

Solar inverter

USER GUIDE

Solar inverter
(IVPS/IVPM Series)



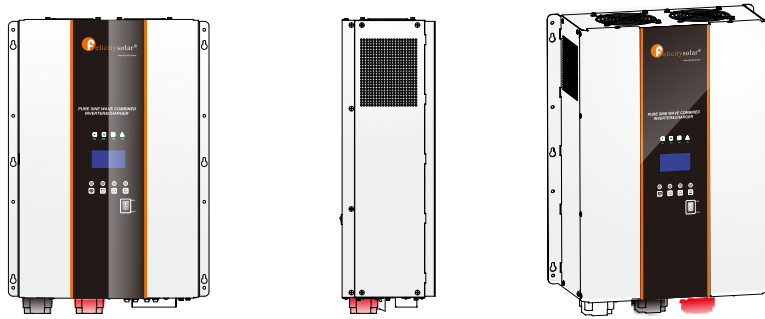
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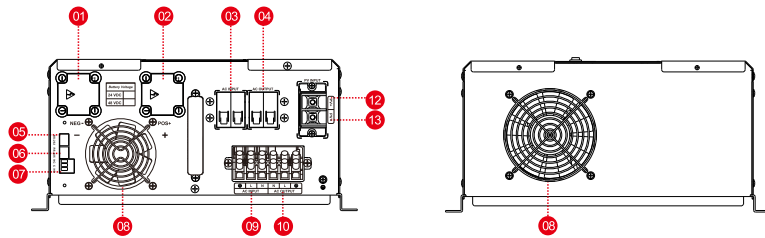
Advantage

- Bypass charging function: when the unit off, it can be activated with bypass output and can charge the battery.
- High charging current, the max charging current can be 200A for IVPM10048 and 180A for IVPM7548, 170A for IVPM5048 .
- Wide range of AC input voltage: the range of AC input voltage is 90-280V. It can be better compatible with generator working. It is rare to have wide range input voltage for the power frequency inverter.
- Electricity and battery priority is optional: customer can choose Electricity or battery priority according to their needs.
- Battery self-defined: customer can set the overcharge voltage and float voltage, and over-discharge voltage.
- 50/60HZ compatible
- Intelligent: Intelligent adjustment of over-discharge voltage, intelligent fine-tuning of over-discharge voltage according to the power of the load; intelligent cooling fan, intelligent adjustment of speed according to power and charging current and core temperature inside the machine
- Safety: Safety design is upgraded overall. Comprehensive protection, such as over-charge protection/over-discharge protection/overload protection/output short-circuit protection/over-temperature protection, etc. Among them, transformer over-temperature protection is a leading design in the industry
- Later it can communicate with our MPPT. And the electricity charging and solar charging can be managed comprehensively and scientifically.

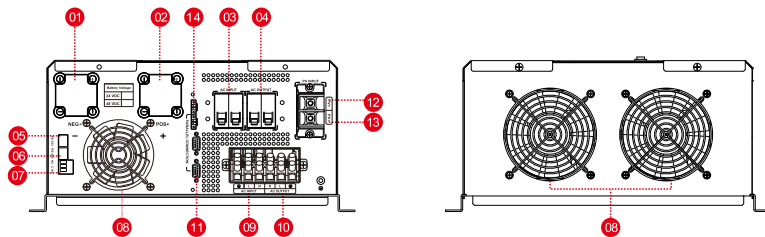
Product Overview



IVPM5048 / IVPM7548 TYPE

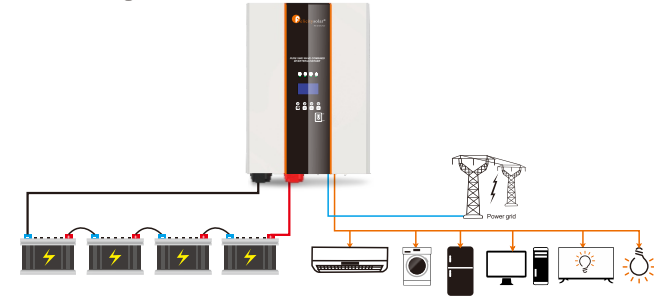


IVPM10048 TYPE



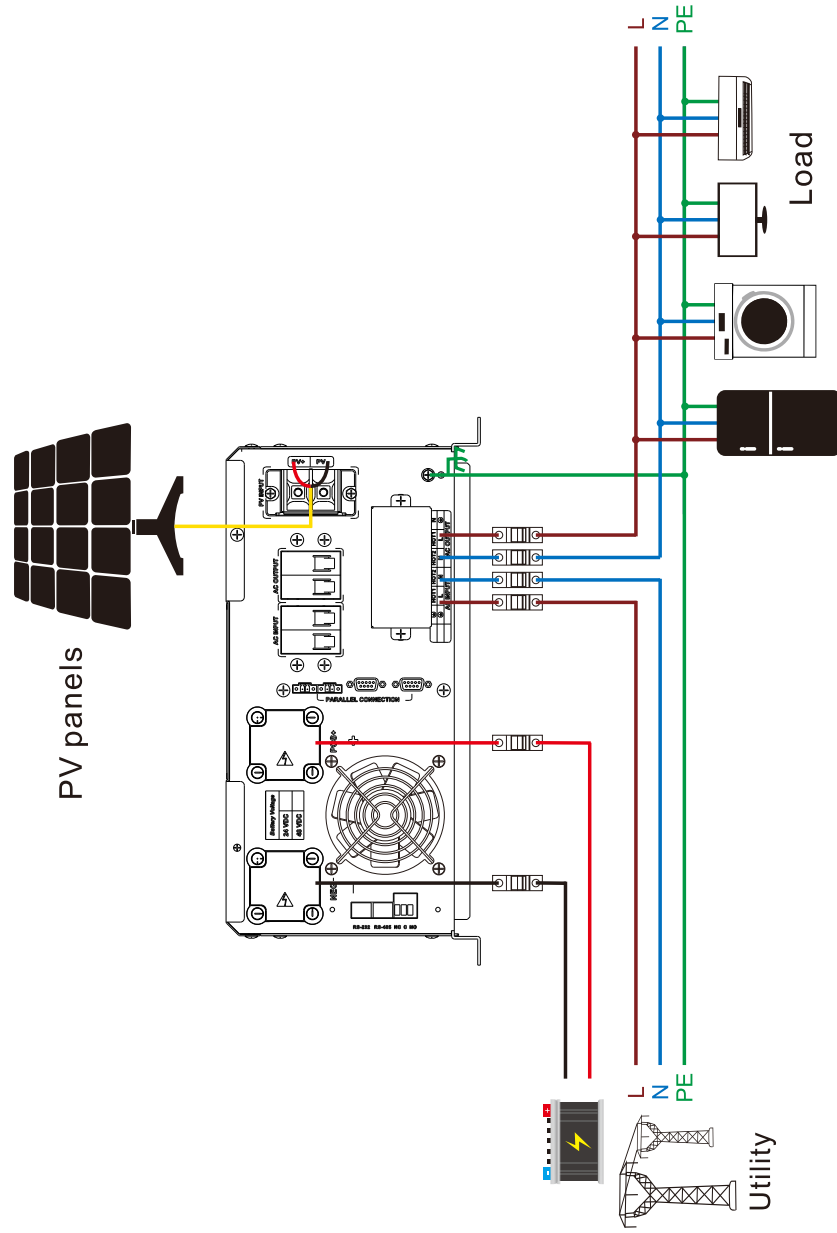
- | | |
|----------------------------------|------------------------------|
| 1. Battery negative terminal | 2. Battery positive terminal |
| 3. AC Input breaker | 4. AC Output breaker |
| 5. RS-232 | 6. RS-485 |
| 7. Dry contact port | 8. Fan |
| 9. AC Input terminal | 10. AC Output terminal |
| 11. Parallel connection terminal | 12. PV positive terminal |
| 13. PV negative terminal | 14. Current Sharing terminal |

