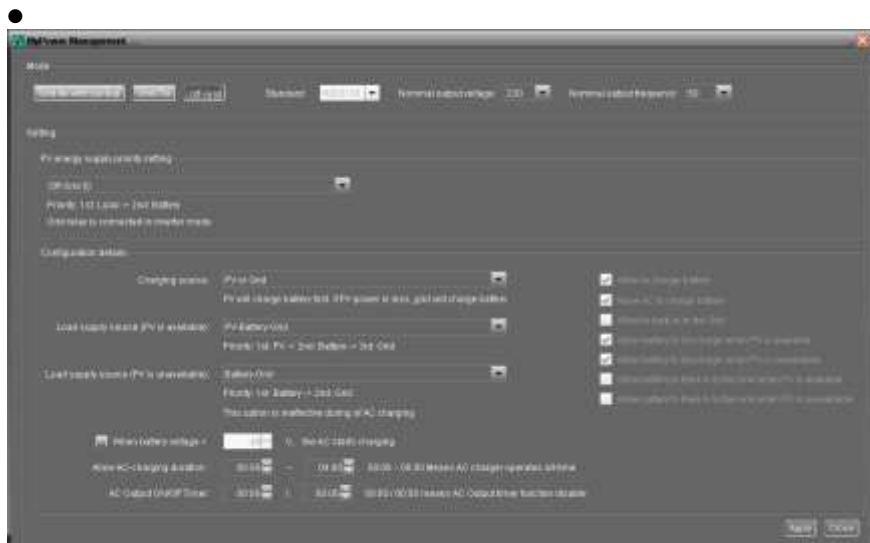
**NOTE:**

## Grid-Tie

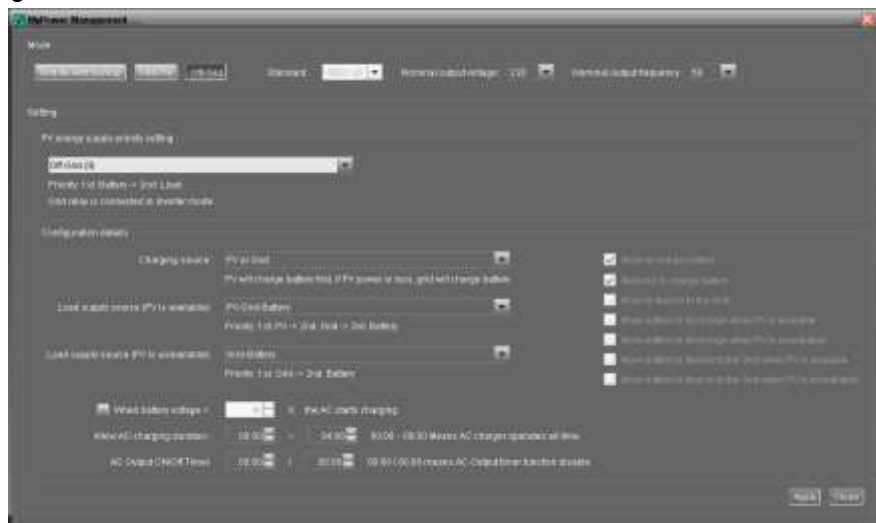




## Off-Grid

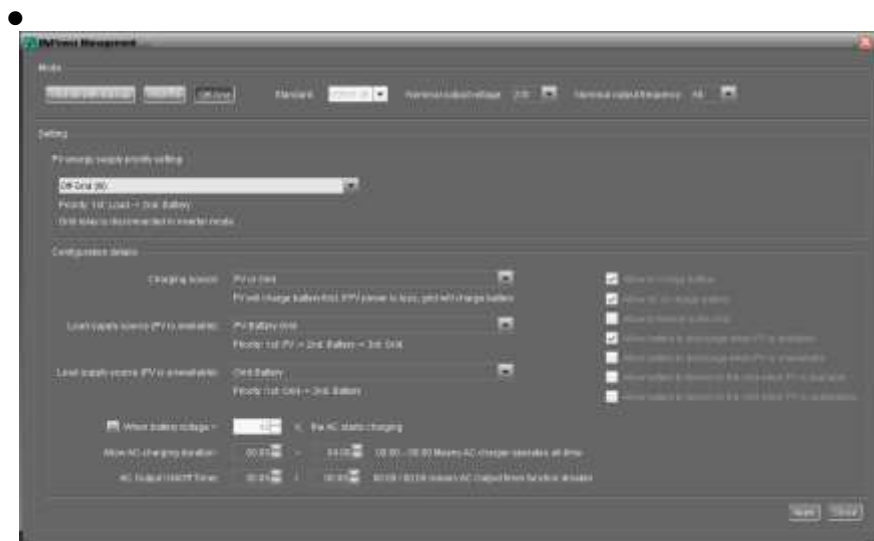


## NOTE:



## NOTE:

## NOTE:



## NOTE:



**NOTE:**

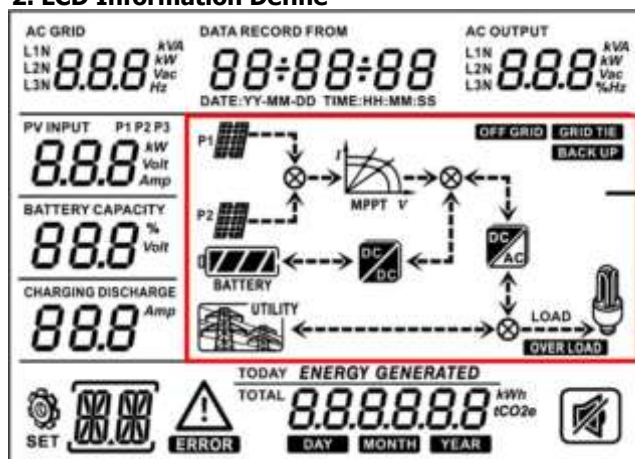
## 15. Operation

### 15-1. Interface








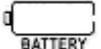





**NOTICE:**

### 15-2. LCD Information Define



Real-time operation  
status

Display	Function
AC GRID L1N 88.8 L2N Vac L3N Hz	
AC OUTPUT L1N 88.8 L2N kW L3N Vac %Hz	
PV INPUT P1 P2 88.8 kW Vac	
BATTERY CAPACITY 88.8 % Vac	

CHARGING/DISCHARGE 88.8 Amp	
	
ERROR	
	
DATA RECORD FROM 88:88:88 DATE: YY-MM-DD TIME: HH-MM-SS	
	
 UTILITY	
 BATTERY	
 BATTERY	 BATTERY
 BATTERY	
 LOAD	
	
OVER LOAD	
TODAY ENERGY GENERATED TOTAL 88.88.88 Amp-HOUR DAY MONTH YEAR	

### 15-3. Button Definition



**NOTE:**

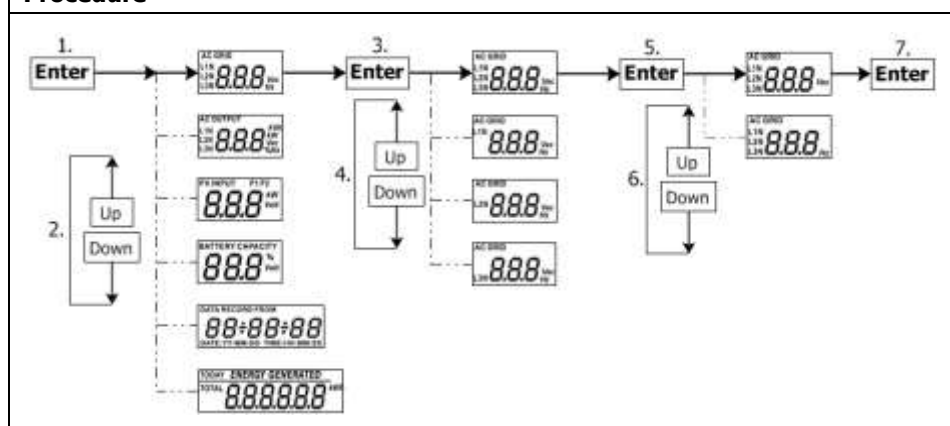
