



User Manual

Energy Storage System (ESS)

SMILE-T10-HV

V04

IMPRINT

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Copyright Statement

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Version Information

Version	Date	Content
V01	04102021	New
V02	01092021	Add DRM and Regional Application Standard

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1. Information on this Document

1.1 Content and Structure of this Document

This document is valid for product of SMILE-T10-HV system which include inverter SMILE-T10-HV-INV, battery pack SMILE-BAT-8.2PH.

This document describes the mounting, installation, commissioning, configuration, operation, troubleshooting and decommissioning of the product as well as the operation of the product user interface.

Observe all documentation that accompanies the product, keep them in a convenient place and available at all times.

Illustrations in this document are reduced to the essential information and may deviate from the real product.

1.2 Target Group

This document is intended for qualified persons and end users. Only qualified persons are allowed to perform the activities marked in this document with a warning symbol. Tasks that do not require any particular qualification are not marked and can also be performed by end users. Qualified persons must have the following skills:

- Knowledge of how an inverter works and operates
- Training in how to deal with the dangers and risks associated with installing and using electrical devices, batteries and systems
- Training in the installation and commissioning of electrical devices and systems
- Knowledge of the applicable standards and directives
- Knowledge of and compliance with this document, including all safety precautions
- Knowledge of and compliance with the documents of the battery manufacturer, including all safety precautions.

1.3 Levels of Warning Messages

The following levels of warning messages may occur when handling the product.

 **DANGER**

DANGER indicates a hazardous situation which, if not avoided, will result in death or serious injury.

 **WARNING**

WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury.


CAUTION

CAUTION indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

NOTICE

NOTICE indicates a situation which, if not avoided, can result in property damage.



INFORMATION provides tips which are valuable for the optimal installation and operation of the product.

1.4 Nomenclature

Complete designation	Designation in this document
SMILE-BAT-8.2PH (INDOOR)	Battery Pack (INDOOR)
SMILE-BAT-8.2PH (OUTDOOR)	Battery Pack (OUTDOOR)
SMILE-BAT-8.2PH-P (OUTDOOR)	Battery Pack (OUTDOOR)
SMILE-T10-HV-INV (INDOOR)	Inverter (INDOOR)
SMILE-T10-HV-INV (OUTDOOR)	Inverter (OUTDOOR)
SMILE-T10-HV-INV with SMILE-BAT-8.2PH	Product

2. Safety

2.1 Intended Use of the Inverter

The inverter, the battery pack and the energy meters make up a system for optimization of self-consumption in a household. The inverter is equipped with two MPP trackers and converts the direct current from the PV array into grid-compliant three-phase current and feeds it into the utility grid. The Battery Pack is used for the intermediate storage of the energy.

The product is suitable for indoor and outdoor use.

The product must only be operated with PV arrays of protection class II in accordance with IEC 61730, application class A. The PV modules must be compatible with this product.

PV modules with a high capacity to ground must only be used if their coupling capacity does not exceed 1.0 μF .

All components must remain within their permitted operating ranges at all times.

Use this product only in accordance with the information provided in the enclosed documentation and with the locally applicable standards and directives. Any other application may cause personal injury or property damage.

Alterations to the product, e.g. changes or modifications, are only permitted with the express written permission of AlphaESS. Unauthorized alterations will void guarantee and warranty claims. AlphaESS shall not be held liable for any damage caused by such changes.

Any use of the product other than that described in the Intended Use section does not qualify as appropriate.

The enclosed documentation is an integral part of this product. Keep the documentation in a convenient place for future reference and observe all instructions contained therein.

The type label must remain permanently attached to the product.

2.2 Safety Precaution for Battery Pack

2.2.1 General Safety Precautions

Over-voltages or wrong wiring can damage the battery pack and cause deflagration, which can be extremely dangerous.

All types of breakdown of the battery may lead to a leakage of electrolyte or flammable gas.

Battery pack is not user serviceable. High voltage is present in the device.

Read the label with Warning Symbols and Precautions, which is on the right side of the battery pack.

Do not connect any AC conductors or PV conductors directly to the Battery Pack which should be only connected to the Inverter.

Do not charge or discharge damaged battery.

Do not damage the Battery Pack in such ways as dropping, deforming, impacting, cutting or penetrating with a sharp object. It may cause a leakage of electrolyte or fire.

Do not expose battery to open flame.

2.2.2 Response to Emergency Situations

The Battery pack comprises multiple batteries that are designed to prevent hazards resulting from failures. However, AlphaESS cannot guarantee their absolute safety.

- If a user happens to be exposed to internal materials of the battery cell due to damage on the outer casing, the following actions are recommended.
Inhalation: Leave the contaminated area immediately and seek medical attention.
Eye contact: Rinse eyes with running water for 15 minutes and seek medical attention.
Contact with skin: Wash the contacted area with soap thoroughly and seek medical attention.
Ingestion: Induce vomiting and seek medical attention.

If a fire breaks out in the place where the battery pack is installed, perform the following countermeasures:

- Fire extinguishing media
Respirator is not required during normal operations.
Use FM-200 or CO₂ extinguisher for battery fire.
Use an ABC fire extinguisher, if the fire is not from battery and not spread to it yet.
- Firefighting instructions
 1. If fire occurs when charging batteries, if it is safe to do so, disconnect the battery pack circuit breaker to shut off the power to charge.
 2. If the battery pack is not on fire yet, extinguish the fire before the battery pack catches fire.

3. If the battery pack is on fire, do not try to extinguish but evacuate people immediately.

 **WARNING**

There may be a possible explosion when batteries are heated above 150°C.

When the battery pack is burning, it leaks poisonous gases. Do not approach.

- Effective ways to deal with accidents

On land: Place damaged battery into a segregated place and call local fire department or service engineer.

In water: Stay out of the water and don't touch anything if any part of the battery, inverter, or wiring is submerged.

Do not use submerged battery again and contact the service engineer.

2.3 Important Safety Instructions

This section contains safety precautions that must be observed at all times when working on or with the product.

To prevent personal injury and property damage and to ensure long-term operation of the product, read this section carefully and follow all safety precautions at all times.



DANGER

Danger to life due to electric shock when live components or cables are touched

High voltages are present in the conductive components or cables of the product. Touching live parts and cables results in death or lethal injuries due to electric shock.

- Do not touch non-insulated parts or cables.
- Disconnect the product from voltage sources and make sure it cannot be reconnected before working on the inverter or the Battery Pack.
- After disconnection, wait 5 minutes until the capacitors have discharged.
- Do not open the product.
- Wear suitable personal protective equipment for all work on the product.



DANGER

Danger to life due to electric shock when live components or DC cables are touched

When exposed to sunlight, the PV array generates high DC voltage which is present in the DC conductors. Touching the live DC cables results in death or lethal injuries due to electric shock.

- Disconnect the inverter from voltage sources and make sure it cannot be reconnected before working on the device.
- Do not touch non-insulated parts or cables.
- Do not disconnect the DC connectors under load.
- Wear suitable personal protective equipment for all work on the inverter.



