



Pure Sine Wave Inverter

User Manual



Models:

TP10K/TP10KB
TP20K/TP20KB
TP30K/TP30KB
TP40K/TP40KB

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Important Safety Instructions

Please reserve this manual for future review.

This manual contains all the safety, installation, and operation instructions for the TPower series pure sine wave inverter ("inverter" referred to in this manual).

1. Explanation of symbols

Please read related literature accompanying the following symbols to use the product and efficiently ensure personal and property safety.

Please read the related words carefully when encountering the following symbols in the manual.

Symbol	Definition
	Indicate any practical advice for reference.
	IMPORTANT: Indicate a critical tip during the operation. If ignored, the device may run in error.
	CAUTION: Indicate potential hazards. If not avoided, it may cause the device to be damaged.
	WARNING: Indicate the danger of electric shock. If not avoided, it would cause casualties.
	WARNING HOT SURFACE: Indicates the risk of high temperature, if not avoided, would cause scalds.
	Read the user manual carefully before any operation.

Symbols of inverter

	This symbol indicates that after disconnecting the inverter from the grid and battery bank, you should wait for five minutes before touching the internal conductive devices.
	Read the instructions before performing any operation on the inverter.
	Danger! Electric Shock Risk! There are live devices here, only professional and qualified personnel can install and operate it.

	The entire system should be installed by professional and technical personnel.
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2. Requirements for professional and technical personnel

- Professionally trained.
- Familiar with related safety specifications for the electrical system.
- Read this manual carefully and master related safety cautions.


3. Professional and technical personnel is allowed to do

- Install the inverter at the specified location.
- Conduct trial operations for the inverter.
- Operate and maintain the inverter.



4. Safety cautions before installation

 IMPORTANT	<p>When receiving the inverter, please first check if any damage occurred in transportation. If you find any problem, don't hesitate to contact the transportation company or our company.</p>
 CAUTION	<ul style="list-style-type: none"> • When placing or moving the inverter, follow the manual's instructions. • When installing the inverter, evaluate whether the operation area has any arc danger. • The inverter needs to be connected to a battery. The battery's minimum capacity (Ah) is recommended to be five times the current, which equals the inverter's rated output power divided by the battery's voltage.
 WARNING	<ul style="list-style-type: none"> • Please do not place the inverter in places where children can touch it. • The inverter is off-grid type, and it is strictly prohibited to be connected to the grid; otherwise, the inverter would be damaged. • The inverter is only allowed for stand-alone operation. It is prohibited to connect multiple units' output in parallel or in series; otherwise, the inverter will be damaged.

5. Safety cautions for mechanical installation



 WARNING	<ul style="list-style-type: none"> • Before installation, ensure the inverter has no electrical connection. • Ensure the heat dissipation space for the inverter installation. Do not install the inverter in humid, salt spray, corrosion, greasy, flammable, explosive, dust accumulative, or other severe environments.
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6. Safety cautions for electrical connection

 CAUTION	<ul style="list-style-type: none"> • Check if all the wiring connections are tight to avoid the danger of heat accumulation due to a loose connection. • The inverter shell must be connected to the ground. The cross-section of the connection cable should not be less than 10mm² for TP10K/TP10KB series, and not be less than 16mm² for TP20K/TP20KB~TP40K/TP40KB series • The DC input voltage must strictly follow the parameter table. Too high or low DC input voltage will damage the inverter's normal operation. • The connection length between the battery and the inverter is recommended to be less than 3 meters. If greater than 3 meters, please reduce the current density of the connection wire. • A fast-acting fuse or breaker should be used between the battery and the inverter, whose rated current should be twice the nominal input current. • DO NOT install the inverter close to the flooded lead-acid battery because the terminals' sparkle may ignite the hydrogen released by the battery.
 WARNING	<ul style="list-style-type: none"> • Both utility input and AC output are of high voltage, do not touch the wiring connection to avoid electric shock. • The AC output terminal is only for the load connection. Do NOT connect it to another power source or utility. Otherwise, the inverter will be damaged. Turn off the inverter when connecting loads. • It is strictly forbidden to connect a transformer or a load with a surge power (VA)


	<p>exceeding the overload power at the AC output port. Otherwise, the damage will be caused to the inverter.</p> <ul style="list-style-type: none"> Do not connect battery chargers or similar products to the input terminal of the inverter. Otherwise, the inverter will be damaged.
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7. Safety cautions for inverter operation

 WARNING HOT SURFACE	When the inverter works, the cover temperature is very high because of the accumulated heat; please do not touch it.
 CAUTION	Please do not open the inverter cabinet to operate when the inverter is working.

8. The dangerous operations which would cause an electric arc, fire, or explosion

- Hot-plug the high-voltage fuse on the inverter DC side.
- Touch the wire end, which may be electriferous and hasn't been insulation treated.
- Touch the wiring copper row, terminals, or internal devices, which may be electriferous.
- The power cable connection is loose.
- Screw or other spare parts inadvertently falls into the inverter.
- Improper operations by untrained non-professional or technical personnel.


 WARNING	Once an accident occurs, it must be handled by professional and technical personnel. Any incorrect operation would cause a more severe accident.
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9. Safety cautions for stopping the inverter

- Firstly turn off the breakers on the utility input side and AC output side, then turn off the DC switch;
- After the inverter stop working for five minutes, the internal conductive devices can be touched;
- The inverter can be restarted after removing the faults which may affect its safety performance;
- There are no maintenance parts in the inverter; please get in touch with our after-sales service personnel if any maintenance service is required.

10. Safety cautions for inverter maintenance

- Testing equipment is recommended to check the inverter to make sure there is no voltage or current;
- When conducting electrical connection and maintenance work, must post temporary warning signs or put up barriers to prevent unrelated personnel from entering the electrical connection or maintenance area;
- Improper maintenance operation to the inverter may cause personal injury or equipment damage;
- Please wear an anti-static wrist strap to prevent static damage or avoid unnecessary contact with the circuit board.

 CAUTION	The inverter's safety mark, warning label, and nameplate should be visible, not removed or covered.
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1 Product Overview

1.1 Information & Features

The TPower series is designed as a pure sine wave inverter, which converts 110/220VDC to 220/230VAC. This device consists of a DC-AC inverting module and an AC-AC bypass module. It also features high reliability, high efficiency, a simple appearance, full protection, easy installation, and operation functions.

DC-AC inverting module is an intelligent and fully digitally designed component with advanced SPWM technology. The module is designed with the pure sine wave output to convert 110/220VDC to 220/230VAC for multiple AC loads, such as home appliances, electric tools, industrial devices, audio equipment, and solar photovoltaic system.

AC-AC bypass module used an advanced control algorithm to ensure output voltage stability and achieve the fast switching feature. Also, the high reliability and high-performance semiconductor inside the module reduces the size and prolongs service life.

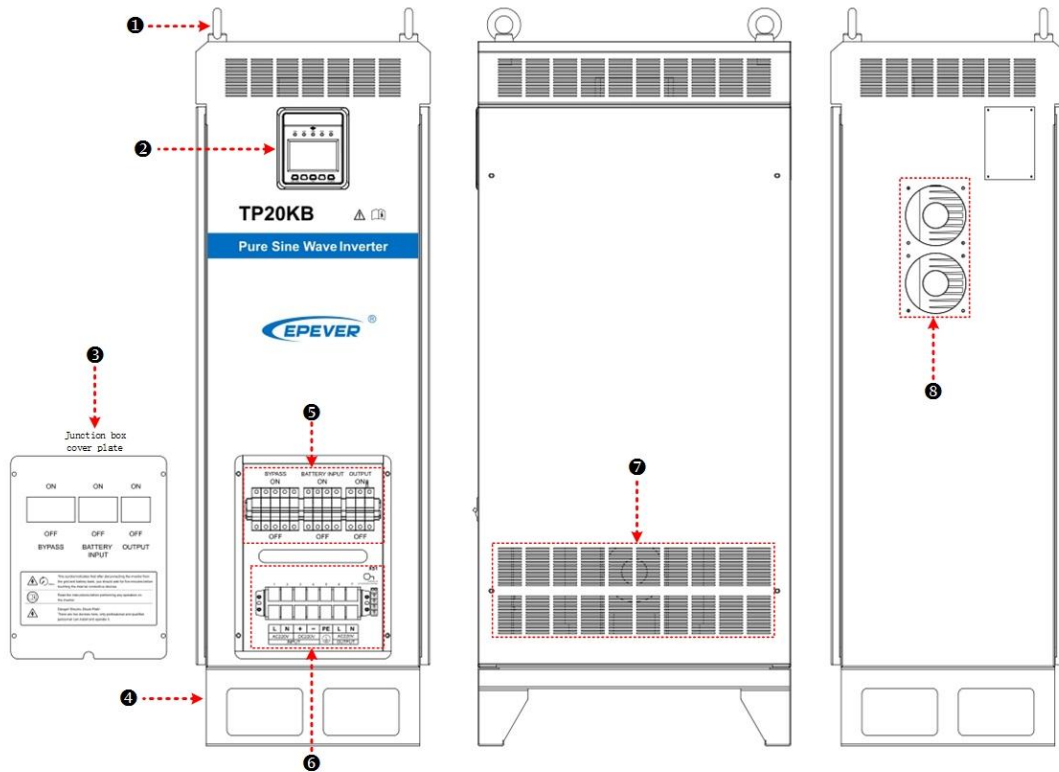
The 4.2 inches segment type of LCDs the system operation data and states in real-time.

The case in sheet-metal design is featured with high intensity and shielding electromagnetic interference. Also, the universal rotary caster is optional for the system, which contains lifting support feet to fix or move the inverter at any time and improve product mobility and flexibility.

