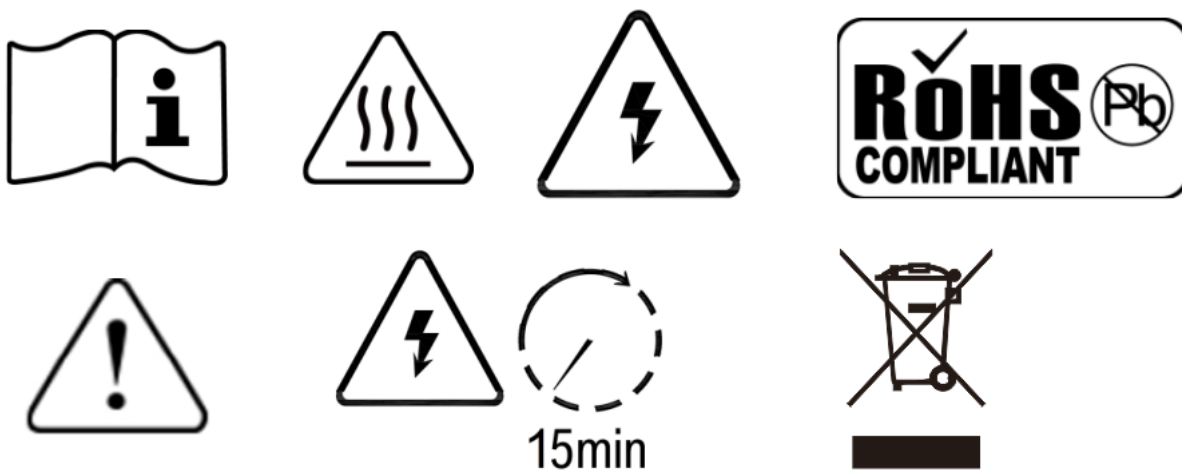


USER MANUAL

Uni Inverter Charger

PG6.0S/8.0S





WARNING: HIGH VOLTAGE INSIDE

CAUTION: THE DC FUSE MUST HAVE BEEN

TURNED OFF BEFORE SERVICING

MADE IN CHINA

Disclaimer

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- Take no warranty as to the accuracy, sufficiency of suitability of any technical or other information provided in this manual or other documentation.
- Assumes no responsibility or liability for loss or damage, whether direct, indirect, consequential or incidental, which might arise out of the use of such information.
- TBB offer standard warranty with its products, taking no responsibility for direct or indirect loss due to equipment failure.

About this Manual

This manual describes our product features and provides procedure of installations. This manual is for anyone intending to install our equipment.

General Instruction

Thanks for choosing our products and this manual were suitable for PG series Uni Inverter Charger. This chapter contains important safety and operation instructions. Read and keep this User Guide well for later reference.

The inverter needs to be installed by professionals and please pay attention to the following points prior to installation:

Please check the input voltage or voltage of battery is same to the nominal input voltage of this inverter.

- Please connect positive terminal “+” of battery to “+” input of the inverter.
- Please connect negative terminal “-” of battery to “-” input of the inverter.
- Please use the shortest cable to connect and ensure the secure connection.
- While connecting, please secure the connection and avoid short cut between positive terminal and negative terminal of battery, which will cause damage of battery.
- Inverter will have high voltage inside. Only authorized electrician can open the case.
- The inverter WAS NOT designed to use in any life retaining equipment.

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1. General Safety Instruction

1.1 Safety instruction

As dangerous voltages and high temperature exist within the inverter, only qualified and authorized maintenance personnel are permitted to open and repair it. Please make sure the inverter is turned off before opening and repairing it.

This manual contains information concerning the installation and operation of PG inverter. All relevant parts of the manual should be read prior to commencing the installation. Please follow the local stipulation meantime.

Any operation against safety requirement or against design, manufacture, safety standard are out of the manufacturer warranty.

1.2 General precaution

- DO NOT expose to dust, rain, snow or liquids of any type, it is designed for indoor use. DO NOT block off ventilation, otherwise the inverter would be overheating.
- To avoid fire and electric shock, make sure all cables selected with right gauge and being connected well. Smaller diameter and broken cable are not allowed to use.
- Please do not put any inflammable goods near to inverter.
- NEVER place unit directly above batteries, gases from a battery will corrode and damage PG series Uni Inverter Charger.
- DO NOT place battery over PG series Uni Inverter Charger.

1.3 Precaution regarding battery operation

- Use plenty of fresh water to clean in case battery acid contacts skin, clothing, or eyes and consult with doctor as soon as possible.
- The battery may generate flammable gas during charging. NEVER smoke or allow a spark or flame in vicinity of battery.
- DO NOT put the metal tool on the battery, spark and short circuit might lead to explosion.
- REMOVE all personal metal items such as rings, bracelets, necklaces, and watches while working with batteries. Batteries can cause short-circuit current high enough to make metal melt, and could cause severe burns.

2. Instruction

2.1 Brief Instruction

2.1.1 General Description

PG series is the new generation high frequency Uni Inverter Charger designed for various type of mobile system including recreational vehicles and utility vehicles etc.

It has built-in inverter, AC charger, MPPT solar charger controller, DCDC bi-directional charger and insulation guard. The Uni Inverter Charger design will save the significant installation space and labor cost for the users.

PG inverter delivers high reliability, performance and industry leading efficiency for mission critical application. Its distinguishing surge capability makes it capable to power most demanding appliances, such as air conditioner, water pump, washing machine, freezer etc.

With the function of power assist & power control, it can be used to work with a limited AC source such as generator or limited grid. PG inverter can automatically adjust its charging current avoiding grid or generator to be overloaded. In case of temporary peak power appear, it can work as the supplement source to generator or grid.

