AURAWATT

USER MANUAL

SP SERIES 3-6KW

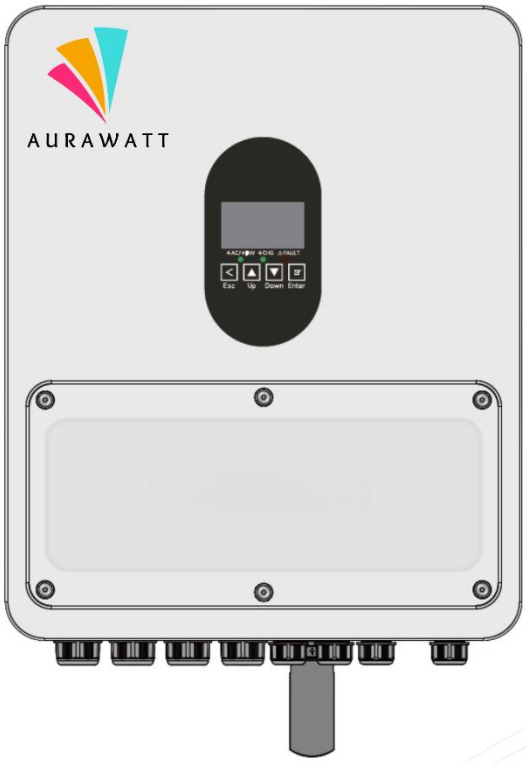


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1. Foreword and Applicable Products

This document introduces the installation, wiring, configuration, and maintenance of the inverter. Please read this manual carefully to understand product safety and familiarize yourself with the product's functions before installation and use.

1.1 Applicable Products

This manual applies to **AURAWATT** inverters, specifically the **AW-SP 3-6kW** models:

- **AW-SP 3000**
- **AW-SP 4000**
- **AW-SP 5000**
- **AW-SP 6000**

1.2 Applicable Personnel

Only **professional, qualified electrical technicians** who are familiar with local codes, standards, and electrical systems should install and commission these inverters. Personnel must undergo rigorous training and use insulated tools and wear personal protective equipment (PPE).

2. Safety First (Crucial Precautions)

The safety precautionary information in this document must always be observed. Improper operation may result in serious injury or property damage.

2.1 General Warnings & Hazards

- **High Voltage Hazard:** The inverter operates at high voltage. Disconnect the power supply when operating the inverter.
- **Delayed Discharge:** Wait **5 minutes** after the equipment is powered down until it is fully discharged, as the internal components remain charged for a period.
- **Hot Surface:** The surface of the inverter is hot and should **not be touched** during operation to prevent burns.
- **Grounding:** The protective ground of the inverter must be **firmly connected**.
- **Protection Devices:** It is recommended to add breakers or fuses on both the AC and PV sides. Their specification should be greater than **1.25 times** the rated current.

2.2 PV String & DC Safety

- Ensure DC cables are tight and not loose after connection.
- Use a multimeter to measure positive and negative DC terminals to ensure **correct polarity** and that the voltage is within the allowable range.
- Do not connect the same PV string to more than one inverter.
- The PV string connected to the inverter cannot be grounded.

- Ensure the DC breaker is OFF before connecting the DC input cables, and the DC voltage is lower than **60 V DC**.

