HV Stacked Household Energy Storage Cube

Models: MESS-HV16.13K / 21.5K / 26.88K / 32.26K / 37.63K / 43.0K

User Manual (Formatted for AU/NZ Use)

Version 1.0, October 2025

www.megalion.com.au

MEGALION AUSTRALIA

Table of Contents

1. Safety Precautions

1.1 General Safety

Before installing, operating, or maintaining this device, read this manual and obey all labels and safety instructions. Instructions herein supplement safe-work practices and relevant standards; they do not replace them. Use only in environments that meet specified design requirements. The manufacturer is not liable for operation outside specified conditions; non-compliant installation or use (including breach of Australian/New Zealand Standards); unauthorised disassembly, modification, or software changes; failure to follow instructions and warnings; damage due to natural disasters; transport/storage damage; negligence or misuse; or removal of identification marks.

- Do not install, handle, or operate outdoors during adverse weather (lightning, heavy rain, snow, high winds).
- Observe all warning labels and protective measures.
- Use correct, serviceable tools and follow this manual.
- Isolate power before installation, wiring, maintenance, or replacement.
- Do not wash the device with water.
- Inspect for physical damage (drop, impact, dent) before use.
- Test for voltage before touching any conductor or terminal.
- Repair paint scratches promptly to prevent corrosion.
- Do not alter device structure or installation sequence without manufacturer approval.
- In case of fire, evacuate and activate emergency response. Do not re-enter a burning building.
- User-supplied materials/tools must comply with local laws and standards.
- Do not lift/carry via battery terminal bolts.

1.2 Personnel Requirements

- Only licensed electricians or trained personnel may install, operate, or maintain this device.
- Only qualified professionals may remove safety facilities or repair the device.
- Personnel must hold licences/permits required under AU/NZ law (e.g., high-voltage work, working at heights, specialised equipment).
- Component or software/firmware replacement by professional or authorised personnel only.

Definitions:

- Professional personnel: Experienced, trained in hazards during installation/operation/maintenance.
- Trained personnel: Have relevant technical training/experience; understand risks and can mitigate them (includes supervised apprentices).
- Operators: May interact with the device but are not trained or professional personnel.

1.3 Electrical Safety

Grounding Requirements:

- Connect protective earthing first; remove last during disassembly.
- Do not cut, bend, or damage the earthing conductor.
- Do not operate without a correctly installed earth.

- Verify earthing integrity before energising.

AU/NZ STANDARD — HIGHLIGHT: AS/NZS 3000 (Wiring Rules) applies to all installation wiring. See also AS/NZS 3017 (testing), AS/NZS 3008.1.1 (current-carrying capacity/voltage drop), and AS/NZS 5139 (battery systems).

General Electrical Requirements — DANGER ⚠️

- Confirm the device is undamaged; faults may cause electric shock or fire.
- All electrical connections must comply with AS/NZS 3000, AS/NZS 5139, and DNSP requirements.
- Obtain distributor/network approval before grid connection.
- Use only cables compliant with local regulations.
- Use insulated, rated tools for high-voltage operation.

DC Operation — DANGER ⚠️

- Never install/remove power cables while energised (risk of arcing, fire, injury).
- Isolate upstream DC and AC with lockable devices; apply LOTO.
- Verify conductor identification and polarity before connection.
- If multiple inputs exist, disconnect all; operate only after complete power-down.

Wiring Requirements:

- Keep ≥30 mm clearance from heat sources.
- Bundle same-type cables; separate different types by ≥30 mm; avoid twisting/crossing.
- Protect cables at penetrations (grommets/glands) from sharp edges/burrs.
- Lay/install cables at ≥0 °C; if stored below 0 °C, condition at room temperature ≥24 h before install.

Anti-Static Requirements:

- Wear anti-static gloves when handling internal components/PCBs.
- Avoid clothing that generates static.

1.4 Battery Safety

No responsibility is accepted for faults, injury, or loss arising from: overdue storage/over-discharge; incorrect connections; failure to set battery management parameters; change of use scenario (e.g., added loads, mixed brands/capacities); unsuitable site/power conditions; poor maintenance (including terminals not re-torqued); theft; or expired warranty.

Battery Safety — DANGER ⚠️

- Do not work live.
- Keep away from heat sources/direct sun.
- Do not disassemble, puncture, immerse, or modify.
- Lithium-ion systems present fire risk; electrolyte is flammable/toxic; thermal runaway emits CO/HF; gas accumulation can explode.
- Store separately in original packaging; avoid over-stacking; do not use beyond warranty.

- Transport in indicated orientation; avoid impacts.
- No hot-work near batteries.
- Operate within specified temperature range only.
- Quarantine damaged batteries; monitor for smoke/heat/leaks.

Personal Safety and Device Operation:

- Wear appropriate PPE; stop work and secure the area if hazards arise.
- Use tools correctly to avoid injury/device damage.
- Enclosure surfaces may be hot in operation (burn risk).
- Ensure reliable earthing before use.
- Avoid contact with electrolyte (harmful to skin/eyes).
- Keep flammables away; do not short terminals; keep top of unit clear.

