

Off-grid hybrid inverter with built-in solar charge controller all in one

Product Usage Manual



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Dear customer, thank you for choosing our products. Please read the following instructions carefully before using this product:

Please keep this manual for future reference





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I.Security statement

1.1 Security identification

The following security symbols may appear in this manual, which represent the following meanings:

Security symbol	Meaning
 Danger	Indicates that ignoring safety warnings can lead to serious accidents of personal injury.
 Warning	The risk of serious injury, serious damage to equipment or disruption of major operations is indicated if safety warnings are ignored.
 Attention	Indicates the risk of moderate injury, moderate damage to equipment or partial business interruption if safety warnings are ignored.
 Note	Indicates that the content is additional information to the text.

For electrical and electronic equipment, safety involves the whole process of installation, trial operation, operation and maintenance. Therefore, incorrect use or misoperation will endanger the life and personal safety of operators or third parties and the safety of equipment. In order to avoid casualties and equipment damage, all the following safety information tips such as danger, warning and attention should be strictly observed during operation and maintenance.

1.2 Safety Notes



Warning!

All installation operations for integrated machines must be completed by professional technicians. Professional and technical personnel must undergo special training, complete reading of this manual and master operational safety issues.

If the non-professional installation operation caused personnel injury, the company will not bear the relevant responsibility.

If not installed and operated in accordance with the instructions in this manual, resulting in damage to the integrated machine, will not be within the scope of our warranty.

①Before installation



Attention!

When receiving the product, check if the integrated machine is damaged during transportation. If you find any problems, please contact us or the transportation company immediately.

②Installation

Before installing the integrated machine, make sure that the integrated machine has not been electrically connected and electrified.



Warning!

1. area where the machine is placed must be more than 30 from the wall CM、 well ventilated, away from water, combustible gases and corrosives.

2. machine should not be side, should keep the right panel inlet hole, left panel fan outlet hole unobstructed.

3. ambient temperature around the machine should be kept between -25~+55 degrees.

4. machine is disassembled and used at low temperature, there may be condensation of water droplets. It must wait until the machine is completely dry inside and outside before it can be installed and used, otherwise there is a danger of electric shock.

5. machine is stopped for a long time, make sure the machine is completely dry and free of corrosion before it can be installed and used.



Warning!

Before all equipment is fully connected, be sure to disconnect the photovoltaic array end, battery end, load end, etc.

Prevent water from entering the whole machine.



Attention!

All electrical installations must comply with local and national electrical installation standards. To ensure safe operation, proper grounding, proper conductor size and necessary short circuit protection are required.

The connecting cable must choose the appropriate specification, the connection is firm and the insulation is good.

After installation, check that all line connections are tight to avoid the danger of heat accumulation due to virtual connection.

③in operation



Danger!

Integrated machine live state, do not open the machine cover board!

④Maintenance



Danger!

Maintenance work should be carried out by professional maintenance technicians.

The machine needs to be cut off before maintenance, wait 5 minutes after power failure before removing the machine.

II. Product characteristics

2.1 Summary

This is a multi-functional off-grid energy storage solar integrated machine, integrated with MPPT solar charging controller, power frequency pure sine wave inverter and UPS functional modules in one;

A full bridge inverter is used in the main power circuit, and the loop +LC filter is used to convert the DC low voltage to the pure sine wave of the specified voltage grade. By adding the complementary function of power supply, the load power supply is selected as power supply or inverter by relay, and the reliability of power consumption is improved.

The control part adopts the same battery side common ground method, which is convenient to realize sampling and control, and the inverter output adopts differential sampling mode to realize the isolation of the original side. Control chip using DSP chip, fast control speed, high accuracy.

2.2 Product characteristics

- Compatible with lead-acid batteries, ternary lithium, lithium iron phosphate and other battery types.
- With an ultra wide operating voltage range for photovoltaic arrays.
- MPPT maximum power point tracking technology of solar charging controller, the tracking efficiency is not less than 99.5. Compared with the common PWM algorithm, the efficiency is improved by 15~20.
- Using high quality imported components, advanced power conversion circuit, the maximum conversion efficiency can reach more than 98%, full load efficiency can reach 97%, a variety of tracking algorithms combined, can quickly track to the maximum power point.
- Photovoltaic charging has three-stage charging mode: MPPT- lifting charging-floating charging.
- pure sine wave ac output.
- With overcharge, overplay, overtemperature, overload and other comprehensive protection

functions.

- RS485 communication, can provide communication protocol, facilitate customer unified integrated management and secondary development.
- Through the PC of the upper computer and mobile phone APP view and set up charging control, inverter and other operating parameters, specific reference to the upper computer and APP manual (optional).
- Inverter and bypass can achieve seamless switching, can achieve the switching process of electrical equipment continuous electricity.
- Inverter adopts built-in pure copper power frequency isolation transformer, instant load capacity is strong, load impact resistance is strong.