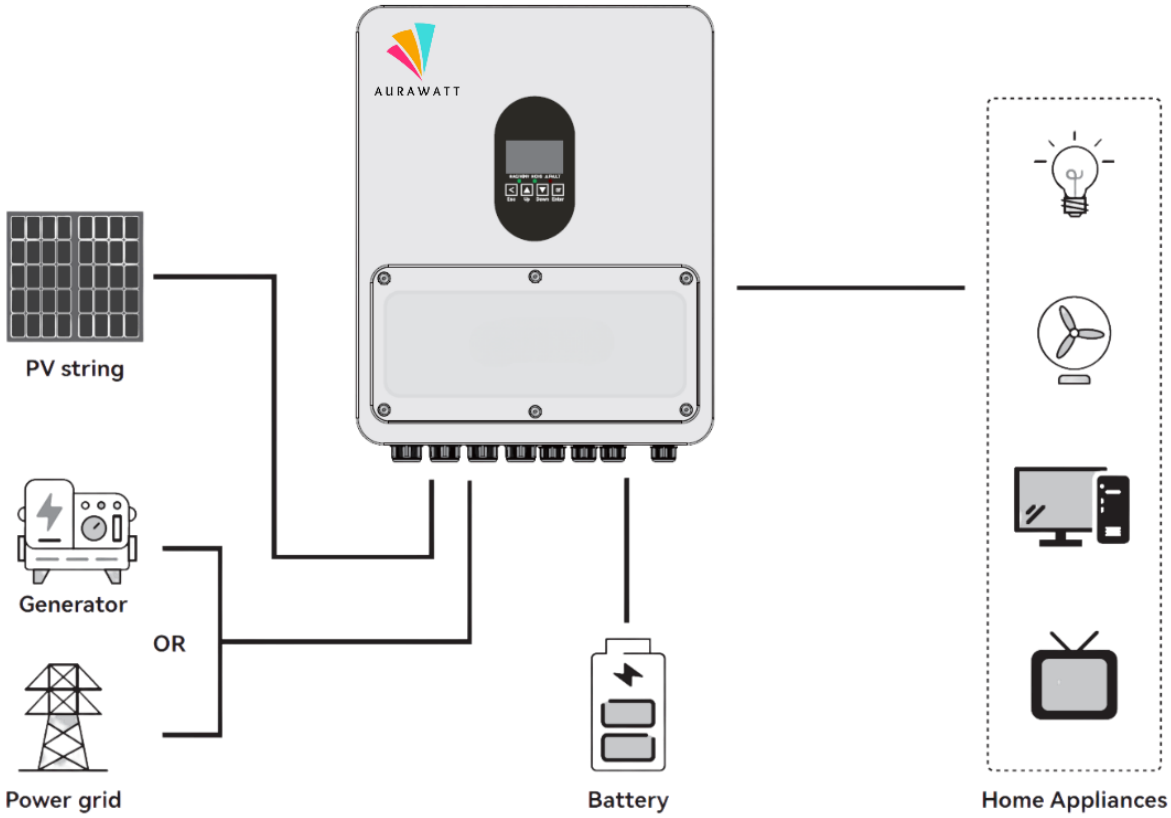
2.3 Battery Safety

- An externally mounted DC breaker is required when connecting the battery.
- Connecting and disconnecting battery cables is prohibited while the inverter is running.

3. Product Overview and Key Features

The hybrid inverters developed by AURAWATT, use advanced control algorithms for integrated energy management in photovoltaic and energy storage systems.

3.1 Basic System Architecture

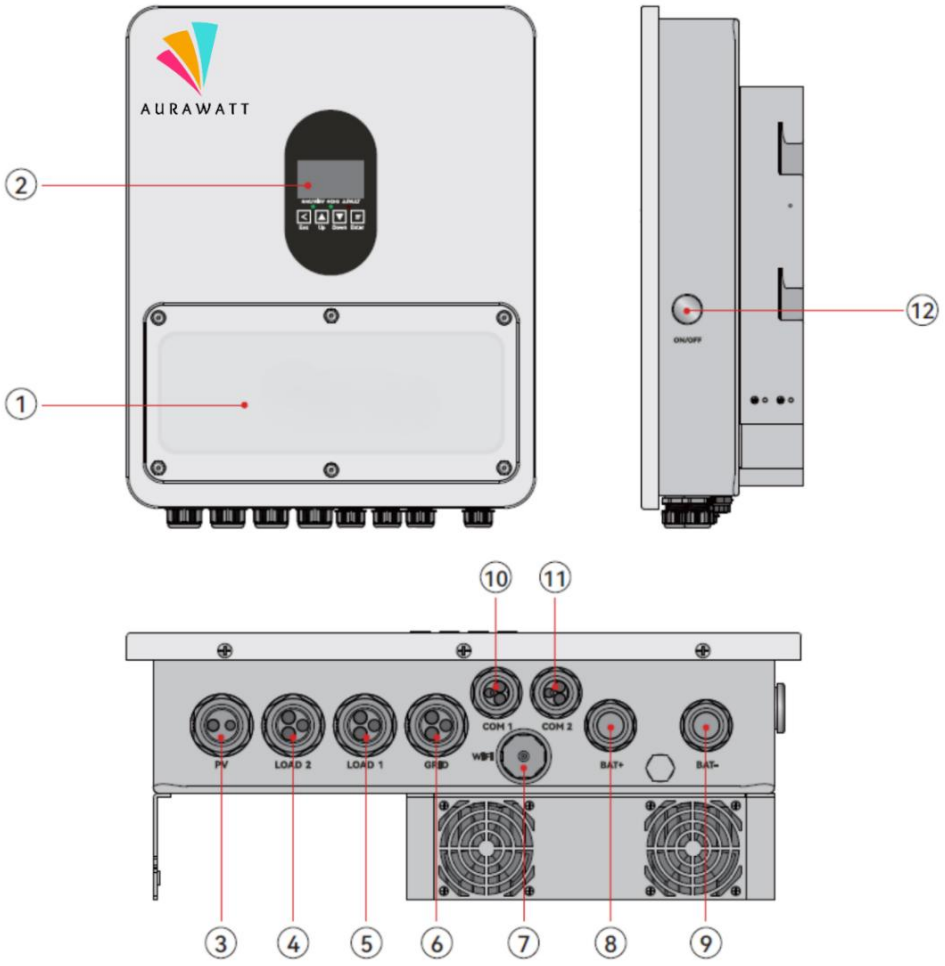


3.2 Main Functional Features (AW-SP Single-Phase)

- **Output:** Pure sine wave inverter.
- **PV Input:** MPPT ranges **60V–450V**, 500Voc. Supports 70V PV voltage startup.
- **Inputs:** Compatible with utility mains or generator power. Wide grid voltage range (**90–280Vac**).

