

Sunova-eFox Off-Grid

Energy Storage System

Sunova-eFox-35E

Sunova-eFox-50E



User Manual

Copyright

This user manual' s copyright belongs to original manufacturer. Any unit or individual shall not reproduce or partially reproduce the contents of this manual without permission, and shall not convert or distribute in any form or means. Manufacturer reserves the copyright, and owns the power of interpretation. All information may be changed or updated without notice, please understand.

Preface

Sunova-eFox Series Energy Storage System is a multi-functional power supply device designed to comprehensively use for residential and commercial projects. With built-in lithium battery, this system can provide uninterrupted and stable power supply, and ensure the normal use of the utility when the grid is out. This device can run in the most economical and practical mode based on the user requirement to bring objective economical benefits and not cause any environmental pollution.

This user manual mainly introduces the operation, installation and specification of the device. Please read through this user manual before install and operate the system. Please keep this user manual for future use.

Table of Contents

1. Introduction	04
1.1 Application	04
1.2 Components	08
1.3 Sunova-eFox Dimension	09
1.4 Quality Inspection	10
1.5 Label	10
1.6 Safety	09
2. Installation	11
2.1 Device Overview	11
2.1.1 Device Carrying	11
2.1.2 Unboxing Guide	12
2.1.3 Installation	15
2.2 Electric Installation	17
2.2.1 Wiring Procedure	17
3. Operation	19
3.1 LCD Display	19
3.2 LCD Display Icons	20
3.3 LCD Setting	23
3.4 Display Information	32
3.5 Operating Mode	33
3.6 Monitoring	36
4. Maintenance	37
4.1 Fault Code	37
4.2 Warning Indicator	38
4.3 Specification	40
4.4 Trouble shooting	41
4.5 Activation	42

1 Introduction

1.1 Application

Sunova-eFox series can connect with solar panels, grid (or generator), load, it built-in lithium battery, hybrid inverter and energy management system. Sunova-eFox has four working modes: SOL (Solar first), UEI (Utility first), SBU(Solar-Battery-Utility), SUB (Solar-Utility -Battery). These working modes are described refer to the setting part.

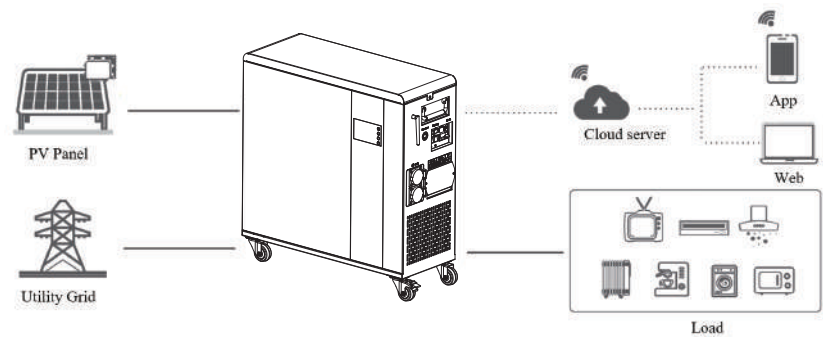
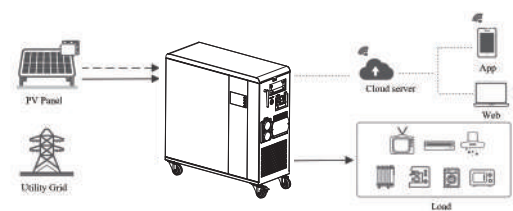
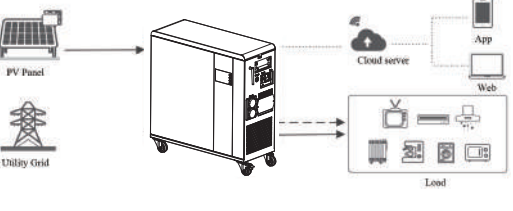
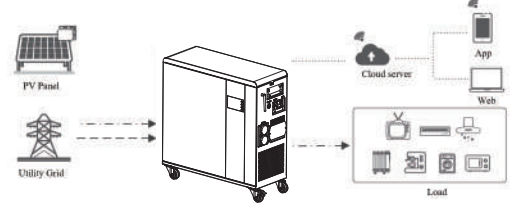
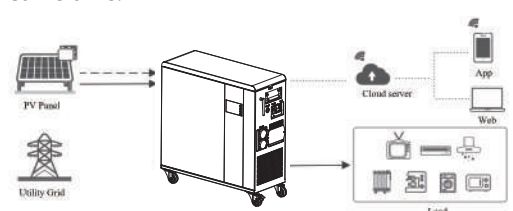
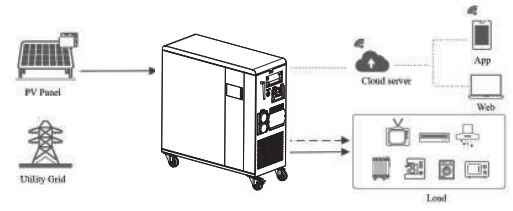
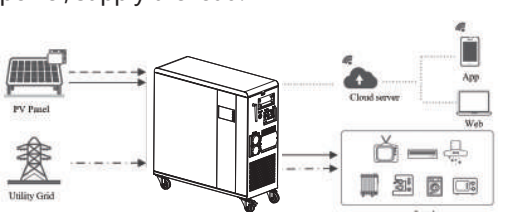


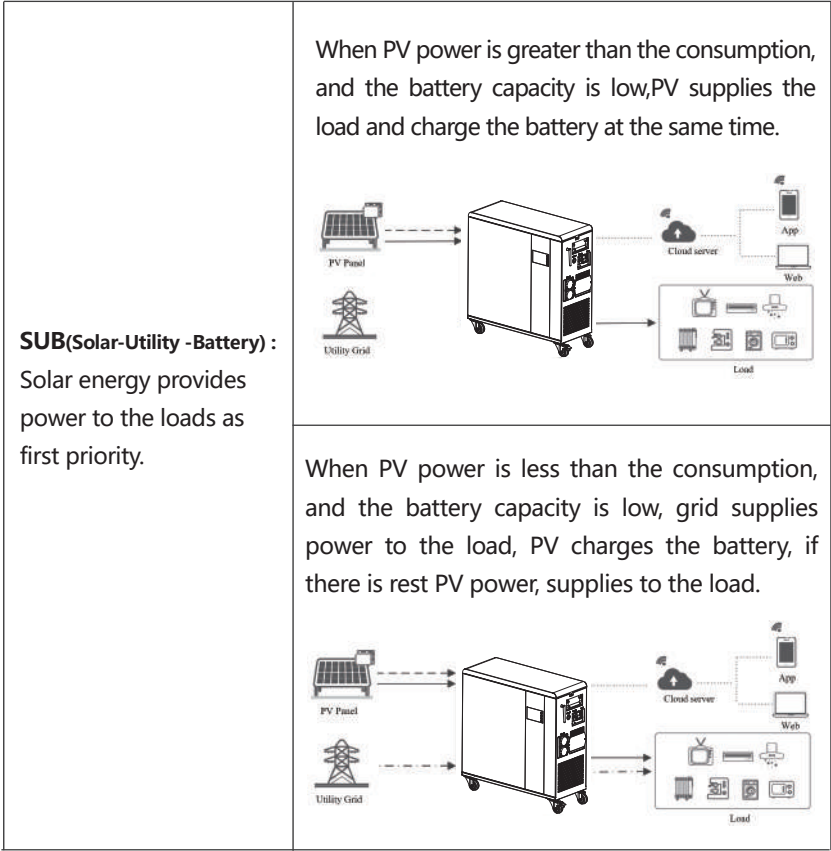
Figure 1 Sunova-eFox Working Diagram

1.1.1 Operation Modes

Definition	Battery voltage too low: Lower than the value of setting 12. Battery voltage too high: Higher than the value of setting 13. Battery -----> PV Panel -----> Utility Grid - . - . - .>
------------	--

