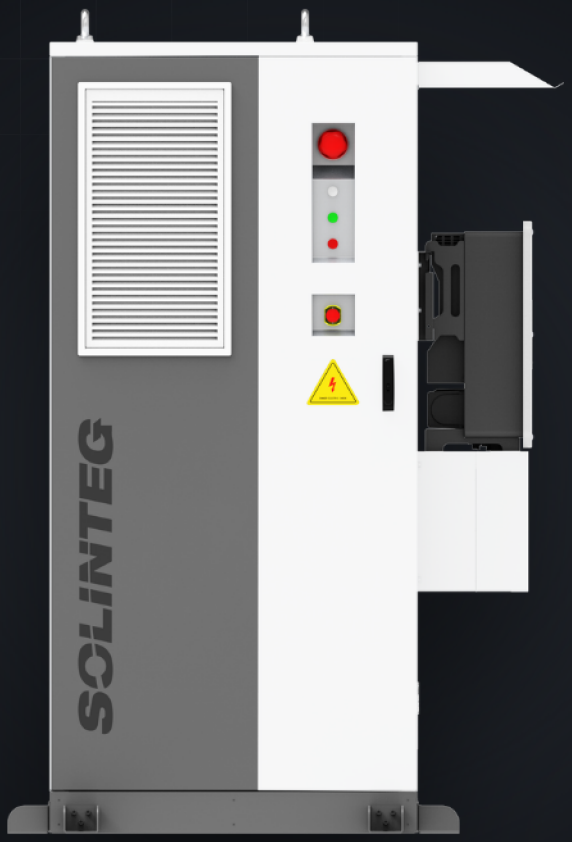
aerl | SOLINTEG

USER MANUAL

All-In-One Energy Storage System

Commercial Outdoor Energy Storage,
25–50 kW, 64.3–112.5 kWh



AIO-25K · 29.9K · 30K · 40K · 50K

User Manual

REV 1.0.1, 8 NOV 2026

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AUSTRALIAN EDITION

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Document

Revision
1.0.1 (Australian edition)

Effective
11 / 2026

Audience
Licensed installers

Manufacturer
Solinteg

Usable energy
57.9–101.3 kWh

Enclosure
IP55, outdoor

Cooling
Forced air, A/C

Fire protection
Aerosol, per pack + cabinet

Format
A4 · 87 pages

About This Manual

This manual covers the safety instructions, product description, transport, storage, installation, electrical connection, commissioning, maintenance and troubleshooting of the All-In-One energy storage system.

The All-In-One is manufactured by Solinteg. It combines a Solinteg E2BR outdoor air-cooled battery cabinet (the "cabinet" in this manual) with a Solinteg M2HT 25–50 kW hybrid inverter mounted on the side of the cabinet. The model (AIO-25K to AIO-50K) sets the inverter power, and the cabinet sets the storage capacity:

Storage option	64 kWh	80 kWh	96 kWh	112 kWh
Solinteg cabinet model	E2BR-S64K-C	E2BR-S80K-C	E2BR-S96K-C	E2BR-S112K-C
System energy	64.3 kWh	80.3 kWh	96.4 kWh	112.5 kWh
Usable energy	57.87 kWh	72.27 kWh	86.76 kWh	101.25 kWh
Ingress protection	IP55	IP55	IP55	IP55
Cabinet dimensions (W × H × D)	1050 × 2262 × 1140 mm	1050 × 2262 × 1140 mm	1050 × 2262 × 1140 mm	1050 × 2262 × 1140 mm
Weight	1101 ± 22 kg	1214 ± 24 kg	1327 ± 26 kg	1440 ± 28 kg

Who This Manual Is For

This manual is for licensed electrical workers who install, operate and maintain the cabinet. Anyone working on the cabinet must:

- understand electrical, cabling and mechanical work, and how battery energy storage systems operate
- be trained in installing and commissioning electrical equipment
- know the electrical standards and regulations that apply on site. In Australia these include AS/NZS 3000, AS/NZS 5139 and AS/NZS 4777.1
- hold the licences required in the state or territory where the work is done.

Only people who meet all of these requirements may install, maintain or troubleshoot the cabinet.

Safety Symbols

This manual uses the following symbols. Read and follow every instruction they mark.

Danger

Indicates a hazard with a high level of risk that, if not avoided, will result in death or serious injury.

Warning

Indicates a hazard with a medium level of risk that, if not avoided, could result in death or serious injury.

Notice

Indicates a hazard with a low level of risk that, if not avoided, could result in minor or moderate injury, or damage to equipment.

Note

Extra information to help you use the equipment efficiently. Notes are not safety warnings.

About This Edition

This manual is based on Solinteg's E2BR user manual. AERL has rewritten the text for clarity and adapted it for Australia. The product specifications are Solinteg's. Illustrations are for reference only and may differ from your product. The manual may be updated as the product changes. Download the latest edition from aerl.com.au.

Nothing in this manual excludes, restricts or modifies any right or remedy you have under the Australian Consumer Law.

Safety Instructions

Warranty exclusions, personal safety, electrical safety

01

1.1 Warranty Exclusions

Before you transport, store, install, operate or maintain the equipment, read this manual carefully and follow it, the labels on the equipment and every safety instruction in this manual.

The manufacturer's warranty does not cover damage caused by:

- improper transport
- incorrect storage, installation or use
- installation or use by unqualified or untrained people
- failure to follow the instructions and safety warnings in this manual
- operation in an environment that does not meet the requirements of this manual
- operation outside the limits in the technical specifications
- unauthorised disassembly or modification of the product or its software
- unauthorised opening of the equipment covers, or removal or replacement of internal components
- abnormal natural events (force majeure), such as lightning, earthquake, fire or storm
- installation or operation that does not comply with local standards and regulations
- a product that is outside its warranty period.

1.2 Personal Safety

To avoid injury, death or damage to the equipment, read these precautions before you start work.

- Only trained and licensed electrical workers may install the equipment.
- Remove watches, bracelets, rings, necklaces and other conductive items before you install or operate the equipment, to avoid burns from electric shock.
- Never work on the equipment while it is energised. Sparks and arcs from connecting or disconnecting live cables can cause fire or injury.
- Wear suitable personal protective equipment (PPE) during installation and operation.
- If you need a ladder, use a timber or insulated ladder.
- Before you operate the cabinet, make sure it is securely anchored. The cabinet has a high centre of gravity and can tip over, causing injury and damage.
- Some parts of the equipment can exceed 60 °C during operation. Keep away from vents, the cooling system and other hot surfaces.
- Install the equipment where children and animals cannot reach it.
- Do not use the backup supply of this equipment for:
  - life-support or other medical equipment
  - equipment or precision instruments that may malfunction or be damaged by a power failure or fluctuation.

1.3 Electrical Safety

- Operate the equipment strictly in accordance with this manual.
- Make all electrical connections in accordance with local regulations. In Australia, comply with AS/NZS 3000, AS/NZS 5139, AS/NZS 4777.1 and the requirements of the local network service provider.
- Isolate the power supply before you install the equipment. Never work on live equipment.
- Connect the protective earth before anything else. When removing the equipment, disconnect the protective earth last.
- Select cables in accordance with local regulations and this manual.
- Connect cables securely and tighten terminal screws to the specified torque.
- A damaged cable must be replaced by a qualified person.
- Isolate the power supply before connecting power and communication cables.
- Do not open the internal covers of the cabinet. Except for the terminal wiring described in this manual, opening covers or replacing internal components may cause injury or damage and will void the warranty.
- Before working on the battery terminals, open the battery circuit breaker or isolator. The battery is at high voltage.

1.4 Installation Requirements

- Before installation, check that all parts, tools and materials are present. After installation, count them again to make sure nothing has been left inside the equipment. Install every part (except optional parts) as this manual requires.
- Do not drill holes in the equipment. Drilling can damage it and affect its performance.
- Install the equipment in a well-ventilated area away from other heat sources, so the cooling system can work properly.
- Keep the vents and heat-dissipation paths clear at all times. Heat build-up can damage the equipment or cause a fire.
- Do not open the cabinet door in rain or high humidity. If you must, protect the inside of the cabinet from water.
- Never install or operate the equipment where there is flammable or explosive gas or smoke.
- Do not install the equipment in a low-lying area. Keep it away from drains, air-conditioner outlets, vents and anywhere water may leak, so that liquid cannot enter the equipment.

1.5 Battery Safety

- Check battery polarity carefully. Never short-circuit the positive and negative terminals. A short circuit produces very high current and heat, and can cause leakage, smoke, flammable gas, thermal runaway, fire or explosion.
- Never work on the battery while it is energised.
- Never stand or lean on the battery, or allow people or equipment to press against it.
- Do not expose the battery to high temperature or humidity. Keep ventilation and heat dissipation unobstructed.
- Never disassemble, modify, shake, drop, strike, crush or puncture the battery, or subject it to pressure shock. Damage can cause leakage, smoke, flammable gas, thermal runaway, fire or explosion.
- Never weld, grind or do other hot work near the battery. Sparks or arcs can start a fire.
- Never mix battery models or brands.
- Never use second-hand or damaged batteries.
- Before working on the battery, check for any pungent or burning smell around it.
- Batteries must be handled and maintained only by qualified people wearing PPE (including goggles, rubber gloves, a respirator and protective clothing) in accordance with local requirements.
- A battery damaged by puncture, impact, crushing, external heat or overcharging can go into thermal runaway, leak, or release toxic and flammable gas. Take safety measures on site, in accordance with local requirements, to prevent fire, protect people and avoid damage.
- Install and commission the battery in accordance with local laws, regulations and standards, and provide fire-protection equipment.

- During storage and transport, keep the outer packaging intact. Place or stack batteries the right way up, as marked on the box. Never place them upside down, on their side, on end or tilted.
- Inspect the equipment regularly for loose connections, rust, corrosion and foreign objects, and fix any problem promptly. A loose screw connection causes a voltage drop that can overheat and burn the battery at high current.
- Recharge the battery promptly after it is discharged, to avoid damage from over-discharge. A battery stored for more than six months must be inspected and tested by a qualified person before use.
- Do not charge the battery when the ambient temperature is below the minimum operating temperature.
- If a battery is swollen or its case is dented or broken, stop using it immediately and contact the installer or a qualified service person to remove and replace it. Keep a damaged battery away from other equipment and from flammable and explosive materials, and keep unqualified people away.

Product Description

Product overview, dimensions, components, electrical system

02

2.1 Product Overview

The All-In-One is a commercial energy storage system, manufactured by Solinteg. Its Solinteg E2BR cabinet combines a high-capacity battery, a high-voltage box, an electrical compartment and a fire-protection system. With the Solinteg M2HT hybrid inverter mounted on its side, it forms an outdoor energy storage system that is easy to install and expand. It suits a wide range of commercial and industrial applications.

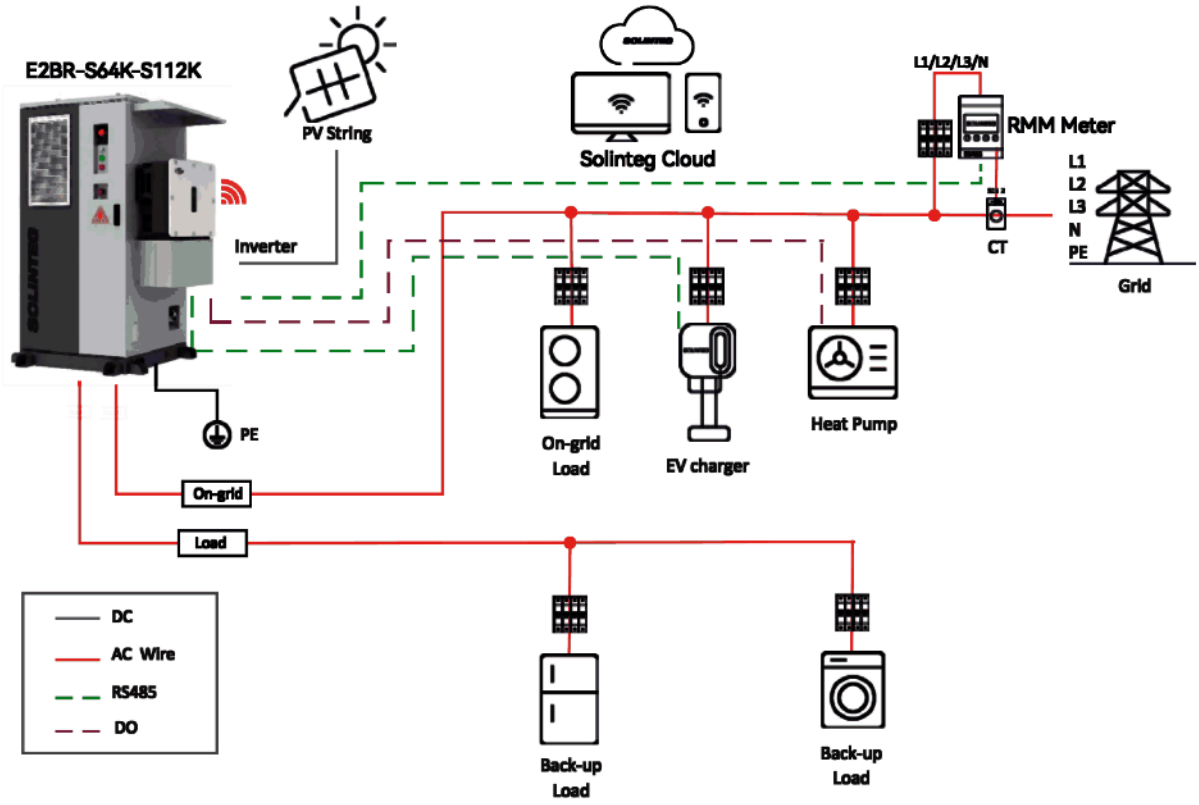


Figure 2.1 Typical All-In-One system.

Equipment	Description
Battery cabinet (Solinteg E2BR-S64/80/96/112K-C)	Outdoor air-cooled energy storage cabinet. Stores energy and provides stable backup power.
Hybrid inverter (Solinteg M2HT 25–50 kW)	PV and battery hybrid inverter. Converts DC to AC and manages energy flow.
Smart meter and CTs (RMM meter)	Measures power and communicates with the inverter, which uses the data to control battery charging and discharging and export to the grid.
EV charger	Charges electric vehicles. Solinteg chargers can communicate with Solinteg inverters.

Equipment	Description
Solinteg Cloud	Remote monitoring platform. View system data at any time.
Loads and heat pump	The system can control SG Ready heat pumps, configured by the user to suit the site.

2.2 Dimensions

The cabinet alone measures 1050 × 2262 × 1140 mm (W × H × D). With the inverter fitted the system is 1376 mm wide, and with the rain shelter 1468 mm. The lifting eyes add 93 mm to the height (2355 mm).

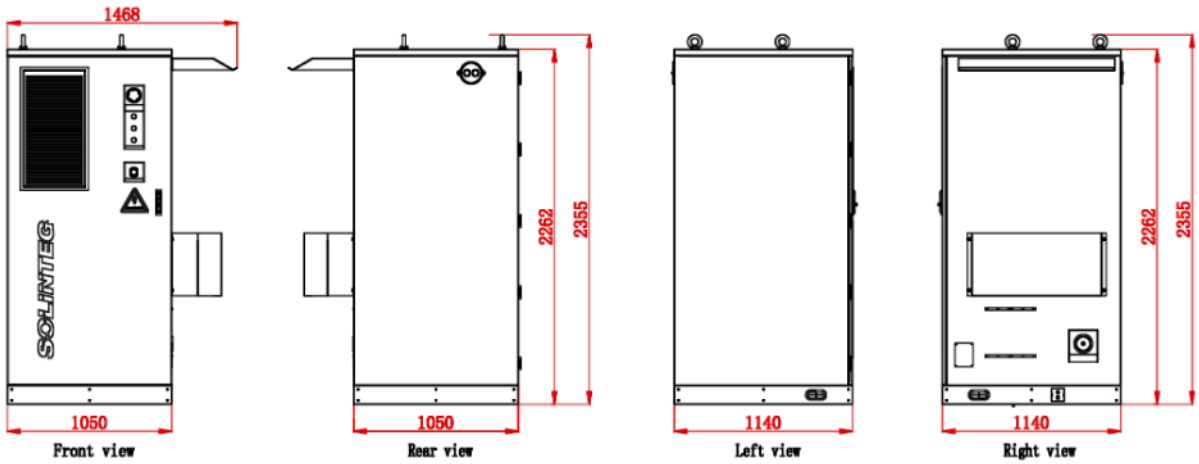


Figure 2.2 Cabinet appearance and dimensions.

2.3 Components

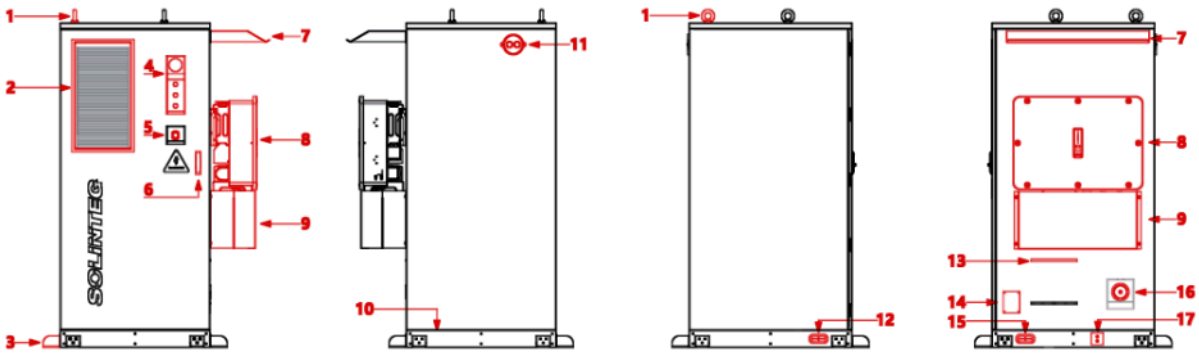


Figure 2.3 Cabinet components, exterior (diagram A).

No.	Name	Description
1	Lifting eye	For lifting the cabinet
2	Air outlet, cooling system	Air-conditioner air inlet and outlet
3	Mounting foot*	For anchoring the cabinet
4	Operation indicators	Show system operating and fault status

No.	Name	Description
5	Emergency stop button	For an emergency stop
6	Door lock	Locks and opens the cabinet door
7	Rain shelter	Protects the inverter from rain and snow
8	Inverter**	25–50 kW hybrid inverter
9	Cable cover	Protects the cables
10	Decorative panels	Trim around the base of the cabinet
11	Explosion-relief vents	Release gas pressure
12	Left cable entry	For cable routing
13	Cable clamp	For securing cables
14	Rating plate	Product specifications
15	Right cable entry	For cable routing
16	Fire-water inlet	For connecting an external fire-water supply
17	Cabinet earth point	Protective earth for the cabinet enclosure

* Mounting feet can be fitted on any of the four sides. Fit them on the left and right, or front and rear, to suit the site.

** The cabinet provides a mounting position for one inverter, which makes installation and wiring easier. In the illustrations, the inverter is mounted on the side of the cabinet.

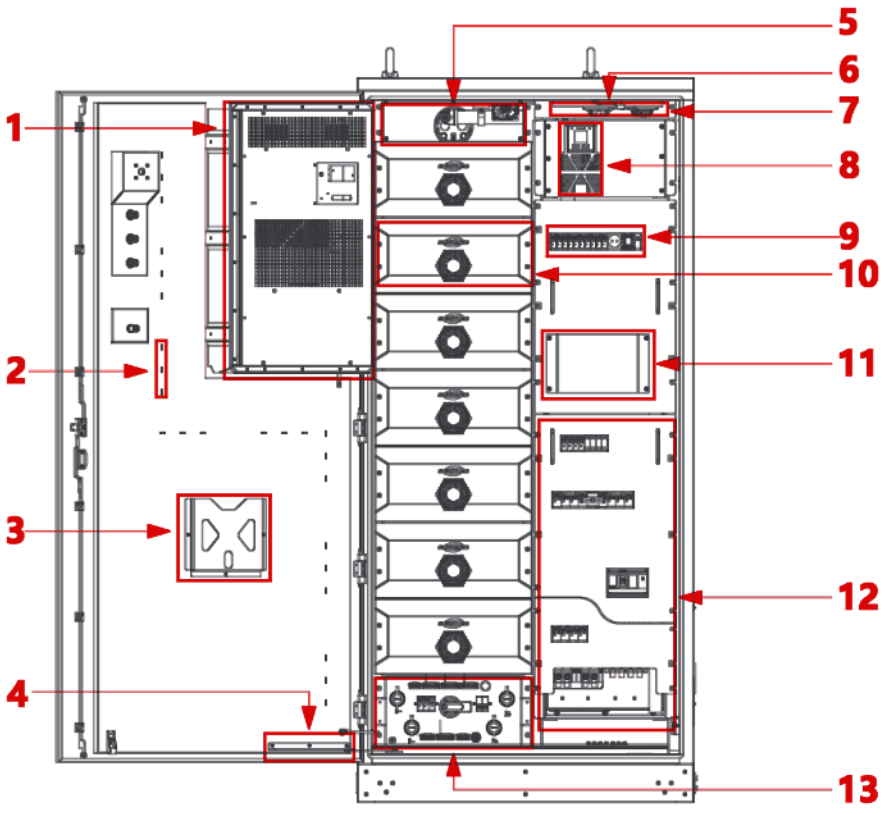


Figure 2.4 Cabinet components, interior (diagram B).

No.	Name	Description
1	Air conditioner	Controls the temperature and humidity inside the cabinet
2	Cable tie bar	For tying cables
3	Document holder	Holds the cabinet documents
4	Door stay	Holds the front door open in wind
5	Fire-protection system	Temperature, gas and smoke detectors with automatic fire suppression
6	Sensors	Temperature and smoke sensors
7	Door switch and lighting	Door limit switch and cabinet lighting
8	UPS	Keeps critical control circuits in the cabinet powered
9	Control power supply	Control switches for the high-voltage box, air conditioner, UPS and service socket
10	Battery pack	Stores energy
11	Spare space	Space for future expansion
12	Electrical compartment	Power distribution for the cabinet
13	High-voltage box (master control)	Collects battery and fire data and controls the cabinet

2.3.1 Side cable panel

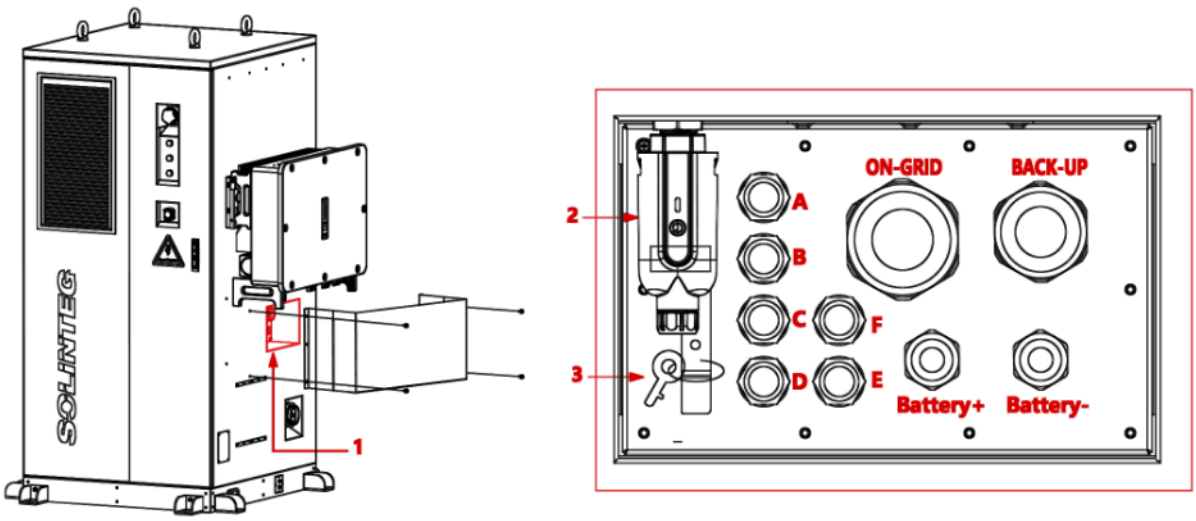


Figure 2.5 Side cable panel.

No.	Name	Description
1	Side cable panel	Cable pass-through between the inverter and the cabinet
2	Communication port panel	Communication connections between the cabinet and the inverter
3	Cabinet key	Key for the cabinet door

No.	Name	Description
4	On-grid	Cable entry for the inverter on-grid cable
5	Back-up	Cable entry for the inverter back-up (load) cable
6	Battery +	Cable entry for the battery positive cable to the inverter
7	Battery –	Cable entry for the battery negative cable to the inverter
8 (A)	Spare	Spare port
9 (B)	Inverter comms	Communication between the inverter and the battery (BMS)
10 (C)	Inverter emergency stop	Emergency stop signal to the inverter
11 (D)	Spare	Spare port
12 (E)	Spare	Spare port
13 (F)	Spare	Spare port

Note

The cabinet door key is stored here. Remove it after unpacking.

2.3.2 Cabinet base

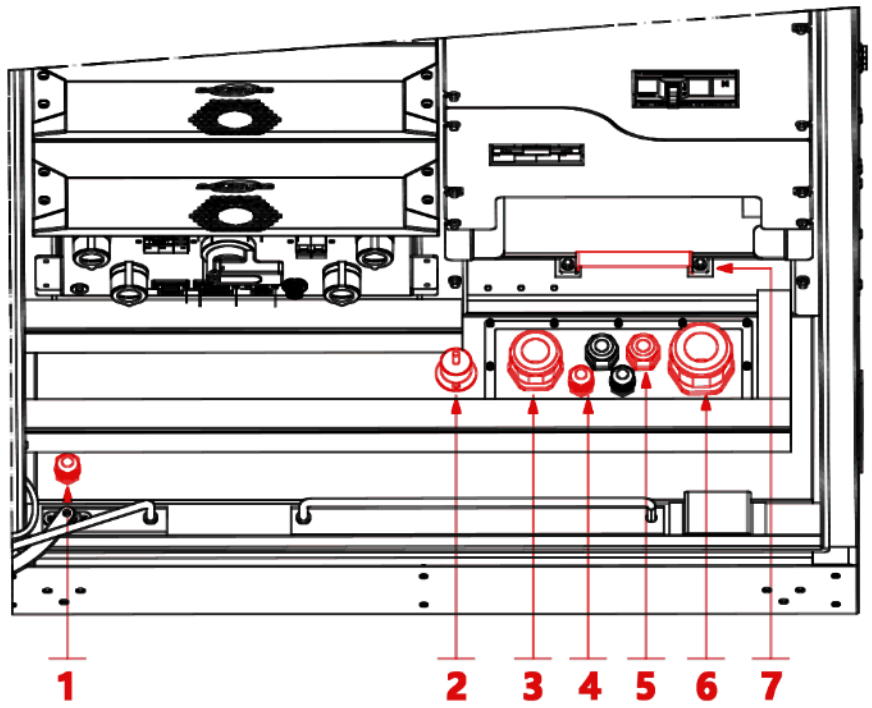


Figure 2.6 Underside of the cabinet.