2.1.2 Naming Rules

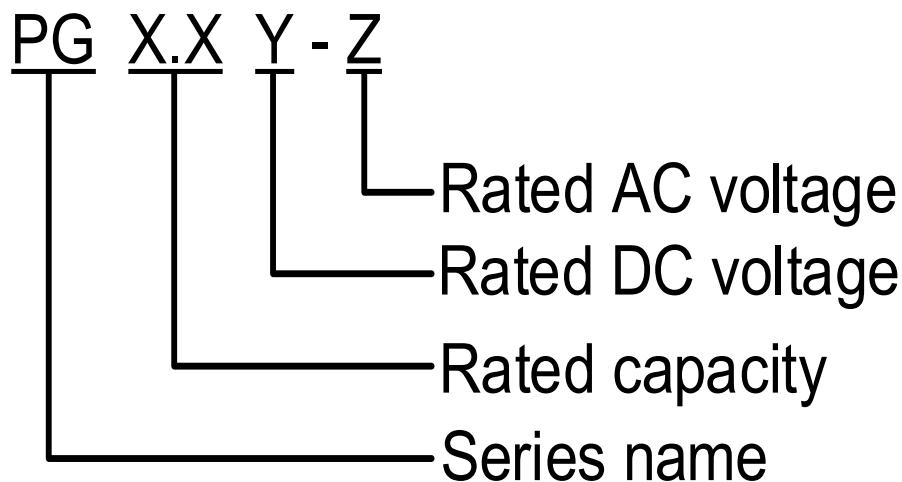


figure	explanation	
PG	series name	
6.0/8.0	Represent rated capacity	6000W/8000W
S	Represent rated DC voltage	48VDC
/	Represent rated AC voltage	230V

2.2 Structure

2.2.1 Front

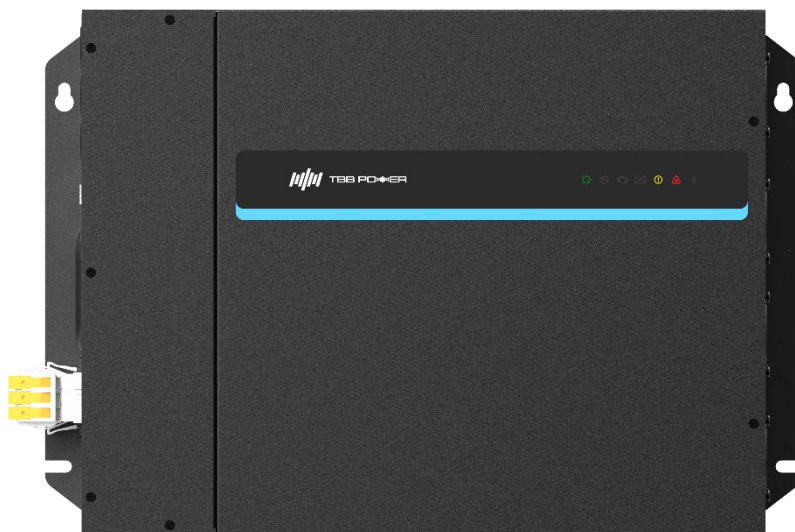


Figure 2-1 PG inverter structure in front view

2.2.2 LED indicators

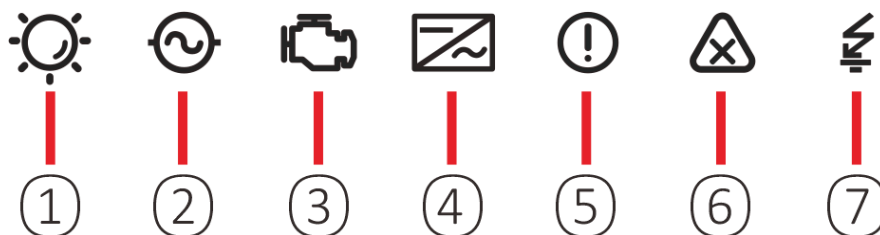


Figure 2-2 LED indicators

Table 2-1 LED indicators

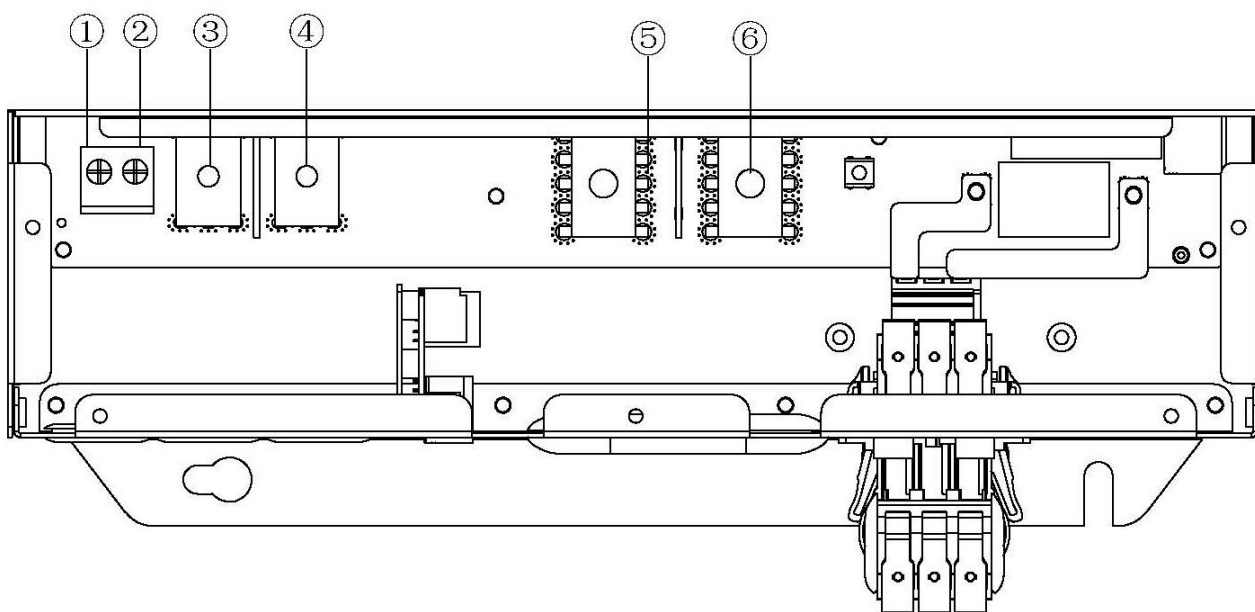
Name	Color	Function
 ① Solar	Green	Off: No solar input Slow flashing: Solar input is detected but MPPT is not working ON: MPPT charger is working
 ② AC in	Green	Off: No AC input Slow flashing: AC input detected but no charging or bypass power supply Fast flashing: Bypass power supply is working ON: AC charger is working
 ③ DC/DC	Green	OFF: Alternator is not working. Slow flashing: Alternator input is detected but DC/DC is not working

		Fast flashing: 48V battery is charging to starter battery or powering the loads. ON: 12V alternator is charging to 48V battery.
 ④ Invert	Green	OFF: 48V battery is not detected Slow flashing: 48V battery is connected Fast flashing: Inverter power assist function is working. ON: Inverter is working.
 ⑤ Alarm	Yellow	OFF: No alarm Fast flashing: Alarm happens
 ⑥ Fault	Red	OFF: No fault Fast flashing: Fault happens
 ⑦ Insulation guard fault	Red	OFF: In invert mode, insulation guard is normal. ON: Insulation guard is abnormal, the inverter stops the output.

