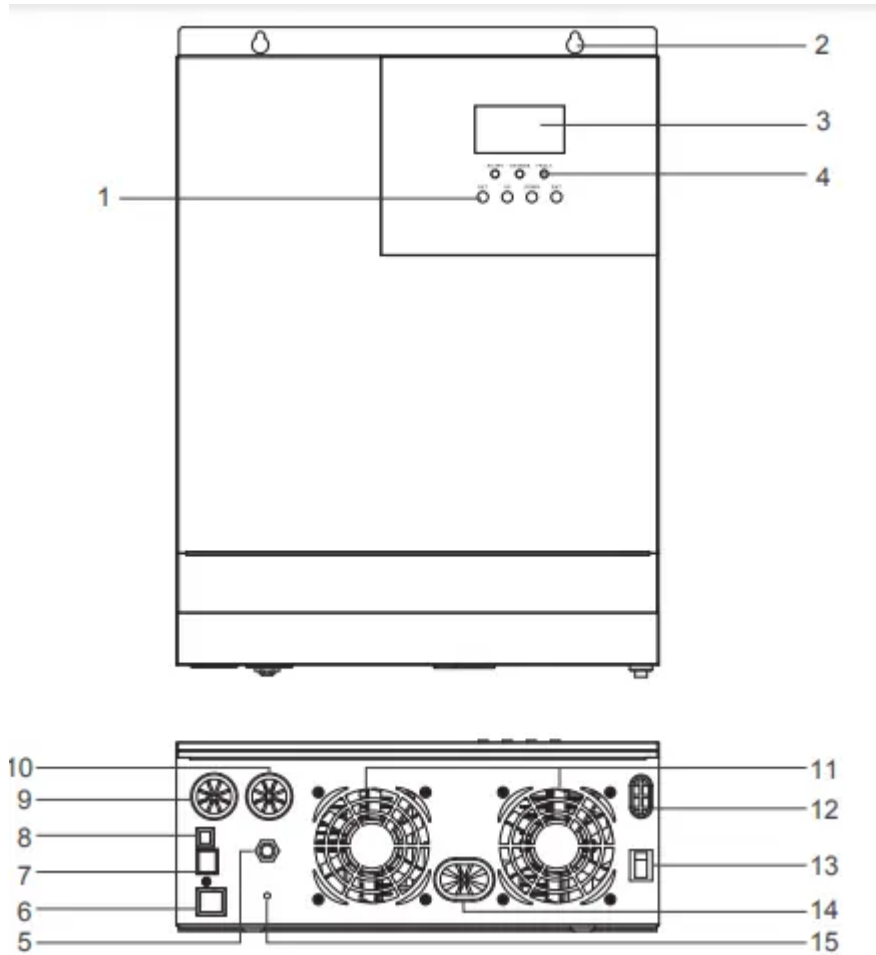


Product Overview

Identification of Parts

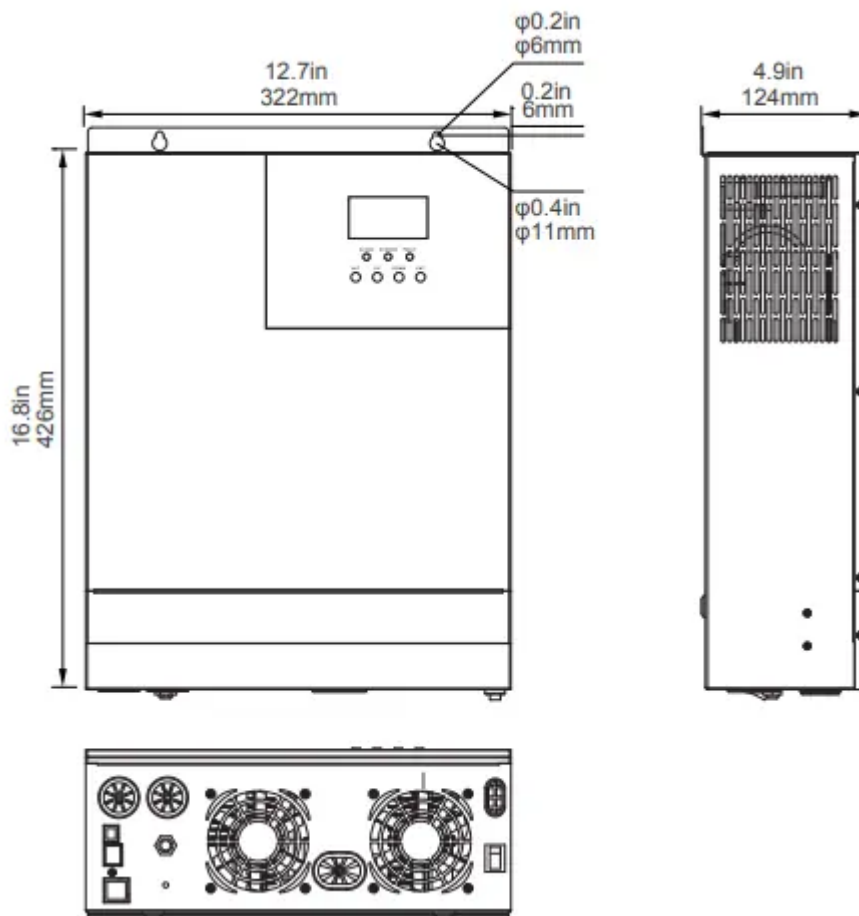


Key Parts

1. LCD Buttons
2. Mounting Holes
3. LCD Screen
4. LED Indicators
5. AC Input Breaker
6. Dry Contact Port
7. RS485/CAN Communication Port
8. USB Debugging Port (Internal Use)
9. AC Input Terminal

- 10. AC Output Terminal
- 11. Cooling Fans
- 12. PV Input Terminal
- 13. Main On/Off Power Switch
- 14. Battery Input Terminal
- 15. Grounding Lug

Dimensions



Optional Components



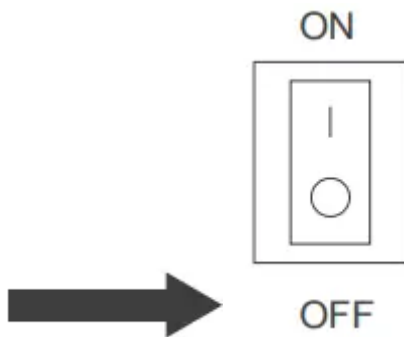
Renogy BT-2 Bluetooth Module:

The BT-2 Bluetooth module is a great addition to any Renogy charge controllers with a RS485 port and is used to pair charge controllers with the Renogy BT App. After pairing is done you can monitor your system and change parameters directly from you cell phone or tablet. No more wondering how your system is performing, now you can see performance in real time without the need of checking on the controller's LCD.

Operation

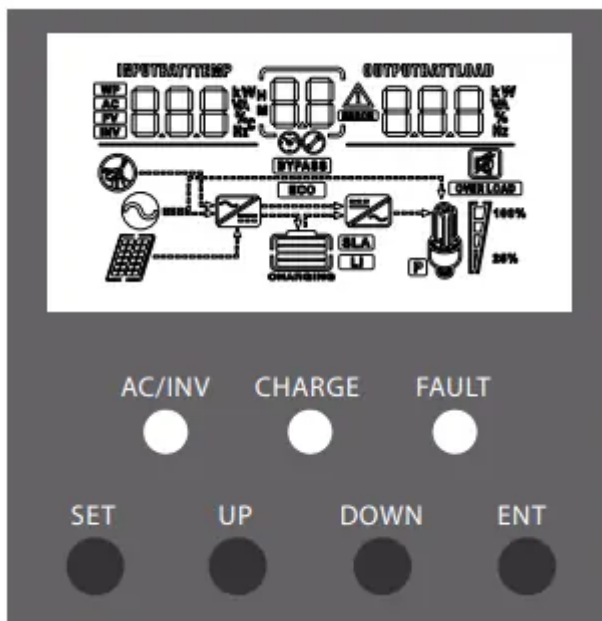
Assuming all connections are correct and tightly secured, Locate the power button on the solar inverter and turn the main power switch to the ON position.