SOL (Solar first): Solar energy provides power to the loads as first priority.	When PV power is greater than the consumption, and the battery capacity is low, the PV will supply power to the load and charge the battery at the same time. 
	When PV power is less than the consumption, and the battery capacity is high, PV and battery supply power to the load at the same time. 
UEI (Utility first): Utility gird will provide power to the loads as first priority.	The grid supplies power to the load and charges the battery when the battery capacity is low. 

	When PV power is greater than the consumption, and the battery capacity is low, the PV will supply power to the load and charge the battery at the same time.  The diagram illustrates a power management system. On the left, a PV Panel and a Utility Grid are connected to a central inverter/battery unit. The PV Panel has a solid arrow pointing to the unit, while the Utility Grid has a dashed arrow. The central unit has a solid arrow pointing to a Cloud server, which is connected to an App and a Web interface. Below the Cloud server, a Load is shown with various household appliances. The unit also has a direct solid arrow to the Load.
SBU(Solar-Battery-Utility) : Solar energy provides power to the loads as first priority.	When PV power is less than the consumption, and the battery capacity is high,PV and battery suplay power to the load at the same time.  This diagram is identical to the one above, showing the PV Panel and Utility Grid connected to the central unit, which manages power to the Cloud server, App, Web, and Load.
	When PV power is less than the consumption, and the battery capacity is low, grid supplies the load, PV charges the battery, if there is rest PV power, supply the load.  This diagram is identical to the others, showing the PV Panel and Utility Grid connected to the central unit, which manages power to the Cloud server, App, Web, and Load.



1.2 Components

After unpacking the package, please inspect the components based on the below table.

Table 1 Component list

NO.	Pictures	Description	Quantity
1		Sunova-eFox OFF-GRID Energy Storage System	1 pcs
2		WiFi module antenna	1 pcs
3		Tube terminal red	3pcs
4		Tube terminal black	3pcs
5		Tube terminal yellow	2pcs
6		User manual	1 pcs
7		Qualified Certificate	1pcs
8		APP Operation Guide	1 pcs
9		Packing List	1 pcs

1.3 Sunova-eFox Dimension

The size is slightly different according to the type, below for reference.

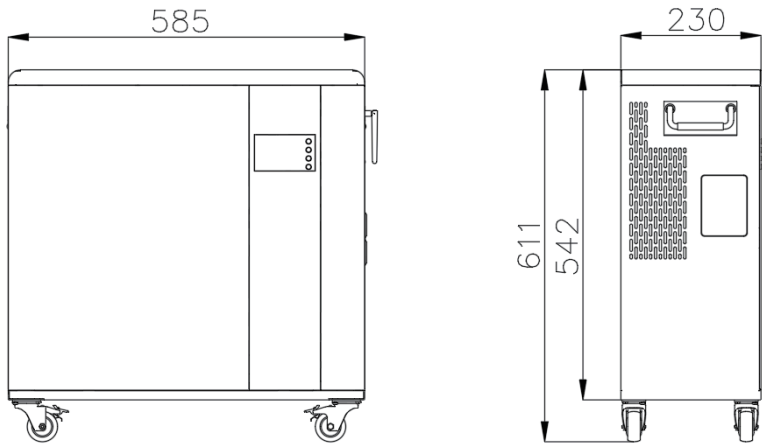


Figure 2 Sunova-eFox Dimension

1.4 Quality Inspection

Before installation, please confirm that the packaging is unbroken, and after unpacking, check that all parts are consistent with the packaging list and are in good condition.

Table 2 Quality Inspection

Operation	Warning
Check Package	No damage
Check Component	No loss or damage
Check built-in Accessory	No loss or damage

1.5 Label

	• Danger: Possibility of fatal voltage
	• Warning: Possibility of device damage or personal injury
	• Warning: Heat injury

1.6 Safety

This user manual includes safety introduction. Please read this manual carefully before installing, maintaining and operating the equipment. If you do not operate in accordance with this manual, if there is equipment damage or personal injury or death, manufacturer will not be responsible for it.

	❖ Must be grounded before operation.
	❖ Do not open the cover of the storage unauthorized. The electrical parts and components inside of the storage are electrostatic. Take measurements to avoid electrostatic discharge during relevant operation.
	❖ Only qualified electricians are allowed to operate the storage under the permission of local power departments. Ensure reliable installation and electrical connection before operation ❖ Only qualified electricians are allowed to perform the maintenance, inspection, and components replacement of this product.
	❖ Do not remove any part and component of the storage unintended; Otherwise, damage to the device and physical injury may occur.

2 Installation

2.1 Device Overview

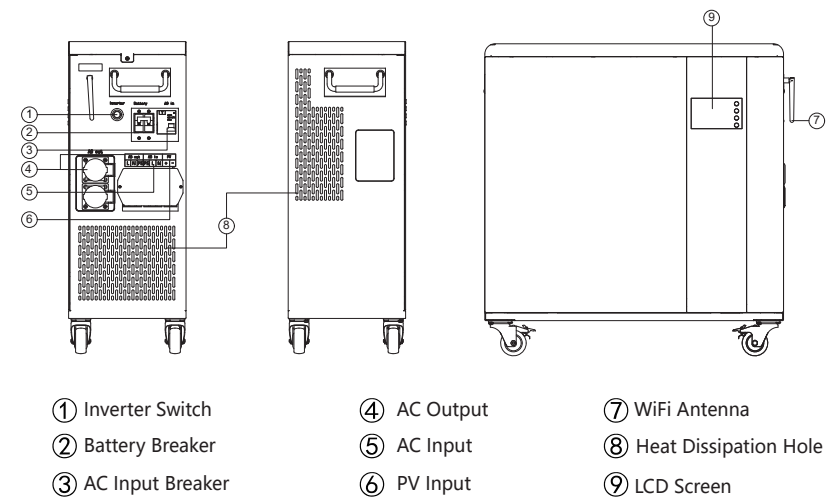


Figure 3 Device Overview

2.1.1 Device Carrying



Warning!

The device weight (67.6kg) may cause personal injury.

- Please note that the device weight when move or deliver the device.
- Select the firm installation platform.
- Use proper tools for installation.
- At least two people to install.

2.1.2 Unboxing Guide

The iron buckle is sharp, please pay attention to personal safety when unboxing!

- (1) Use screwdriver to pry off the top cover clasp.