- **Battery Compatibility:** Supports lead acid and li-ion batteries, and can work with or without a battery.
- **Load Management:** Features **Dual AC Outputs** for intelligent load management (LOAD 1: BACK-UP Load; LOAD 2: Smart Load).
- **Parallel Capability:** Supports parallel operation up to **6 units**.
- **Protection:** Includes complete short circuit, overload, over current, over/under voltage, and over temperature protection.
- **Rating:** IP66 protection rating.

3.3 Product Appearance



① Terminal cover	⑤ LOAD 1	⑨ Battery (-)
② LCD display	⑥ GRID	⑩ COM 1 Port(Dry Contact,CT,BMS Port)
③ PV	⑦ WIFI Port	⑪ COM 2 Port(Parallel Port)
④ LOAD 2	⑧ Battery (+)	⑫ Power ON/OFF switch

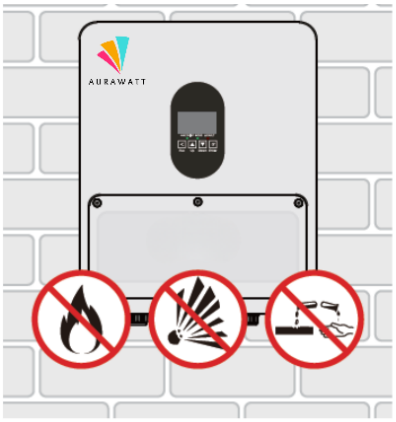
4. Installation Summary

4.1 Installation Requirements

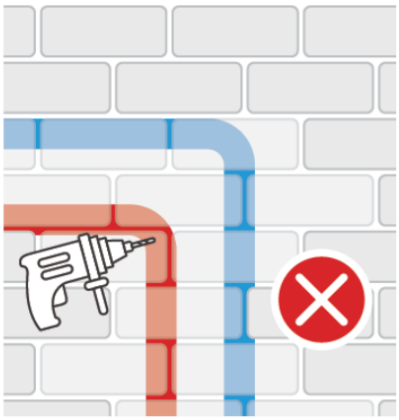
- **Environment:** Must not be installed in flammable, explosive, or corrosive environments. Altitude must be lower than the maximum working altitude of **3000 m**.
- **Carrier:** Must be sturdy, non-flammable, and fire-resistant. Avoid poorly insulated carriers to prevent vibration noise.
- **Angle:** Recommended installation angle is **vertical or tilted back ≤15°**

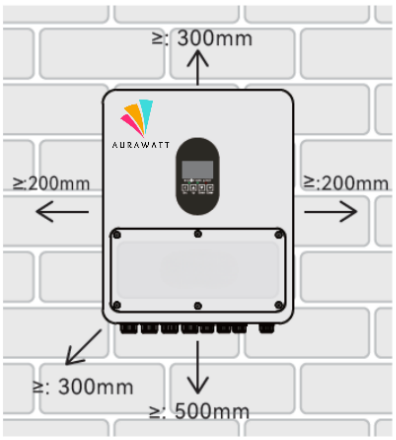
4.2 Spacing Requirements

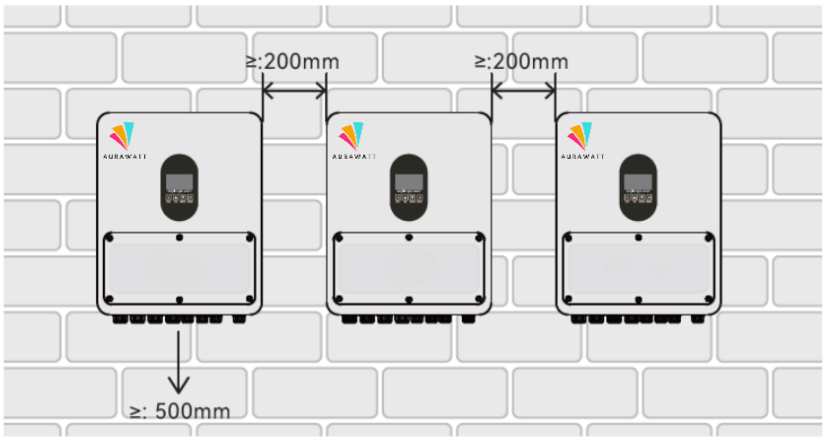
Ensure adequate clearance for ventilation and heat dissipation:

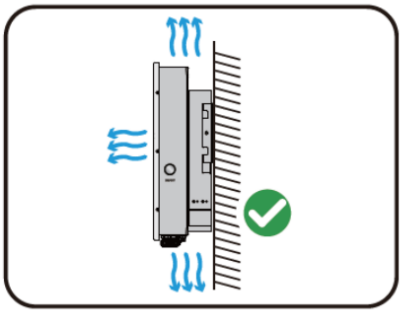


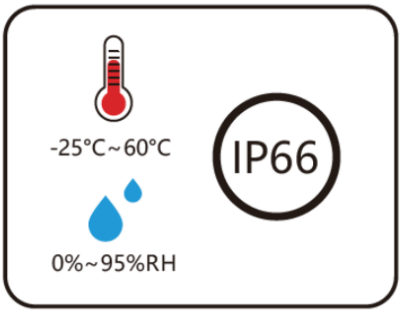


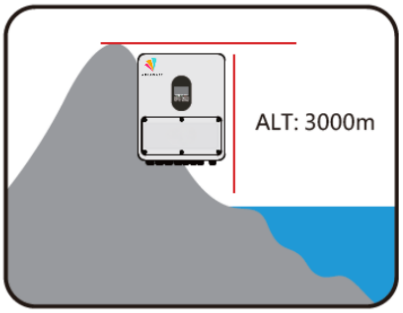




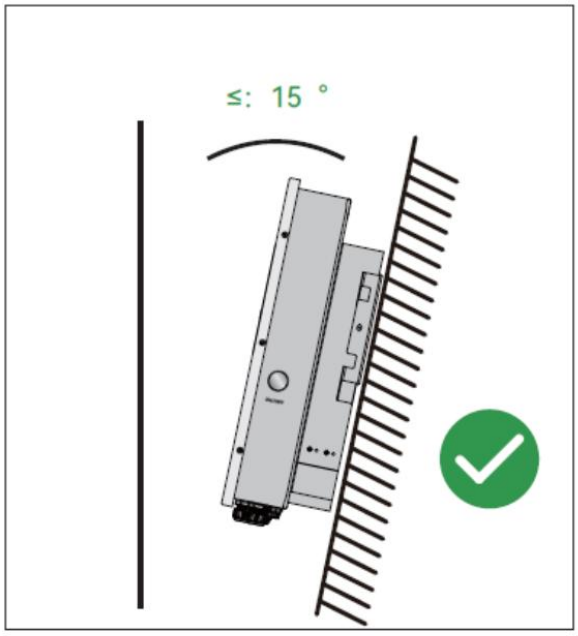






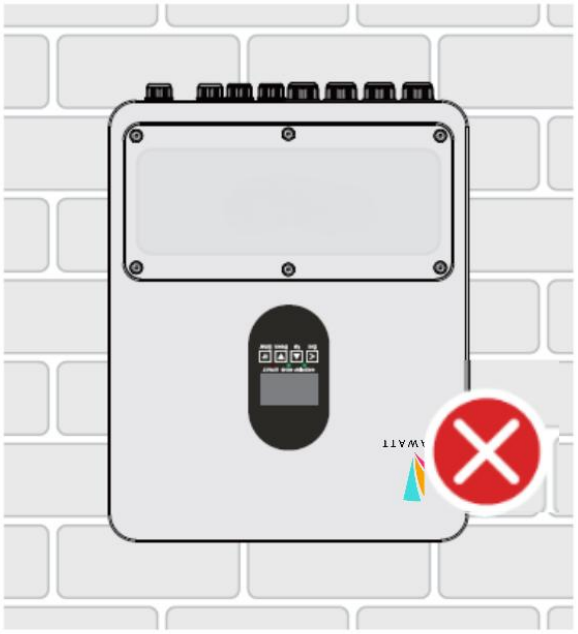


4.3 Inverter Mounting



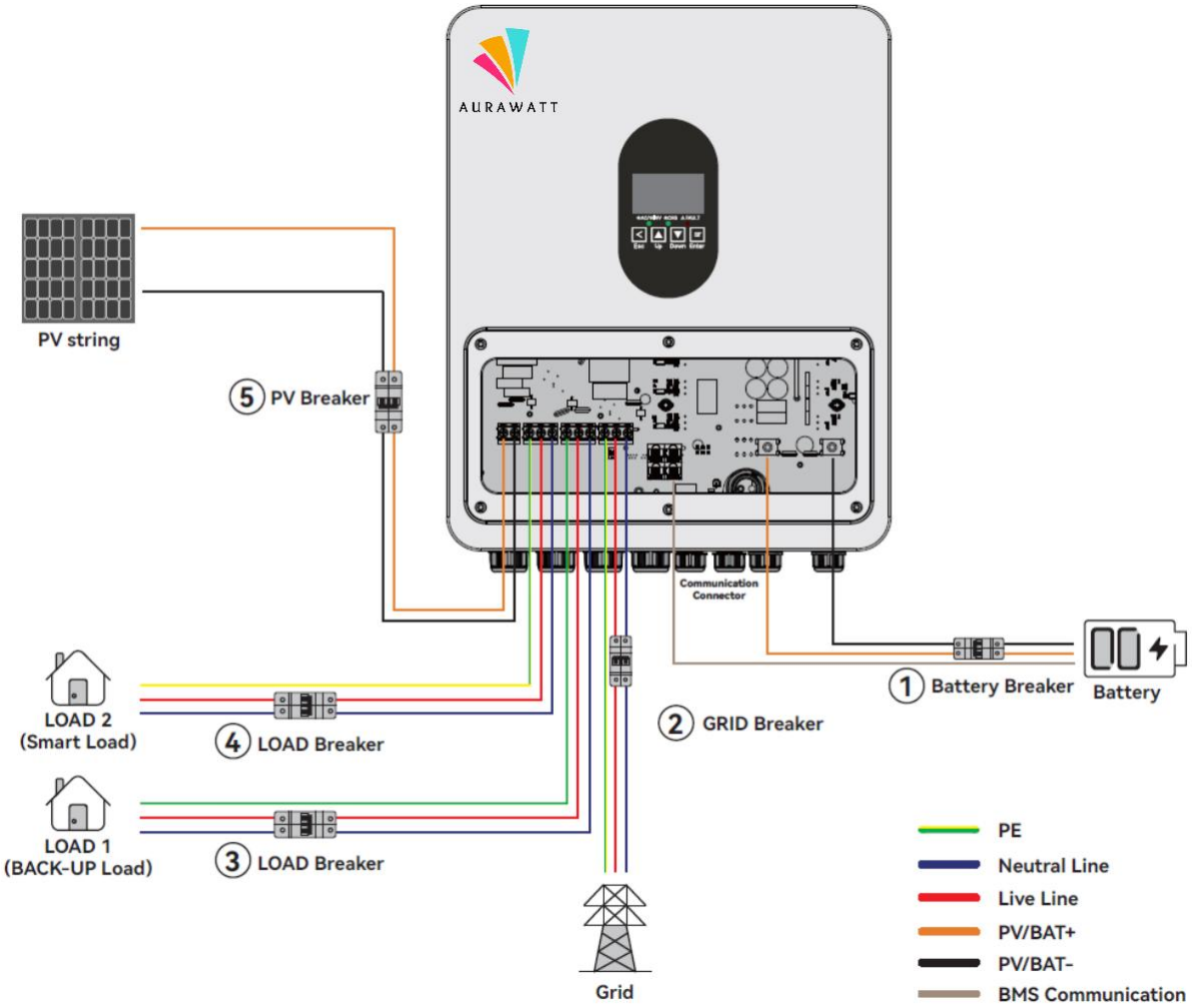






5. Electrical Connection Summary