Connection diagram

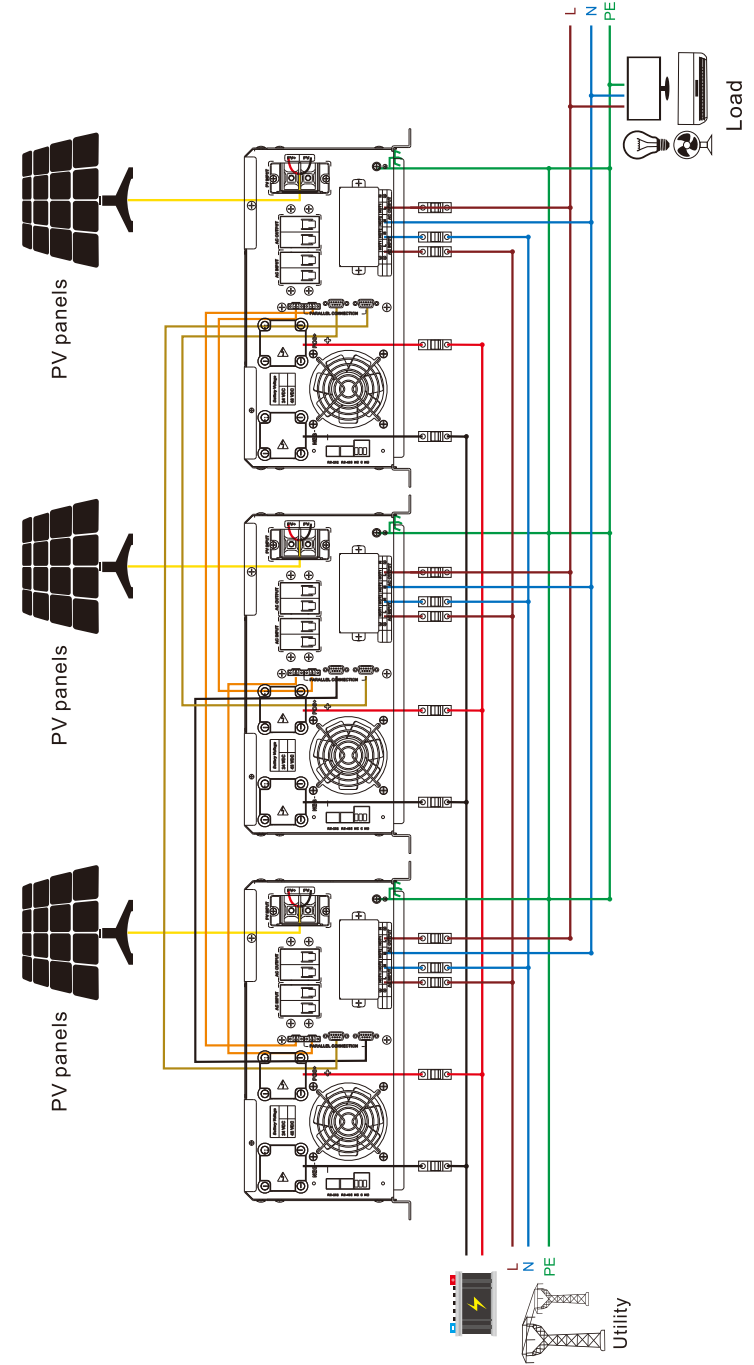


Wiring System for Inverter

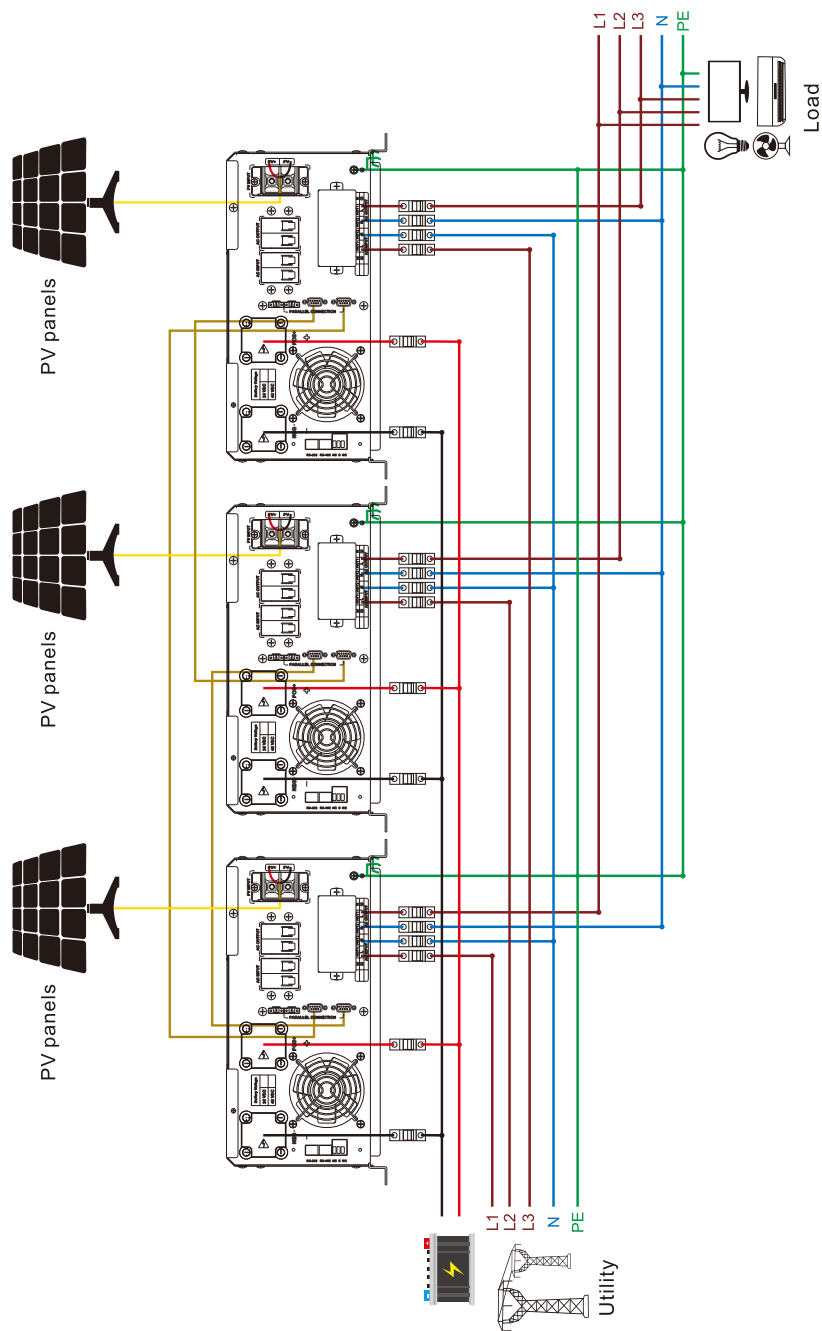
Single phase connection diagram for single unit.



Single Phase Parallel connection diagram for three inverters in parallel
(Only valid for 10048 model)



Three Phase Parallel connection diagram for three inverters in parallel.
(Only valid for 10048 models)



Parallel LCD Setting

Setting items

Program	Description	Selectable option	
28	AC output mode *This setting is only available when the inverter is in standby mode (Switch off).		When the units are used in parallel with single phase, please select "PAL" in program 28.
			It is required to have at least 3 inverters or maximum 6 inverters to support three-phase equipment. It's required to have at least one inverter in each phase or it's up to four inverters in one phase.
			Please select "3P1" in program 28 for the inverters connected to L1 phase, "3P2" in program 28 for the inverters connected to L2 phase and "3P3" in program 28 for the inverters connected to L3 phase.
			Be sure to connect share current cable to units which are on the same phase.
			Do NOT connect share current cable between units on different phases. Besides, power saving function will be automatically disabled

COMMISSIONING

Parallel in single phase

Step 1: Check the following requirements before commissioning:

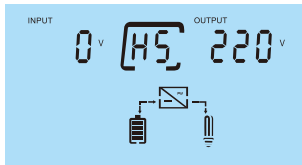
- Correct wire connection
- Ensure all breakers in Line wires of load side are open and each Neutral wires of each unit are connected together.

Step 2: Turn on each unit and set "PAL" in LCD setting program 28 of each unit. And then shut down all units.

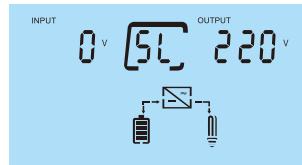