DANGER

Danger to life due to electric shock from touching an ungrounded PV module or array frame

Touching ungrounded PV modules or array frames results in death or lethal injuries due to electric shock.

- Connect and ground the frame of the PV modules, the array frame and the electrically conductive surfaces so that there is continuous conduction. Observe the applicable local regulations.

 **DANGER****Danger to life due to electric shock when touching live system components in case of a ground fault**

If a ground fault occurs, parts of the system may still be live. Touching live parts and cables results in death or lethal injuries due to electric shock.

- Disconnect the product from voltage sources and make sure it cannot be reconnected before working on the device.
- Touch the cables of the PV array on the insulation only.
- Do not touch any parts of the substructure or frame of the PV array.
- Do not connect PV strings with ground faults to the inverter.

 **DANGER****Danger to life due to high voltages on the Battery Pack**

Lethal voltage is present at the pin connector for the power cable. Reaching into the pin connector for the power cable can result in lethal electric shock.

- Do not open the Battery Pack.
- Do not wipe over the Battery Pack with a damp cloth.
- Leave the protective caps on the pin connectors for the batteries power connection until the inverter cables are connected to the Battery Pack.
- Disconnect the product from voltage sources and make sure it cannot be reconnected before working on the inverter or the Battery Pack.

 **WARNING****Risk of chemical burns from electrolyte or toxic gases**

During normal operation, no electrolyte can leak from the battery pack and no toxic gases can form. Despite careful construction, if the battery pack is damaged or a fault occurs, it is possible that electrolyte may be leaked or toxic gases formed.

- Store the battery pack in a cool and dry place.
- Do not drop the battery pack or damage it with sharp objects.
- Only set the battery pack down on its back, i.e., on the side with the mounting lugs.
- Do not open the battery pack.
- Do not install or operate the battery pack in potentially explosive atmosphere or areas of high humidity.
- If moisture has penetrated the battery pack (e.g. due to a damaged enclosure), do not install or operate the battery pack.
- In case of contact with electrolyte, rinse the affected areas immediately with water and consult a doctor without delay.

**CAUTION****Risk of burns due to hot heatsink and housing**

The heatsink and housing can get hot during operation.

- During operation, do not touch any parts other than the cover of the inverter.

NOTICE**Damage to the inverter due to electrostatic discharge**

- Touching electronic components can cause damage to or destroy the inverter through electrostatic discharge.
- Ground yourself before touching any component.

NOTICE**Damage due to cleaning agents**

The use of cleaning agents may cause damage to the product and its components.

- Clean the product and all its components only with a cloth moistened with clear water.

2.4 Symbols on the Label

Symbols on the type label of the inverter:

Symbol	Explanation
	Beware of a danger zone This symbol indicates that the product must be additionally grounded if additional grounding or equipotential bonding is required at the installation site.
	Beware of electrical voltage The product operates at high voltages.
	Beware of hot surface The product can get hot during operation.
	Danger to life due to high voltages in the inverter; observe a waiting time of 5 minutes High voltages that can cause lethal electric shocks are present in the live components of the inverter. Prior to performing any work on the inverter, disconnect it from all voltage sources as described in this document.
	WEEE designation Do not dispose of the product together with the household waste but in accordance with the disposal regulations for electronic waste applicable at the installation site.
	Observe the documentation Together with the red LED, this symbol indicates an error.
	Certified safety The product is TÜV-tested and complies with the requirements of the EU Equipment and Product Safety Act.
	CE marking The product complies with the requirements of the applicable EU directives.
	RCM (Regulatory Compliance Mark) The product complies with the requirements of the applicable Australian standards.

Symbols on the type label and warning label of the battery pack:

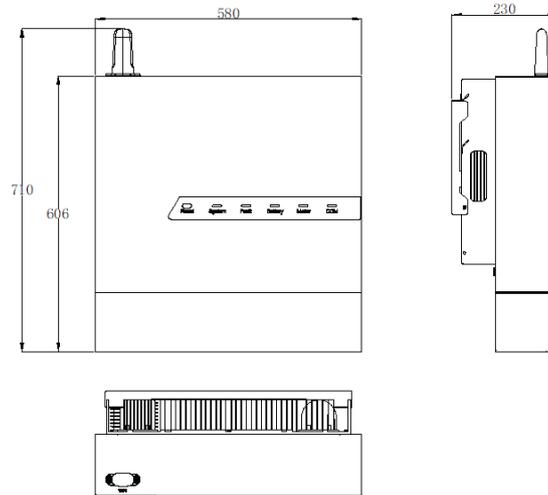
Symbol	Explanation
	Beware of a danger zone This symbol indicates that the product must be additionally grounded if additional grounding or equipotential bonding is required at the installation site.
	Beware of electrical voltage The product operates at high voltages.
	Risk of chemical burns
	Risk of explosion
	WEEE designation Do not dispose of the product together with the household waste but in accordance with the disposal regulations for electronic waste applicable at the installation site.
	Observe the documentation Together with the red LED, this symbol indicates an error.
	Risk of electrolyte leakage
	CE marking The product complies with the requirements of the applicable EU directives.
	Refer to the instruction for operation
	Use eye protection
	Fire, naked light and smoking prohibited
	No nearing

 Li-Ion	Do not dispose of the battery pack together with the household waste but in accordance with the locally applicable disposal regulations for batteries
	Recycling code
UN38.3	Marking for transport of dangerous goods The product passes the certifications of the UN38.3

3. Product Introduction and Application Scenarios

3.1 Inverter Description

Inverter appearance and dimensions

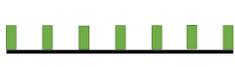
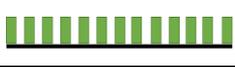


Inverter LED Signals



Five LED indicators and one reset button are provided on the display panel. These LED indicators provide information about the operational status of the system. The external communication devices will be restarted with the inverter if you long press the reset button for 5s.

LED Indicator	Status	Explanation
SYSTEM		The system works normally.
		The system is not operating.
FAULT		A fault of the system has occurred.
		No fault
BATTERY		The battery pack works normally.
		Battery communication exists but is not working normally
		Battery communication loss exists

METER		Meter communication works normally.
		Meter communication lost
		Grid Meter communication lost in AC or Hybrid mode, flash once every 500ms
		PV Meter communication lost in AC or Hybrid mode, flash once every 1s
COM		Normal communication with the server
		Disconnect to the server
		Normal communication with the APP,flash once every 4s
		Connected to the server but not logged in ,flash once every 2s
		Connected to the router,flash once every 1s
		Connected to the WiFi module, flash once every 500ms