No.	Name	Description
1	Air-conditioner drain	External drain for the air conditioner
2	Flood sensor	Detects water in the cabinet

No.	Name	Description
3	Load cable entry	Entry for the load cable
4	Cable entry	Spare cable entry
5	Cable entry	Cable entry
6	Grid cable entry	Entry for the grid cable
7	PE	Earth cable connection

2.3.3 Electrical compartment

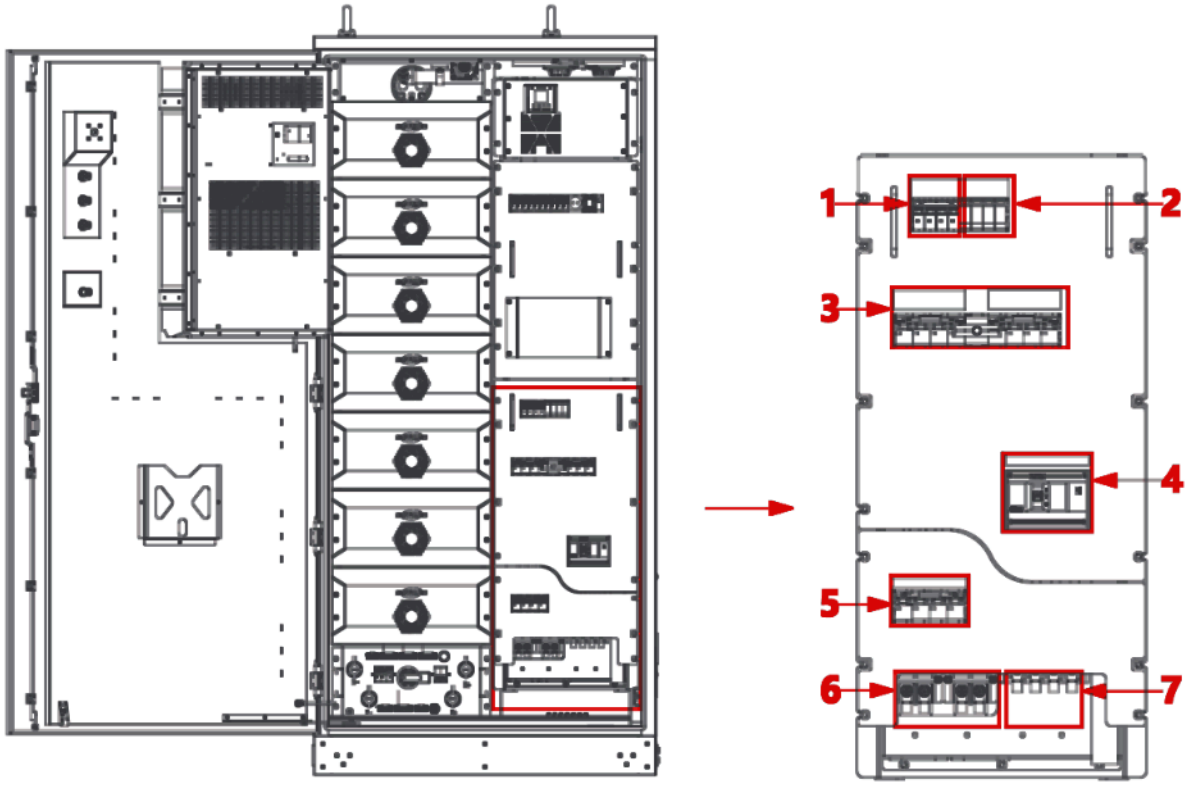


Figure 2.7 Layout of the electrical compartment.

No.	Label	Description
1	QF7	Surge protection device (SPD) breaker
2	SPD	AC surge protection device
3	QF6-1 / QF6-2	Bypass breakers (switch between normal operation and maintenance bypass)
4	QF4	Grid breaker
5	QF5	Load breaker, with load terminals
6	—	Spare
7	Grid terminals	Grid terminals L1, L2, L3, N

2.3.4 Control power supply

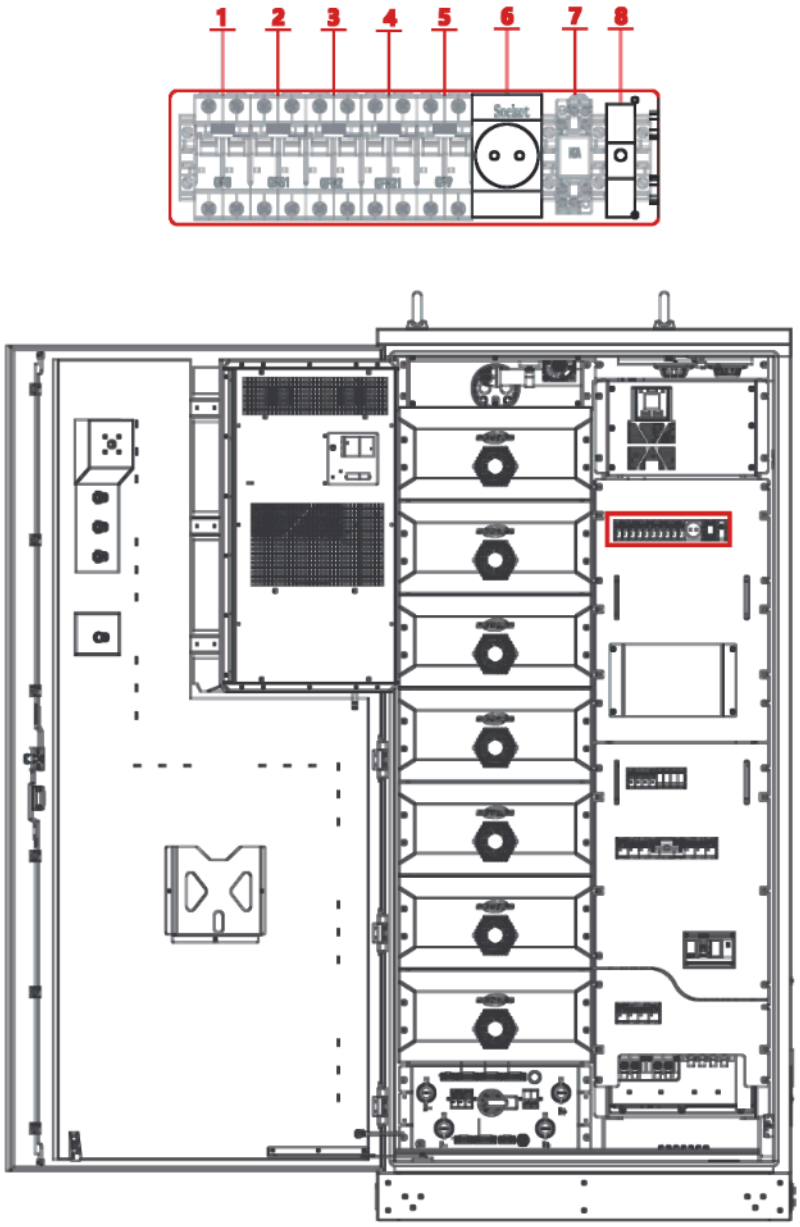


Figure 2.8 Layout of the control power circuit.

No.	Label	Description
1	QF8	Auxiliary main breaker
2	QF81	Air-conditioner breaker
3	QF82	UPS breaker
4	QF821	Controller PDU AC breaker
5	QF9	Socket breaker
6	Socket	Service socket
7	KA	Fire-signal relay
8	—	Spare breaker

2.3.5 High-voltage box

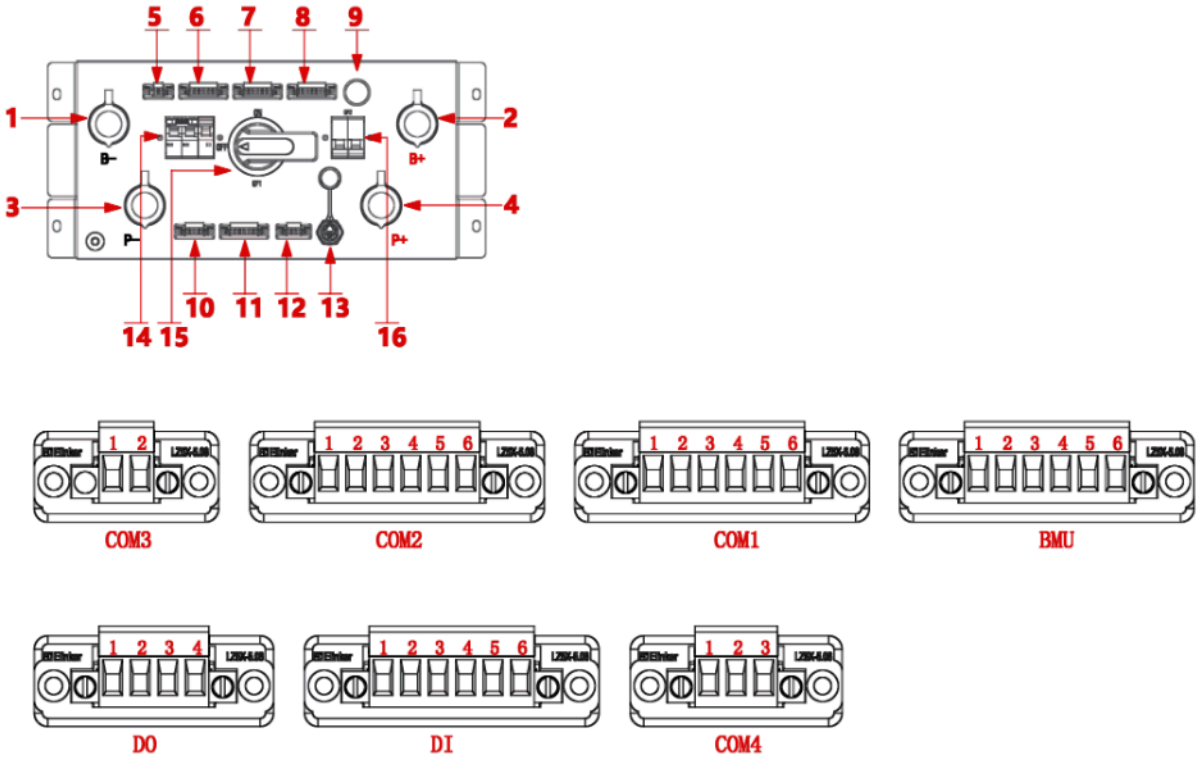


Figure 2.9 Layout of the high-voltage box.

No.	Label	Pin	Description
1	B−	B−	To the battery pack negative terminal
2	B+	B+	To the battery pack positive terminal
3	P−	P−	To the inverter negative terminal
4	P+	P+	To the inverter positive terminal
5	COM3	1: 24 V DC+ · 2: 24 V DC−	24 V DC supply for the battery pack fans
6	COM2	1: RS485 A · 2: RS485 B	Spare
6	COM2	3: RS485 A · 4: RS485 B	Communication module (dongle) interface
6	COM2	5: RS485 A · 6: RS485 B	Air-conditioner RS485 interface
7	COM1	1: 24 V DC+ · 2: 24 V DC−	24 V DC supply (BA)
7	COM1	3: CAN H · 4: CAN L	BMS debug CAN port
7	COM1	5: CAN H · 6: CAN L	Inverter communication CAN port
8	BMU	1: 24 V DC+ · 2: 24 V DC−	24 V DC BMU supply
8	BMU	3: ADD SET · 4: —	BMU address setting

No.	Label	Pin	Description
8	BMU	5: CAN H · 6: CAN L	BMU CAN interface
9	HR	—	High-voltage box fault indicator
10	DO	1: NO1 · 2: COM1	Cabinet running signal output (running indicator)
10	DO	3: NO2 · 4: COM2	Cabinet fault signal output (fault indicator)
11	DI	1	Signal input common
11	DI	2	SPD status input
11	DI	3	Fire status input
11	DI	4	Flood status input
11	DI	5	Door switch status input
11	DI	6	Emergency stop button status input
12	COM4	1: 220 V AC L · 2: N · 3: PE	AC supply for the BMS
13	LAN	—	BCU to BAMS communication
14	QF3	—	Controller DC supply breaker
15	QF1	—	Controller main switch
16	QF2	—	Controller AC supply breaker

2.3.6 Battery pack

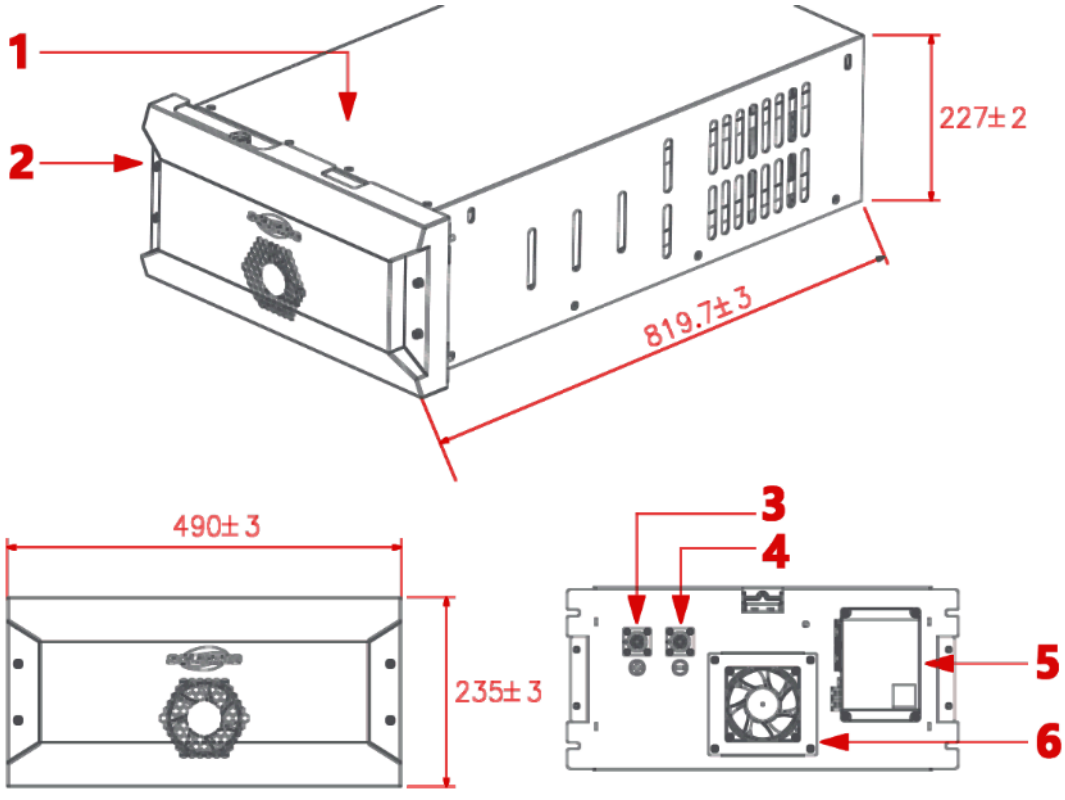


Figure 2.10 Battery pack.

No.	Name	No.	Name
1	Battery pack	4	Battery pack negative terminal
2	Front cover	5	BMU
3	Battery pack positive terminal	6	Fan

No.	Item	Specification	Remarks
1	Cell type	MB31	
2	Nominal capacity	314 Ah	Standard cell charge and discharge
3	Nominal voltage	51.2 V	3.2 V per cell
4	Nominal energy	16.076 kWh	Standard cell charge and discharge
5	Standard charge power	0.5P	
6	Standard discharge power	0.5P	
7	Cell balancing	Passive	
8	Thermal management	Forced air cooling	
9	Operating temperature	Discharge −20 to 50 °C · Charge 1 to 50 °C	
10	Storage temperature	−20 to 45 °C	
11	Fire protection	Built-in aerosol module	
12	Operating humidity	5–95% RH	
13	Storage conditions	Under 1 month: −30 to 55 °C, 90% RH max Over 3 months: −10 to 45 °C, 90% RH max Recommended: 10 to 30 °C, 85% RH max	
14	Ingress protection	IP20	
15	Weight	114 ± 5 kg	Including front cover
16	Dimensions (W × H × D)	487 × 227 × 791.5 mm 490 × 235 × 819.7 mm	Excluding front cover Including front cover
17	Maximum altitude	3000 m	Derate above 3000 m
18	Enclosure material	SGCC (galvanised steel)	
19	Front cover material	SPCC (cold-rolled steel)	

2.3.7 Air conditioner

> **Danger**
> Keep the air-conditioner drain line clear. Water pooling in the cabinet from a blocked drain can damage the unit. Do not change the air-conditioner controller settings. Incorrect settings can stop it controlling the cabinet temperature and humidity, and damage the batteries.

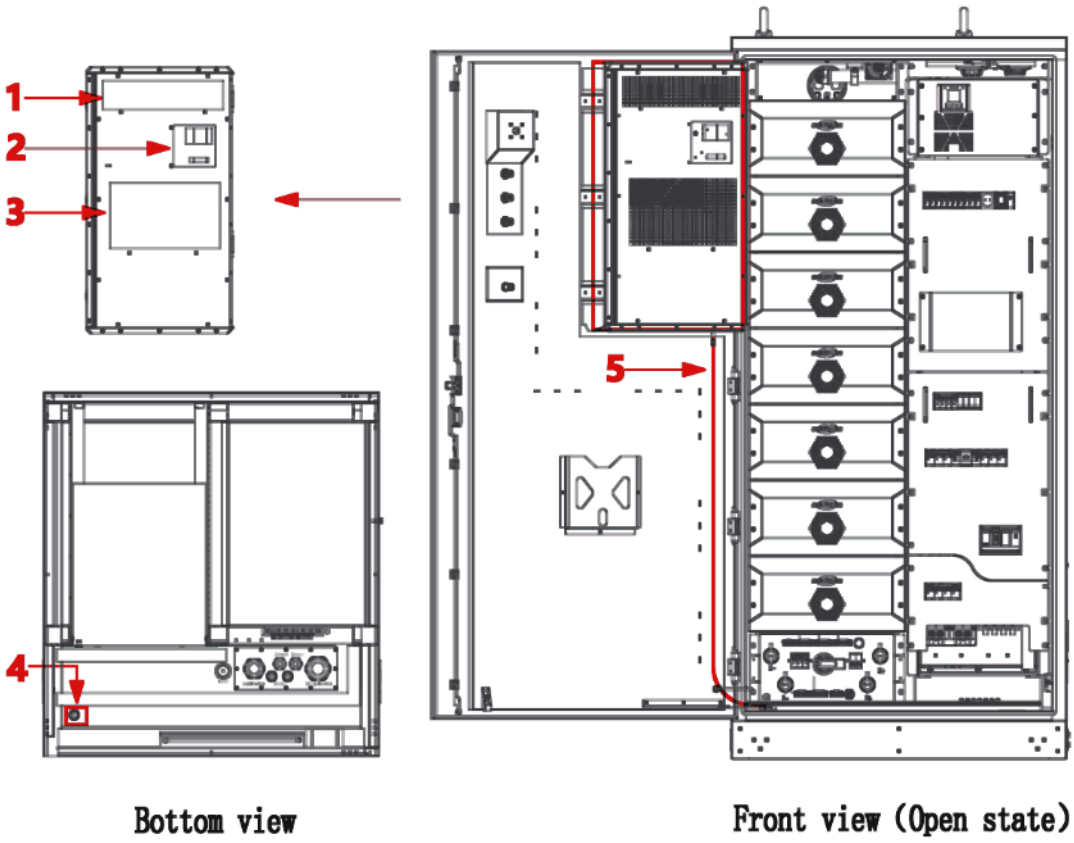


Figure 2.11 Air conditioner.

No.	Name	Description
1	Air outlet	Cool air out
2	Controller	Reads temperature and humidity, and controls them to the set points
3	Return air inlet	Draws in warm air from the cabinet
4	Drain outlet	Condensate drain
5	Drain hose	Condensate drain

> **Note**
> Run the end of the drain hose out through the air-conditioner drain port. We recommend running it to a drain, so that water does not collect under the cabinet.

Air conditioner	Specification
Rated supply	230 V AC ± 10%, 50 ± 1 Hz
Rated power (cooling / heating)	1.0 / 2.2 kW
Rated current (cooling / heating)	4.6 / 10.2 A
Rated cooling capacity	2.0 kW
Heating power	2.0 kW
Maximum operating current	11 A
Airflow, internal fan	800 m^3/h
Airflow, external fan	900 m^3/h
Temperature control range	20 to 50 °C
Humidity control	Yes
Operating temperature	−40 to 50 °C
Refrigerant	R134a

2.3.8 Fire-protection system

> **Notice**
>
> The door switch at the top right of the cabinet tells the high-voltage box when the door is open. Close the door when you finish work, to keep out moisture and small animals. The cabinet light switches on automatically when the door opens. Leave the light switch in its normal position. The light switches off 30 seconds after the door closes.

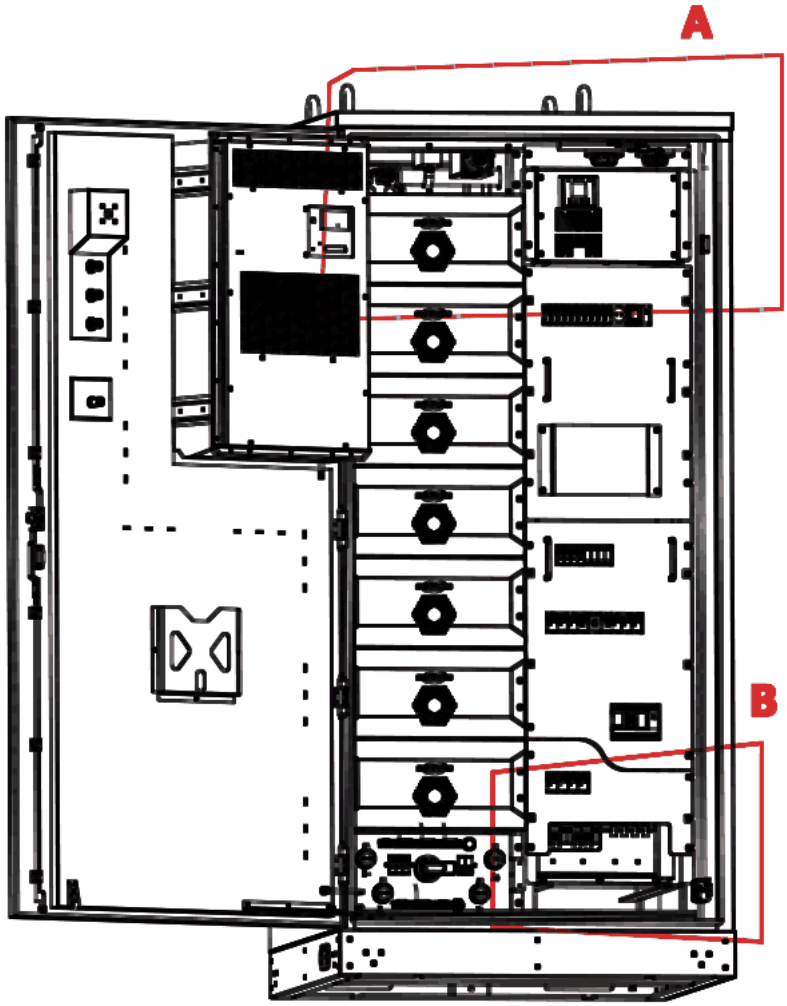


Figure 2.12 Fire-protection system, overview.

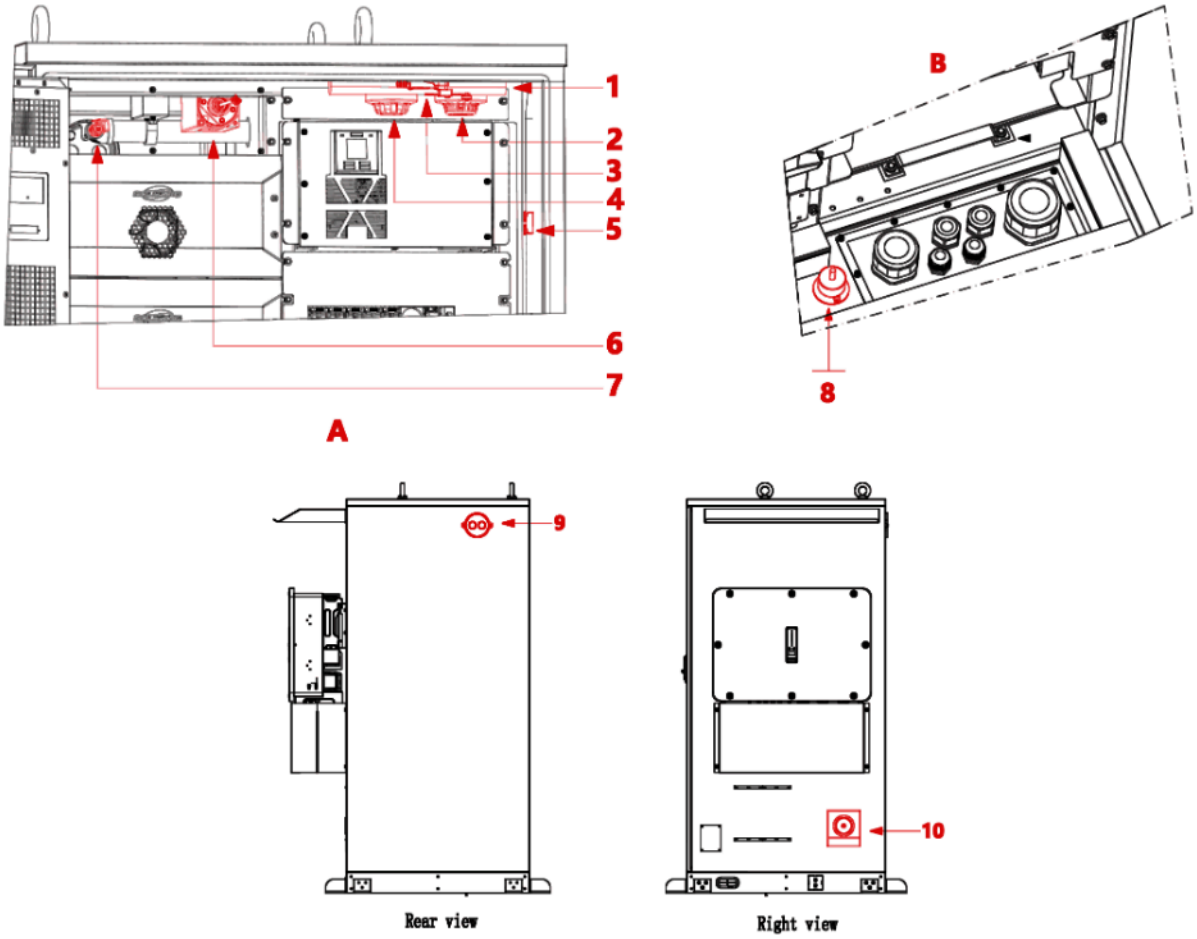


Figure 2.13 Fire-protection system, details A and B.