#### 15-4. Query Menu Operation

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- 

#### Setting Display Procedure

- **Input voltage or frequency of AC input**

##### Procedure



- ### Procedure
- 
- ```

graph LR
    1[1. Enter] --> S1[DC BATT  
11.6 88.8  
12.0 88.8  
12.5 88.8]
    S1 -- Up --> 2[2.]
    S1 -- Down --> 3[3. Enter]
    2 -- Up --> S2[DC BATT  
11.6 88.8  
12.0 88.8  
12.5 88.8]
    2 -- Down --> 3
    3 --> S3[DC BATT  
11.6 88.8  
12.0 88.8  
12.5 88.8]
    S3 -- Up --> 4[4.]
    S3 -- Down --> 5[5. Enter]
    4 -- Up --> S4[DC BATT  
11.6 88.8  
12.0 88.8  
12.5 88.8]
    4 -- Down --> 5
    5 --> S5[DC BATT  
11.6 88.8  
12.0 88.8  
12.5 88.8]
    S5 -- Up --> 6[6.]
    S5 -- Down --> 7[7. Enter]
    6 -- Up --> S6[DC BATT  
11.6 88.8  
12.0 88.8  
12.5 88.8]
    6 -- Down --> 7
    7 --> S7[DC BATT  
11.6 88.8  
12.0 88.8  
12.5 88.8]
    S7 --> S8[TOTAL ENERGY GENERATED  
TOTAL 8888888]
  