The following describes the basic operation of the solar inverter charger



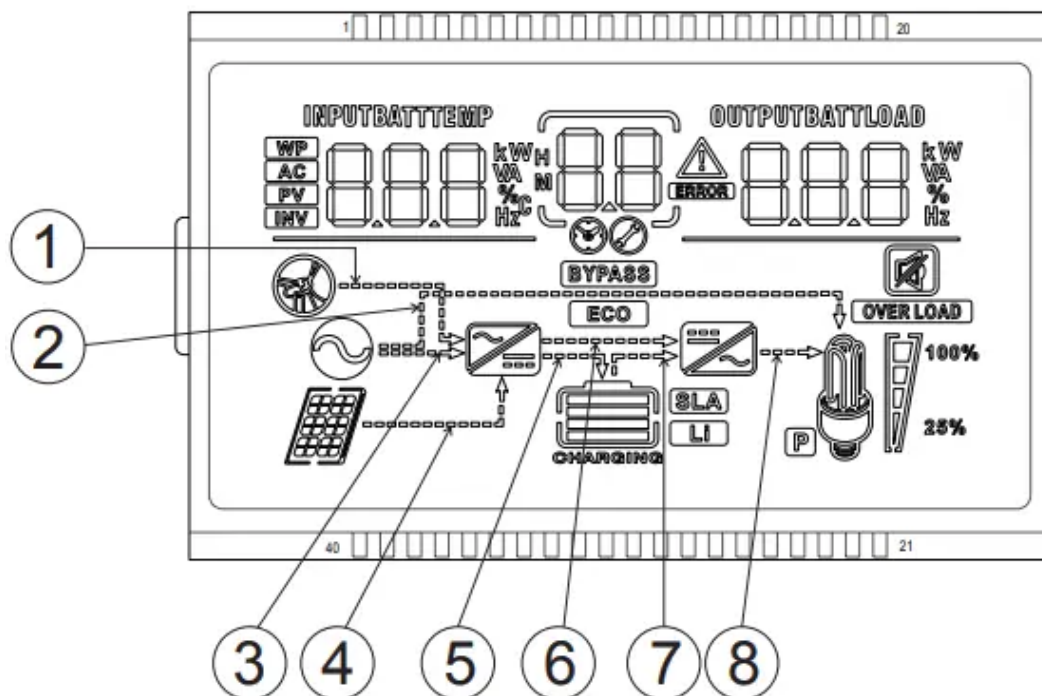
LCD Operation

The solar inverter is equipped with 3 LCD indicators and 4 working buttons






























LED	Color	Behavior	Parameter
AC/INV	Yellow	Solid	The output will be powered by the AC Line
		Flash	The output is powered by battery or PV in battery mode
CHARGE	Green	Flash	Battery is charging
		Solid	Battery is fully charged
FAULT	Red	Solid / Flash	System fault







Key	Parameter
SET	Go to / Exit Settings menu
UP	Previous selection
DOWN	Next choice
ENT	Under the Settings menu, determine/enter options



1. The arrow only displays during startup and not part of the solar inverter functionality.
2. Indicates that the utility/grid is powering the load.
3. Indicates that the power utility/grid is powering the battery charging circuit (AC-DC)
4. Indicates solar (PV) power to the battery charging circuit (DC-DC)
5. Indicates that the charging circuit 1 is charging the battery.
6. The arrow only displays during startup and not part of the solar inverter functionality.
7. Indicates that the battery is powering the inverter circuit (DC-AC)
8. Indicates that the inverter circuit is powering the load.

