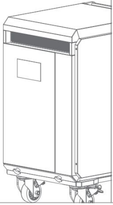
POWISER

ULTRA12K

Portable Integrated Machine



Product Manual

www.ipowiser.com

EN P1-P18

中文 P19-P36

CONTENTS

EN

01 Manual Information
1.1 Scope 2
1.2 Target Audience 2
1.3 Safety Instructions 2
1.4 Application Overview 3
1.5 Product Features 3

02 Product Overview 4

03 Installation
3.1 Unpacking Inspection 4
3.2 Preparation 5
3.3 Equipment Installation 6
3.4 Parallel System Communication 6
3.5 AC Input/Output Connection 7
3.6 PV Connection 7
3.7 Assembly 8
3.8 Starting the ULTRA12K 8

04 Operation
4.1 Power On/Off 9
4.2 Operation and Display Panel 9
4.3 Parameter Setting Description 10

05 Working Mode
5.1 Charging Mode 13
5.2 Power Supply Mode 13

06 Fault Codes and Countermeasures
6.1 Fault Codes 14
6.2 Troubleshooting 16

07 Protection Function and Product Maintenance
7.1 Protection Function 17
7.2 Maintenance 19

08 Specifications and Parameters 20

---

01 Manual Information

This manual provides instructions on the assembly, installation, operation, and troubleshooting of the device. Please read this manual carefully before installation and operation. Retain this manual properly for future reference.

1.1 Scope

This manual provides safety and installation guidelines, along with detailed information on tools and wiring.

1.2 Target Audience

Thisdocumentisintendedforinstallationbyqualifiedpersonnelandoperationbytheenduser.
Qualified personnel must possess the following competencies:
1、Comprehensive knowledge of the inverter's operating principles and procedures.
2、Training in the identification, handling, and mitigation of hazards and risks related to the installation and use of electrical equipment and systems.
3、Training in the installation and commissioning processes for electrical equipment and systems.
4、Familiarity with applicable standards and directives.
5、Ability to understand and comply with this document and all associated safety information.

1.3 Safety Instructions

1、Prior to operating this machine, thoroughly read all instructions and warning labels provided in the machine manual, as well as all relevant sections of this guide. The manufacturer reserves the right to withhold quality assurance should any equipment damage result from improper installation contrary to the instructions in this manual.
2、Do not disassemble this machine. For maintenance or repairs, please return it to a qualified Service Center. Improper reassembly may create risks of electric shock or fire.
3、All operations and connections must be performed by certified electrical or mechanical engineers. All electrical installations must comply with applicable local electrical safety standards.
4、To reduce the risk of electric shock, disconnect all cables before performing any maintenance or cleaning. Switching off the power supply does not eliminate the risk of electric shock.
5、For optimal performance of the ULTRA12K, select cables of appropriate size in accordance with the specified requirements.
6、Grounding Instructions – The ULTRA12K must be connected to a permanent grounding wiring system. When installing the ULTRA12K, strict adherence to local codes and regulations is mandatory.
7、Short circuits are strictly prohibited.
Do not connect to mains power when the DC input is short-circuited.
8、Do not install the machine outdoors, or in environments that are humid, oily, flammable, explosive, or subject to heavy dust accumulation.
Warning!! Only qualified maintenance personnel are permitted to service this equipment. If the fault persists after performing troubleshooting according to the fault table, please return the ULTRA12K to the local dealer or Service Center for repair.
9、The polarity of the parallel input terminals of this product must not be reversed, as doing so may damage the equipment or cause unpredictable hazards.
10、Before operation, verify that the ULTRA12K is fully assembled.
11、The input power to the load equipment must ensure that the ULTRA12K is the sole input device; parallel connection with other AC power sources is strictly prohibited to prevent damage.
12、It is recommended to install suitable fuses or circuit breakers externally on the ULTRA12K.

CONTENTS

中文

01 本手册信息
1.1、范围 23
1.2、目标群体 23
1.3、安全指令 23
1.4、应用介绍 24
1.5、产品特色 24

02 产品概述 25

03 安装
3.1、开箱检查 25
3.2、准备 26
3.3、安装设备 27
3.4、并机系统通信 27
3.5、AC输入/输出连接 28
3.6、PV连接 28
3.7、总装 29
3.8、启动ULTRA12K 29

04 操作
4.1、电源开/关 30
4.2、操作和显示面板 30
4.3、设置参数说明 31

05 工作模式
5.1、充电模式 34
5.2、供电模式 34

06 故障代码及应对措施
6.1、故障代码 35
6.2、故障排除 37

07 保护功能及产品维护保养
7.1、保护功能 38
7.2、维护保养 40

08 规格参数 41

---

01 本手册信息

本手册介绍了本机的组装、安装、操作和故障排除。请在安装和操作前仔细阅读本手册。请妥善保存本手册，以备日后参考。

1.1 范围

本手册提供安全和安装指南以及有关工具和接线的信息。

1.2 目标群体

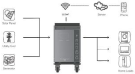
本文档适用于有资格的人员安装和最终用户执行操作。
合格人员必须具备以下技能:
1、了解逆变器的工作原理和操作方法。
2、接受过如何处理与安装使用电气设备和安装相关的危险风险的培训。
3、电气设备的安装和调试方面的培训。
4、了解适用的标准和指令。
5、了解并遵守本文件和所有安全信息。

1.3 安全指令

1、在使用本机前，请阅读本机说明书上的所有说明和警告标记以及本手册的所有相关章节。如不按本手册的说明进行安装而造成设备损坏，本公司有权不作质量保证。
2、请勿拆卸本机。需要保养或维修时，请送到有资质的服务中心。不正确的重新组装可能会导致触电或火灾的危险。
3、所有操作和连接由专业的电气或机械工程师进行，所有电气安装必须符合当地电气安全标准。
4、为了降低触电的风险，在进行任何维护或清洁之前，请断开所有电线。因关闭电源并不能降低触电的风险。
5、为了使ULTRA12K最佳运行，请按照要求的规格选择合适的电缆尺寸。
6、接地说明ULTRA12K应连接到永久接地布线系统。安装ULTRA12K时，请务必遵守当地的要求和法规。
7、严禁造成交流输出和直流输入短路。直流输入短路时，严禁连接市电。
8、请不要将机器安装在户外、潮湿、油腻、易燃易爆或粉尘大量聚集等恶劣环境中。
警告! !只有有资质的维修人员才能维修本设备。如果按照故障排除表进行故障排除后，故障仍然存在，请将ULTRA12K送回当地经销商或服务中心进行维修。
9、本产品并机输入端极性禁止反接，否则容易损坏设备或发生不可预测的危险。
10、在操作前，请确认ULTRA12K已完全组装好。
11、负载设备输入电源需确认ULTRA12K为唯一输入设备，禁止与其它输入交流电源并联使用，避免造成损坏。
12、建议在ULTRA12K外部安装合适的保险或断路器。

滚滚长江东逝水

1.4 Application Overview



The above illustration depicts the device's application scenarios (specific operational functions vary according to the scenario). A complete application system comprises the following elements:

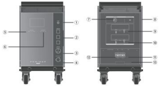
1、Photovoltaic Array: This photovoltaic input converts sunlight into a DC power source via the photovoltaic effect. This energy can be used to charge the ULTRA12K or directly inverted to AC power output to supply the load equipment.
2、Mains Power or Diesel Generator: AC input that supplies power to the load equipment and simultaneously charges the battery; In the event of AC input loss, the ULTRA12K can automatically switch to battery and photovoltaic array power supply to maintain continuous power to the load equipment, thereby ensuring uninterrupted operation (i.e., the load will not cease functioning due to power outage).
3、Supports up to 2 units in parallel: enables energy storage and energy release functions according to ULTRA12K requirements.
4、Household loads: supports linear and nonlinear load applications, including computers, refrigerators, air conditioners, televisions, water heaters, and other household appliances.
5、ULTRA12K: performs energy conversion and safety management for the entire system.
6、WiFi: enables remote monitoring and management via a dedicated application.