3.2 Battery Pack Description

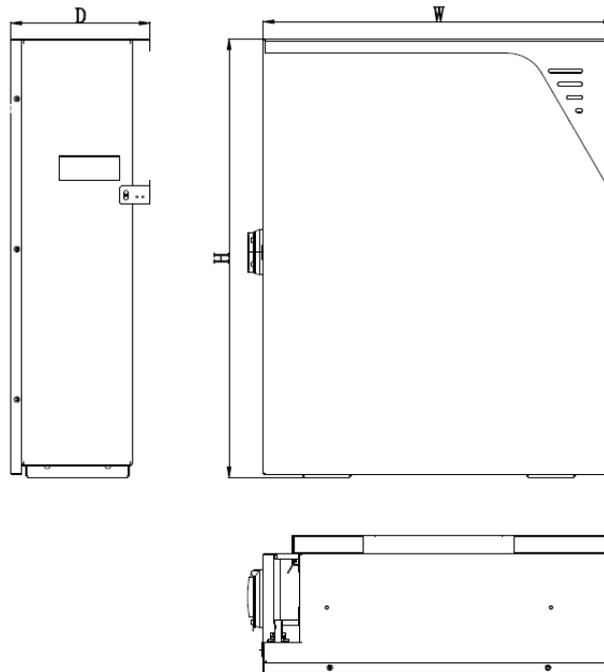


Figure 1 Battery pack appearance and dimensions

Item	SMILE-BAT-8.2PH (OUTDOOR)	SMILE-BAT-8.2PH (INDOOR)	SMILE-BAT-8.2PH-P (OUTDOOR)
Dimension (W*H*D)	580*820*230 mm	580*730*230 mm	580*820*230 mm

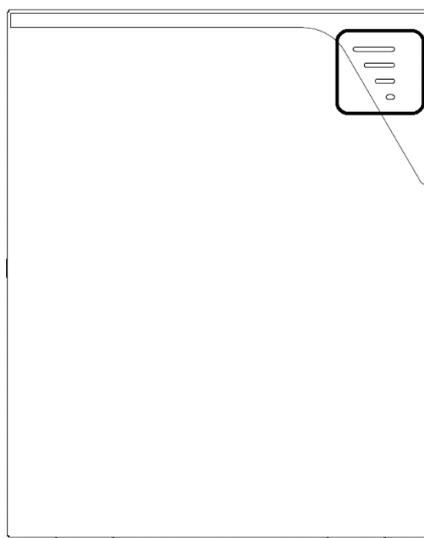


Figure 2 Battery pack LED signals

Four LED indicators are provided on the display panel. Different colors represent different states, green for SOC state, yellow for protection state, red for error state.

The LED indicators provide information about the SOC operational status of the battery pack.

LED Indicator	SOC	Description
<p style="text-align: center;">Standby: Green LEDs flash every second</p>		<p style="text-align: center;">$SOC \leq 5\%$</p> <p>The first line of the LED indicator flashes every 10s.</p>
		<p style="text-align: center;">$5\% < SOC \leq 30\%$</p> <p>The first line of the LED indicator is always on. When the SOC is less than 30% and the battery is being charged, the first line of the LED indicator will flash every 3s.</p>
		<p style="text-align: center;">$30\% < SOC \leq 55\%$</p> <p>The first and second line of the LED indicator are always on. When the battery is being charged and the SOC is between 30% and 55%, the second line of the LED indicator will flash every 3s.</p>
		<p style="text-align: center;">$55\% < SOC \leq 80\%$</p> <p>The first, second and third line of the LED indicator are always on. When the battery is being charged and the SOC is between 55% and 80%, the third line of the LED indicator will flash every 3s.</p>
		<p style="text-align: center;">$80\% \leq SOC \leq 100\%$</p> <p>All the LED indicators are always on. When the battery is being charged and the SOC is between 80% and 100%, the fourth line of the LED indicator will flash every 3s.</p>

3.3 Application Scenarios

AlphaESS SMILE-T10-HV system (include SMILE-T10-HV-INV and SMILE-BAT-8.2PH) can be applied in DC-coupled systems (mostly new installation), AC-coupled systems (mostly retrofit) and Hybrid-coupled systems (mostly retrofit, and PV capacity - increase), as the following scheme show:

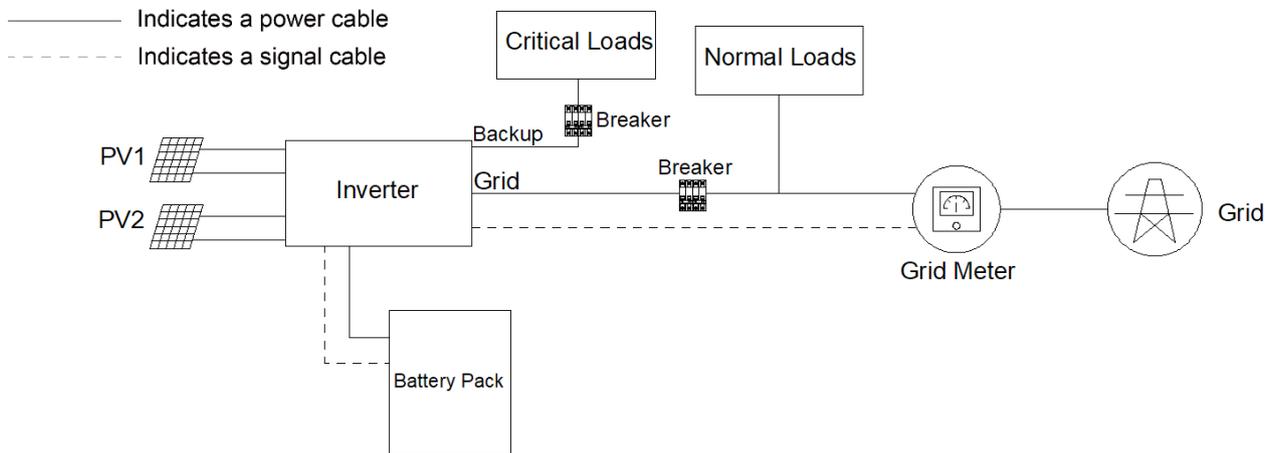


Figure 3 DC-coupled Storage System - Scheme

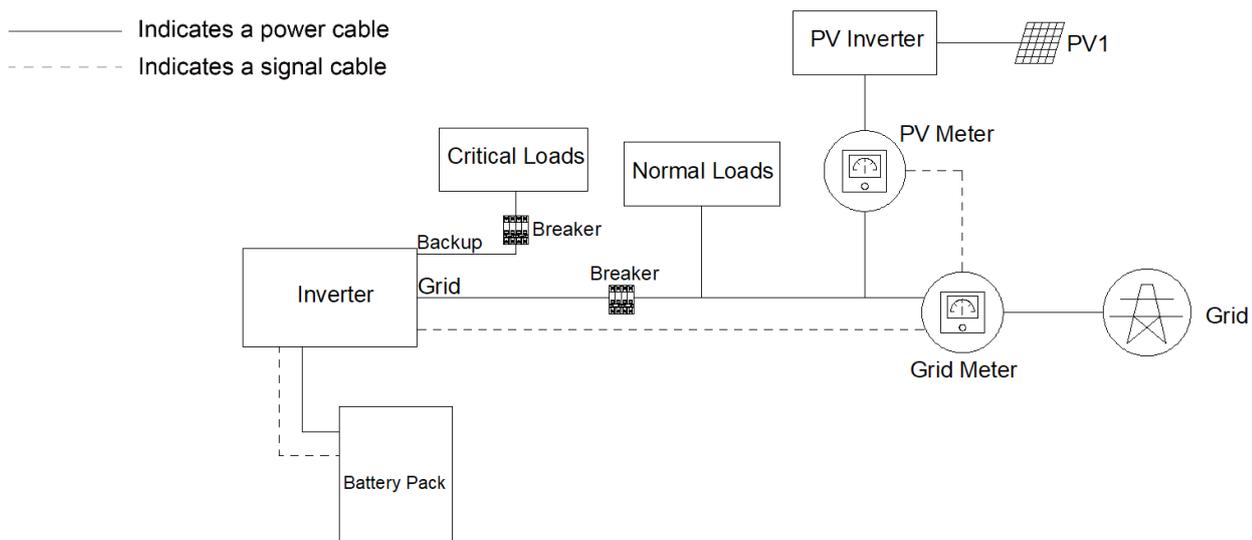


Figure 4 AC-coupled Storage System - Scheme

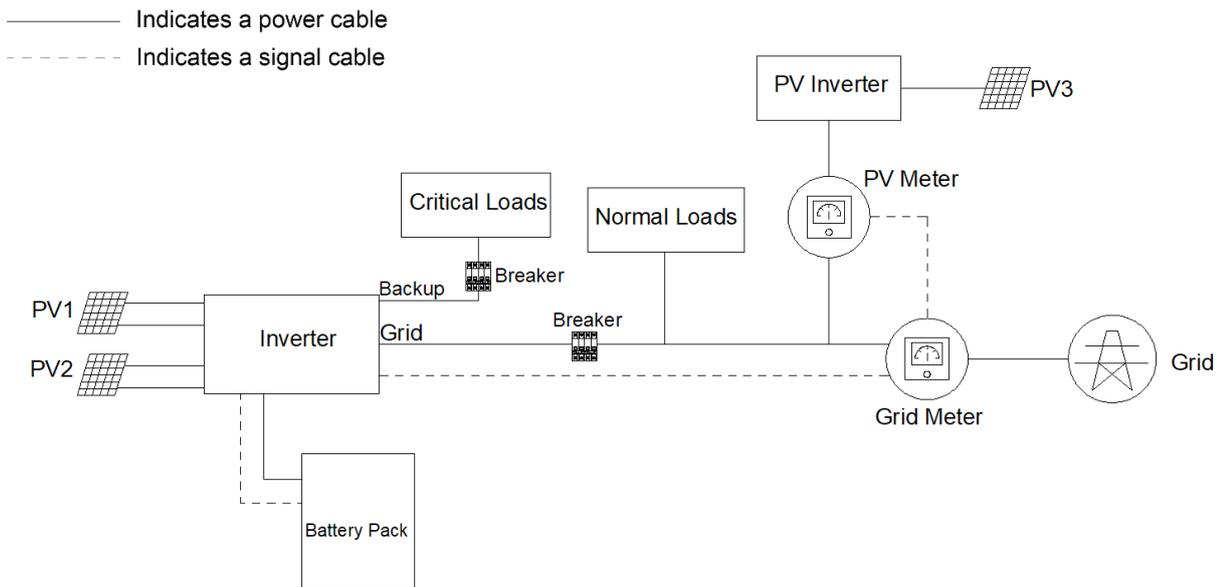


Figure 5 Hybrid-coupled Storage System - Scheme

4. Storage

4.1 Inverter Storage

The following requirements should be met if the inverter is not put into use directly:

1. Do not unpack the inverter.
2. Keep the storage temperature at $-40\sim 70^{\circ}\text{C}$ and the humidity at $5\%\sim 95\%$ RH.
3. The inverter should be stored in a clean and dry place and be protected from dust and water vapor corrosion.
4. Up to six inverters can be stacked. To avoid personal injury or device damage, please stack inverters with caution to prevent them from falling over.
5. During the storage period, check the inverter periodically. (It is recommended that the check is performed every three months.) Replace the packing materials that are damaged by insects or rodents in a timely manner.
6. If the inverters have been stored for more than two years, it must be checked and tested by professionals before being put into use.

4.2 Battery Storage

The following requirements should be met if the battery pack is not put into use directly:

1. Place batteries according to the signs on the packing case during storage. Do not put batteries upside down or sidelong.
2. Stack battery packing cases by complying with the stacking requirements on the external package.
3. Store the battery pack out of reach of children and animals.
4. Store the battery pack where it should be minimal dust and dirt in the area.
5. Handle batteries with caution to avoid damage.
6. The storage environment requirements are as follows:
 - Ambient temperature: $-10\sim 55^{\circ}\text{C}$; recommended storage temperature: $15\sim 30^{\circ}\text{C}$

- Relative humidity: 15%~ 85%
 - Place batteries in a dry and clean place with proper ventilation.
 - Place batteries in a place that is away from corrosive organic solvents and gases.
 - Keep batteries away from direct sunlight.
 - Keep batteries at least 2 meters away from heat sources.
7. The batteries in storage must be disconnected from external devices. The indicators (if any) on the batteries should be off.
8. Batteries should be delivered based on the "first in, first out" rule.
9. The warehouse keeper should collect battery storage information every month and periodically report the battery inventory information to the planning department. The batteries that have been stored for nearly 6 months should be recharged timely.
10. If a lithium battery is stored for a long time, capacity loss may occur. If a lithium battery is stored for 12 months in the recommended storage temperature, the irreversible capacity loss rate is 3%~10%. It is recommended that batteries not be stored for a long period. If the batteries need to be stored for more than 6 months, it is recommended to recharge the batteries to 65~75% of the SOC. For example, they can be recharged every 6 months at least, and must be recharged to at least 50% of the SOC.