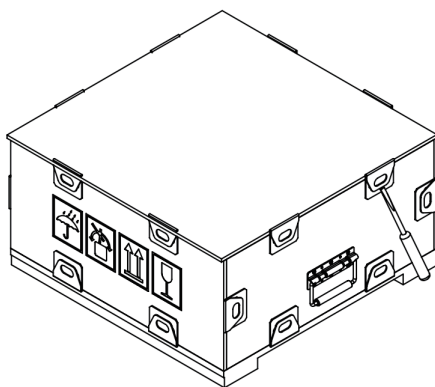


Figure 4

- (2) Remove the top cover after prying off all the cover buckles.

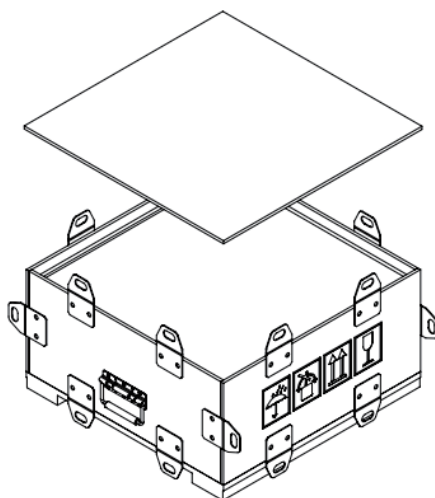


Figure 5

(3) After prying off the side cover iron buckle, remove the four side covers.

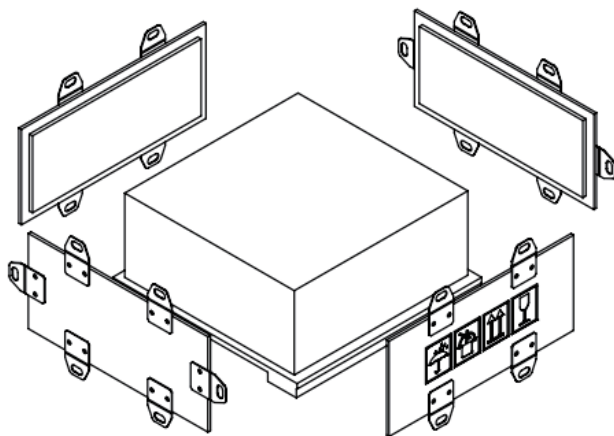


Figure 6

(4) Take out the machine; the machine is heavy, please pay attention.

	Warning: ❖ Ensure the installed place be well ventilate and conform to device using condition. ❖ No flammable and combustible objects are allowed to put within 4m. ❖ The environmental temperature shall keep between 0°C and 40°C.
	Warning: ❖ No smoking and setting off fireworks nearby. ❖ Ensure clean and ventilate in the surrounding area. ❖ Ensure the wiring conform to requirement to avoid fire.

	❖ Adequate ventilation of the room or location in which the device containing vented or valve-regulated batteries is located, to prevent the accumulation of hazardous gases;
	-Servicing of batteries should be performed or supervised by personnel knowledgeable about batteries and the required precautions. -When replacing batteries, replace with the same type and number of batteries or battery packs. -CAUTION: Do not dispose of batteries in a fire. The batteries may explode. -CAUTION: Do not open or damage batteries. Released electrolyte is harmful to the skin and eyes. It may be toxic. -CAUTION: A battery can present a risk of electrical shock and high short-circuit current. The following precautions should be observed when working on batteries: - Remove watches, rings, or other metal objects. - Use tools with insulated handles. - Wear rubber gloves and boots. - Do not lay tools or metal parts on top of batteries. - Disconnect charging source prior to connecting or disconnecting battery terminals. - Determine if battery is inadvertently grounded. If inadvertently grounded, remove source from ground. Contact with any part of a grounded battery can result in electrical shock. The likelihood of such shock can be reduced if such grounds are removed during installation and maintenance (applicable to equipment and remote battery supplies not having a grounded supply circuit). - Rinse acid splashes thoroughly with clear water for a long time and consider consulting a doctor. -Battery terminals and connectors shall be accessible for maintenance with the correct tools.

	❖ All electrical connections must be in accordance with local and national standards. ❖ Only with the permission of the utility grid, the storage can be connected to the utility grid. Disconnect the storage from all the external power sources before service! Do not open the enclosure when the storage is working. ❖ When the enclosure lid is removed, live components can be touched which can result in death or serious injury due to electric shock. Batteries deliver electric power, resulting in burns or a fire hazard when they are short-circuited, or wrongly installed.
	❖ All the AC cables should be equipped with correctly colored cables for distinguishing. Please refer to related standards about the wiring color.
	❖ Do not touch live parts until 5 minutes after disconnection from the power sources.

2.1.3 Installation

The device shall be indoor installed and vertical placed. The place where it is installed shall be able to ensure the stability and safety of the product.

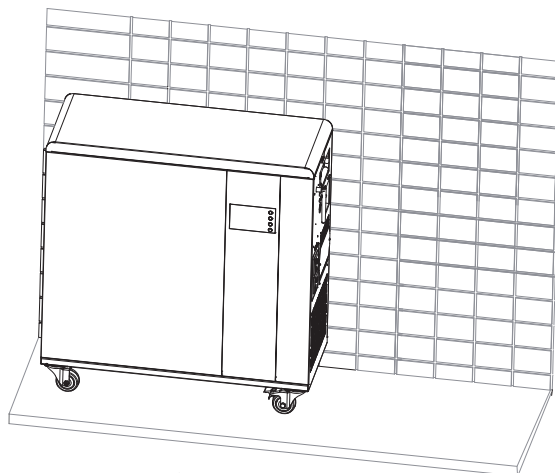


Figure 7

After installing against the wall, the caster buckle should be locked to prevent sliding.

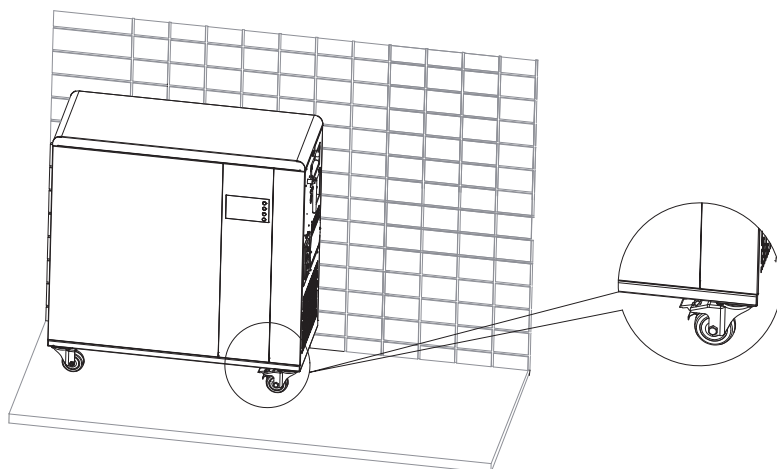


Figure 8

Other objects around Sunova-eFox should be more than 200mm away from the equipment to ensure good ventilation.