1.5 Product Features

1、Includes segmented charge and discharge functions.
2、Supports up to 6 units in parallel; Max. Power: 72 kW; Capacity: 60 kWh..
3、Solar power and mains power can supply load equipment simultaneously.
4、Equipped with dual activation capability, triggered upon connection of built-in power and photovoltaic power sources.
5、Incorporates an energy-saving mode to minimize no-load power consumption.
6、Provides four optional Charging Modes: Solar Only, Mains Power Priority, Solar Priority, and Hybrid Charging.
7、Features two output modes: Mains Bypass and Inverter Output, equipped with uninterruptible power supply (UPS) functionality.
8、Equipped with comprehensive protections including short-circuit, over-voltage, under-voltage, overload, and reverse feed prevention, delivering 360° all-around safeguarding.
9、The ON/OFF button controls the main power switch of the ULTRA12K unit.
10、Employs fully digital dual-loop voltage and current control combined with advanced SPWM technology, producing a pure sine wave output.

11、Implements advanced MPPT technology achieving an efficiency of up to 99.9%.
12、Utilizes an intelligent variable-speed fan for efficient heat dissipation, thereby extending system lifespan.

02 Product Overview



① ON/OFF switch button
② 20A 120V AC OUTPUT x 3
③ 30A 120V AC OUTPUT x 1
④ 30A 120V/240V AC OUTPUT x 1
⑤ USB-A x 2 18W
⑥ USB-C x 2 100W
⑦ High-voltage photovoltaic switch
⑧ LOW PV input port - XT60
⑨ HIGH PV input port - MC4-01
⑩ HIGH PV input port - MC4-02
⑪ AC output port
⑫ AC input port
⑬ Parallel communication port
⑭ CT & Communication Port
⑮ Dry Contact Port

03 Installation

3.1 Unpacking Inspection

Prior to installation, inspect the unit to ensure the packaging is undamaged. The package should include the following items:

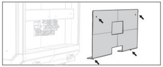
ULTRA12K x 1

User manual x 1

Terminals x 6

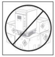
3.2 Preparation

Before connecting any wires, remove the four screws on the bottom cover as illustrated.

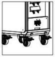


3.3 Equipment Installation

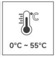
Before selecting an installation site, please consider the following points:



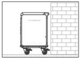
1、Do not place the ULTRA12K on combustible building materials.



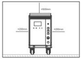
2、Position the machine on a relatively level surface and lock the casters securely.



3、Maintain an ambient temperature between 0°C and 55°C to ensure optimal performance.



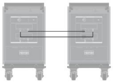
4、It is recommended to install the machine adjacent to a wall.



5、Maintain the clearance from other objects and surfaces as illustrated in the adjacent figure to ensure sufficient heat dissipation,Ensure adequate space is available for cable removal.

3.4 AC Paralleling System Communication

When inverter communication is necessary in a parallel system, ensure that the inverter communication cable is properly connected between ULTRA12K units.



Supports parallel connection of up to 6 ULTRA12K units, with a maximum power of 72 kW and a maximum capacity of 60 kWh.

3.5 AC Input/Output Connection

▲ Warning‼ Before connecting the AC input power, please ensure that the AC input circuit breaker of the ULTRA12K is in the OFF position. This will ensure that the ULTRA12K can be safely disconnected during maintenance.

▲ Warning‼ There are two terminals marked "IN" and "OUT"circuit breaker. Please do not misconnect the input and output circuit breakers.

▲ Warning‼ Using the appropriate cable for AC input connection is essential for the safe and efficient operation of the system. To reduce the risk of injury, please use the correct recommended cable size as shown below.

Recommended cable requirements for AC input/output wiring:

Name	Recommended AC input wire size	Maximum bypass input current	Recommended circuit breaker Or circuit breaker model	Torque value
AC output/input cable	13mm2/6AWG	60A	3P—63A	1.2-1.6Nm

Please follow the steps below to complete the AC input/output connection:

1. Before making AC input/output connections, always disconnect the AC input/output circuit breaker.
2. Remove the 10mm insulation sleeves from eight conductors. Shorten phases L1, L2, and the neutral conductor N by 3mm.

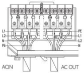
---

2. Ensure that the AC input/output cables are securely connected before turning on the circuit breaker.

3. Before disconnecting the AC input/output cables, be sure to turn off the circuit breaker."

⏚ → Grounding Conductor (yellow-green)
L1, L2 → LINE (brown or black)
N → Neutral (blue)

5. Ensure the wire connections are secure.



▲ Warning:
Ensure the polarity of the AC wiring is correct. If the L and N wires are reversed, it may cause a power short circuit when multiple ULTRA12K units operate in parallel.

▲ Appliances such as air conditioners need at least 2 to 3 minutes to restart, as sufficient time is needed to balance the refrigerant gas within the circuit.
If a power outage occurs and power is restored within a short period, it can damage your connected appliances. To prevent such damage, please confirm whether the air conditioner has a delay function before installation. If not, the ULTRA12K will trigger an overload fault and cut off the output to protect your appliances, but it may still cause internal damage to the air conditioner.

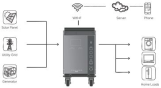
3.6 PV Connection

▲ **Dangerous**
- Turn the PV SWITCH to the OFF position before connecting the high-voltage PV input.
- All wiring must be performed by qualified personnel.
- Do not connect the same high-voltage PV string to multiple ULTRA12K units, as this may cause damage.

Using the appropriate cable to connect the PV module is essential for the safe and efficient operation of the system. To reduce the risk of injury, please use the correctly recommended cable size as shown below.

Name	Recommended PV Input Wire Gauge	Maximum PV Input Current	Recommended circuit breaker Or circuit breaker model	Torque value
PV Cable	5.2mm²/10AWG	22A	2P—32A	1.2-1.6Nm

1.4 应用介绍



上图为设备使用的应用场景(具体使用功能根据场景应用)。一个完整的应用系统由如下内容组成：

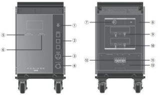
1、光伏阵列：光伏输入，太阳光通过光伏效应产生一个直流电源，此能量可以给ULTRA12K充电，或者直接逆变为交流输出电源给负载设备供电。
2、市电或柴油机：AC 输入，给负载设备供电的同时可以给电池充电；当AC输入丢失时，ULTRA12K可以自动切换为电池和光伏阵列给负载设备供电，从而实现不间断供电功能（即负载不会因掉电而出现不工作情况）。
3、支持最多2台并机：根据ULTRA12K需求情况实现存储能量及释放能量功能。
4、家庭负载：支持线性及非线性负载应用，如电脑，冰箱，空调，电视，热水器等家庭设备。
5、ULTRA12K：实现整个系统的能量转化及安全管理。
6、WiFi：能够通过APP实现远程监控管理。

1.5 产品特色

1、具有分段式充放电功能。
2、支持最多2台并机，功率最大24KW，容量20kWh。
3、太阳能和市电可以给负载设备供电。
4、具有双激活功能，内置电源改AC电源及光伏电源接入即可触发。
5、具有节能模式功能，降低空载损耗。
6、拥有4种充电模式可选：仅太阳能、市电优先、太阳能优先、混合充电。
7、拥有市电旁路、逆变输出两种输出方式，具备不间断供电功能。
8、具有完备的短路保护，过欠压保护，过载保护，反灌保护等，360°全方位防护。
9、ON/OFF按钮控制ULTRA12K整机开关。
10、采用全数字化电压电流双闭环控制，先进的SPWM技术，输出纯正弦波。
11、先进的MPPT技术，效率高达99.9%。
12、采用智能可调速风扇，高效散热，延长系统寿命。

---

02 产品概述



① ON/OFF按钮开关
② 20A 120V AC OUTPUT x 3
③ 30A 120V AC OUTPUT x 1
④ 30A 120V/240V AC OUTPUT x 1
⑤ USB-A x 2 18W
⑥ USB-C x 2 100W
⑦ 高压光伏开关
⑧ LOW PV输入端口 - XT60
⑨ HIGH PV输入端口-MC4-01
⑩ HIGH PV输入端口-MC4-02
⑪ AC输出端口
⑫ AC输入端口
⑬ 并机通讯端口 x 2
⑭ CT通讯端口
⑮ 干结点端口

03 安装

3.1 开箱检查

安装前请检查机组，确保包装内无损坏。你应该在包裹中收到以下物品：

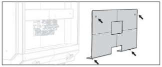
ULTRA12K x 1

用户手册x 1

接线端子x 6

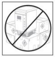
3.2 准备

在连接所有线路之前，请按如下所示拆下底盖的四个螺钉。

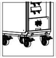


3.3 安装设备

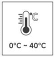
在选择安装位置之前，请考虑以下几点:



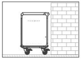
1、禁止将ULTRA12K放置在易燃的建筑材料上。



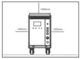
2、放置在相对平整的地面，锁死脚轮。



3、环境温度应在0°C至40°C之间，以确保最佳运行。



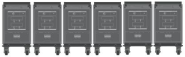
4、建议靠墙放置。



5、确保保持上图所示的位置与其他物体和表面的距离，以保证足够的散热，并有足够的空间拆除电线。

3.4 交流并机系统通信

如果需要在并联系统中使用与逆变通信，应确保ULTRA12K和ULTRA12K之间连接逆变通信电缆。



最大可并6台ULTRA12K，最大功率72kW，最大容量60kWh。

3.5 AC输入/输出连接

▲ 警告‼连接AC输入电源前，请确认ULTRA12K AC输入电源AC空开为关闭状态。这将确保ULTRA12K在维护期间可以安全地断开。

▲ 警告‼有两个有"IN"和"OUT"标记的空气开关。请不要误接输入和输出的空气开关。

▲ 警告!使用合适的电缆进行AC输入连接对系统的安全、高效运行非常重要。为减少受伤风险，请使用正确的推荐电缆尺寸，如下所示：

AC输入/输出电线的建议电缆要求：

名称	推荐AC输入接线线径	最大旁路输入电流	推荐空气开关或断路器型号	扭矩值
AC输出/输入电缆	13mm²/6AWG	60A	3P—63A	1.2-1.6Nm

请按照以下步骤实现AC输入/输出连接:

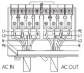
1、在进行AC输入/输出连接之前，一定要先断开AC输入/输出空气开关。

2、确保AC输入/输出线缆连接牢固后，再打开空气开关。

3、如需移除AC输入/输出线缆前，请务必断开空气开关。

4、确保电线连接牢固。

⏚ →地线（黄绿色）
L1、L2→LINE(棕色或黑色)
N→中性(蓝色)



▲ 警告：
确保AC电线的极性正确。如果L线和N线连接相反，可能会引起这些ULTRA12K并联工作时电源短路。

▲ 空调等电器需要至少2-3分钟才能重启，因为必需要有足够的时间来平衡电路内的制冷剂气体。
如果发生电源短缺并在短时间内恢复，会对您连接的电器造成损坏。为了防止这种损坏，请在安装前确认空调是否具有延时功能。否则,ULTRA12K会触发过载故障并切断输出，保护你的电器，但有时它仍然会引起空调内部损坏。

3.6 PV连接

▲ **危险**
- 在连接高压PV输入之前，请将PV SWITCH旋转至OFF。
- 所有接线必须由合格人员进行。
- 请勿将同一路高压PV组串连接至多台ULTRA12K，否则可能导致损坏。

使用合适的电缆连接PV组件对系统的安全和高效运行非常重要。为减少受伤风险，请使用如下所示的正确推荐电缆尺寸。

名称	荐PV输入接线线径	最大PV输入电流	推荐空气开关或断路器型号	扭矩值
PV线缆	5.2mm²/10AWG	32A	2P—32A	1.2-1.6Nm

PV组件选择:

在选择合适的PV组件时，请务必考虑以下参数:
1、PV组件开路电压(Voc)不超过最大值，PV阵列开路逆变器电压。
2、PV组件开路电压(Voc)应高于电池最小电压。

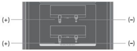
PV Module Selection:

When selecting the appropriate PV module, be sure to consider the following parameters:
1. The PV module open-circuit voltage (Voc) must not exceed the maximum inverter PV array open-circuit voltage.
2. The PV module open-circuit voltage (Voc) should be higher than the battery minimum voltage.

Product Model	Max. PV Array Open-Circuit Voltage	Starting Voltage	PV Array MPPT Voltage Range
ULTRA12K	500Vdc	120Vdc	90Vdc~450Vdc

Please follow the steps below to connect high-voltage PV modules.

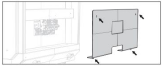
1. Check whether the polarity of the cables connecting the PV modules and PV input connectors is correct. Then, connect the MC4 cable positive (+) to the PV input connector positive (+). Connect the cable negative (-) to the PV input connector negative (-).



2. Ensure the wire connections are secure.

3.7 Assembly

After connecting all wiring, place the bottom cover as shown below and tighten the four screws.



3.8 Starting the ULTRA12K

Step 1: Turn the PV SWITCH to the ON position, then close the AC Input and AC Output circuit breakers in sequence.
Step 2: Press the ULTRA12K POWER button. The indicator light will turn on, signaling that the ULTRA12K has been activated.
Step 3: Start the loads one by one in order of power from lowest to highest.

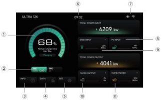
04 Operation

4.1 Power On/Off

Once the device is properly installed (with the extended battery pack well connected), simply press the POWER switch (located on the right side of the chassis) to turn on the device.

4.2 Operation and Display Panel

The operation and display panel, shown in the figure below.



①	Battery Parameters	⑦	Bluetooth, WiFi
②	AC/DC Switch	⑧	PV Input Parameters
③	INFO – System Information	⑨	AC Input Parameters
④	DATA – Historical Data	⑩	AC/DC Output Parameters
⑤	SET – Settings	⑪	AC Output Parameters – Home Load
⑥	Time		

Real-time Data Viewing Method:

On the LCD main screen, tap the corresponding display module to view the machine's real-time data.

4.3 Parameter Setting Description

Screen operation instructions: Press the "Settings" button to enter the settings menu. Once inside, select the desired option to configure. Use "<" or ">" to choose the parameter, then press "Confirm" to save the settings.

Setting	Option	Description
General settings		
Power supply priority	Power grid supply priority	Mains power will supply the load first. Only when there is no mains power input will it switch to photovoltaics and battery to supply the load.
	Photovoltaic Priority Mode	In Photovoltaic Priority Mode, photovoltaics supply power to the load first. When photovoltaic energy is insufficient, the battery simultaneously supplies power to the load. The system switches to mains power only when there is no photovoltaic input or when the battery voltage falls below the 'Battery switch to mains power voltage' setting.
	Hybrid	Hybrid grid mode, which can be configured via the 'Grid
System voltage	120V	Selectable at 100/105/110/120/127Vac, default is 120Vac. AC output power = rated power × (set voltage / 120)
System Frequency Level	50.0Hz	Bypass Adaptive: when mains power is present, the system automatically adapts to the frequency of the first mains input; when mains power is absent, the output frequency can be set via this menu. The default frequency for 120V machines is 60Hz.
	60.0Hz	
	UPS Default	Bypass Adaptive: when mains power is present, the system automatically adapts to the frequency of the first mains input; when mains power is absent, the output frequency can be set via this menu. The default frequency for 120V machines is 60Hz.
	GEN	When input comes from a diesel engine, this mode must be selected. In this mode: The AC input voltage range for 120V machines is 90–140V; (The lower input voltage limit changes to 85V when the system voltage is 100V or 105V) Frequency range: 40–70Hz
Energy-saving mode	Disable	Disable Energy-saving mode
	Enable	When Energy-saving mode is enabled, if the load on each phase is zero or less than 25W, the inverter output will shut down after a delay. If the load on any phase exceeds 50W, the inverter will automatically restart.
Charging Priority	Default Hybrid Mode	Photovoltaics and mains power hybrid charging prioritizes photovoltaics. When photovoltaic energy is insufficient, mains power supplements charging. When photovoltaic energy is sufficient, mains charging stops. Note: Photovoltaics and mains can charge simultaneously only when mains bypass output is under load. During inverter operation, only photovoltaics charging can be activated.
	Mains power priority	Mains power priority charging; photovoltaic charging only activates when mains power are unavailable.
	Photovoltaic Priority	Photovoltaic priority charging; mains charging only activates when photovoltaics is unavailable.
	Photovoltaics Only	Photovoltaic charging only; mains charging will not activate.
Output Phase Setting	180° Phase Difference	Phase voltage difference of 180 degrees
	Output In Phase	Phase voltage difference of 0 degrees