Battery Handling Precautions:

- Remove jewellery; use insulated tools; wear rubber gloves/boots and safety glasses.
- Disconnect charging supply before connecting/disconnecting terminals.
- Determine whether battery is inadvertently earthed; if so, isolate supply before work.

Emergency Measures — DANGER ⚠️

- Abnormal battery (leak/odour): Keep non-professionals away; contact trained personnel. Responders wear goggles, rubber gloves, respirator, and protective clothing. First aid: inhalation—fresh air; eyes—flush ≥15 min; skin—wash with water/soap; ingestion—seek medical care.
- Fire: Power off only if safe. Use CO_2, FM-200, or ABC dry powder extinguishers. Avoid HV components; wear respiratory protection and keep distance.
- Flood: Power down only if safe; do not touch flooded parts; do not reuse water-exposed batteries—use licensed recycling/disposal.
- Battery falling/impact: Do not use impacted batteries. If odour/damage/smoke/fire: evacuate and call emergency services. If apparently undamaged: have professionals assess or recycle.

Battery Recycling ♻

- Dispose per local law; never as household rubbish.
- Contact a licensed battery recycler for leaking/damaged/end-of-life batteries.
- Avoid high temperatures, direct sun, humidity, and corrosives.

1.5 Storage Requirements

- Record storage conditions (temperature, humidity, environment).
- Long-term storage not recommended; typical irreversible capacity loss after 12 months at recommended temperatures: 3–10%.
- Environment: 0–25 °C; 35–85% RH; dry, clean, ventilated; avoid solvents/corrosives and sun.
- Store upright per packaging labels; follow stacking instructions.
- After expired storage, have professionals test/approve prior to use.

1.6 Handling & Transportation Requirements

NOTICE — UN38.3 Compliance: This product complies with UN38.3 transport testing for dangerous goods.

- Load/unload per local laws and industry standards; avoid rough handling to prevent leaks/rupture/explosion/fire.
- Ship only if intact with no odour/smoke/fire.
- Transport modes: rail/air not supported; maritime per IMDG; land per ADR/JTT617; meet regulatory requirements of origin/destination.
- Protect from rain/snow/water; avoid drops, mechanical impact, inversion, or tilting.
- If abnormal situations occur, follow emergency measures.

1.7 Installation Environment Requirements

- Comply with local laws and AU/NZ standards for lithium products.
- Keep inaccessible to children and away from living/working areas (e.g., bedrooms, lounges, kitchens, studies, laundries).
- Garages: locate out of vehicle path; consider bollards.
- Basements: maintain ventilation; keep flammables away.
- Install on solid, flat, load-bearing surfaces; dry, well-ventilated locations; shade from sun/rain; clean surroundings free from solvents/corrosives.
- For natural-disaster-prone areas, adopt protective measures.
- Keep away from fire/heat sources; avoid water accumulation and proximity to taps, drains, sprinklers.
- Do not install in explosive atmospheres or on mobile platforms (ships/trains/vehicles).
- Salt-mist: Do not install outdoors within 500 m of coast or where sea breeze affects site.
- Temperature: Charging 0–55 °C; Discharging −25–55 °C; pre-warm after cold storage.

1.8 Mechanical Safety

- Use timber or fibreglass ladders for electrical work; ensure ≈75° ladder angle and stability.
- Inspect ladder condition/capacity; secure against slipping; have a spotter.
- Wear goggles and gloves when drilling; shield device and clean debris promptly.
- Handle heavy objects with care; wear safety shoes/gloves.

1.9 Testing a New Device

On first power-up, a qualified person must configure parameters correctly. Incorrect settings may breach certification and affect operation.

1.10 Maintenance & Replacement — DANGER ⚠

- Power off; observe delayed discharge labels/times; follow safety precautions.
- Exclude unauthorised personnel; use temporary signage/barriers.
- Contact dealer/service provider for faults; do not re-energise until resolved.
- Do not open covers without authorisation (shock risk; may void warranty).
- After isolation, wait ≥5 minutes, then prove the DC bus and work area de-energised with a meter.
- Battery maintenance under supervision of trained personnel.
- Replace only with the same type battery/pack.

- Remove all tools/parts before re-closing.
- For extended non-use, store and maintain charge per this manual.

2. Product Introduction

2.1 Product Shape & Dimensions

Example (6-module stack) overall height ≈1287 mm. See product drawings.

2.2 Product Images

Front, back, left, and right side views as per figures.

2.3 Product Label Description

Sign	Name	Description
Ground identification	Protective earth	Location of ground connection.
⚠ Anti-electric shock	Electric shock hazard	Disconnect multiple switches to isolate power before maintenance.
📘 Read manual	Read instructions	Refer to the storage system instruction manual.