5.1 System Wiring Block Diagram



5.2 Protective Ground Wires (PE)

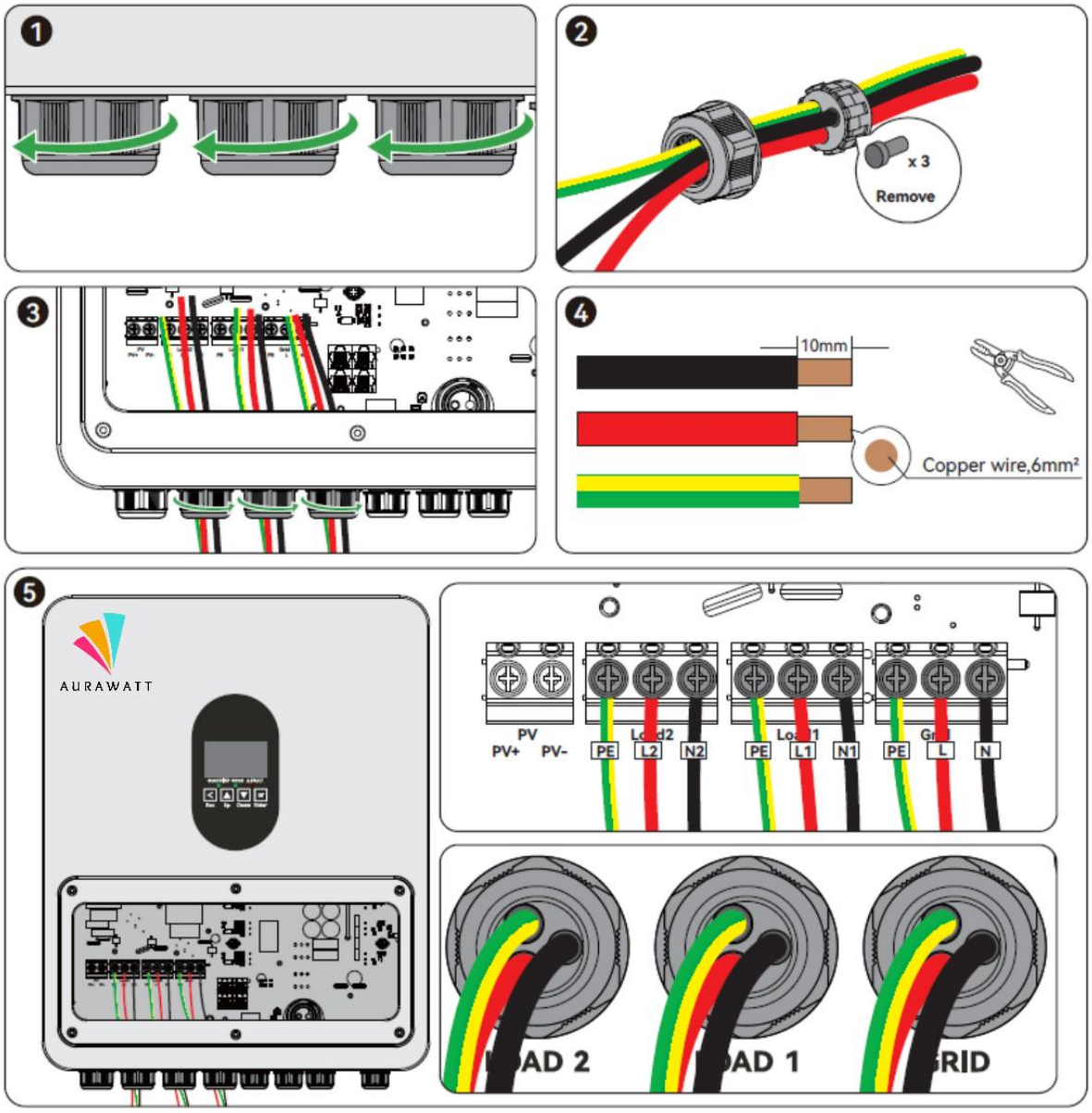
- **Specification:** Outdoor multi-core copper cable, conductor cross-sectional area: **6 mm²**.
- **Note:** The protective ground of the chassis cannot replace the protective ground of the AC terminal.