NOET: It's necessary to turn off switch when setting LCD program. Otherwise, the setting can not be programmed.

Step 3: Turn on each unit.

CD display in Master unit



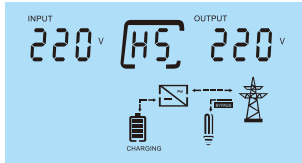
LCD display in Slave unit



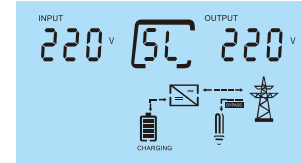
NOTE: Master and slave units are randomly defined.

Step 4: Switch on all AC breakers of Line wires in AC input. It's better to have all inverters connect to utility at the same time.

LCD display in Master unit



LCD display in Slave unit



Step 5: If there is no more fault alarm, the parallel system is completely installed.

Step 6: Please switch on all breakers of Line wires in load side. This system will start to provide power to the load.

10.2 Support three-phase equipment

Step 1: Check the following requirements before commissioning:

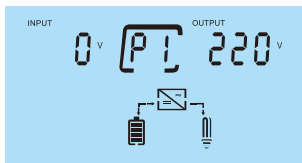
- Correct wire connection
- Ensure all breakers in Line wires of load side are open and each Neutral wires of each unit are connected together.

Step 2: Turn on all units and configure LCD program 28 as P1, P2 and P3 sequentially. And then shut down all units.

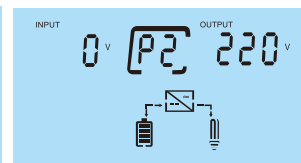
NOET: It's necessary to turn off switch when setting LCD program. Otherwise, the setting can not be programmed.

Step 3: Turn on all units sequentially.

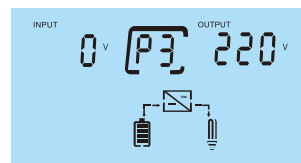
LCD display in L1-phase unit



LCD display in L2-phase unit

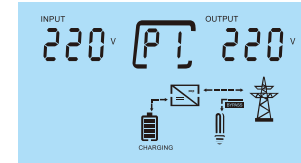


LCD display in L3-phase unit

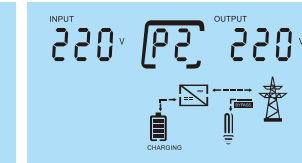


Step 4: Switch on all AC breakers of Line wires in AC input. If AC connection is detected and three phases are matched with unit setting, they will work normally.