5. WiFi Setting

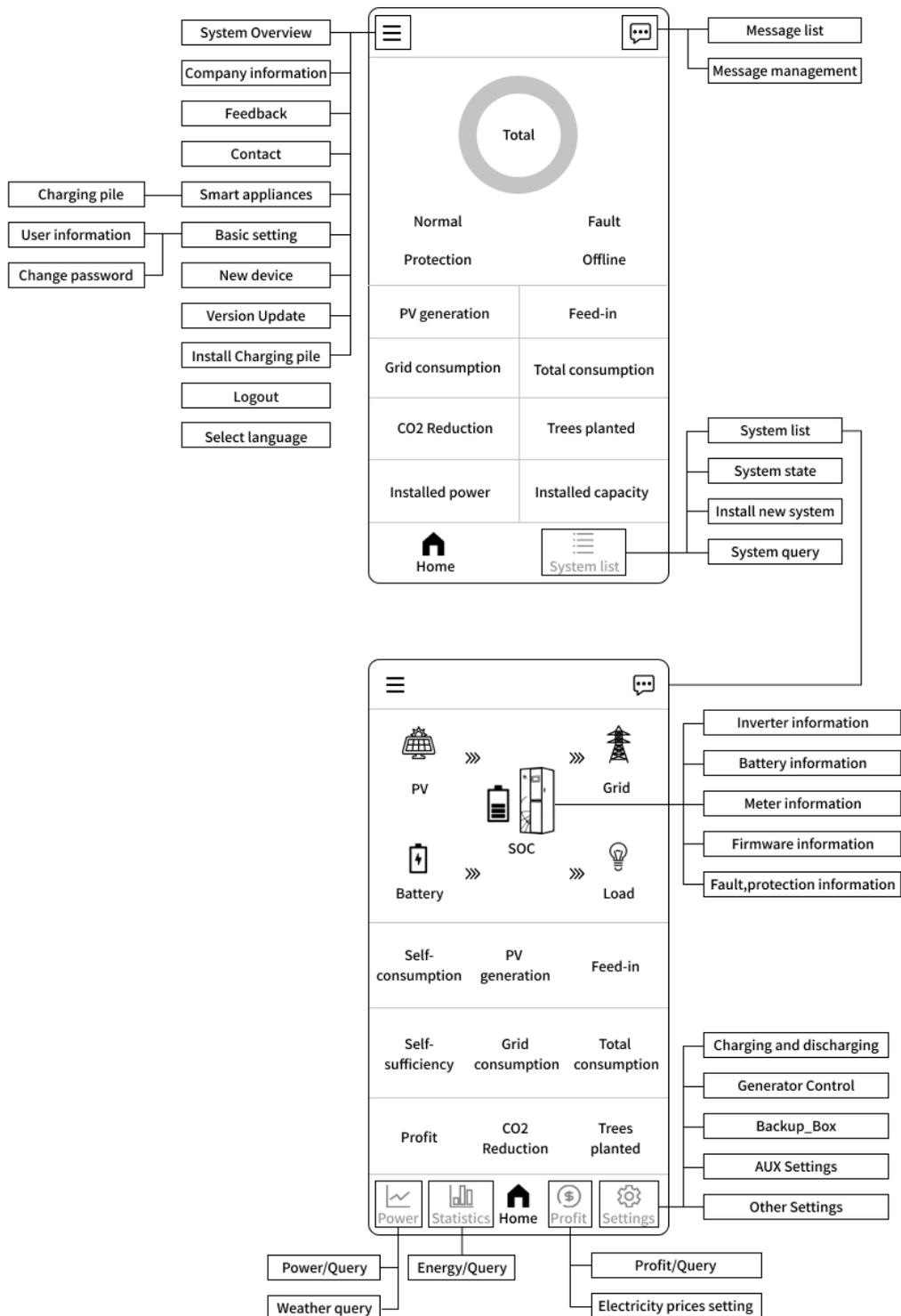
5.1 Download and Install APP

1. Android device users can download the APP through major Android application markets such as Google Play.
2. IOS device users can search for “AlphaESS” in AppStore and download the APP.



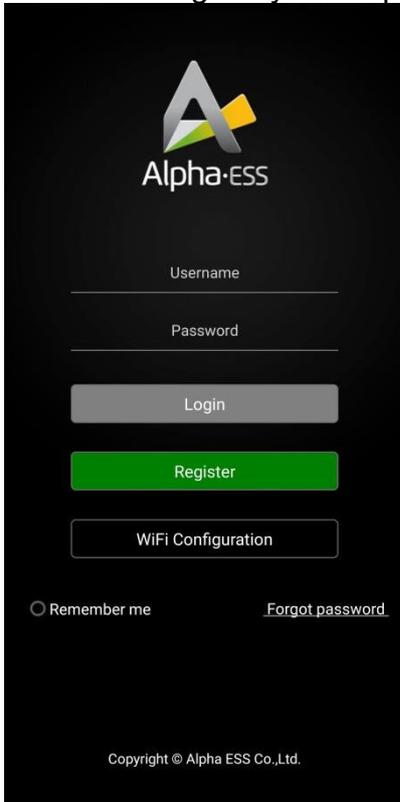
Figure 6 AlphaESS-APP

5.2 Overview of Functions for Installer Account



5.3 WiFi Module Setting

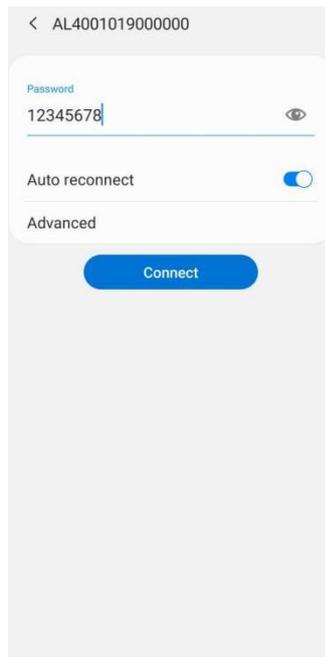
This section is for users who have a system with a WiFi module. AlphaESS App supports network configuration, setting of the system basic parameter, and the viewing of system operation and configuration information.



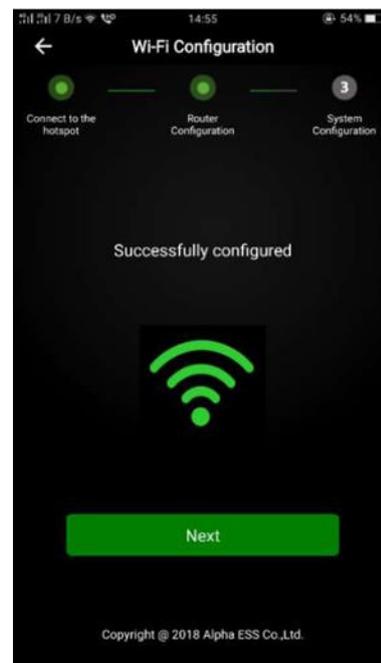
Step 1: Open AlphaESS APP, click the “Wi-Fi Configuration” button and enter the WiFi configuration interface.



Step 2: After that please check whether your mobile phone has connected to the system’s hotspot.



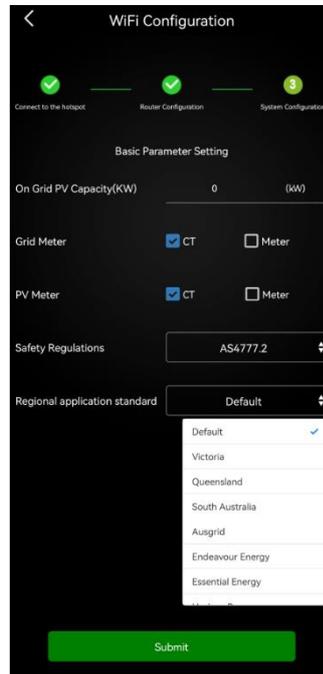
Step 3: If your mobile phone hasn't connected to the system's hotspot, please open the Wi-Fi network list. Please find the hotspot named by the product SN in WLAN list then enter the password "12345678" and connect to it. After successfully setting it, please go back to APP and click "Next".



Step 4: Select the WiFi of your home you are using, enter the password, complete the WiFi configuration and submit. If there is no network currently, you can click Jump over to skip the WiFi configuration step and directly set the system parameters.

Note:

The system will not be able to connect to the Internet without WiFi configuration.



Step 5: Set basic parameters, including PV capacity on the grid side, the type of meters, safety regulations and regional application standard. Click “Submit” when the settings are complete.

Note:

When the safety regulation is set as AS4777.2, the secondary sub-options can be selected according to the region or local grid company (Please refer to Appendix 2).