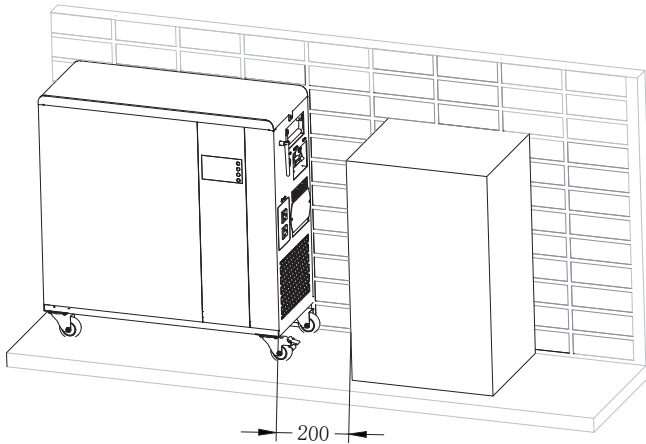


Figure 9

2.2 Electric Installation

The Sunova-eFox is ground mounted, shall put on the ground vertically.

2.2.1 Wiring Procedure

- (1) Cut off the circuit breaker of grid and PV .
- (2) Ensure Smart Unit be not carelessly turned on.
- (3) Detach the screws on the side case.
- (4) Remove the side cover case.

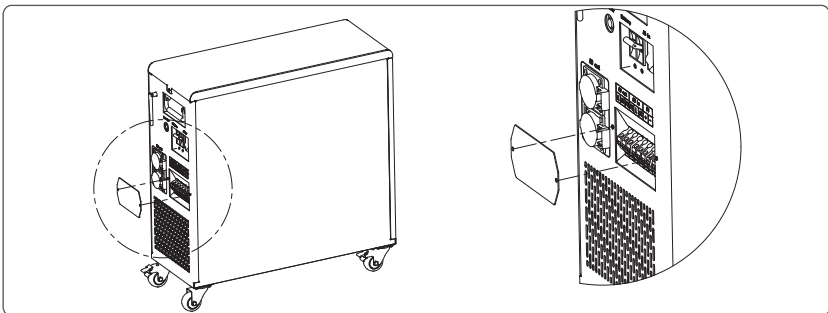


Figure 10

- (5) wiring refer to the Figure 11-12
- (6) Install the cover.

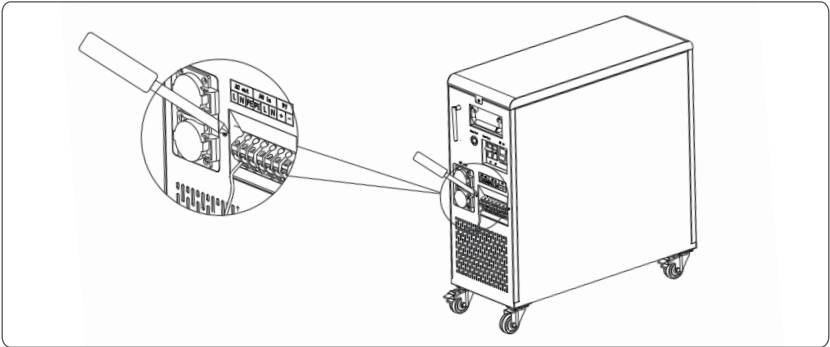


Figure 11

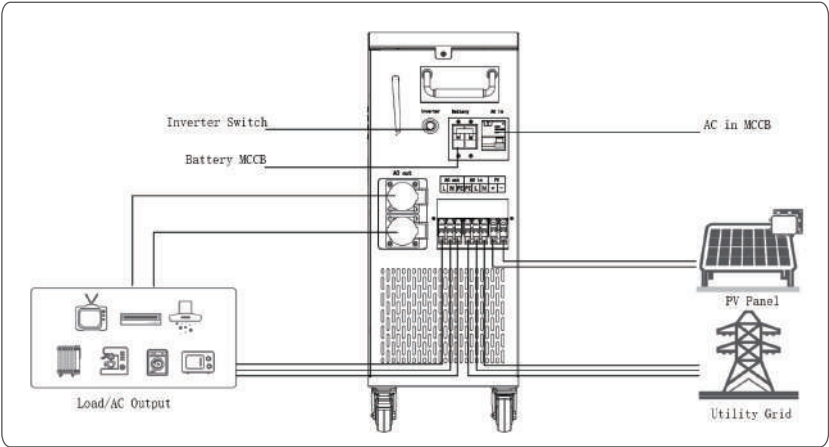


Figure 12

Table 3 Cable Size

Function	Typical Power		Cable size	Torque
Load	Sunova-eFox	3kVA/5kVA	10AWG	1.4~1.6Nm
Grid		3kVA/5kVA	10AWG	1.4~1.6Nm
PV		3kVA/5kVA	10AWG	1.4~1.6Nm

3 Operation

3.1 LCD Display

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

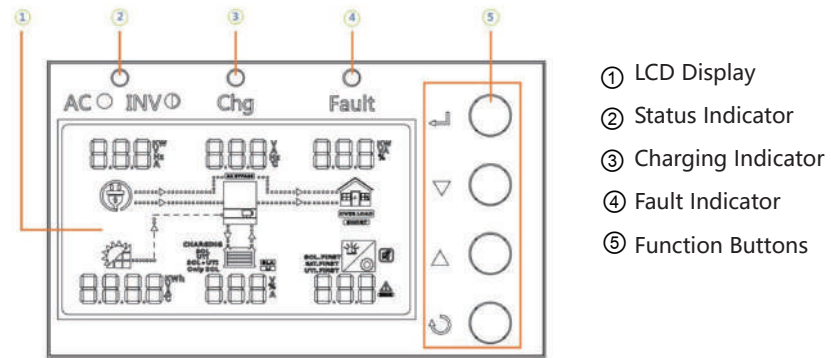


Figure 13 LED Display

Table 4 LED Indicator

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

Table 5 Function Button

Function Button	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

3.2 LCD Display Icons

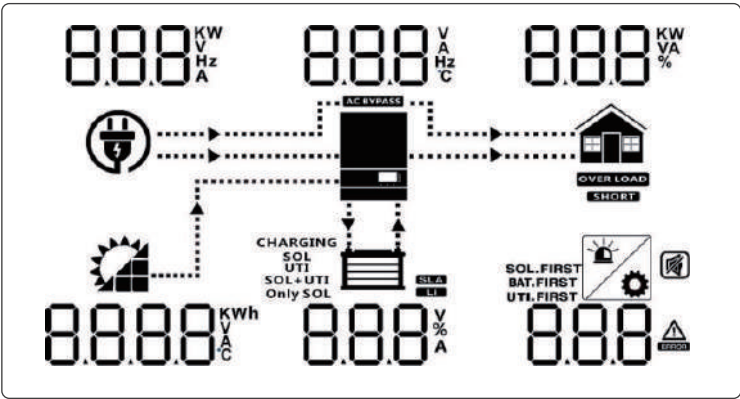


Figure 14 Display Icons

Table 6 Function Button

Icon	Description
AC Input Information	
	AC input icon
	Indicates AC input power, AC input voltage, AC input frequency, AC input current.
	Indicates AC power loads by bypass.