```

[illegible]



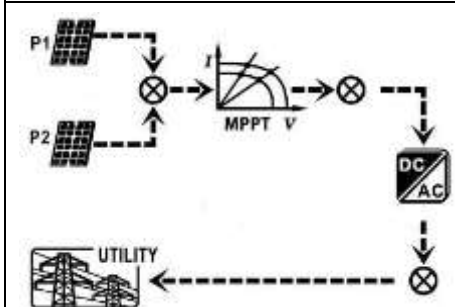
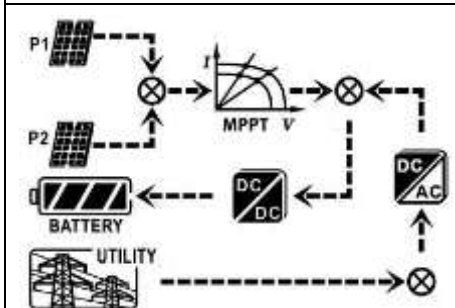
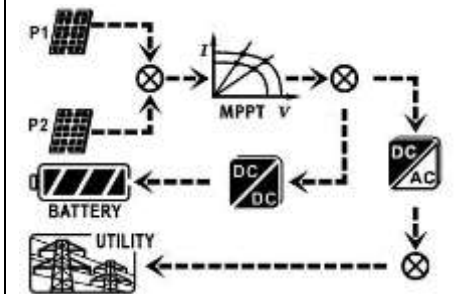
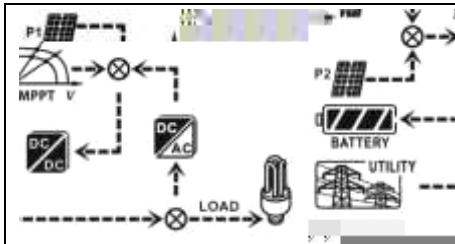
- **Battery voltage or percentage.**

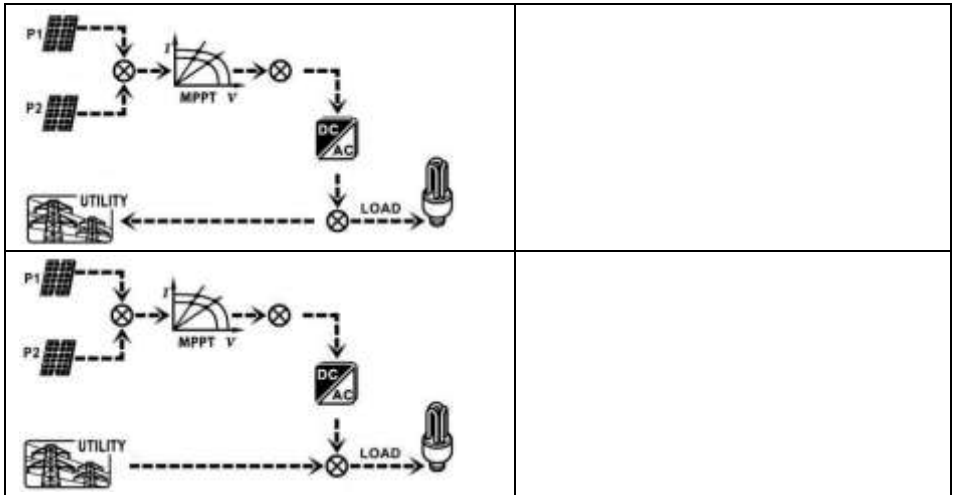
| Procedure |
|-----------|
|           |