6. Commissioning

6.1 Checking Before Power-On

Table 9-1 Installation checklist

No.	Check Item	Acceptance Criteria
1	Battery pack and inverter mounting	The battery pack and inverter are mounted correctly, securely, and reliably.
2	WiFi mounting	The WiFi module is mounted correctly, securely, and reliably
3	Cable layout	Cables are routed properly as required by the customer.
4	Cable tie	Cable ties are secured evenly and no burr exists.
5	Grounding	The ground cable is connected correctly, securely, and reliably.
6	Switch and breakers status	All breakers connecting to or on the product are OFF.

7	Cable connections	The AC cable, PV cable, battery cable, and communication cables are connected correctly, securely, and reliably.
8	Unused power terminals	Unused power terminals are blocked by water-tight caps.
9	Mounting environment	The mounting space is proper, and the mounting environment is clean and tidy, without foreign object.

6.2 Configuring the safety standard

Please set the safety standard appropriate for your country or purpose via APP or Web during pilot run;



The safety standard must be set correctly

If you select a safety standard which is not valid for your country and purpose, it may cause a disturbance in the energy storage system and lead to problems with the grid operator. When selecting the safety standard, you must always observe the locally applicable standards and directives as well as the properties of the PV system (e.g. PV system size, grid-connection point).

- If you are not sure which safety standard is valid for your country or purpose, contact your grid operator for information on which safety standard is to be configured.

6.3 Check the Running State

Prerequisites

Before switching on the AC breaker between the inverter and the grid, check whether the AC voltage on the power grid side of the AC breaker is within the specified range. Please select the acceptance of installation on site when the light intensity is strong.

Procedure

1. Ensure that the all breakers connecting to or on the product are OFF.
2. Check the grid-connected state of the product

Short press the power button on the left side of battery pack, then switch on the battery breaker on the right side of battery pack.

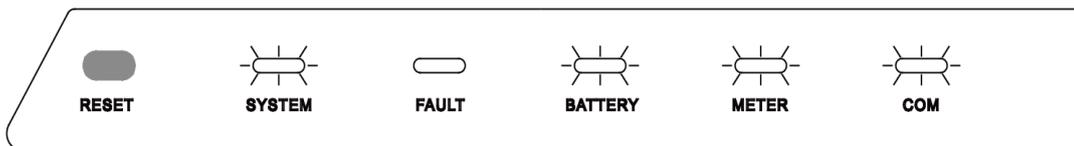
Switch on the battery breaker which is located at the bottom middle inverter.

Switch on the PV switch which is located at the bottom left inverter.

Switch on the external AC breaker between the grid and the inverter.

Set the operating parameters through the APP.

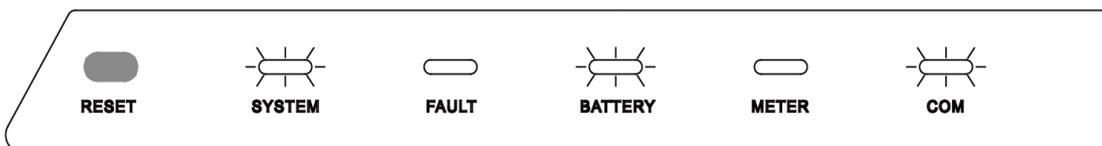
Wait about 3 minutes for the inverter to enter the grid-connected state, and observe the indicators states on the display panel of the inverter. At this time, the following 4 LEDs ("SYSTEM", "BATTERY", "METER", "COM") on the display panel is always on.



3. Check the UPS state of the product

Switch off the external AC breaker between the grid and the inverter.

The inverter will enter the UPS state at once, and observe the indicators states on the display panel of the inverter. At this time, the following 3 LEDs ("SYSTEM", "BATTERY", "COM") on the display panel is always on.



Check the wiring of the backup load

Switch on the external AC breaker between the load and the inverter.

Please connect a low-power electrical appliance to the socket of backup load. If the electrical appliance can work normally, it means that the wiring of the backup has been installed successfully.

NOTICE

During commissioning, if the LED indicators on the display panel of the inverter or the battery pack show red, please refer to Section **Error! Reference source not found.** for troubleshooting.

6.4 Powering Off the Product

WARNING

After the inverter and battery pack is powered off, the remaining electricity and heat may still cause electric shocks and body burns. Therefore, put on protective gloves and operate the product 5 minutes after the power-off.

Procedure

1. Long press the power button for 6 seconds on the left side of battery pack, then switch off the battery breaker on the right side of battery pack.
2. Switch off the battery breaker which is at the bottom middle inverter.
3. Switch off the PV switch at the bottom left of the inverter.
4. Switch off the PV switch between the PV string and the inverter if there is any.
5. Switch off the AC breaker between the inverter and the load.
6. Switch off the AC breaker between the inverter and the grid.

7. Maintenance and Troubleshooting

7.1 Routine Maintenance

Normally, the inverter and battery pack need no maintenance or calibration.

Disconnect the inverter and battery pack from all power sources before cleaning.

Clean the housing, cover and display with a soft cloth.

To ensure that the inverter and battery pack can operate properly in the long term, you are advised to perform routine maintenance on it as described in this chapter.

Maintenance checklist

Check Item	Acceptance Criteria	Maintenance Interval
Product cleanliness	The heat sinks of the inverter are free from obstacles or dust.	Once every 6 to 12 months
Product visible damage	The inverter and battery pack are not damaged or deformed.	Once every 6 months
Product running status	<ol style="list-style-type: none"> 1. The inverter and battery pack operate with no abnormal sound. 2. All parameters of the inverter and battery pack are correctly set. Perform this check when the inverter and battery pack is running. 	Once every 6 months
Electrical connections	<ol style="list-style-type: none"> 1. Cables are securely connected. 2. Cables are intact, and in particular, the cable jackets touching the metallic surface are not scratched. 3. Unused PV input terminals and COM ports of the inverter, and battery power and COM terminals are locked by watertight caps if the product is mounted outdoor. 	Perform the first maintenance 6 months after the initial commissioning. From then on, perform the maintenance once every 6 to 12 months.



CAUTION

Risk of burns due to hot heatsink and housing of the inverter

The heatsink and housing can get hot during operation.

- During operation, do not touch any parts other than the cover of the inverter.
- Wait approx. 30 minutes before cleaning until the heatsink has cooled down.