*Slow flashing is on for 0.5seconds and off for 1.5 seconds in a loop.

*Fast flashing is on for 0.5 seconds and off for 0.5 seconds in a loop.

2.2.3 Connection compartment



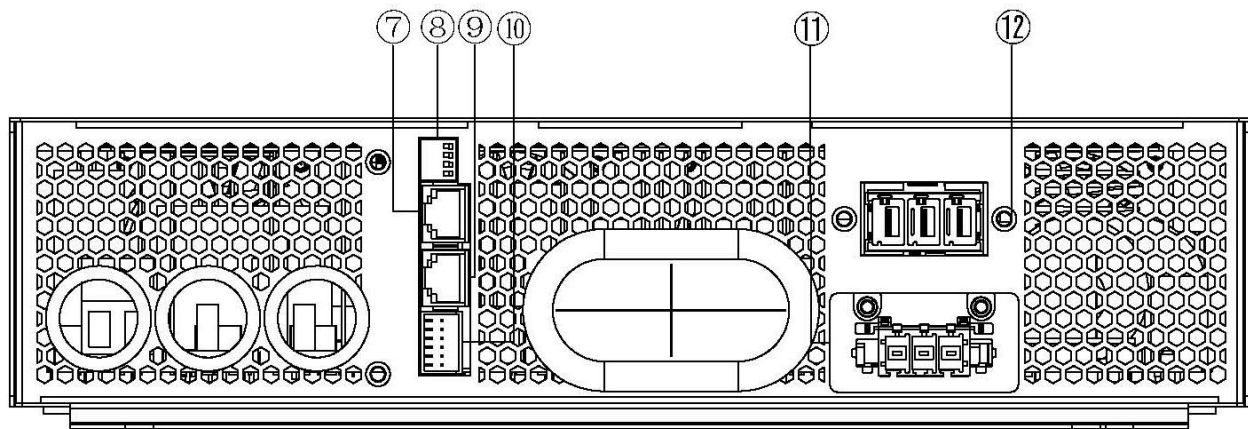
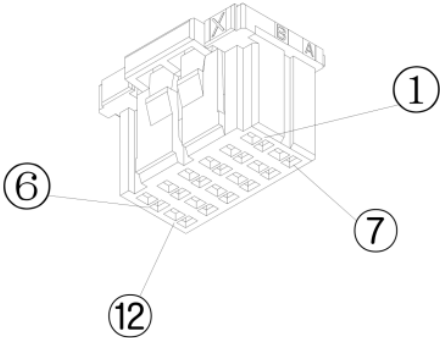


Figure 2-3 Terminals

Table 2-2 Terminals introduction

No.	Silk-screen	Definition
①	PV+	Solar panel positive port
②	PV-	Solar panel negative port
③	ALT+	ALT positive port
④	ALT-	ALT negative port
⑤	BAT-	Backup battery negative port
⑥	BAT+	Backup battery positive port
⑦	CAN	CAN communication port
⑧		Dip switch
⑨	Display	For display connection
⑩	COM	COM port
⑪	AC IN	AC input port. Connector type: WAGO 831-3203 L: Live wire, PE: Ground wire, N: Neutral wire
⑫	AC OUT	AC output port. Connector type: WAGO 832-1203 L: Live wire, PE: Ground wire, N: Neutral wire

Table 2-3 COM cable pin definitions

Port	Foot No.		Definition
COM	1	Connector type: WD2500-2H06B001W 	Starter battery voltage sampling+
	2		Starter battery voltage sampling-
	3		Isolation power supply +12V_ISO
	4		Isolation power supply 0V_ISO
	5		CAN_L
	6		CAN_H
	7		D+ signal input
	8		System On/Off Switch, for remote switch or dry contact output
	9		Relay_NC, dry contact
	10		28VDC/3A

			output, normally close	
	11		Relay_NO, dry contact output, normally open	
	12		Relay_COM, dry contact output, common point	

Table 2-4 CAN pin definition

Port	Foot No.	Definition	Comments
CAN	1	/	RJ45 standard connector
	2	/	
	3	/	
	4	CAN_H	
	5	CAN_L	
	6	/	
	7	/	
	8	/	

Table 2-5 Display pin definition

Port	Foot No.	Definition	Comments
Display	1	SW_ON_Ctrl	RJ45 standard connector
	2	SW_ON_Ctrl_1	
	3	RS485_A	
	4	CAN_H	
	5	CAN_L	
	6	RS485_B	
	7	+12V_ISO	
	8	0V_ISO	