2.4 Product Specifications

Product Family: MESS-HV (Stacked Household Energy Storage Cube)

Product Model	MESS-HV 16.13K	MESS-HV 21.5K	MESS-HV 26.88K	MESS-HV 32.26K	MESS-HV 37.63K	MESS-HV 43.0K
Electrical Parameter						
Battery Chemistry	Hybrid Electrolyte Solid State LFP					
Module Parameter	5.37kWh					
Battery Capacity	120Ah	120Ah	120Ah	120Ah	120Ah	120Ah
System Configuration	1P42S	1P56S	1P70S	1P84S	1P98S	1P112S
Total Energy	16.13kWh	21.50kWh	26.88kWh	32.26kWh	37.63kWh	43.0kWh
Nominal Voltage	134.4V	179.2V	224V	268.8V	313.6V	358.4V
Voltage Rang	119.7-150.36 V	159.6-200.48 V	199-250.6V	239.4-300.72 V	279.3-350.84 V	319.2-400.96 V
Max.Charge/ Discharge current	100A	100A	100A	100A	100A	100A
Cycle Life	6000 cycles (25±2°C, 0.5C,70%SOH)					
Communication	CAN					
Monitoring Type	Wifi					
General Parameter						
Size (W*D*H) mm	600x423x765	600x423x939	600x423x1113	600x423x1287	600x423x1461	600x423x1635
Weight	160kg	205kg	250 kg	295 kg	340kg	385kg
Installation Method	Outdoor/ Indoor; Floor Mounted					
Cooling Method	Natural Cooling					
Warranty	10 Years					
Certification	IEC62619;IEC60730-1;EN62477-1;EN IEC62040-1;CE; UN38.3					

Environment Parameter	
IP Ingress Protection	IP65
Humidity	0~90%RH (No condensation)
Best Operating Temperature	Charge 5 - 45°C Discharge -25 - 45°C
Storage Temperature Range	-20°C - 35°C
Altitude	<2000m

2.5 BMS Functional Characteristics

High-reliability control with integrated SBC + MCU + ADC + HSD architecture; high-precision pack voltage/current and cell data acquisition; SOC/SOH estimation; insulation resistance measurement; CAN/RS485 communication with PCS/EMS/cloud; high/low-side drive outputs and dry contacts; DO/DI for HV interlock; NTC (10 k) temperature acquisition with sensor fault diagnostics; automatic addressing; local data storage with power-off retention; Bootloader/remote firmware upgrades over CAN; designed for up to 1000 V systems and IEC/UL compliant.

Number	Alarm and Fault Protection	Level
1	Pack Over Voltage(V)	3
2	Pack Under Voltage (V)	3
3	Delta Cell Voltage (mV)	2
4	Cell Over Voltage (mV)	3
5	Cell Under Voltage (mV)	3
6	Discharge Over Temperature (°C)	2
7	Discharge Under Temperature (°C)	2
8	Charge Over Temperature (°C)	2
9	Charge Under Temperature (°C)	2
10	Delta Cell Temperature (°C)	2
11	Charge Over Current (A)	3
12	Discharge Over Current (A)	3
13	Insulation Fault	3
l4	Low SOC (%)	1
15	Low SOH (%)	2
16	Ambient Over Temperature(°C)	2
17	Ambient Low Temperature(°C)	2

2.6 BMS-Compatible Inverter Manufacturers

CAN type communication	RS485 type communication
PYLON	PYLON
Growatt	Growatt
Victron	SRNE
GOODWE	Deye
Solis	Voltronic Power
Pace Electronics	Pace Electronics
SOFAR	—
KSTAR	—
SMA	—
MEGAREVO	—
Afore	—
INVT	—

AU/NZ STANDARD — HIGHLIGHT: Grid-connected inverters must comply with AS/NZS 4777.2 and local DNSP rules; installation/commissioning per AS/NZS 4777.1 where applicable.

2.7 Performance & Test Conditions

- Tests on new batteries within one week of shipment; ≤5 cycles prior to testing.
- Standard conditions: 20 ± 5 °C, 45–85% RH (or 15–30 °C, 25–85% RH if acceptable).
- Instruments: dimension gauge (0.01 mm), voltmeter (≥10 kΩ/V), ammeter (total external resistance <0.01 Ω), impedance meter (1 kHz LCR).
- Standard charge: CC 60 A until any cell 3.55 V, then CC 6 A until any cell 3.58 V.
- Standard discharge: CC 60 A to any cell 2.85 V.
- Rest between charge/discharge: ≈30 min unless otherwise specified.
- Appearance: No cracks, rust, or leakage.

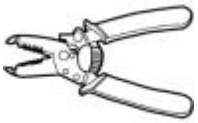
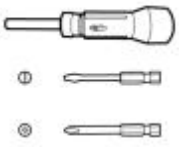
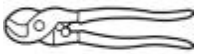
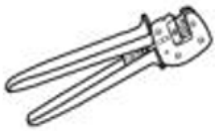
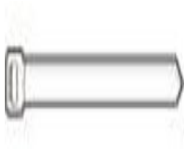
3. Application Scenarios