7.2 Troubleshooting

7.2.1 Inverter Error Troubleshooting

Error No.	Error description	Solution
100000	Grid_OVP	1. Check whether Grid is abnormal. 2. Confirm whether the grid cable connection is normal. 3. Restart inverter and ensure whether the fault is existing.
100001	Grid_UVP	
100002	Grid_OFP	
100003	Grid_UFP	
100005	BUS_OVP1	Restart inverter and ensure whether the fault is existing.
100006	BUS_OVP2	
100007	Insulation_fault	1. Check whether PV cable connection is reliable. 2. Check whether PV cable is damaged.
100008	GFCI_fault	Restart inverter and ensure whether the fault is existing.
100009	Leakage current test failure	
100010	Grid_relay_fault	
100011	Over_Temperature	1. Check whether the environment around inverter is with poor heat dissipation. 2. Confirm whether inverter installation meet the installation requirements.
100014	M_S_com_fault	Restart System and ensure whether the fault is existing.
100038	Output_DC_over_current	
100043	Output_overload	1. Check whether Backup load is overload. 2. Restart inverter and confirm whether the fault is existing.
100044	APU_UVP	Restart System and ensure whether the fault is existing.
100046	DC_Input_Disturbance	
100047	Grid disturbance	1. Check whether Grid is abnormal. 2. Confirm connection of grid cable is normal. 3. Restart inverter and ensure whether the fault is existing.
100048	Grid_unbalance	
100049	Frequency_jitter	
100050	Grid_overcurrent	
100051	Grid_current_track_fault	Restart inverter and ensure whether the fault is existing.
100052	Backup_ovp	1. Check whether Backup port cable is normal. 2. Restart inverter and confirm whether the fault is existing.
100053	Dc_bus_unbalancevolt	Restart inverter and ensure whether the fault is existing.
100054	Dc_bus_undervolt	
100055	Dc_bus_unbalancevolt2	
100056	IGBT_over_current	Restart inverter and ensure whether the fault is existing.
100057	Grid_disturbance2	1. Confirm whether Grid is distorted severely. 2. Check whether PV cable connection is reliable.
100058	AFCI_check_protect	1. Check whether PV cable connection is reliable.

		2. Check whether PV cable is damaged.
100059	Grid_current_sampling_abnormal	1. Confirm whether Grid is distorted severely. 2. Check whether PV cable connection is reliable.
100060	Dsp_selfcheck	Restart inverter and ensure whether the fault is existing.
100061	Grid_short_time_over_current	1. Confirm whether Grid is distorted severely. 2. Check whether PV cable connection is reliable.
100062	Bat_overnvolt_hardware_fault	1. Check whether battery breaker has tripped off. 2. Check whether battery is damaged.

7.2.2 Battery Protection Description

LED Indicator	Protection Code	LED Display	Description	Troubleshooting
Yellow LEDs flash once every 1S.	1		Temperature difference	Wait for automated recovery. In case the problem is not recovery for a long time, call for service.
	3		High temperature	Stop discharging and charging until this code is eliminated and Wait for the temperature to drop.
	4		Low-temperature discharge	Stop discharging until this code is eliminated and Wait for the temperature to rise.
	5		Over-current charge	Wait for automated recovery. In case the problem is not recovery for a long time, call for service.
	6		Over-current discharge	
	8		Cell overvoltage	
	9		Cell under voltage	See NOTE or call for service
	11		Low-temperature charge	Stop charging until this code is eliminated and Wait for the temperature to rise.

7.2.3 Battery Error Description

LED Indicator	Error Code	LED display	Description	Troubleshooting
Red LEDs flash once every 1S.	Error 01		Hardware error	Restart the batteries. In case the problem is not resolved, call for service.
	Error 03		Hardware error	
	Error 05		Hardware error	
	Error 06		Circuit Breaker Open	Close circuit breaker after shutting down the battery.
	Error 08		LMU Disconnect (slave)	Reconnect the BMS communication cable.
	Error 09		SN missing	Call for service.
	Error 10		LMU Disconnect (master)	Reconnect the BMS communication cable.
	Error 11		Software version inconsistent	Call for service.
	Error 12		Multi master	Restart all batteries within 30s.
	Error 13		MOS overtemperature	Power off the battery and power on the battery after 30~40 minutes.
	Error 14		Insulation fault	Restart battery and In case the problem is not resolved, call for service.
	Error 15		Total voltage fault	Restart battery and In case the problem is not resolved, call for service.

 **NOTE:**

When the protection code NO. 9 appears, please quickly push the Power button 5 times in 10 seconds to force the BMS startup the MOSFET of discharging. Thus the open-circuit voltage of the battery will be detected by the inverter and get charged.

8. Remove & Return

8.1 Removing the Product

Procedure

Step 1 Power off the product by following the instructions in section 0 Powering Off the Product.

Step 2 Disconnect all cables from the product, including communication cables, PV power cables, battery cables, AC cables, and PE cables.

Step 3 Remove the WiFi module from the inverter.

Step 4 Remove the inverter from the mounting bracket.
Remove the Battery pack from the mounting bracket.

Step 5 Remove the mounting bracket.

8.2 Packing the Product

If the original packaging is available, put the battery pack or inverter inside it and then seal it using adhesive tape.

If the original packaging is not available, put the battery pack or inverter inside a suitable cardboard box and seal it properly.

8.3 Disposing of the Product

If the battery pack or inverter service life expires, dispose of it according to the local disposal rules for electrical equipment and electronic component waste.

Dispose of the packaging and replaced parts according to the rules at the installation site where the device is installed.

Do not dispose the inverter and the battery pack with normal domestic waste.



9. Specification

9.1 Datasheet of Hybrid Inverter SMILE-T10-HV-INV

Item	SMILE-T10-HV-INV (OUTDOOR)	SMILE-T10-HV-INV (INDOOR)
Input DC (PV side)		
Recommended max. PV power	16000 W	
Max. PV input voltage	1000 V	
Rated voltage	600 V	
Start-up voltage	160 V	
MPPT voltage range	200 ~ 850 V	
Max. input current	26 A / 26 A	
Max. short circuit current	39A / 39 A	
Inverter max. back feed current to the array	0 A	
MPPT number/Max input strings number	2 / 4	
Battery Side		
Battery Type	Li-ion	
Battery Voltage range	240 ~ 288 V	
Maximum Charging Power	10 kW	
Maximum Charge/discharge current	40 A / 40 A	
Communication	CAN	
Output AC (Back-up)		
Rated output power	10 kW	
Max. apparent output power	10 kVA	
Back-up switch time	<10 ms	
Rated output voltage	L1/ L2/ L3/N/PE, 220/380 V, 230/400 V	
Rated frequency	50/60 HZ	
Rated output current	16.7 A	
THDv(@linear load)	2%	
Input AC (Grid side)		
Rated Input voltage range	L1/ L2/ L3/N/PE, 220/380 V, 230/400 V	
Frequency range	45~55 Hz / 55~65 Hz	
Rated input power	15 kW	

Max. input current	22 A	
Output AC(Grid side)		
Rated output power	10 kW	
Max. apparent output power	10 kVA	
Operation phase	Three phase	
Rated grid voltage	L1/ L2/ L3/N/PE, 220/380 V, 230/400 V	
The grid voltage range	320 ~ 480 V	
Rating grid frequency	50 / 60 Hz	
AC grid frequency range	47~52 Hz / 57~62 Hz	
Rating grid output current	16.7 A	
Max. output current	16.7 A	
Max output overcurrent protection	32Arms	
Power Factor	>0.99 (0.8 leading - 0.8 lagging)	
THDi	<2%	
Protection class/ Over voltage category	I / III	
Efficiency		
Max efficiency	>98.4%	
EU efficiency	>97.7%	
Protection		
Anti-islanding protection	Integrated	
Insulation Resistor detection	Integrated	
Residual current monitoring unit	Integrated	
Output over current protection	Integrated	
Output short protection	Integrated	
Output over voltage protection	Integrated	
DC reverse polarity protection	Integrated	
PV overvoltage protection	Integrated	
Battery reverse protection	Integrated	
PV switch	Integrated	
Battery breaker	Integrated	
General data		
Dimensions(W*H*D)	580*606*230 mm	
Weight	30 kg	
Topology	Transformerless	
Operation temperature range	-25 ~ +60 °C	
Ingress protection	IP65	IP21