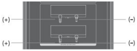
Setting	Option	Description
Maximum Charging Current	220A Default	Maximum total charging current setting. Range: 0~220A.
Maximum Mains Charging Current	160A Default	Range: 0~160A, default 160A.
Enable Buzzer Mute	Disable default	An alarm sounds when the main input source status changes or the machine malfunctions
	Enable	Buzzer mute
Charging current for full battery detection	3A default	When the battery type is lead-acid, if the battery voltage is greater than or equal to the float charge value and the charging current is below this setting, the battery is considered fully charged and charging stops; When the battery type is lithium battery, if the battery voltage is greater than or equal to the constant voltage charging value and the charging current is below this setting, the battery is considered fully charged and charging stops;
Inverter mode N-G connection	DIS default	Automatic connection of the N line to the PE line is prohibited under any operating condition
	ENA	When off-grid with no mains power input, the N line automatically connects to PE; when mains power is present on the bypass, the N line automatically disconnects from PE.
Charge/Discharge Settings		
Constant Voltage Charging Maximum Time	120 (default)	Maximum time setting for constant voltage charging. Maximum charging time after the constant voltage charging voltage is reached. Setting range is 5 to 900 minutes, in 5-minute increments.
Enable timed mains charging	Default: Disable	Disable timed mains charging
	Enable	Enable timed mains charging
	0h 0min	Charging start time – Segment 1
	0h 0min	Charging end time – Segment 1
	0h 0min	Charging start time – Segment 2
	0h 0min	Charging end time – Segment 2
	0h 0min	Charging start time – Segment 3
	0h 0min	Charging end time – Segment 3
Enable timed battery discharging	Default: Disable	Disable timed mains charging
	Enable	Enable timed mains charging
	0h 0min	Charging start time – Segment 1
	0h 0min	Charging end time – Segment 1
	0h 0min	Charging start time – Segment 2
	0h 0min	Charging end time – Segment 2
	0h 0min	Charging start time – Segment 3
	0h 0min	Charging end time – Segment 3

Setting	Option	Description
Parallel Operation Settings		
Parallel operation mode	Single-player	Single-unit settings
	Parallel operation	Parallel Operation Settings
Independent enable for battery pack in parallel operation	Disabled (Default)	Use of battery pack in parallel connection
	Enabled	Battery can be used independently
BMS Settings		
Battery SOC low alarm value	15% Default	If battery capacity falls below this value, the machine will display alarm 07. The alarm can be cleared when the battery capacity rises above this value by 5%.
Battery SOC low shutdown point	10% Default	If battery capacity falls below this value and mains power is available, the machine will switch to mains power operation.
Battery full SOC threshold	100% Default	Charging battery priority mode: when battery capacity exceeds this value, the machine will switch from mains power back to inverter mode.
Other settings		
Screen-on time	/	Adjustable from 5 min to always on
Screen brightness	/	10%–100%
Power on/off control	Power on	Enable inverter output
	Power off	Disable inverter output (power off after 2 min)
Machine reboot control	Reboot	Reboot inverter
Language selection	/	Chinese/English
Current machine time	/	2024/01/01 00：00

产品型号	Max.PV阵列开路电路	启动电压	PV阵列MPPT 电压范围
ULTRA12K	500Vdc	120Vdc	90Vdc~485Vdc

请按照以下步骤进行高压光伏组件连接：

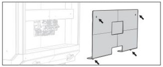
1、检查PV组件和PV输入接头的连接电缆极性是否正确。然后，将MC4线缆的正极(+)连接到PV输入连接器的正极(+)。将线缆的负极(-)连接到PV输入连接器的负极(-)上。



2、确保电线连接牢固。

3.7 总装

连接好所有线路后，请按下图所示将底盖放并拧紧四个螺钉。



3.8 启动ULTRA12K

第一步：按下ULTRA12K POWER按钮开关，指示灯亮起，表明ULTRA12K已被激活。
第二步：依次先将光伏PV SWITCH旋至ON、并将交流输入和交流输出的空气开关闭合。
第三步：按照功率由小到大的顺序逐一启动负载。

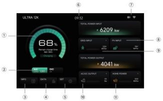
04 产品概述

4.1 电源开/关

按下ULTRA12K POWER按钮开关，指示灯亮起，表明ULTRA12K已被激活。

4.2 操作和显示面板

操作和显示面板，如下图所示，



①	电池参数	⑦	蓝牙、WiFi
②	AC/DC开关	⑧	PV输入参数
③	INFO-系统信息	⑨	AC输入参数
④	DATA-历史数据	⑩	AC/DC插口输出参数
⑤	SET-设置	⑪	AC输出参数-家庭负载
⑥	时间		

实时数据查看方法：

在LCD主屏幕，点击对应的显示模块查看机器各项实时数据。

4.3 设置参数说明

屏幕操作说明：按"设置"按钮进入设置菜单，进入设置菜单后，可以选择要设置的选项，按"<"、">"选择要设置的参数，按"确认"上传设置参数。

设置项	设置选项	说明
常规设置		
供电优先级	电网供电优先	市电会优先给负载供电。 仅当无市电输入时，才会切换至光伏和电池给负载供电。
	电池供电优先	光伏会优先给负载供电，光伏能量不足时，电池会同时给负载供电；仅当电池欠压或者低于"电池切换市电电压"设置值时切换至市电供电；仅当电池充饱或者高于"市电转回电池电压"设置值时切换至电池放电。市电优先模式，仅当无市电输入时切换至电池逆变。
	PV供电优先	光伏优先模式，光伏会优先给负载供电，光伏能量不足时，电池会同时给负载供电，仅当无光伏输入或者电池低于"电池切换市电电压"设置值时切换至市电。
	Hybrid	混网模式，可通过"并网设置"设置项设置混网模式。
系统电压	120V	100/105/110/120/127Vac可设，默认120Vac。 交流输出功率=额定功率*（设置电压/120）
系统频率等级	50.0Hz	旁路自适应，有市电时，自动适应首次上市电时的频率；无市电时，可通过该菜单设置输出频率。120V机器默认60Hz。
	60.0Hz	
市电范围	UPS默认	120V机器窄范围输入市电电压范围90-140V（系统电压100V/105V时输入电压下限变为85V）； 频率范围：47- 55Hz (50Hz)；57Hz - 65Hz (60Hz)；
	GEN	柴油机输入时，需设置为此模式，此时： 120V机器输入交流电压范围90-140V； （系统电压100V/105V时输入电压下限变为85V） 频率范围：40- 70Hz
	APL模式	
节能模式	Disable	禁止节能模式。
	Enable	启用省电模式后，如果每相的负载为空或小于25W，则在延迟一段时间后关闭逆变器输出。当任何相位负载大于50W时，逆变器自动重启。

设置项	设置选项	说明
充电优先级	混合模式默认	光伏和市电混合充电，优先光伏充电，光伏能量不足时，市电充电补充。光伏能量充足时，市电停止充电。注意：仅市电旁路输出带载时光伏和市电才能同时充电，逆变工作时，只能启动光伏充电。
	市电优先	市电优先充电，仅市电无效的时候才启动光伏充电。
	光伏优先	光伏优先充电，仅光伏无效的时候才启动市电充电。
	仅光伏	仅光伏充电，不启动市电充电。
输出相位设置	相差180°	相电压之间差180度。
	输出同相	相电压之间差0度。
最大充电电流	200A 默认	最大总充电电流设置，设置范围0~200A。
市电最大充电电流	160A 默认	设置范围0-160A，默认160A。
蜂鸣器静音使能	Disable默认	当主输入源的状态发生变化或机器出现故障时，会发出警报声。
	Enable	蜂鸣器静音。
逆变模式N-G连接	DIS默认	禁止任何工况下，N线与PE线自动连接。
	ENA	离网无市电输入时，N线自动与PE连接；旁路有市电输入时，N线自动与PE断开。
电池设置		
定时市电充电任务	0h 0min	1段开始充电时间。
	0h 0min	1段结束充电时间。
	0h 0min	2段开始充电时间。
	0h 0min	2段结束充电时间。
	0h 0min	3段开始充电时间。
	0h 0min	3段结束充电时间。
定时电池放电任务	Disable 默认	关闭定时市电放电。
	Enable	打开定时市电放电。
	0h 0min	1段开始放电时间。
	0h 0min	1段结束放电时间。