Features:

- Advanced SPWM technology and pure sine wave output
- Fully digitalized voltage and current double closed-loop control
- Low output harmonic distortion (THD \leq 3%)
- Mode selection of bypass priority and inverter priority
- Output voltage 220/230VAC and frequency 50/60Hz selectable
- Real-time power query and output power statistics function
- Automatic protection features against short circuits, overheating, and overload.
- 4.2 inches LCD shows the system operation data and state dynamically with a friendly AI interface
- Multiple LED indicators show the operating status of the system in real-time
- Designed with soft boot control to avoid the battery being damaged by high current impact when turning on the system
- AC OUT button controls the AC output individually
- Smart fan control reduces energy consumption and noise
- Use popular semiconductor modules with high reliability and low power consumption
- Designed with a remote switch & RS485 communication interface to achieve the features of remote monitoring and hardware Stop & Start, also the Wi-Fi and Bluetooth communication modules are selectable
- Universal rotary caster is optional for free movement and fixation.
- Modular design, easy maintenance, and repair

1.2 Structure



①	Ring 2 pieces	Carry the inverter.
②	Display unit	Include LED indicators, LCD, and buttons to indicate and display system operation state and parameters. See Chapter 3 .
③	Junction box cover plate	To cover the terminals and circuit breakers.
④	Base ⁽¹⁾	To fix the inverter
⑤	Input/output circuit breaker group ⁽²⁾	Protective devices to safely cut off the current.
⑥	Input /Output terminal ⁽²⁾	Wire connection with utility, battery, load, and grounding.
⑦	Heat dissipating hole	Dissipate the heat inside the inverter.
⑧	Fan ⁽³⁾	Forced cooling for the inverter.

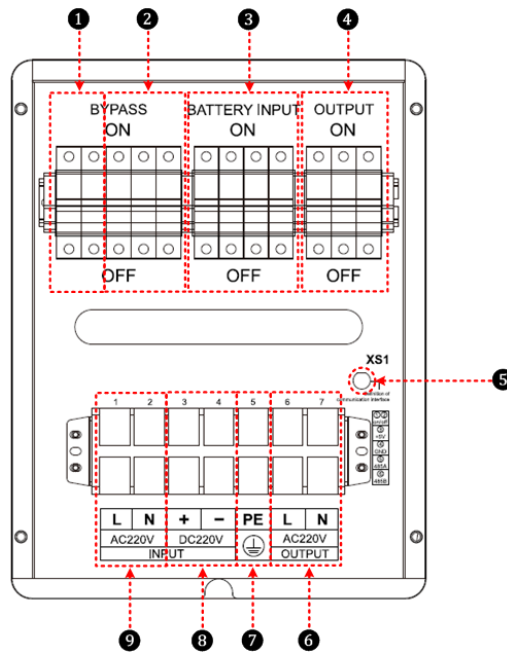
(1) FOOT MASTER caster(Optional accessory)



Rotate clockwise to raise the supporting feet, then to move the inverter.

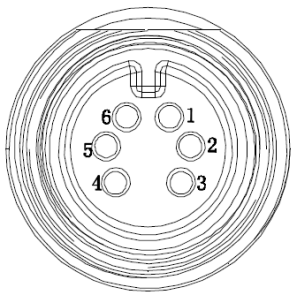
Rotate counterclockwise to lower the supporting feet, then to fix the inverter.

(2) Terminals and breakers



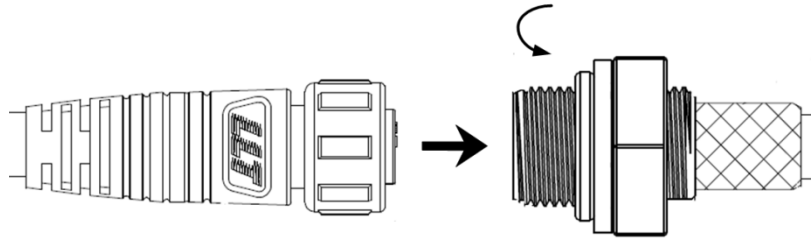
❶	Bypass input arrester	❷	AC output terminals
❸	Bypass input breaker	❸	Grounding terminal
❹	Battery input breaker	❹	Battery input terminals
❺	AC output breaker	❺	Bypass input terminals
❻	Remote switch & RS485 communication port★		

★Remote switch & RS485 communication port pin definitions:



1-Red 2-White	ON/OFF
3-Yellow	+5Vdc
4-Black	GND
5-Blue	485A
6-Green	485B

★Interface connection method :



(3) DC fan and AC fan

DC fan (2 pieces):

When the radiator temperature rises to 45°C above, the DC fans will start; the DC fans will stop when the radiator temperature declines to 35°C below.

<p>! IMPORTANT</p>	<p>DC fans have the self-checking function when the inverter is powered. The DC fans would automatically run for three seconds.</p>
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AC fan (3 pieces):

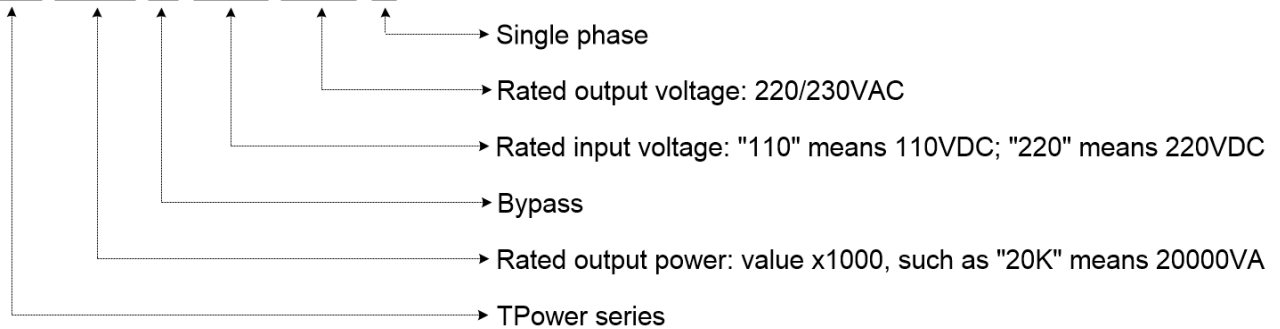
Inverter priority:

The AC fans will start when the internal temperature rises to 35°C above and with inverter output.

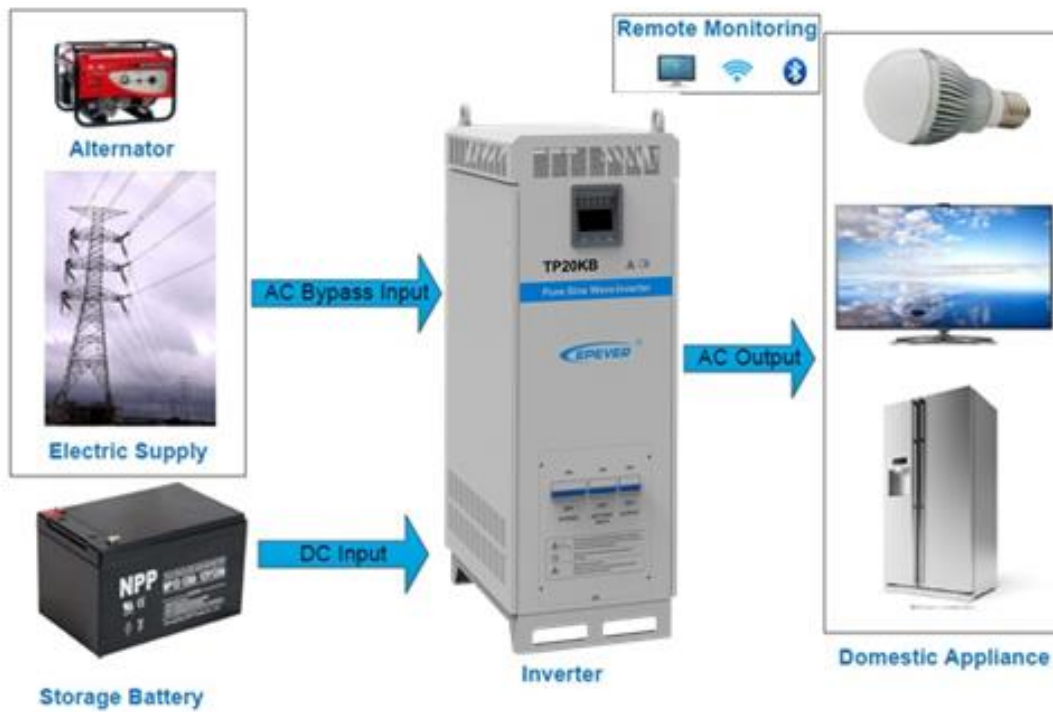
The AC fans will stop when the internal temperature declines to 30°C below or with no inverter output.