No.	Name	Description
1	Automatic light	Switches on when the door opens and off 30 s after it closes
2	Temperature sensor	Measures the cabinet temperature and signals the fire-control system
3	Door switch	Monitors whether the cabinet door is open or closed
4	Smoke sensor	Measures smoke concentration and signals the fire-control system
5	Fire test terminal	Disconnect here before fire testing, so the aerosol extinguisher does not discharge
6	Aerosol fire module	Receives the fire alarm signal and activates the fire-protection system
7	Extinguisher nozzles	Discharge the extinguishing agent
8	Flood sensor	Detects water in the cabinet and signals the high-voltage box
9	Explosion-relief vent	Releases gas pressure
10	Fire-water inlet	Connection for an external fire-water supply

Battery pack protection. Each battery pack has its own aerosol extinguishing module. It discharges when a fire triggers its thermal fuse line (170 °C).

Cabinet protection. As standard, the cabinet also has a separate aerosol fire module with smoke and temperature detectors. The system automatically detects a fire, activates the extinguishing module and discharges the agent, reports the discharge to the BMS through a dry contact, and disconnects the main power circuit.

2.3.9 Inverter

The All-In-One inverter is a Solinteg M2HT 25–50 kW hybrid inverter. It is packed separately from the cabinet and mounted on the side of the cabinet during installation (section 4.2.3). The illustration below is for reference only. See the inverter manual for details.

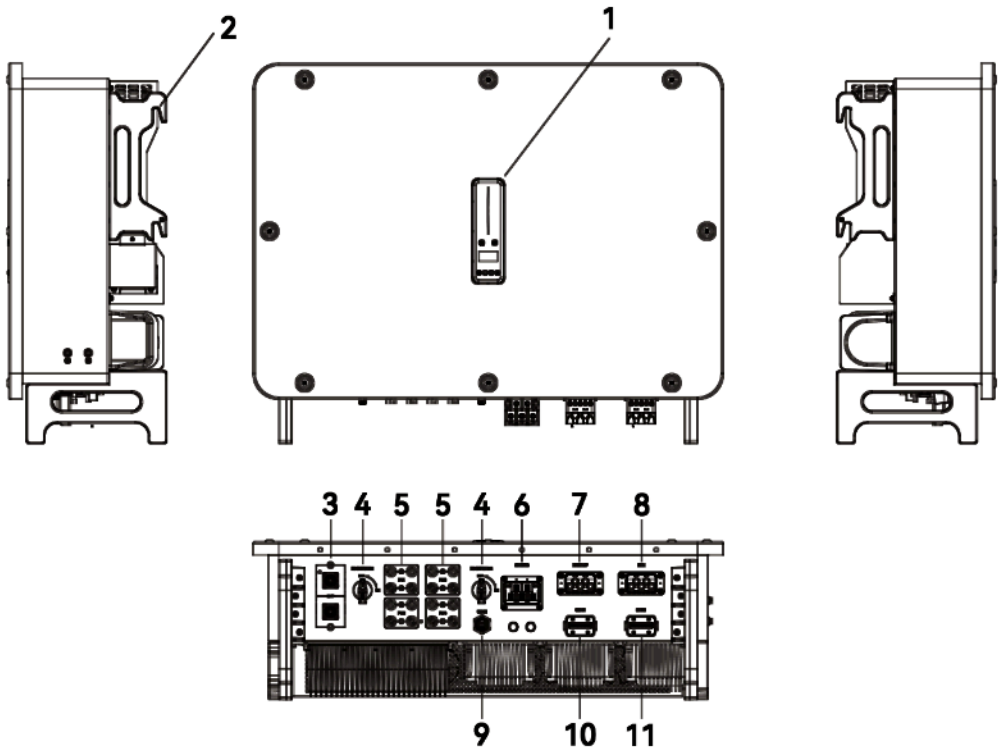


Figure 2.14 Solinteg M2HT 25–50 kW hybrid inverter.

No.	Name	Description
1	Indicators, OLED display and button	Show the inverter's operating information and status
2	Hanger	Hangs the inverter on its mounting bracket
3	Battery input terminals	Battery connectors
4	DC switch	Safely isolates the DC circuit
5	DC input terminals	PV connectors
6	On-grid output terminal	On-grid output cable connection
7	Back-up output terminal	Back-up output cable connection
8	Generator input terminal	Diesel generator AC cable connection

No.	Name	Description
9	COM1 port	Communication module (dongle)
10–11	COM2 and COM3 ports	Multi-function communication connectors

2.4 Electrical System

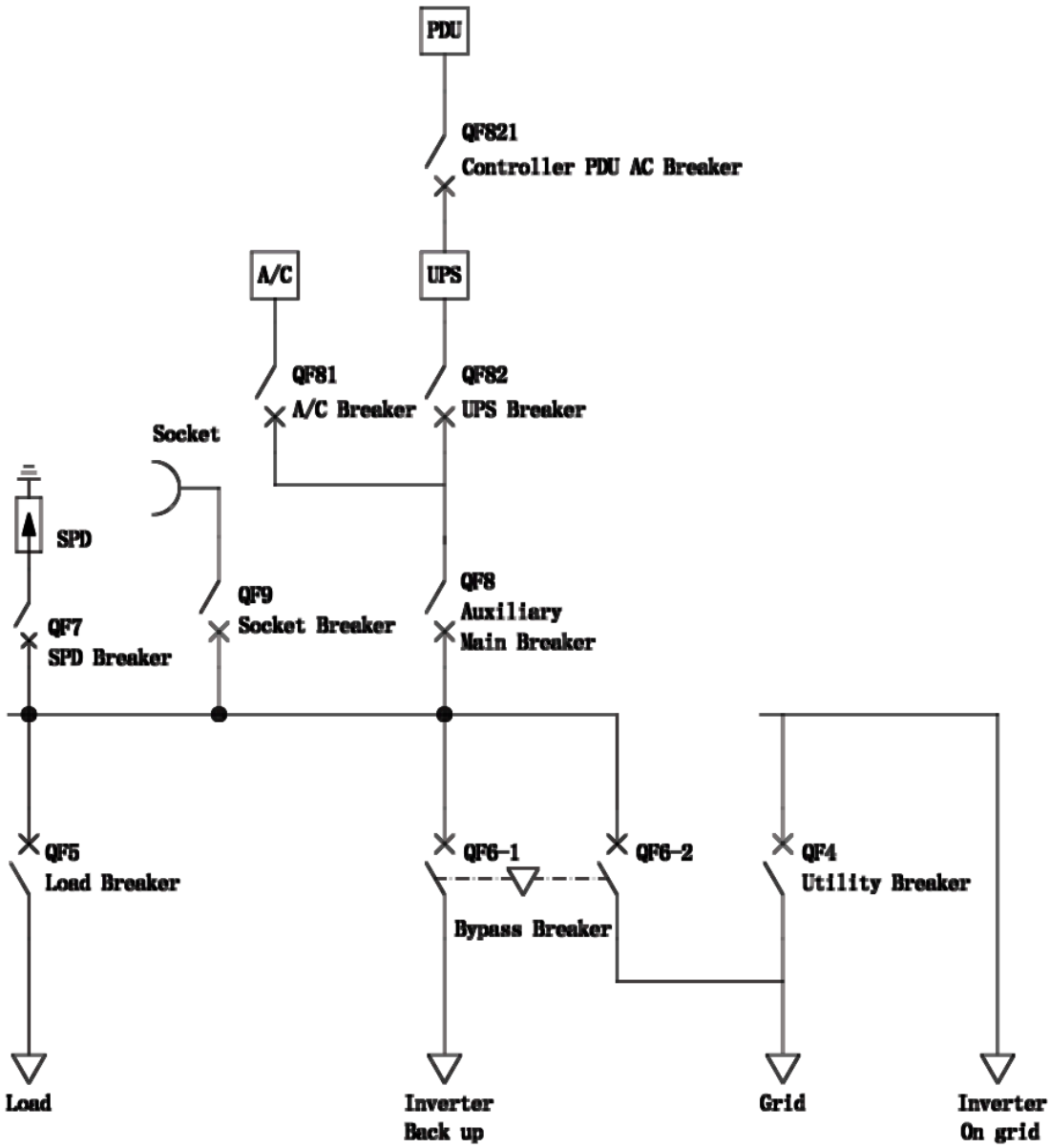


Figure 2.15 Single-line diagram of the electrical system.

- In normal operation, the system supplies the loads.
- If the cabinet fails, you can isolate it and keep the loads supplied from the grid with the bypass switch.
- If both the PV and storage system and the grid fail, the UPS keeps the high-voltage box and the cabinet lighting powered for up to 2 hours. The UPS does not supply the site loads.

Bypass operation

In normal operation, leave the bypass switch in the left-hand (normal) position, as shown below.

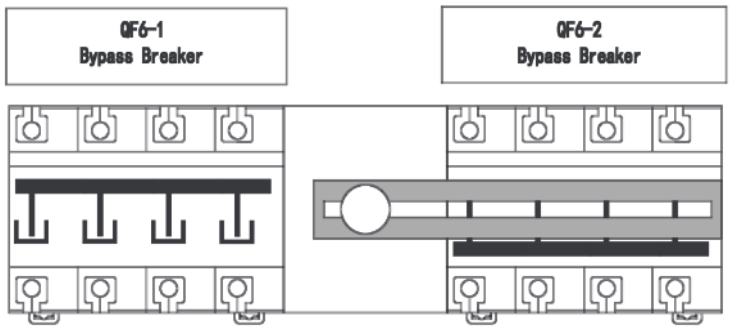


Figure 2.16 Bypass switch in the normal operating position.

If the grid is healthy but the cabinet has a fault, switch to bypass supply:

1. Switch off QF6-1 on the left of the bypass switch.
2. Slide the interlock in the middle to the left.
3. Switch on QF6-2 on the right of the bypass switch.

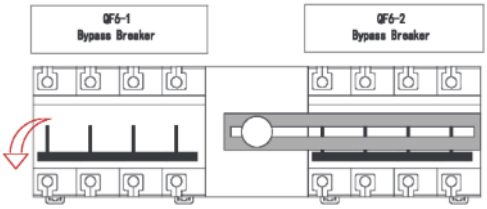


Figure 2.17 Step 1: QF6-1 off.

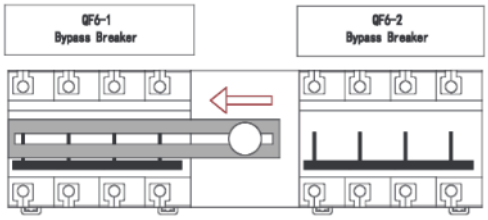


Figure 2.18 Step 2: interlock moved left.

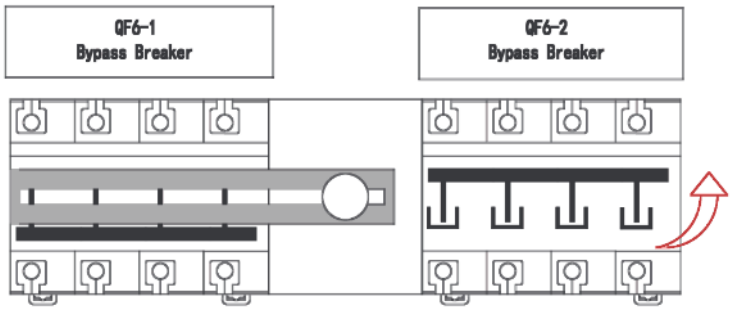


Figure 2.19 Step 3: QF6-2 on (bypass supply).

> **Note**
> In bypass, the cabinet cannot supply the loads and the inverter cannot start.
> The auxiliary circuits (high-voltage box, air conditioner, door switch and sockets) keep running.

Transport and Storage

Unpacking, transport, storage, packing list

03

3.1 Unpacking

> **Notice**
>
> Inspect the outer packaging before you accept delivery. Unpack only if it is intact. If the packaging is damaged, contact your supplier immediately. The parts box is inside the cabinet. Open the cabinet door to remove it after unpacking. After unpacking, remove the decorative panels from around the cabinet and refit them as described in section 4.2.

You will need two adjustable spanners, a claw hammer, a flat-blade screwdriver, pliers, a ladder at least 1.5 m high, gloves and other PPE. The cabinet is more than 2 m tall, so use the controls required for working at height.

1. Use the screwdriver, pliers and claw hammer to lever up and straighten the clips on the top of the crate, then lift off the lid.
2. Lever up and straighten the clips around the crate, then remove the side panels. Have a second person hold the panels so the crate does not fall.
3. Open the front and rear cabinet doors. Use an adjustable spanner to remove the bolts that fix the cabinet to the pallet.

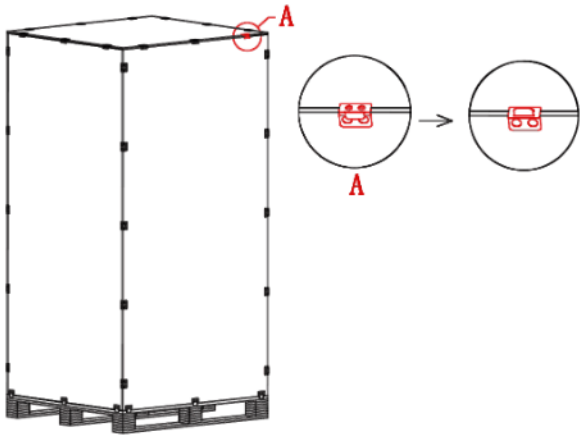


Figure 3.1 Removing the crate lid.

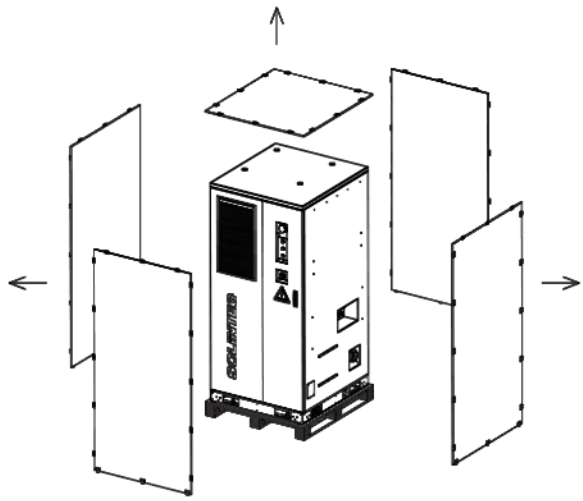


Figure 3.2 Removing the crate sides.

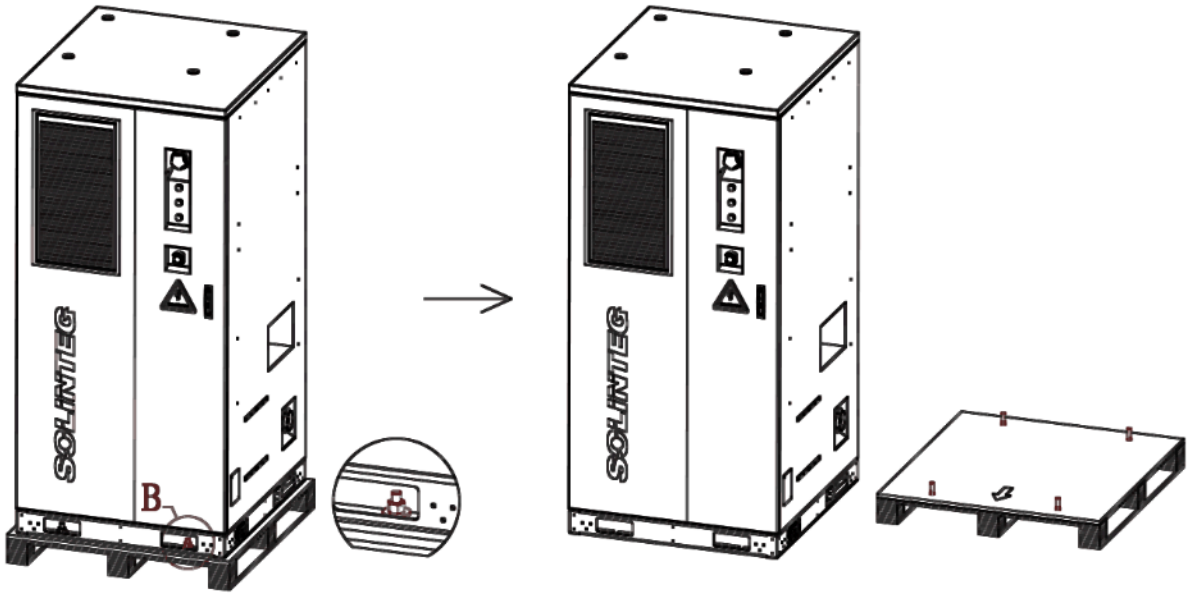


Figure 3.3 Removing the pallet bolts.

3.2 Transport

Danger

Protect the equipment from water during transport, avoid impacts, and never transport it upside down. Damage can lead to fire or explosion. Before transport, check the packaging for damage, odour, leaks and other abnormalities. Never transport damaged goods: they may cause fire or explosion.

Notice

Follow the warning labels on the packaging and the cabinet, and all transport requirements. Secure the cabinet so it cannot tip during transport and handling. Keep the tilt angle at 10° or less. Choose a transport method that suits the equipment and protect it during transport. The cabinet contains lithium-ion batteries (Class 9 dangerous goods). The carrier must be licensed to carry dangerous goods and must comply with the regulations that apply. In Australia, this is the Australian Dangerous Goods Code.

3.2.1 Lifting

1. Lift in strict accordance with local laws. The crane operator and dogger or rigger must hold the required high risk work licences, and be trained and competent.
2. The lifting equipment must meet local regulations and be tested and certified. The crane must have a lifting capacity of at least 2 t and a working radius of at least 2 m. Fit the lifting eyes securely so they cannot loosen or come off.

3 Before lifting, check that:

a. the lifting gear is complete, certified and secure, and the slings are attached safely so they cannot slip or break

b. the operators are trained, licensed and competent

c. the cabinet doors are closed and locked and everything inside is secure, so nothing can fall out

d. the weather is suitable: no rain, snow or strong wind.

4 After unpacking, take the lifting eyes and rubber washers from the parts box. Remove the waterproof plugs from the mounting holes on top of the cabinet, and screw the lifting eyes and washers in firmly, as shown below. If you do not need the lifting eyes, leave the waterproof plugs in place so the holes do not clog or corrode.

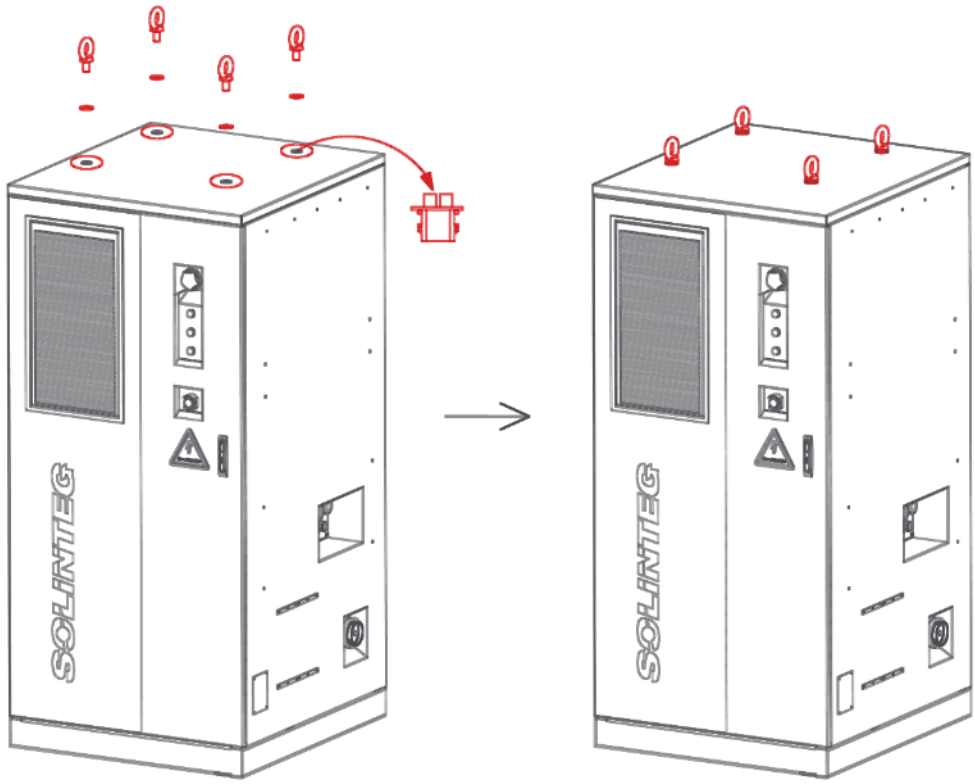


Figure 3.4 Fitting the lifting eyes.

3.2.2 Forklift handling

1 Use a forklift rated for at least 2 t. The operator must hold a forklift high risk work licence.

2 A competent spotter must supervise the move.

3 Allow for the cabinet's centre of gravity, and strap it to the forklift so it cannot tip.

4 Use the forklift pockets shown below.

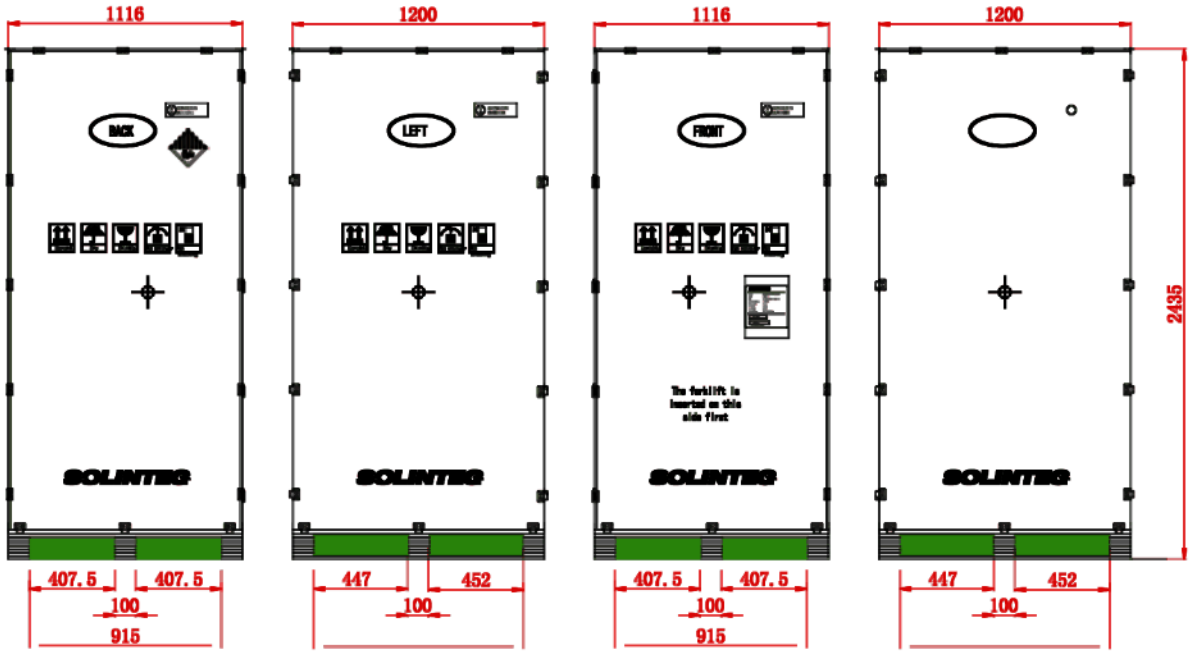


Figure 3.5 Forklift pockets: rear, left, front and right views.

3.3 Storage

1. For long-term storage, leave the cabinet in its original packaging and inspect the packaging regularly.
2. Store the cabinet as instructed by the warning labels and markings on the packaging.
3. Storage temperature: −20 to 45 °C.
4. Storage humidity: 5–95% RH.

Choose the storage conditions to suit the storage time:

Storage time	Temperature	Relative humidity
Up to 3 months	−20 to 45 °C	90% max
More than 3 months	−10 to 45 °C	90% max
Recommended	10 to 30 °C	85% max

> **Notice**
> The batteries are installed in the cabinet, so the battery storage requirements also apply.

Danger

Store batteries indoors, in an area that is out of direct sun and rain, dry and ventilated, away from heat and ignition sources, free of radiation, chemically safe, free of dust and conductive metal dust, and equipped with fire-protection equipment. Store batteries as instructed by the warning labels on the packaging. Do not store them with other electronic equipment, chemicals or anything else that may cause interference or a hazard. Limit stacking height so the lower layers are not crushed or deformed.

Warning

Long-term storage of batteries is not recommended. If it cannot be avoided, recharge the batteries regularly to prevent damage. A battery stored for more than six months must be inspected and tested by a qualified person before use.