2.2.4 Dimension

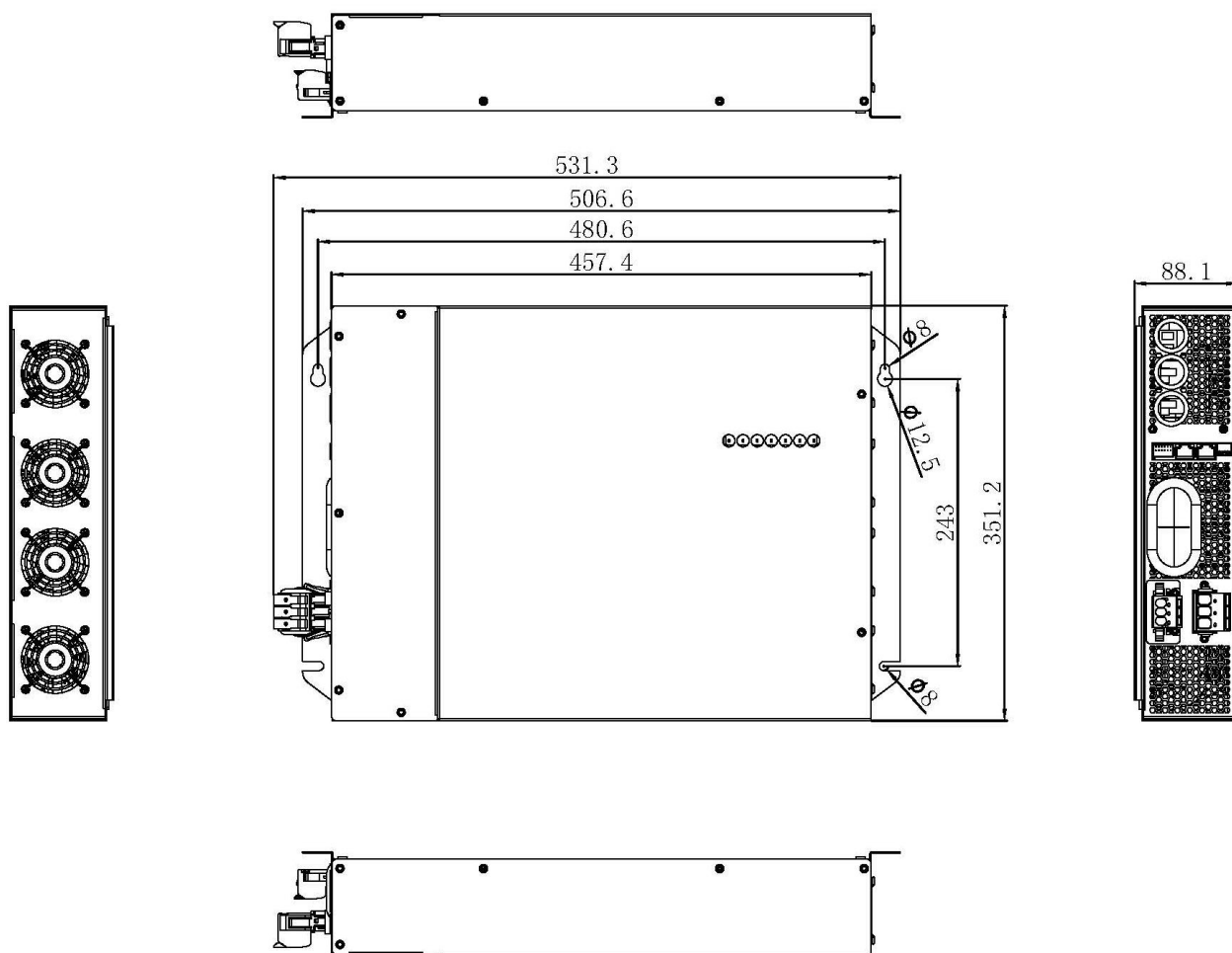


Figure 2-4 Dimension of PGPG6.0S/PG8.0S (Unit: mm)

2.3 Function

2.3.1 High performance inverter

- Powerful overload capability to meet stable requirements of various inductive loads.
- High efficiency inverter and low power consumption to maximize the system's service time.

2.3.2 Power control and Power assist

PG series offers a unique feature of power control & power assist, which is very useful upon you have a limited grid supply or working with generator. PG series will take control of energy flow automatically, using extra power to charge the battery or inverting as the supplement to the grid or generator. With this feature, you can avoid tripping of shore power MCB or generator oversize.

2.3.3 Insulation Guard built-in

When the PG series works as inverter, it can monitor the insulation status of the Live and Neutral wires to the ground wire in real time. When the insulation becomes low, the inverter output can be automatically turned off to protect the user's electrical safety.

2.3.4 Reliable Inverter output

Ultra-fast transition time up to 2ms

If the AC input fails or exceeds the preset maximum AC input current, PG inverter will switch to "inverter mode" to ensure that the power supply is not disturbed. When the AC input is restored or meets the maximum AC input current, it will switch back again. Due to its ultra-fast transmission design, up to 2 milliseconds, the PG inverter offers an uninterruptible power supply to the users.

Overload protection

In the inverter state, when an overload alarm occurs and the load cannot be carried for a long time, PG will actively reduce the inverter voltage (as low as 90% of the inverter set voltage) to reduce the resistive load power.

*The function can be disabled by parameter settings.

2.3.5 Professional Battery Charger

Powerful AC battery charger

PG is designed to charge battery quickly and fully. Microprocessor controlled charging algorithm with variable absorption charging timer could guarantee the optimal charging for batteries of different discharged state. The max charger power of PG5.0S/PG6.0S/PG8.0S is 6000W/8000W respectively. And the max charging current of PG6.0S/PG8.0S is 110A/150A.

Built-in MPPT charger controller

Built in MPPT solar charger, which can automatically charge the backup battery or starter battery within the range of PV input voltage and energy.

Maximum power point tracking (MPPT) of PV panels can work stably even in low light conditions in the morning and evening, without frequent start stop or output current sudden changes and other abnormal phenomena.

Recommended open circuit voltage range for PV panel configuration 15~60V@25°C.

Built-in bidirectional Converter charger

With the built in DC/DC, when PG is connected to the vehicle alternator, it can automatically charge the backup battery during driving according to the alternator's status.

When PG is connected to a traditional alternator or D+ signal is not detected, it will automatically charge the backup battery when the starter battery voltage is greater than 13.0V. If the input power of the alternator is less than the maximum power of the DC/DC, the DC/DC will automatically derate and stabilize the starter battery terminal voltage at 13.0V as default.

When the alternator is intelligent type and D+ signal is correctly connected, PG will automatically charge the backup battery upon detecting the D+ signal. If the input power of the generator is less than the maximum power of the DC/DC, the DC/DC will automatically derate and stabilize the starter battery terminal voltage at 12V as default.

When the alternator doesn't work, the DC/DC will charge the starter battery or offer the power supply to the loads from the backup battery automatically. The battery voltage is stable at 13V.

It can support 24V chassis or outputs which requires the setting by an external screen.

Professional charger for Lithium battery

After connecting to the lithium battery through CAN communication, PG inverter can automatically

respond to the charging request of the lithium battery BMS. It offers the most suitable charging voltage to the lithium battery. At the same time, PG reads the battery information from the BMS to the remote displayer.

If there is a communication loss during use, PG will charge the battery as the voltage and current values in history records.

If there is no CAN communication, the default charging voltage is 53.2V which can be set by the displayer.

Automatic wake-up the charging from system hibernation

Once a lithium battery is over-discharged, it can lead to the dissolution of copper foil at the anode, with the formation of copper dendrites that can puncture the separator and cause an internal short circuit and thermal runaway. Charging the battery on-time is critical for the maintenance.

PG series can automatically charge the battery once it detects there is a charging source even the battery has been shut down by battery switch manually or by BMS protection.

Kindly be noticed that the BMS of the battery should have the wake-up function, like TBB M series and R series battery.

- Solar wake-up

When PV input is detected and the input voltage greater than 15V, PG can automatically turn on to charge the backup battery.

- AC mains wake-up

When AC grid input is detected and the input voltage and frequency is in the nominal range, PG can automatically turn on to charge the backup battery.