1.3 Naming rule

TP 20K B-220/220-1



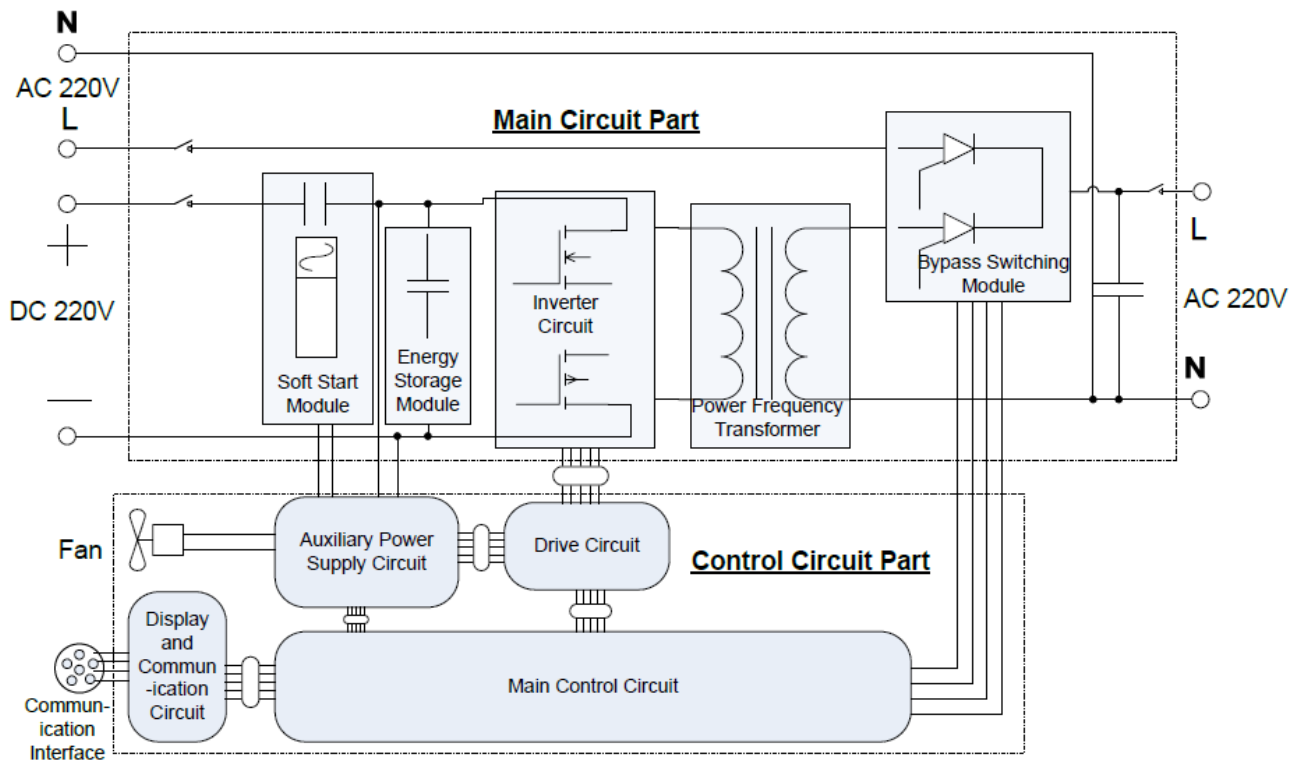
1.4 Connection schematic diagram



WARNING

The AC equipment must be determined according to the output power of the inverter. Do not connect the load exceeding the inverter's maximum input power. Otherwise, the inverter may be damaged.

1.5 Electrical schematic diagram



2 Installation

2.1 Attentions

- Please read the manual carefully to familiarize yourself with the installation steps.
- Be very careful when installing the batteries, especially flooded lead-acid batteries. Please wear eye protection, and have fresh water available to rinse if there is any contact with battery acid.
- Keep the battery away from metal objects, which may cause a short circuit.
- Loose connections and corroded wires may produce high heat that can melt wire insulation, burn surrounding materials, or even cause a fire. Ensure tight connections, use cable clamps to secure cables, and prevent them from swaying in motion.
- Select the system connection cables according to the current density no higher than 5A/mm². (Following the National Electrical Code Article 690, NFPA70).
- For outdoor installation, keep out of the direct sunshine and rain infiltration.
- High voltage exists inside the inverter after turning off the switch. Do not open or touch the internal devices and wait five minutes before conducting related operations.
- Do not install the inverter in humid, salt spray, corrosion, greasy, flammable, explosive, dust accumulative, or other severe environments.
- Prohibit reverse connection at the battery input end; otherwise, it will easily damage the equipment or cause unpredictable danger.
- Both utility input and AC output are high voltage; please do not touch the wiring connection.
- When the fan is working, please do not touch it to avoid injury.

2.2 Wire & breaker selection

Wiring and installation mode should comply with national and local electrical code requirements.

- **Wire and circuit breaker selection for utility input**

Model	Utility wire size	Breaker
TP10KB	25mm ² /3AWG	AC/2P—63A
TP20KB	35mm ² /1AWG	AC/2P—100A
TP30KB	42mm ² /1AWG	AC/2P—150A
TP40KB	50mm ² /1/0AWG	AC/2P—200A


- **Wire and circuit breaker selection for battery**

Model	Battery wire size	Breaker
TP10K TP10KB	35mm ² /1AWG(110VDC)	DC/2P—125A
	25mm ² /3AWG(220VDC)	DC/2P—63A
TP20K TP20KB	35mm ² /1AWG	DC/2P—125A

TP30K TP30KB	42mm ² /1AWG	DC/2P—200A
TP40K TP40KB	50mm ² /1/0AWG	DC/2P—250A

• **Wire and circuit breaker selection for AC output**

Model	AC wire size	Breaker
TP10K TP10KB	25mm ² /3AWG	AC/2P—63A
TP20K TP20KB	35mm ² /1AWG	AC/2P—100A
TP30K TP30KB	42mm ² /1AWG	AC/2P—150A
TP40K TP40KB	50mm ² /1/0AWG	DC/2P—200A

 IMPORTANT	<ul style="list-style-type: none"> • The wire size is for reference only. Use thicker wires to lower the voltage drop and improve the system performance when the distance between utility and inverter or between inverter and batter is far. • The above wire size and circuit breaker size are for recommendation only. Please choose a suitable wire and circuit breaker according to the practical situation.
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2.3 Mounting

Installation steps:


Step 1: Professional personnel read this manual carefully.

Step 2: Determine the installation location and heat dissipation space.

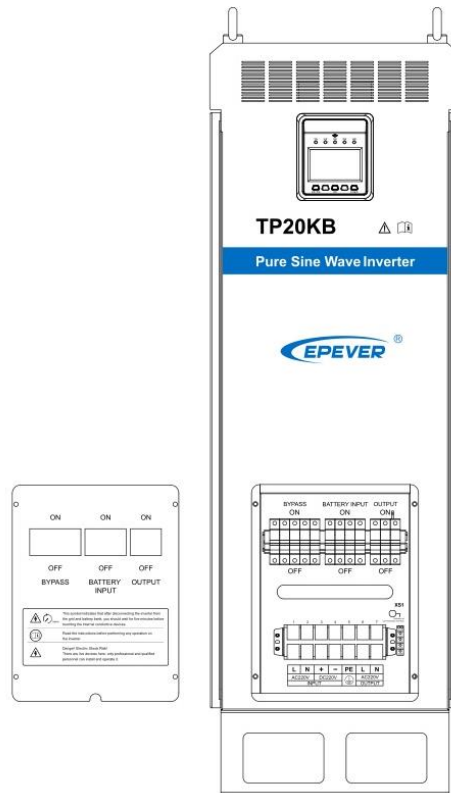
Move the equipment: as the equipment is relatively large, it is recommended to use a forklift or crane; if the ground is flat, it can be moved by wheels.

Place the equipment: As the equipment is heavy, it is recommended to be placed on flat ground, with 300mm space reserved all around, to ensure heat dissipation.

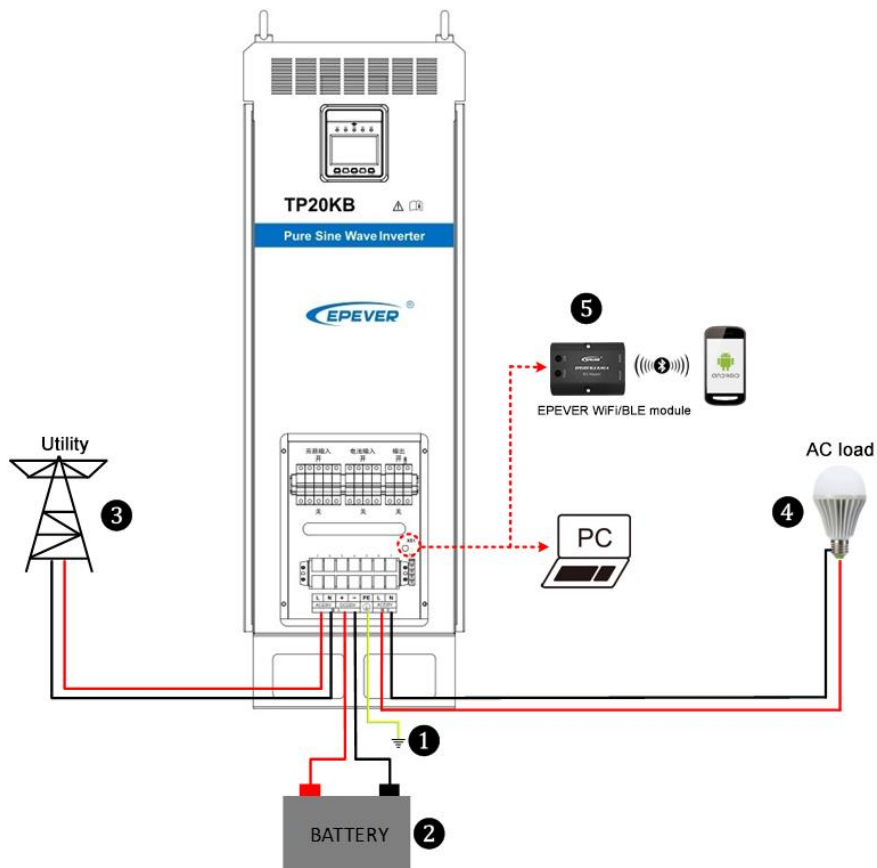
Fix the equipment: If the optional caster is chosen, rotate counterclockwise to fix and turn clockwise to move.

 WARNING	<p>Risk of explosion!</p> <p>Never install the inverter with flooded batteries in a sealed enclosure! Do not install the device in a confined area where battery gas can accumulate.</p>
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Step 3: Takedown the junction box cover plate with special tools.




Step 4: Wiring





Wiring order:

① Ground — ② Battery — ③ Utility — ④ AC loads

 WARNING	Never connect the utility to the inverter output; otherwise, the inverter may be damaged.
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• **Grounding**

The voltage of the whole system exceeds the safety voltage level. Thus reliable grounding is needed. The grounding wire shall be the thicker wire no less than 35mm²) and shall be as short as possible. The grounding point shall be as close as possible to the inverter.

 CAUTION	When wiring, follow the order ① ② ③ ④ to connect the cables to the equipment, then follow the order ① ② ③ ④ to connect the ground, battery, utility, and load.
 WARNING	<ul style="list-style-type: none"> • Ensure all the wiring connections are reliable; otherwise, massive heat would accumulate at the connection points to damage the terminals or even cause a fire. • Danger, high voltage! Terminals of the Utility input, AC output, and DC input produce high voltage, do not close the breakers during wiring, and ensure each component's correct polarity.

Step 5: Connect accessories

Connect the WIFI module or Bluetooth module to the inverter. And then, the end-users can real-time monitor the inverter's running status or set related parameters by the phone APP.

Connect the inverter to the PC through communication cables and an RJ45 adapter. And then, the end-users can real-time monitor the inverter's running status or set related parameters by the PC software.