2.3 Interface definitions

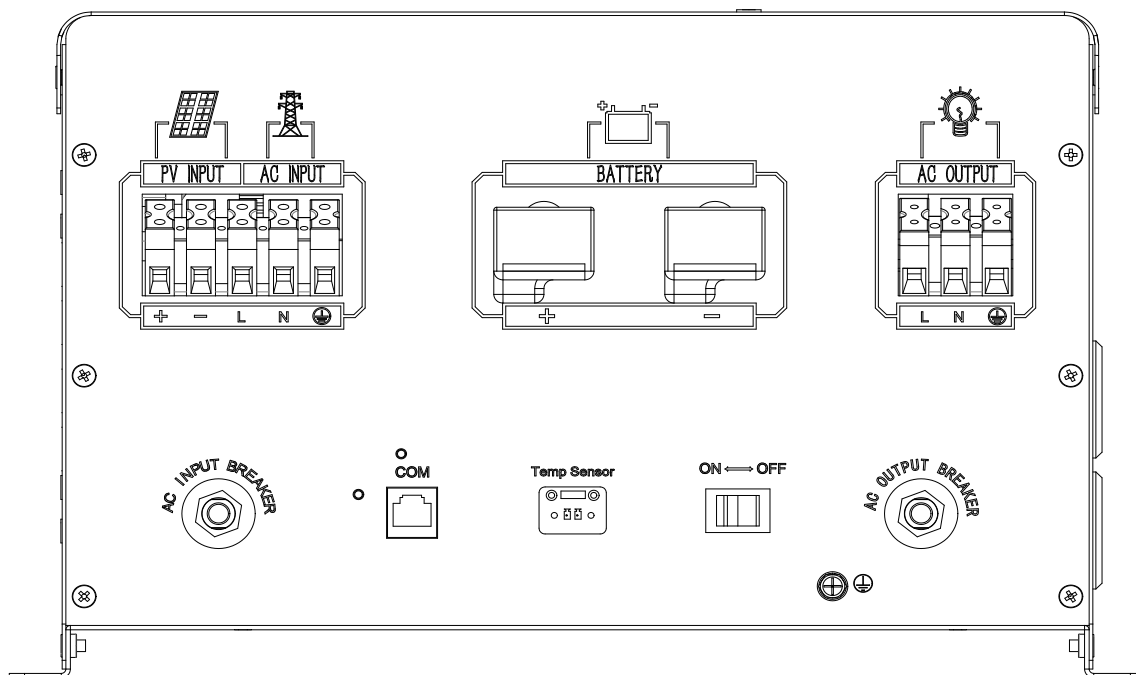


Figure 2-1 Product Interface Definition Chart

Table 2-1 Product Interface Definitions

Serial number	Name of name	Function	Note
1	PV INPUT(+)	PV array positive	PV array input
2	PV INPUT(-)	PV array negative	
3	AC INPUT (L)	Electricity input	Power input
4	AC INPUT (N)	Electricity input	
5	BATTERY+	Battery positive	Battery terminal
6	BATTERY-	Battery negative	
7	AC OUTPUT(L)	Load	AC load output
8	AC OUTPUT(N)	Load	
9	Temp sensor	Battery temp measurement	Measuring battery temperature
10	COM	Communications port	Computer、WIFI、GPRS communication monitoring

11	AC INPUT BREAKER	Power input overload protection	Overload protection
12	AC OUTPUT BREAKER	Load output overload protection	

III. Installation

3.1 Installation considerations

Before installation, you must read the entire installation section, familiar with the installation steps.

When installing the battery, be very careful. For the installation of the open lead acid battery, wear a protective mirror. Once in contact with the battery acid, please rinse with clean water in time.

Avoid placing metal objects near the battery to prevent short circuit of the battery.

Acid gas may be produced when the battery is charged to ensure good ventilation around the battery.

Please install in the indoor, outdoor installation to avoid direct sunlight and Rain Water infiltration.

The virtual connection point and the corroded wire may cause great heat, melt the insulation layer of the wire, ignite the surrounding material, and even cause a fire, so it is best to ensure that the connection head is tightened, and the wire is better fixed with the bandage. Avoid loose connection when moving.

The installed battery set should match the charging voltage and recommended charging current range.



Danger!

Explosive hazard! Do not install one machine and battery in the same closed space! Do not install in a closed space where battery gas may gather.

3.2 Installation instructions

1. Select installation location

Avoid installing the integrated machine in direct sunlight, high temperature and easy water, and ensure that the whole machine is well ventilated.

2. Open box and inspection

Check if the outer packing is damaged or deformed;

Open box inspection: control inverter integrated machine, a manual, accessories, etc;

Check mainframe appearance and accessories are in good condition;

Please contact us for the above abnormal situation.

3. Fixed machine

The front of the machine is laid flat or the integrated machine is fixed to the installation platform or the cabinet mounting support by screws through the ear, and sufficient ventilation and heat dissipation space is reserved around the installation;

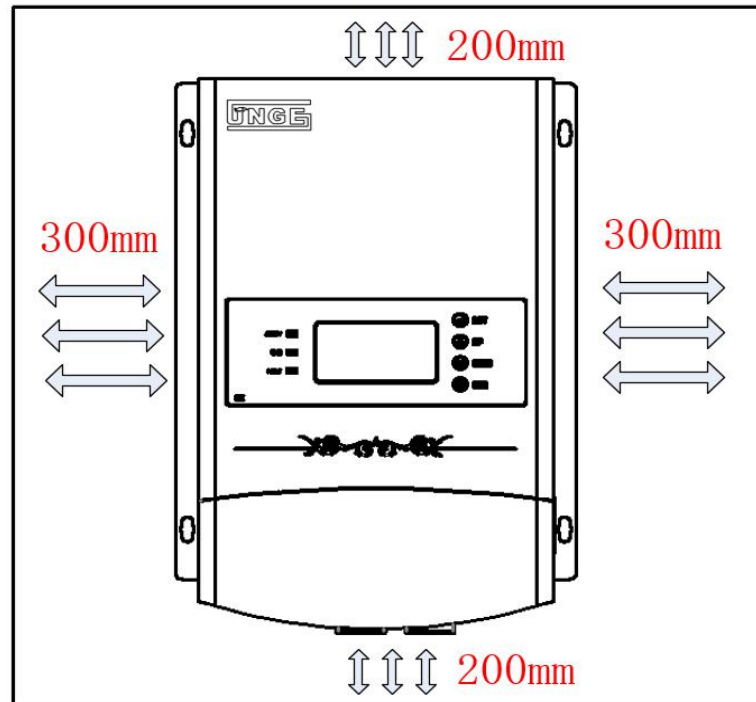


Fig3-1 Reserved space around installation of equipment

3.3 Connections

3.3.1 and Cable Selection Reference Standard

The following table shows the copper wire diameter size converted according to the current level. The actual cable size is greater than or equal to the data in the table:

Table 3-1 Cable Size

	Cable Selection Table									
Current rating/ A	10	20	30	40	50	60	70	80	100	120
Diameter/ mm ²	2	4	6	8	10	12	14	16	20	24
AWG	14	11	9	8	7	6	5	5	4	3

3.3.2 installation wiring operation steps

Step 1: connect battery, photovoltaic module, electricity, load, temperature sensor, monitoring background;

The battery, load, photovoltaic module, electricity, temperature sensor, monitoring background (upper computer / WIFI module / GPRS module) connected in turn, the wiring process disconnected all switches, pay attention to distinguish between positive and negative cable access;

Before connecting the battery, make sure the battery is in normal condition to ensure the normal operation of the system.

Cables with suitable diameters shall not be lower than the national power safety scale, and the general diameter shall be not less than 5 A/mm²Select current density and minimize connection length to reduce loss.



Warning: the load end is forbidden to connect more than one machine surge power electrical equipment to prevent damage to the integrated machine!



Warning: when you need to move, make sure that all wiring is fixed, because the virtual connection point may lead to heat accumulation, serious fire;



Warning: photovoltaic input voltage can not exceed the maximum voltage of photovoltaic array circuit;

The calculation formula of current voltage of photovoltaic panel : $[(\text{current temperature}) - 25^{\circ}\text{C}] \times K \times \text{photovoltaic panel nominal open circuit voltage } (25^{\circ}\text{C}) + \text{photovoltaic panel nominal open circuit voltage } (25^{\circ}\text{C})$

Step 2: Wiring Diagram

Lock the cable on the connecting post through the lower side of the housing.