Icon	Description
PV Input Information	
	PV input icon
	Indicate PV input power, voltage, current, etc.
Output Information	
	Inverter Icon
	Indicate output voltage, current, frequency, Inverter temperature.
Load Information	
	Load Icon
	Indicates power of load, power percentage of load.
	Indicates overload happened.
	Indicates short circuit happened.
Battery Information	
	Battery Icon
	Indicates battery voltage, energy percentage, battery current.
	Indicates SLA battery
	Indicates Lithium battery
	Indicates charging source priority: Solar first, Utility first, solar and utility, or only solar

Icon	Description
Other Information	
SOL.FIRST BAT.FIRST UTI.FIRST	Indicates output source priority: Solar first, Utility first, SBU mode or SUB mode.
8.8.8 	Indicates warning code or fault code.
	Indicates a warning or a fault is happening.
	Indicates it is during setting values.
	Indicates the alarm is disabled.

Table 7 Battery information

In AC mode, battery icon will present battery capacity		
Battery Status		SOC < 25%
		25%≤SOC < 50%
		50%≤SOC < 75%
		75%≤SOC
In AC mode, battery icon will present battery charging status.		
Status	Battery SOC	LCD Display
Constant current mode/Constant voltage mode	SOC < 25%	4 bars will flash in turns.
	25%≤SOC < 50%	Bottom bar will be on and the other three bars will flash in turns.
	50%≤SOC < 75%	Bottom two bars will be on and the other two bars will flash in turns.
	75%≤SOC	Bottom three bars will be on and the top bar will flash in turns.

3.3 LCD Setting

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

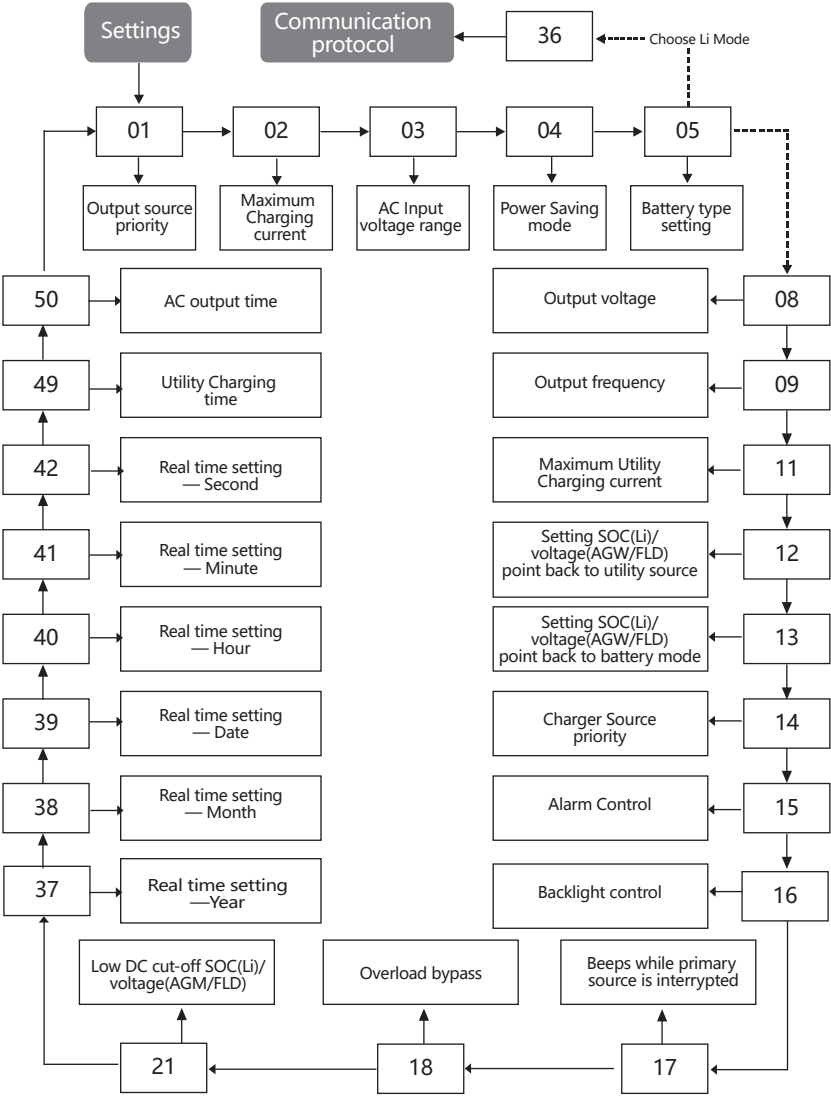


Table 8 Setting Program

Program	Description	Setting option	
01	Output source priority selection: To configure load power source priority	Solar First	OPPr SOL 001°
		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 grid provides power to the loads only when any below one condition happens: -Solar energy is not available -Battery voltage drops to low-level warning voltage or the setting point in program 12.	
		Utility First	OPPr UTI 001°
		Utility gird 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.	
		SBU Priority (Default)	OPPr SBU 001°
		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 grid provides power to the loads only when battery voltage drops to either low-level warning voltage or the setting point in program 12.	

Program	Description	Setting option	
		SUB Priority	OPPF SUB 001 ⁰
		Solar energy provides power to the loads as first priority. If solar energy is not sufficient to power all connected loads, solar and utility grid will supply power to the loads at the same time. Battery provides power to the loads only when solar energy is not sufficient and there is no utility.	
03	AC input voltage range	Appliances (default)	ACV APL 003 ⁰
		If selected, acceptable AC input voltage range will be within 90~280Vac.	
		UPS	ACV UPS 003 ⁰
		If selected, acceptable AC input voltage range will be within 170~280Vac.	
		Generator	ACV GEN 003 ⁰
		If selected, acceptable AC input voltage range will be within 90~280Vac. In this mode, the max charging current is 30A.	
04	Power saving mode enable/disable	Disable (default)	SAVE DIS 004 ⁰
		If disabled, no matter connected load is low or high, the on/off status of inverter output will not be effected.	
		Enable	SAVE ENA 004 ⁰
		If enabled, the inverter output will be off when connected load is pretty low or not detected.	

Program	Description	Setting option	
05	Battery type	AGM	BAtt AGM 005°
		Flooded	BAtt FLd 005°
		Lithium (Default)	BAtt LI 005°
		Only suitable when communicated with BMS	
		User-defined	BAtt USE 005°
		If "User-Defined" is selected, battery charge voltage and low DC cut-off voltage can be set up in program 19, 20 and 21.	
		User-defined 2	BAtt USE 005°
36	RS485 communication protocol	Suitable when lithium battery without BMS communication	
		If "User-defined 2" is selected, battery charge voltage and low DC cut-off voltage can be set up in program 19, 20 and 21. It is recommended to set to the same voltage in program 19 and 20(full charging voltage point of lithium battery). The inverter will stop charging when the battery voltage reaches this setting.	
		Protocol 1	PtCL L01 036°
		Protocol 2	PtCL L02 036°
	CAN communication protocol	⋮	⋮
		Protocol 50	PtCL L50 036°
		Protocol 51	PtCL L51 036°
		Protocol 52	PtCL L52 036°
		⋮	⋮
		Protocol 99	PtCL L99 036°