设置项	设置选项	说明
定时电池放电任务	0h 0min	2段开始放电时间。
	0h 0min	2段结束放电时间。
	0h 0min	3段开始放电时间。
	0h 0min	3段结束放电时间。
并机设置		
并机模式	单机	单机使用设置项。
	并机	并机使用设置项。
本机通讯地址	1 默认	并机模式，设置范围1~6，ID不可重复，并机开机会自动分配地址；单机模式设置范围1~254。
并机电池组独立使能	禁止 默认	电池组并接使用。
	使能	电池可单独使用。
BMS设置		
电池SOC低告警值	15% 默认	电池容量率低于该值，机器会报警07，电池容量率高于该值5%后可以清除告警。
电池SOC-AC关机点	10% 默认	电池容量率低于该值并且市电可用时，机器会切换到市电运行。
电池充饱SOC判断值	100% 默认	充电电池优先模式，电池容量率高于该值，机器会从市电切回逆变模式。
其他设置		
亮屏时间	/	5min至常亮可调。
屏幕亮度	/	10%~100%
语言选择	/	中文/English
机器当前时间	/	2024/01/01 00：00

05 Working Mode

5.1 Charging Mode

1) Photovoltaic Priority: Photovoltaic priority charging; mains charging only activates when photovoltaics fail. During the day, solar power generation is fully utilized; at night, mains charging maintains the battery level. This mode is suitable for areas with a relatively stable power grid and higher electricity prices.

2) Mains Power Priority: Mains power takes priority when charging the storage battery; photovoltaic charging only engages if mains power is unavailable.

3) Hybrid Charging: Photovoltaics and mains power charge the battery together, prioritizing photovoltaic MPPT charging. When photovoltaic energy is insufficient, mains power supplements it; when photovoltaic energy is sufficient, mains charging stops. This method charges the fastest and is ideal for regions with unstable power grids, providing reliable backup power at any time.

4) Only Solar Charging (Only Solar): Charging only from photovoltaics, without initiating mains charging. This is the most energy-efficient method, with battery power solely derived from solar energy, typically used in areas with strong sunlight.

5.2 Power Supply Mode

1) Photovoltaic Priority Mode: Switches to mains power supply and charging when PV are unavailable. This mode maximizes solar energy utilization while maintaining the battery level, suitable for regions with relatively stable power grids.

The power supply priority sequence implemented is: PV – Battery – Mains.

2) Mains Power Priority Mode: Only switches to battery inverting supply when mains power is absent; when mains power is available, it switches to mains charging and supply. The device acts as a backup UPS, designed for areas with unstable power grids. Switching does not affect photovoltaic charging.

The implemented Power Supply Priority is: Mains – PV – Battery.

3) Battery Priority Mode: Battery Priority Mode: PV power supplies the loads first. When PV power is insufficient, the battery will supplement the load power.

The system will switch to mains power only when the battery is under-voltage or when the battery voltage drops below the set value of "Battery-to-Mains Switching Voltage".

The system will switch back to battery discharge only when the battery is fully charged or when the battery voltage rises above the set value of "Mains-to-Battery Switching Voltage".

The output source priority is: PV – Battery – Mains.

4) Hybrid Mode:

Output energy supplementation: The inverter's generated power supplies only the load (when generation power is less than load power). Note: In hybrid load sharing, mains power and PV jointly supply the load; if PV is insufficient, mains power provides the additional power.

Constant power grid-tied operation: inverter power generation is directly connected to the grid (generated power may exceed load power). Note: photovoltaic generation meets load power demand, and the surplus is fed into the grid.

06 Fault Codes and Countermeasures

6.1 Fault Codes

Fault ID	Fault Name	Does it affect output	Description
【01】	Battery voltage undervoltage reminder	No	Battery voltage is below 【18】 setting, indicating the battery is in an undervoltage state.
【02】	Battery voltage low voltage protection	Yes	Battery voltage is low; output is shut down to prevent battery discharge.
【03】	Battery discharge average current overcurrent protection	Yes	Battery discharge average current exceeds the maximum input battery current for 1 minute; output will be turned off to protect against battery discharge.
【04】	Battery discharge instantaneous overcurrent protection	Yes	Battery discharge instantaneous current exceeds device maximum instantaneous value; output will be turned off to protect against battery discharge.
【05】	Battery not connected	Yes	Battery not connected warning.
【06】	Battery overvoltage	Yes	Battery voltage exceeds the selected battery type or set battery voltage; output will be turned off to protect against battery charging.
【07】	BMS battery capacity low alarm	No	Lithium battery BMS battery capacity low reminder. (BMS enable setting active)
【08】	BMS battery capacity low protection	Yes	Lithium battery BMS battery capacity is low; output is disabled to stop battery discharge for protection. (BMS enable setting is active)
【09】	Bypass overload protection	Yes	Mains power overload under load; AC output is disabled and mains charging is stopped.
【10】	Battery inverting overload protection	Yes	Battery discharge inverting overload under load; AC output is disabled and battery discharge is stopped for protection.
【11】	Battery inverting AC output short circuit	Yes	Battery discharge inverting AC output short circuit; AC output is disabled and battery discharge is stopped for protection.
【12】	Battery inverting AC output overcurrent	Yes	Battery discharge inverting AC output overcurrent; AC output is disabled and battery discharge is stopped for protection.
【13】	Battery inverting voltage DC component abnormal	Yes	Battery inverting voltage DC component regulation abnormal, AC Output shutdown and battery discharge protection activated.
【14】	Bus overvoltage software sampling protection	Yes	Internal battery boost, boost bus voltage overvoltage software protection, AC Output shutdown and charging stopped.
【15】	Bus overvoltage hardware sampling protection	Yes	Internal battery boost, boost bus voltage overvoltage hardware protection, AC Output shutdown and charging stopped.

Fault ID	Fault Name	Does it affect output	Description
【16】	Bus undervoltage protection	Yes	Internal battery boost, boost bus voltage undervoltage protection, AC Output shutdown and charging stopped.
【17】	Bus Short Circuit Protection	Yes	Internal battery boost and boost bus voltage short circuit protection; AC Output and charging are disabled.
【18】	PV Input Overvoltage	Yes	Protection triggered: solar input voltage exceeds maximum allowable input voltage.
【19】	/	/	/
【20】	PV Overcurrent Protection	No	Solar charging overcurrent hardware protection activated; solar charging disabled.
【21】	/	/	/
【22】	PV Radiator Overtemperature	No	Solar charging radiator temperature too high; solar charging disabled.
【23】	AC Radiator Overtemperature	Yes	AC charging or battery inverting discharge radiator temperature too high; AC charging or battery inverting discharge disabled.
【24】	Main Transformer Overtemperature	Yes	The internal main transformer temperature is too high during AC charging or battery inverting discharging; AC charging or battery inverting discharging will be stopped.
【25】	AC Input Relay Short Circuit	Yes	AC input relay short circuit protection prevents inverter AC output from backfeeding into the bypass AC input.
【26】	AC Output Relay Short Circuit	Yes	AC output relay short circuit protection disables the inverter output and all charging functions.
【27】	Fan Fault	Yes	Fan stall or failure detected; inverter output and all charging functions will be disabled.
【28】	/	/	/
【29】	/	/	/
【30】	Model Detection Error	Yes	Machine type was not set at the factory; model identification error.
【31】	/	/	/
【32】	/	/	/
【33】	Parallel operation control CAN Communication failure	Yes	In parallel operation mode, CAN Communication loss error disables AC Output and Charging.
【34】	Parallel operation control CAN Communication failure	Yes	In parallel operation mode, CAN Communication loss error disables AC Output and Charging.
【35】	Parallel operation mode fault	Yes	In parallel operation mode, the System has inconsistent Machine parallel operation mode 【31】 settings.
【36】	Parallel current sharing fault	Yes	In parallel operation mode, the Battery inverting AC Output of each Machine shows significant current sharing differences, disabling AC Output and Charging.

