USER MANUAL

INVERTER / CHARGER
7.2KW/8.2KW/10.2KW

M-HMK-F3-102-EN-A01

Table Of Contents

ABOUT THIS MANUAL

Purpose

This manual describes the assembly, installation, operation and troubleshooting of this unit. Please read this manual carefully before installations and operations. Keep this manual for future reference.

Scope

This manual provides safety and installation guidelines as well as information on tools and wiring.

SAFETY INSTRUCTIONS

WARNING: This chapter contains important safety and operating instructions. Read and keep this manual for future reference.

1. Before using the unit, read all instructions and cautionary markings on the unit, the batteries and all appropriate sections of this manual.
2. **CAUTION** --To reduce risk of injury, charge only deep-cycle lead acid type rechargeable batteries. Other types of batteries may burst, causing personal injury and damage.
3. Do not disassemble the unit. Take it to a qualified service center when service or repair is required. Incorrect re-assembly may result in a risk of electric shock or fire.
4. To reduce risk of electric shock, disconnect all wirings before attempting any maintenance or cleaning. Turning off the unit will not reduce this risk.
5. **CAUTION –** Only qualified personnel can install this device with battery.
6. **NEVER** charge a frozen battery.
7. For optimum operation of this inverter/charger, please follow required spec to select appropriate cable size. It's very important to correctly operate this inverter/charger.
8. Be very cautious when working with metal tools on or around batteries. A potential risk exists to drop a tool to spark or short circuit batteries or other electrical parts and could cause an explosion.
9. Please strictly follow installation procedure when you want to disconnect AC or DC terminals. Please refer to INSTALLATION section of this manual for the details.
10. One piece of 150A fuse is provided as over-current protection for the battery supply.
11. GROUNDING INSTRUCTIONS -This inverter/charger should be connected to a permanent grounded wiring system. Be sure to comply with local requirements and regulation to install this inverter.
12. NEVER cause AC output and DC input short circuited. Do NOT connect to the mains when DC input short circuits.
13. **Warning!!** Only qualified service persons are able to service this device. If errors still persist after following troubleshooting table, please send this inverter/charger back to local dealer or service center for maintenance.

INTRODUCTION

This is a multi-function inverter/charger, combining functions of inverter, solar charger and battery charger to offer uninterruptible power support with portable size. Its comprehensive LCD display offers user-configurable and easy-accessible button operation such as battery charging current, AC/solar charger priority, and acceptable input voltage based on different applications.

Features

- Pure sine wave inverter
- Inverter running without battery
- Configurable input voltage range for home appliances and personal computers via LCD setting
- Configurable battery charging current based on applications via LCD setting
- Configurable AC/Solar Charger priority via LCD setting
- Compatible to mains voltage or generator power
- Auto restart while AC is recovering
- Overload/ Over temperature/ short circuit protection
- Smart battery charger design for optimized battery performance
- Cold start function

Basic System Architecture

The following illustration shows basic application for this inverter/charger. It also includes following devices to have a complete running system:

- Generator or Utility.
- PV modules

Consult with your system integrator for other possible system architectures depending on your requirements.

This inverter can power all kinds of appliances in home or office environment, including motor-type appliances such as tube light, fan, refrigerator and air conditioner.

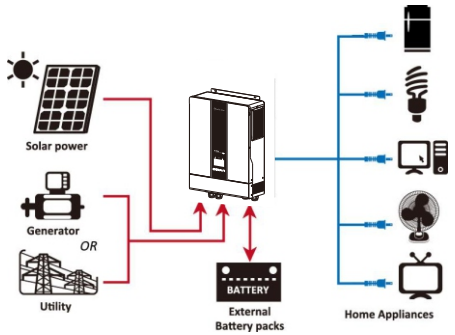
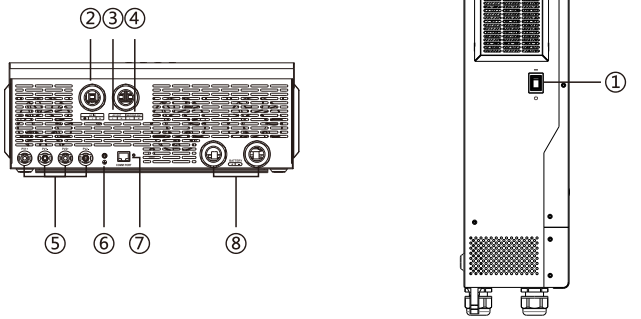


Figure 1 Hybrid Power System

Product Overview



1. Power on/off switch
2. AC input
3. AC ouput
4. Second output
5. PV1 and Pv2 input
6. GND
7. Communication port
8. Battery input

INSTALLATION

Unpacking and Inspection

Before installation, please inspect the unit. Be sure that nothing inside the package is damaged. You should have received the following items inside of package:

- The unit x 1
- User manual x 1
- Dust cover (optional)
- Mc4 terminal head x 2

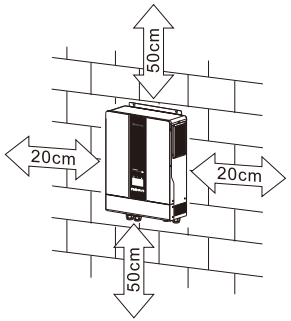
Preparation

Before connecting all wirings, please take off bottom cover by removing two screws as shown below.

Mounting the Unit

Consider the following points before selecting where to install:

- Do not mount the inverter on flammable construction materials.
- Mount on a solid surface
- Install this inverter at eye level in order to allow the LCD display to be read at all times.
- For proper air circulation to dissipate heat, allow a clearance of approx. 20 cm to the side and approx. 50 cm above and below the unit.
- The ambient temperature should be between 0℃ and 55℃ to ensure optimal operation.
- The recommended installation position is to be adhered to the wall vertically.
- Be sure to keep other objects and surfaces as shown in the diagram to guarantee sufficient heat dissipation and to have enough space for removing wires.