Icon	Function	Icon	Function
	Indicates that the AC input is connected to AC Source		Indicates that the inverter mode circuit is working
	This icon indicates a wide voltage AC input Mode (APL mode)		Indicates that the solar inverter charger is in the power bypass (Bypass)
	Indicates that the PV input is connected		Indicates that the inverter circuit is powered to the load
	Indicates that the solar inverter charger is connected to the battery. Status:  0 %~24%,  25%~49%,  50%~74%,  75%~100%		Indicates load percentage in 25% increments from the overall wattage of the solar inverter charger  0 %~24%,  25%~49%,  50%~74%,  ≥75%
	Indicates that the current battery type of the solar inverter charger is lithium		Indicates that the buzzer is not enabled

	Indicates that the current battery type of the solar inverter charger is a sealed lead acid		Indicates that an alarm has occurred on the solar inverter charger
	Indicates that the battery is charging		Indicates that the solar inverter charger is in a faulty state
	Indicates AC/PV charging circuit is working		Indicates that the solar inverter charger is in set mode
	AC Load voltage output		When not in setting mode displays alarm or fault code
	Indicates the solar inverter is operating under ECO power saving mode.		

The following is on the left side of the LCD	
	Indicates AC input
	Indicates PV input
	Indicates inverter circuit
	The icon appears only at startup and is irrelevant to functionality of the solar inverter
	Shows battery voltage, total battery charge current, charge power, AC input voltage, AC input frequency, PVInput voltage, internal heatsink temperature, and software version
The following is on the right side of the LCD	
	Indicates output voltage, output current, output power, output visual power, battery discharge current, software version. In this setting mode, the settings under the currently set parameter item code are displayed

LCD Menu Screens

On the LCD home screen, press the "UP" and "DOWN" buttons to turn the page to view the solar inverter's real-time data.

1	Battery Input Voltage	Fault code	Load Output Voltage
2	PV Temperature		PV Output Kilowatts
3	PV Input Voltage		PV Output Current
4	Battery Input Current		Battery Output Current
5	Battery Input Kilowatts		Battery Output Kilowatts
6	AC Input Frequency		AC Output Load Frequency
7	AC Input Voltage		AC Output Load Current
8	Internal Parameters		Load Output KVA
9	Inverter Temperature		Inverter Output Load Kilowatts
10	APP Software Version		Bootloader Software Version
11	Model PV Voltage Rating		Model PV Power Rating
12	Model Battery Voltage Rating		Model Output Current Rating

LCD Programmable Features

Press the "SET" key to enter parameter setting mode. After entering the settings menu, the parameter number 00 flashes and you can press the "UP" and "DOWN" keys to select the parameter code that you want to set. To access the parameter program press "ENT" key to enter the parameter editing state, at which point the value of the parameter flashes. Adjusts the value of the parameter through the "UP" and "DOWN" buttons, and finally press "ENT" to press the key, complete the edit of the parameter, and return to the parameter selection state.

Parameters Number	Parameter Name	Set options	Description
00	Exit	[00] ESC	Exit the settings menu
01	Load Working Mode	[01] SOL	<p>Solar energy provides power to the loads as priority. If solar energy is not enough to power all connected loads, battery energy will supply power to the loads at the same time.</p> <p>Utility provides power to the loads only when any one condition happens:</p> <ul style="list-style-type: none"> - Solar energy is not available - Battery voltage drops to low-level set-point in Program 04
		[01] Utl (Default)	<p>Utility will provide power to the loads as priority. Solar and battery energy will provide power to the loads only when utility power is not available.</p>
		[01] SBU	<p>Solar energy provides power to the loads as priority. If solar energy is not enough to power all connected loads, battery energy will supply power to the loads at the same time.</p> <p>Utility provides power to the loads only when battery voltage drops to</p>

			low-level set-point in Program 04.
02	Output Frequency	[02] 50.0	The output frequency can be set through this menu. By default, the value should be 60Hz
		[02] 60.0 (Default)	
03	AC Input Voltage Range	[03] APL	By default, the input voltage range is the same, 90~140VAC
		[03] UPS (Default)	By default, the input voltage range is the same, 90~140VAC
04	Battery Power to Utility Setpoint	44.0V (Default)	Setting voltage point back to utility source when selecting "SBU " or "SOL" in program 01. When the voltage of the battery is lower than this setting, the output switches from inverting to the utility. The setting range is from 39.6V - 52V, in 0.4V increments.
05	Utility to Battery Power setpoint	[05] 58.8V (Default)	Setting voltage point back to battery mode when selecting "SBU" or "SOL" in program 01. When the battery voltage is higher than the setting value, the output is switched from the utility to the battery mode. The setting range is 48V - 58.8V, in 0.4V increments. *Cannot be higher than [14]
06	Battery Charging Mode	[06] CSo	Solar energy will charge battery as priority. Utility