4. System Installation

4.1 Inspection Before Installation

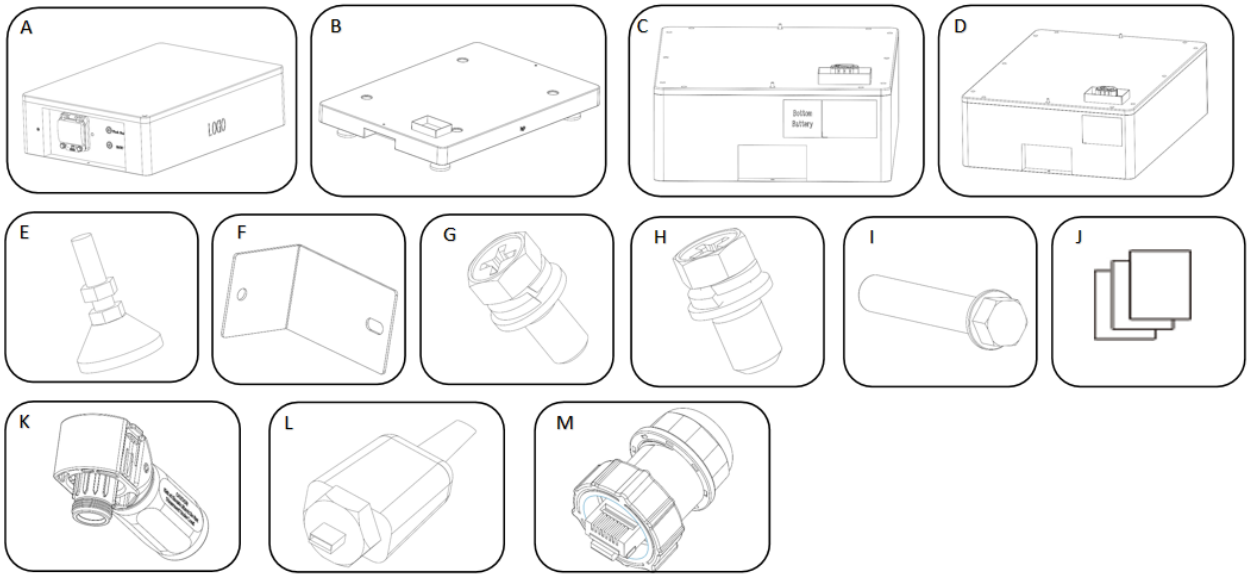
- Outer packaging: Check for holes/cracks or signs of internal damage; verify model. If abnormal or incorrect, do not open—contact dealer.
- Deliverables: After unpacking, confirm all components are present and undamaged.

4.2 Preparing Tools & Meters

Type	Tools and Instruments		
Install	 Percussion drill	 Torque socket wrench	 Open-end wrench (8;10;18mm)
	 Diagonal pliers	 Wire stripper	 Torque screwdriver
	 Rubber hammer	 Tool knife	 Wire nippers
	 Crimping pliers	 Cold pressing terminal crimping pliers	 Disassembly and assembly tools
	 Cable tie	 Vacuum cleaner	 A multimeter

	 marking pen	 Steel tape	 Level ruler
	 hydraulic clamp	 Heat shrinkable sleeve	 Hot air gun
Personal protective equipment	 Safety gloves	 Protective glasses	 Anti-dust masks
	 Safety shoes		

4.3 Scope of Delivery



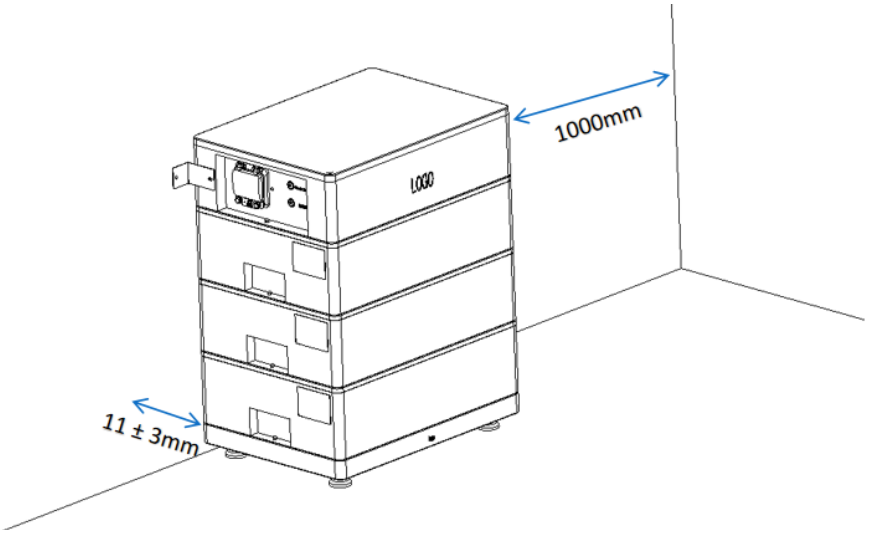
Item	Name	Qty
A	BMS	1
B	Base	1
C	Bottom battery (marked “Bottom Battery”)	1
D	Battery modules	1–5
E	Adjustable feet	4
F	“L” brackets (wall fixing)	2
G	M5×12 screws	6–16
H	M6×12 screws	3
I	Expansion bolts (e.g., M6×50)	2
J	Documentation (manuals)	1
K	Power connectors	4
L	Wi-Fi plug	1
M	COMM-IN connectors	2