⚠ **SUITABLE FOR MOUNTING ON CONCRETE OR OTHER NON-COMBUSTIBLE SURFACE ONLY.**

Install the unit by screwing two screws. It's recommended to use M4 or M5 screws.

Battery Connection

This model can be operated without battery connection. Connect to battery if necessary.

CAUTION: For safety operation and regulation compliance, it's requested to install a separate DC over-current protector or disconnect device between battery and inverter. It may not be requested to have a disconnect device in some applications, however, it's still requested to have over-current protection installed. Please refer to typical amperage in below table as required fuse or breaker size.

WARNING! All wiring must be performed by a qualified personnel.

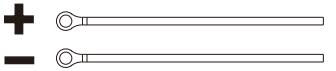
WARNING! It's very important for system safety and efficient operation to use appropriate cable for battery connection. To reduce risk of injury, please use the proper recommended cable as below.

Recommended battery cable size:

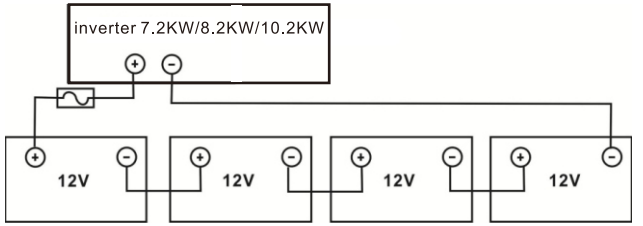
Model	Wire Size	Cable (mm²)	Torque value (max)
7.2KW/8.2KW/10.2KW	1 x 2AWG	25	2 Nm

Please follow below steps to implement battery connection:

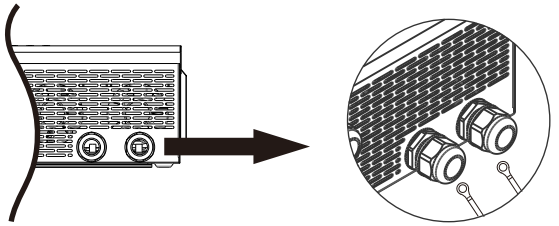
1. Remove insulation sleeve 18 mm for positive and negative conductors.
2. Suggest to put bootlace ferrules on the end of positive and negative wires with a proper crimping tool.



3. Connect all battery packs as below chart.

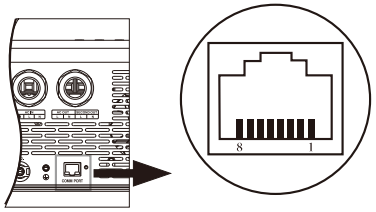


4. Insert the battery wires flatly into battery connectors of inverter and make sure the bolts are tightened with torque of 2 Nm in clockwise direction. Make sure polarity at both the battery and the inverter/charge is correctly connected and conductors are tightly screwed into the battery terminals.
   Recommended tool: #2 Pozi Screwdriver



⚠	**WARNING: Shock Hazard** Installation must be performed with care due to high battery voltage in series.
⚠	**CAUTION!!** Before making the final DC connection or closing DC breaker/disconnector, be sure positive (+) must be connected to positive (+) and negative (-) must be connected to negative (-).

Communication Port



Pin on Rj45	Description
1	RS485-A
2	RS485-B
8	GND

AC Input/Output Connection

CAUTION!! Before connecting to AC input power source, please install a **separate** AC breaker between inverter and AC input power source. This will ensure the inverter can be securely disconnected during maintenance and fully protected from over current of AC input. The recommended spec of AC breaker is 63A for 7.2KW/8.2KW/10.2KW.

CAUTION!! There are two terminal blocks with "IN" and "OUT" markings. Please do NOT mis-connect input and output connectors.

WARNING! All wiring must be performed by a qualified personnel.

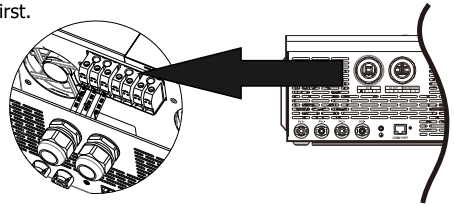
WARNING! It's very important for system safety and efficient operation to use appropriate cable for AC input connection. To reduce risk of injury, please use the proper recommended cable size as below.

Suggested cable requirement for AC wires

Model	Gauge	Cable (mm^2)	Torque Value
7.2KW/8.2KW/10.2KW	10 AWG	6	1.2 Nm

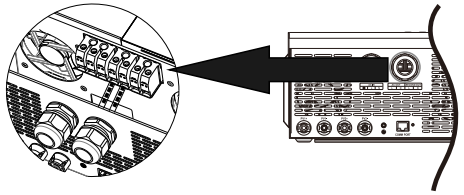
Please follow below steps to implement AC input/output connection:

1. Before making AC input/output connection, be sure to open DC protector or disconnector first.
2. Remove insulation sleeve 10mm for six conductors. And shorten phase L and neutral conductor N 3 mm.
3. Insert AC input wires according to polarities indicated on terminal block and tighten the terminal screws. Be sure to connect PE protective conductor (⏚) first.
   ⏚→**Ground (yellow-green)**
   L→LINE (brown or black)
   N→Neutral (blue)



⚠	**WARNING:** Be sure that AC power source is disconnected before attempting to hardwire it to the unit.