Fault ID	Fault Name	Does it affect output	Description
【37】	Parallel operation ID setting error	Yes	In parallel operation mode, RS485 address conflict detected; the faulty Machine disables AC Output and Charging. After the master automatically reallocates the address, the fault will be cleared and parallel operation will resume.
【38】	Parallel Battery inconsistency	Yes	In parallel operation mode, there are large differences in Battery voltage input among Machines.
【39】	Parallel operation mode, mains input source mismatch	Yes	Parallel operation mode, mains input source mismatch.
【40】	Parallel operation mode synchronization fault	Yes	Parallel operation mode hardware synchronization signal reception fault, stopping parallel operation and AC Output.
【41】	Parallel operation program version mismatch	Yes	Machines with program version mismatch detected in the parallel operation system, stopping parallel operation and AC Output.
【42】	Parallel operation communication line wiring fault	Yes	Parallel operation communication line wiring fault detected, stopping parallel operation and AC Output.
【43】	Serial number error	Yes	Factory serial number not set, or duplicate factory serial numbers detected in the system.
【49】	BMS communication error	No	Check if the communication line is connected properly and if 【11】 is set to the corresponding lithium battery communication
【50】	Other BMS fault alarms	No	After checking the lithium battery BMS fault type, clear the lithium battery fault
【51】	BMS battery over-temperature alarm	No	Lithium battery BMS over-temperature alarm
【52】	BMS battery over-current alarm	No	Lithium battery BMS battery over-current alarm
【53】	BMS battery over-voltage alarm	No	Lithium battery BMS battery over-voltage alarm
【54】	BMS battery under-voltage alarm	No	Lithium battery BMS battery under-voltage alarm
【55】	BMS battery low-temperature alarm	No	Lithium battery BMS low-temperature alarm

6.2 Troubleshooting

Fault ID	Fault	Solution
/	No display on the screen	Check whether the storage battery circuit breaker or PV circuit breaker is ON; ensure the switch is in the 'ON' position; press any key to exit screen sleep mode.
【06】	Storage battery over-voltage protection	Check if the storage battery voltage exceeds the protection value. If exceeded, the battery needs to be discharged until the voltage falls below the over-voltage recovery point.
【01】 【02】	Battery under-voltage protection	Wait for the storage battery charging to recover above the under-voltage disconnect recovery voltage.

Fault Code	Fault	Solution
【27】	Fan Fault	Check whether the fan has stopped or is blocked by any object.
【22】 【23】	Heatsink over-temperature protection	When the device temperature cools below the over-temperature recovery point, normal charge and discharge control will resume.
【09】 【10】	Bypass overload protection, inverting overload protection	① Reduce electrical equipment; ② Restart the all-in-one unit to restore load output.
【11】	Inverting short circuit protection	①Carefully inspect the load connections and clear any short circuit faults; ②Restore power to resume load output.
【18】	PV Overvoltage	Use a multimeter to check whether the PV input voltage exceeds the maximum allowed input voltage.
【05】	Battery not connected alarm	Check whether the battery is disconnected or the battery side circuit breaker is open.
【40】 【42】	Parallel operation wiring fault	Check whether the parallel operation wires are improperly connected, such as being loose or incorrectly connected
【37】	Parallel operation ID setting error	Check for duplicate parallel operation ID number settings
【39】	Parallel operation mode, mains input source mismatch	Verify that the mains power input for parallel operation comes from the same input interface
【41】	Parallel operation program version mismatch	Verify that the software version of each machine is consistent
【49】	BMS communication error	Ensure the BMS communication cable and inverter communication port are correctly connected

Note: If the product fault cannot be resolved using the above methods, please contact our after-sales service department for technical support. Do not disassemble the equipment yourself.

07 Protection Function and Product Maintenance

7.1 Protection Function

Serial No.	Protection Function	Description
1	PV current/power limiting protection	When the configured Photovoltaic Array charging current exceeds the PV rated current, charging will be limited to the rated current.
2	PV nighttime anti-reverse charging protection	At night, because the Storage battery voltage is higher than the PV Module voltage, discharging from the Storage battery through the PV Module is prevented.
3	Mains input overvoltage protection	When the mains voltage exceeds 280V (230V model), mains charging will stop and the system will switch to inverter output.
4	Mains input undervoltage protection	When the mains voltage falls below 170V (230V model/UPS mode) or 90V (APL mode), mains charging will stop and the system will switch to inverter output.

05 工作模式

5.1 充电模式

1. **光伏优先**：光伏优先充电，只有在光伏失效的时候才启动市电充电。白天充分利用太阳能发电，晚上转市电充电，可保持电池电量，用于电网相对稳定和电价比较贵的地区。
2. **市电优先**：市电优先给蓄电池充电，只有在市电无效的时候才启动光伏充电。
3. **混合充电**：光伏和市电混合充电，优先光伏MPPT充电，光伏能量不足时，市电补充。光伏能量充足时，市电停止充电。这种方式充电最快，适合电网不稳定地区，随时可以提供充足的后备电源供应。
4. **仅光伏充电(Only Solar)**：仅光伏充电，不启动市电充电。这种方式为最节能方式，电池电能均来自于太阳能，通常在光照条件好的地区使用。

5.2 供电模式

1. 光伏优先：当光伏无效时切换至市电供电及充电。该模式最大化利用太阳能，同时可以保持电池电量，适用于电网相对稳定地区。
   实现的供电顺序优先级为：光伏-电池-市电。

2. 市电优先：仅当无市电时切换至电池逆变供电，有市电时切换至市电充电及供电使用。设备相当于后备UPS，用于电网不稳定地区。切换不影响光伏充电。
   实现的供电顺序优先级为：市电-光伏-电池。

3. 电池供电优先：光伏会优先给负载供电，光伏能量不足时，电池会同时给负载供电；仅当电池欠压或者低于"电池切换市电电压"设置值时切换至市电供电；仅当电池充饱或者高于"市电转回电池电压"设置值时切换至电池放电。
   实现的供电顺序优先级为：光伏-电池-市电。

4. Hybrid模式：
   给输出补能：逆变器发电能量只给负载（发电功率<负载功率）
   备注：混合带载，市电和光伏一起带载，光伏不够市电补充；
   恒功率并网：逆变器发电能量直接并网（发电功率可能大于负载功率）
   备注：光伏发电足够负载功率，多余并网发电。

06 故障代码及应对措施

6.1 故障代码

故障序号	故障名称	是否影响输出	说明
【01】	电池电压欠压提醒	否	电池电压低于【18】设置项，提醒电池处于电池欠压状态。
【02】	电池电压低压保护	是	电池电压处于低压，关闭输出停止电池放电保护。
【03】	电池放电平均电流过流保护	是	电池放电平均电流大于最大输入电池电流持续1分钟，关闭输出停止电池放电保护。
【04】	电池放电瞬时值过流保护	是	电池放电电流瞬时值大于器件最大瞬时值，关闭输出停止电池放电保护。
【05】	电池未连接	是	电池未连接告警。
【06】	电池过压	是	超过所选择电池类型或设置的电池电压，关闭输出停止电池充电保护。
【07】	BMS电池容量率低报警	否	锂电池BMS电池容量率低提醒。（设置BMS使能有效）
【08】	BMS电池容量率低保护	是	锂电池BMS电池容量率低，关闭输出停止电池放电保护。（设置BMS使能有效）
【09】	旁路过载保护	是	市电带负载过载，关闭交流输出及停止市电充电。
【10】	电池逆变过载保护	是	电池放电逆变带载过载，关闭交流输出及停止电池放电保护。
【11】	电池逆变交流输出短路	是	电池放电逆变交流输出短路，关闭交流输出及停止电池放电保护。
【12】	电池逆变交流输出过流	是	电池放电逆变交流输出过流，关闭交流输出及停止电池放电保护。
【13】	电池逆变电压直流分量异常	是	电池逆变电压直流分量调节异常，关闭交流输出及停止电池放电保护。
【14】	母线过压软件采样保护	是	内部电池升压，升压母线电压过压软件保护，关闭交流输出及充电。
【15】	母线过压硬件采样保护	是	内部电池升压，升压母线电压过压硬件保护，关闭交流输出输出及充电。