4.4 Installation Instructions

4.4.1 Select the Installation Position

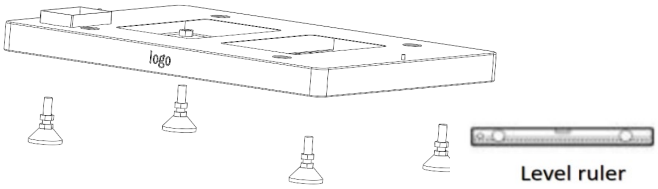
- Front with product icon visible; rear fixing bracket close to wall. Keep device-to-wall spacing 11 ± 3 mm.
- Choose solid brick/concrete wall and floor; other substrates must be flame-retardant and support total weight.
- Well-ventilated location; ambient 0–45 °C; RH 0–95% non-condensing; avoid sun, rain, and snow; ensure air circulation.
- Keep area free of unrelated devices and flammables; reserve service clearances for heat dissipation and isolation.
- After unpacking, keep modules upright as indicated; do not invert/tilt/stack loosely.
- Each battery ≈46 kg; use team lifting, PPE, and avoid foot injuries.

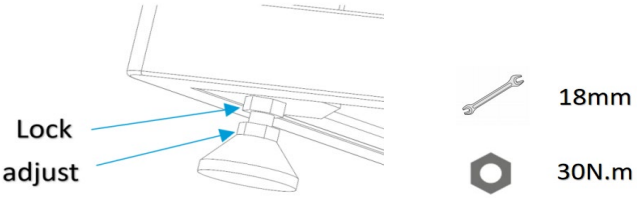
- Never short circuit poles; avoid impacts; store ≈30–50% SOC at room temperature; recharge every ≈3 months if stored.



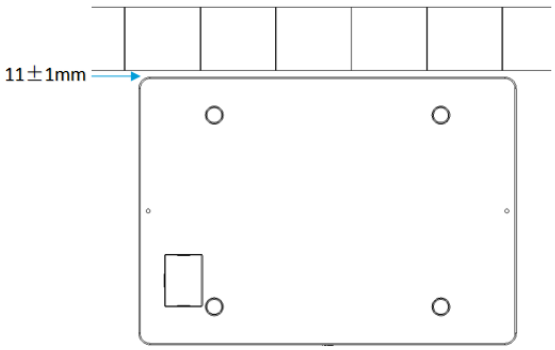
4.4.2 Installing Devices (Base, Batteries, BMS, Brackets)

- Install adjustable feet on base; level floor; tighten foot lock nuts (typical 30 N·m).

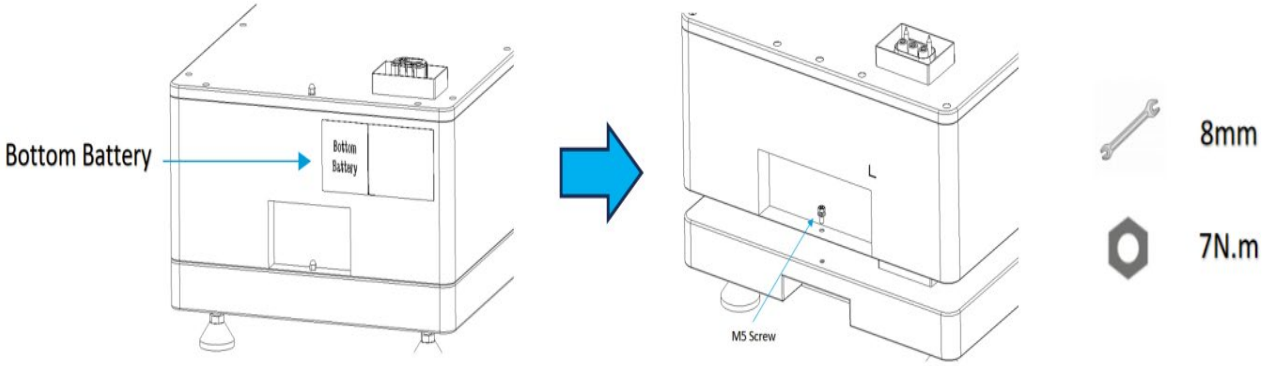




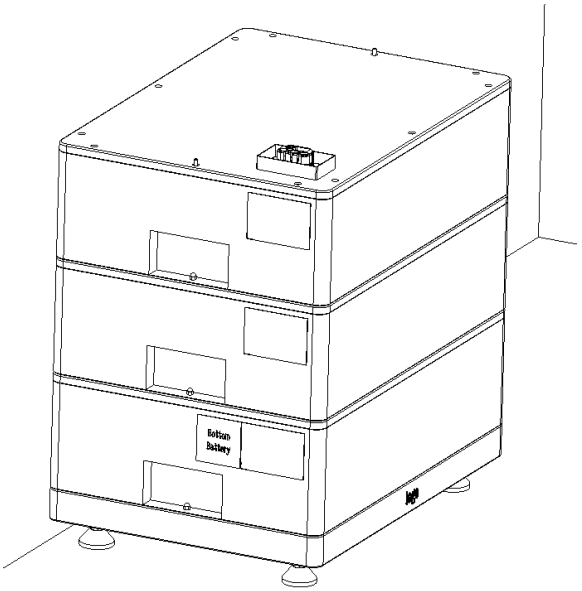
- Position base parallel to wall with 11 ± 3 mm spacing.