4. Then, insert AC output wires according to polarities indicated on terminal block and tighten terminal screws.
   L→LINE (brown or black)
   N→Neutral (blue)



5. Make sure the wires are securely connected.

CAUTION: Appliances such as air conditioner are required at least 2~3 minutes to restart because it's required to have enough time to balance refrigerant gas inside of circuits. If a power shortage occurs and recovers in a short time, it will cause damage to your connected appliances. To prevent this kind of damage, please check manufacturer of air conditioner if it's equipped with time-delay function before installation. Otherwise, this inverter/charger will trig overload fault and cut off output to protect your appliance but sometimes it still causes internal damage to the air conditioner.

PV Connection

CAUTION: Before connecting to PV modules, please install **separately** a DC circuit breaker between inverter and PV modules.

WARNING! It's very important for system safety and efficient operation to use appropriate cable for PV module connection. To reduce risk of injury, please use the proper recommended cable size as below.

Model	Wire Size	Cable (mm^2)	Torque value（max）
7.2KW/8.2KW/10.2KW	1 x 10AWG	6	1.2 Nm

PV Module Selection:

When selecting proper PV modules, please be sure to consider below parameters:

1. Open circuit Voltage (Voc) of PV modules not exceeds max. PV array open circuit voltage of inverter.
2. Open circuit Voltage (Voc) of PV modules should be higher than min. battery voltage.

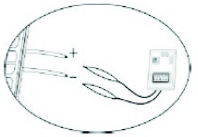
INVERTER MODEL	7.2KW	8.2KW	10.2KW
Max. PV Array Open Circuit Voltage	500Vdc		
PV Array MPPT Voltage Range	90Vdc~450Vdc		

Take 250Wp PV module as an example. After considering above two parameters, the recommended module configurations are listed as below table.

Solar Panel Spec. (reference) - 250Wp - Vmp: 30.1Vdc - Imp: 8.3A - Voc: 37.7Vdc - Isc: 8.4A - Cells: 60	SOLAR INPUT (Min in serial: 6 pcs, max. in serial: 13 pcs)	Q'ty of panels	Total input power
	6 pcs in serial	6 pcs	1500W
	8 pcs in serial	8 pcs	2000W
	12 pcs in serial	12 pcs	3000W
	13 pcs in serial	13 pcs	3250W
	12 pieces in serial and 3 sets in parallel	36 pcs	8200W
	10 pieces in serial and 4 sets in parallel	40 pcs	10200W

PV Module Wire Connection

Step 1: Check the input voltage of PV array modules, The acceptable input voltage of the inverter is 120VDC-500VDC. Please make sure that the maximum current load of each PV input connector is 10A.



CAUTION: Exceeding the maximum input voltage can destroy the unit!! Check the system before wire connection.

Step 2: Disconnect the DC circuit breaker.

Step 3: Assemble provided PV connectors with PV modules by the following below steps.

Components for Py connectors and Tools:

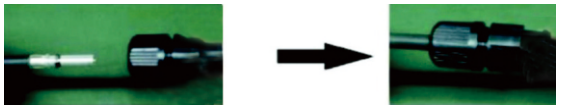
Female connector housing		Male terminal	
Female terminal		Crimping tool and spanner	
Male connector housing			

Cable preparation and connector assembly process:

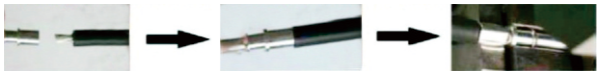
Strip one cable 8 mm on both end sides and be careful NOT to nick conductors.

Insert striped cable into female terminal and crimp female terminal as shown below charts.

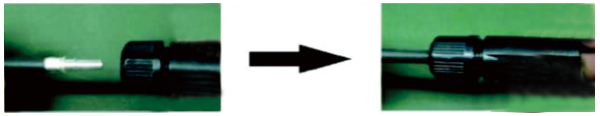
Insert assembled cable into female connector housing as shown below charts.



Insert striped cable into male terminal and crimp male terminal as shown below charts.

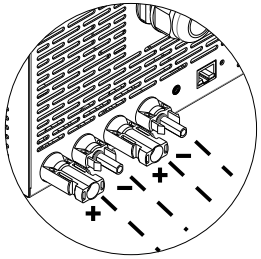


Insert assembled cable into male connector housing as shown below charts.



Then, use spanner to screw pressure dome tightly to female connector and male connector as shown below.

Step 4: Check correct polarity of connection cable from PV modules and PV input connectors, Then, connect positive pole (+) of connection cable to positive pole (+) of PV input connector, Connect negative pole (-) of connection cable to negative pole (-) of PV input connector.

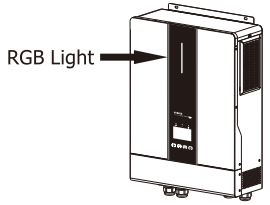


Final Assembly

After connecting all wirings, please put bottom cover back by screwing two screws as shown below.

RGB Light(option)

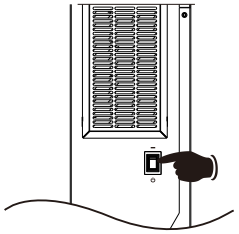
LCD Parameter Sheet(Note:91-98 only for RGB light).



OPERATION

Power ON/OFF

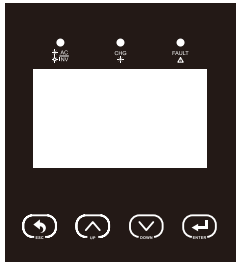
Side view of unit



Once the unit has been properly installed and the batteries are connected well, simply press On/Off switch (located on the button of the case) to turn on the unit.