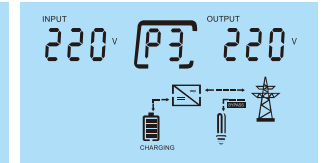
LCD display in L1-phase unit



LCD display in L2-phase unit



LCD display in L3-phase unit



Step 5: If there is no more fault alarm, the system to support 3-phase equipment is completely installed.

Step 6: Please switch on all breakers of Line wires in load side. This system will start to provide power to the load.

Note 1: To avoid overload occurring, before turning on breakers in load side, it's better to have whole system in operation first.

Note 2: Transfer time for this operation exists. Power interruption may happen to critical devices, which cannot bear transfer time.

Dry Contact Signal

There is one dry contact (3A/250VAC) available on the rear panel. It could be used to deliver signal to external device when battery voltage reaches warning level.

Unit Status	Condition		Dry contact port:	
			NC&C	NO&C
Power Off	Unit is off and no output is powered.		Close	Open
Power On	Output is powered from Battery or Solar.	Program 18 set as Utility	Battery voltage < Low DC warning voltage.	Open
			Battery voltage > battery charging reaches floating stage.	Close
		Program 18 is set as BAT or Solar first	Battery voltage < Setting value in Program 19.	Open
			Battery voltage > Setting value in Program 20 or battery charging reaches floating stage.	Close

Specifications (IVPS Series)

Line Mode Specifications				
Model	IVPS3524	IVPS5048	IVPS7548	IVPS10048
Rated Output Power(VA)	3500VA	5000VA	7500VA	10000VA
Rated Output Power(W)	2800W	4000W	6000W	8000W
Nominal DC Input Voltage	24V	48V		
Input Voltage Waveform	Sinusoidal(Utility or generator)			
Nominal Input Voltage	220Vac			
Low Line Disconnect	170±7Vac(UPS) 90±7Vac(APL)			
Low Line Re-connectAC Input Range	180±7Vac(UPS) 100±7Vac(APL)			
High Line Disconnect	280±7Vac			
High Line Re-connect	270±7Vac			
Max AC Input Voltage	280Vrms			
Nominal Input Frequency	50Hz/60Hz			
Low Line Frequency Disconnect	40±1Hz			
Low Line Frequency Re-connect	42±1Hz			
High Line Frequency Disconnect	65±1Hz			
High Line Frequency Re-connect	63±1Hz			
Output Voltage Waveform	As same as input waveform			
Over-Load Protection(SMPS load)	AC 30A	Air switch protection		
Output Short Circuit Protection	AC 30A	Air switch protection		
Efficiency(Line mode)	≥95% (Rated R load, and battery is fully charged)			
Transfer Time (AC to DC)	15ms (typical)			
Transfer Time (DC to AC)	15ms (typical)			
Pass Through Without Battery	No			
Max Bypass Overload Current	AC 30A	AC 63A		
Utility Charge Mode Specifications				
Nominal Input Voltage	220Vac			
Input Voltage Range	90~280Vac			
Nominal Output Voltage	Dependent on battery type			
Max Charge Current	40A	50A	60A	80A
Charge Current Regulation	0A~40A	0A~50A	0A~60A	0A~80A
Battery Initial Voltage	Circuit breaker			
Charger Short Circuit	AC 30A	AC 63A		
Breaker Size	Dependent on battery type or Self-defined			
Over Charge Protection	Yes			

Charge Algorithm				
Charging way	Three phases: Boost CC (constant current level) → boost CV (constant voltage level) →Float (constant pressure level)			
Charge Stage Transition Definitions	(1)Boost CC Stage: If A/C input is applied, the charger will run at full current in CC mode until the charger reaches the boost voltage. (2)Boost CV Stage: the charger will keep the boost voltage in Boost CV mode until the T1 timer has run out. Then drop the voltage down to the float voltage, when the charging current is lower than 20% setting value. (3)Float Stage: In float mode, the voltage will stay at the float voltage. If the A/C is reconnected or the battery voltage drops below 24Vdc/48Vdc, the charger will reset the cycle above. 			
Battery Type Setting	Battery Type	Boost CC, CV		Float
		24V / 48V		24V / 48V
	AGM	28.8V / 57.6V		27.2V / 54.4V
	Flooded	29.2V / 58.4V		27.6V / 55.2V
	Self Defined	Adjustable, up to 31.5V/61.0V		
Inverter Mode Specifications				
Model	IVPS3524	IVPS5048	IVPS7548	IVPS10048
Output Voltage Waveform	Pure sine wave			
Nominal Output Voltage	220Vac±5%			
Nominal Output Frequency(Hz)	50±0.3Hz/60Hz±0.3Hz (Adjustable)			
Output Voltage Regulation	±5%rms			
Peak Efficiency	90%			
Over-Load Protection (SMPS load)	5s@≥150% load; 10s@105%~150% load			
Surge rating	2* rated power for 5 seconds			
Capable of Starting Electric	Yes			
Output Short Circuit Protection	Yes			
Cold Start Voltage	23V/46V			
Low Battery Alarm	Load < 50% , 23V/46V / Load ≥ 50% , 22V/44V			
Low Battery Recovery	Load < 50% , 23.5V/47V / Load ≥ 50% , 23V/46V			
Low DC Input Shut-down	Load < 50% , 21.5V/43V / Load ≥ 50% , 21V/42V			
High DC Input Alarm & Fault	31.5V±0.4V/63V±0.4V			
High DC Input Recovery	31.0V±0.4V/62V±0.4V			
General Specifications				
Operating temperature	0°C~40°C			
Storage temperature	-15°C~60°C			
Package Dimension	552x408x290mm	552x408x295mm	607x540x290mm	670x470x355mm

Specifications (IVPM Series)