- Alternator wake-up

For 12V chassis alternators, when the voltage is greater than 13.5V without D+ signal or 10.5V with up level D+ signal, PG can automatically turn on to charge the backup battery.

For 24V chassis alternators, when the voltage is greater than 27V without D+ signal or 21V with up level D+ signal, PG can automatically turn on to charge the backup battery.

2.3.6 Protection function

The PG inverter is equipped with a series of complete hardware and software protection functions to ensure its stable and reliable operation.

Over temperature protection

When the internal temperature of the inverter is too high, it can automatically protect it; When the temperature returns to normal, it can automatically recover.

Overload protection

When overload protection is triggered, the inverter will automatically shut down and restart.

Short circuit protection

When the output is short circuited, it will automatically shut down and restart after 60 seconds.

3. Installation and Wiring



Keep away from fire, avoid direct sunlight and rain; do not store flammable, explosive or corrosive gases or liquids in the working environment. Don't install in a working environment with metal conductive dust.

- Please install the equipment in a location of dry, clean, cool with good ventilation.
- Operating temperature: -30~65℃
- Storage temperature: -40~75℃
- Cooling: Forced fan
- Relative humidity in operation: 5~95% non condensation.

3.1 Installation preparation

Please confirm whether the product has been damaged during transportation and whether the accessories are complete.

Table 3-1 Packing List

Item	Qty
PG Uni Inverter Charger	1
User manual	1
M6 screws	4
WAGO 832-1103/037-9037 for AC output	1
WAGO 831-1103/037-000 for AC input	1
M8 flat washer	4
M8 lock washer	4
M8 hex nut	4

3.2 Installation

- PG inverter supports horizontal or vertical installation. Due to the air inlet being located above, horizontal installation is preferred to reduce the risk of dust/debris clogging the air inlet. Do not install upside down.
- PG inverter adopts a forced air cooling method for heat dissipation. To ensure good heat dissipation, sufficient wiring space is required, and it is recommended to have a certain number of heat dissipation holes in the installation space to ensure air convection. Please determine the installation space and hole positions of the host according to Figure 2-4. Leave 200mm or more space in front and behind the host, and 50mm or more space on both sides of the host to ensure heat dissipation, as shown in Figure 3-1.
- After determining the installation position and mounting holes, fix the PG inverter with four M6 screws (recommended torque 6-8N*m).

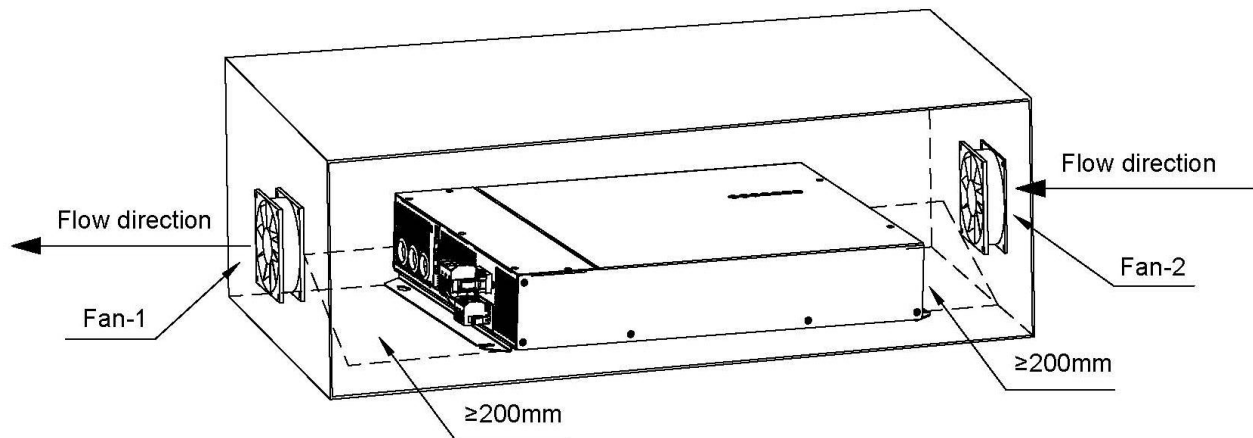


Figure 3-1 installation space requirements

3.3 Wiring preparation

3.3.1 Prepare suitable circuit breakers

- Positive pole cables should be equipped with overcurrent protection devices such as DC fuses or DC circuit breakers at 125% of the nominal rated value.
- The withstand voltage of the DC circuit breaker on the battery side should be greater than 63V.
- The withstand voltage of the PV side DC circuit breaker should be greater than the open circuit voltage of the photovoltaic array.
- The requirements of the circuit breaker type are as Table 3-2

Table 3-2 Requirements for Circuit Breaker Type

No.	Name	Requirements
1	Battery circuit breaker	Nominal voltage >63VDC Nominal current >200A@PG6.0S Nominal current >240A@PG8.0S
2	Alt input circuit breaker	Nominal voltage >63VDC Nominal current >150A
3	PV input circuit breaker	Nominal voltage >63VDC Nominal current >80A
4	AC input circuit breaker	Nominal voltage >230VAC Nominal current >40A
5	AC output circuit breaker	Nominal voltage >230VAC Nominal current >75A

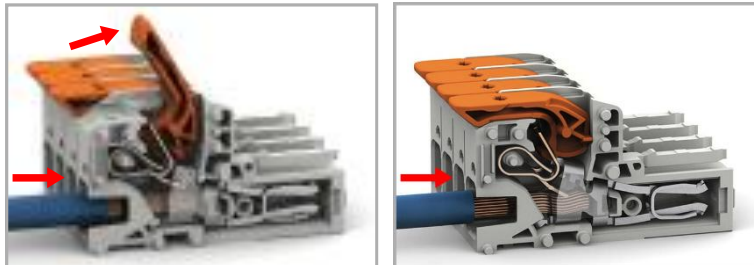
Note: The selection of the above circuit breakers or fuses must comply with the requirements of local laws and regulations.

3.3.2 Wire preparation

- It is recommended to install cables with insulation level not lower than Y level (90 °C).
- Use the WAGO connectors packed with the inverter for AC input and output cables.
AC input: WAGO 831-1103/037-000, AC output: WAGO 832-1103/037-9037

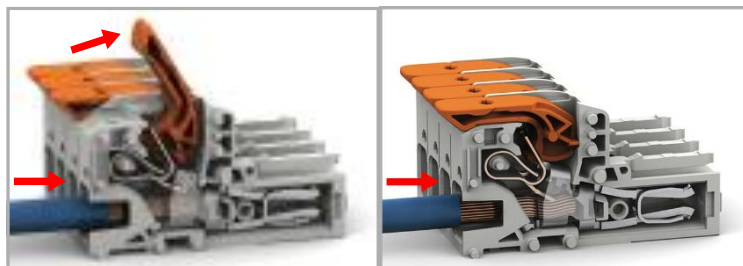
Here are the harness instructions.