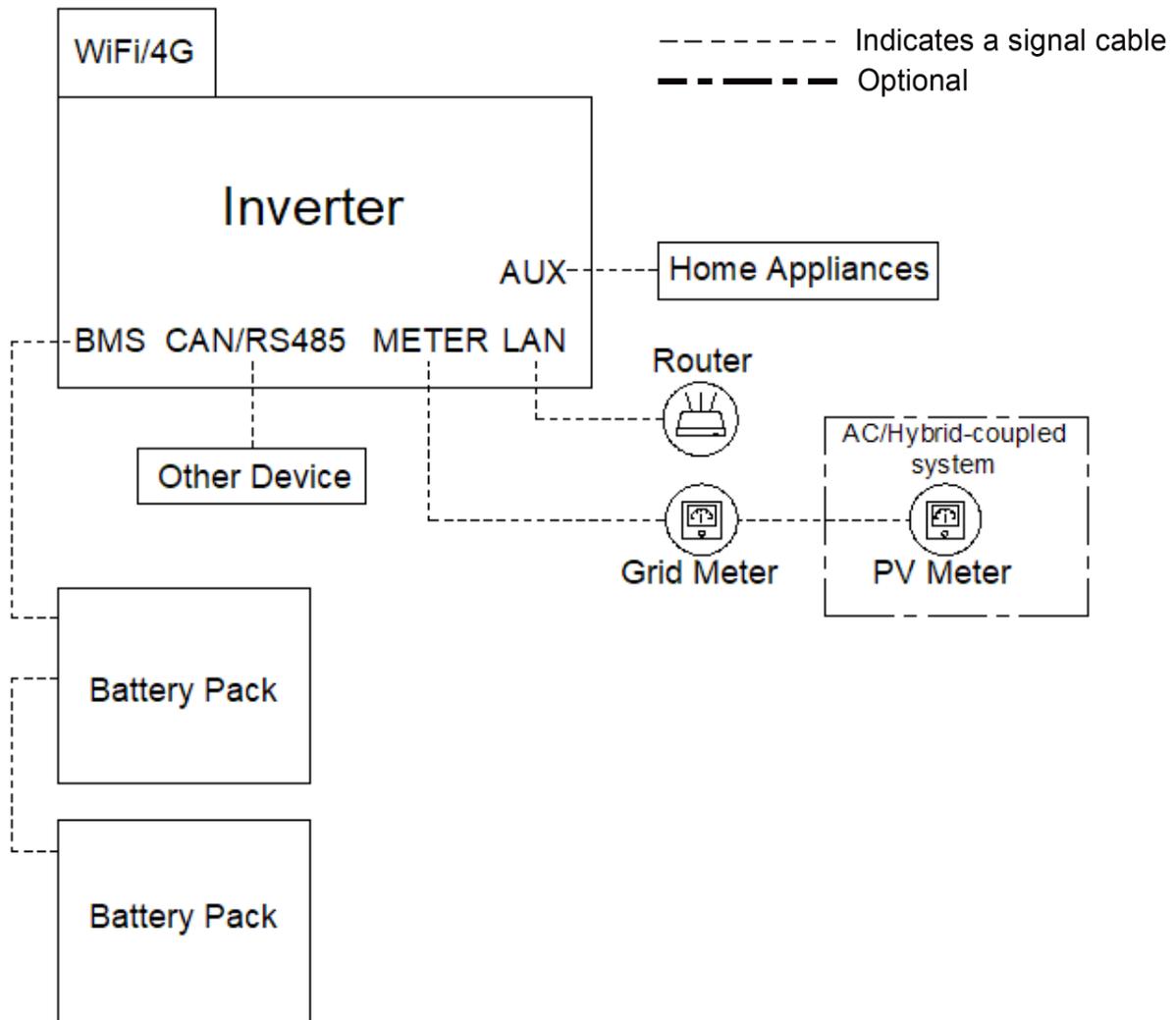
Noise emission	<30 dB(A)
Cooling concept	Natural convection
Max. operation altitude	3000 m
Grid connection standard	G98 or G99, VDE-AR-N 4105 / VDE V 0124, EN 50549-1, VDE 0126 / UTE C 15/VFR:2019, RD 1699/RD 244 / UNE 206006 / UNE 206007-1, CEI 0-21, C10/11, NRS 097-2-1, TOR, EIFS 2018.2, IEC 62116, IEC 61727, IEC 60068, IEC 61683, EN 50530, MEA, PEA
Safety/EMC standard	IEC62040-1, IEC62109-1/-2.AS3100, NB/T 32004, EN61000-6-2, EN61000-6-3
Features	
DC connection	MC4 connector
AC connection	Terminal block
Communication	LAN, WiFi (optional)
Warranty	5 years standard

9.2 Datasheet of Battery Pack SMILE-BAT-8.2PH

Item	SMILE-BAT-8.2PH (OUTDOOR)	SMILE-BAT-8.2PH (INDOOR)	SMILE-BAT-8.2PH-P (OUTDOOR)
Battery Type	LFP (LiFePO4)		
Weight	88 kg	72 kg	75 kg
Dimension (W*H*D)	580*820*213 mm	580*730*200 mm	580*820*213 mm
Ingress protection	IP65	IP21	IP65
Warranty	5 Year Product Warranty, 10 Year Performance Warranty		
Energy Capacity	8.2 kWh		
Usable Capacity	7.8 kWh		
Depth of Discharge (DoD)	95%		
Nominal Voltage	256 V		
Operating Voltage Range	240~288 V		
Internal Resistance	≤ 90 mΩ		
Max. Charging/Discharging Current	1.2C (38.4 A)	1C (32 A)	1C (32 A)
Operating Temperature Range*	0~49°C (Charging mode) / -10~49°C (Discharging mode)		
Relative Humidity	0% ~ 95%	15% ~ 85%	0% ~ 95%
Monitoring Parameters	System voltage, current, cell voltage, cell temperature, PCBA temperature		
Communication	CAN and RS485 compatible		
Safety	IEC62619(Cell), IEC 62619(Pack)		
Transportation	UN38.3		

* During low temperature and high temperature, the battery performance will be derating.

Appendix 1: Communication Connection Figure



NOTICE

- If the extra PV inverter is not used, the system is suitable for DC mode.
- If you have the extra PV inverter, the system is suitable for AC or Hybrid mode.

Appendix 2: Regional Application Standard

Choose the correspond Regional Application Standard, the power quality modes Volt-var and Volt-Watt will run automatically (only for regions with AS/NZW 4777.2 safety regulations).

Regional application Standard	Electric Company
Australia A	N/A
Australia B	N/A
Australia C	N/A
New Zealand	N/A
Vector	Vector