3.4 Packing List

Item	Name	Specification	Qty
1	Battery cabinet	Solinteg E2BR-S64–112K-C	1 set
1.1	Cabinet door key	—	2
1.2	Decorative panel	—	4
1.3	Power cable to inverter on-grid port	3L + N + PE	1
1.4	Power cable to inverter back-up port	3L + N + PE	1
1.5	Battery cable	BAT+	1
1.6	Battery cable	BAT–	1
2	Parts box	—	1 set
2.1	Rain shelter (with seal)	1000 × 415 × 80 mm	1
2.2	Cable cover 01	830 × 150 × 400 mm	1
2.3	Cable cover 02	398.5 × 166.7 × 53.5 mm	2
2.4	Mounting foot	100 × 120 × 80 mm	4
2.5	Lifting eye (with rubber washer)	M24	4
2.6	Hex bolt	M6 × 16	11
2.7	Hex bolt	M8 × 16	10
2.8	Hex bolt	M8 × 25	12
2.9	Countersunk screw	M5 × 10	24
2.10	Expansion anchor	M20 × 150	4
2.11	Communication module	—	1

Item	Name	Specification	Qty
2.12	Gland sealing ring	M42-26	1
2.13	Lug, grid cable	SC50-8	4
2.14	Lug, PE	SC16-8	2
2.15	Lug, load cable	C45-25	4
2.16	Battery communication cable	—	1
2.17	Inverter emergency stop cable	—	1
3	Document pocket	—	1 set
3.1	User manual	—	1
3.2	Single-line diagram	—	1

Note

If the lugs in the parts box do not suit your cables, supply suitable lugs.

Warning

Keep the cabinet door keys secure. Only authorised people may have access to them.

Mechanical Installation

Installation requirements, mechanical installation

04

4.1 Installation Requirements

4.1.1 Site

Choose a site that meets the product requirements, local fire codes, and the laws and regulations that apply.

- Comply with local laws and electricity industry standards and regulations.
- The site must meet local fire codes and have fire-fighting equipment and a fire-water connection point.
- Avoid unstable ground that may deform or settle, and areas with corrosive pollution such as salt or alkali.

4.1.2 Foundation

The cabinet weighs up to about 1440 kg (S112) and the inverter 89 kg. Design the foundation for at least 2 t, the local seismic code and the ground conditions, so that it can carry the cabinet and the people working on it. Build the foundation from concrete, solid brick, steel or a similar material. Compact and level the base: the level tolerance is 3 mm and the slope must not exceed 5°. The foundation must not sag or tilt.

Provide cable trenches or conduit entries in the foundation, and avoid buried services when you build it.

The drawings below are for reference only. Design and build the foundation to suit the site and local requirements.

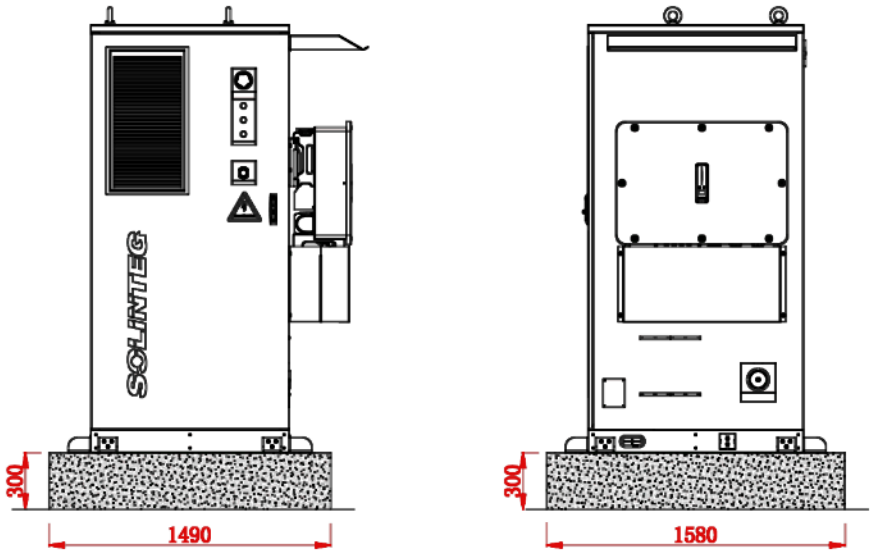


Figure 4.1 Foundation, front and side views.

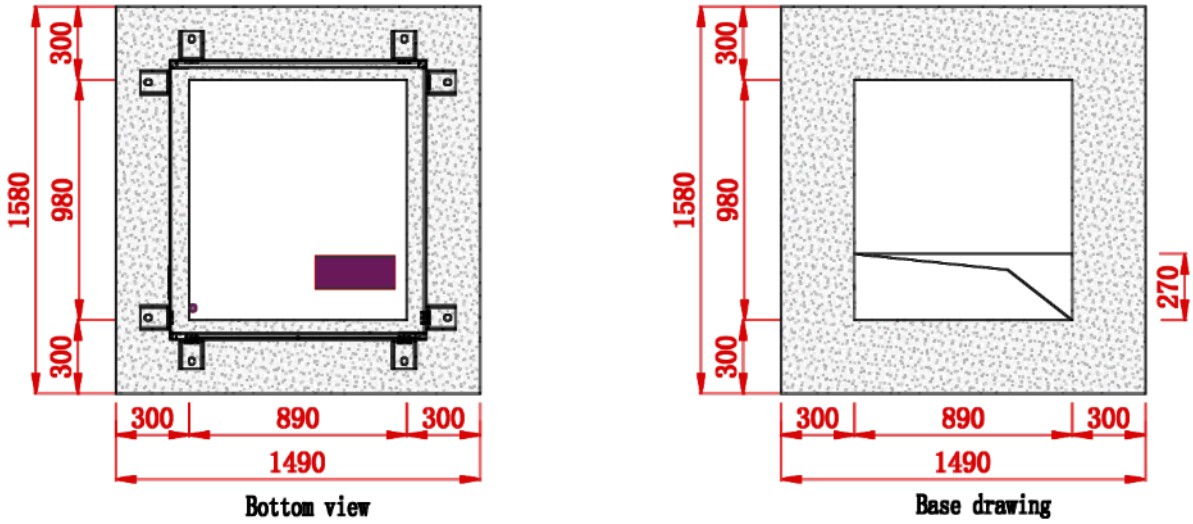


Figure 4.2 Foundation, plan and base drawing.

4.1.3 Environment

1. Keep the separation from homes, public places and other buildings required by local fire codes and standards. If the separation cannot be achieved, build a fire wall between the cabinet and the neighbouring building as the local fire code requires. We recommend a locked fence around the installation to keep out unauthorised people.
2. Keep the site away from heat, flames and other high-temperature sources; flammable or explosive materials; dust; corrosive substances and gases; strong electromagnetic fields; and strong vibration or noise.
3. The site must drain well. Do not install the cabinet where water collects. Provide drainage and flood barriers to suit local weather.
4. The site must also meet these conditions:
   a. ambient temperature: −20 to 50 °C (discharging −20 to 50 °C, charging 0 to 50 °C)
   b. relative humidity: 5–95% RH
   c. altitude: 3000 m or less.

Minimum distance from	Distance
The coast	More than 2000 m
Heavy pollution sources: smelters, coal mines, thermal power stations and similar	More than 1500 m
Medium pollution sources: chemical, rubber and electroplating plants and similar	More than 1000 m
Light pollution sources: food processing, tanneries, boilers, abattoirs, landfills, sewage treatment plants and similar	More than 500 m

4.1.4 Clearances

Keep the clearances shown below around the cabinet.

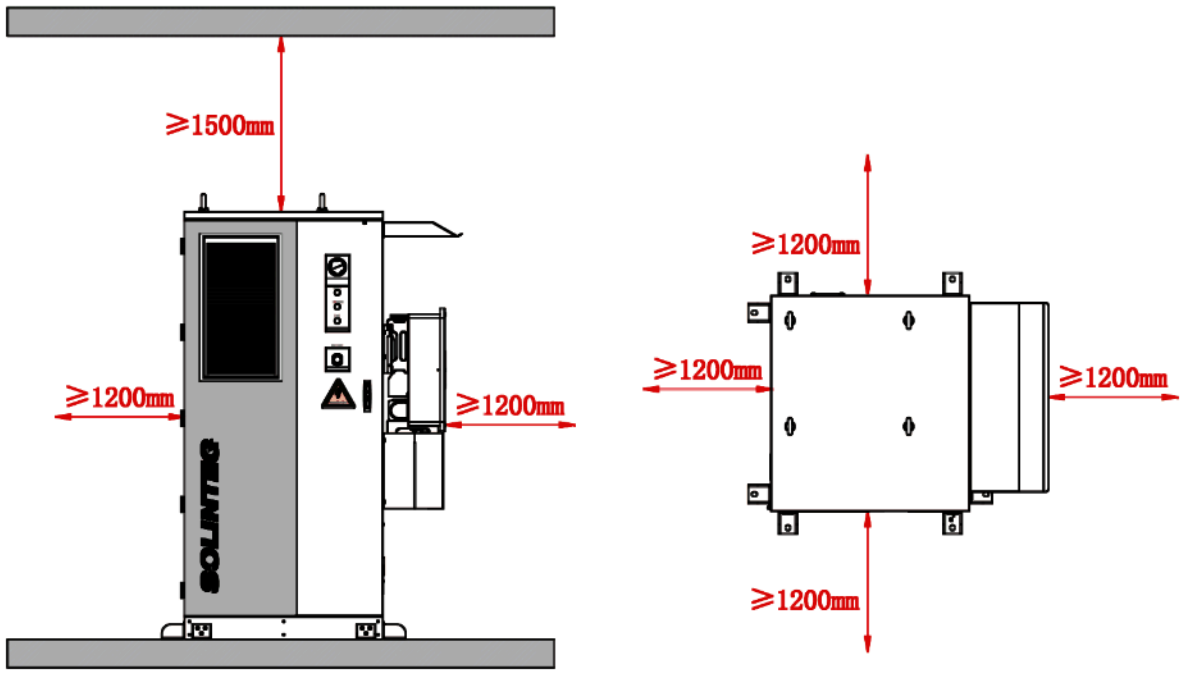


Figure 4.3 Installation clearances.

4.1.5 Tools

You need at least the tools below. Use other tools as the site requires. All tools must comply with local requirements.

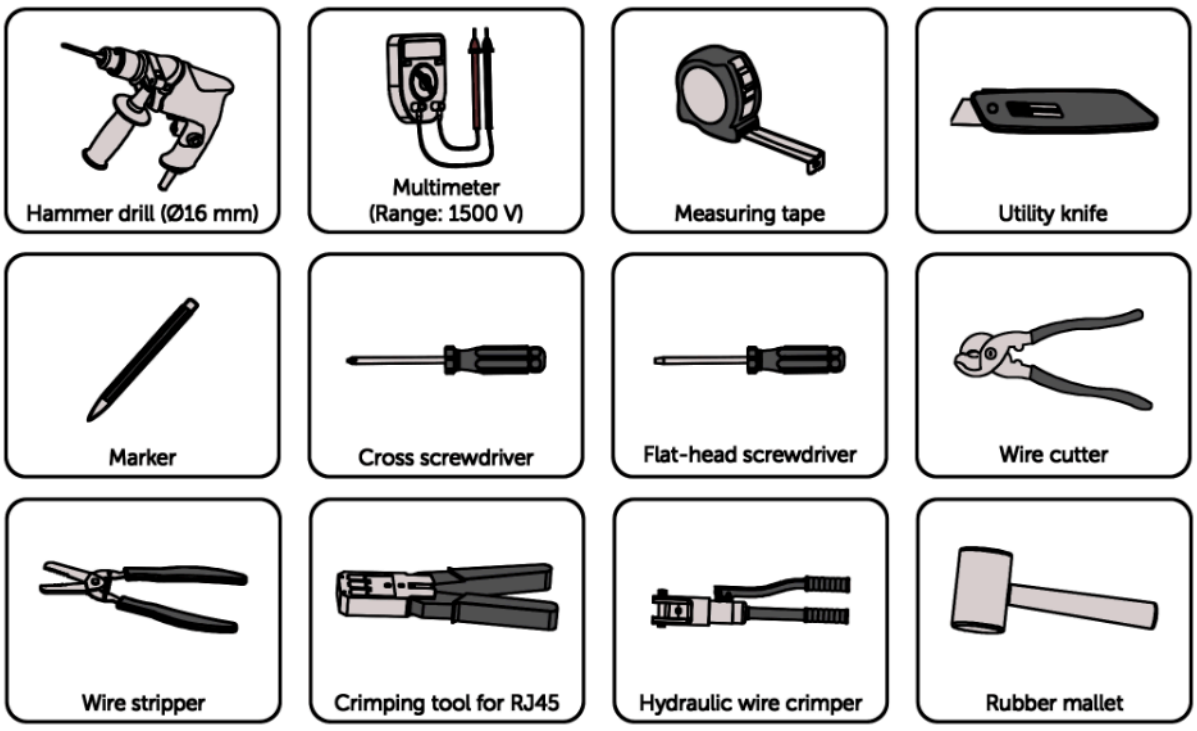


Figure 4.4 Recommended installation tools.

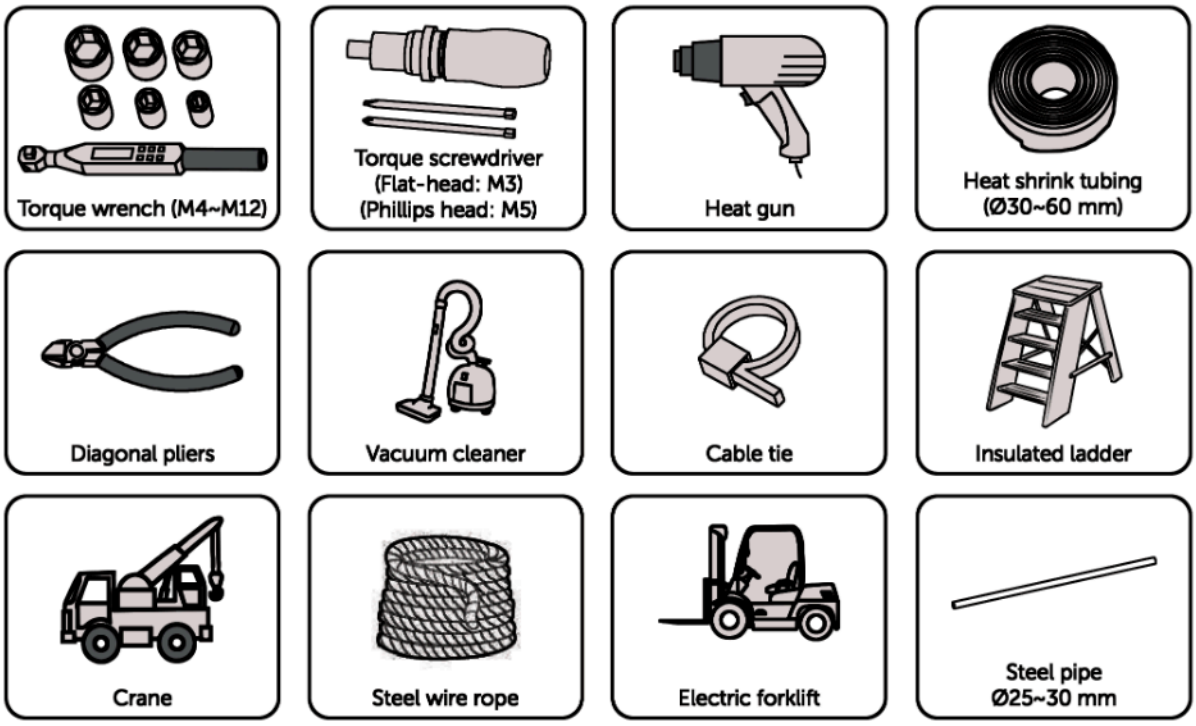


Figure 4.5 Recommended installation tools (continued).

4.2 Mechanical Installation

Take the mounting hardware out of the cabinet and check it against the packing list before you start, so you are not held up by missing parts.

> **Danger**
>
> Do not install, wire or operate the equipment outdoors in lightning, rain, snow or other severe weather. Before drilling, digging or other construction work, locate and avoid buried pipes and cables. Wear the PPE required by regulations. Cover the equipment, and the components inside the cabinet, during installation so that debris cannot get in. Clean the equipment when installation is complete.

4.2.1 Installing the cabinet

1	Move the cabinet into position by crane (section 3.2.1) or forklift (section 3.2.2).
2	Fit the decorative panels around the cabinet with the 24 M5 × 10 countersunk screws from the parts box, as shown.

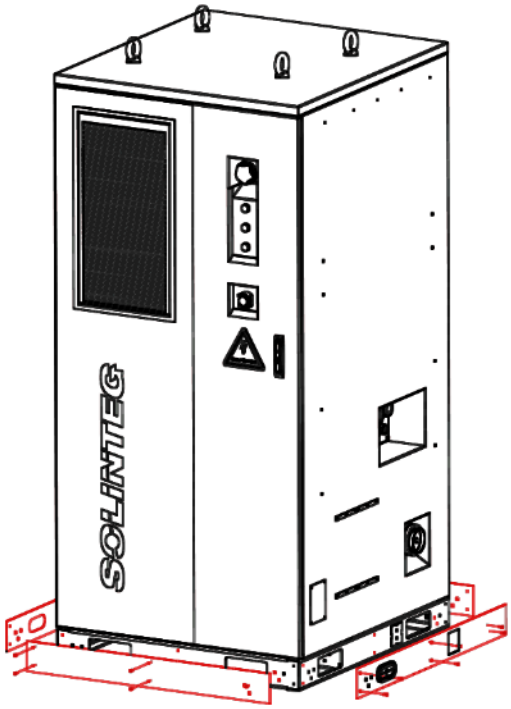
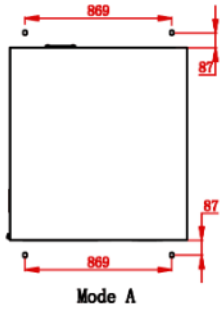


Figure 4.6 Fitting the decorative panels.

3 Take the four mounting feet, 12 M8 × 25 hex bolts and four M20 × 150 expansion anchors from the parts box. Choose front-and-rear or left-and-right mounting to suit the site, and mark out the holes as shown.



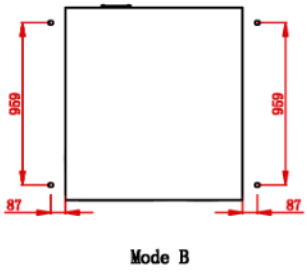


Figure 4.7 Hole positions, mode A.



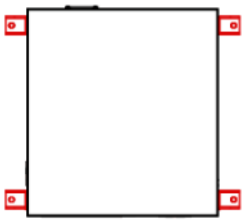


Figure 4.8 Hole positions, mode B.

4 Drill the holes with a hammer drill: 25 mm diameter, 150 mm deep. Vacuum the holes clean.

5 Tap the M20 × 150 expansion anchors into the holes with a rubber mallet, and fix the feet to the ground. Do not tighten the anchors yet.

6 Bolt the feet to the cabinet with the M8 × 25 bolts, as shown. When all the bolts are in, tighten them evenly.

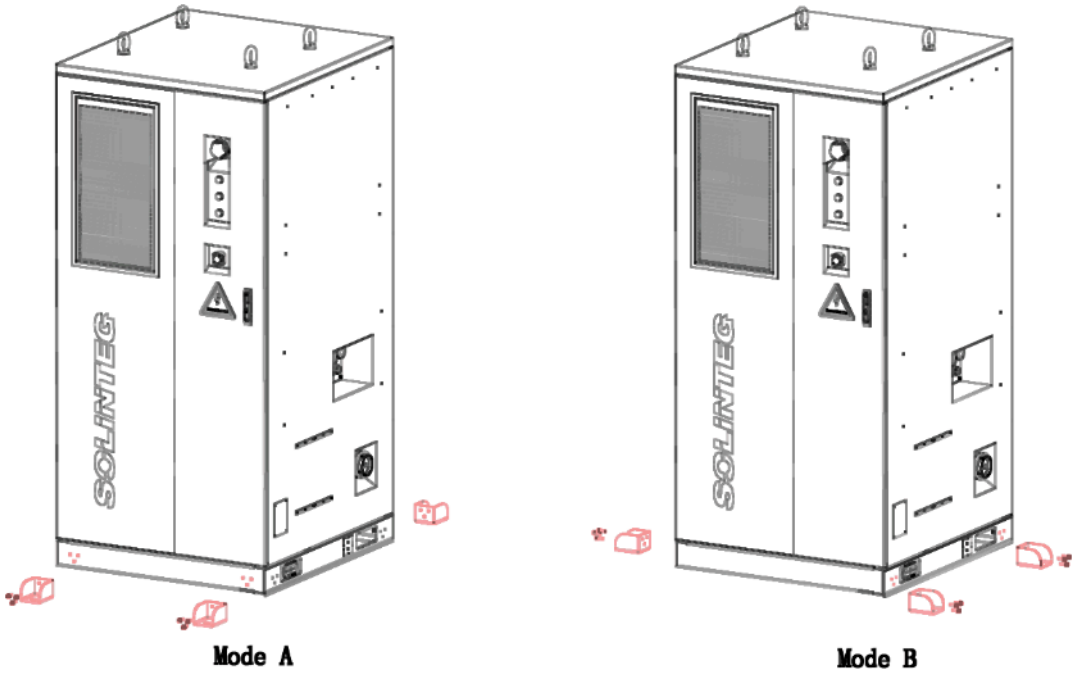


Figure 4.9 Mounting feet: front-and-rear (left) or left-and-right (right, optional).

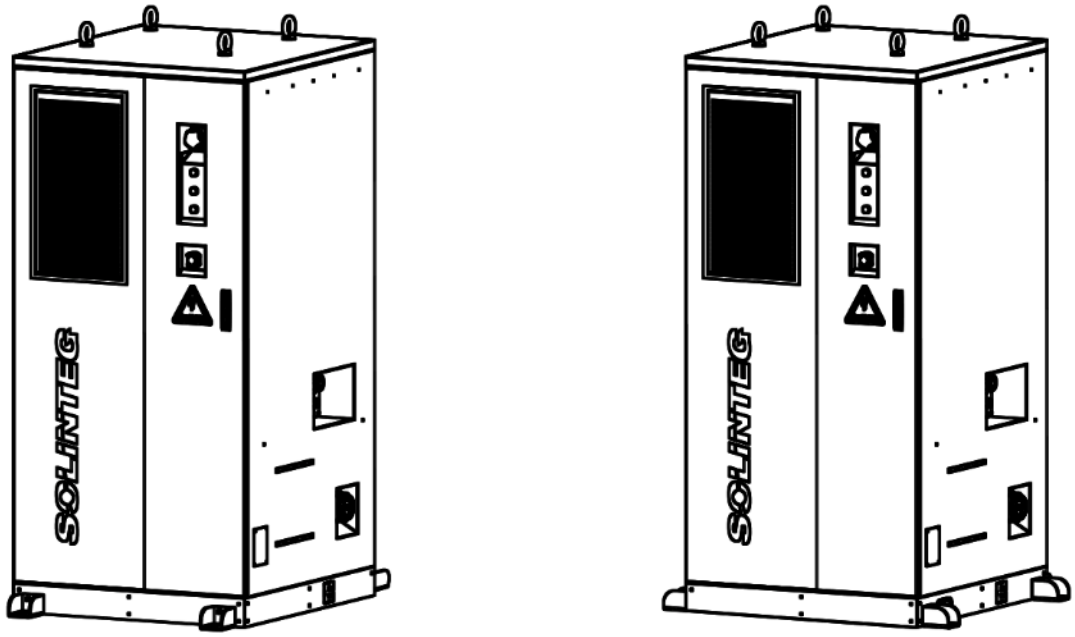


Figure 4.10 Mounting feet fitted, modes A and B.

4.2.2 Installing the rain shelter

1	Take the rain shelter, five M6 × 16 bolts and waterproof washers from the parts box. Fit a washer on each bolt.
2	Bolt the rain shelter to the mounting area above the right-hand side of the cabinet, as shown.

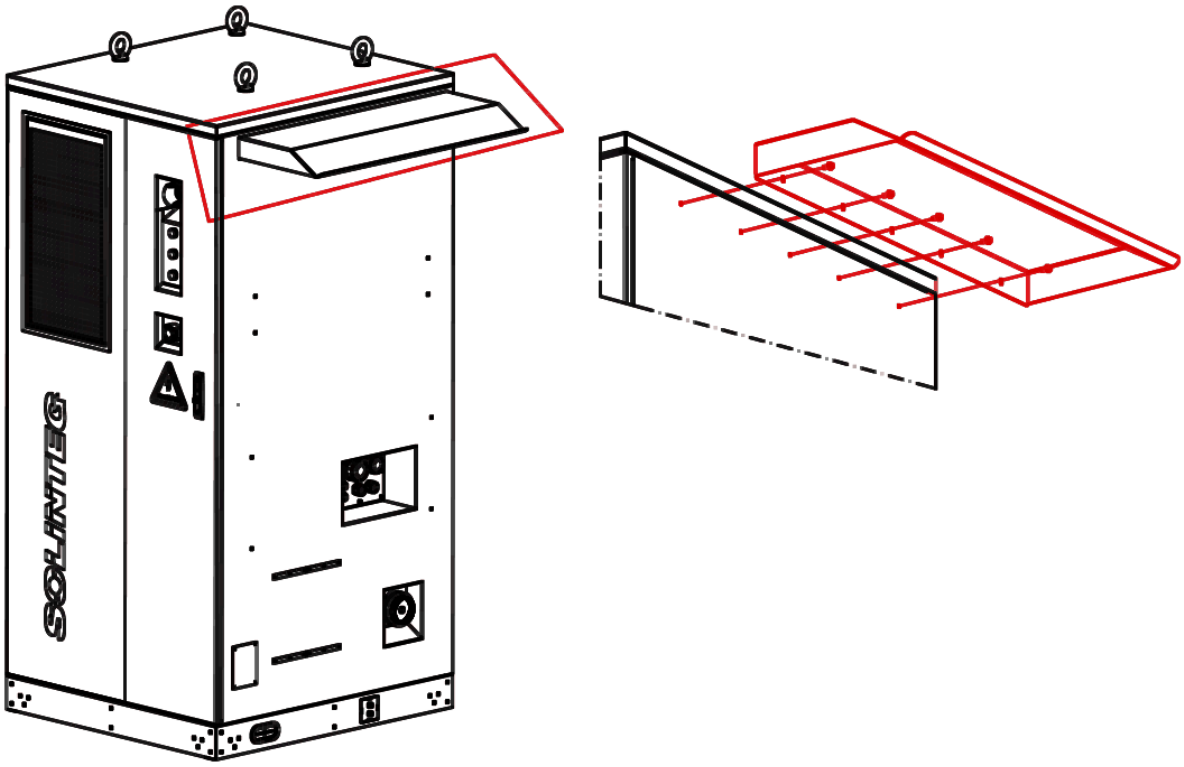


Figure 4.11 Installing the rain shelter.