Operation and Display Panel

The operation and display panel, shown in below chart, is on the front panel of the inverter. It includes three indicators, four function keys and a LCD display, indicating the operating status and input/output power information.



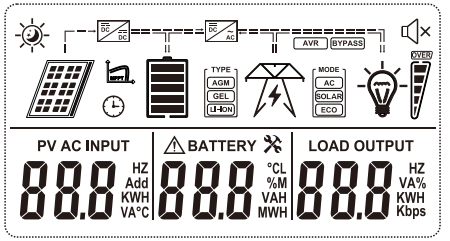
LED Indicator

LED Indicator			Messages
INV/AC	Green	Solid On	Output is powered by utility in Line mode.
		Flashing	Output is powered by battery or PV in battery mode.
CHG	Green	Solid On	Battery is fully charged.
		Flashing	Battery is charging.
FAULT	Red	Solid On	Fault occurs in the inverter.
		Flashing	Warning condition occurs in the inverter.

Function Keys

Function Key	Description
ESC	To exit setting mode
UP	To go to previous selection
DOWN	To go to next selection
ENTER	To confirm the selection in setting mode or enter setting mode

LCD Display Icons



Icon	Function Description
Input Source Information	
AC INPUT	Indicates the AC information
PV INPUT	Indicates the SOLAR information
PV AC INPUT 88.8 HZ Add KWH VA°C	Indicates input voltage, input voltage, solar voltage
Output Information	
LOAD OUTPUT 88.8 HZ VA% KWH Kbps	Indicates output voltage, output frequency, load percentage, VA in load, load watts and discharge current
Battery Information	
BATTERY 88.8 °CL %M VAH MWH	Indicates battery voltage and charging current
	The battery capacity status is 0-10%, 10-30%, 30-50%, 50-70%, 70-90% and 90~ 100%

0%~10%	10%~30%	30%~50%	50%~70%	70%~90%	90%~100%
					

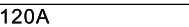
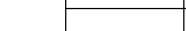
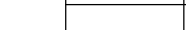
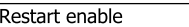
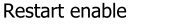
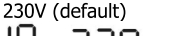
Load Information					
OVER	Indicates overload				
	Indicates load				
	0%~25%	25%~45%	45%~65%	65%~85%	85%~100%
					
Mode Operation Information					
	Indicates unit connects to PV				
	Indicates unit connects to AC				
	Indicates MPPT				
	Indicates the DC/DC inverter circuit is working				
	Indicates the DC/AC inverter circuit is working				
Buzzer Information					
	Indicates buzzer on				
	Indicates buzzer off				

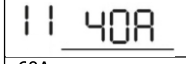
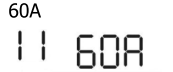
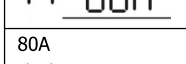
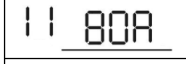
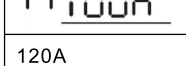
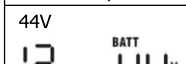
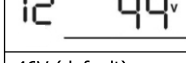
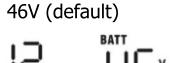
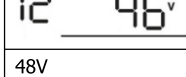
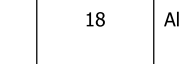
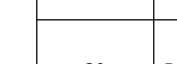
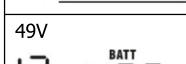
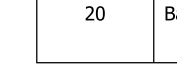
LCD Setting

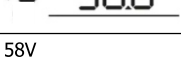
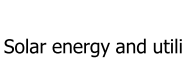
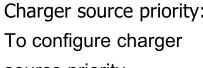
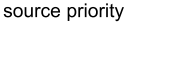
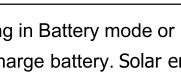
After pressing and holding ENTER button for 3 seconds, the unit will enter setting mode. Press "UP" or "DOWN" button to select setting programs. And then, press "ENTER" button to confirm the selection or ESC button to exit.

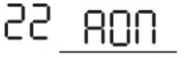
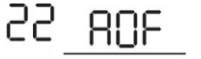
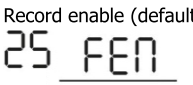
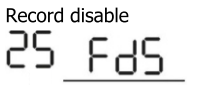
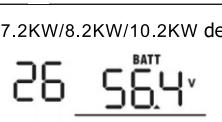
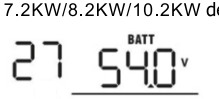
Setting Programs:

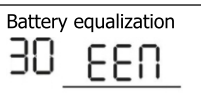
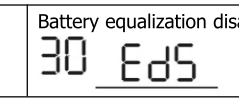
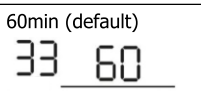
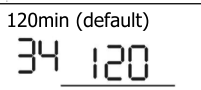
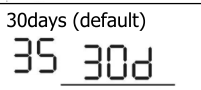
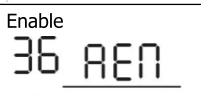
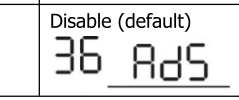
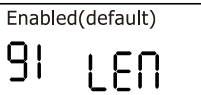
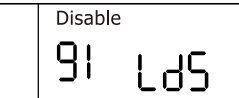
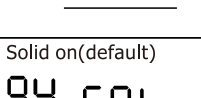
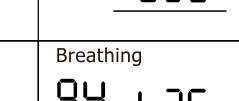
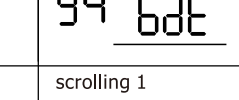
Program	Description	Selectable option	
01	Output source priority: To configure load power source priority	Utility first 	Utility will provide power to the loads as first priority. Solar and battery energy will provide power to the loads only when utility power is not available.
		Solar first (default)	Solar energy provides power to the loads as first priority. If solar energy is not sufficient to power all connected loads, utility will supply power to the loads at the same time. Battery provides power to the loads only when any one condition happens: - Solar energy and utility is not available. - Solar energy is not sufficient and utility is not available.
		SBU priority	Solar energy provides power to the loads as first priority. If solar energy is not sufficient to power all connected loads, battery energy will supply power to the loads at the same time. Utility provides power to the loads only when battery voltage drops to either low-level warning voltage or the setting point in program 12.
02	Maximum charging current: To configure total charging current for solar and utility chargers. (Max. charging current = utility charging current + solar charging current)	10A 	20A 
		30A 	40A 
		50A 	60A (default) 