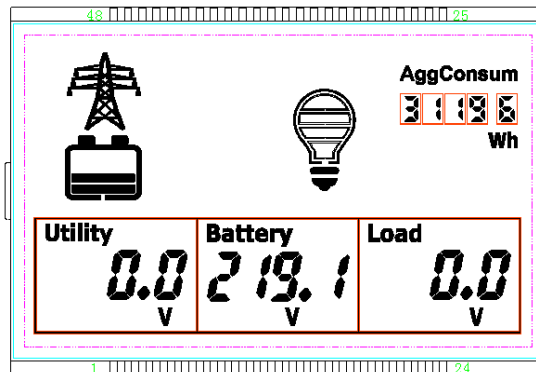
Note: For detailed accessories, refer to the *TPower-1P Accessories* file.

Step 6: Double-check the reliability of wiring connections.

Step 7: Put on the cover plate.

Indicator: Inverter indicator on solid

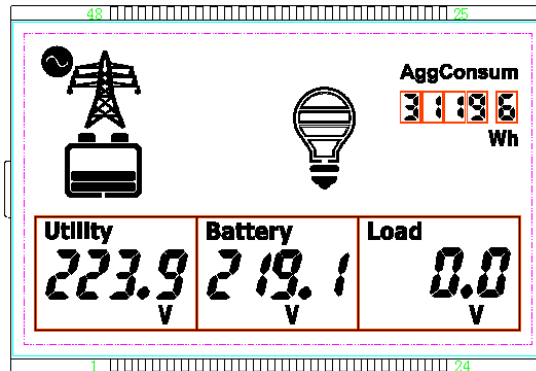
LCD:



Step 8: Connect the bypass circuit breaker

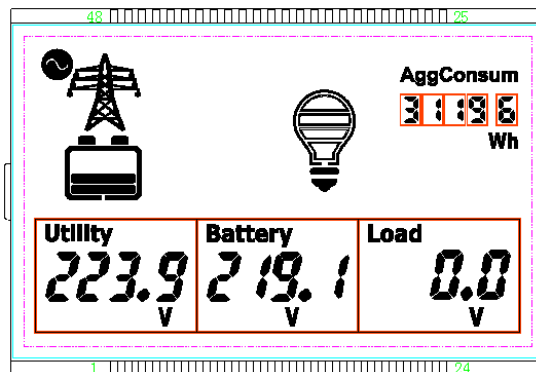
The indicator: Utility indicator on solid

LCD:



Step 9: Connect the load circuit breaker

LCD:



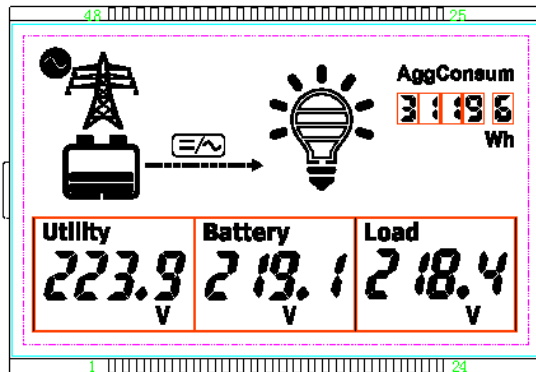
Step 10: Inverter output

Method 1: Press the "AC output" button for 3 seconds, and the inverter will start the output.

Method 2: Connect the remote switch, short-circuit cable 1(red), cable 2(white) of the remote switch, and RS485 communication interface; the inverter would start the output.


Indicator: The inverter indicator is slowly flashing, and the load indicator is ON solid.

LCD:



Step 11: Turn on the load


LED indicators: Inverter and load indicators are slowly flashing.


 CAUTION	<ul style="list-style-type: none">• Suppose the power is supplied to the different AC loads. In that case, it is suggested to turn on the loads with a larger surge current till the load normally works, then turn on the loads with a smaller surge current. Especially for inductive loads, they should
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	<p>be turned on one by one. Please do not turn on the loads simultaneously to avoid excessive impact on the inverter and shorten its life span.</p> <ul style="list-style-type: none"> • If the inverter is not in regular operation, or the LCD or indicator displays abnormality, refer to Section 5 to clear the fault or contact the after-sale service personnel of our company.
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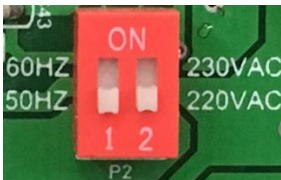
Step 12: Power off the equipment

1. Disconnect the AC load circuit breaker.
2. Press and hold the "AC output" button to turn off the inverter output.
3. Disconnect the bypass circuit breaker.
4. Disconnect the battery circuit breaker.

 WARNING	<ul style="list-style-type: none"> • As electricity exists in the capacitance, the LCD screen would be off after 30 seconds; wait 5 minutes before opening the equipment to repair. • The inverter has a soft stat design and only takes effect when it starts. Do not frequently switch the input circuit breaker when the inverter is incompletely powered off. Otherwise, the input battery would undergo a high current impact. The input circuit breaker can be connected again after the LCD screen is off.
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 WARNING	<p>After the inverter is disconnected from the utility and battery bank, you must wait 5 minutes before touching the internal conductive devices.</p>
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2.4 Output voltage/frequency grade switch




When the dial switch 1 is placed to the ON side, the output frequency is 60Hz, otherwise it is 50Hz,

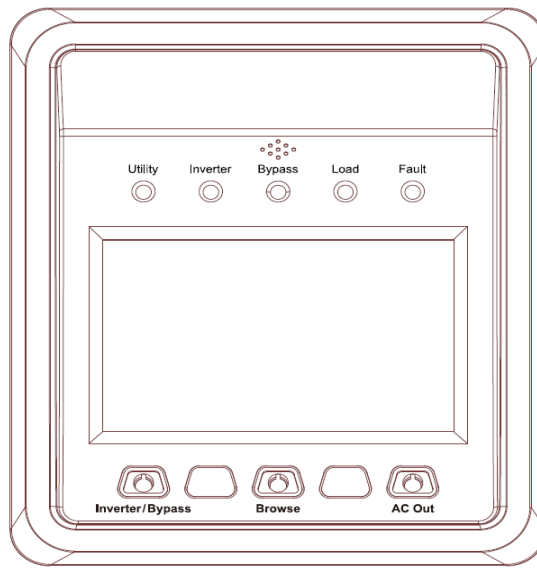
When the dial switch 2 is placed to the ON side, the output voltage is 230VAC, otherwise it is 220VAC.

Operating steps:

Open the cover plate on the inverter's right side and find the dial switches on the control board at the top left corner; see the picture above. Set the output voltage/frequency according to demand, then restart the inverter to take effect.

 IMPORTANT	<ul style="list-style-type: none"> • The factory default output voltage is 220VAC, and the output frequency is 50Hz. • The accessories can refer to the Packing List.
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3 Interface



3.1 Indicator

Indicator	Color	Status	Instruction
Utility	Green	OFF	No utility input
		On Solid	Utility input but no load
		Slowly Flashing(0.5Hz)	Utility bypass with load
		Fast Flashing(2.5Hz)	Utility fault
Inverter	Green	OFF	Inverter OFF
		On Solid	Inverter Priority
		Slowly Flashing(0.5Hz)	Inverter working
		Fast Flashing(2.5Hz)	Inverter fault
Bypass	Green	OFF	Bypass OFF
		On Solid	Bypass Priority
		Slowly Flashing(0.5Hz)	Bypass working
		Fast Flashing(2.5Hz)	Bypass fault
Load	Green	OFF	Power off the inverter
		On Solid	AC output but no load
		Slowly Flashing(0.5Hz)	AC output with load
		Fast Flashing(2.5Hz)	Output voltage abnormal
Fault	Red	OFF	Inverter normal
		On Solid	Inverter fault

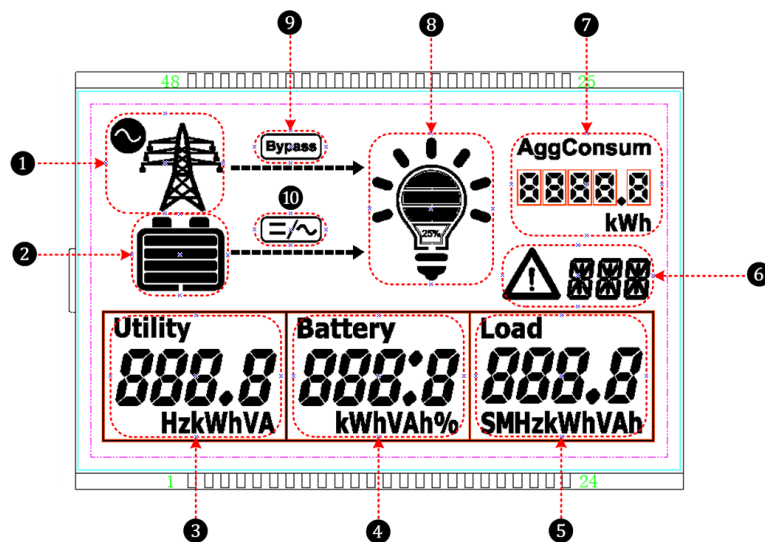
3.2 Buzzer

Buzzer	Instruction
No beep	No operation and fault
One beep	Operation succeed
Buzzer beep every10s	Fault prompt
Buzzer beep every1s	Fault warning

3.3 Buttons

Button	Operation	Instruction
Inverter/Bypass	Press the button	Return the voltage interface quickly
	Press the button and hold on 3s	Switch the inverter and bypass mode
Browse	Press the button	Browse the Utility/Battery/Load column parameters
	Press the button and hold on 3s	Browse the Utility/Battery/Load column parameters quickly
AC output	Press the button and hold on 3s	Switch the inverter output and no output mode
Inverter/Bypass + Browse	Press the button and hold on 3s	Clear the generated energy
Browse + AC output	Press the button and hold on 3s	Clear the faults









3.4 LCD Display



The LCD can be viewed clearly when the angle between the end-user's horizontal sight and the LCD screen is within 90°. If the angle exceeds 90°, the LCD cannot be viewed clearly.