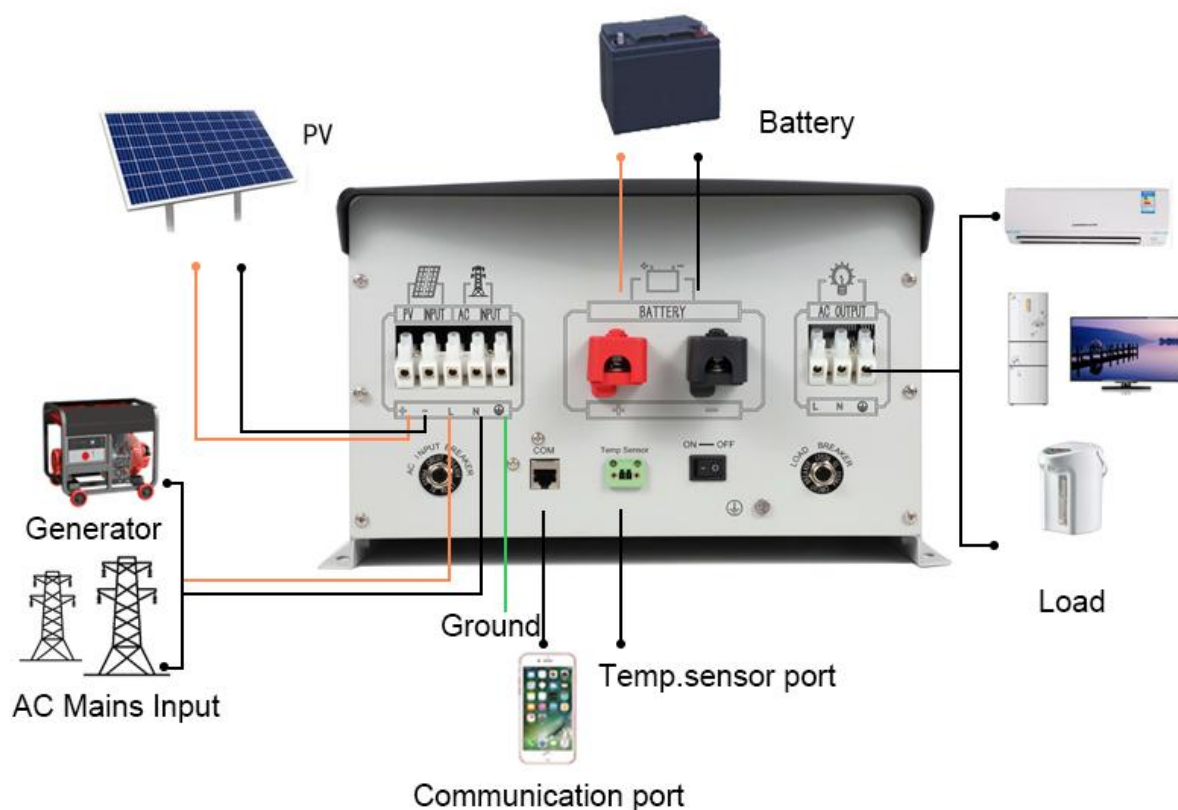


Figure 3-2 I wiring diagram

Explain: Monitoring background support PC upper computer, support WIFI module, GPRS module and Ethernet expansion to achieve APP cloud monitoring (optional), see PC upper computer and APP instructions;

One machine default lead-acid battery, if connected to other types of batteries need to carry out the corresponding battery type and series set, see the PC upper computer or APP instructions related to the settings;



Warning!

Electric shock is dangerous! No bare-hand contact with high-voltage photovoltaic modules, municipal live parts;

2. please ensure that the solar array voltage in the system does not exceed the maximum photovoltaic input voltage range of the integrated machine;

3. load output should not exceed the maximum power of the machine;

Step 3: Check the connection

Check that all wiring polarity is correct and terminals are locked;

IV. Operational instructions

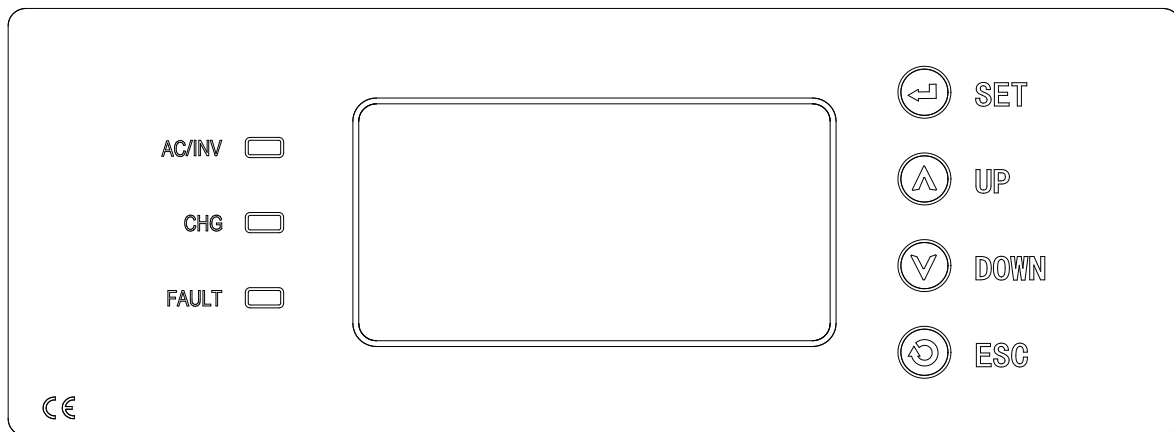


Figure 4-1 Display Panel Picture

4.1 Indicator Function

The LED indicator lights on the display panel are fault lights FAULT (red), charge indicator lights CHG (yellow), load indicator lights AC/INV (green), and their functions are defined as shown in the table below.

Table 4-1 Indicator Definition

Serial number	Indicator	State	Definition	Remarks
1	Failure indicator (red)	Light off	Normal operation, no malfunction	
2		Always bright	Failure incidents	
3	Charge indicator (yellow)	Light off	No charge	
4		Always bright	The battery is charging	
5	Output indicator (green)	Always bright	Output normal	
6		Light off	Turn off output	

4.2 Key

Table 4-2 Key function

Press button	Function	Remarks
SET	Function 1: main menu key, function 2: parameter setting	

	save key;	
UP	Function 1: display parameters up page, function 2: parameter settings plus;	
DOWN	Function 1: display parameters down page, function 2: parameter setting minus;	
ESC	Exit Settings interface	
Note: restore factory settings: under the main interface, press the DOWN, and then press the SET button, both press about 10s at the same time.		