Program	Description	Setting option	
NOTE 1: When set the battery type as “LI” in program 05, the setting option 12,13,21 will change to display percent. At the “LI” type battery, the maximum charge current can’ t be modify by the user. When the communication fail, the inverter will cut off output. If it lost the communication with the battery, you can set the battery type to “USER” for emergency, then contact the installer.			
12	Setting SOC point back to utility source when selecting “SBU priority” or “Solar first” in program 01.	62AC 50 012	Default 30%, 20%~50% Settable
13	Setting SOC point back to battery mode when selecting “SBU priority” or “Solar first” in program 01.	AC26 95 013	Default 65%, 30%~100% Settable
21	Low DC cut-off SOC, If “LI” is selected in program 05,this program can be set.	CUT 20 021	Default 10%, 5%~30% Settable
NOTE 2: When the inverter is cut-off, it must to charge by solar or utility until the SOC> setting 21+10%, the inverter will restart.			
06	Auto restart when overload occurs	Restart Disable (Default) LdRS d15 006	Restart Enable LdRS ENA 006
07	Auto restart when over temperature occurs	Restart Disable (Default) LdRS d15 007	Restart Enable

Program	Description	Setting option	
08	Output voltage	230V(Default) OUTV 230 008	220V OUTV 220 008
		240V OUTV 240 008	208V OUTV 208 008
		*This setting is only available when the inverter is in standby mode (Switch off).	
09	Output frequency	60Hz OUTF 60 009	50Hz(Default) OUTF 50 009
		*This setting is only available when the inverter is in standby mode (Switch off).	
11	Maximum utility charging current.	ACI 30 011 3.5K :Default 30A, 0A~60A Settable 5K :Default 30A, 0A~80A Settable	
14	Charger source priority: To configure charger source priority	If this off grid solar inverter is working in Line, Standby or Fault mode, Charger source can be programmed as below:	
		Solar First CGPF 050 014	Solar energy will charge battery as first priority. Utility will charge battery only when solar energy is not available.
		Solar and Utility grid (Default) CGPF 500 014	Solar energy and utility grid will both charge battery.
		Only solar CGPF 050 014	Solar energy will be the only charger source no matter utility is available or not.

Program	Description	Setting option	
		If this off grid solar inverter 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.	
15	Alarm Control	Alarm on (default) BUZZ ON 015	Alarm off BUZZ OFF 015
16	Backlight control	Backlight on(default) LCdb ON 016	Backlight off LEdb OFF 016
17	Beeps while primary source is interrupted	Alarm on (default) ALAN ON 017	Alarm off ALAN OFF 017
18	Overload bypass	Bypass Disable byp diS 018	Bypass enable (Default) byp ENA 018
		When enabled, the unit will transfer to line mode if overload occurs in battery mode.	
28	Address setting (for expansion)	No need to set, keep it default	
37	Real time setting---Year	2018 037	Default 2018, Range 2018-2099
38	Real time setting---Month	MON 12 038	Default 01, Range 01-12
39	Real time setting---Date	DAY 13 039	Default 01, Range 01-31
40	Real time setting---Hour	HOUR 13 040	Default 00, Range 00-23
41	Real time setting---Minute	MIN 50 041	Default 00, Range 00-59
42	Real time setting---Second	SEC 50 042	Default 00, Range 00-59

Program	Description	Setting option	
43	Battery equalization	Battery equalization enable EQ ENA 043	Battery equalization disable (default) EQ DIS 043
		If "flooded" or "user-Defined" is selected in program 05, this program cannot be set up.	
44	Battery equalization voltage	EQV 58.4 044	Default 58.4V, 48.0V-58.4V Settable
45	Battery equalized time	EQT 60 045	Default 60Min, 5min-90min Settable
		EQT 60 045	
46	Battery equalized timeout	EQT 120 046	Default 120Min, 5min-90min Settable
		EQT 120 046	
47	Equalization interval	EQI 30 047	Default 30 days, 5days-90days Settable
		EQI 30 047	
48	Equalization activated immediately	Equalization activated immediately ON EQ ON 048	Equalization activated immediately OFF (default) EQ OFF 048
		If equalization function is enabled in program 43, this program can be setup. If " ON" is selected in this program, it's to activate battery equalization immediately and LCD main page will shows "EQ". If " OFF "is selected, it will cancel equalization function until next activated equalization time arrives based on program 47 setting. At this time, "EQ" will not be show in LCD main page.	

Program	Description	Setting option	
49	Utility grid charging time	0000 (Default)  	The time allows utility grid to charge the battery. Use 4 digits to represent the time period, the upper two digits represent the time when utility grid start to charge the battery, setting range is from 00 to 23, and the lower end to charge the battery, setting range is from 00 to 23. (e.g. 2320 represents the time allows utility grid end to charge the battery is from 23:00 to the next day 20:59, and the utility grid charging is prohibited outside for this period).
50	AC output time	0000 (Default) Allow inverter to power the load all day run.  	The time allows inverter to power the load. Use 4 digits to represent the time period, the upper two digits represent the time when inverter start to power the load, setting range is from 00 to 23, and the lower two digits represent the time when inverter end to power the load, setting range is from 00 to 23. (e.g. 2320 represents the time allows inverter to power the load is from 23:00 to the next day 20:59, and the inverter AC output power is prohibited outside of this period).
02/19/20/21/22/23/24/43/44/45/46/47/48		No need to set, keep it default	

3.4 Display Information

The LCD display information will be switched in turns by pressing “UP” or “DOWN” key. The selection information is switched as below order: voltage, frequency, current, power, firmware version.