Line Mode Specifications			
Model	IVPM5048	IVPM7548	IVPM10048
Rated Output Power(VA)	5000VA	7500VA	10000VA
Rated Output Power(W)	4000W	6000W	8000W
Nominal DC Input Voltage	48V		
Input Voltage Waveform	Sinusoidal(Utility or generator)		
Nominal Input Voltage	220Vac		
Low Line Disconnect	170±7Vac(UPS) 90±7Vac(APL)		
Low Line Re-connectAC Input Range	180±7Vac(UPS) 100±7Vac(APL)		
High Line Disconnect	280±7Vac		
High Line Re-connect	270±7Vac		
Max AC Input Voltage	280Vrms		
Nominal Input Frequency	50Hz/60Hz		
Low Line Frequency Disconnect	40±1Hz		
Low Line Frequency Re-connect	42±1Hz		
High Line Frequency Disconnect	65±1Hz		
High Line Frequency Re-connect	63±1Hz		
Output Voltage Waveform	As same as input waveform		
Over-Load Protection(SMPS load)	Air switch protection		
Output Short Circuit Protection	Air switch protection		
Efficiency(Line mode)	≥95% (Rated R load, and battery is fully charged)		
Transfer Time (AC to DC)	15ms (typical)		
Transfer Time (DC to AC)	15ms (typical)		
Pass Through Without Battery	No		
Max Bypass Overload Current	AC 63A		
Utility Charge Mode Specifications			
Nominal Input Voltage	220Vac		
Input Voltage Range	90~280Vac		
Nominal Output Voltage	Dependent on battery type		
Max Charge Current	50A	60A	80A
Charge Current Regulation	0A~50A	0A~60A	0A~80A
Battery Initial Voltage	Circuit breaker		
Charger Short Circuit	AC 63A		
Breaker Size	Dependent on battery type or Self-defined		
Over Charge Protection	Yes		
Solar Charging & Utility Charging(MPPT built-in controller is optional)			
Max PV Open Circuit Voltage	170Vdc	170Vdc	170Vdc
PV Array MPPT Voltage Range	65~145Vdc	65~145Vdc	65~145Vdc
Max Input Power	6600W	6600W	6600W
Max Solar Charging Current	120A	120A	120A
Max Charging current(Utility + Solar)	170A	180A	200A

Charge Algorithm

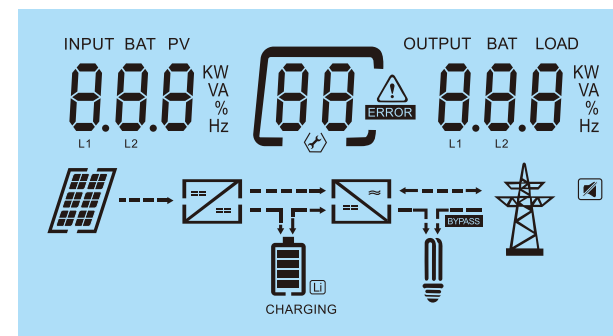
Charging way	Three phases: Boost CC (constant current level) → boost CV (constant voltage level) →Float (constant pressure level)		
Charge Stage Transition Definitions	(1)Boost CC Stage: If A/C input is applied, the charger will run at full current in CC mode until the charger reaches the boost voltage. (2)Boost CV Stage: the charger will keep the boost voltage in Boost CV mode until the T1 timer has run out. Then drop the voltage down to the float voltage, when the charging current is lower than 20% setting value. (3)Float Stage: In float mode, the voltage will stay at the float voltage. If the A/C is reconnected or the battery voltage drops below 24Vdc/48Vdc, the charger will reset the cycle above. 		
Battery Type Setting	Battery Type	Boost CC, CV	Float
		24V / 48V	24V / 48V
	AGM	28.8V / 57.6V	27.2V / 54.4V
	Flooded	29.2V / 58.4V	27.6V / 55.2V
	Self Defined	Adjustable, up to 31.5V/61.0V	
Inverter Mode Specifications			
Model	IVPM5048	IVPM7548	IVPM10048
Output Voltage Waveform	Pure sine wave		
Nominal Output Voltage	220Vac±5%		
Nominal Output Frequency(Hz)	50±0.3Hz/60Hz±0.3Hz (Adjustable)		
Output Voltage Regulation	±5%rms		
Peak Efficiency	90%		
Over-Load Protection (SMPS load)	5s@≥150% load; 10s@105%~150% load		
Surge rating	2* rated power for 5 seconds		
Capable of Starting Electric	Yes		
Output Short Circuit Protection	Yes		
Cold Start Voltage	23V/46V		
Low Battery Alarm	Load < 50% , 23V/46V / Load ≥ 50% , 22V/44V		
Low Battery Recovery	Load < 50% , 23.5V/47V / Load ≥ 50% , 23V/46V		
Low DC Input Shut-down	Load < 50% , 21.5V/43V / Load ≥ 50% , 21V/42V		
High DC Input Alarm & Fault	31.5V±0.4V/63V±0.4V		
High DC Input Recovery	31.0V±0.4V/62V±0.4V		
General Specifications			
Operating temperature	0°C~40°C		
Storage temperature	-15°C~60°C		
Package Dimension	607x540x290mm		670x470x355mm

Front Panel



Function Key	Description
ESC	To exit setting mode
UP	To go to previous selection
DOWN	To go to next selection
ENTER	To confirm the selection in setting mode or enter setting mode
Indicator light instruction	
LCD backlight	Setting the control of LCD backlight enable, LCD backlight will always-on. Setting the control of LCD backlight disable, have no operation the LCD backlight will go out after 60s.
Fault LED light	If inverter in fault event, the red light will always-on. If inverter in warning event, the red light will flash. Inverter work normally, red light go out.
Battery LED light	Charging the battery, the battery light flash. If battery is full, battery light will always-on. The battery is not charged, the battery light will go out.
City electricity LED light	City electricity is normal, the LINE light will always-on. No city electricity, the LINE light will go out.
Inverter LED light	Battery discharging, inverter light will always-on. Battery not discharging, inverter light will go out.
Buzzer beep	Turn on/off the inverter, the buzzer will last for 2.5s. Press any button, the buzzer will last for 0.1s. Hold on the ENTER button, the buzzer will last for 3s. If in fault event, the buzzer will keep going. If in warning event, the buzzer will beep discontinuous.

LCD Display Icons



Icon	Function description
Input Source Information	
INPUT	Indicates the AC input.
INPUT 	Indicate input voltage, input frequency, battery voltage.
Configuration Program and Fault Information	
	Indicates the setting programs.
	Indicates the warning and fault codes. Warning: flashing with warning code. Fault: lighting with fault code
Output Information	
OUTPUT BAT LOAD 	Indicate output voltage, output frequency, load percent, load in VA, load in Watt.
Battery Information	
	Indicates battery level by 0-24%, 25-49%, 50-74% and 75-100%. The Li icon represents a lithium battery.