4.3 LCD Display

The display of the integrated machine adopts the segment code screen display mode, and the layout diagram of the display screen is as follows:

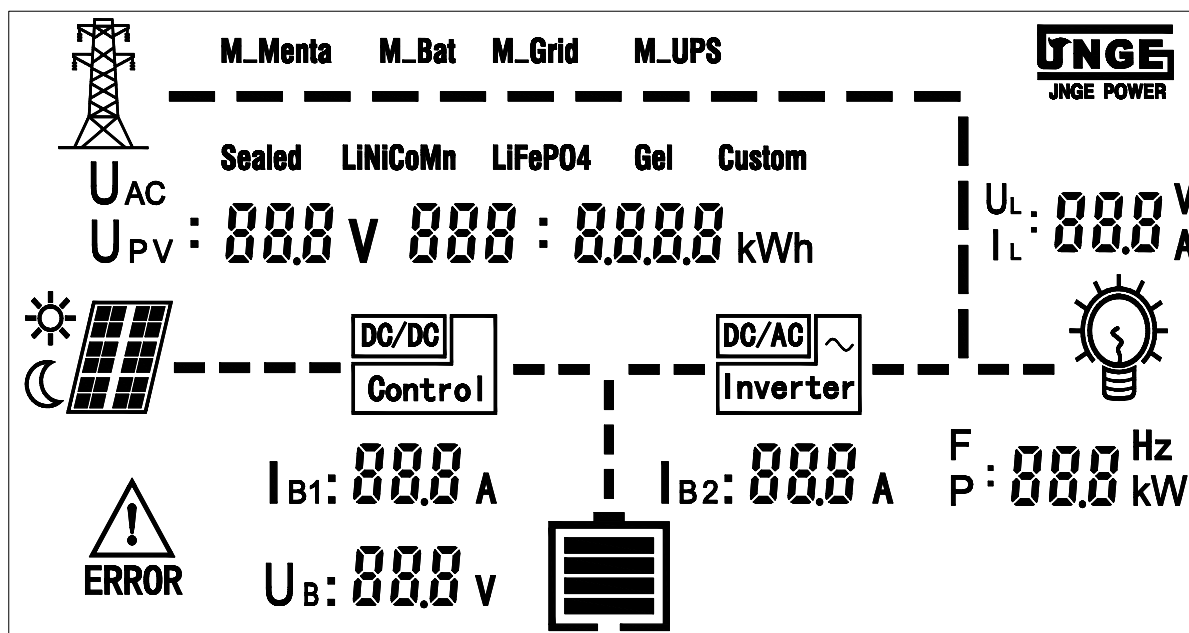







Figure 4-2 Layout Chart

Table 4-3 Features

Name of icon	Definition	Function Description
	Day	The icon indicates day.
	Night	The icon indicates night.
	PV panels	The icon lights up to indicate that PV array is connected.
	Battery power	The icon lights up to indicate battery is connected as well as battery power.
	Load icon	Load lights up to indicate load output.






	Status icon	The icon lights up and scrolls to indicate charging and discharging states respectively.
	Fault icon	The icon flashes to indicate a system failure.
	Grid icon	Actual AC mains grid voltage higher than or equal to the AC mains grid undervoltage point display tower sign
	Controller icon	Icon lights on to indicate controller operation.
	Inverter icon	Icon lights on to indicate inverter operation.

Table 4-4 Functional description of the field

Field name	Definition	Function Description
UAC	Electricity voltage	Light on, displays the current voltage in the data display area;
UPV	PV panel voltage	Light on, displays the current PV voltage in the data display area;
UL	Load voltage	Light on, displays the current inverter voltage in the data display area;
IL	Load current	Light on, displays the current inverter current in the data display area;
IB1	PV charging current	Light on, displays the current photovoltaic charging current in the data display area;
IB2	Inverter current/current charge	Light on, displays the current charging current in the data display area;
UB	Battery voltage	Light on, displays the current battery voltage in the data display area;
F	Load frequency	Light on, displays the current inverter frequency in the data display area;
P	Load power	Light on, displays the current inverter power in the data display area;
ERROR	Alarm Instructions	Light on, when there is a fault;
M_Menta	Smart Mode	Light on, indicating that the machine is currently in intelligent mode;
M_Bat	Battery priority mode	Light on, indicating that the machine is currently work with battery priority mode;
M_Grid	AC Mains Power priority mode	Light on, indicating that the machine is currently work with AC mains priority mode;
M_UPS	UPS mode	Light on, indicating that the machine is currently in UPS mode;
Sealed	Lead acid batteries	Light on, indicating that the battery type is lead acid type;
LiNiCoMn	Lithium ternary	Light on, indicating that the battery type is a ternary lithium battery;
LiFePO4	Lithium iron phosphate	Light on, indicating that the battery type is lithium iron phosphate battery;
Gel	Gel batteries	Light on, indicating that the battery type is a colloidal battery;
Custom	Custom customization	Light on, indicating that the number of batteries can be set according to the actual number of batteries series.

4.4 Working mode

1. Smart Mode

a、 When the battery voltage is higher than inverter start voltage, load will be powered by battery. If choose built-in solar controller, when the PV generation power is higher than the load power, loads will be completely supplied by the PV, and the excess energy is used to charge the battery. When the PV generation power is less than the load power, loads will be powered by both PV and battery.

b、 When the battery voltage is less than the inverter turn-off voltage, and the AC input is normal, the machine will be converted to the AC mains supply load mode. When the solar controller is built in, the battery will be charged by PV and the load does not consume PV and battery energy.

2. Battery priority mode

a、 When the battery is fully charged, even if the mains input is normal, the machine will switch to battery power supply, and the battery will supply power to the load. If it has built-in solar controller, when the PV generation power is higher than the load power, it is completely supplied by the PV to the load, and the excess energy is used to charge the battery. When the PV generation power is less than the load power, the insufficient part is supplemented by the battery, and both the PV and battery will supply the load.

b、 When the battery voltage is low and the AC mains power input is normal, the machine will be converted to AC mains power supply. When the solar controller is built in, the battery will be charged by PV and the load does not consume PV and battery energy.

3. AC mains priority mode

a. When the AC mains power is normal (within the machine's mains input voltage range), the AC mains output stable AC power for the load (the load does not consume PV and battery energy);

b. When the AC mains power is abnormal (the AC mains power exceeds the working range of the machine or the AC mains power is interrupted), the machine will switch to battery inverter to supply power to the load. If the built-in solar controller, when the PV generation power is greater than the load power, it is completely supplied by the PV to the load, and the excess energy is used to charge the battery; when the PV generation power is less than the load power, the insufficient part is supplemented by the battery, and the PV and the battery supply power to the load.