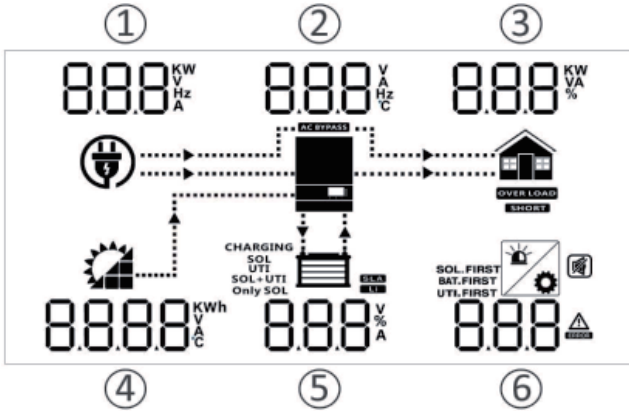
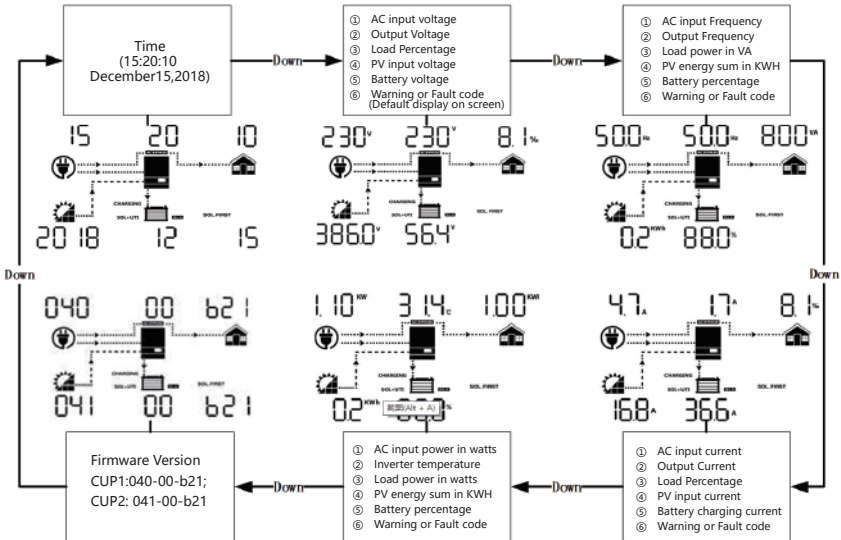
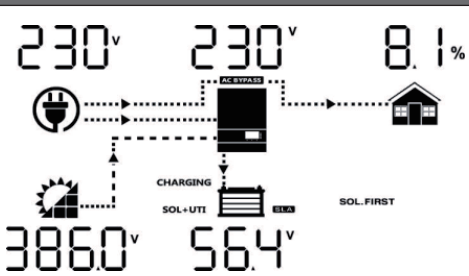
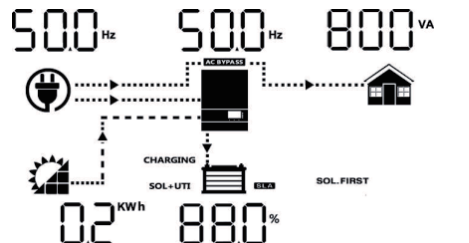
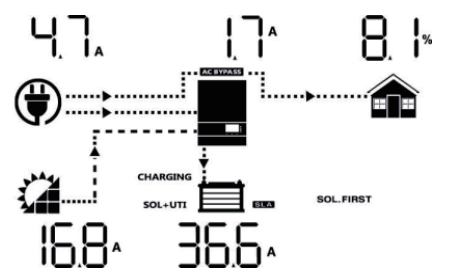
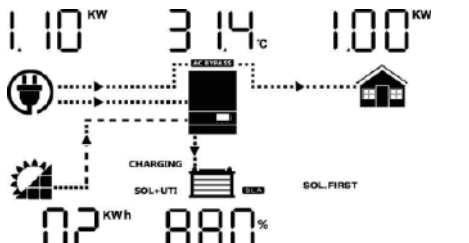


Figure 15 Display Information



3.5 Operating Mode

Table 9 Display Information

Setting Information	LCD display
① AC input voltage ② Output Voltage ③ Load Percentage ④ PV input voltage ⑤ Battery voltage ⑥ Warning or Fault code (Default display on screen)	 The LCD display shows the following information: AC input voltage (230V), Output Voltage (230V), Load Percentage (8.1%), PV input voltage (386.0V), Battery voltage (56.4V), and a warning icon. The display also includes a diagram of the inverter system with labels: AC BYPASS, CHARGING, SOL-UTI, and SOL-FIRST.
① AC input Frequency ② Output Frequency ③ Load power in VA ④ PV energy sum in KWH ⑤ Battery percentage ⑥ Warning or Fault code	 The LCD display shows the following information: AC input Frequency (500 Hz), Output Frequency (500 Hz), Load power in VA (800 VA), PV energy sum in KWH (0.2 KWH), Battery percentage (88.0%), and a warning icon. The display also includes a diagram of the inverter system with labels: AC BYPASS, CHARGING, SOL-UTI, and SOL-FIRST.
① AC input current ② Output Current ③ Load Percentage ④ PV input current ⑤ Battery charging current ⑥ Warning or Fault code	 The LCD display shows the following information: AC input current (4.7 A), Output Current (1.7 A), Load Percentage (8.1%), PV input current (16.8 A), Battery charging current (36.6 A), and a warning icon. The display also includes a diagram of the inverter system with labels: AC BYPASS, CHARGING, SOL-UTI, and SOL-FIRST.
① AC input power in watts ② Inverter temperature ③ Load power in watts ④ PV energy sum in KWH ⑤ Battery percentage ⑥ Warning or Fault code	 The LCD display shows the following information: AC input power in watts (1.10 KW), Inverter temperature (3.14 C), Load power in watts (1.00 KW), PV energy sum in KWH (0.2 KWH), Battery percentage (88.0%), and a warning icon. The display also includes a diagram of the inverter system with labels: AC BYPASS, CHARGING, SOL-UTI, and SOL-FIRST.

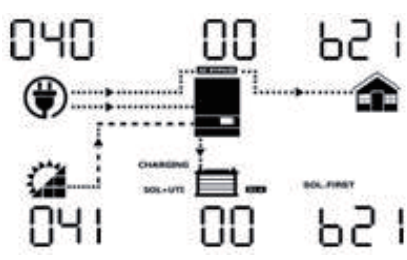
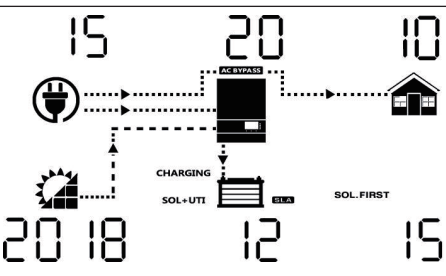
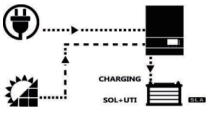
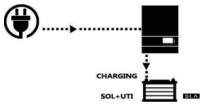
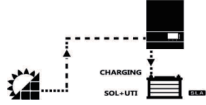
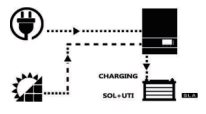
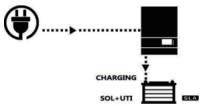
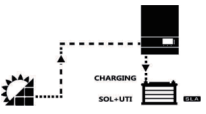
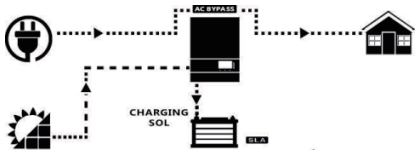
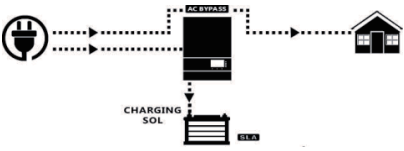
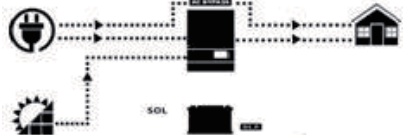
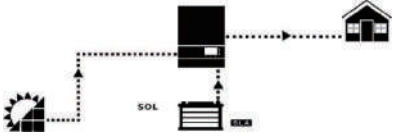
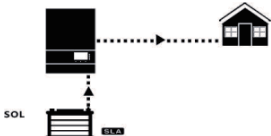
Setting Information	LCD display
Firmware Version CUP1:040-00-b21; CUP2: 041-00-b21	
Time (15:20:10, December 15, 2018)	

Table 10 Operating mode description

Operation mode	Description	LCD display	
Standby Mode / Power Saving Mode Note: *Standby mode: The inverter is not turned on yet but at this time, the inverter can charge battery without AC output. *Power saving mode: If enabled, the output of inverter will be off when connected load.	No output is supplied by the unit but it still can charge batteries.	Charge by utility and PV energy 	Charging by utility 
		Charging by PV energy 	No charging 
Fault Mode Note: * Fault mode: Errors are caused by inside circuit or external reasons such as over temperature, output short circuit and so on.	PV energy and utility can charge batteries	Charge by utility and PV energy 	Charging by utility grid 
		Charging by PV energy 	No charging 

Operation mode	Description	LCD display
Utility grid Mode	The unit will provide output power from the mains. It can also charge the battery at line mode.	Charging by PV energy 
		Charging by utility grid 
		No battery connected 
Battery Mode	The unit will provide output power from battery and PV power	Power from battery and PV power 
		Battery from battery power only 

3.6 Monitoring

For data monitoring, please refer to the "APP Operation Guide" manual.