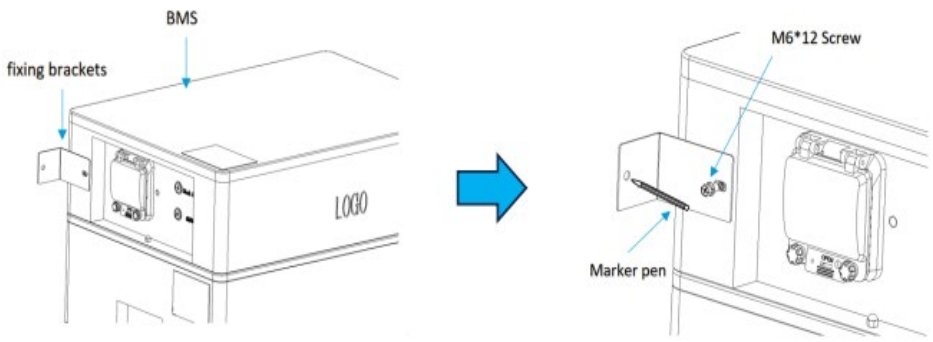
- Install bottom battery module (“Bottom Battery”) onto base; two-person lift; typical fastener torque 7 N·m.

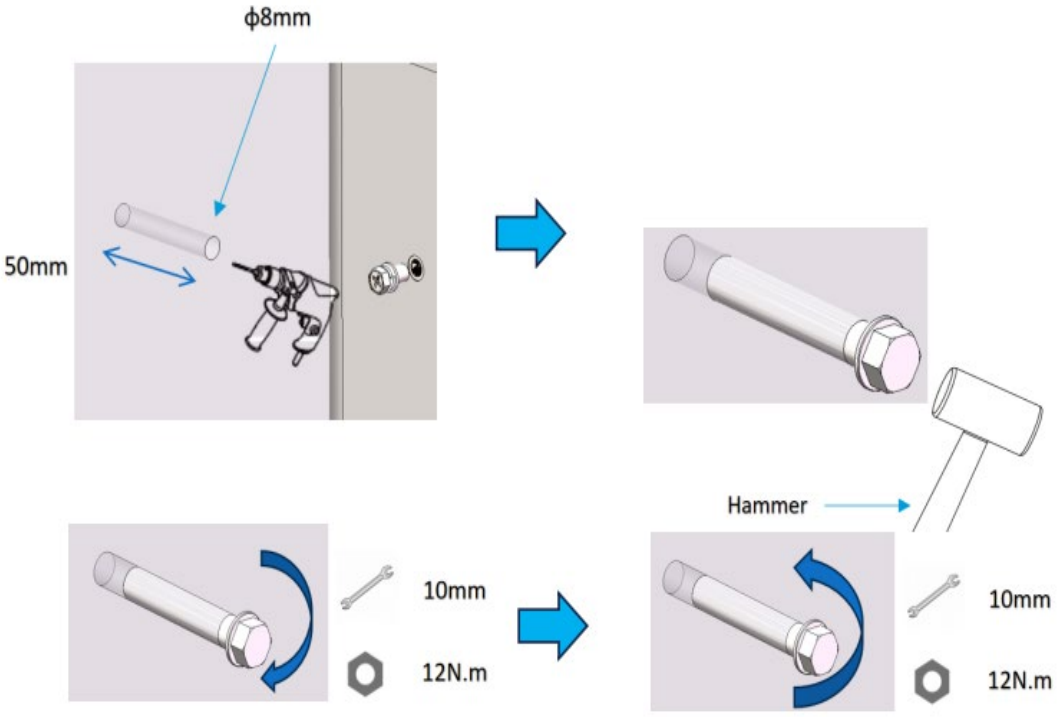


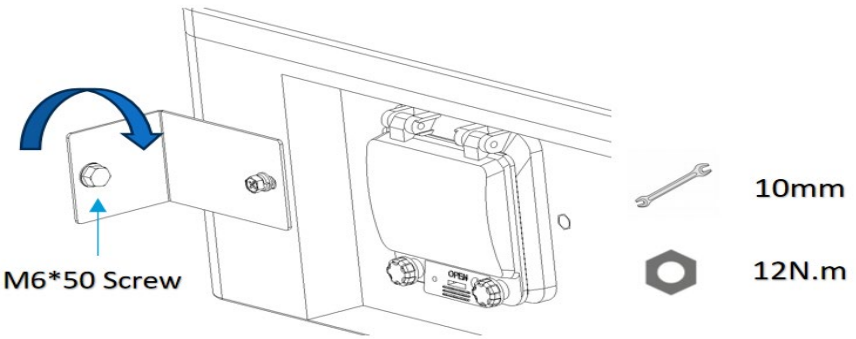
- Stack remaining modules carefully; wear safety footwear and anti-slip gloves.



- Install BMS and wall fixing brackets: mark holes; drill Ø8 mm × 50 mm; install expansion anchors; torque bracket screws ≈12 Nm.