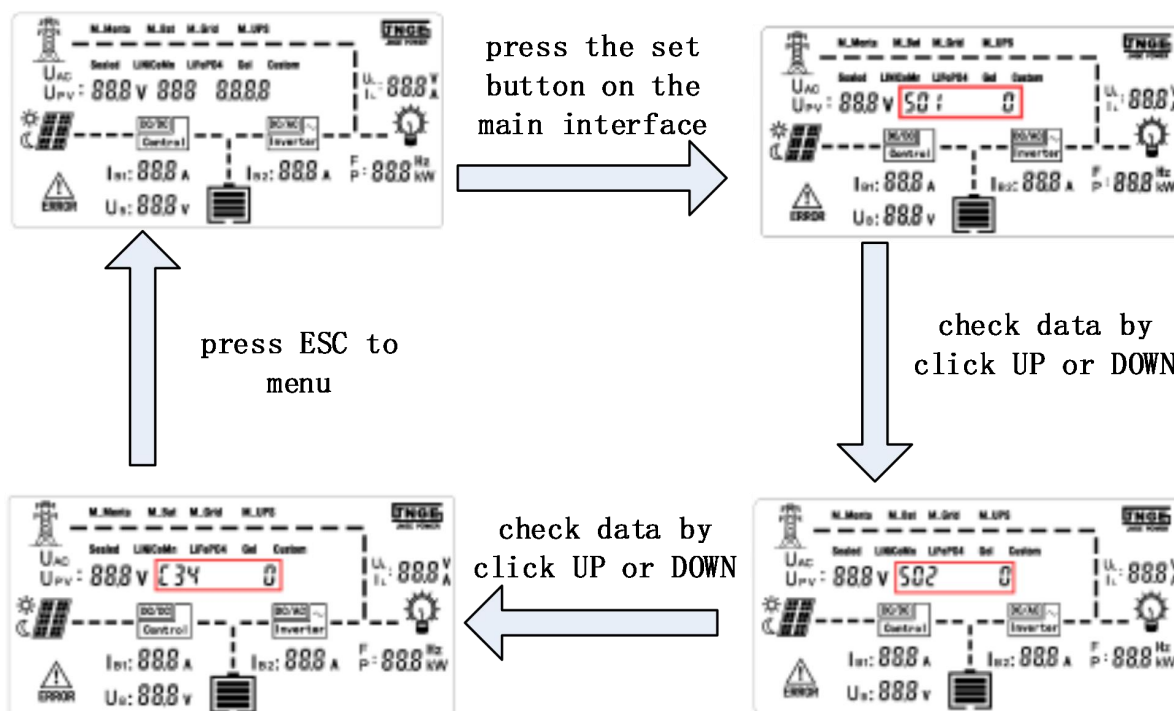
4. Energy saving mode

a. The machine works in battery mode (it is invalid in AC mains mode). When the load power is less than 50VA, the machine inverter will start and stop regularly to save battery energy (that is, the machine will intermittently interrupt the inverter Output); when the load power is higher than 50VA, the machine inverter will always work in the inverter state (that is, the machine will not interrupt the inverter output intermittently).

4.5 General parameter settings

4.5.1. Parameter type setting interface:

Press the settings (set) button in the main menu interface, will appear S01 enter the parameter type setting interface, and then press (UP or DOWN) key to look at other parameter type setting interface, S02→S03→S04→. Press (ESC) button to return to main menu interface in any parameter type setting interface;



4-3: Parameter type settings

Table 4-5 Introduction to Break Code

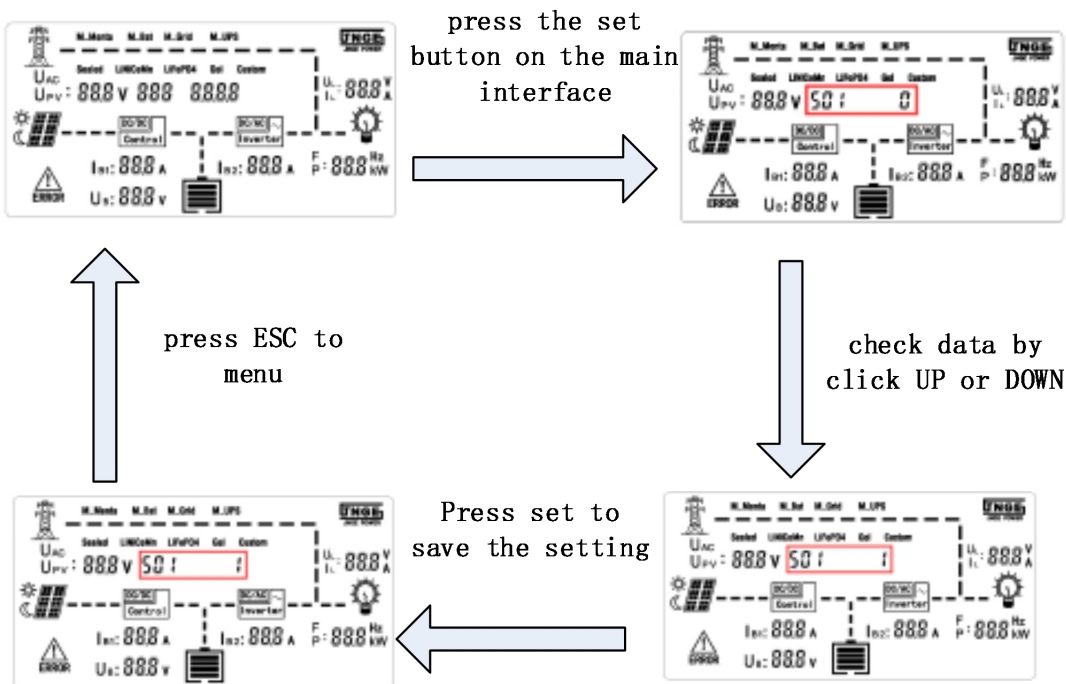
Display codes	Content implications	Display codes	Content implications
S01	Work model	S02	Inverter Switchgear
S03	PV Charger Switching Machine	N04	Equipment Modbus address
N05	Bypass voltage undervoltage protection point	N06	Bypass voltage undervoltage recovery point
N07	Bypass voltage overvoltage protection point	N08	Bypass voltage overvoltage recovery point
N09	Inverter open voltage point	N10	Inverter Turnoff Voltage Point
N11	Energy Saving Mode Opening Point	N12	Energy saving mode shutdown
N13	Inverter frequency	N14	Inverting voltage
N15	Inverter K coefficient	N16	Overvoltage Point
N17	Inverting Over current Point	N18	Inverter rated current
N19	Inverter Overload Protection Point 1	N20	Inverter Overload Protection Point 2
N21	Inverter Overload Protection Point 3	C22	Overvoltage voltage
C23	Charge Limit Voltage	C24	Overvoltage Recovery Voltage
C25	Boost charging voltage	C26	Upcharge Return Voltage
C27	Floating Charge Voltage	C28	Over discharge voltage
C29	Under voltage recovery voltage	C30	Battery undervoltage
C31	Boost charging time	C32	Rated charging current rating
C33	Battery string	C34	Battery type