4 Maintenance

4.1 Fault Code

Fault Code	Fault Event	Icon on
01	Fan is locked	
02	Over temperature	
03	Battery voltage is too high	
04	Battery voltage is too low	
05	Output short circuited	
06	Output voltage is too high	
07	Overload time out	
08	Bus voltage is too high	
09	Bus soft start failed	
11	Main relay failed	
51	Over current or surge	
52	Bus voltage is too low	
53	Inverter soft start failed	
55	Over DC voltage in AC output	
56	Battery connection is open	
57	Current sensor failed	
58	Output voltage is too low	
80	CAN fault	
81	Host loss	

4.2 Warning Indicator

Warning Code	Warning Event	Audible Alarm	Icon flashing
01	Fan locked when inverter is on	Beep 3 times every second	01 [▲]
02	Over temperature	Beep once every second	02 [▲]
03	Battery over charged	Beep once every second	03 [▲]
04	Low battery	Beep once every second	04 [▲]
07	Overload	Beep once every 0.5 second	07 [▲]
10	Output power derating	Beep once every 3 second	10 [▲]
12	Solar charger stop due to low battery	Beep once every second	12 [▲]
13	Solar charger stop due to high PV voltage	Beep once every second	13 [▲]
14	Solar charger stop due to overload	Beep once every second	14 [▲]
15	Parallel input utility grid different	Beep once every second	15 [▲]
16	Parallel input phase error	Beep once every second	16 [▲]
17	Parallel output phase loss	Beep once every second	17 [▲]
18	Buck over current	Beep once every second	18 [▲]
19	Battery disconnect	No beep	19 [▲]
20	BMS communication error	Beep once every second	20 [▲]
21	PV power insufficient	Beep once every second	21 [▲]
22	Parallel forbidden without battery	Beep once every second	22 [▲]
25	Parallel inverters' capacity different	Beep once every second	25 [▲]
33	BMS communication loss	Beep once every second	33 [▲]
34	Cell over voltage	Beep once every second	34 [▲]

Warning Code	Warning Event	Audible Alarm	Icon flashing
35	Cell under voltage	Beep once every second	35 [▲]
36	Total over voltage	Beep once every second	36 [▲]
37	Total under voltage	Beep once every second	37 [▲]
38	Discharge over voltage	Beep once every second	38 [▲]
39	Charge over voltage	Beep once every second	39 [▲]
40	Discharge over temperature	Beep once every second	40 [▲]
41	Charge over temperature	Beep once every second	41 [▲]
42	Mosfet over temperature	Beep once every second	42 [▲]
43	Battery over temperature	Beep once every second	43 [▲]
44	Battery under temperature	Beep once every second	44 [▲]
45	System shut down	Beep once every second	45 [▲]

4.3 Specification

Model	Sunova-eFox-35E	Sunova-eFox-50E
Battery		
Rated voltage	51.2V	
Voltage range	44.8~57.6V	
Capacity	5.12kWh	5.12kWh
Max. discharge rate	1C	
Max. charge rate	1C	
Battery type	Li-ion (LFP)	
AC Output(Backup)		
Rated power	3500W	5000W
Surge power	7000W,5s	10000W,5s
Rated output voltage	220/230/240V	
Max. output current	16A	22.7A
Rated frequency	50/60Hz	
THDv	< 3%	
Output wave	Pure Sine Wave	
Output type	AC Socket×2+Terminals	
AC Input		
AC input voltage range	170~280V	
AC input frequency	50/60Hz	
AC charge current(Battery)	30A(0~60A Adjustable)	30A(0~80A Adjustable)
PV Input		
Max. PV power(Recommended)	4500W	6000W
Max. PV voltage	450V	
MPPT voltage range	120~430V	
Max PV charge current(Battery)	80A	100A
General Data		
Range of working temperature	Charge: 0°C~50°C/Discharge: -10°C~50°C	
Optimal working temperature range	20°C~30°C	
Storage temperature	-15°C~60°C	
Humidity	5%~95%	
Cooling strategy	Fan	
Weight	67.6kg	67.6kg
Dimension [W x H x D]	585*611*230mm	585*611*230mm
Enclosure protection rating	IP20	
Communication	WiFi/RS485	

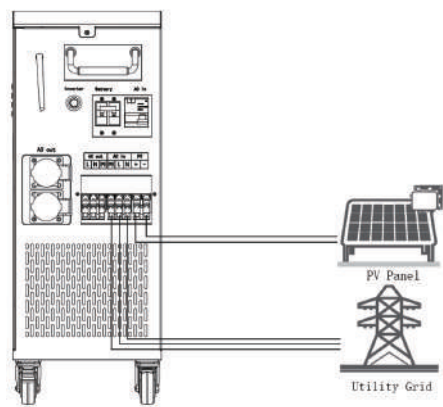
4.4 Trouble Shooting

Problem	LCD/LED/Buzzer	Explanation / Possible cause	What to do
Unit shuts down automatically during start up process.	LCD/LEDs and buzzer will be active for 3 seconds and then complete off.	The battery voltage is too low(<setting in program 5)	1. Re-charge battery. 2. Replace battery.
No response after power on.	No indication.	1. The battery voltage is far too low. 2. Battery polarity connect reversed.	1. Check if batteries and the wiring are connected well. 2. Re-charge battery. 3. Replace battery.
Mains exist but the unit works in battery mode.	Input voltage displayed as 0 on the LCD and green LED is flashing.	Input protector is tripped	Check if AC breaker is tripped and AC wiring is connected well.
	Green LED is flashing.	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 setting is correct. (UPS appliance)
	Green LED is flashing.	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 01	Fan fault	Replace the fan.
	Fault code 05	Output short circuited.	Check if wiring is connected well and remove abnormal load.
	Fault code 02	Internal temperature of inverter component is over 100°C.	Check whether the air flow of the unit is blocked or whether the ambient temperature is too high.
	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.

Problem	LCD/LED/Buzzer	Explanation/Possible cause	What to do
Buzzer beeps continuously and red LED is on.	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 07	Overload error. The inverter is overload 110% and time is up.	Reduce the connected load by switching off some equipment.
	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.	
	Fault code 56	Battery is not connected well or fuse is burnt.	If the battery is connected well, please return to repair center.

4.5 Activation

If you accidentally discharge the battery capacity to zero and can’ t turn it on, you need to activate it by connecting PV or Utility grid to reuse it.





SUNOVA SOLAR

Leading one-stop PV Supplier

Sunova Solar Technology Co., Ltd

Add: H building, Standard Plant Phase II,
Runzhou Road, Huishan District, Wuxi City,
Jiangsu Province, P.R.China, 214000

E-mail: info@sunova-solar.com

Tel: +86 510 8595 9369

Web: www.sunova-solar.com