4.4.3 Electrical Installation

- Tools:

Item	Tool		
Tool	Multimeter 	Protective gloves 	Flat-head screwdriver 
	Electric screwdriver 	Phillips screwdriver 	Socket wrench 

- Side Panel Interfaces:

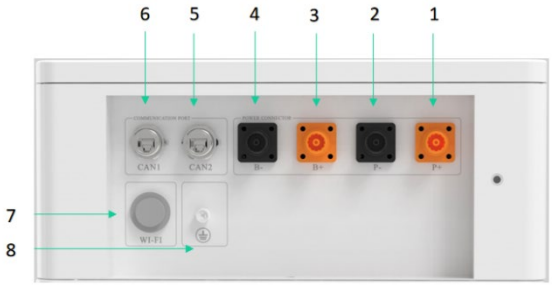


Table Interface Definition

Item	Name	Model	Remarks
1/2	PCS connector	/	1500V/125A
3/4	Battery connector	/	1500V/125A
5/6	Communication port	RJ45	CAN To PCS RS485 Internal Connection
7	Wifi	/	032.00±0.5 M25
8	Grounding terminal	/	
9	Black start switch	/	When the grid loses external power supply, the energy storage system can utilise its own energy storage equipment to supply power, long press the start button for 6-8 seconds, hear the sound, black start successfully
10	Power switch	/	
11	Miniature Circuit breaker	2P MX+OF	500V125A

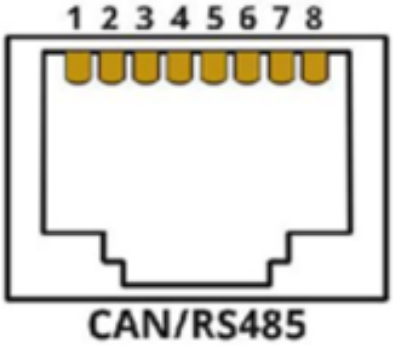


Figure 9: CAN/RS485 Port Interface

Table RJ45 Port Definition

	Description
CAN	Pin 1: CAN2-H Pin 2: CAN2-L Pin 3 & 6: GND Pin 4: CAN_H Pin 5: CAN_L Pin 7 & 8: NC

Table Communication Cable Requirements

Cable Gauge	Strip Length	Maximum Cable Length
CAT5 or better (22 AWG)	RJ-45 connector	45m

Table Power Cable Requirements

Size	Diameter	Max. Voltage	Max current
25 sq mm	5.827mm	1000V	120A

Table Output/Internal cable definition

Cable	Type	Recommended Specification	Length(m)	Source
DC output power Cable (inverter to battery, negative & positive)	1000 V min	25 sq mm XLPE	20m max	Prepared by the installer
Signal cable(inverter to battery)	Outdoor shielded twisted pair cable: Pin 1, 4, 5: NC Pin 2, 7: RS485-A	CAT 5 or better. Conductor cross-sectional area: 0.20-0.35mm2; Cable outer	1.5m	Prepared by the installer

	Pin 3, 6: RS485-B Pin 8: GND	diameter: 6.2-7mm;		
Ground cable	4 sq mm			Prepared by the installer