①	Utility	⑥	Fault code
②	Battery	⑦	AggConsum
③	Utility parameters Voltage/Current/Power/Frequency	⑧	Load status
④	Battery parameters Voltage/Current/Power	⑨	System running in bypass status
⑤	Load parameters Voltage/Current/Power/Frequency	⑩	System running in inverter status

3.5 Icon

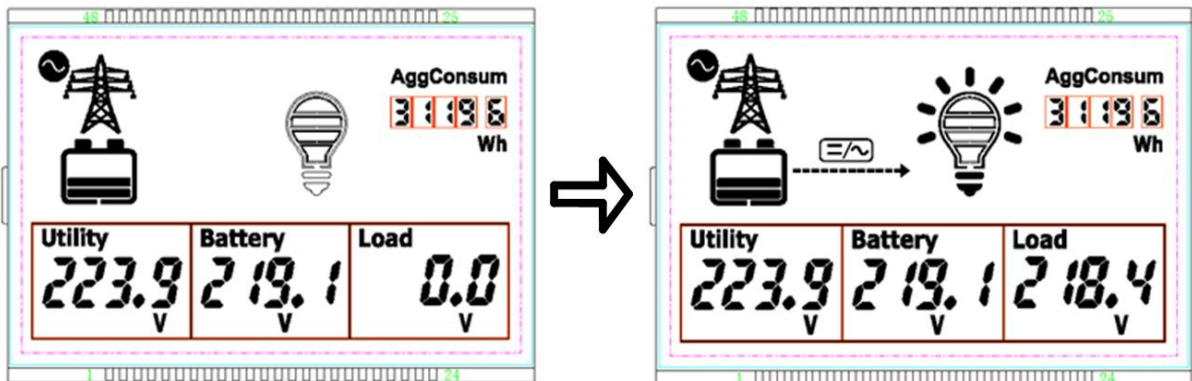
Icon	Instruction	Icon	Instruction
	No Utility connecting		Load≤25%
	Utility connecting		Load(25~50%)
	Inverter output ON		Load(50~75%)
	Inverter output OFF		Load(75~100%)

3.6 Operation

1) Turn on the load:

Operation:

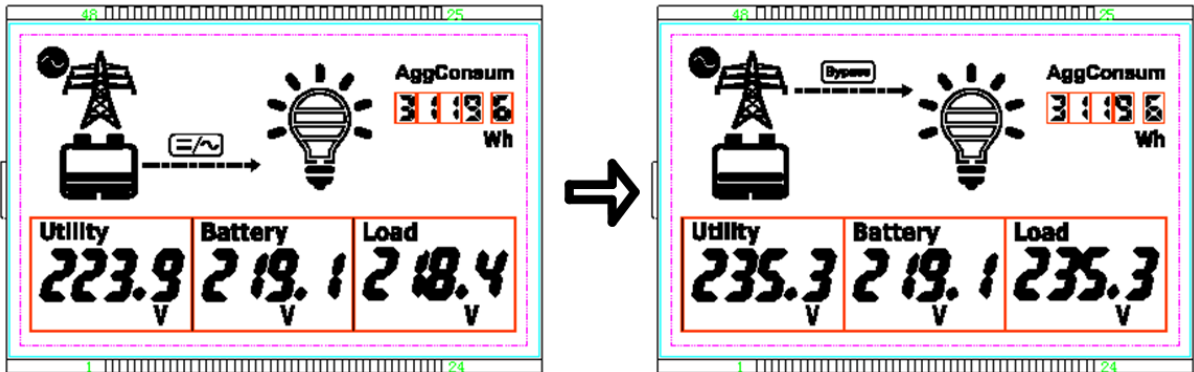
Press the "AC output" button for 3 seconds; the load indicator changes to ON status.



2) Switch from inverter mode to bypass mode

Operation:

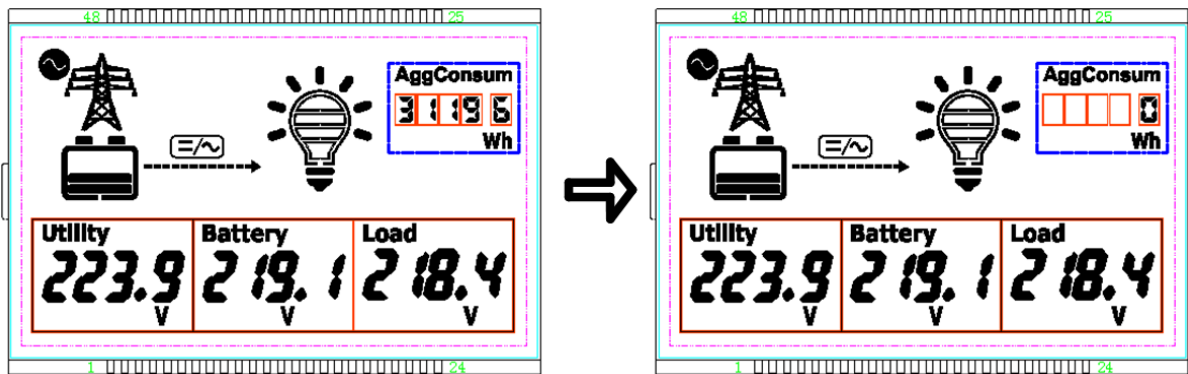
Press the "inverter/bypass" button for 3 seconds; the bypass indicator changes from off to solid on, inverter indicator changes to off status.



3) Clear electricity mode

Operation:


Press the "inverter/bypass" and "browse" buttons for 3 seconds together to clear the accumulated consumed electricity.



4) Clear fault

Operation:

Under failure state, short press any button, and the buzzer would stop sounding, but the failure code would still be displayed.

 IMPORTANT	In the unrecoverable fault mode, press and hold the "Browse + AC output" buttons to clear the fault, and the inverter will resume output. It is confirmed that the fault has been eliminated before pressing the buttons.
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4 Protection

Protection	Phenomenon	Protection	Recovery
Input reverse polarity protection	When the DC input reverses polarity, the LCD is off.	The inverter will not be damaged.	It resumes work after correction.
Input over voltage protection	Inverter mode: The DC input voltage exceeds the max. input voltage Fault code "IOV" Buzzer beeps in short cycle	The inverter stops working and switches to the bypass mode. The AC output continues (If no bypass input is available or the bypass circuit breaker is disconnected, the AC output is stopped.)	The fault warning stops when the input voltage resumes normal, and the system auto switches to the inverter mode.
	Bypass mode: The DC input voltage exceeds the max. input voltage Fault code "IOV" Buzzer beeps in a long cycle	The bypass works normally, and the AC output continues.	When the input voltage is normal, the fault warning stops.
Input low voltage protection	Inverter mode: The DC input voltage is lower than the min. input voltage Fault code "ILV" Buzzer beeps in short cycle	The Inverter stops working and switches to the bypass mode. The AC output continues (If no bypass input is available or the bypass circuit breaker is disconnected, the AC output is stopped.)	The fault warning stops when the input voltage resumes normal, and the system auto switches to the inverter mode.
	Bypass mode: The DC input voltage is lower than the min. input voltage Fault code "ILV" Buzzer beeps in a long cycle	The bypass works normally, and the AC output continues.	When the input voltage is normal, the fault warning stops.
Output voltage abnormal	The AC output voltage exceeds the range of 220±20Vac Fault code "OVA"	The AC output stops.	The AC output voltage recovers to the range of 220±20Vac.

	Buzzer beeps in short cycle		
Output overload	The output power is 1.1 times greater than the rated output power Fault code "OOL" Buzzer beeps in short cycle	The AC output stops.	Reduce the load power.
Output short circuit	Fault code "OSC" Buzzer beeps in short cycle	The load output is shut off immediately. And then, the load output is auto-recovered three times (The first delay is for 5 seconds, the second for 10 seconds, and the third for 15 seconds).	The load output is recovered after the short circuit failure is cleared. The output is auto-recovered every 24 hours after the fault happens. Clear the fault and restart the device manually; the load output recovers.
IGBT over current	Fault code "ISC" Buzzer beeps in short cycle	The load output is shut off immediately. And then, the output is auto-recovered three times (The first delay is for 5 seconds, the second for 10 seconds, and the third for 15 seconds).	Suppose the IGBT over-current state continues after three times auto-recovery. In that case, the output will recover only after the fault is cleared and the device is manually restarted.
Radiator over-temperature protection	The radiator temperature exceeds 85°C Fault code "ROT"	The AC output stops	When the temperature returns to normal, the fault warning disappears. And then, the AC output recovers.
Internal over-temperature protection	The internal temperature exceeds 60°C Fault code "IOT"	The AC output stops	When the temperature returns to normal, the fault warning disappears. And then, the AC output recovers.
Bypass overvoltage	Inverter mode: The bypass input voltage exceeds 264VAC Fault code "BOV" Buzzer beeps in a long cycle	The inverter works normally, and the AC output continues.	When the bypass input voltage returns to normal, the fault warning disappears.
	Bypass mode: The bypass input voltage exceeds 264VAC Fault code "BOV"	Auto switch to the inverter mode, and the AC output continues (if the inverter circuit has a fault, the AC output will stop).	When the bypass input voltage returns to normal, the fault warning disappears, and the device auto switches to the bypass mode.

	Buzzer beeps in short cycle		
Bypass low voltage	Inverter mode: The bypass input voltage lower than 176VAC Fault code "BLV" Buzzer beeps in a long cycle	The inverter works normally, and the AC output continues.	When the bypass input voltage returns to normal, the fault warning disappears.
	Bypass mode: The bypass input voltage is lower than 176VAC. Fault code "BLV" Buzzer beeps in a short cycle	Auto switch to the inverter mode, and the AC output continues (if the inverter circuit has a fault, the AC output will stop).	When the bypass input voltage returns to normal, the fault warning disappears, and the device auto switches to the bypass mode.
Bypass frequency abnormal	Inverter mode: The bypass input frequency exceeds 50Hz/60Hz±10% Fault code "BFA" Buzzer beeps in a long cycle	The inverter works normally, and the AC output continues.	When the bypass input frequency returns to normal, the fault warning disappears.
	Bypass mode: The bypass input frequency exceeds 50Hz/60Hz±10% Fault code "BFA" Buzzer beeps in a short cycle	Auto switch to the inverter mode, and the AC output continues (if the inverter circuit has a fault, the AC output will stop).	When the bypass input frequency returns to normal, the fault warning disappears, and the device auto switches to the bypass mode.
Communication fault	Fault code "CFA"	The AC output continues	Turn on/off the inverter through the remote switch at the communication interface.