故障序号	故障名称	是否影响输出	说明
【16】	母线欠压保护	是	内部电池升压，升压母线电压欠压保护，关闭交流输出输出及充电。
【17】	母线短路保护	是	内部电池升压，升压母线电压短路保护，关闭交流输出输出及充电。
【18】	PV输入电压过压	是	太阳能输入电压超过最大允许输入电压保护。
【19】	/	/	/
【20】	PV电流过流保护	否	太阳能充电过流硬件保护，关闭太阳能充电。
【21】	/	/	/
【22】	PV散热器过温	否	太阳能充电散热器温度过高，关闭太阳能充电。
【23】	交流散热器过温	是	交流充电或电池逆变放电散热器温度过高，关闭交流充电或电池逆变放电。
【24】	主变压器温度过温	是	交流充电或电池逆变放电内部主变压器温度过高，关闭交流充电或电池逆变放电。
【25】	交流输入继电器短路	是	交流输入继电器短路保护，防止逆变交流输出反灌至旁路交流输入。
【26】	交流输出继电器短路	是	交流输出继电器短路保护，关闭逆变输出及各充电功能。
【27】	风扇故障	是	风扇堵转或失效故障，关闭逆变输出及各充电功能。
【28】	/	/	/
【29】	/	/	/
【30】	型号侦测错误	是	机型出厂未设置，型号识别错误。
【31】	/	/	/
【32】	/	/	/
【33】	并机控制can通讯故障	是	并机模式下，CAN通讯丢失故障，关闭交流输出及充电。
【34】	并机控制can通讯故障	是	并机模式下，CAN通讯丢失故障，关闭交流输出及充电。
【35】	并机模式故障	是	并机模式下，系统存在机器并机模式【31】项设置不一致。
【36】	并机均流故障	是	并机模式下，电池逆变交流输出各机不均流输出差异较大，关闭交流输出及充电。

故障序号	故障名称	是否影响输出	说明
【37】	并机ID设置错误	是	并机模式下，RS485地址重复冲突，故障机关闭交流输出及充电，待主机自动重新分配地址后会重新清除故障进入并机。
【38】	并机电池不一致	是	并机模式，各机电池电压输入差异大。
【39】	并机模式， 市电输入源不一致	是	并机模式，市电输入源不一致。
【40】	并机模式同步故障	是	并机模式，硬件同步信号接收故障，停止并机及交流输出。
【41】	并机程序版本不一致	是	并机系统中存在程序版本不一致的机器，停止并机及交流输出。
【42】	并机通讯线接线故障	是	并机通讯线接线存在故障，停止并机及交流输出。
【43】	序列号错误	是	出厂未设置序列号，或者系统中有机器出厂序列号设置重复。
【49】	BMS通讯错误	否	需检查通讯线是否连接正确及【11】是否设置为对应的锂电池通讯协议。
【50】	BMS其余故障告警	否	查看锂电池BMS故障类型后，清除锂电池故障。
【51】	BMS电池过温报警	否	锂电池BMS过温报警。
【52】	BMS 电池过流报警	否	锂电池BMS 电池过流报警。
【53】	BMS 电池过压报警	否	锂电池BMS 电池过压报警。
【54】	BMS电池欠压报警	否	锂电池BMS电池欠压报警。
【55】	BMS电池低温报警	否	锂电池BMS低温报警。

6.2 故障排除

故障序号	故障名称	说明
/	屏幕无显示	检查蓄电池空开或者PV空开是否已合上；开关是否处于"ON"状态；按屏幕上的任意按键退出屏幕休眠模式。
【06】	充电电池过压保护	查看蓄电池电压是否超过保护值。超过时，需要对电池进行放电至电压低于电池过压恢复点之下。
【01】 【02】	电池欠压保护	待蓄电池充电恢复到低压断开恢复电压以上。

故障序号	故障名称	说明
【27】	风扇故障	检查风扇是否不转了或者是否被其它东西堵住了。
【22】 【23】	散热器过温保护	待设备温度冷却到超温恢复温度以下时，恢复正常充、放电控制。
【09】 【10】	旁路过载保护、逆变过载保护	①减少用电设备； ②重启一体机，负载恢复输出。
【11】	逆变短路保护	①仔细检查负载连接情况，清除短路故障点； ②重新上电，负载恢复输出。
【18】	PV过压	用万用表检查PV输入电压是不是超过最高允许输入电压。
【05】	电池未接告警	检查电池是否未接或者电池侧断路器是不是没有合上。
【40】【42】	并机接线故障	检测并机线是否没有连接好，例如：松动或者连接错误。
【37】	并机ID设置错误	并机ID号的设置是否有重复现象。
【39】	并机模式， 市电输入源不一致	检查并机的市电输入是不是同一输入接口。
【41】	并机程序版本不一致	检查每台机器的软件版本是否是一致的。
【49】	BMS通讯错误	检查BMS通讯线和逆变器通讯端口是否连接正确。

注：如果遇到上表中的方法无法解决的产品故障，请与我们的售后服务部门联系，寻求技术支持，不要自行拆解设备。

07 保护功能及产品维护保养

7.1 保护功能

序号	保护功能	说明
1	PV限流/限功率保护	当配置的光伏阵列充电电流超过PV 额定电流时，将会以额定电流进行充电。
2	PV夜间防反充保护	夜间由于蓄电池的电压大于 PV 组件的电压，防止蓄电池通过 PV 组件放电。
3	市电输入过压保护	当市电电压超过 280V （230V机型）时，将停止市电充电，并且转逆变输出。
4	市电输入欠压保护	当市电电压低于 170V （230V机型/UPS模式）或90V（APL模式）时，将停止市电充电，并且转逆变输出。

Serial No.	Protection Function	Description
5	Battery overvoltage protection	When the battery voltage reaches the overvoltage disconnect point, charging from PV and mains power to the battery will automatically stop to prevent overcharging damage.
6	Battery under-voltage protection	When the battery voltage reaches the low voltage disconnect point, discharging from the battery will automatically stop to prevent overdischarge damage.
7	Load output short circuit protection	If a short circuit fault occurs at the load output terminal for more than 200 ms, the output AC voltage will be immediately shut off.
8	Heatsink over-temperature protection	When the internal temperature of the integrated unit is too high, charging and discharging will stop; they will resume once the temperature returns to normal.
9	Overload protection	Outputs resume 3 minutes after overload protection; output is shut down after 5 consecutive overloads until the inverter is powered on again. Refer to the technical parameters table at the end of the manual for specific overload levels and durations.
10	PV reverse protection	The inverter will not be damaged if the PV polarity is reversed.
11	AC backfeed protection	Prevents the battery inverter from backfeeding AC power into the bypass AC input.
12	Bypass overcurrent protection	Built-in bypass overcurrent protection circuit breaker.
13	Battery input overcurrent protection	When the battery discharge output current exceeds the maximum value and lasts for 1 minute, it switches to AC input load.
14	Battery input protection	If the battery is reverse connected or the inverter's internal short circuit occurs, the inverter's internal battery input fuse will blow to prevent battery damage or fire.
15	Charging short circuit protection	When PV or AC is charging, if the external battery port is short-circuited, the inverter will protect itself and stop outputting current.
16	CAN Communication loss protection	During parallel operation, an alarm will be triggered if CAN Communication is lost.
17	Parallel wiring fault protection	During parallel operation, if the parallel cable is disconnected, the device will activate protection.
18	Parallel battery voltage difference fault protection	During parallel operation, if the battery connections are inconsistent and the battery voltage significantly differs from that detected by the master unit, the device will activate protection.
19	Parallel mains power voltage difference fault protection	During Parallel operation, if the AC IN input connections are inconsistent, the device will activate protection.
20	Synchronization signal failure protection	In Parallel operation bus faults, if lead signals fail and machine behaviors become inconsistent, the device will activate protection.

7.2 Maintenance

To maintain optimal performance, it is recommended to perform the following inspections twice annually:

1、Ensure the airflow around the ULTRA12K is unobstructed and remove any dirt or debris from the ventilation outlets.

2、Inspect all exposed wires for insulation damage caused by sun exposure, friction with nearby objects, decay, insect or rodent damage, and repair or replace wires as needed.

3、Verify that all indicators and displays correspond with device operation; monitor for any faults or error messages and take corrective action as necessary.

4、Inspect all wiring terminals for corrosion, insulation damage, overheating, or signs of burning/discoloration, and tighten the terminal screws.

5、Check for dirt, insect nests, and corrosion; clean as required and regularly maintain insect screens.