4.2.3 Installing the inverter

1	Fix the inverter mounting bracket to the right-hand side of the cabinet with four M8 × 16 bolts from the parts box, as shown.
2	Lift the inverter with suitable equipment and hang it on the bracket.
3	Tighten the M6 screws on both sides to secure the inverter, as described in the inverter manual.

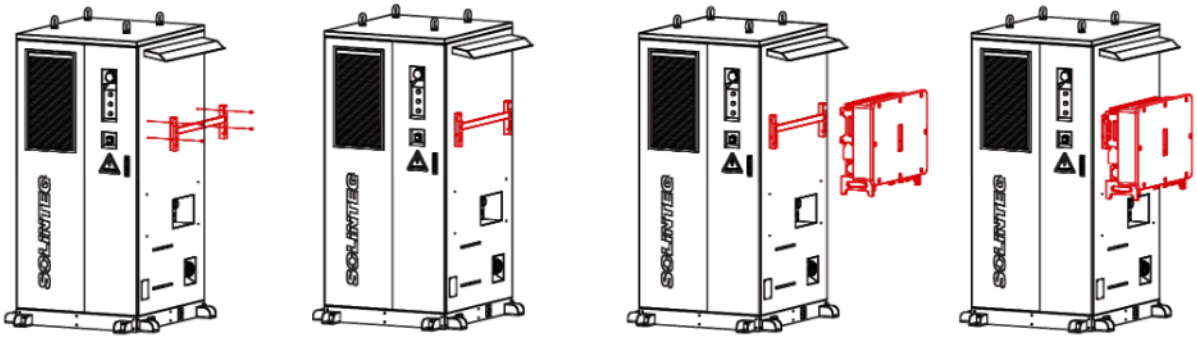


Figure 4.12 Fitting the inverter bracket.

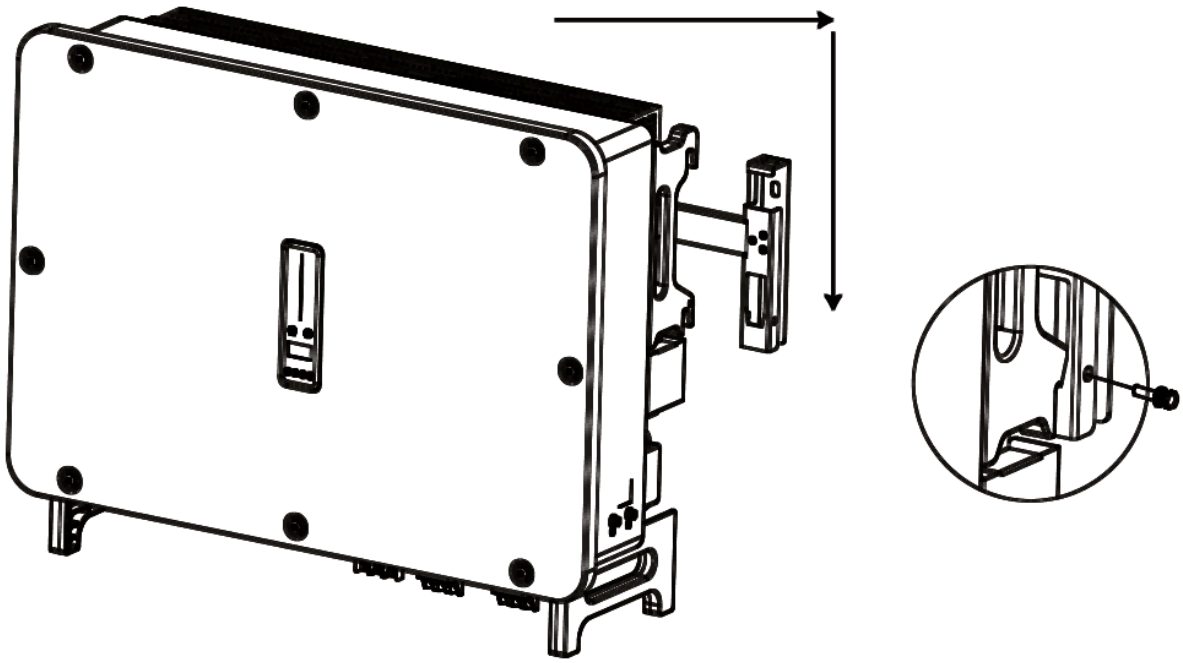


Figure 4.13 Hanging the inverter.

Electrical Installation

Installation requirements, earthing the cabinet

05

> **Notice**
>
> Read this manual before you start, so you understand all the installation requirements. Make sure the mechanical installation is complete and no parts or tools have been left in the cabinet. Check the seals on the cable entries before you start. Leave the waterproof plugs in unused cable entries. When installation is complete, seal the cable entries as local requirements specify.

5.1 Installation Requirements

5.1.1 Tools

Wiring tools: wire strippers, side cutters, crimping tool, RJ45 crimping tool, multimeter (DC range above 1100 V), screwdrivers and hex keys.

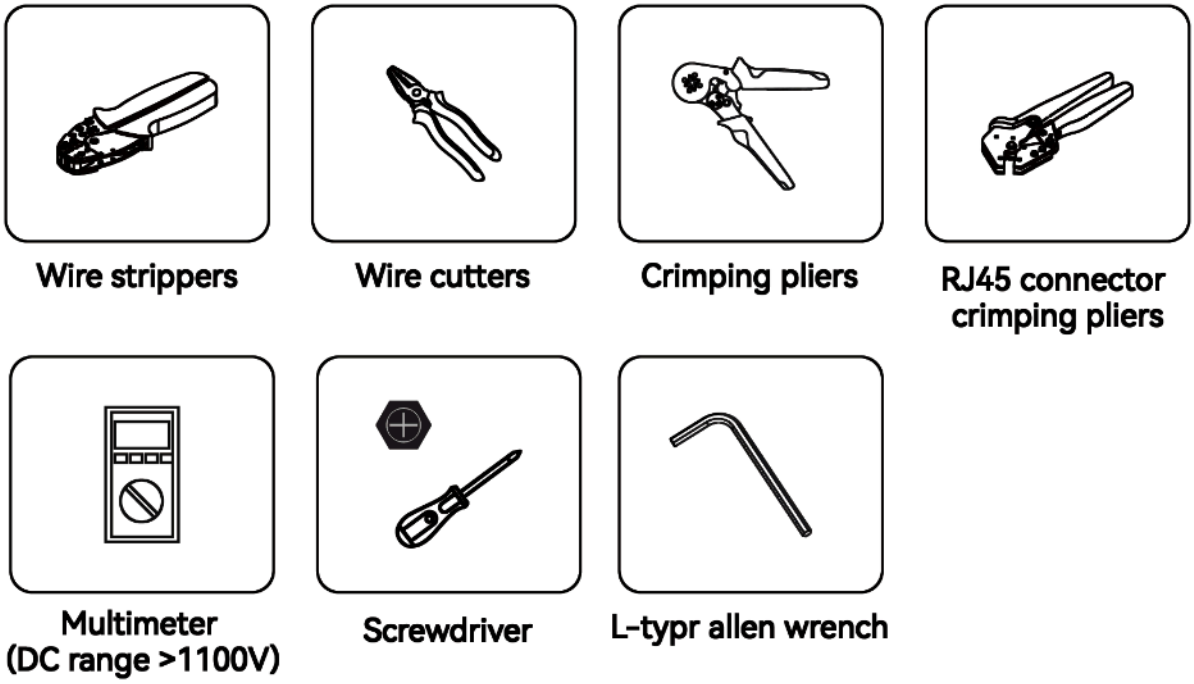


Figure 5.1 Wiring tools.

5.1.2 Materials you supply

Supply the following materials, selected to the recommended specifications and the site conditions.

No.	Item	Recommended specification	Purpose
1	Grid cable	4 × 35 mm² + 1 × 16 mm², or 4 × 50 mm² + 1 × 16 mm²	Cabinet to the site switchboard
2	Load cable	4 × 25 mm² + 1 × 16 mm², or 4 × 35 mm² + 1 × 16 mm²	Cabinet to the site loads
3	Earth cable	50 mm² green/yellow PE cable	Use a PE cable or an earthing flat bar, to suit the site
4	PE lug	SC50-8	
5	Earthing flat bar	Hot-dip galvanised, 40 × 4 mm	
6	Cable tray or duct	To suit the site	Cable routing
7	Sealing material	To suit the site	Sealing cable entries

Cable	Recommended specification	Cable outside diameter
Grid cable	4 × 35 mm² + 1 × 16 mm², or 4 × 50 mm² + 1 × 16 mm²	37–44 mm
Load cable	4 × 25 mm² + 1 × 16 mm², or 4 × 35 mm² + 1 × 16 mm²	22–32 mm

Note

If the cable is smaller than the recommended diameter, seal it with the gland sealing ring or the fire-stopping putty from the parts box.

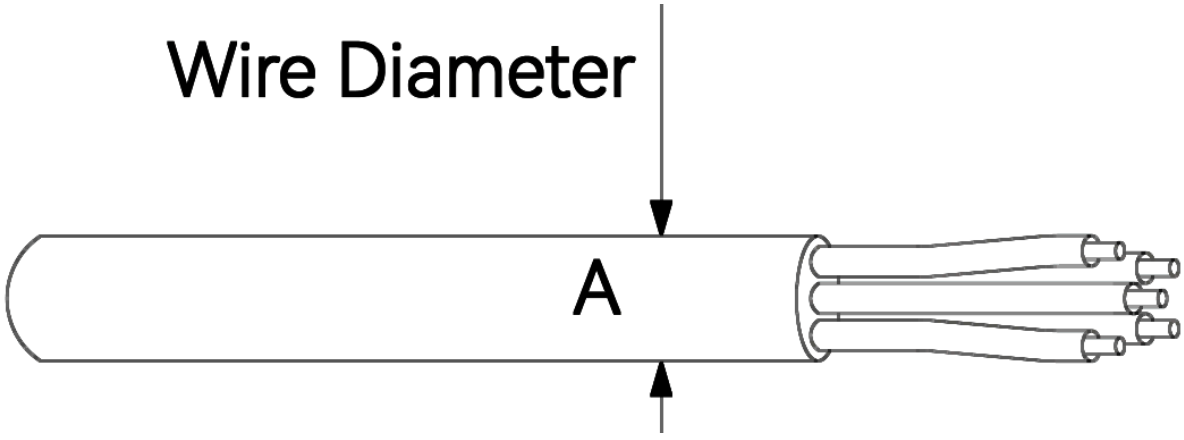


Figure 5.2 Cable outside diameter (A).

5.2 Earthing the Cabinet

> **Danger**
> Connect the cabinet earth first, as soon as the cabinet is installed. When removing the cabinet, disconnect the earth last. A faulty earth is a danger to people and equipment. Keep the cabinet earth in good condition during commissioning and operation.

1. Using two M8 × 16 hex bolts from the parts box (torque 8 N·m), connect the earth point on the right of the cabinet to the site earthing system with 40 × 4 mm hot-dip galvanised flat bar or 50 mm² PE cable, as shown.
2. Paint any cut ends of the flat bar with anti-corrosion paint.

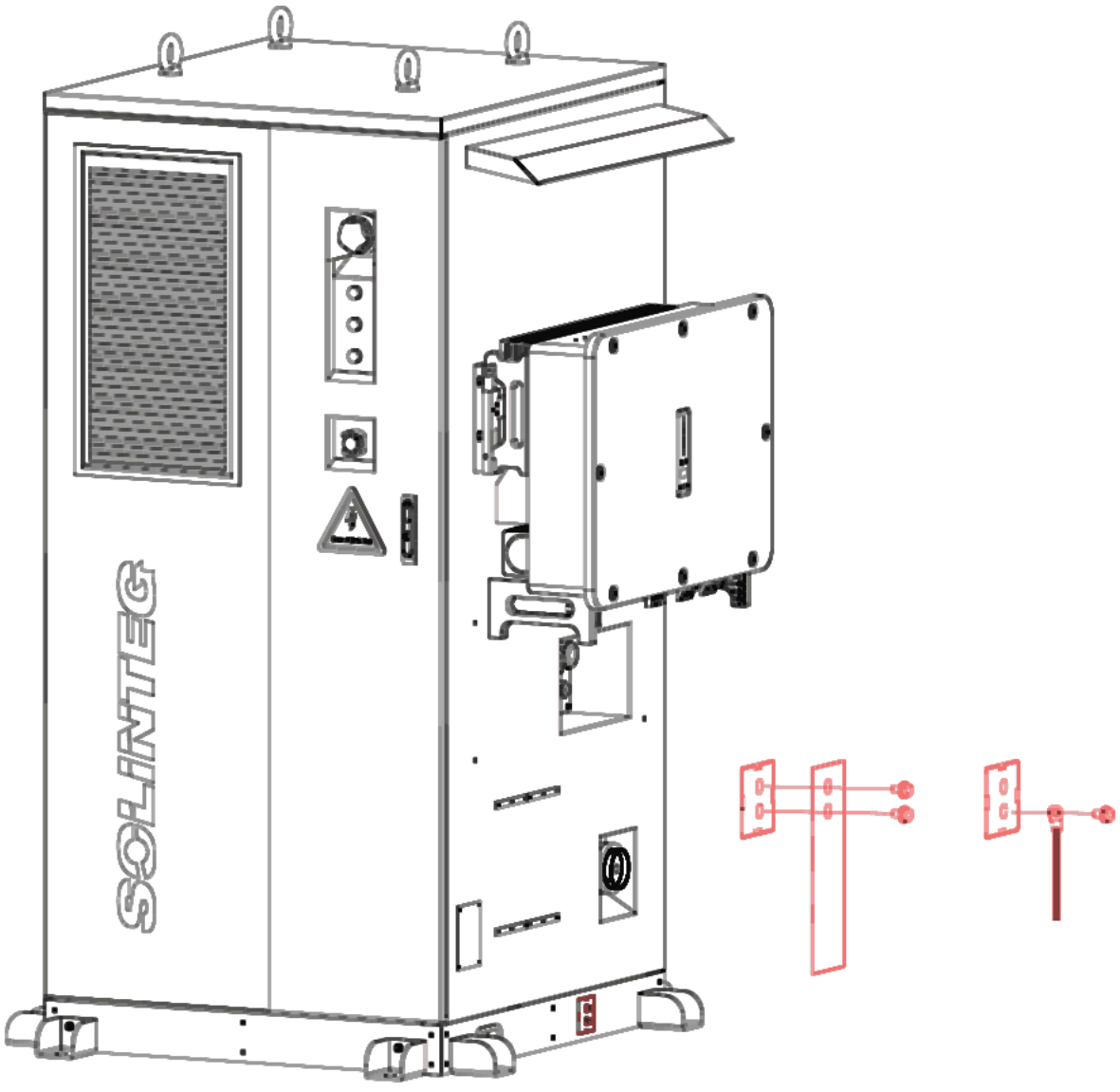


Figure 5.3 Earth connection.

5.3 Cable Connections

Danger

Make sure every power switch is off before you connect any cable, to avoid injury and short circuits. Make sure the cabinet earth is reliably connected before you connect any cable. Failure to do so can cause injury or death. Secure every cable terminal so it cannot loosen over time. A loose terminal can damage the equipment.

Notice

The cables between the cabinet and the inverter are supplied, with one end already connected inside the cabinet. After unpacking, check the cables for damage, then connect the other ends to the inverter as described below.

5.3.1 Inverter wiring

Connect the cables as shown in the diagram below and as the inverter manual requires. When all the wiring is done, tighten the gland compression nuts on the side cable panel.

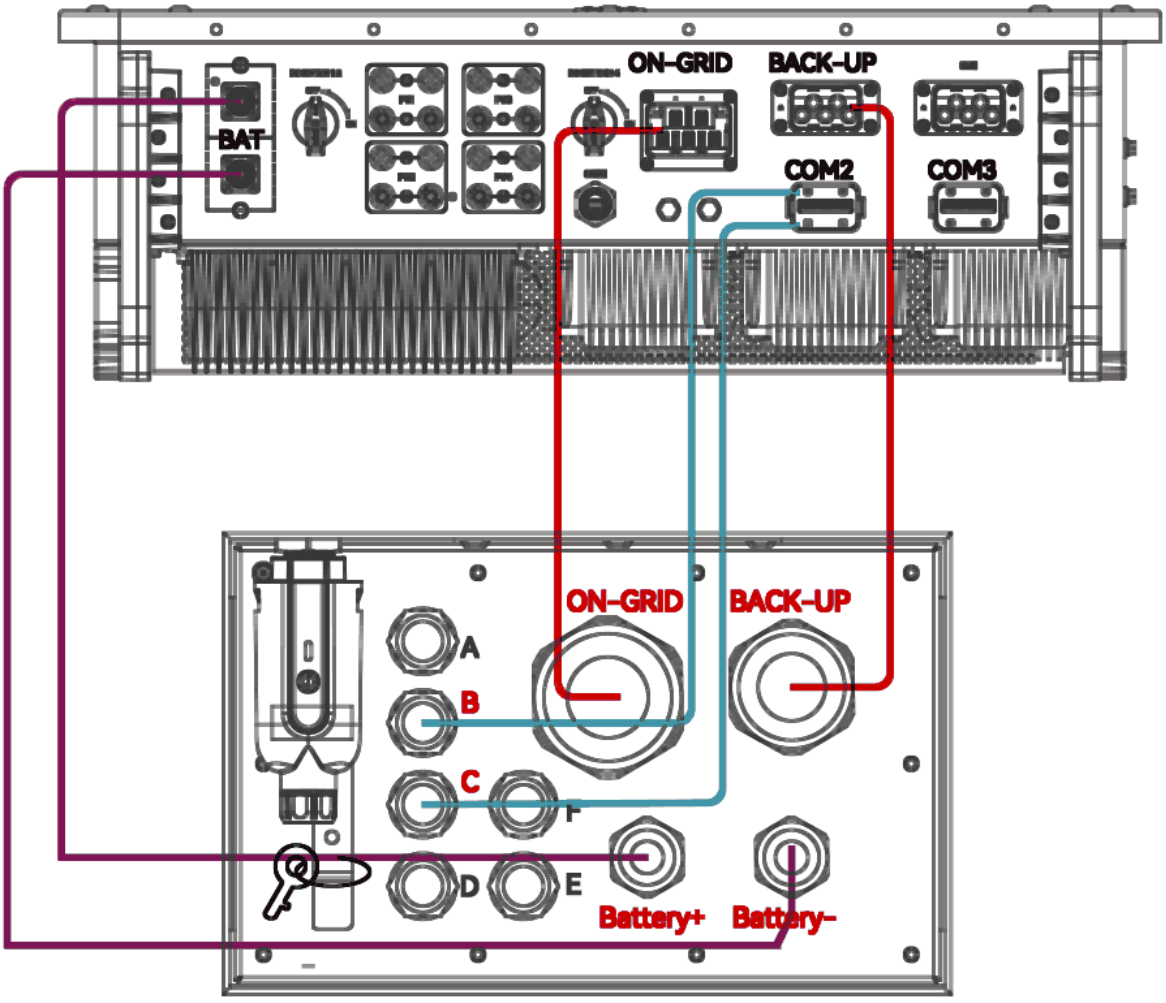


Figure 5.4 Cables between the cabinet and the inverter.

Inverter on-grid AC cable

Loosen the compression nuts of the glands on the side cable panel, as shown below. Pull the inverter on-grid and back-up cables out far enough to reach the inverter terminals.

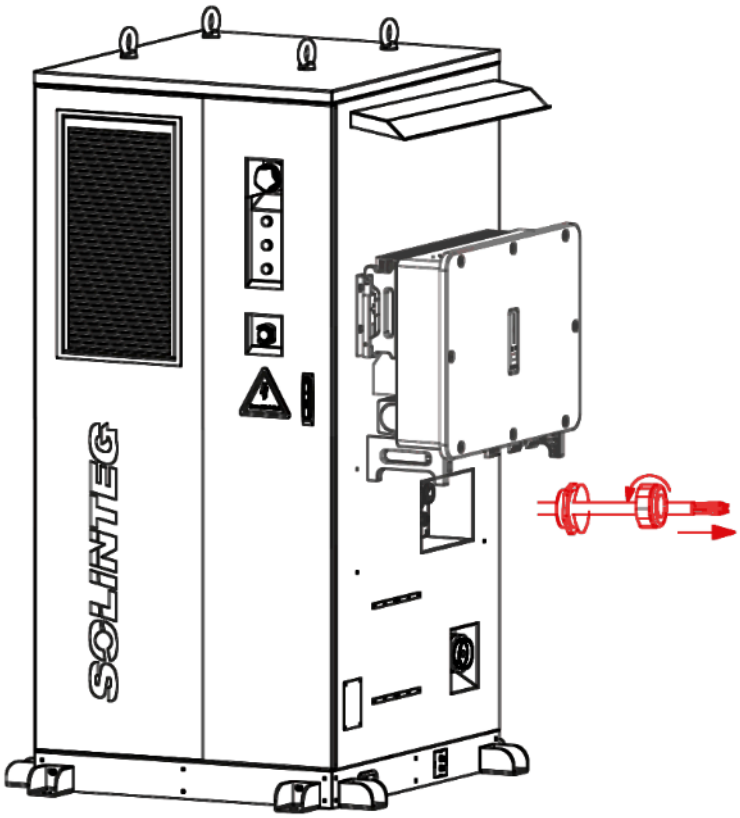


Figure 5.5 Inverter on-grid AC side.

1	The connector accepts cables of 22–40 mm outside diameter. Remove seal insert parts to suit the cable: above 24.5 mm remove part 1; above 28.5 mm also remove part 2; above 32.5 mm also remove part 3.
2	Thread the cable through the locknut, seal insert and housing, in that order.
3	Fit the lugs to L1, L2 and L3 in order, and tighten the screws to 3.8 ± 0.1 N·m.

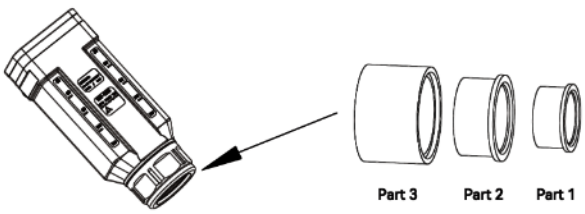


Figure 5.6 Seal insert parts.

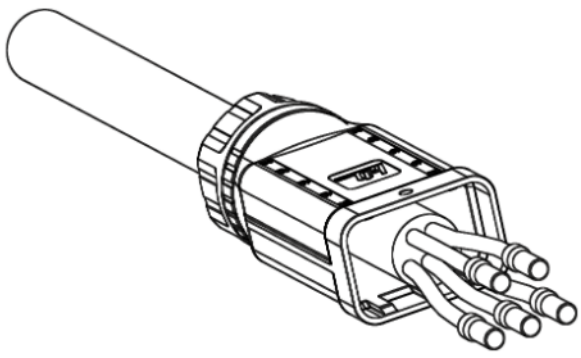


Figure 5.7 Threading the cable.

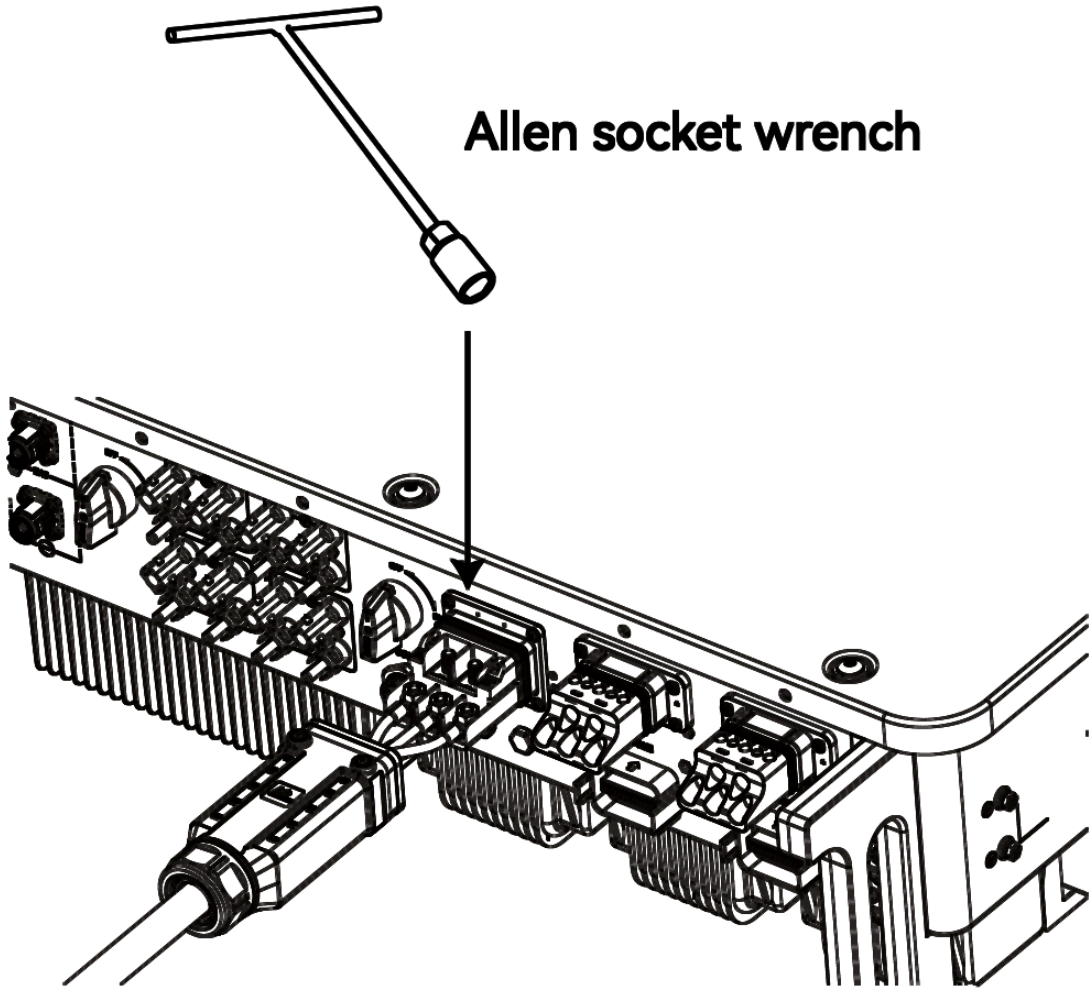


Figure 5.8 Tightening the phase terminals.