In battery mode, it will present battery capacity.

Load Percentage	Battery Voltage	LCD Display
Load >50%	< 11.1V/PCS	
	11.1~ 11.6V/PCS	
	11.6V ~ 12.1V/PCS	
	> 12.1V/PCS	
Load < 50%	< 11.3V/PCS	
	11.3 ~ 11.8V/PCS	
	11.8 ~ 12.3V/PCS	
	> 12.3V/PCS	
Mode Operation Information		
	Indicates the utility.	
BYPASS	Indicates load is supplied by utility directly.	
	Indicates the inverter / charger is working.	
Mute Operation		
	The alarm is disabled.	

LCD Setting

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

Setting items

Program	Description	Selectable option	
00	Exit setting	00	ESC
02	Output frequency setting	50Hz(default) OPF 02 50 Hz	Output frequency configuration
		output frequency is 60Hz OPF 02 60 Hz	
03	Utility input range setting	Appliance mode(default) AC 03 APL	APL should be selected, when the utility is not well.
		UPS mode AC 03 UPS	
05	Battery type setting	The battery type is self-define(default) bAt 05 USE	If "Self-defined" is selected, battery charge voltage and low DC cut-off voltage can be set up in program 07, 08 and 11.
		The battery type is Flooded bAt 05 FLd	
		The battery type is AGM bAt 05 AGn	
		The battery type is LiB bAt 05 LiB	
06	Max utility charging current setting	20A (default) CHC 06 20 A	3500VA: Setting range is from 0 to 40A 5000VA: Setting range is from 0 to 50A 7500VA: Setting range is from 0 to 60A 10000VA: Setting range is from 0 to 80A

Setting items

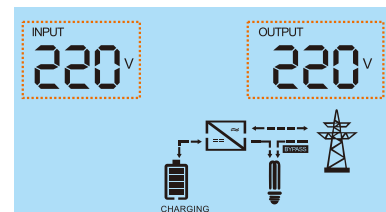
Program	Description	Selectable option	
07	Bulk charging voltage setting (C.V voltage)	48V model(57.6V default) CU 07 57.6V	If self-defined is selected in program 05, this program is enable. Setting range is from 48.0V to 61.0V. Increment of each click is 0.1V.
		24V model(28.8V default) CU 07 28.8V	If self-defined is selected in program 05, this program is enable. Setting range is from 25.0V to 31.5V. Increment of each click is 0.1V.
08	Floating charging voltage	48V model(54.4V default) FLU 08 54.4V	If self-defined is selected in program 5, this program is enable. Setting range is from 48.0V to 61.0V. Increment of each click is 0.1V.
		24V model(27.2V default) FLU 08 27.2V	If self-defined is selected in program 5, this program is enable. Setting range is from 25.0V to 31.5V. Increment of each click is 0.1V.
09	Charger priority.	If inverter is working in utility mode, charge priority can be set as below. However, when inverter is working in Battery mode, only PV can charge battery.	
		PV first CHS 09 PU	PV will charge battery first. Utility will charge battery only when PV is unavailable.
		PV and Utility (default) CHS 09 PAU	PV and utility will charge battery together.
		PV Only CHS 09 PU0	Only PV can charge the battery.
10	Max charging current (Max charging current = utility charging current + PV charging current)	60A (default) bcc 10 60 A	3500VA: Setting range is from 0 to 120A 5000VA: Setting range is from 0 to 170A 7500VA: Setting range is from 0 to 180A 10000VA: Setting range is from 0 to 200A

11	Low DC cut-off voltage	48V model(42V default) bcv 11 42.0V	If self-defined is selected in program 5, this program is enable. Setting range is from 42.0V to 52.0V. Increment of each click is 0.1V.
		24V model(21V default) bcv 11 21.0V	If self-defined is selected in program 5, this program is enable. Setting range is from 21.0V to 26.0V. Increment of each click is 0.1V.
12	Overload bypass function	Disable (default) LbP 12 ENA	If it is enabled, the inverter will switch to utility mode if overload happens in battery mode.
		LbP 12 DIS	
15	Buzzer Alarm	Enable (default) bEP 15 ENA	
		bEP 15 DIS	
16	BMS communication setup	external communication(default) bnS 16 nnt	external communication Baud rate 2400 bit/s.
		BMS communication bnS 16 bnS	BMS communication, Baud rate 9600 bit/s.
17	Back light of LCD	Enable (default) bL 17 ENA	Setting the control of LCD backlight enable, LCD backlight will always-on. Setting the control of LCD backlight disable, have no operation the LCD backlight will go out after 60s.
		bL 17 DIS	
18	Output source priority	Utility first (default) OPS 18 UTI	Utility will provide power to the loads first, battery will provide power to the loads only when utility power is not available.
		PV first OPS 18 PU	PV provides power to the loads first. If PV energy is not sufficient, battery will feed power to the loads. Utility provides power to the loads only when any one condition happens: (1) PV is unavailable; (2) Battery voltage drops to low-level warning voltage or the setting point in program 19.

18	Output source priority	Battery first OPS  BAT	battery provides power to the loads first, utility provides power to the loads only when battery voltage drops to either low-level warning voltage or the setting point in program 19. And when battery voltage return to the setting point in program 20, the inverter will switch to battery mode;
19	Setting battery voltage point back to utility when selecting "BAT priority" in program 18.	48V model(default 46.0V) buv  46.0V	Setting range is from 44.0V to 51.0V. Increment of each click is 1V.
		24V model(default 23.0V) buv  23.0V	Setting range is from 22.0V to 25.5V. Increment of each click is 0.5V.
20	Setting battery voltage point back to battery mode when selecting "BAT priority" in program 18.	48V model(default 54.0V) bbv  54.0V	Setting range is from 48.0V to 58.0V. Increment of each click is 1V. "FUL" means the battery should be charged to float mode;
		24V model(default 27.0V) bbv  27.0V	Setting range is from 24.0V to 29.0V. Increment of each click is 0.5V. "FUL" means the battery should be charged to float mode;
37	Power Key Mode	Output off (default) Ptn  00F	When power key is off and utility is charging to battery, Output is off.
		Output on Ptn  00n	When power key is off and utility is charging to battery, Output is on.