	Please Note: 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 enough		will charge battery only when solar energy is not available
		[06] Cub	Utility will charge battery as priority. Solar energy will charge battery only when utility power is not available
		[06] SnU (Default)	Solar energy and utility will charge battery at the same time. MPPT Solar energy will be priority charging and when it is insufficient, Utility will become priority. When the photovoltaic energy is sufficient again, Utility will stop charging
		[06] oSo	Solar energy will be the only charging source even if utility is available
07	Maximum charging current: To configure total charging current for solar and utility chargers. (Max. charging current = utility charging current + solar charging current)	[07] 80A (Default)	The maximum solar charging is 80A, the maximum Grid/Utility charging is 40A (adjustable in Program 28), totaling the maximum current of 120A. The range can be configured between 0 ~ 120A
08	Battery type	[08] USE	User-defined, all battery parameters can be set
		[08] SLd (Default)	Sealed lead-acid/AGM battery, constant voltage charging 58.4V, float charging voltage 55.2V



		[08] FLd	Flooded lead-acid battery, constant voltage charging 58.4V, float charging voltage 55.2V
		[08] GEL	Gel lead-acid battery, constant voltage charging 56.8V, float charging voltage 55.2V
		[08] LF14 LF15 LF16	Lithium iron phosphate battery corresponding to 14 strings, 15 strings and 16 strings Default constant voltage charging voltage 14 strings: 50.4V 15 strings: 54V 16 strings: 57.6V
		[08] n14 n13	Lithium-ion battery corresponding to 12 strings, 13 strings and 14 strings Default constant voltage charging voltage 13 strings: 53.2V 14 strings: 57.2V
09 *available in USER and lithium setting only	Boost Charge Voltage	[09] 58.4 (Default)	Changes the charging voltage setting, set the range 48V to 58.4V, in 0.4V increments
10	Boost Charge Duration	[10] 120 min (Default)	Raise the boost charge time setting, refers to the constant voltage

*available in USER setting only			charging reached at Program 09 . The range is 5min to 900min, in 5 minute increments
11 *available in USER setting only	Float Charge Voltage	[11] 55.2V (Default)	Floating charging voltage set range 48V to 58.4V, in 0.4V increments
12 *available in USER and lithium setting only	Low Voltage Load Disconnect	[12] 42V (Default)	It is recommended to set this voltage below the maximum voltage the battery can withstand. When this voltage is reached, the loads will be powered off after a time delay adjustable in Program 13 The range is 38V to 50V, in 0.4V increments
13 *available in USER and lithium setting only	Battery Over-discharged Delay Time **If a power shortage occurs and recovers in a short time, it can cause damage to your connected appliances. To prevent this kind of damage, please check manufacturer if heavy load appliances are equipped with time-delay function before installation	[13] 5S (Default)	The following parameter sets the delay-time after the battery voltage is below the set-point in Program 12. The set range is 5-50 seconds, in 5s increments



14 *available in USER and lithium setting only	Battery Undervoltage Alarm	[14] 43.8V (Default)	Warning that the battery is approaching low voltage. The output does not shut down and the range is 40V to 52V, in 0.4V increments
15 *available in USER and lithium setting only	Battery Discharge Limit Voltage	[15] 40V (Default)	When the battery voltage goes below this voltage set-point, the solar inverter will immediately disconnect and shut down immediately. The set range is 36V to 50V, in 0.4V increments
16 *available in FLD and USER setting only	Set Equalization charging	[16] DIS	No equalization charging
		[16] ENA (Default)	Enables equalization charging
17 *available in FLD and USER setting only	Battery Equalization Voltage	[17] 59.2V (Default)	Set equalization charging voltage. The range is 48V to 59.2V, in 0.4V increments
18 *available in FLD and USER setting only	Battery Equalization Duration	[18] 120min (Default)	Setting range is from 5min to 900 min. , in 5min increments
19 *available in FLD and	Battery Equalization Time-Delay	[19] 240min (Default)	Setting range is from 5min to 900 min, in 5min increments