5 Troubleshooting

➤ DC input troubleshooting

Fault	Fault Code	Working mode	LED indicators	Buzzer	Status	Troubleshooting
Input reverse polarity	—	—	—	—	LCD screen off	Correct the wire connection of DC input polarity.
Input over voltage	IOV	Inverter mode	Inverter indicator fast flashing	1S	Recover	Check whether the DC input voltage exceeds the max. input voltage. Recover when voltage declines to the rated input voltage.
		Bypass mode	Fault indicator on solid	10S		
Input low voltage	ILV	Inverter mode	Inverter indicator fast flashing	1S		Check whether the DC input voltage is lower than the min. input voltage. Recover when the voltage rises to the rated input voltage.
		Bypass mode	Fault indicator on solid	10S		

➤ Inverter output troubleshooting

Fault	Fault Code	Working mode	LED indicators	Buzzer	Status	Troubleshooting
Output voltage abnormal	OVA	—	Fault indicator on solid	1S	Recover	Check whether the inverter output voltage exceeds 220VAC±20.
Output overload	OOL	—	Fault indicator on solid		Locked up	Check whether the load power is greater than 1.1 times the rated power
Output short circuit	OSC	—	Fault indicator on solid		Check whether the inverter output line is short.	

➤ Utility input troubleshooting

Fault	Fault Code	Working mode	LED indicators	Buzzer	Status	Troubleshooting
Bypass overvoltage	BOV	Inverter mode	Bypass indicator fast flashing	10S	Recoverable	Check whether the bypass input voltage exceeds 264VAC. Recover when voltage declines to 220VAC.
		Bypass mode	Fault indicator on solid	1S		

Bypass low voltage	BLV	Inverter mode		10S		Check whether the bypass input voltage is lower than 176VAC. Recover when the voltage rises to 220VAC.
		Bypass mode		1S		
Bypass frequency abnormal	BFA	Inverter mode		10S		Check whether the bypass input frequency is in the range of 50Hz/60Hz±10%.
		Bypass mode		1S		

➤ **Others**

Fault	Fault Code	Working mode	LED indicators	Buzzer	Status	Troubleshooting
IGBT over current	ISC	Inverter mode	Inverter indicator fast flashing Fault indicator on solid	1S	Locked up	(1) After powering off, check whether the load is a short circuit. (2) Open the left cover plate after powering off for five minutes, check whether the IGBT screw or wire connection is loose, and check whether the IGBT is broken.
Radiator over temperature	ROT	—	Fault indicator on solid		Recoverable	Check whether the backside fan usually works. Reduce the load power.
Internal over temperature	IOT	—	Fault on solid			Check whether the AC fans are working normally. Reduce the load power Check whether the upside fan works normally; check whether the ambient temperature exceeds 50°C. Reduce the load power
Communication fault alarm	CFA	—	Fault on solid		After powering off, open the right cover plate and check whether the panel's wiring connections are loose.	

6 Maintenance

The following inspections and maintenance tasks are recommended at least twice yearly for good performance.

- Make sure no block on airflow around the inverter. Clear up any dirt and fragments on the heat sink.
- Check all the naked wires to ensure insulation is not damaged by sun exposure, frictional wear, dryness, insects or rats, etc.
- Verify that the indicator display is consistent with the actual operation. Pay attention to any troubleshooting or error indication. Take corrective action if necessary.
- Confirm that terminals have no corrosion, insulation damage, high temperature, or burnt/discolored sign, and tighten terminal screws to the suggested torque.
- Clear up dirt, nesting insects, and corrosion in time.
- Check and confirm that the lightning arrester is in good condition. Replace a new one in time to avoid damaging the inverter and other equipment.



WARNING

Risk of electric shock!

Confirm all the power is turned off and all the capacitor's energy has been discharged before performing the above operations.

7 Specifications

Item	TP10K-110/220-1	TP10KB-110/220-1	TP10K-220/220-1	TP10KB-220/220-1
Technical parameters				
Rated input voltage	110VDC		220VDC	
Battery Input voltage range	93VDC ~ 146VDC		187VDC ~ 293VDC	
Max. input current	122A		60A	
Rated output power	10000VA			
Rated output voltage	220/230VAC±3% (Battery power mode)			
Output frequency	50Hz/60Hz±3% (Battery power mode)			
Load power factor	0.2 ~ 1			
Output way	Single-phase			
Output wave	Pure Sine Wave			
Output THD	≤ 3%(Resistive load)			
Max. inverter efficiency	>90%(Resistive rated load)			
Bypass Input voltage range	—	170VAC ~ 275VAC	—	170VAC ~ 275VAC
Bypass transfer time	12mS			
No-load consumption	≤ 2%			
Backlight	30S (Turn on by pressing the button)			
Mechanical Parameters				
Dimension(LxWxH)	600x450x1294mm			
Net Weight	150Kg		148Kg	

Item	TP20K-220/220-1	TP20KB-220/220-1	TP30K-220/220-1	TP30KB-220/220-1
Technical parameters				
Rated input voltage	220VDC			
Battery Input voltage range	185VDC ~ 295VDC		185VDC ~ 295VDC	
Max. input current	150A		234A	
Rated output power	20000VA		30000VA	
Rated output voltage	220/230VAC±3%(Battery power mode)			
Output frequency	50Hz/60Hz±3%(Battery power mode)		50Hz/60Hz±3%(Battery power mode)	
Load power factor	0.2 ~ 1			
Output way	Single-phase			
Output wave	Pure Sine Wave			
Output THD	≤ 3%(Resistive load)			
Max. inverter efficiency	>90%(Resistive rated load)		>90%(Resistive rated load)	
Bypass Input voltage range	—	170VAC ~ 275VAC	—	170VAC ~ 275VAC
Bypass transfer time	12mS			
No-load consumption	≤ 2%		≤ 2%	
Backlight	30S(Turn on by pressing the button)			
Mechanical Parameters				
Dimension(LxWxH)	600x450x1414mm		600x480x1444mm	
Net Weight	188Kg		228Kg	

Item	TP40K-220/220-1	TP40KB-220/220-1
Technical parameters		
Rated input voltage	220VDC	
Battery Input voltage range	203VDC ~ 280VDC	
Max. input current	263A	
Rated output power	40000VA	
Rated output voltage	220/230VAC±3%(Battery power mode)	
Output frequency	50Hz/60Hz±3%(Battery power mode)	
Load power factor	0.2 ~ 1	
Output way	Single-phase	
Output wave	Pure Sine Wave	
Output THD	≤ 3%(Resistive load)	
Max. inverter efficiency	>92%(Resistive rated load)	
Bypass Input voltage range	—	170VAC ~ 275VAC
Bypass transfer time	12mS	
No-load consumption	≤ 2%	
Backlight	30S(Turn on by pressing the button)	
Mechanical Parameters		
Dimension(L×W×H)	660x560x1554mm	
Net Weight	270Kg	

Environmental parameters:

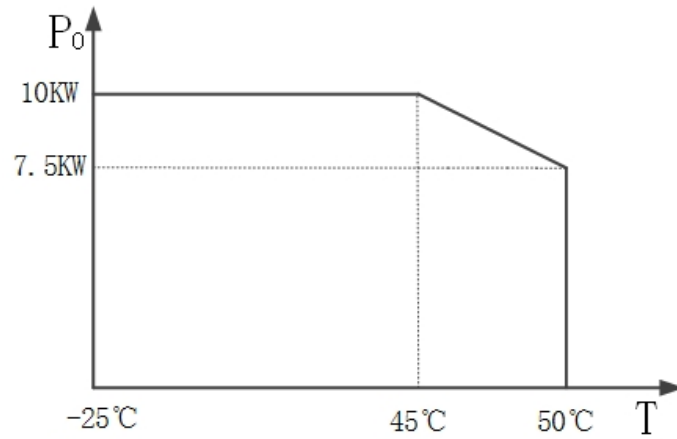
Work temperature	-25°C ~ 50°C★
Noise	< 65Db (1m)
Enclosure	IP20
Relative humidity	0 ~ 95%(N.C.)
Altitude	5000m (Derating above1500m)★

★Instruction for inverter derating

1. Temperature derating for TP10K, TP10KB, TP20K, TP20KB, TP30K, TP30KB:

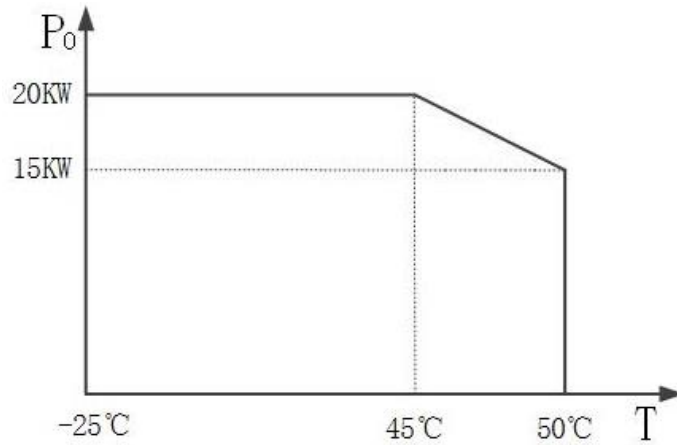
For each increase of 1°C above 45°C, the output power is reduced by 5% of the rated power.