5.3 AC Cable Connection (GRID, LOAD 1/LOAD 2)

Ensure the L, N, and PE wires match the terminals exactly; incorrect connection will damage the equipment.

Inverter Model	Cable Size (L/N/PE)	Torque Value
3kW	6 mm²/8 AWG	1.4~1.6 Nm

4kW	6 mm^2/8 AWG	1.4~1.6 Nm
5kW	6 mm^2/8 AWG	1.4~1.6 Nm
6kW	6 mm^2/8 AWG	1.4~1.6 Nm



5.4 DC Input Cable (PV)

Inverter Model	Wire Size	Torque Value
3kW	2.5 mm^2/12 AWG	2~3 N.m
4kW	2.5 mm^2/12 AWG	2~3 N.m
5kW	2.5 mm^2/12 AWG	2~3 N.m

6kW	2.5 mm^2/12 AWG 2~3 N.m

5.5 Battery Cables

Inverter Model	Wire Size	Torque Value
3kW	16 mm^2/4 AWG	2~3 Nm
4kW	16 mm^2/4 AWG	2~3 Nm
6kW	25 mm^2/2 AWG	2~3 Nm
6kW	25 mm^2/2 AWG	2~3 Nm

5.6 Recommended Breaker Specifications

These are the recommended specifications for protective devices:

Inverter Model	Battery DC Breaker	Grid AC Breaker	Backup AC Breaker	PV Breaker
3kW	63V/125A	250V/32A	250V/32A	35A
4kW	63V/125A	250V/32A	250V/32A	35A
5kW	63V/160A	250V/50A	250V/50A	35A
6kW	63V/160A	250V/50A	250V/50A	35A