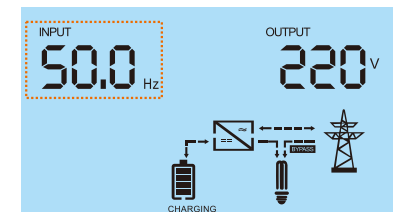
Display Information

The LCD information will be switched by pressing "Up" or "Down" key. The selectable information is switched as below order: input voltage/frequency, battery voltage, charging current, output voltage/frequency, load percent, load in Watt, load in VA, load in Watt, main CPU Version.



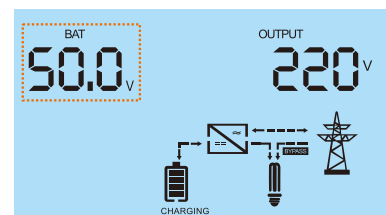
Input voltage/Output voltage

Utility voltage is 220V, output voltage is 220V



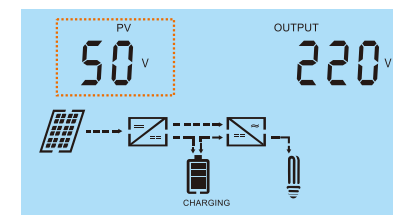
Input frequency

Utility frequency is 50.0Hz



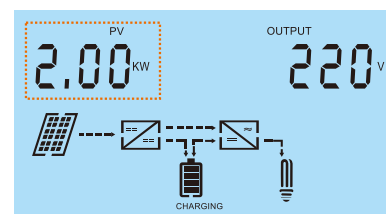
Battery voltage

Battery voltage is 50.0V



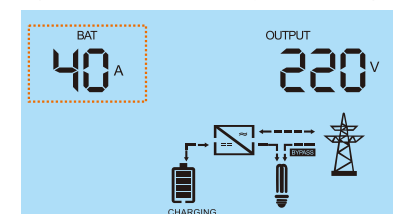
PV voltage

PV voltage is 50V
(for PWM / MPPT Charge Controller)



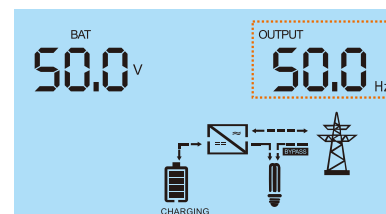
PV power

PV power is 2KW
(for PWM / MPPT Charge Controller)



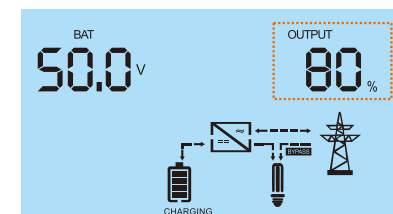
Charging current

Charging current is 40A



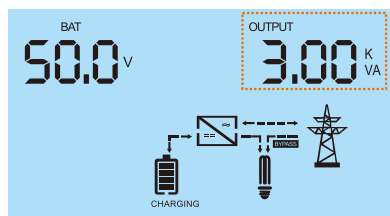
Output frequency

Output frequency is 50Hz

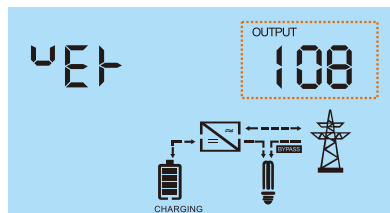


Load percentage

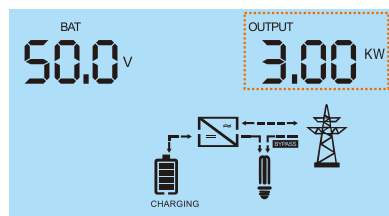
Load percent is 80%

**Load in VA**

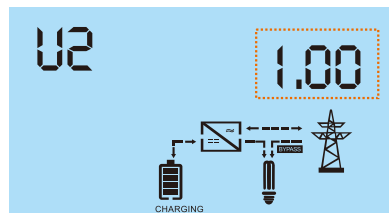
The load is 3.0KVA

**CPU software version**

CPU software version 108

**Load in Watt**

The load is 3.0KW.

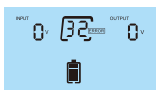
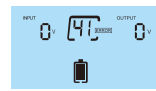
**PWM Charge Controller software version**

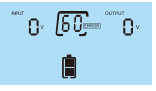
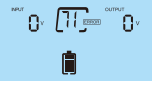
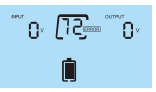
CPU software version 1.00
PWM Charge Controller software version
(for PWM Charge Controller Build-in)

Fault Code Table

When fault event happens, inverter will cut off output, and the red LED is solid on. At the same time, fault code is shown on the LCD screen.

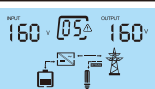
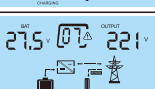
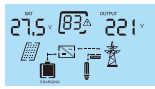
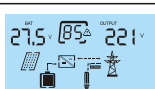
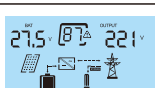
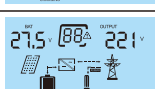
Fault Code	Fault information	Trouble Shooting	
13	Overload happens	Not allowed to overload when the inverter in battery mode, If overload, please turn off the inverter first, and then decrease the load let the load power less than the rated output power of invert, turn on the inverter again. If overload and the AC input is on, wait for 30s and it will clear away the fault automatically and work normally.	
14	Output voltage high	Restart the inverter or Contact our engineer.	
15	Output short	If AC input is on, must cut off the AC input first and then turn off the inverter, disconnect all AC output wiring and turn on it. If the screen still display fault, please connect our engineer. And if the inverter can work again, please check the output wiring and load, make sure all of them not shorted connection.	
17	Battery voltage high	Read the battery voltage from the screen, and measure the voltage of battery with multimeter . if both of the voltage are more than 60v, maybe the battery have some problem we must stop using it.	
18	Over temperature	Turn off the inverter, let it cool down, after the temperature back to normal and you can use it again.	
21	Over current happen in charging mode	Please contact our engineer.	
22	Inv soft start timeout	Please contact our engineer.	
24	Output voltage low	Turn off the inverter, disconnect all AC output wiring and then turn on it, if it still fault please contact our engineer, if it work normally, please check the output whether connect a big power load, disconnect the big one and turn on the inverter, confirm it can work normally.	
28	Current sensor is abnormal	Please contact our engineer.	