Table 4-6 Introduction to Function Setting Interface

Interface	Content description	Remarks
S01 work model	0: Smart Mode 1: Battery Priority Mode 2: AC power priority mode 3: Energy saving mode	
S02 inverter switch machine	0: Inverter shutdown ; 1: Inverter turn on	
S03 PV charger switch machine	0: PV charging shutdown 1: PV charging turn on	
N13 inverter frequency	0: 50HZ; 1: 60HZ	
C34 battery type	0: lead acid battery 1: Gel battery 2: ternary lithium battery 3: lithium iron phosphate 4: customized;	

4.5.2 parameter setting:

Press the set (set) button in standby mode, enter the parameter type setting interface, then press the (SET) button to enter the corresponding type of parameter value modification interface, press (UP or DOWN) button to modify, After modification, press (SET) button to save;



4-4: Introduction to parameter settings

Other general parameter settings are the same as working mode settings;

4.5.3, Machine connection with PC computer or APP (WIFI or GPRS mode) setting method, please refer to the corresponding upper computer manual and the corresponding manual;





















Note

PC upper computer or APP (WiFi or GPRS mode) are for optional, inverter has single communication which can only one them as communication, and cannot combined.

V Fault and Maintenance

5.1 Fault warning instructions

Fault code	Failure events	Fault phenomenon
E25	Zero Point of Inverter Current	 red light, flashing with E25 icon, buzzer activated
E26	Negative voltage zero	 red light, flashing with E26 icon, buzzer activated
E27	Zero anomaly of load voltage	 red light, flashing with E27 icon, buzzer activated
E28	Zero anomaly of grid voltage	 red light, flashing with E28 icon, buzzer activated
E00	Battery overload	 red light, flashing with E00 icon, buzzer activated
E10	Battery undervoltage	 red light, flashing with E10 icon, buzzer activated
E09	Inverter output soft start fault	 red light, flashing with E09 icon, buzzer activated
E04	Inverter Output Soft Overpass	 red light, flashing with E04 icon, buzzer activated
E11	Inverter output soft overload	 red light, flashing with E11 icon, buzzer activated
E05	Overheating of inverter radiator	 red light, flashing with E05 icon, buzzer activated
E07	Inverter output overload	 red light, flashing with E07 icon, buzzer activated
E15	Transformer overheating	 red light, flashing with E15 icon, buzzer activated
E14	Failure of inverter radiator temperature sensor	 red light, flashing with E14 icon, buzzer activated

E08	Memory read-write failures	 ERROR red light, flashing with E08 icon, buzzer activated
E34	PV input overvoltage	 ERROR red light, flashing with E34 icon, buzzer activated
E38	Charging overcurrent	 ERROR red light, flashing with E38 icon, buzzer activated
E37	Overtemperature inside controller	 ERROR red light, flashing with E37 icon, buzzer activated
E44	Charger NTC abnormal	 ERROR red light, flashing with E44 icon, buzzer activated

5.2 System maintenance

In order to maintain the best long-term performance, it is recommended to conduct the following checks twice a year.

- (1) Make sure the integrated machine is securely installed in a clean, dry environment.
- (2) Make sure the airflow around the controller is not blocked and remove any dirt or debris from the radiator.
- (3) Check that all exposed wires are damaged by sun exposure, friction with other objects around them, decay, insect or rodent damage, etc. Please be sure to repair or replace the wire.
- (4) Tighten the screws of all electrical connection terminals as recommended.
- (5) Check the grounding of all parts of the system and verify that all grounding conductors are firmly and correctly grounded.
- (6) Check all wiring terminals to see if there are corrosion, insulation damage, high temperature or burning, discoloration signs, tighten terminal screws.
- (7) Check for dirt, nesting insects and corrosion and clean as required.
- (8) If the arrester has failed, replace the failed arrester in time to prevent lightning damage to the integrated machine and even other equipment.



Note: Electric shock is dangerous!

The above operation must ensure that all power supply has been disconnected, and then the corresponding inspection or operation!

VI. Warranty commitments

This machine has a 1-year free warranty period from the date of sale.

Maintenance procedures: before requiring maintenance, check the user's manual to determine that there is a problem with the integrated machine. If it can not be resolved, please contact the sales to deliver the defective integrated machine back to our company, freight prepaid, and provide date and location information related to the purchase. In order to enjoy the quick repair guarantee service, the returned product must indicate the model and the detailed cause of the failure, as well as the type of components in the system and related parameters, battery and system load. This information is very important to quickly solve your maintenance requirements.

If due to customer reasons improper use or not in accordance with this manual to operate, and cause damage to the integrated machine, the company is not responsible! Maintenance procedures refer to the above procedures, only charged maintenance costs.

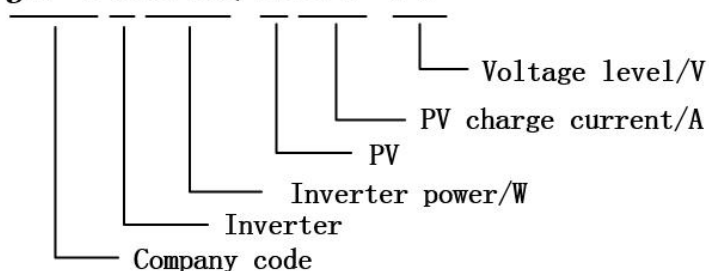
Statement: the company reserves the right to change products, product updates without prior notice!

Version number: V1.0

VII. Equipment parameters

7.1、Machine Model Description:

Machine Naming Method: JN-FI5000/S100-96



7.2、Machine Parameter Tables

Inverter and controller all-in-one parameters																		
Parameter Name		JN-F parameter table (and adjustable range)																
Model		JN-FI1000/S50-*			JN-FI1500/S50-*		JN-FI2000/S50-*		JN-FI3000/S70-*		JN-FI4000/S100-*			JN-FI5000/S100-*			JN-FI6000/S100-*	
Battery voltage		12V	24V	48V	24V	48V	24V	48V	24V	48V	24V	48V	96V	24V	48V	96V	48V	96V
AC mains input	Maximum Charge current (The charging current is adjustable)	50A	25A	13A	38A	19A	50A	25A	75A	38A	100A	50A	25A	125A	63A	31A	75A	38A
	Electricity input voltage range	±10%~±15%																
	Power input frequency	45Hz~65 Hz																
Inverter output	Rated power	1000W			1500W		2000W		3000W		4000W			5000W			6000W	
	Wave	Pure sine wave																
	Output voltage	110VAC/115VAC/120VAC/220VAC/230VAC/240VAC ±5% (customizable)																