WAGO 831-1103/037-000:



1. Strip length = 11 to 13 mm.
- 2a. Lift and open the operating handle upward, then insert a fine-stranded conductors until it contacts the limit stop block, and press the operating handle back into its original position.
- 2b. Insert stripped solid conductor until it hits backstop.

WAGO 832-1103/037-9037:



1. Strip length = 18 to 20 mm.
- 2a. Lift and open the operating handle upward, then insert a fine-stranded conductors until it contacts the limit stop block, and press the operating handle back into its original position.
- 2b. Insert stripped solid conductor until it hits backstop.

- For the power cable, please refer to the below recommended specifications.

Table 3-3 Recommended power cable specifications and connector type

Connector on PG	Silk printing	Recommended cable specification and terminal type			
		Gauge	Length	Color	Terminal type
PV connector port	PV+	10~16mm ²	<3m	Red	Rod terminal
	PV-	10~16mm ²	<3m	Black	Rod terminal
ALT	ALT+	35~50mm ²	<3m	Red	M8 terminal

connector port	ALT-	35~50mm ²	<3m	Black	M8 terminal
BAT connector port	BAT-	50~75mm ²	<3m	Black	M8 terminal
	BAT+	50~75mm ²	<3m	Red	M8 terminal
AC IN connector port	L	6~10mm ²	<3m	Red	WAGO 831- 1103/037-000
	PE	6~10mm ²	<3m	Yellow & Green	
	N	6~10mm ²	<3m	Black	
AC OUT connector port	L	10~16mm ²	<3m	Red	WAGO 832- 1103/037-9037
	PE	10~16mm ²	<3m	Yellow & Green	
	N	10~16mm ²	<3m	Black	

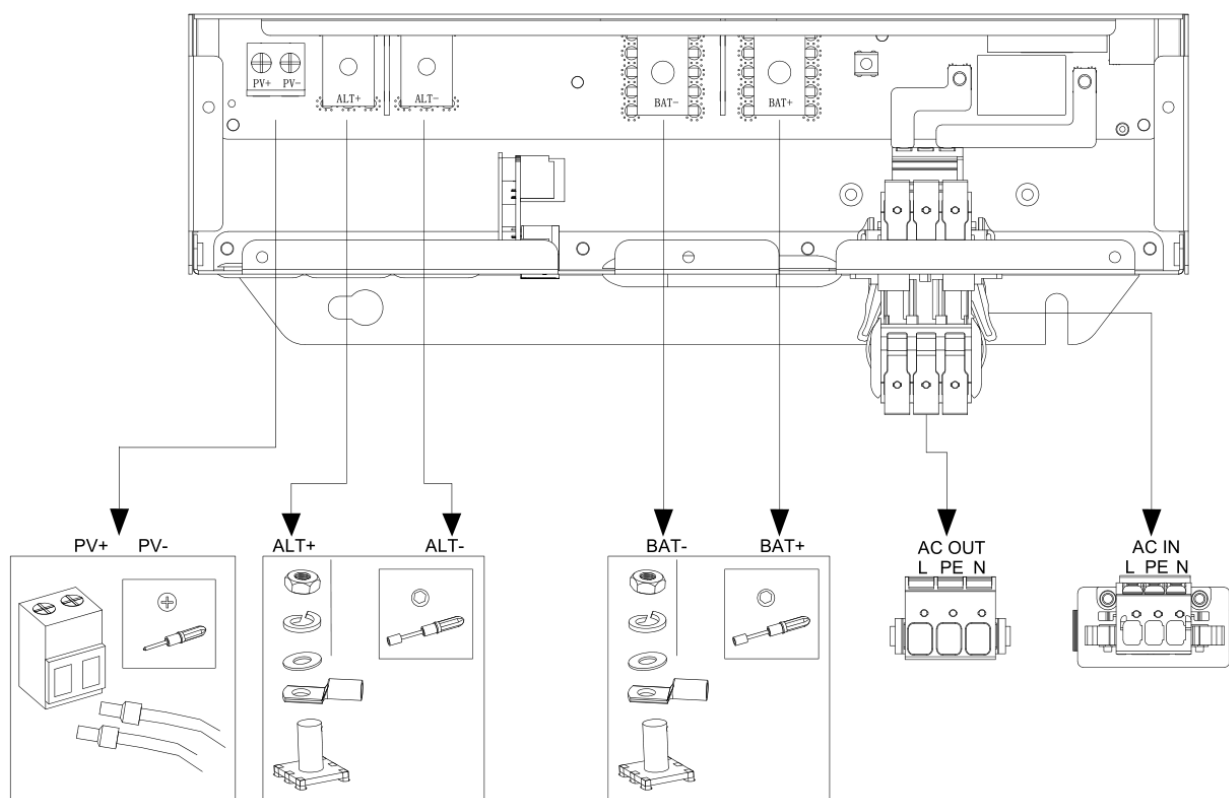
3.3.3 Wiring

Before installation, please double confirm the below items carefully.



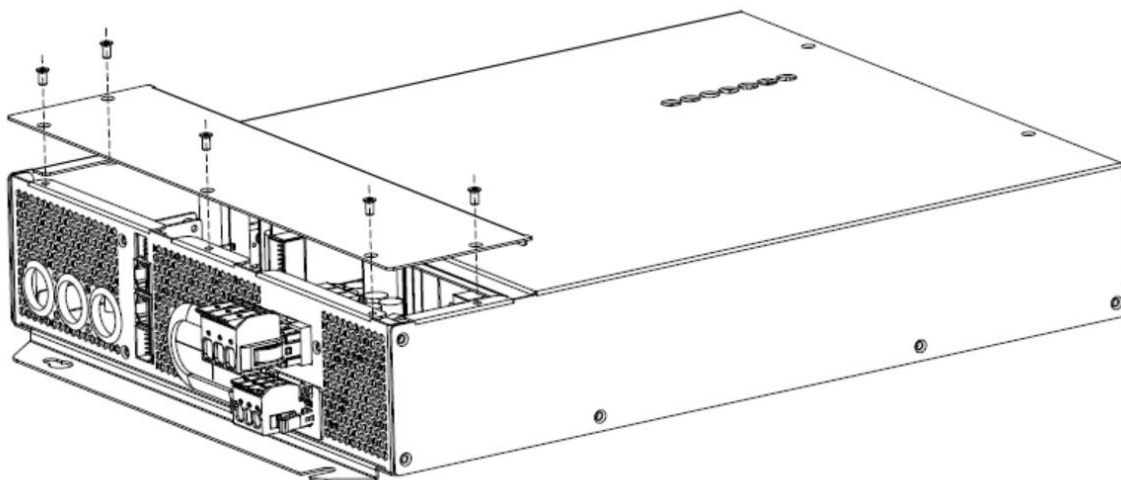
1. The voltage of the battery pack matches the DC input voltage of the installed inverter.
2. The polarity of the DC input is correct.
3. AC input and output cable is connected correctly.
4. The circuit breaker of AC input and output has been installed and meets the requirements of Table 3-2. And the circuit breaker is disconnected.