4	Fit the insulating spacer into its hole in the connector insert.
5	Fit the insulating spacer at the N/PE end into its hole.
6	Fit the N and PE lugs, and tighten the screws to 3.8 ± 0.1 N·m.

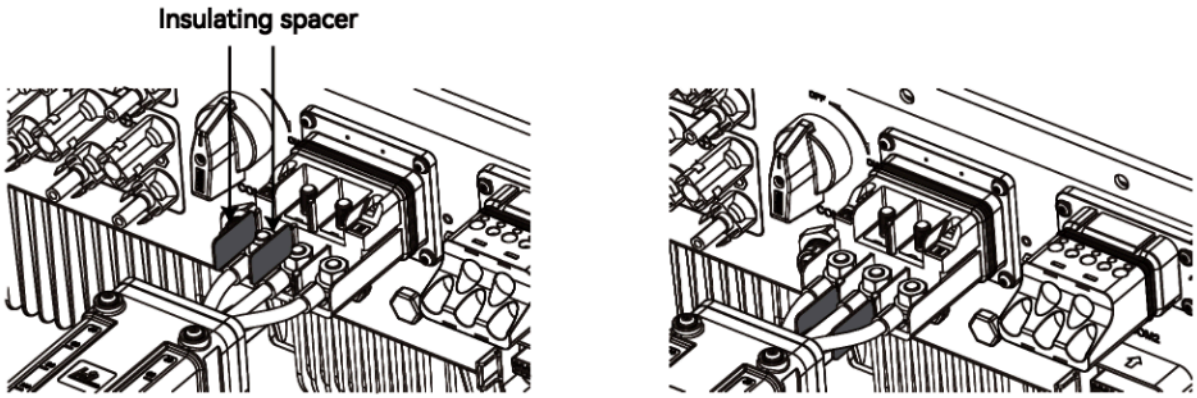


Figure 5.9 Fitting the insulating spacers.

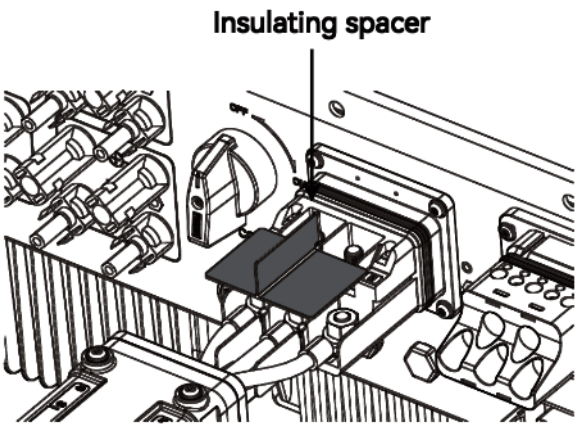


Figure 5.10 Insulating spacer at the N/PE end.

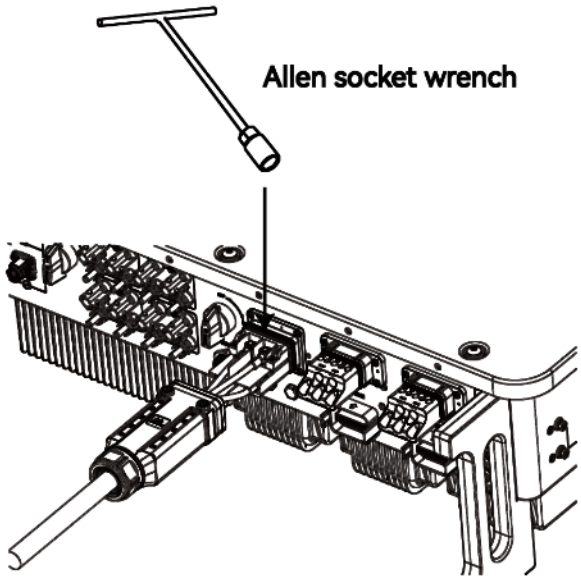


Figure 5.11 Tightening N and PE.

7	Push the housing onto the connector insert, then tighten the Phillips screws.
8	Tighten the nut with an open-ended spanner to 10.0 ± 0.1 N·m.
9	Feed the excess cable back through the cable entry, then refit and tighten the gland compression nut.

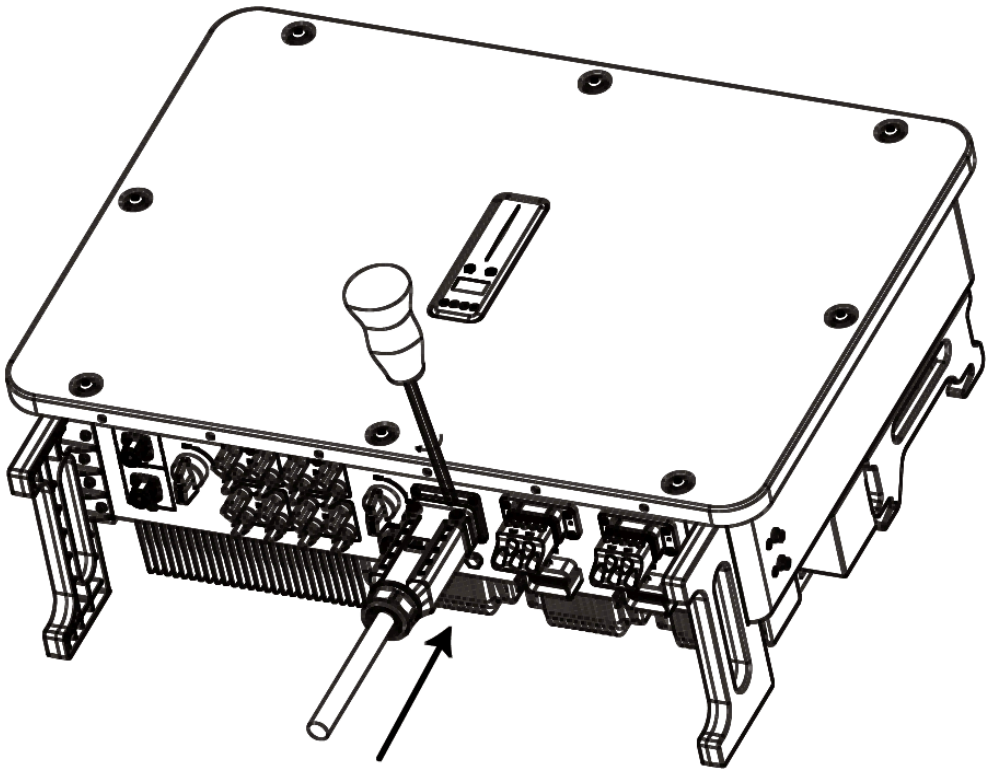


Figure 5.12 Connecting the on-grid cable to the inverter.

Inverter back-up AC cable

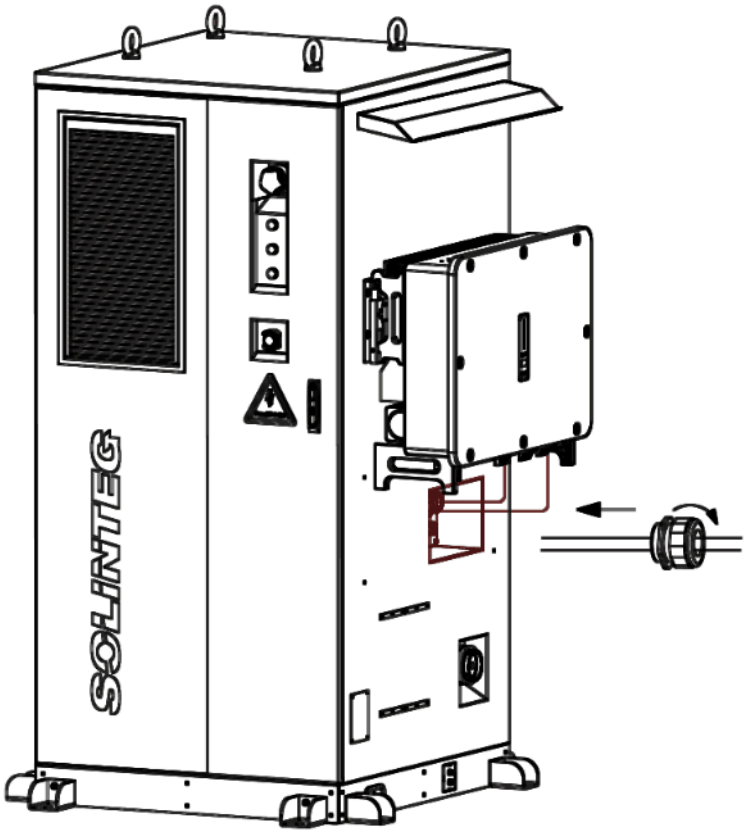


Figure 5.13 Inverter back-up AC side.

> **Notice**
> Do not confuse the back-up connector with the generator connector.

1	If the cable is larger than 24 mm outside diameter, remove part 1 of the connector seal insert.
2	Strip 95–100 mm of the outer sheath, and 15 mm of insulation from each L1, L2, L3, N and PE core.
3	Thread the stripped cable through the locknut and housing, in that order. Fit bootlace ferrules to multi-strand copper cores.
4	Insert the cores into the connector insert, matching the markings. Tighten the terminal screws to 5 ± 0.1 N·m.
5	Push the housing onto the insert until it clicks, then tighten the nut with an open-ended spanner to 10.0 ± 0.1 N·m. It clicks three times when it is fully tightened.
6	Feed the excess cable back through the cable entry, then refit and tighten the gland compression nut.

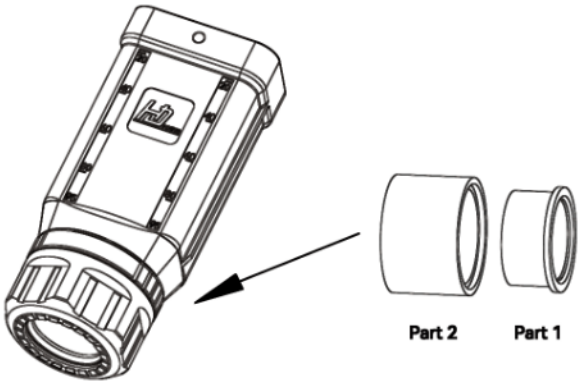


Figure 5.14 Seal insert parts.

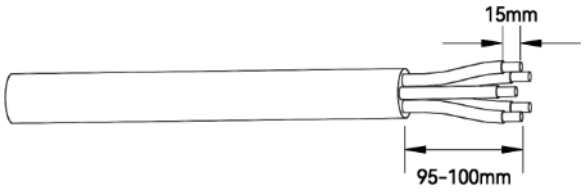


Figure 5.15 Strip lengths.

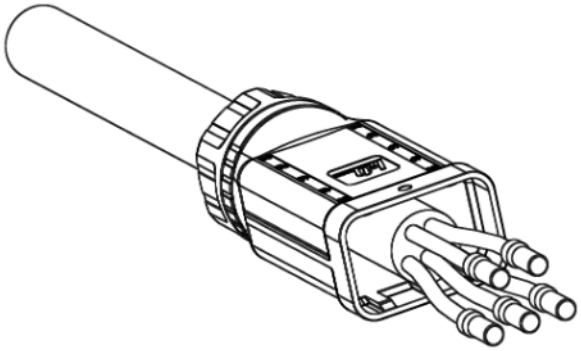


Figure 5.16 Threading the cable.

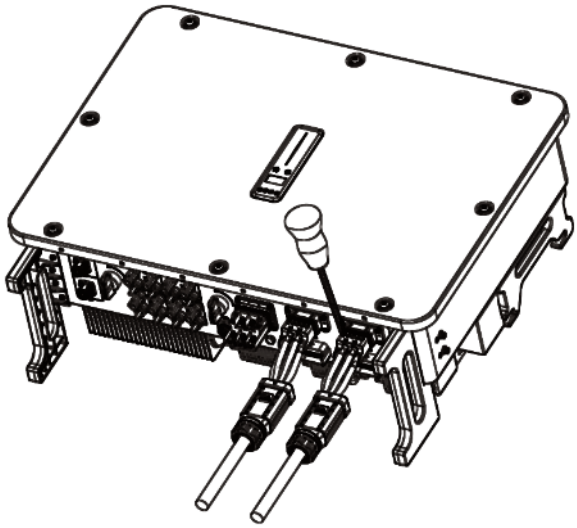


Figure 5.17 Connecting the cores.

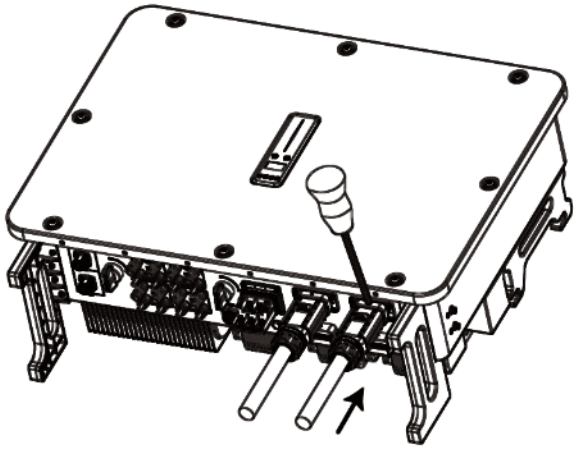


Figure 5.18 Fitting the connector.

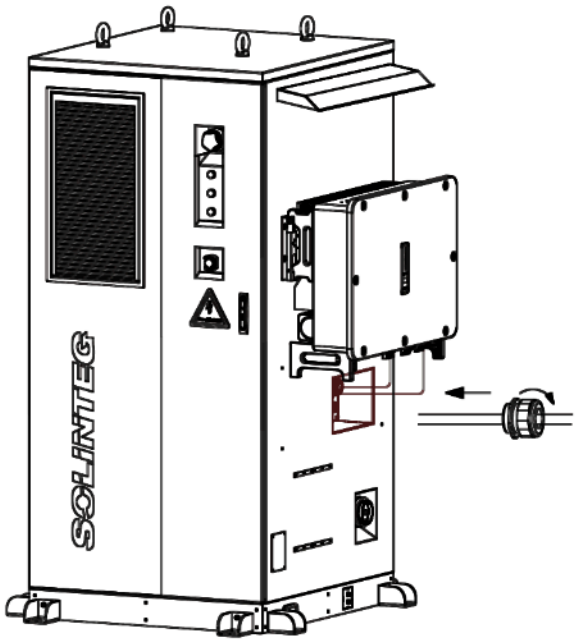


Figure 5.19 Back-up cable connected.

Battery cables

Before connecting the battery, open the grid-side AC breaker and the battery-side breaker, and turn the inverter DC switch to OFF.

> **Note**
> Before connecting to the inverter, measure the battery terminal voltage with a multimeter. It must not exceed 840 V. Before connecting the battery terminals, check that the cable polarity is correct.

1	Loosen the compression nuts of the glands on the side cable panel, as shown below. Pull the battery cables out far enough to reach the inverter battery terminals.
2	Plug the positive and negative connectors into the inverter battery terminals. They click when they are fully engaged.
3	To unplug a connector, press its release button with a screwdriver, then pull it out.
4	Feed the excess cable back through the cable entry, then refit and tighten the gland compression nut.

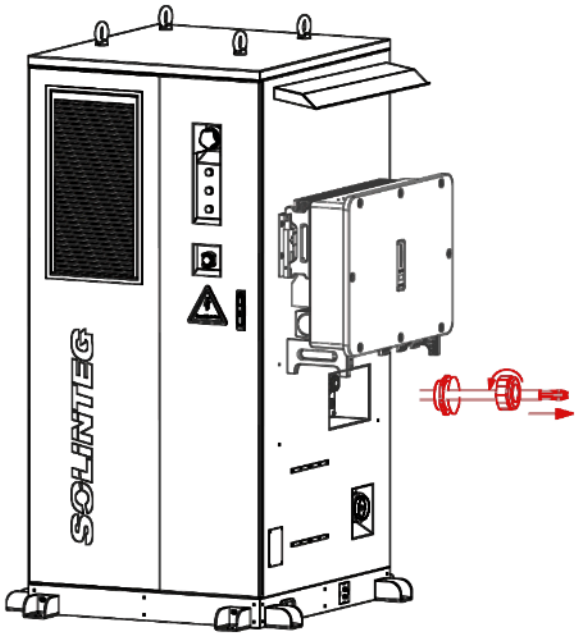


Figure 5.20 Pulling out the battery cables.

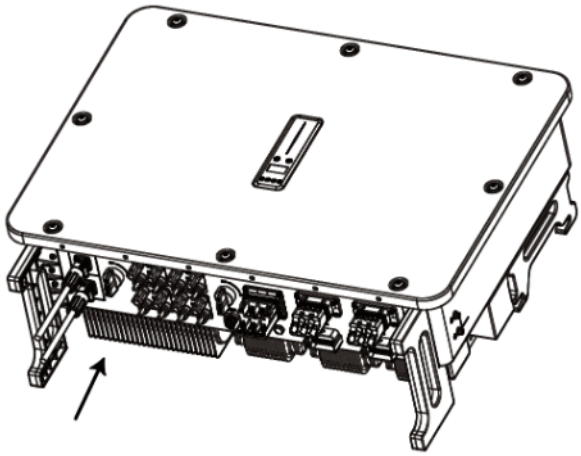


Figure 5.21 Plugging in the battery connectors.

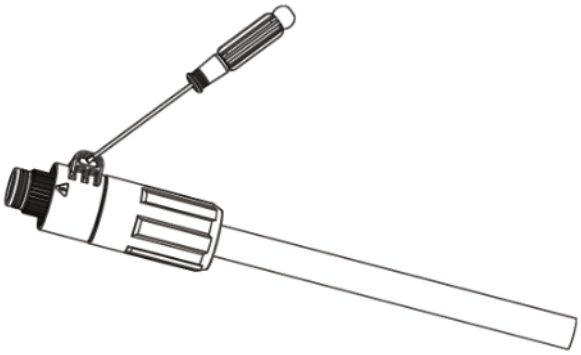


Figure 5.22 Releasing a battery connector.

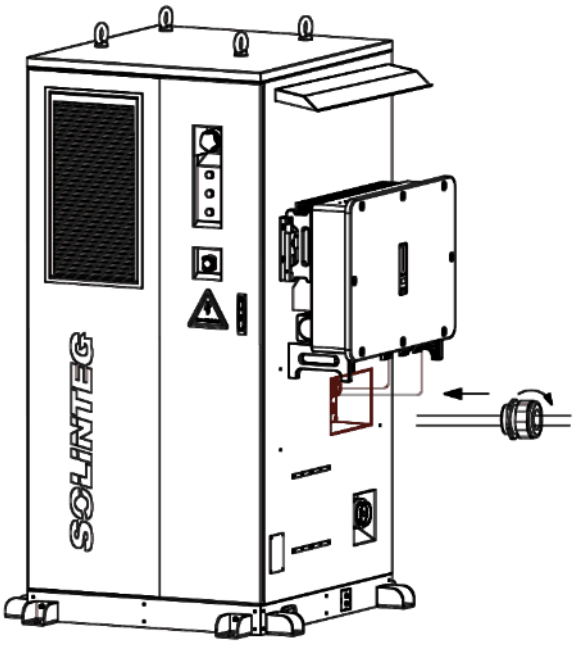


Figure 5.23 Battery cables connected.

Communication cable (BMS)

> **Note**
> Do not earth an unused communication cable or connect it to other equipment.

> **Notice**
> Use the inverter's **BMS 1** port. The BMS 2 port is not used. All the inverter COM3 connections are RJ45.

1. Loosen the gland of communication port B (inverter comms) on the side cable panel and remove its sealing ring. Pass one end of the communication cable through the gland and sealing ring.
2. Plug the cable into communication port B of the cabinet, then refit the sealing ring and compression nut.
3. Crimp an RJ45 plug onto the inverter end of the cable, wired to the BMS 1 pinout below.
4. Pass the RJ45 plug through the inverter COM3 swivel nut and into the open side of the rubber seal. Plug it into the matching RJ45 socket in the inverter COM3 connector.

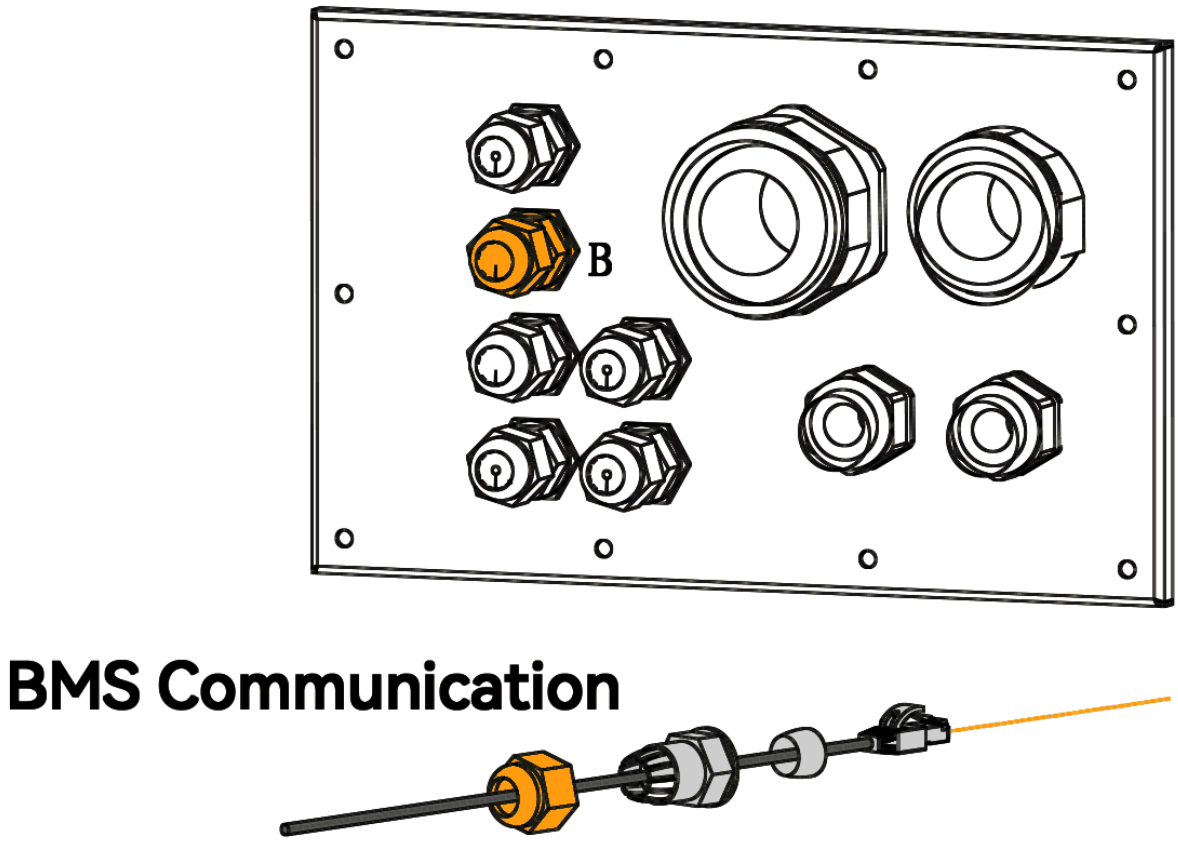


Figure 5.24 Communication port B on the side cable panel.

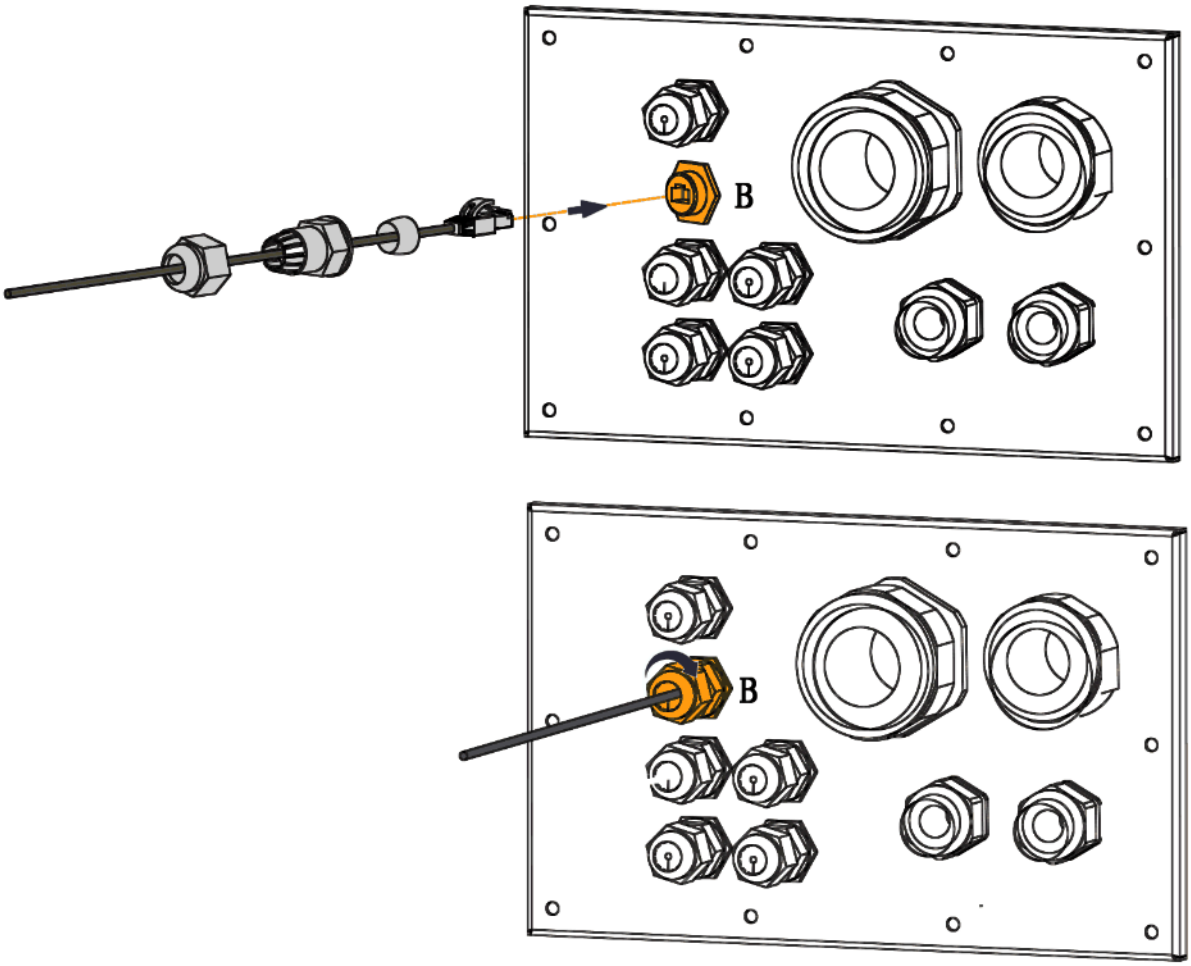


Figure 5.25 Fitting the communication cable at the cabinet.