	range																	
	Output frequency	50HZ/60HZ																
	Maximum Inverter Efficiency	>92%																
Solar Charge Controller (Optional)	Max. charge current	50A			50A			50A		70A		100A			100A			100A
	PV max. input power	600 W	1200 W	2400 W	1200 W	2400 W	1200 W	2400 W	1680 W	3360 W	2400 W	4800 W	9600 W	2400 W	4800 W	9600 W	4800 W	9600 W
	PV Open circuit voltage range	20V~100 V (12 V systems)																
		40V~145 V (24 V system)																
		80V~145 V (48 V system)																
		160V~240 V (96 V system)																
	MPPT efficiency	> 99.5%																
Charging mode		Three stages: constant current (fast charge), constant voltage, floating charge																
Battery type		Lead acid batteries, GEL batteries, Lithium iron phosphate, Lithium ternary, Customized.																
Display mode		LCD Color Screen																
Mode of communication		RS485、 PC monitoring, WIFI/GPRS module and Ethernet extension app for cloud monitoring																
Working environment		-25℃ ~+55℃																
Storage temperature		-30℃ ~+70℃																
Use altitude		Above 3000 m above sea level																
Equipment protection grade		IP21																
Humidity		10%~90%																
KG Net																		
Product size		385*267*179 mm							467*337*199 mm				554*372*229 mm					
KG gross																		
Packing size																		

7.3 Reference Table for Battery Parameters:

Lead acid and Gel batteries					
System rated voltage	12V system (1 string)	24V system (2 strings)	48V system (4 strings)	96V system (8 strings)	System rated voltage
Overcharge voltage	13 ~ 17V	26 ~ 34V	52 ~ 68V	104 ~ 136V	15.5V
Overcharge return	13 ~ 17V	26 ~ 34V	52 ~ 68V	104 ~ 136V	15V
Charging limite voltage	9 ~ 15V	18 ~ 30V	36 ~ 60V	72 ~ 120V	14.9V
Boost charge Voltage	9 ~ 15V	18 ~ 30V	36 ~ 60V	72 ~ 120V	14.4V
Boost charge return Voltage	9 ~ 15V	18 ~ 30V	36 ~ 60V	72 ~ 120V	13.9V
Float charging voltage	9 ~ 15V	18 ~ 30V	36 ~ 60V	72 ~ 120V	13.8V
Over discharge voltage	7 ~ 13V	14 ~ 26V	28 ~ 52V	56 ~ 104V	10.8V
Over discharge return voltage	9 ~ 15V	18 ~ 30V	36 ~ 60V	72 ~ 120V	13.1V
Lithium ternary (single section 3.7 V)					
System rated voltage	3 string range	6 string range	12 string range	24 string range	3 strings default
Overcharge voltage	10.5 ~ 15V	21 ~ 30V	49 ~ 70V	98 ~ 140V	13.5V
Overcharge return	10.5 ~ 15V	21 ~ 30V	49 ~ 70V	98 ~ 140V	12.6V
Charging limite voltage	10.5 ~ 15V	21 ~ 30V	49 ~ 70V	98 ~ 140V	12.6V
Boost charge Voltage	10.5 ~ 15V	21 ~ 30V	49 ~ 70V	98 ~ 140V	12.3V
Boost charge return Voltage	10.5 ~ 15V	21 ~ 30V	49 ~ 70V	98 ~ 140V	12V
Float charging voltage	10.5 ~ 15V	21 ~ 30V	49 ~ 70V	98 ~ 140V	12.3V
Over discharge voltage	6 ~ 13.5V	12 ~ 24V	28~56V	56~112V	9.3V
Over discharge return voltage	6 ~ 13.5V	12 ~ 27V	28 ~ 63V	56 ~ 126V	10.5V
Lithium iron phosphate (single section 3.2 V)					
System rated voltage	3 string range	6 string range	12 string range	24 string range	3 strings default
Overcharge voltage	9 ~ 12V	18 ~ 24V	42 ~ 56V	84 ~ 112V	11.7V
Overcharge return	9 ~ 12V	18 ~ 24V	42 ~ 56V	84 ~ 112V	11.1V
Charging limit voltage	9 ~ 12V	18 ~ 24V	42 ~ 56V	84 ~ 112V	11.1V

Boost charge Voltage	9 ~ 12V	18 ~ 24V	42 ~ 56V	84 ~ 112V	10.8V
Boost charge return Voltage	9 ~ 12V	18 ~ 24V	42 ~ 56V	84 ~ 112V	10.2V
Float charging voltage	9 ~ 12V	18 ~ 24V	42 ~ 56V	84 ~ 112V	10.8V
Over discharge voltage	6 ~ 9V	12 ~ 18V	28~42V	56~84V	8.4V
Over discharge return voltage	6 ~ 12V	12 ~ 24V	28 ~ 56V	56 ~ 112V	9.6V