Kindly be noticed that either of above may cause the damage of the inverter. And the damage caused by the wiring error is not covered by the warranty.



Please refer to the following steps for wiring:

Step 1: Remove the five fixing screws on the front side of the inverter, then detach the small cover.



Step 2: Connect the negative terminals of two "BAT -" batteries, with a recommended torque of $12\text{N}\cdot\text{m}$, to ensure that the wiring is securely fastened.

Step 3: Connect the positive pole of the "ALT+" battery, with a recommended torque of $12\text{N}\cdot\text{m}$, to ensuring that the wiring is securely fastened.

Step 4: Connect the positive pole of the "BAT+" battery, with a recommended torque of $12\text{N}\cdot\text{m}$, to ensure that the wiring is securely fastened.

Step 5: Connect the positive and negative terminals of PV+ and PV- terminals, with a recommended torque of $1.5\text{N}\cdot\text{m}$, to ensure that the wiring is securely fastened;

Step 6: Connect the "AC IN" WAGO 831-1103/037-000 connector with a recommended insertion force of 35N. Connect the "AC OUT" WAGO 832-1103/037-9037 connector with a recommended insertion force of 35N.

Step 7: Install the inverter small cover plate and tighten it with screws.

Step 8: Connect the signal cable.

Step 9: Clean the installation site, remove excess tools and materials, and use a vacuum cleaner to remove foreign objects such as iron filings and cable insulation. In order to prevent foreign objects such as iron filings generated during the drilling process from being blown into the interior of the inverter and causing damage to the inverter during power on, it is strictly prohibited to use an air gun to clean the installation site.

4. Operation

4.1 Pre startup inspection

Please follow the steps below to perform a pre boot check:

1. The installation of the inverter meets all of the requirements above. The space meets the heat dissipation requirements.
2. The cable layout is tidy, and the connection is safe and fastened.
3. The ground wire is reliably connected and installed firmly.
4. Confirm again that the battery circuit breaker is in a disconnected state.
5. Ensure that the cables are properly and securely connected.
6. The installation space is reasonable, the environment is clean and tidy, and there are no construction residues.

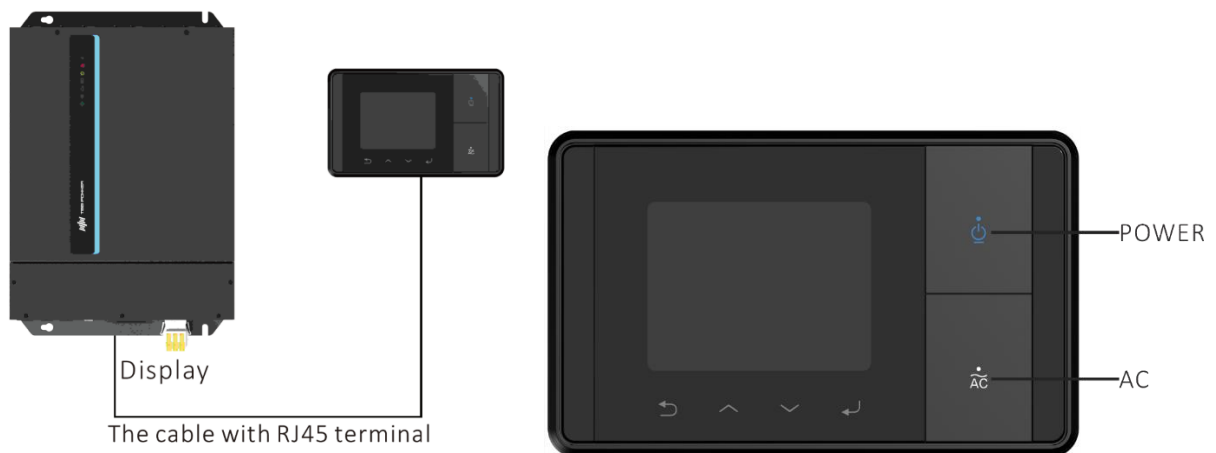
4.2 Power on and off

4.2.1 With VS28-LS

VS28-LS is an optional displayer for PG inverter. It has 2.8" screen, power on/off button and user-friendly interface. It is recommended to be used with PG inverter and TBB battery.

For more details about the interface, please refer the manual with the VS28-LS.

After connecting the VS28-LS and PG inverter, press the "POWER" power button to turn on/off PG. Press the "AC" button on VS28-LS to control the inverter AC output of PG.



4.2.2 Without VS28-LS

If VS28-LS is not equipped, PG can be turned on and off through the ON/OFF Switch pin on the COM port (Table 2-3 COM cable feet definitions).

5. Trouble shooting

5.1 Fault code

The “fault” LED  will flash when a fault happened. And more detailed description can be checked on VS28-LS's screen.