USER setting only			
20 *available in FLD and USER setting only	Equalization interval	[20] 30 days (Default)	Setting range is from 0 days to 30 days, in 1 day increments
21 *available in FLD and USER setting only	Enable Equalization Immediately	[21] DIS (Default)	Stops equalization charging immediately
		[21] ENA	Starts Equalization charging immediately
22 *Power-saving Mode (ECO Mode)	Power-saving Mode	[22] DIS (Default)	Disables power-saving mode
		[22] ENA	After a 5min delay from setting, the inverter will enter a power saving mode and detect the load size. Loads greater than or equal to 50W, will be powered by the solar inverter. Otherwise, it will automatically stay in a low detecting mode and not power any loads under 50W
23	Overload auto-start	[23] DIS	Overload automatic restart is disabled, and the unit will not turn on the loads
		[23] ENA (Default)	Enables automatic restart if the load shutdown output has occurred. The unit



			attempts to restart the output after 3 minutes and After 5 attempts the unit will not longer resume to turn on the loads
24	Overtemperature auto-start	[24] DIS	Over-temperature automatic re-start is disabled
		[24] ENA (Default)	The over-temperature protection is activated and upon temperature dropping, the unit automatically restarts
25	Buzzer alarm	[25] DIS	No alarm
		[25] ENA (Default)	Enable alarm
26	Alarm	[26] DIS	No alarm prompts when the status of the primary input source changes
		[26] ENA (Default)	Enable alarm prompts when the status of the primary input source changes
27	Overload bypass: When enabled, the unit will transfer to line mode if overload occurs in battery mode.	[27] DIS	When disabled, the unit will not transfer to Utility mode
		[27] ENA (Default)	When enabled, the unit will transfer to Utility mode if overload occurs in battery mode.
28	Maximum AC Charging Current	[28] 40A (Default)	The range can be configured between 0-40A
29	Split Phase		



		[29] DIS (Default)	Supply for industrial frequency transformer (disabled)
		[29] ENA	Supply for industrial frequency transformer (enabled)
35	Low Voltage Disconnect Recover	[35] 50.4V (Default)	Set point that recovers and reconnects the solar inverter from being disconnected in Low Voltage Disconnect. The range is from 44V -58.4V, in 0.4V increments.
36	PV Charging Current	[36] 80A (Default)	Adjustable PV current settings. The range is from 0 – 80A.
37	Battery Charging Boost Return Setpoint	[37] 52V (Default)	When the battery reached at floating status, it will need to be lower than this setpoint before it starts charging. The range is the (Undervoltage Warning) ~ (Floating Voltage – 1.2V) for the respective battery



Electronic Protections



Number	Protection	Description
1	PV Current/ Power Limiting Protection	When the configured PV array charge current exceeds the PV rated current, it will be charged at the rated current
2	PV Night anti-charge protection	At night, the battery is prevented from discharging through the PV component because the voltage of the battery is greater than the voltage of the PV component
3	Overvoltage Protection	Triggered when AC Input voltage reaches 140V
4	Power Input Undervoltage Protection	When utility input is below 90VAC, charging is stopped and the solar inverter is in inverter mode
5	Battery Over-voltage Protection	When the battery voltage reaches the overvoltage disconnect point, the PV and the utility automatically stop charging the battery, preventing damage from overcharging the battery
6	Battery low-voltage protection	When the battery voltage reaches the low voltage disconnect voltage point, the battery discharge is automatically stopped to prevent excessive discharge of the battery from being damaged
7	Load output short-circuit protection	When a short-circuit fault occurs at the load output, the output AC voltage is immediately turned off and outputs again after 1sec, for 3 more attempts. If they fail, then the unit will need to be manually powered on
8	Over-temperature protection	When the internal temperature of the unit is too high, the it will stop charging and discharging
9	Overload protection	Output again after 3 minutes after overload protection, overload 5 times in a row until the solar inverter charger is powered back, with A table of technical parameters after reference to the load level and duration of the manual