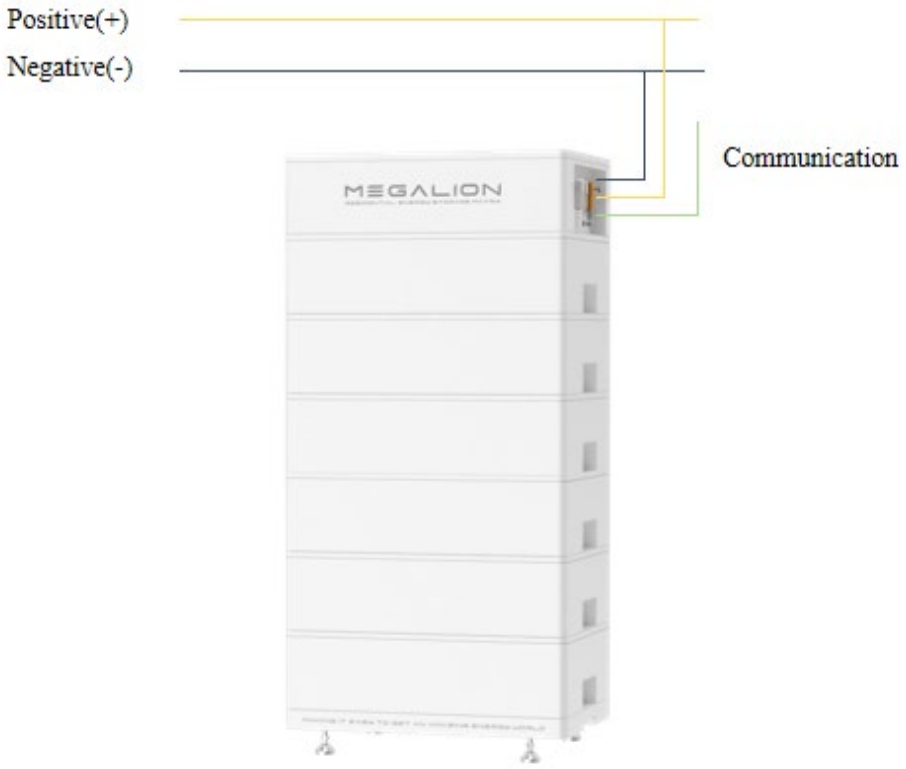


Figure 10: Cable Connection Unit

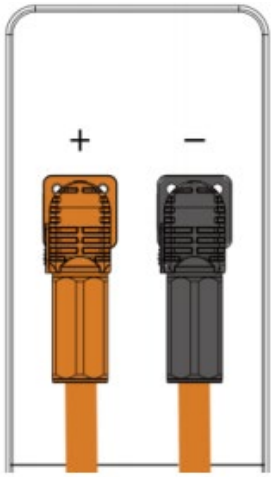


Figure 11: Wiring harness connection diagram

- Comms ports (CAN ↔ PCS / RS485); Wi-Fi port; grounding terminal; black-start switch; power switch; 2P minature circuit breaker 500 V/125 A.
- RJ45 — CAN/RS485: CAN2-H (1), CAN2-L (2), CAN_H (4), CAN_L (5), GND (3/6 on certain variants); RS485 map per latest diagram.
- Comms cable: CAT5 (22 AWG) or better with RJ45; max length 45 m.
- Power cable: DC inverter↔battery 25 sq mm (Ø≈5.83 mm) rated 1000 V, 120 A; earth sized per AS/NZS 3000 and AS/NZS 3008.1.1.
- Signal cable: shielded twisted pair 0.20–0.35 mm^2; OD 6.2–7 mm.
- Wiring harness: quick-plugs (orange = +, black = –). Connect inverter DC posts with ring terminals; verify polarity; tighten to inverter spec.
- Connection sequence: isolate mains/PV; inverter OFF; product OFF; connect ring terminals; connect negative quick-plug; then positive quick-plug.
- Disconnection sequence: open mains/PV; inverter OFF; product OFF; remove negative quick-plug; remove positive quick-plug; remove ring terminals.
- Isolation/LOTO/PPE: Isolate AC/DC, apply LOTO, prove de-energised; wear DC-rated gloves, eye protection; maintain clearances per AS/NZS 5139.

4.4.4 Operating System

- Startup inspection: verify wiring and torque; cross-check with electrical diagram.
- Startup: close miniature circuit breaker; turn on storage system; turn on inverter; verify comms (e.g., inverter UI green).
- Shutdown: turn off inverter; then turn off storage system switches/circuit breakers.

5. Fault Handling

Notifications via app/email for abnormal conditions. Report issues via the app; treat as energised until fully isolated and proven de-energised. Actions must comply with AS/NZS 3000 and AS/NZS 5139.

#	Alarm	Reason	Handling
1	Pack over-voltage	Threshold exceeded	Prohibit charging
2	Pack under-voltage	Below threshold	Prohibit discharging
3	Delta cell voltage high	Cell ΔV > threshold	Auto balancing starts
4	Cell over-voltage	Single cell above limit	Prohibit charging
5	Cell under-voltage	Single cell below limit	Prohibit discharging
6	Discharge temperature high	—	Reduce discharge power
7	Discharge temperature low	—	Prohibit discharging
8	Charge temperature high	—	Reduce charge power
9	Charge temperature low	—	Prohibit charging
10	Delta cell temperature high	Sensor spread	Investigate thermal balance
11	Charge over-current	Threshold exceeded	Reduce/limit charge current
12	Discharge over-current	Threshold exceeded	Reduce/limit discharge current
13	Insulation fault	Reduced/lost insulation resistance	Troubleshoot/repair
14	Low SOC	Insufficient remaining energy	Charge promptly
15	Low SOH	Ageing/degradation	Service/replace as required
16	Ambient temperature high	—	Reduce charge/discharge power
17	Ambient temperature low	—	Prohibit charge/discharge
18	Communication failure	PCS/BMS comms error	Check comms harness
19	Main relay fault (+/−/pre-charge)	Adhesion/damage	Shut down power switch; inspect relay/circuit
20	Temperature sensor fault	Sensor malfunction	Inspect/replace sensor

6. Regulatory Compliance & Standards (AU/NZ)

- AS/NZS 5139 — Electrical installations—Safety of battery systems for use with power conversion equipment.
- AS/NZS 3000 (Wiring Rules) — Earthing/bonding, isolation, protection, labelling, signage.
- AS/NZS 4777.2 — Inverter requirements (with AS/NZS 4777.1 where applicable).
- AS/NZS 3008.1.1 — Cable selection: current-carrying capacity and voltage drop.
- AS/NZS 3017 — Testing & verification.
- UN38.3 — Transport testing for dangerous goods.
- IMDG / ADR / JTT617 — Maritime/road transport of dangerous goods.
- WHS (AU) / HSWA 2015 (NZ) — Safety legislation.
- DNSP Service & Installation Rules — Local network requirements.
- Labels & Signage: Identification; shutdown/isolation; hazards; PPE; emergency contacts.
- Handover Docs: SLD; datasheets; commissioning records; settings; verification & test results; maintenance schedule; emergency procedures; warranty and recycling info.

© 2025 Megalion. All rights reserved. This manual may be updated; check the website for the latest version.