02		70A 	80A 
		90A	100A 
		110A	120A 
		130A	140A 
		150A	160A 
03	AC input voltage range	Appliances (default) 	If selected, acceptable AC input voltage range will be within 90-280VAC.
		UPS 	If selected, acceptable AC input voltage range will be within 170-280VAC.
05	Battery type	AGM (default)	Flooded 
		User-Defined 	If "User-Defined" is selected, battery charge voltage and low DC cut-off voltage can be set up in program 26, 27 and 29.
06	Auto restart when overload occurs	Restart disable (default) 	Restart enable 
07	Auto restart when over temperature occurs	Restart disable (default)	Restart enable 
09	Output frequency	50Hz (default)	60Hz 
10	Output voltage	220V	230V (default) 
		240V	
11	Maximum utility charging current Note: If setting value in program 02 is smaller than that in program in 11, the inverter will apply charging	2A	10A 
		20A	30A (default) 

	current from program 02 for utility charger.	40A 	50A 
		60A 	70A 
		80A 	90A 
		100A 	110A 
		120A 	130A 
		140A 	
12	Setting voltage point back to utility source when selecting "SBU priority" or "Solar first" in program 01.	Available options in 7.2KW/8.2KW/10.2KW model:	
		44V 	45V 
		46V (default) 	47V 
		48V 	49V 
		50V 	51V 
13	Setting voltage point back to battery mode when selecting "SBU priority" or "Solar first" in program 01.	Available options in 7.2KW/8.2KW/10.2KW model:	
		Battery fully charged 	48V 
		49V 	50V 
		51V 	52V
		53V 	54V (default)

		55V	56V 
		57V	58V 
16	Charger source priority: To configure charger source priority	If this inverter/charger is working in Line, Standby or Fault mode, charger source can be programmed as below:	
		Solar and Utility (default)	Solar energy and utility will charge battery at the same time.
		Only Solar	Solar energy will be the only charger source no matter utility is available or not.
		If this inverter/charger is working in Battery mode or Power saving mode, only solar energy can charge battery. Solar energy will charge battery if it's available and sufficient.	
18	Alarm control	Alarm on (default)	Alarm off 
19	Auto return to default display screen	Return to default display screen (default) 	If selected, no matter how users switch display screen, it will automatically return to default display screen (Input voltage /output voltage) after no button is pressed for 1 minute.
		Stay at latest screen 	If selected, the display screen will stay at latest screen user finally switches.
20	Backlight control	Backlight on (default)	Backlight off 

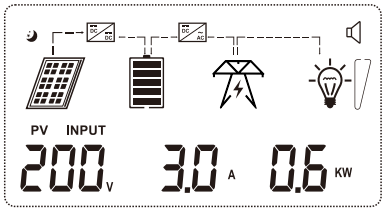
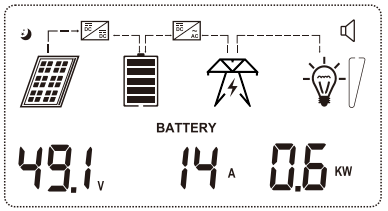
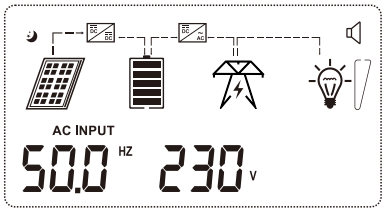
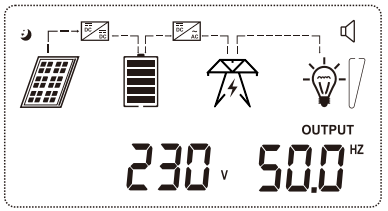
22	Beeps while primary source is interrupted	Alarm on (default) 	Alarm off 
23	Overload bypass: When enabled, the unit will transfer to line mode if overload occurs in battery mode.	Bypass disable (default) 	Bypass enable 
25	Record Fault code	Record enable (default) 	Record disable 
26	Bulk charging voltage (C.V voltage)	7.2KW/8.2KW/10.2KW default setting: 56.4V 	
		If self-defined is selected in program 5, this program can be set up. Setting range is from 48.0V to 61.0V for 7.2KW/8.2KW/10.2KW model. Increment of each click is 0.1V.	
27	Floating charging voltage	7.2KW/8.2KW/10.2KW default setting: 54.0V 	
		If self-defined is selected in program 5, this program can be set up. Setting range is from 48.0V to 61.0V for 7.2KW/8.2KW/10.2KW model. Increment of each click is 0.1V.	
29	Low DC cut-off voltage	7.2KW/8.2KW/10.2KW default setting: 40.0V 	
		If self-defined is selected in program 5, this program can be set up. Setting range is from 40.0V to 48.0V for 7.2KW/8.2KW/10.2KW model. Increment of each click is 0.1V. Low DC cut-off voltage will be fixed to setting value no matter what percentage of load is connected.	