32	INV NTC is Disconnected is abnormal	Please contact our engineer.	
34	Heavy over load or output short	Please refer to Fault 13 and 15 handling.	
40	CAN data loss	1. Check if communication cables are connected well and restart the inverter. 2. If the problem remains, please contact your installer.	
41	Host data loss		
42	Synchronization data loss		
43	The battery voltage of each inverter is not the same.	1. Make sure all inverters share same groups of batteries together. 2. Remove all loads and disconnect AC input and PV input. Then, check battery voltage of all inverters. If the values from all inverters are close, please check if all battery cables are the same length and same material type. Otherwise, please contact your installer to provide SOP to calibrate battery voltage of each inverter. 3. If the problem still remains, please contact your installer.	
44	AC input voltage and frequency are detected different.	1. Check the utility wiring connection and restart the inverter. 2. Make sure utility starts up at same time. If there are breakers installed between utility and inverters, please be sure all breakers can be turned on AC input at same time. 3. If the problem remains, please contact your installer.	
45	AC output current unbalance	1. Restart the inverter. 2. Remove some excessive loads and re-check load information from LCD of inverters. If the values are different, please check if AC input and output cables are in the same length and material type. 3. If the problem remains, please contact your installer.	
46	AC output mode setting is different.	1. Switch off the inverter and check LCD setting #28. 2. For parallel system in single phase, make sure no 3P1, 3P2 or 3P3 is set on #28. For supporting three-phase system, make sure no "PAL" is set on #28. 3. If the problem remains, please contact your installer.	

60	Current feedback into the inverter is detected.	1. Restart the inverter. 2. Check if LN cables are not connected reversely in all inverters. 3. For parallel system in single phase, make sure the sharing are connected in all inverters. For supporting three phase system, make sure the sharing cables are connected in the inverters in the same phase, and disconnected in the inverters in different phases. 4. If the problem remains, please contact your installer.	
71	The firmware version of each inverter is not the same.	1. Update all inverter firmware to the same version 2. Check the version of each inverter via LCD setting and make sure the CPU versions are same. If not, please contact your installer to provide the firmware to update. 3. After updating, if the problem still remains, please contact your installer.	
72	The output current of each inverter is different.	1. Check if sharing cables are connected well and restart the inverter. 2. If the problem remains, please contact your installer.	

Warning Code Table

When warning event happens, the red LED is flashing. At the same time, the warning code is flashing on the LCD screen.

Warning Code	Warning information	Trouble Shooting
01	Overload happens	The inverter forbid to over-load, the last working time will depend on the percent of load. 
04	Battery low	The voltage of battery is too low, the battery should be charging. 
05	Power derating (low utility voltage)	Read the voltage from the screen and confirm the voltage of AC input is about 90-170v. If it is ,means the voltage of AC input is low, it can work normally. If not, please contact our engineer. 
06	TX NTC is disconnected	Please contact our engineer. 
07	INV NTC is disconnected	Please contact our engineer. 
/	 Flash	City electricity is not match to the inverter
83		Faults for over charging current of built in MPPT 
84		Faults for battery low voltage of built in MPPT 
85		Faults for battery high voltage of built in MPPT 
87		Faults for high temperature of built in MPPT 
88		Faults for pv over voltage of built in MPPT 

MPPT charger controller match to the Inverter

In actually application system, MPPT controller and inverter will charge the battery at the same time, the charging current will excessive to occur unsafe situation, so we add the function of match the inverter and the MPPT controller to protect the battery more better, and more scientific to management the charging from solar panel or utility source.

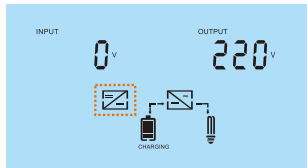
NOTE: The inverter and MPPT controller are both just from our company can be matched and the maximum continuous charging current should be no more than 30% of the battery capacity. For example for the 48V200AH battery pack ,the continuous charging current should be less than 60A.

The inverter match to the MPPT controller have 2 main function

- 1.Enable or disable inverter to match MPPT function.(Special note: when the inverter upgrades the firmware, it needs to disable the function matching MPPT first)
- 2.Limited the the inverter charging current, the method as follow: A) When the MPPT charging current $\geq$ the current limited by the inverter ,and then the inverter maximum charging current is 0.B)When the MPPT charging current $<$ the current limited by the inverter, the inverter maximum charging current =the total charging current set by the inverter -MPPT charging current.

Match the inveter to the MPPT controller:

1. To enable the inverter to match the MPPT controller, the inverter and MPPT controller should be switched on first, and the communication lines between them have been connected;
2. Then press the "Down" button of the inverter for more than 2.5 seconds, until the MPPT charger icon flashes. Release the button,. The icon flash indicates that the inverter is trying to communicate with MPPT.The icon of the inverter stops flashing 10 seconds after the button is released, and when the communication is successful, it means that it has been enabled successfully.
3. Once enabled successfully, matching MPPT function flag will be saved in EEPROM, and restart the inverter needn't to manually enable again.
4. After successful enabling, the pv-voltage, power and other information of MPPT will be displayed when page-turning on the LCD screen.

Action	Instruction	LCD display
Match the MPPT function enable	Long press "Down" button until the icon in the red box in the right picture flashes, indicating that the inverter is trying to communicate with MPPT. The icon stops flashing after the inverter loosens the button for 10 seconds	

Matching MPPT function is prohibited:

1. To prevent the inverter from matching the MPPT function, the MPPT should be turned off or the communication connection between the two should be disconnected.
2. Then long press the "Down" button of the inverter for more than 2.5 seconds, until the MPPT charger icon flashes. At this point, the button can be released. The flashing icon indicates that the inverter is trying to communicate with MPPT. The flashing icon will stop 10 seconds after the button is released. Failure to communicate indicates a successful prohibition.
3. After successful prohibition, matching the MPPT function flag will be saved in EEPROM. Restart the inverter without manual prohibition again.
4. After successful prohibition, pv-voltage, power and other information of MPPT will no longer be displayed on the LCD screen.



Abiter

Instruction

When the matching MPPT function is prohibited successfully, MPPT information will no longer be displayed.

MPPT function is prohibited successfully. If the MPPT function is prohibited successfully, the MPPT function will no longer be displayed. If the MPPT function is prohibited successfully, the MPPT function will no longer be displayed.