No.	Fault LED indication	VS28-LS message	Comments and recommended actions
01	Flashing continuously once	INV: Output short circuit [ERR 101]	Check if there is a short circuit at loads.
02	Flashing continuously twice	INV: Output overload protection [ERR 102]	Switch off part of the AC loads
03	Flashing continuously 3 times	INV: Output over current [ERR 103]	1.Check the ac loads. 2. Restart the inverter. Contact your installer if it still exists.
04	Flashing continuously 4 times	INV: Interior over voltage [ERR 104]	Restart the inverter. Contact your installer if it still exists.
05	Flashing continuously 5 times	INV: MPPT over current [ERR 105]	Restart the inverter. Contact your installer if it still exists.
06	Flashing continuously 6 times	INV: MPPT hardware error [ERR 106]	Restart the inverter. Contact your installer if it still exists.
07	Flashing continuously 7 times	INV: DCDC over current [ERR 107]	Restart the inverter. Contact your installer if it still exists.
08	Flashing continuously 8 times	INV: DCDC hardware error [ERR 108]	Restart the inverter. Contact your installer if it still exists.
09	Flashing continuously 9 times	INV: 48V BAT under voltage [ERR 109]	1.48V backup battery undervoltage, please check the status and connection. 2. Connect to a valid grid or generator. Restart the inverter and charge the battery.
10	Flashing continuously 10 times	INV: 48V BAT over voltage [ERR 110]	48V backup battery overvoltage, please check the status and external voltage of battery

11	Flashing continuously 11 times	INV: PSU error [ERR 111]	Restart the inverter. Contact your installer if it still exists.
12	Flashing continuously 12 times	INV: ROM error [ERR 112]	Restart the inverter. Contact your installer if it still exists.
13	Flashing continuously 13 times	INV: Device over temperature [ERR 113]	1. Check the ventilation and heat dissipation of the inverter, and check if the installation environment temperature is too high. 2. Restart the inverter. Contact your installer if it still exists.
14	Flashing continuously 14 times	INV: Device under temperature [ERR 114]	1. Check if the installation environment is too low temperature. 2. Restart the inverter. Contact your installer if it still exists.
15	Flashing continuously 15 times	INV: Interior sensor error [ERR 115]	Restart the inverter. Contact your installer if it still exists.
16	Flashing continuously 16 times	INV: Interior hardware error [ERR 116]	Restart the inverter. Contact your installer if it still exists.

5.2 Warning code

When the “Alarm” LED  is flashing, please check the message on VS28-LS or refer the below table to confirm the reason and take recommended action.

No.	Warning LED indication	VS28-LS message	Comments and recommended actions
01	Flashing continuously once	INV: 48V BAT low voltage [ALM 001]	Shut down unnecessary loads and charge the battery at the soonest
02	Flashing continuously twice	INV: Fan failure [ALM 002]	Fan abnormal. Check if the fan is stuck and contact the service.
03	Flashing continuously 3 times	INV: Output overload alarm [ALM 003]	Reduce AC loads
04	Flashing continuously 4 times	INV: Device temperature is high [ALM 004]	Inverter over-temp alarm. Check the ventilation condition and installation environment.

05	Flashing continuously 5 times	INV: Input voltage is high [ALM 005]	Check the AC input voltage.
06	Flashing continuously 6 times	INV: Input over frequency [ALM 006]	Check the AC input frequency
07	Flashing continuously 7 times	INV: Input under frequency [ALM 007]	Check the AC input frequency
08	Flashing continuously 8 times	INV: GND wire disconnect [ALM 008]	Check the grounding connection. Or there is abnormality inside the inverter, please contact the service.
09	Flashing continuously 9 times	INV: MPPT temperature is high [ALM 009]	Check the environment temp. Or there is abnormality inside the inverter, please contact the service.
10	Flashing continuously 10 times	INV: MPPT temperature is low [ALM 010]	Check the environment temp. Or there is temp sensor abnormality inside the inverter, please contact the service.
11	Flashing continuously 11 times	INV: DCDC temperature is high [ALM 011]	Check the environment temp. Or there is temp sensor abnormality inside the inverter, please contact the service.
12	Flashing continuously 12 times	INV: DCDC temperature is low [ALM 012]	Check the environment temp. Or there is temp sensor abnormality inside the inverter, please contact the service.
13	Flashing continuously 13 times	INV: 12V output load is high [ALM 013]	Reduce DC 12V loads
14	Flashing continuously 14 times	INV: 12V output voltage is high [ALM 014]	Check the 12V DC output voltage and contact the service
15	Flashing continuously 15 times	INV: PV input voltage is high [ALM 015]	Check the connection of PV side and the voltage.
16	Flashing continuously 16 times	INV: Communication fault [ALM 016]	Check the CAN communication connection and contact the service.

6. Specifications

Model	PG6.0S	PG8.0S
Inverter Charger		
Nominal battery voltage	48V	
Input voltage range	40~57V	
Zero load power/ Static power	≤400mA / ≤1mA	
Cont. output power @25°C (VA)/ (W)	6.0kVA /6.0kW	8.0kVA /8.0kW
Peak Power (2s)	12.0kW	16.0kW
AC output voltage/frequency	230V±2%, 50Hz±0.1%	
Power factor cos Φ	1	
Inverter / AC Charger Efficiency	Max: 96%,Full load: 95.5%	Max: 96%,Full load:95%
Harmonic distortion (THDV)	≤2%	
AC IN voltage/frequency	AC 176V~264V, 45~65Hz	
Max AC charge current	110A@48V	150A@48V
Input Power factor	≥0.99	
Transfer time	2ms (<15ms in Weak AC source mode)	
AC input current	MAX 40A (Default 40A)	
Bi-directional Converter Charger		
ALT Voltage	12V/24V	
Static power	<1mA@12V ALT, <2mA @24V ALT	
ALT current	120A @12V/24V ALT	
Auxiliary Battery Max. Charge/Discharge current	30A(48V BAT)@12V ALT, 60A(48V BAT)@24V ALT	
Converter Power	1500W@12V ALT, 3000W@24V ALT	
Efficiency	Maximum: 95.5%, Full load: 94.8% @12V ALT Maximum: 97.5%, Full load: 97.0% @24V ALT	
MPPT		
PV input voltage range	PV panels Voc: 15~60V @ 25°C	
Max PV short circuit current	60A	
Max power of PV panels	1800W	
Max Charging Current	30A	
Efficiency	Maximum: 96%, Full load: 95% @30V	
MPPT efficiency	>99.5%	
Others		
Dry contact output	Yes, 28VDC/3A	
Insulation guard	Yes (Disabled by default)	
Dimension	506.6*351.2*88.1mm	
Weight	12.5kg	
Cooling	Forced fan	
Noise	≤55db	≤62db
IP rating	IP20	
Altitude	0~5000m (Derating when >2000m)	
Operating temperature range	-30°C~65°C (Derating when > 30°C)	
Storage temperature range	-40°C~75°C	
Humidity	5%~95%, Non condensation	



TBB POWER (XIAMEN) CO., LTD

✉ sales@tbbpower.com

☎ +86-592-5212299

☎ +86-592-5796070

🌐 www.tbbpower.com

Visit official website for more information.