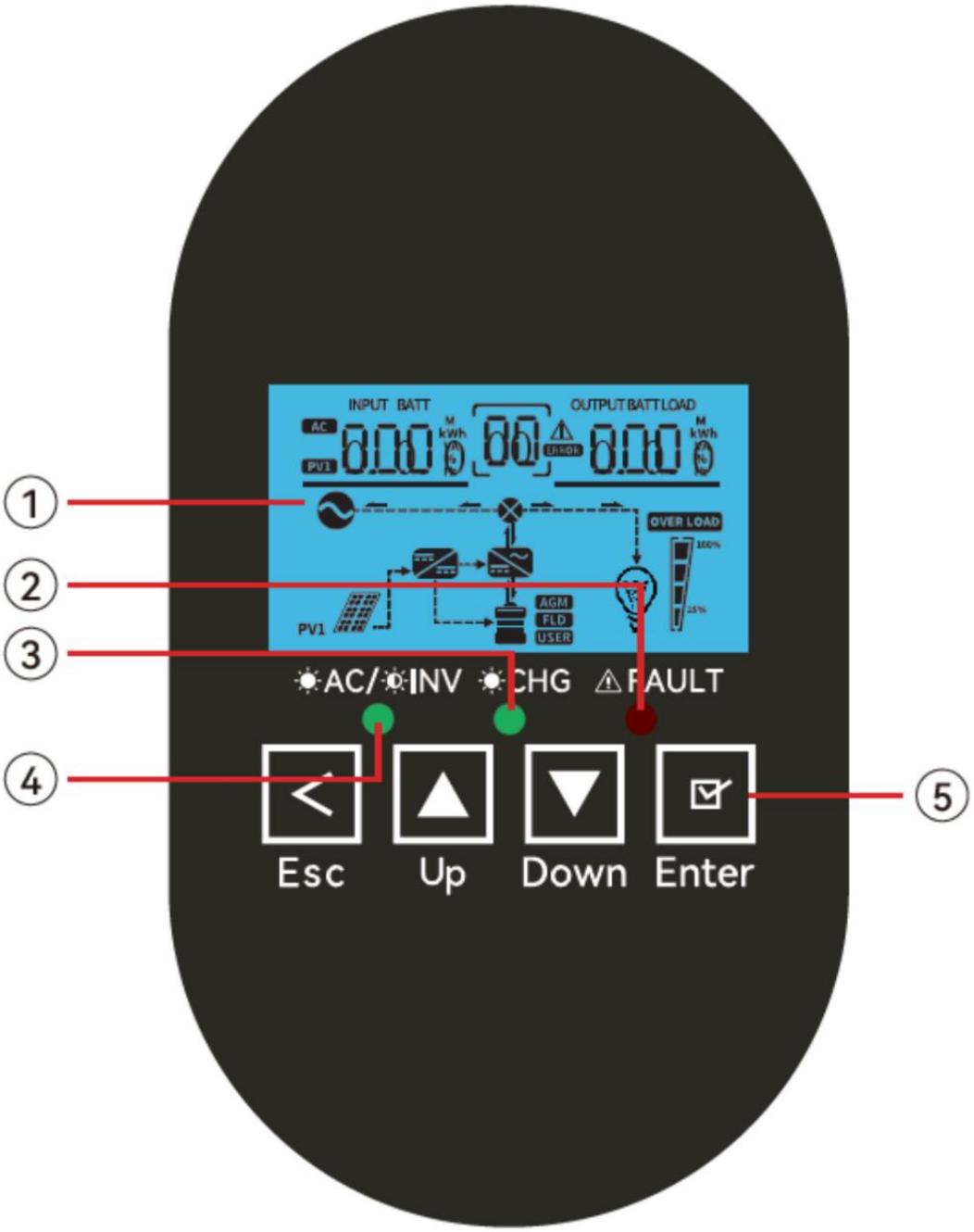
5.7 Power-Up Procedure

1. Close the inverter **LOAD AC breaker**.
2. Close the inverter **DC breaker** between batteries.
3. Close the **PV DC breaker** of the inverter.
4. Close the inverter **GRID AC breaker**.

6. HMI Interface and Key Settings

6.1 Display Panel

The operation panel includes the LCD display, Status indicator (AC/INV), Fault indicator (Red), and Charging indicator (Green).



6.2 LCD Settings

Page	Name	UI	Description
Home			
00	Settings Page		Press and hold the Enter button for 3 seconds to enter the setup mode. Press the Up/Down button to start setup.
I-1	Energy mode		USB: Utility priority, Solar second, Battery last
			SUB: Solar priority, Utility second, Battery last. (default)
			SBU: Solar priority, Battery second, Utility last
I-2	Battery charging mode		CSO: solar first
			SNU: solar and utility (default)
			OSO: only solar
I-4	Meter settings		None (default)
			Meter
			CT
I-5	Zero ground volt fault detection		OFF (default) / ON
I-6	Leakage current detection		OFF (default) / ON
PV Settings (02)			
P-3	PV connection mode		1P: single PV connection (default)
			2P: 2 PV parallel connection

Battery Settings (03)			
B-1	Battery type selection		DC: DC source
			L-A: Lead Acid battery (default)
			LI: Lithium battery
B-2	Max battery charging current		SP: 3KW, 4KW 0-80A; 5KW, 6KW 0-125A (default value depends on the battery type) 5A per level, support long press
B-3	Max battery discharge current		SP: 3KW, 4KW 0-100A; 5KW, 6KW 0-125A (default value depends on the battery type) 5A per level, support long press
B-4	Battery stops charging SOC		0-100% (default 80%) 5% per level, support long press
B-5	Battery stops discharging SOC		0-100% (default 20%) 5% per level, support long press
B-6	Battery charging stop voltage (high voltage cut-off point)		40-60V (default value depends on the battery type) 0.1V per level, support long press
B-7	Battery discharge stop voltage (low voltage cut-off point)		40-60V (default value depends on the battery type) 0.1V per level, support long press
B-8	Battery capacity (lead acid)		50-500Ah (default value depends on the battery type) 10Ah per level, support long press

B-9	Equalized charging voltage		40-60V (default value depends on the battery type) 0.1V per level, support long press