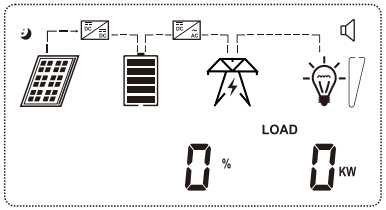
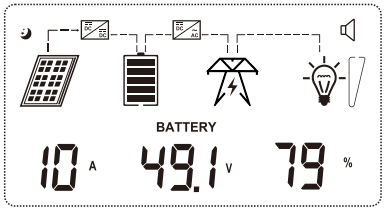
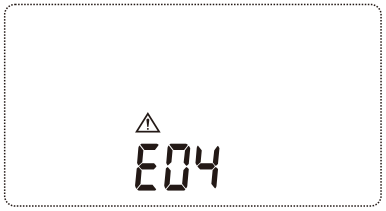
30	Battery equalization	Battery equalization 	Battery equalization disable (default) 
		If "Flooded" or "User-Defined" is selected in program 05, this program can be set up.	
31	Battery equalization voltage	7.2KW/8.2KW/10.2KW default setting: 58.4V 	
		Setting range is from 48.0V to 61.0V for 7.2KW/8.2KW/10.2KW model. Increment of each click is 0.1V.	
33	Battery equalized time	60min (default) 	Setting range is from 5min to 900min. Increment of each click is 5min.
34	Battery equalized timeout	120min (default) 	Setting range is from 5min to 900 min. Increment of each click is 5 min.
35	Equalization interval	30days (default) 	Setting range is from 0 to 90 days. Increment of each click is 1 day
36	Equalization activated immediately	Enable 	Disable (default) 
		If equalization function is enabled in program 30, this program can be set up. If "Enable" is selected in this program, it's to activate battery equalization immediately and LCD main page will shows "  ". If "Disable" is selected, it will cancel equalization function until next activated equalization time arrives based on program 35 setting. At this time, "  " will not be shown in LCD main page.	
91	On/Off control for RGB LED It's necessary to enable this setting to activate RGB LED lighting function.	Enabled(default) 	Disable 
94	RGB LED effect	Solid on(default) 	Breathing 
		Scrolling 	scrolling 1 

95	Data Presentation of data color Energy source(Grid-PV-Battery)and battery charge/discharge status.	Energy source(Grid-PV-Battery) (default) 95 EUS	If selected,the LED color will be background color setting in #96 in AC mode.If PV power is active,the LED color will be data color setting in #97.If the remaining status,the LED color will be set in #98.
		Battery charge/discharge status 95 bES	If selected,the LED color will be background color setting in #96 in battery charging status.The LED color will be data color setting in #97 in battery discharging status.
96	Data 1 color of RGB LED ▲ Invalid when RGB LED effect is set to"breathing".	Sky blue 96 SbL	Blue 96 bLU
		Green 96 UdE	Yellow 96▲ YEL
		Purple 96▲ PUR	
97	Data 2 color of RGB LED ▲ Invalid when RGB LED effect is set to"breathing".	Sky blue 97 SbL	Blue 97 bLU
		Green 97 UdE	Yellow 97▲ YEL
		Purple 97▲ PUR	
98	Data 3 color of RGB LED ▲ Invalid when RGB LED effect is set to"breathing".	Sky blue 98 SbL	Blue 98 bLU
		Green 98 UdE	Yellow 98▲ YEL
		Purple 98▲ PUR	

Display Settings

By pressing the "UP" or "DOWN", the LCD display information will be switched in turn.

Icon	Parameter Interface	LCD Display
①	PV voltage=200V PV current=3.0A PV power=0.6KW	
②	Battery voltage=49.1V Charging current=14A Charging power=0.6KW	
③	AC input frequency=50.0Hz AC input voltage=230V	
④	AC output voltage=230V AC output frequency=50.0Hz	

Icon	Parameter Interface	LCD Display
⑤	Load percentage=0% Load power=0KW	
⑥	Discharging current=10A Battery voltage=49.1V Battery capacity=79%	
⑦	Accident Details (Refer to Fault Reference Code)	

Battery Equalization Description

Equalization function is added into charge controller. It reverses the buildup of negative chemical effects like stratification, a condition where acid concentration is greater at the bottom of the battery than at the top. Equalization also helps to remove sulfate crystals that might have built up on the plates. If left unchecked, this condition, called sulfation, will reduce the overall capacity of the battery. Therefore, it's recommended to equalize battery periodically.

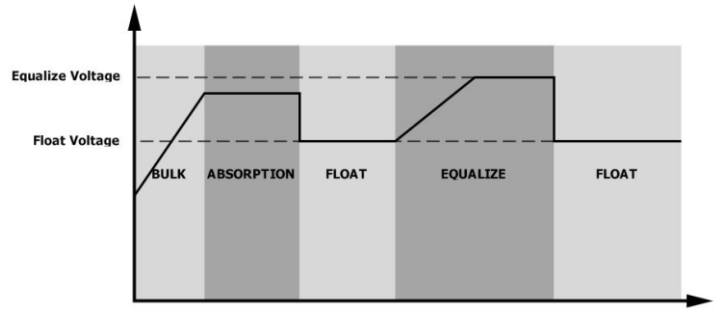
- **How to Apply Equalization Function**

You must enable battery equalization function in monitoring LCD setting program 30 first. Then, you may apply this function in device by either one of following methods:

1. Setting equalization interval in program 35.
2. Active equalization immediately in program 36.

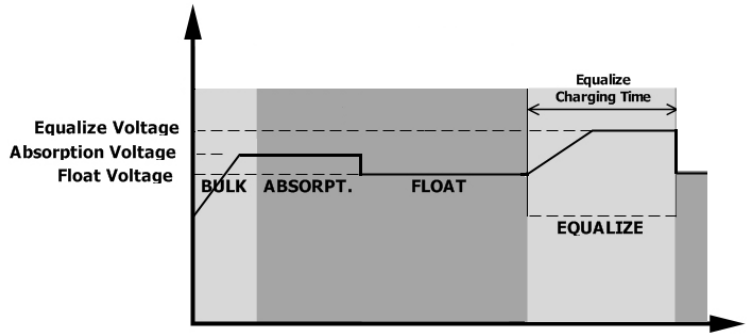
- **When to Equalize**

In float stage, when the setting equalization interval (battery equalization cycle) is arrived, or equalization is active immediately, the controller will start to enter Equalize stage.