- **Date and time.**

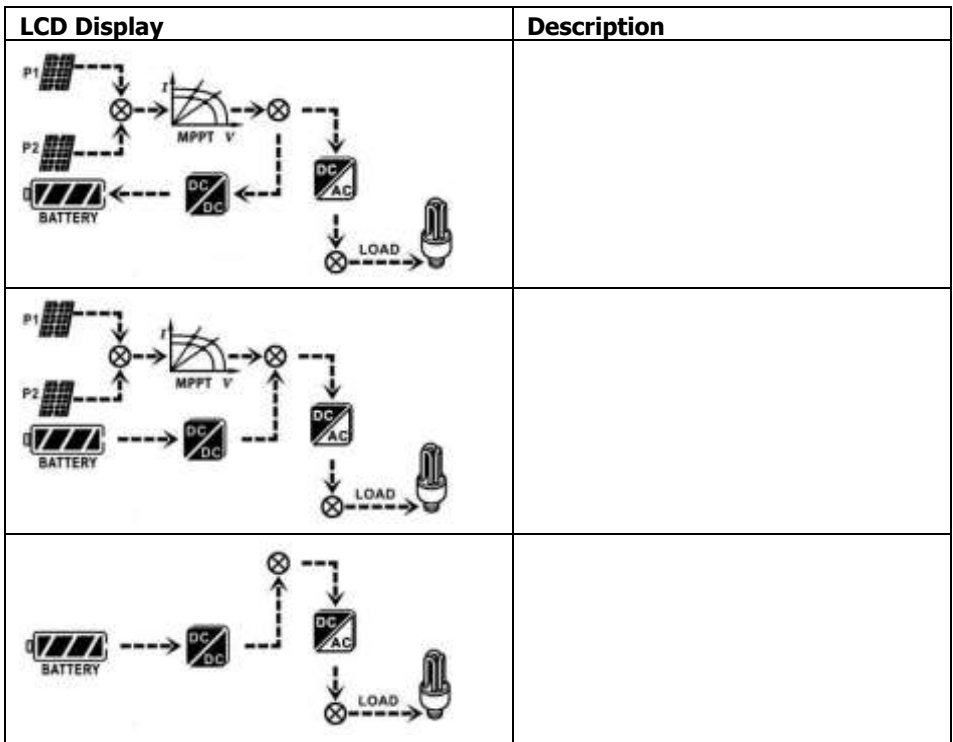
| Procedure |
|-----------|
|           |

- **Today or total energy generated.**

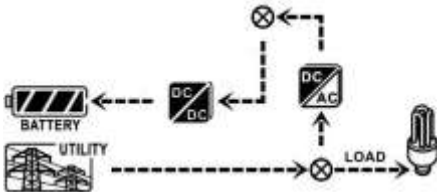
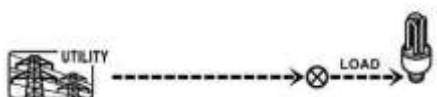




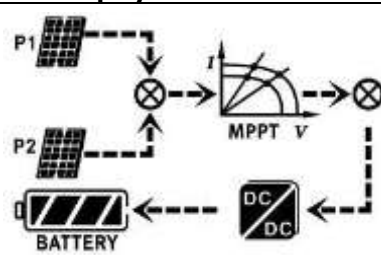
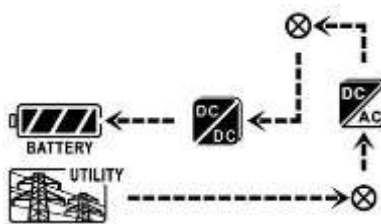

**Inverter mode without grid connected**



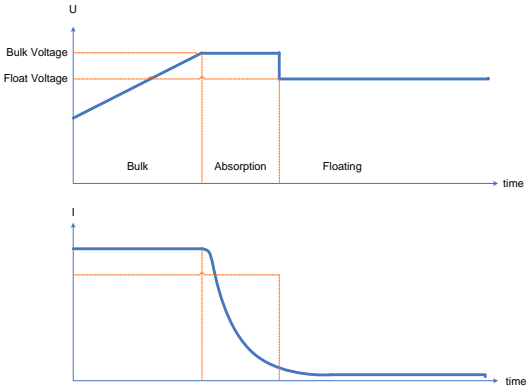
**Bypass mode**

| LCD Display                                                                       | Description |
|-----------------------------------------------------------------------------------|-------------|
|  |             |
|  |             |

**Standby mode :**

| LCD Display                                                                         | Description |
|-------------------------------------------------------------------------------------|-------------|
|    |             |
|   |             |
|  |             |

16. Charging Management

|   |                                                                                               |  |
|---|-----------------------------------------------------------------------------------------------|--|
|   |                                                                                               |  |
|   |                                                                                               |  |
|   |                                                                                               |  |
|   |                                                                                               |  |
|   |                                                                                               |  |
| 5 | <div></div> |  |