10	PV reverse polarity	Protection against reversing PV input connection
11	Bypass Protection protection	Prevents battery power mode from inverting when bypass is active
12	Bypass Flow Protection	Built-in AC input overcurrent protection circuit breaker
13	Battery input overcurrent protection	When the battery discharge output current is greater than the maximum and lasts 1 minute, the AC input is loaded
14	Battery input protection	When the battery is reversed or the inverter is shorted inside, the internal battery input fuse of the inverter fuses to prevent battery damage or fire
15	Charge short-circuit protection	The inverter protects and stops when the external battery port is shorted while the PV or AC is charging stop the output current

Fault Codes



Fault code	Fault name	Description
【01】	BatVoltLow	Battery under-voltage alert
【02】	BatOverCurrSw	Battery discharge current software protection
【03】	BatOpen	Battery not detected
【04】	BatLowEod	Battery undervoltage stopdischarge alarm
【05】	BatOverCurrHw	Battery overcurrent hardware protection
【06】	BatOverVolt	Charge overvoltage protection
【07】	BusOverVoltHw	Bus overvoltage hardware protection
【08】	BusOverVoltSw	Bus overvoltage software protection
【09】	PvVoltHigh	PV overvoltage protection
【10】	PvBuckOCSw	Buck Overcurrent Software Protection
【11】	PvBuckOCHw	Buck Overcurrent Hardware Protection
【12】	bLineLoss	utility power down
【13】	OverloadBypass	Side-by-side load protection
【14】	OverloadInverter	inverter overload protection
【15】	AcOverCurrHw	Inverted overcurrent hardware protection
【16】	-	-
【17】	InvShort	Inverter short-circuit protection
【18】	-	-
【19】	OverTemperMppt	Controller overtemperature protection
【20】	OverTemperInv	inverter over temperature protection
【21】	FanFail	Fan failure
【22】	EEPROM	Memory failure

【23】	ModelNumErr	Model settings are wrong
【24】	-	-
【25】	-	-
【26】	RlyShort	Error between AC output and bypass
【27】	-	-
【28】	-	-
【29】	BusVoltLow	Internal battery boost circuit failure



Fault	Solutions
Screen not displaying	Make sure the battery is properly connected and charged to be able to recognize the solar inverter. or click any button on the screen to exit screen sleep mode.
Rechargeable battery overvoltage protection	Measure whether the battery voltage exceeds 60V and disconnect the photovoltaic array from and the power-on.
Battery undervoltage protection	Wait until the battery is charged to return to above the low voltage recovery voltage.
Fan failure	Check that the fan is not turning or is blocked by something else.
Over-temperature Protection	When the temperature of the equipment cools to, normal charge and discharge control is restored.
Overload Protection	(1) Reduce the use of electrical equipment;(2) restart the solar inverter charger and load recovery output.
Inverter short-circuit protection	Disconnect or reduce any loads from the unit. Shut down the solar inverter charger and turn on again to clear the error.
PV overvoltage	Check with the meter if the PV input voltage is above the maximum allowable input voltage of 145 V operating voltage.
Battery missed alert	Check that the battery is not connected or that the battery side circuit breaker is not closed.

Maintenance

In order to maintain optimal long-term performance, it is recommended to perform inspections of the following items twice a year.

1. Make sure that the air flow around the solar inverter is not blocked and remove any dirt or debris from the radiator.

2. Check all terminals to see if there is corrosion, insulation damage, high temperature or combustion / discoloration signs, tighten the terminal screws.

WARNING Danger of electric shock! Make sure that all power supplies on solar inverter disconnected and that all capacitive power is released before checking or operating accordingly!

Warning

This content is compiled from multiple sources and is provided for reference purposes only. It may not be complete or fully applicable to all situations. If you are unable to resolve your issue, please contact the product manufacturer or an authorized service provider for official support.

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