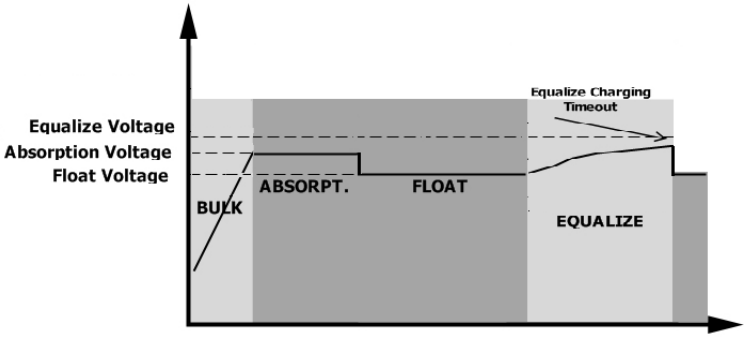


- **Equalize charging time and timeout**

In Equalize stage, the controller will supply power to charge battery as much as possible until battery voltage raises to battery equalization voltage. Then, constant-voltage regulation is applied to maintain battery voltage at the battery equalization voltage. The battery will remain in the Equalize stage until setting battery equalized time is arrived.



However, in Equalize stage, when battery equalized time is expired and battery voltage doesn't rise to battery equalization voltage point, the charge controller will extend the battery equalized time until battery voltage achieves battery equalization voltage. If battery voltage is still lower than battery equalization voltage when battery equalized timeout setting is over, the charge controller will stop equalization and return to float stage.



Fault Reference Code

Fault Code	Fault Event	Icon on
E01	Fan is locked when inverter is off.	E01
E02	Over temperature	E02
E03	Battery voltage is too high	E03
E04	Battery voltage is too low	E04
E05	Output short circuited or over temperature is detected by internal converter components.	E05
E06	Output voltage is too high.	E06
E07	Overload time out	E07
E08	Bus voltage is too high	E08
E09	Bus soft start failed	E09
E10	Output power derating	E10
E15	PV energy is low.	E15
E51	Over current or surge	E51
E52	Bus voltage is too low	E52
E53	Inverter soft start failed	E53
E55	Over DC voltage in AC output	E55
E57	Current sensor failed	E57
E58	Output voltage is too low	E58
E59	PV voltage is over limitation	E59
bP	Battery is not connected	bP⚠
Eq	Battery equalization	Eq

SPECIFICATIONS

Table 1 Line Mode Specifications

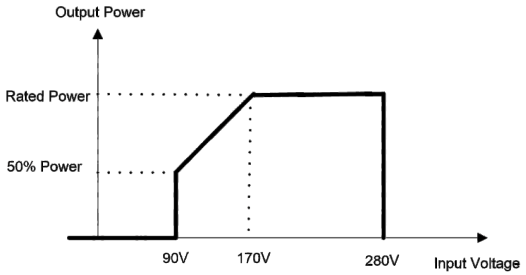
INVERTER MODEL	7.2KW	8.2KW	10.2KW
Input Voltage Waveform	Sinusoidal (utility or generator)		
Nominal Input Voltage	230Vac		
Low Loss Voltage	170Vac±7V (UPS); 90Vac±7V (Appliances)		
Low Loss Return Voltage	180Vac±7V (UPS); 100Vac±7V (Appliances)		
High Loss Voltage	280Vac±7V		
High Loss Return Voltage	270Vac±7V		
Max AC Input Voltage	300Vac		
Nominal Input Frequency	50Hz / 60Hz (Auto detection)		
Low Loss Frequency	40±1Hz		
Low Loss Return Frequency	42±1Hz		
High Loss Frequency	65±1Hz		
High Loss Return Frequency	63±1Hz		
Output Short Circuit Protection	Circuit Breaker		
Efficiency (Line Mode)	>95% (Rated R load, battery full charged)		
Transfer Time	10ms typical (UPS); 20ms typical (Appliances)		
Output power derating: When AC input voltage drops to 170V, the output power will be derated.			

Table 2 Inverter Mode Specifications

INVERTER MODEL	7.2KW	8.2KW	10.2KW
Rated Output Power	7.2KW	8.2KW	10.2KW
Output Voltage Waveform	Pure Sine Wave		
Output Voltage Regulation	230Vac±5%		
Output Frequency	50Hz		
Peak Efficiency	93%		
Overload Protection	3s@≥150% load; 5s@101%~150% load		
Surge Capacity	2* rated power for 5 seconds		
Nominal DC Input Voltage	48Vdc		
Cold Start Voltage	46.0Vdc		
Low DC Warning Voltage @ load < 50% @ load ≥ 50%	 44.0Vdc 42.0Vdc		
Low DC Warning Return Voltage @ load < 50% @ load ≥ 50%	 45.0Vdc 44.0Vdc		
Low DC Cut-off Voltage @ load < 50% @ load ≥ 50%	 41.0Vdc 40.0Vdc		
High DC Recovery Voltage	62Vdc		
High DC Cut-off Voltage	63Vdc		
No Load Power Consumption	60W	70W	75W