**Parameters setting**

|                                |          |       |                                          |          |       |
|--------------------------------|----------|-------|------------------------------------------|----------|-------|
| Min. grid-connected voltage:   | 194 V    | Apply | The waiting time before grid-connection: | 60 Sec.  | Apply |
| Max. grid-connected voltage:   | 294.5 V  | Apply | Max. grid-connected average voltage:     | 253 V    | Apply |
| Min. grid-connected frequency: | 47.45 Hz | Apply | Max. feed-in grid power:                 | 10,000 W | Apply |
| Max. grid-connected frequency: | 51.5 Hz  | Apply |                                          |          |       |


|                                           |       |            |                                                               |      |       |
|-------------------------------------------|-------|------------|---------------------------------------------------------------|------|-------|
| Min. PV input voltage:                    | 300 V | Apply      | <b>Floating charging voltage:</b>                             | 54 V | Apply |
| Max. PV input voltage:                    | 600 V | Apply      | Battery cut-off discharging voltage when Grid is available:   | 48 V | Apply |
| Min. MPV voltage:                         | 350 V | Apply      | Battery re-discharging voltage when Grid is available:        | 54 V | Apply |
| Max. MPV voltage:                         | 650 V | Apply      | Battery cut-off discharging voltage when Grid is unavailable: | 42 V | Apply |
| <b>Max. charging current:</b>             | 80 A  | Apply      | Battery re-discharging voltage when Grid is unavailable:      | 48 V | Apply |
| <b>Max. AC charging current:</b>          | 60 A  | Apply      | Battery temperature compensation:                             | 0 mV | Apply |
| <b>Bulk charging setpoint V. voltage:</b> | 55 V  | Apply      | Feeding grid power calibration:                               | 0 W  | Apply |
| Start LCD screen-saver after:             | None  | Sec. Apply | Max. battery discharge current in hybrid mode:                | 10 A | Apply |


  

|                                      |        |         |       |                                            |        |         |       |
|--------------------------------------|--------|---------|-------|--------------------------------------------|--------|---------|-------|
| Mute buzzer alarm:                   | Enable | Disable | Apply | Generator as AC source:                    | Enable | Disable | Apply |
| Mute the buzzer in the Standby mode: | Enable | Disable | Apply | Activate LiFe battery while commissioning: | Yes    | No      | Apply |
| Mute alarm in battery mode:          | Enable | Disable | Apply | Wide AC input range:                       | Enable | Disable | Apply |

When float charging current is less than X(A) and continued T(Min),then charger off, when battery voltage is less than Y(V),then charger on again.

X: 0 A    T: 60 Min.    Y: 53 V    Apply

 Any schedule change will affect the power generated and shall be conservatively made.

System time: 2014-12-27 

14:01:21    Apply

Close

# 17. Maintenance & Cleaning

- 
- 
- 
- 

**WARNING**

## Battery Maintenance

- 
- 
- 

**CAUTION**

**CAUTION**

**CAUTION**



# 18.    Trouble Shooting

NOTE:

## 18-1. Warning List



| Code | Warning Event | Icon<br>(flashing) | Description |
|------|---------------|--------------------|-------------|
|      |               |                    |             |
|      |               |                    |             |
|      |               |                    |             |
|      |               |                    |             |
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|      |               |                    |             |
|      |               |                    |             |

18-2. Fault Reference Codes

ERROR

| Situation  |             |                | Solution |
|------------|-------------|----------------|----------|
| Fault Code | Fault Event | Possible cause |          |
|            |             |                |          |
|            |             |                |          |
|            |             |                |          |
|            |             |                |          |
|            |             |                |          |
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19. Specifications

|                                      |      |
|--------------------------------------|------|
| MODEL                                | 10KW |
| RATED POWER                          |      |
| PV INPUT (DC)                        |      |
|                                      |      |
|                                      |      |
|                                      |      |
|                                      |      |
|                                      |      |
|                                      |      |
|                                      |      |
|                                      |      |
|                                      |      |
|                                      |      |
| GRID OUTPUT (AC)                     |      |
|                                      |      |
|                                      |      |
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|                                      |      |
|                                      |      |
|                                      | 5    |
| AC INPUT                             |      |
|                                      |      |
|                                      |      |
|                                      |      |
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|                                      |      |
|                                      |      |
| BATTERY MODE OUTPUT (AC)             |      |
|                                      |      |
|                                      |      |
|                                      |      |
|                                      |      |
|                                      |      |
| BATTERY & CHARGER (Lead-acid/Li-ion) |      |
|                                      | 5    |
|                                      |      |
|                                      |      |
|                                      |      |

| GENERAL     |  |
|-------------|--|
| PHYSICAL    |  |
|             |  |
|             |  |
| INTERACE    |  |
|             |  |
|             |  |
| ENVIRONMENT |  |
|             |  |
|             |  |
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|             |  |