IX. Safety Dimensions

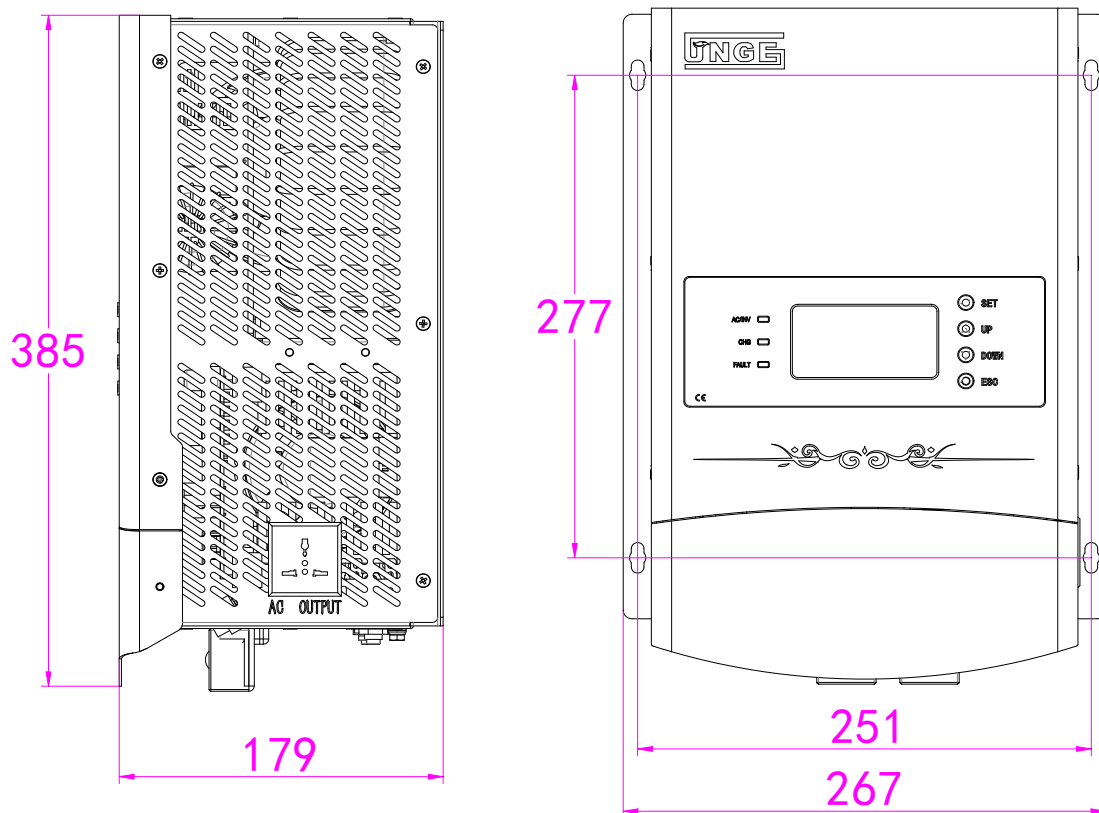


Figure 8-1 1000W ~1500 W installation dimensions

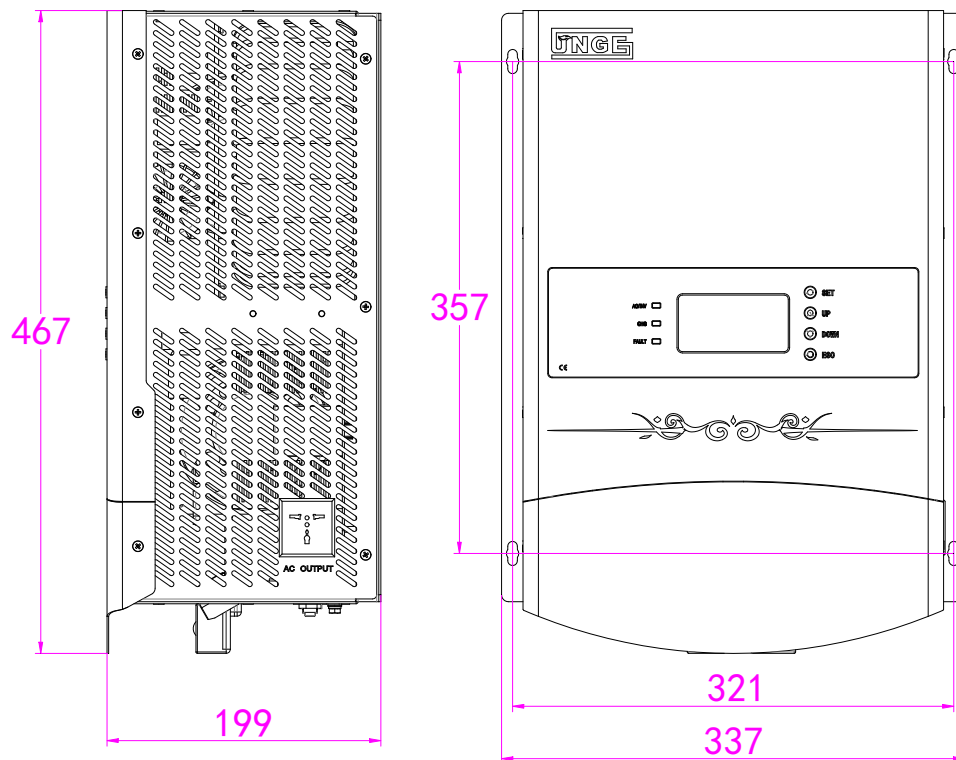


Figure 8-2 2000W ~3000 W integrated machine installation dimensions

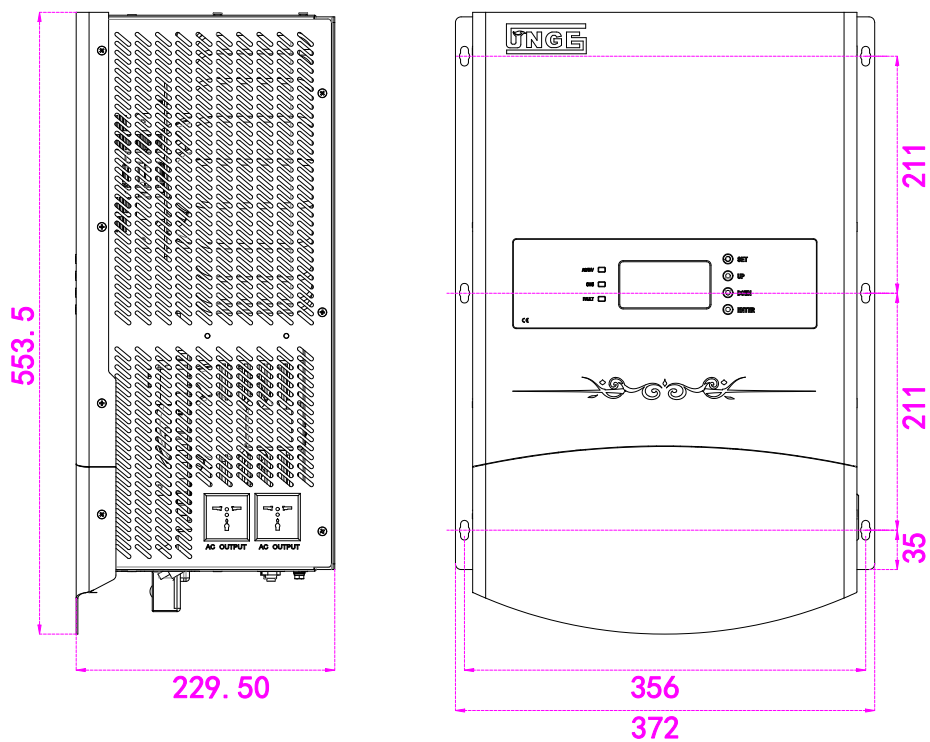


Figure 8-3 4000W ~6000 W integrated machine installation dimensions

9. Packing list and communication module accessories

Serial number	Name of name	Quantity	Remarks
1	Integrated	1	
2	Product Usage Manual	1	
3	External Battery Temp.Senser	1	Optional
4	PC CD	1	Communications optional
5	RJ45 to USB module	1	Communications optional
6	1.5 m special network	1	
7	Operation Manual of PC Monitoring Platform	1	
8	RJ45 to WIFI module	1	Communications optional
9	0.2 mm special network	1	
10	APP Operations Manual	1	
11	RJ45 to GPRS module	1	Communications optional
12	0.2 mm special network	1	
13	APP Operations Manual	1	