Pin	Colour	BMS 1 signal
1	White/orange	RS485_A3
2	Orange	RS485_B3
3	White/green	—
4	Blue	CANH_B1
5	White/blue	CANL_B1
6	Green	—
7	White/brown	CANL_Debug
8	Brown	CANH_Debug

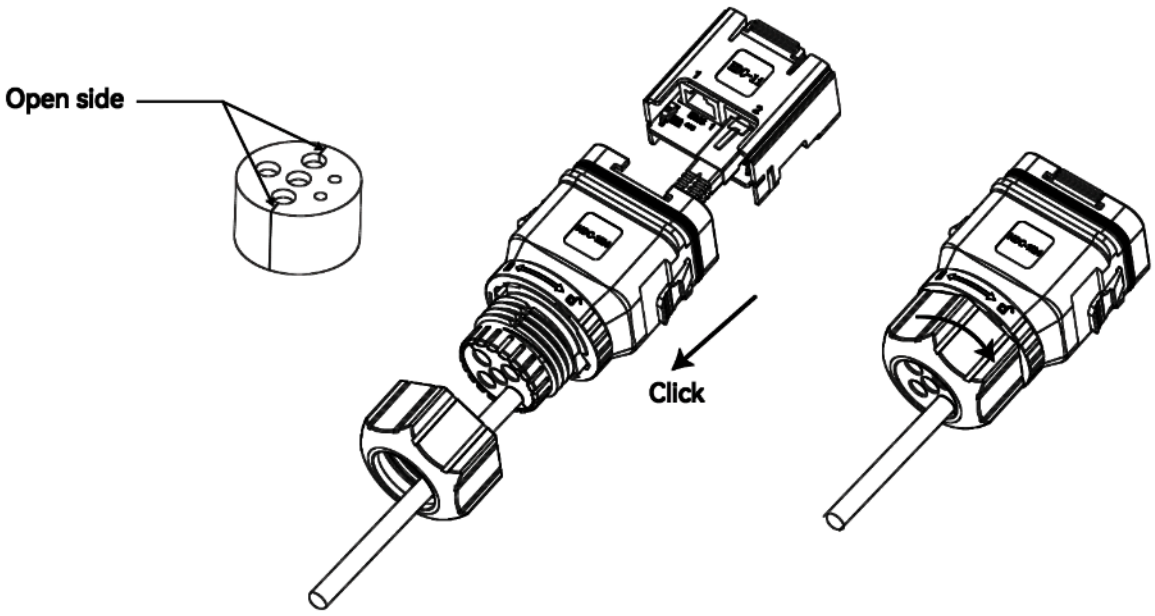


Figure 5.26 Connecting the RJ45 plug at the inverter COM3 connector.

Emergency stop cable

The inverter emergency stop uses the following pins.

Pin	Colour	Signal
1	White/orange	Stop+
2	Orange	Stop+
3	White/green	Stop−
4	Blue	Stop−
5	White/blue	—
6	Green	—
7	White/brown	—
8	Brown	—

The inverter COM2 connector has push-in (screwless) terminals and an RJ45 socket. The steps below are for the push-in terminals.

1. Loosen the nut of emergency stop port C on the side cable panel and remove its sealing ring. Pass the end of the cable without crimped terminals through the nut and sealing ring.
2. Plug the emergency stop cable into port C, then refit the sealing ring and compression nut.
3. Pass the other end of the cable through the inverter COM2 swivel nut and housing. Strip 55 mm of sheath and 8 mm of insulation. The cores are 0.5–1.5 mm².
4. Twist each multi-strand core by hand and crimp a pin ferrule onto it.

5 Following the COM2 terminal definitions in the inverter manual, press down the release on top of each terminal with a flat-blade screwdriver, insert the core and let go.

6 Tug each core to check it is secure. Push the terminal block into the connector until it clicks.

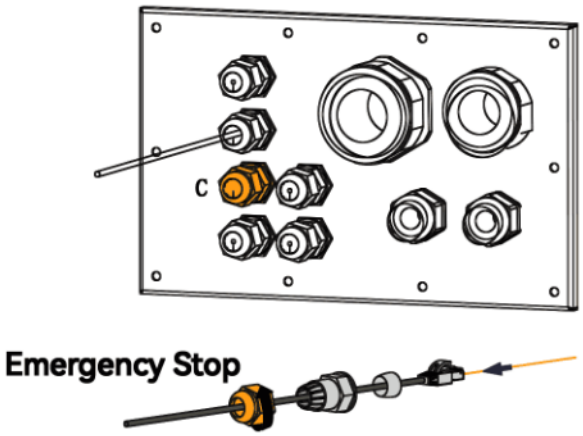


Figure 5.27 Emergency stop port C.

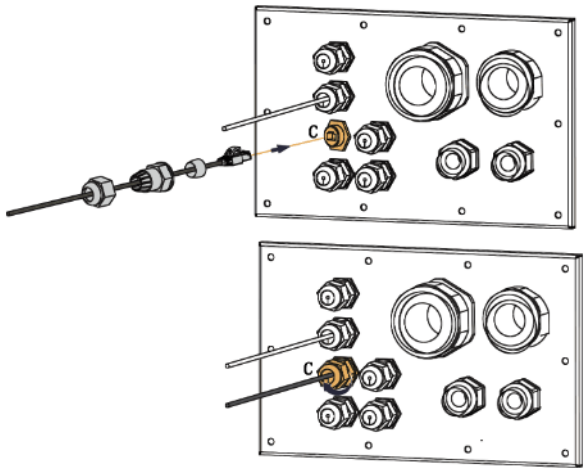


Figure 5.28 Fitting the cable at port C.

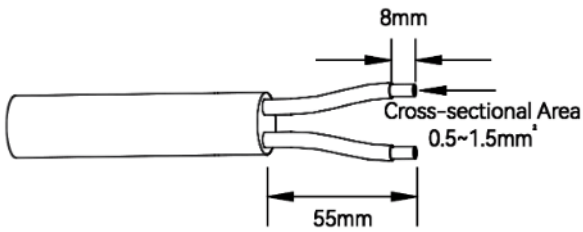


Figure 5.29 Strip lengths.

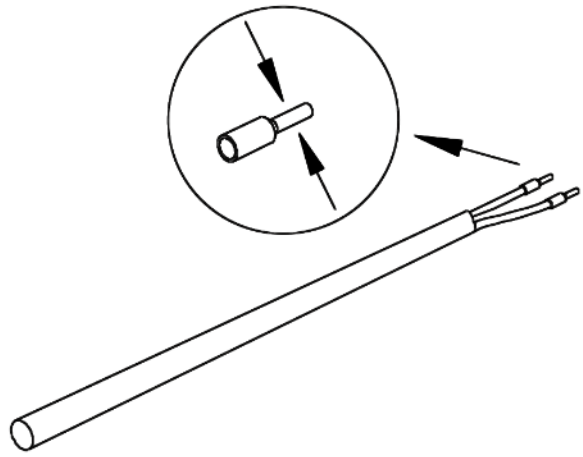


Figure 5.30 Crimping the ferrules.

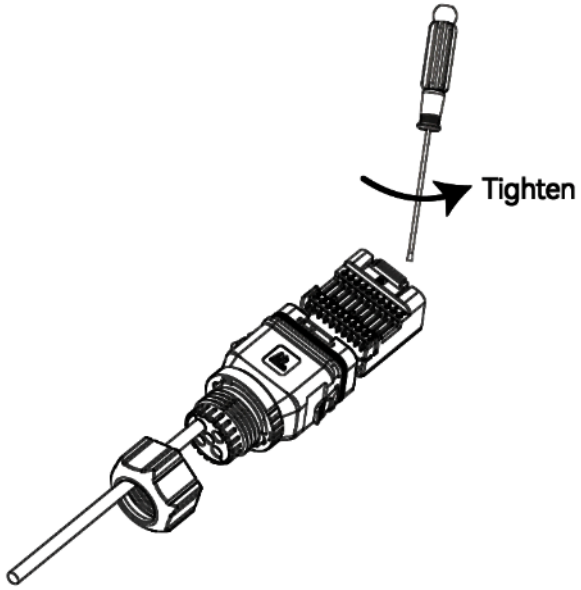


Figure 5.31 Inserting a core.

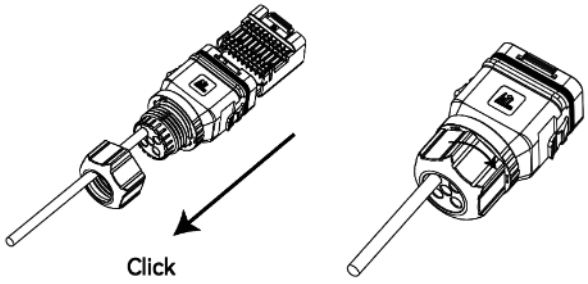


Figure 5.32 Fitting the terminal block.

PV cables

Choose the DC cable to suit the site. The recommended specification is:

Cable	Outside diameter	Conductor size
DC (PV) cable	5.9–8.8 mm	4 mm² (12 AWG) or 6 mm² (10 AWG)

For the PV wiring itself, follow the inverter manual.

Cable cover

We recommend fitting the cable cover after all the cables are connected and the system is commissioned.

1. Tie the cables to the cable tie bar.
2. Take side plates 01 and 02, six M6 × 16 and four M8 × 16 hex socket bolts from the parts box. Assemble the cable cover with the M6 × 16 bolts, as shown.
3. Fix the cable cover to the right-hand side of the cabinet with the M8 × 16 bolts.

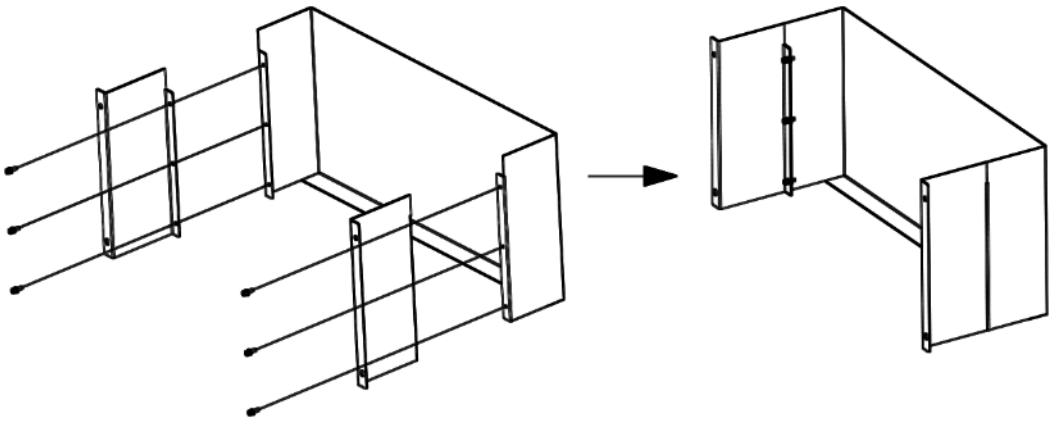


Figure 5.33 Assembling the cable cover.

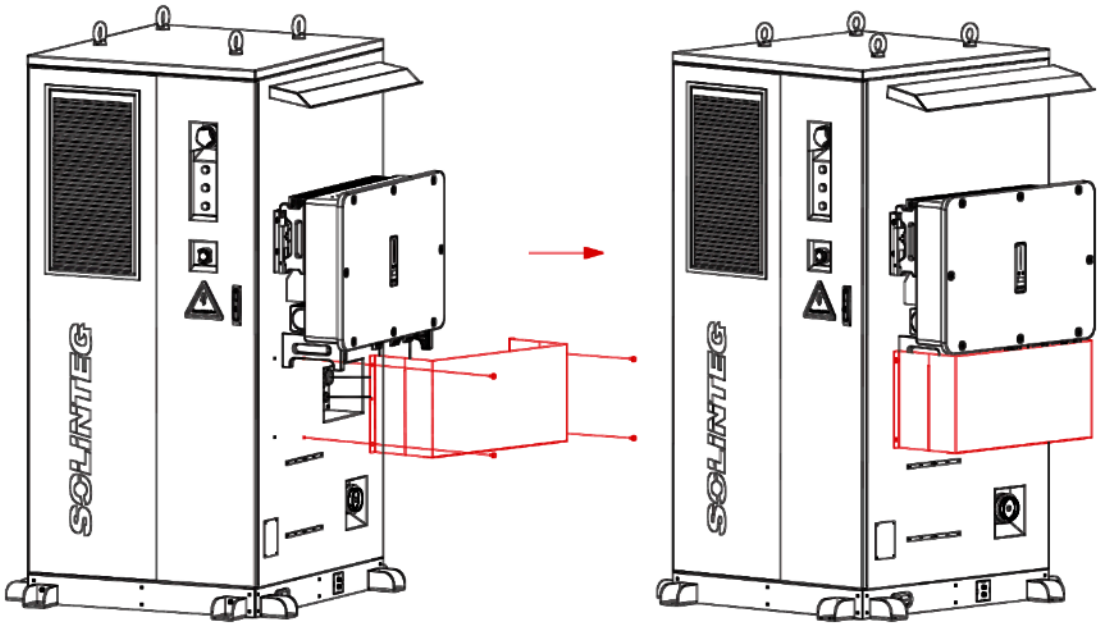


Figure 5.34 Fitting the cable cover.

5.3.2 Battery pack DC cables

> **Note**
> Before connecting the battery terminals, check that the cable polarity is correct.

If the cabinet is to be stored or transported, unplug the main positive and negative battery pack cables first, then close the cabinet.

1	Take the key from the side cable panel.
2	Slide the waterproof cover on the lock to the left, insert the key and turn it to the right. Lift the handle and turn it to the left to open the door. Open the door fully: the door stay locks it open.

3	Remove the battery pack cover at the upper left of the cabinet with a screwdriver.
4	Take off the protective caps and plug the main positive and negative battery connectors into the battery pack terminals, as shown. They click when fully engaged. Refit the battery cover.

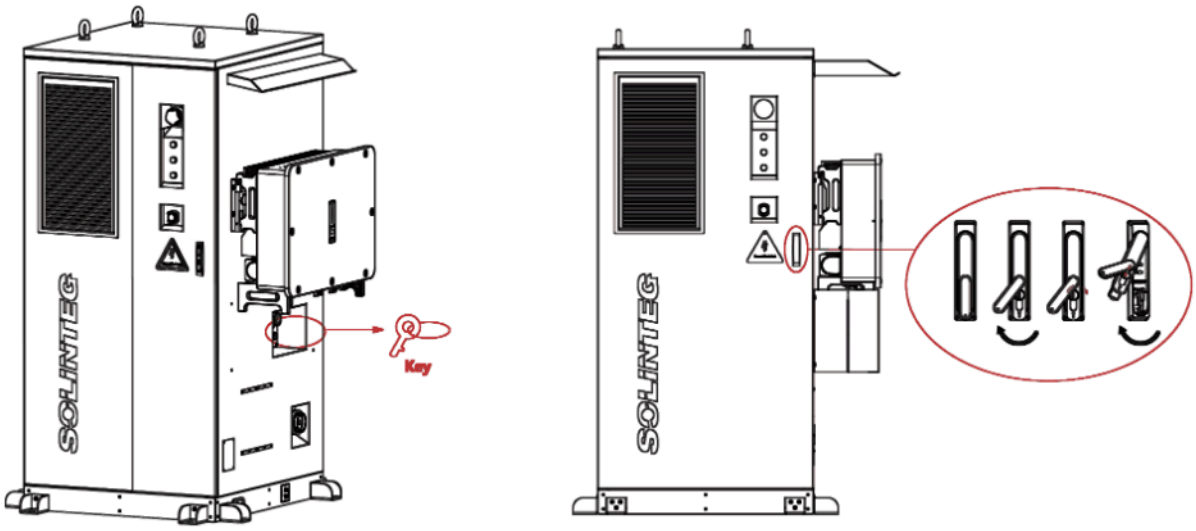


Figure 5.35 Taking the key from the side cable panel.

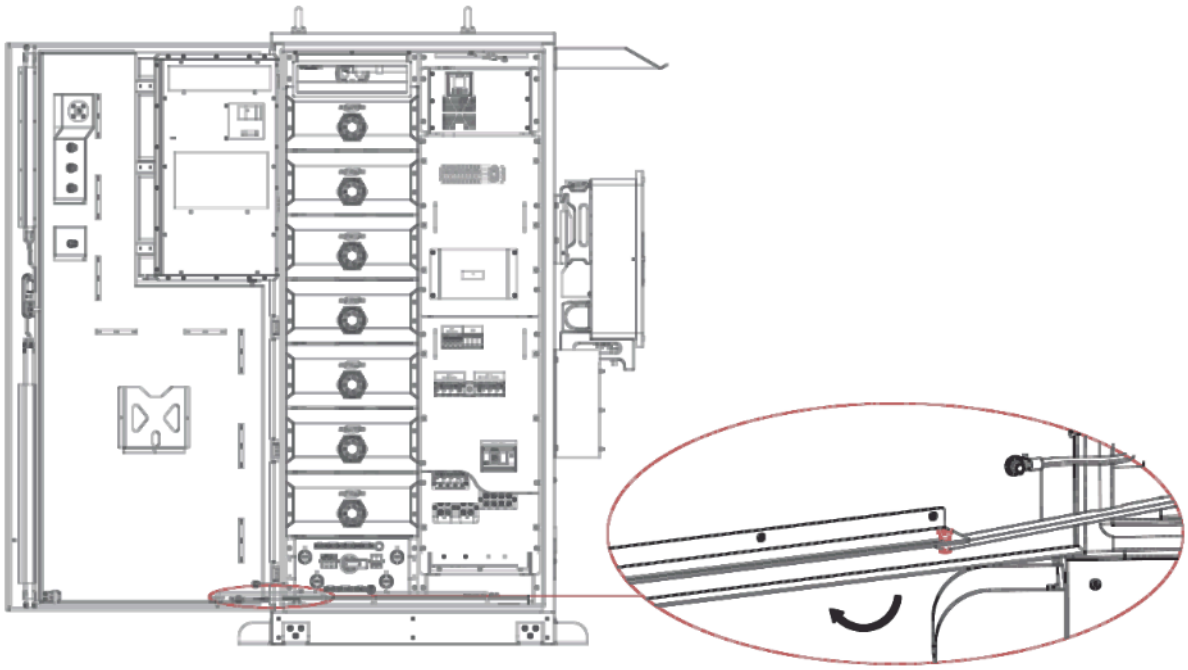


Figure 5.36 Opening the cabinet door.

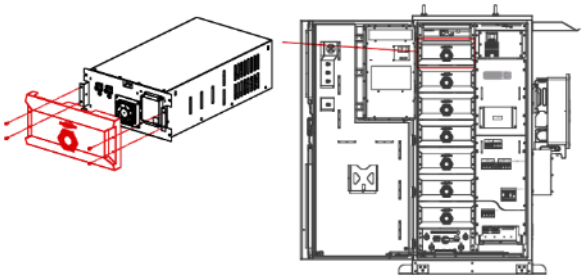


Figure 5.37 Removing the battery pack cover.

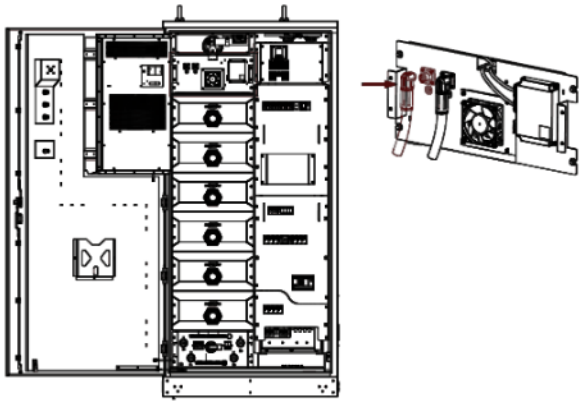


Figure 5.38 Connecting the battery pack cables.

5.3.3 Grid and load cables

Choose cables to suit the site, using the recommended specifications in section 5.1.2.

1	Remove the sealing plate under the electrical compartment with a screwdriver.
2	Remove the nuts and sealing rings from the grid and load cable glands, and take out the waterproof plugs, as shown.

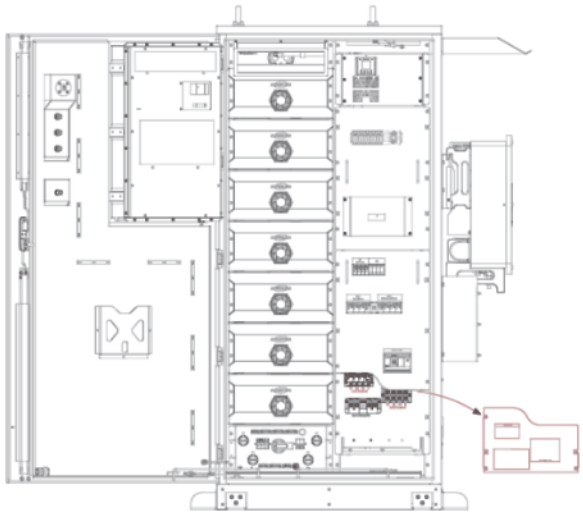


Figure 5.39 Removing the sealing plate.

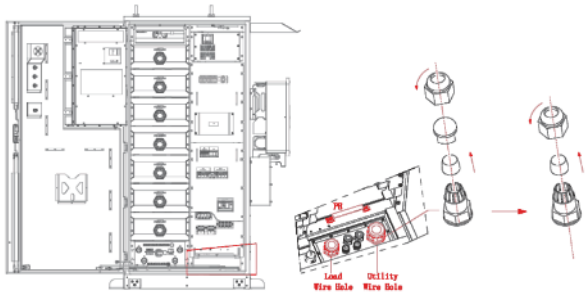


Figure 5.40 Opening the grid and load glands.

If the cable is smaller than the recommended diameter, seal it with the M42-26 gland sealing ring or the fire-stopping putty from the parts box. Fit the M42-26 sealing ring to suit the cable outside diameter (22–44 mm):

Cable outside diameter	M42-26 sealing ring
Less than 26 mm	Fit the complete sealing ring
26 to 31 mm	Remove part 1
31 to 35 mm	Remove parts 1 and 2

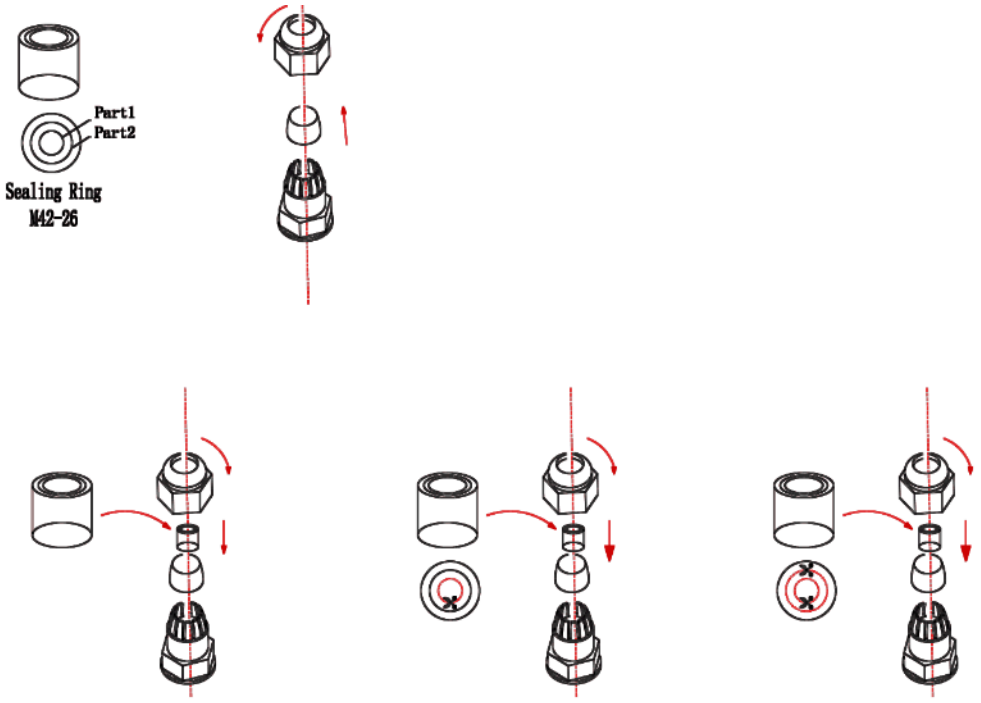


Figure 5.41 M42-26 gland sealing ring.

3 Thread the grid and load cables through the glands, seals and compression nuts in the base plate, as shown. Pull out enough cable to reach the terminals.