B-10	Float charge voltage		40-60V (default value depends on the battery type) 0.1V per level, support long press
B-11	Lithium battery manufacturers		Compatible Manufacturers
B12	Lead-Acid battery type		Ur : custom
			AGM (default) : Absorbent Glass Mat Lead-Acid battery
			GEL: Gel Electrolyte Lead-Acid battery
			FLD (WET): Flooded Lead-Acid battery
B13	Battery automatic activation		OFF/ ON (default ON)
B14	Battery activation voltage		40-60V (default 43.2V)
B15	Battery activation time		10-600s (default 60s)
Utility AC Settings (04)			
A-1	AC Mode		UPS: The grid voltage range is between 170~280V. If it exceeds this range, it will be overvoltage or undervoltage.
			APL (default): ① The grid voltage range is between 90~280V. If it exceeds this range, it will be overvoltage or undervoltage. ② The grid port of APL mode is compatible with generator input and has low frequency sensitivity.
A-2	Solar Sell Enable		OFF (default) / ON

A-3	System work mode		limit to critical load (default)
			limit to home load
A-4	Solar Sell Power Limit		Max power allowed to feed into the grid 0.1kW per level, support long press (default value depends on the device rated)
A-5	AC rated voltage		220V / 230V (default) / 240V
A-6	AC rated frequency		50Hz (default) / 60Hz
Generator Settings (05)			
G-0	Generator input port		OFF: Disable (default)
			G: Grid
			S: Smart Load
G-1	Generator mode		OFF: Disable (default)
			M: Manual
			A: Automatic
G-2	Generator start enable		OFF (default) / ON
G-3	AC input priority		GRI: Grid priority (default) (Requires smart load input port)
			GEN: Generator priority (Requires smart load input port)

G-4	Max generator charging power		Max generator charging power (default rated power)

G-5	Generator startup SOC		0-100% (default 20%) (Requires smart load input port and automatic mode)
G-6	Generator shutdown SOC		0-100% (default 80%) (Requires smart load input port and automatic mode)
Parallel Settings (06)			
P-0	Parallel mode		1PH: single phase (default)
			3PH: three phases mode
P-1	Parallel enable		OFF: Disable (default)
			MAS: Master
			SLA: Slave
P-2	Number of parallel devices		Number of parallel devices (Slave device cannot set)
P-3	Slave address		Slave address. (Master device cannot set)
P-4	Battery sharing enable		OFF (default) / ON (Slave device cannot set)
P-5	Configure three functions		3P1: Three-phase R phase (default)
			3P2: Three-phase S phase
			3P3: Three-phase T phase
Smart Load Settings (07)			

S-1	Smart Load Enable		OFF(default) / ON.
S-2	Smart Load Start SOC		0-100% (default 40%) 5% per level, support long press
S-3	Smart Load Stop SOC		0-100% (default 20%) 5% per level, support long press

S-4	Smart Load Start Voltage		40V-60V (default 46V)
S-5	Smart Load Duration		0-990 (default 0) 5 min increments, support long press
S-6	Smart Load Automatic Start Time		0-24 (default 0)
S-7	Smart Load Automatic Stop Time		0-24 (default 0)
S-8	Smart Load Stop Voltage		40V-60V (default 42V)
Clock Settings (08)			
Year			Year (25 means 2025)
Month			Month
Day			Day
Hour			Hour
Minute			Minute

Second			Second
LCD Settings (09)			
L-1	Automatic screen off time		60s (default)、120s、180s
L-3	Warning fault led flashing enable		OFF/ON (default)

6.3 Smart Load Operation

The Smart Load Port (LOAD2) is managed intelligently. When the grid is abnormal/absent, its operation depends on battery voltage (Lead-Acid) or SOC (Lithium). You must set S-1 to **ON** to use this feature.

- **Lead-Acid Control (Voltage):**
  - Recovery condition: Battery voltage ≥ Set Smart Load Start Voltage (**S-4**, default: 46.0V).
  - Shutdown condition: Battery voltage ≤ Set Smart Load Stop Voltage (**S-8**, default: 42.0V).
- **Lithium Control (SOC):**
  - Recovery condition: SOC ≥ Set Smart Load Start SOC (**S-2**, default: 40%).
  - Shutdown condition: SOC ≤ Set Smart Load Stop SOC (**S-3**, default: 20%).

7. System Maintenance and Contact

7.1 Regular Maintenance

Check electrical connections for loose connections, cable damage, and copper leakage **1 time/half a year to 1 time/year**. Regularly ensure the fan duct is **not blocked or obstructed** to avoid affecting airflow and triggering over-temperature protection.

7.2 Fault Removal

If troubleshooting methods are insufficient, contact the after-sales service centre. When contacting support, collect the following information:

1. Inverter information (Serial number, software version, fault occurrence time, etc.).
2. Equipment installation environment (weather conditions, photos/videos).
3. Grid conditions (overvoltage, undervoltage, etc.).

7.3 Maintenance and Warranty Contact Information

Detail	Source Information
Company Name	**AVAV BUSINESS CONSULTING PVT. LTD.**
Department	Technical Support
Email Address	service@aurawatt.com
Website	www.aurawatt.in
Phone Number	+91 9311920642, +91 9311920645

AURAWATT

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