Our company is not responsible for damages caused by the following reasons:

a) Damage caused by improper use or usage in an incorrect location.

b) The open-circuit voltage of the photovoltaic module exceeds the maximum allowable voltage.

c) Damage caused by operating at temperatures beyond the specified working temperature range.

d) Unauthorized disassembly and repair of the inverter.

e) Damage caused by force majeure. Damage during transportation or handling of the inverter.

⚠ DANGER

Before performing any inspection or operation, please ensure the ULTRA12K switch is turned off, the circuit breaker is disconnected, all power sources are isolated, and the capacitor is fully discharged to avoid the risk of electric shock.

08 Specifications and Parameters

Model	ULTRA12K
Parallel operation mode	
Permitted number of units for parallel operation	1-2
DC Output	
USB Type A	
Number of Interfaces	2 ports 2 channels
Output Power (Max)	18W, QC3.0
Overcurrent Protection	Yes
USB Type C	USB Type C
Number of Interfaces	2 ports 2 channels
Output Power (Max)	100W, PD
Overcurrent Protection	Yes
AC Output	
Rated Output Power	12000W/12000VA
Maximum Peak Power	18000VA
Overload protection	(102% < Load < 110%) ±10%: Error reported and output shuts down after 5 minutes; (110% < Load < 125%) ±10%: Error reported and output shuts down after 10 seconds; Load > 125% ±10%: Error reported and output shuts down after 5 seconds;
Rated Output Voltage	120Vac (L1/N, L2/N)/240Vac(L1/L2)
Rated Output Frequency	50Hz/60Hz
Output Waveform	Pure Sine Wave
UPS Transfer Time	10ms (typical)
Battery	
Battery Type	Lithium Iron Phosphate
Rated Battery Voltage	51.2Vdc
Voltage Range Maximum Mains	40-58.6 Vdc
Power/Generator Charging Current	160A
Maximum Hybrid Charging Current	220A
High Voltage Photovoltaic Input	
Number of MPPT Channels	2
Maximum Input Power	10000W (PV1: 10000W/PV2: 10000W)
Maximum Input Current	32/32A (PV1/PV2)

Model	ULTRA12K
Maximum Open-Circuit Voltage	500Vdc
MPPT Operating Voltage Range	90-485Vdc
Low Voltage Photovoltaic Input	
Maximum Input Power	1300W
Maximum Input Current	22/22A
Maximum Open-Circuit Voltage	60Vdc
MPPT Operating Voltage Range	12-60Vdc
Mains Power/Generator Input	
Rated Input Voltage	120(L1/N, L2/N)/240Vac(L1/L2)
Input Voltage Range	85-140Vac
Frequency Range	50/60Hz
Bypass Overcurrent	String, 60 A/60A (L1,L2)
Efficiency	
MPPT Tracking Efficiency	99.9%
Battery Inverting Maximum Efficiency	>92%
Basic Parameters	
Protection Rating	IP20, for Indoor Use
Ambient Temperature	-15-55°C, derating operation above 45°C
Noise	<60dB
Cooling Method	Forced Air Cooling
Communication	
Built-in Interface	CAN
Dimensions (L*W*H)	498x758x894mm
Weight (kg)	140KG

序号	保护功能	说明
5	电池过压保护	当电池电压达到过压断开电压点时，将自动停止PV和市电对电池充电，防止电池的过度充电而损坏。
6	电池欠压保护	当电池电压达到低压断开电压点，将自动停止对电池放电，防止电池的过度放电而损坏。
7	负载输出短路保护	当负载输出端发生短路故障超过200MS时，会立即关闭输出交流电压。
8	散热器过温保护	当一体机的内部温度过高时，一体机将停止充放电；待温度恢复正常时，一体机将恢复充放电。
9	过载保护	过载保护后3分钟再次输出，连续过载5次关断输出直至机器重新上电，具体过载等级和持续时间参考手册后的技术参数表。
10	PV防反保护	PV极性接反时，机器不会损坏。
11	交流反灌保护	防止电池逆变交流电反灌至旁路交流输入。
12	旁路过流保护	内置交流输入过流保护断路器。
13	电池输入过流保护	当电池放电输出电流大于最大值并持续1分钟后，转交流输入带载。
14	电池输入保护	当电池反接或者逆变器内部短路时，逆变器内部电池输入保险丝会熔断，防止电池损坏或造成的火灾发生。
15	充电短路保护	当PV或AC充电状态下，外部电池端口短路时，逆变器会保护并停止输出电流。
16	CAN通讯丢失保护	并机使用时，当CAN通讯丢失时，会提醒报警。
17	并机接线故障保护	并机使用时，当并机线丢失时，设备会进行保护。
18	并机电池电压差异故障保护	并机使用时，当电池连接不一致，与主机侦测到的电池电压差异较大时，设备会进行保护。
19	并机市电电压差异故障保护	并机使用时，当AC IN输入连接不一致时，设备会进行保护。
20	同步信号故障保护	并机总线间，引导信号发生故障时，各机行为不一致时，设备会进行保护。

7.2 维护保养

为了保持最佳的工作性能，建议每年进行两次以下项目的检查：

1. 确认ULTRA12K周围的气流不会被阻挡住，清除散热口上的任何污垢或碎屑。
2. 检查所有裸露的导线是不是因日晒，与周围其他物体摩擦、干朽、昆虫或鼠类破坏等导致绝缘受到损坏，必要时需维修或更换导线。
3. 验证指示和显示与设备操作相一致，请注意任何故障或错误显示必要时采取纠正措施。
4. 检查所有的接线端子，查看是否有腐蚀、绝缘损坏、高温或燃烧/变色迹象，拧紧端子螺丝。
5. 检查是否有污垢、筑巢昆虫和腐蚀现象，按要求清理，定期清洗防虫网。

本公司对以下原因造成的损害不承担责任：

1. 因使用不当或在错误地点使用而造成的损坏。
2. 光伏组件的开路电压超过最大允许电压。
3. 工作温度超过限制的工作温度范围而造成的损坏
4. 未经授权的人员对逆变器进行拆卸和维修。
5. 不可抗力造成的损坏：在运输或处理逆变器过程中的损坏。

⚠ DANGER

在进行任何检查或操作之前，请确保ULTRA12K开关关闭及空气开关为断开状态，并与所有电源断开，并确保电容器完全放电，以避免电击的危险。

08 规格参数

型号	ULTRA12K
并机模式	
允许并机数量	1-6
直流输出	
USB Type A	
接口数量	2口2路
输出功率（Max）	18W，QC3.0
过流保护	有
USB Type C	
接口数量	2口2路
输出功率（Max）	100W，PD
过流保护	有
交流输出	
额定输出功率	12000W/12000VA
最大峰值功率	18000VA
过载保护	(102%<负载<110%) ±10%: 报错并5分钟后关闭输出; (110%<负载<125%) ±10%: 报错并10秒后关闭输出； 负载>125% ±10%: 报错并5秒后关闭输出;
额定输出电压	120Vac (L1/N, L2/N)/240Vac(L1/L2)
额定输出频率	50Hz/60Hz
输出波形	纯正弦波
UPS切换时间	10ms（典型值）
电池	
电池类型	磷酸铁锂
额定电池电压	51.2Vdc
电压范围 最大市电/发电机充电电流	40-58.6Vdc 160A
最大混合充电电流	220A
高压光伏输入	
MPPT路数	2
最大输入功率	10000W(PV1:10000W/PV2:10000W)
最大输入电流	32/32A(PV1/PV2)

型号	ULTRA12K
最大开路电压	500Vdc
MPPT工作电压范围	90-485Vdc
低压光伏输入	
最大输入功率	1300W
最大输入电流	22/22A
最大开路电压	60Vdc
MPPT工作电压范围	12-60Vdc
市电/发电机输入	
额定输入电压	120(L1/N, L2/N)/240Vac(L1/L2)
输入电压范围	85-140Vac
输入频率范围	50/60Hz
旁路过载电流	裂项，60A/60A（L1,L2）
效率	
MPPT追踪效率	99.9%
电池逆变最大效率	>92%
基本参数	
防护等级	IP20，室内使用
环境温度	-15-55°C,>45°C降额运行
噪音	<60dB
冷却方式	强制风冷
通信	
内置接口	CAN
尺寸（长*宽*高）	498x758x894mm
重量（千克）	140KG

POWISER

For more information,
scan the QR code below to visit
the POWISER official website.