- TP10K, TP10KB

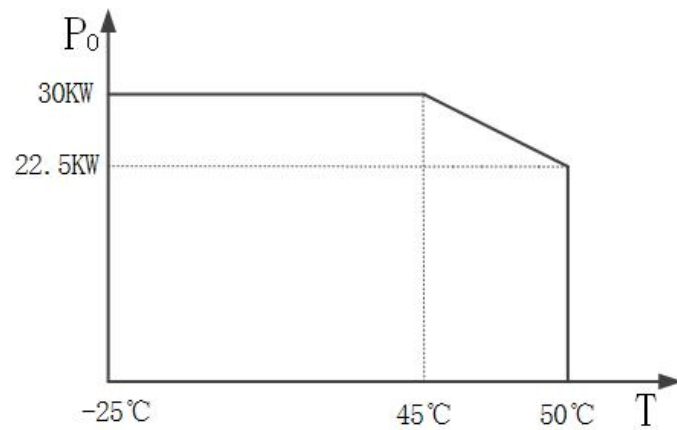


- TP20K, TP20KB

8

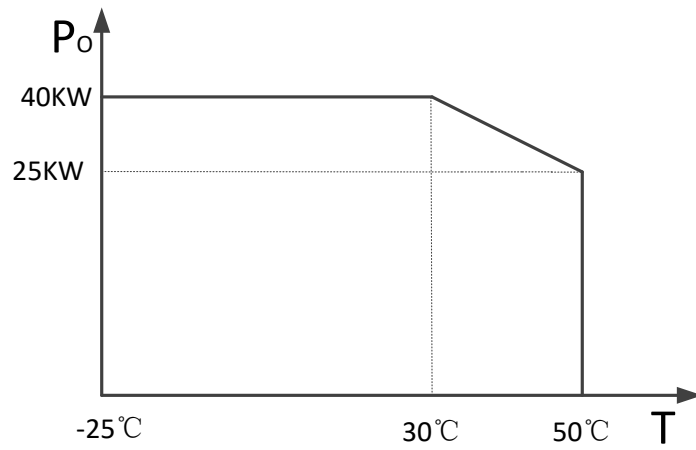


- TP30K, TP30KB



2. Temperature derating for TP40K, TP40KB:

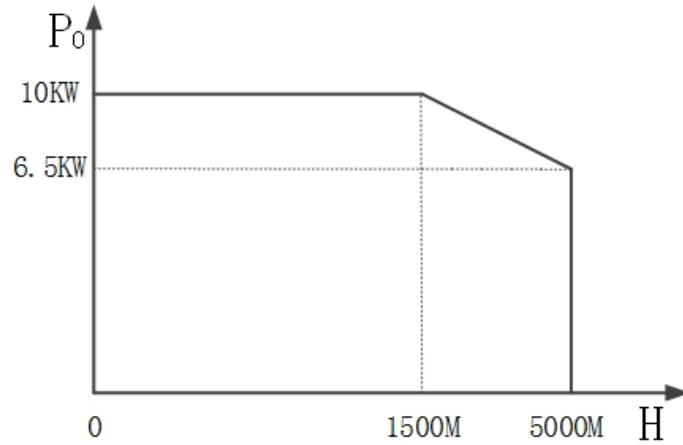
For each increase of 1°C above 30°C, the output power is reduced by 750W.



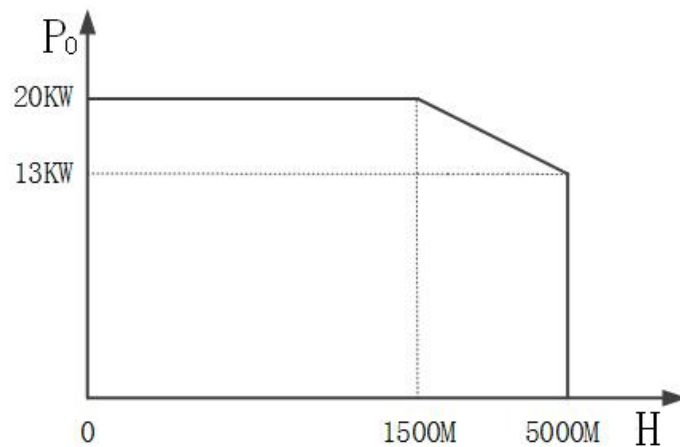
3. Altitude derating:

For each increase of 500m above 1500m, the output power is reduced by 5% of the rated power.

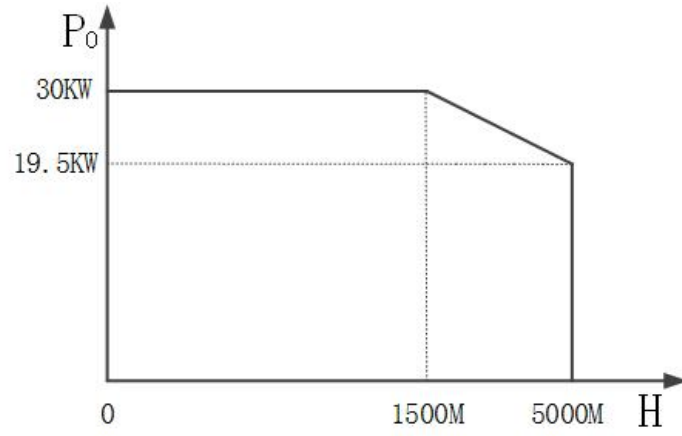
- TP10K, TP10KB



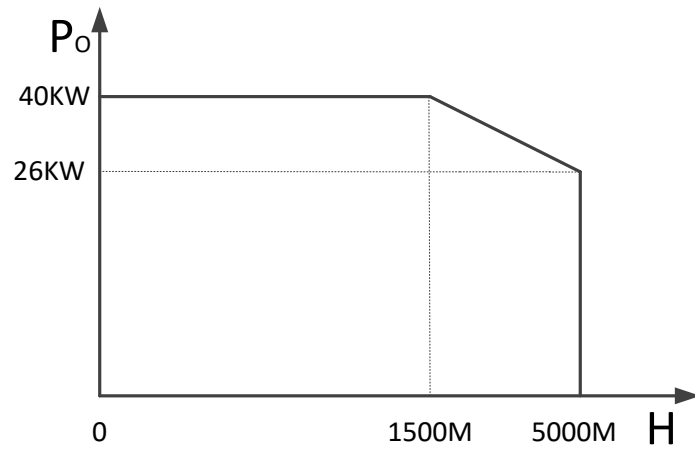
- TP20K, TP20KB



- TP30K, TP30KB



- TP40K, TP40KB



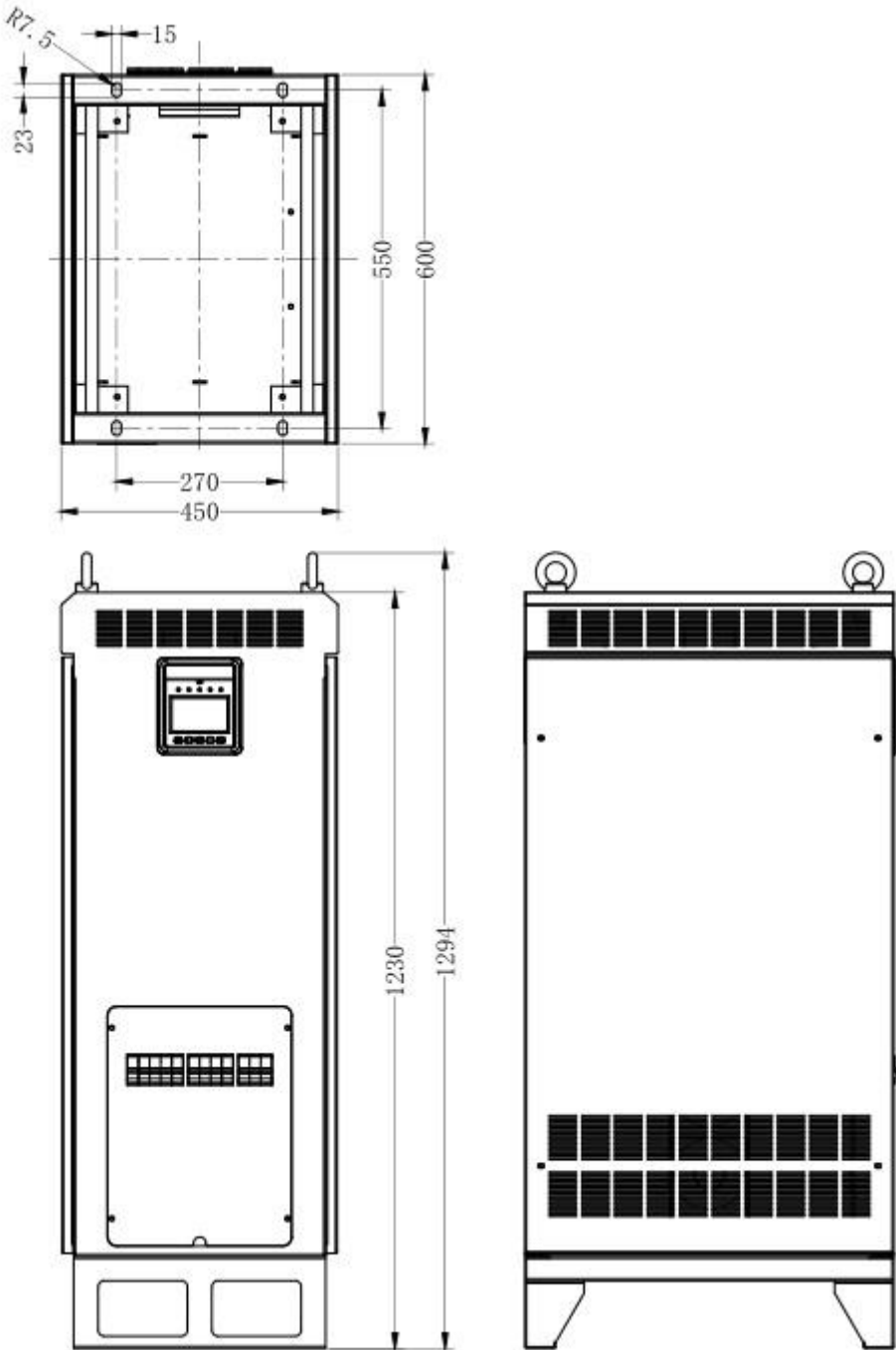
Annex 1 Disclaimer

This warranty does not apply under the following conditions:

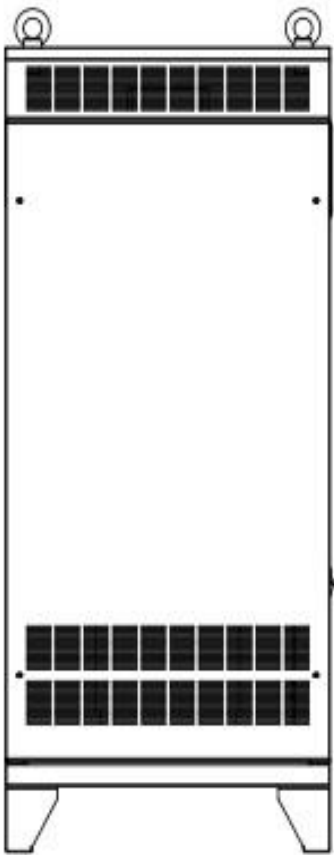
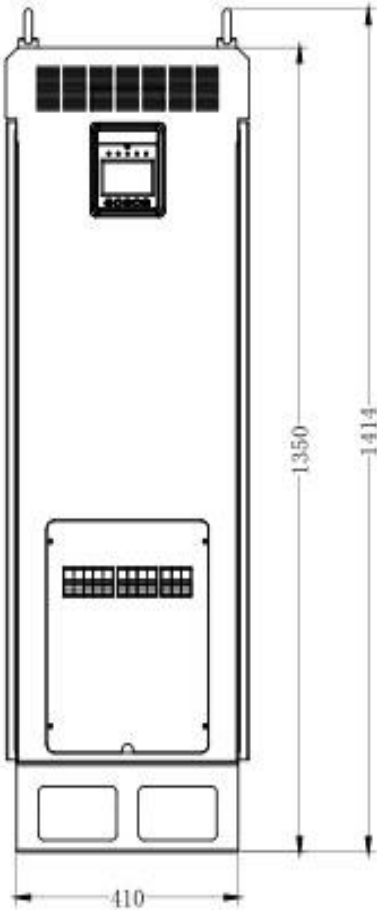
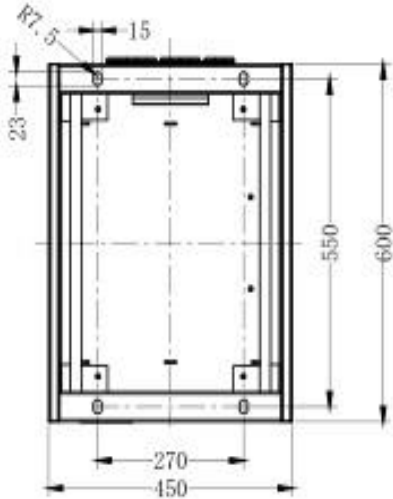
- Damage from improper use or use in an unsuitable environment.
- Load or utility current, voltage, or power exceeds the rated value of the inverter.
- Damage caused by the ambient temperature exceeds the limited working temperature.
- The accident was caused by disobeying the marks or manuals of the inverter, such as electric arc, fire, and explosion.
- User disassembly or attempted to repair the inverter without permission.
- Damage caused by force majeure.
- Damage caused during transportation or loading/unloading.

Annex 2 Mechanical Dimension Diagram

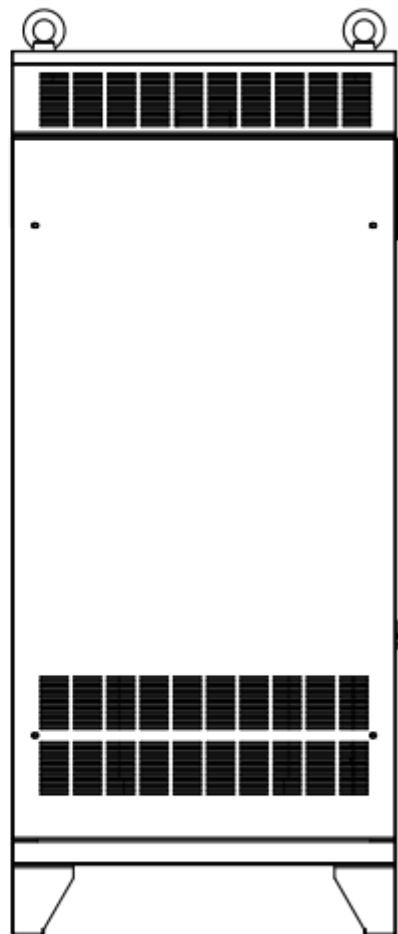
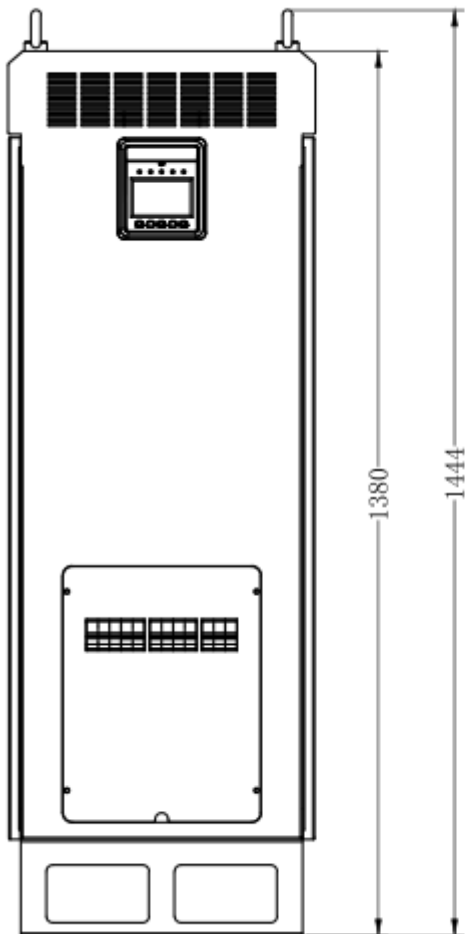
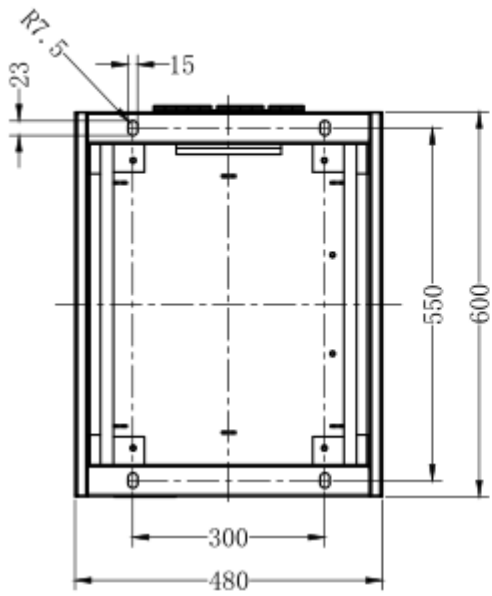
1.TP10K, TP10KB



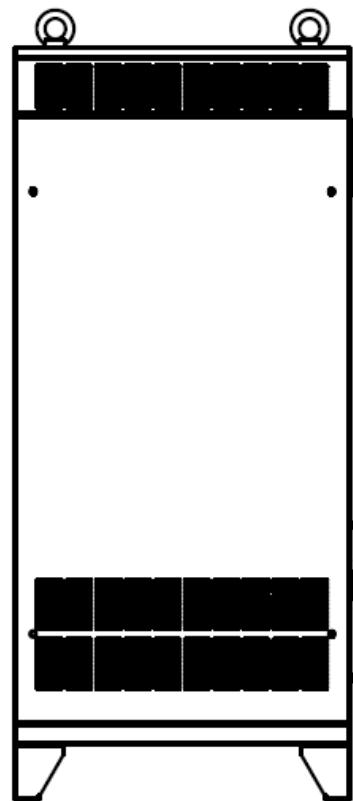
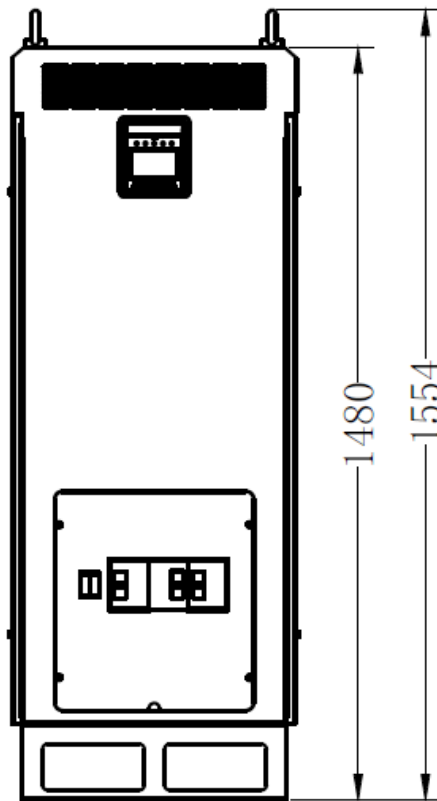
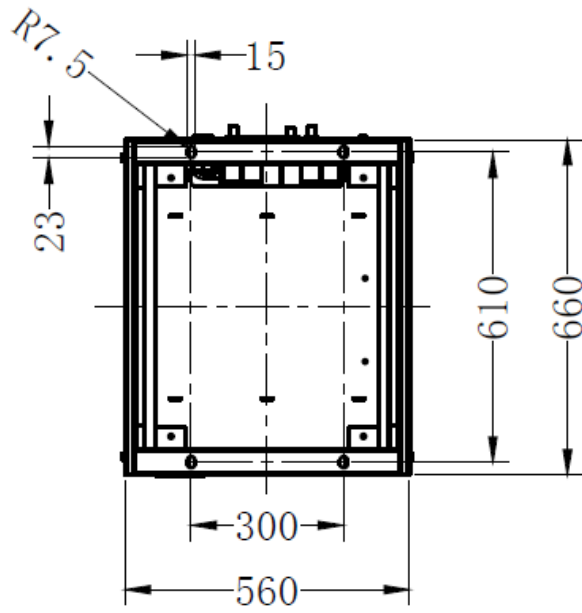
2. TP20K, TP20KB



3. TP30K, TP30KB



4. TP40K, TP40KB



Any changes without prior notice! Version number: V2.2

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