Table 3 Two Load Output Power

INVERTER MODEL	7.2KW	8.2KW	10.2KW
Full Load	7200W	8200W	10200W
Maximum Main Load	7200W	8200W	10200W
Maximum Second Load(battery model)	2400W	2733W	3400W
Main Load Cut Off Voltage	44VDC		
Main Load Return Voltage	52VDC		

Table 4 Charge Mode Specifications

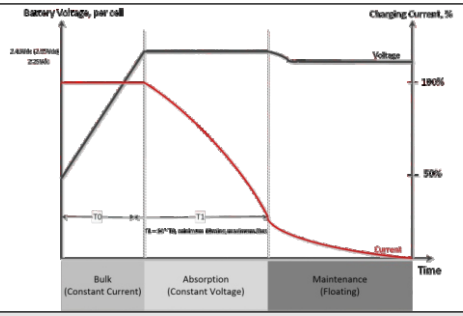
Utility Charging Mode				
INVERTER MODEL		**7.2KW**	**8.2KW**	**10.2KW**
Charging Algorithm		3-Step		
AC Charging Current (Max)		120Amp	140Amp	140Amp
Bulk Charging Voltage	**Flooded Battery**	58.4		
	AGM / Gel Battery	56.4		
Floating Charging Voltage		54Vdc		
Charging Curve				
MPPT Solar Charging Mode				
INVERTER MODEL		**7.2KW**	**8.2KW**	**10.2KW**
Max. PV Array Power		8200W		10200W
Nominal PV Voltage		360Vdc		
PV Array MPPT Voltage Range		90Vdc~500Vdc		
Max. PV Array Open Circuit Voltage		500Vdc		
Max Charging Current (AC charger plus solar charger)		140Amp	160Amp	160Amp

Table 5 Grid-Tie Operation

INVERTER MODEL	**7.2KW**	**8.2KW**	**10.2KW**
Nominal Output Voltage	220/230/240VAC		
Feed-in Grid Voltage Range	195~253VAC		
Feed-in Grid Frequency Range	49~51±1Hz/59~61±1Hz		
Nominal Output Current	31.3A	35.6A	44.3A
Power Factor Range	>0.99		
Maximum Conversion Efficiency (DC/AC)	98%		

Table 6 General Specifications

INVERTER MODEL	**7.2KW**	**8.2KW**	**10.2KW**
Safety Certification	CE		
Operating Temperature Range	-10°C to 50°C		
Storage temperature	-15°C~ 60°C		
Humidity	5% to 95% Relative Humidity (Non-condensing)		
Dimension (D*W*H), mm	561x405x151		
Net Weight, kg	13.1	14.2	14.5

TROUBLE SHOOTING

Problem	**LCD/LED/Buzzer**	**Explanation / Possible cause**	**What to do**
Unit shuts down automatically during startup process.	LCD/LEDs and buzzer will be active for 3 seconds and then complete off.	The battery voltage is too low (<1.91V/Cell)	1. Re-charge battery. 2. Replace battery.
No response after power on.	No indication.	1. The battery voltage is far too low. (<1.4V/Cell) 2. Internal fuse tripped.	1. Contact repair center for replacing the fuse. 2. Re-charge battery. 3. Replace battery.
Mains exist but the unit works in battery mode.	No indication.	Input protector is tripped	Check if AC breaker is tripped and AC wiring is connected well.
	No indication.	Insufficient quality of AC power. (Shore or Generator)	1. Check if AC wires are too thin and/or too long. 2. Check if generator (if applied) is working well or if input voltage range setting is correct. (UPS⇗Appliance)
	No indication.	Set "Solar First" as the priority of output source.	Change output source priority to Utility first.
When the unit is turned on, internal relay is switched on and off repeatedly.	LCD display and LEDs are flashing	Battery is disconnected.	Check if battery wires are connected well.
Buzzer beeps continuously and red LED is on.	Fault code 07	Overload error. The inverter is overload 110% and time is up.	Reduce the connected load by switching off some equipment.
	Fault code 05	Output short circuited.	Check if wiring is connected well and remove abnormal load.
		Temperature of internal converter component is over 120°C.	Check whether the air flow of the unit is blocked or whether the ambient temperature is too high.
	Fault code 02	Internal temperature of inverter component is over 100°C.	
	Fault code 03	Battery is over-charged.	Return to repair center.
		The battery voltage is too high.	Check if spec and quantity of batteries are meet requirements.
	Fault code 01	Fan fault	Replace the fan.
	Fault code 06/58	Output abnormal (Inverter voltage below than 190Vac or is higher than 260Vac)	1. Reduce the connected load. 2. Return to repair center
	Fault code 08/09/53/57	Internal components failed.	Return to repair center.
	Fault code 51	Over current or surge.	Restart the unit, if the error happens again, please return to repair center.
	Fault code 52	Bus voltage is too low.	
	Fault code 55	Output voltage is unbalanced.	

Appendix: Approximate Back-up Time Table

Model	Load (W)	Backup Time @ 48Vdc 100Ah (min)	Backup Time @ 48Vdc 200Ah (min)
7.2KW/ 8.2KW/ 10.2KW	500	613	1288
	1000	268	613
	1500	158	402
	2000	111	271
	2500	90	215
	3200	76	182
	3500	65	141
	4000	50	112
	4500	44	100
	5000	40	90
	6200	36	80
	7200	32	70
	8200	28	60
	9200	24	50
	10200	20	40

Note:

1 .Backup time depends on the quality of the battery, age of battery and type of battery.Specifications of batteries may vary depending on different manufacturers.

2.The final interpretation right of this product belongs to the company.