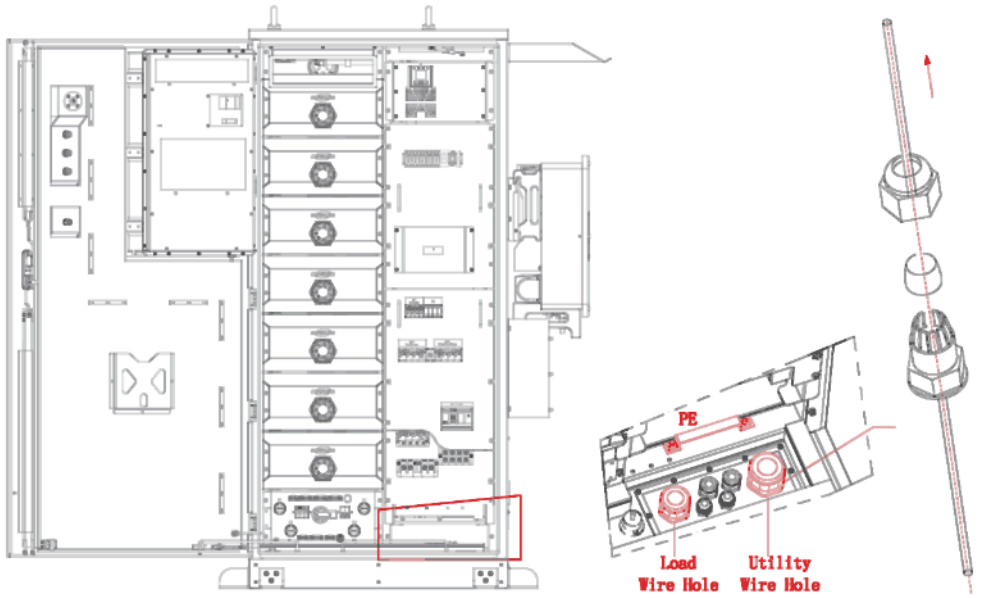


Figure 5.42 Threading the grid and load cables.

Note

If threading is difficult, remove the base mounting plate as shown below, and refit it after the cables are connected.

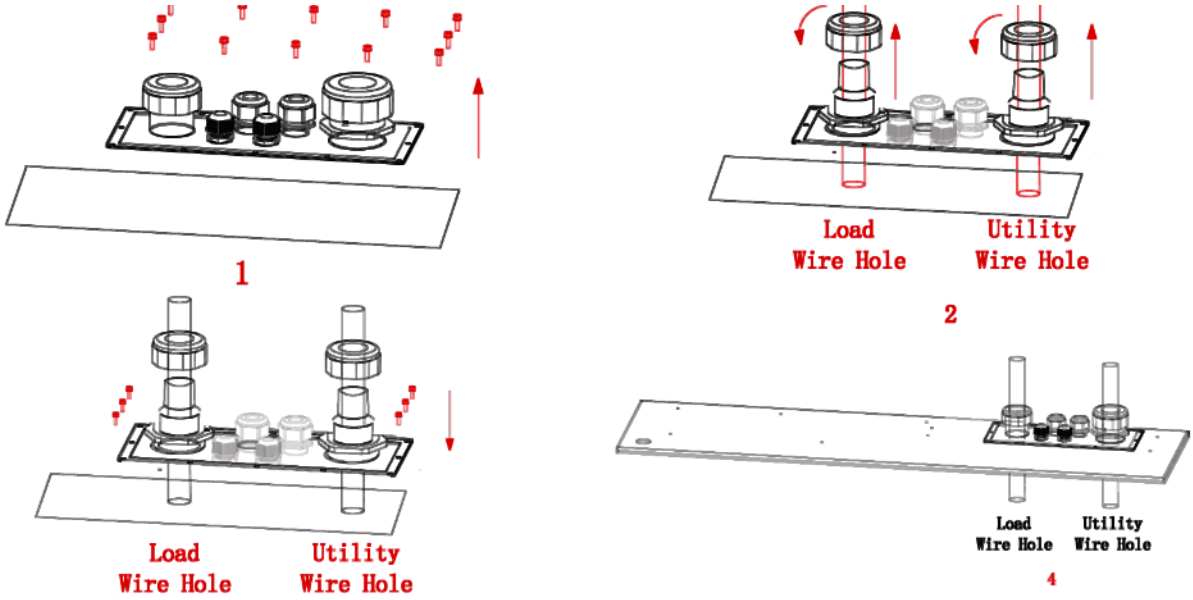


Figure 5.43 Removing the base mounting plate.

4	Strip 95–100 mm of the outer sheath, and 20–25 mm of insulation from each L1, L2, L3, N and PE core.
5	Take the lugs from the parts box: four SC50-8 for the grid cable (12 N·m), four C45-25 for the load cable (3.5 N·m) and two SC16-8 for PE (12 N·m). Crimp them onto the cores.
6	Connect the lugs to L1, L2, L3, N and PE, as shown.

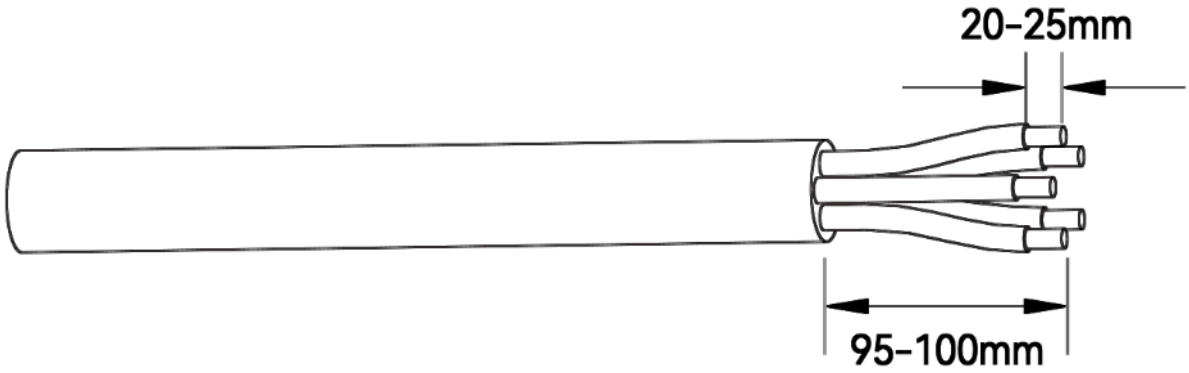


Figure 5.44 Strip lengths.

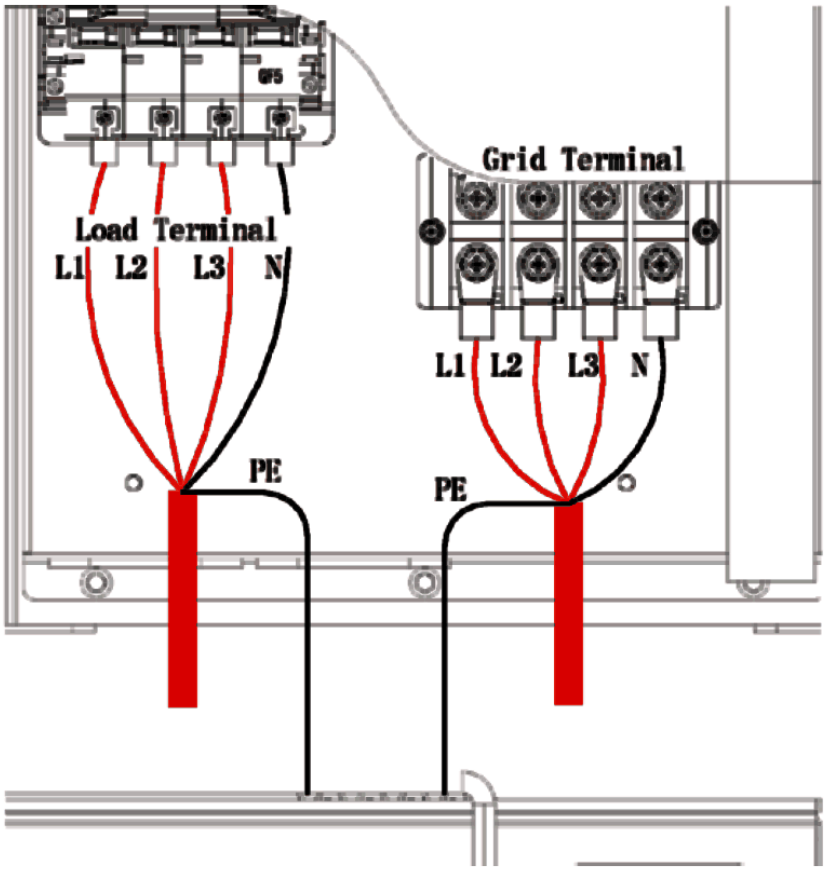


Figure 5.45 Connecting the grid and load cables.

7	Refit the lower cover plate.
8	Refit and tighten the compression nuts. If there is a gap between a cable and its entry, seal it with a sealing material that meets local electrical and fire requirements.
9	Lift the locking pin of the door stay and close the door to the right.

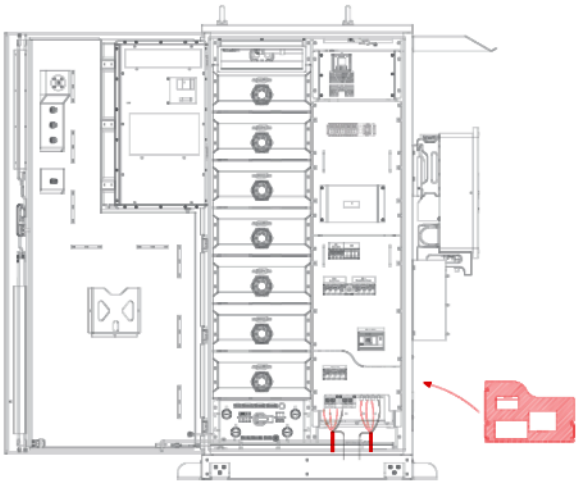


Figure 5.46 Refitting the lower cover plate.

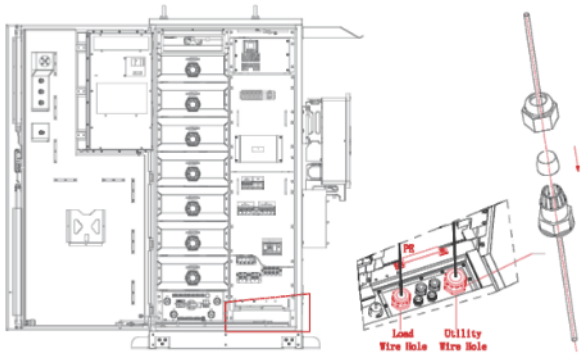


Figure 5.47 Tightening the compression nuts.

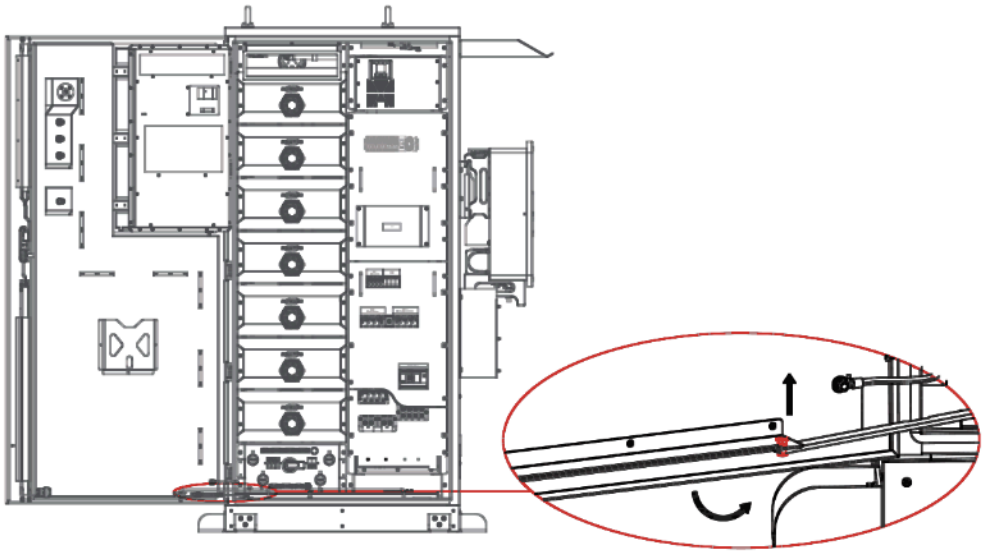


Figure 5.48 Closing the cabinet door.

5.3.4 Fire alarm signal

The cabinet's fire-activation signal is a dry contact. Wire it only if the site needs to monitor fire activation remotely.

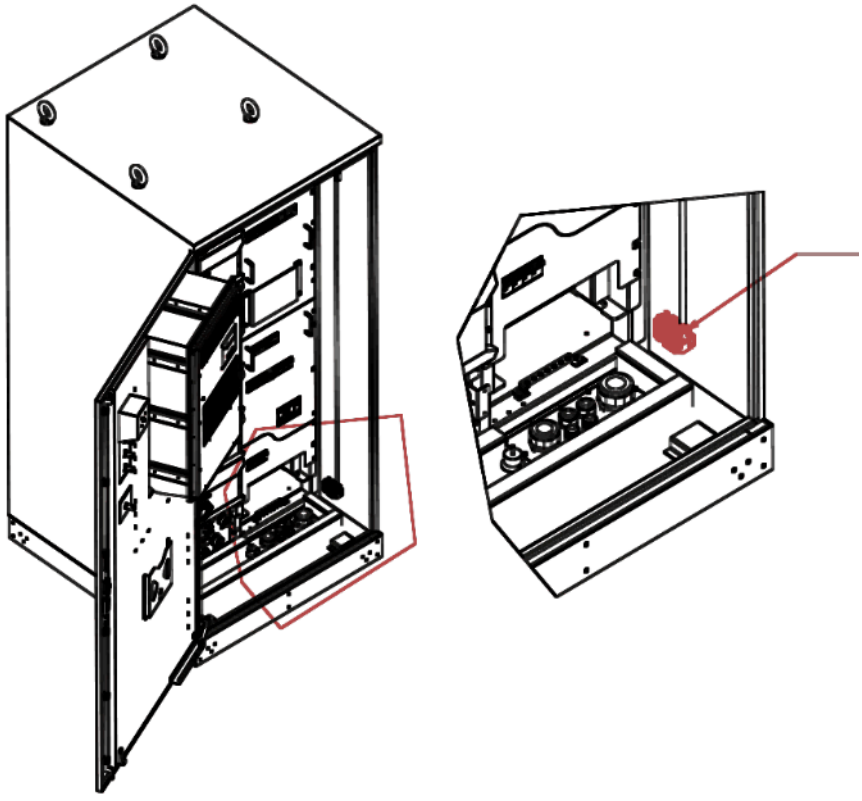


Figure 5.49 Fire signal terminals.

Cable	Recommended specification	Cable outside diameter
Fire signal cable	2 × 1.0 mm² or 2 × 1.5 mm²	10–14 mm

1	Remove the nut and sealing ring from the cable gland in the base of the cabinet, as shown.
2	Pass the fire signal cable through the gland, seal and compression nut in the base plate. Pull out enough cable to reach the terminals.
3	Strip 55 mm of sheath and 8 mm of insulation. Twist each multi-strand core by hand and crimp a pin ferrule onto it (0.5–1.5 mm²).
4	Press and hold the release above each terminal with a flat-blade screwdriver, insert the cores into terminals 1-A and 2-A, and let go. Tug the cables to check they are secure.
5	Tie the cables, then refit and tighten the compression nut.

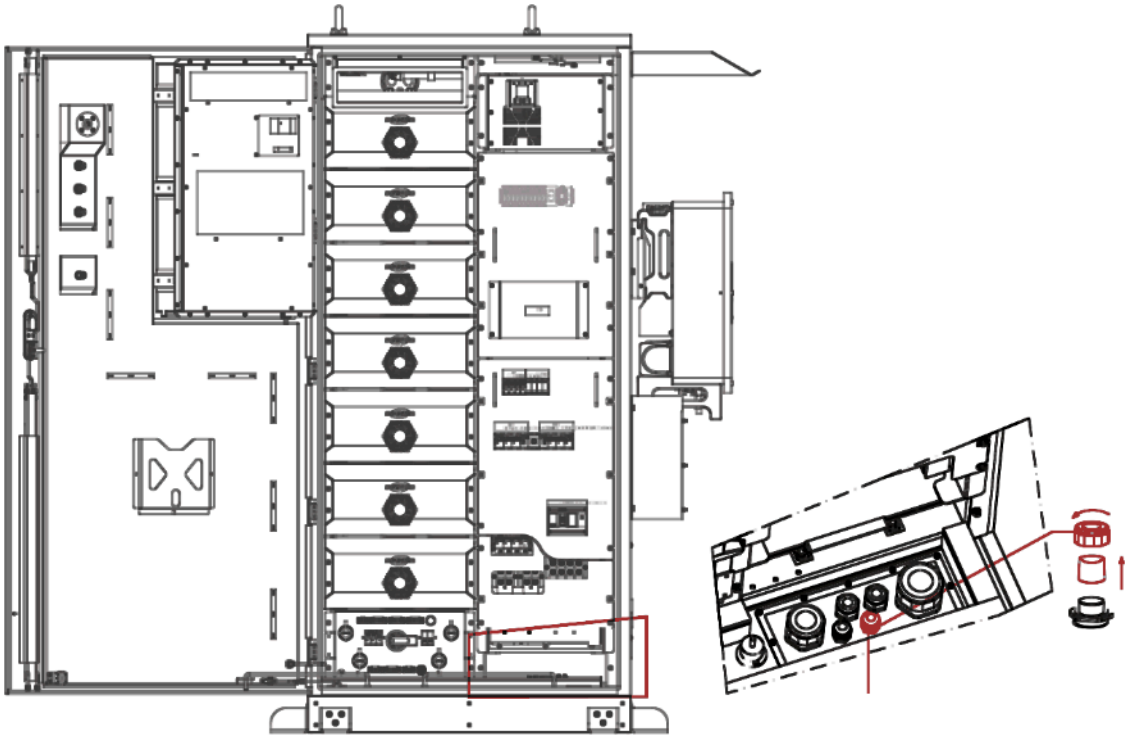


Figure 5.50 Opening the cable gland.

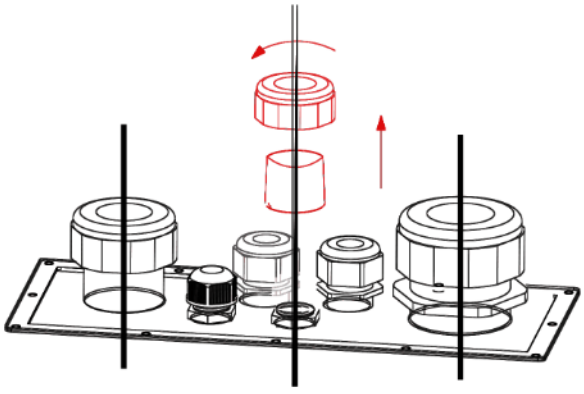


Figure 5.51 Threading the fire signal cable.

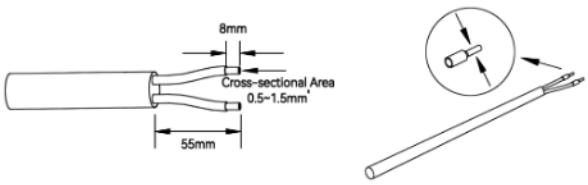


Figure 5.52 Strip lengths and ferrules.

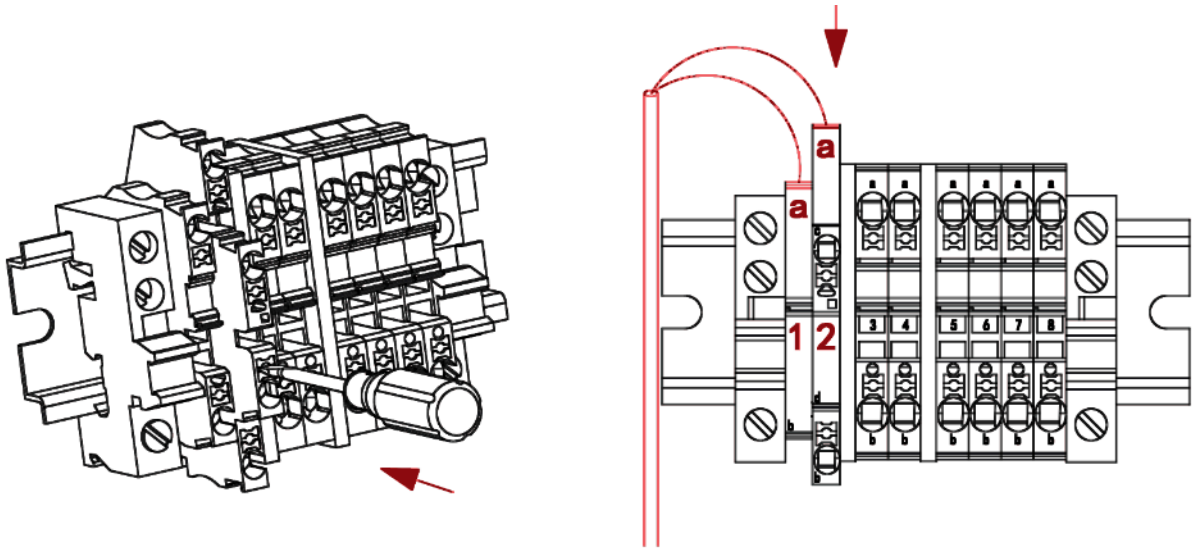


Figure 5.53 Fire signal terminal definition.

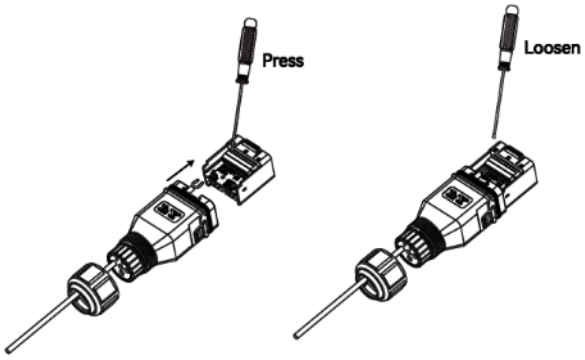


Figure 5.54 Inserting a core: press, insert, release.

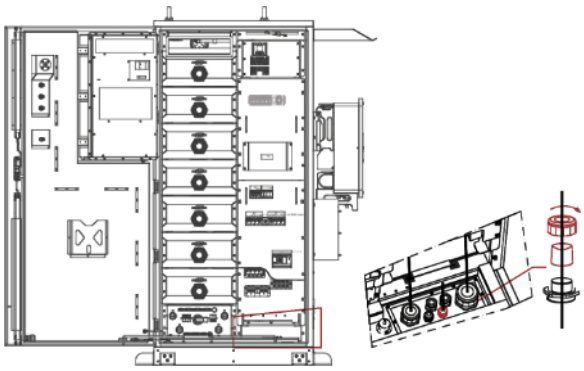


Figure 5.55 Refitting the compression nut.

Commissioning

Start-up and shut-down, operating status

06

6.1 Start-Up and Shut-Down

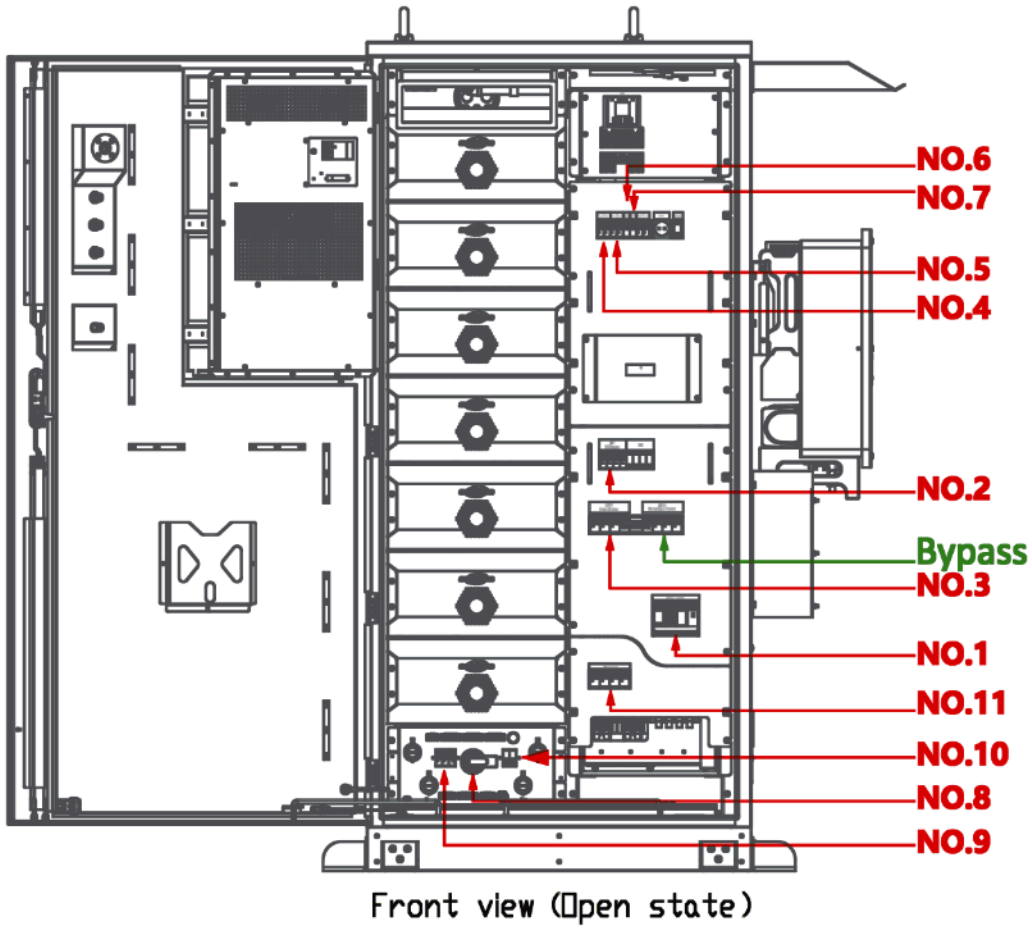


Figure 6.1 Breaker start-up sequence.

Start-up

1	Switch on grid breaker QF4. Grid power is applied and the white power indicator on the cabinet lights.
2	Switch on SPD breaker QF7. The surge protection is in service.
3	Switch on bypass breaker QF6-1. The AC system is in service.
4	Switch on the auxiliary main breaker QF8. The control circuits are powered.
5	Switch on air-conditioner breaker QF81. The air conditioner starts.

6	Switch on UPS breaker QF82. The UPS starts.*
7	Switch on controller PDU breaker QF821. The PDU control supply is on.
8	Switch on the high-voltage box main switch QF1. The BMS powers up.
9	Switch on the high-voltage box DC supply breaker QF3. The DC control supply is on.
10	Switch on the high-voltage box AC supply breaker QF2. The AC control supply is on.
11	The BMS runs a self-test. If there are no alarms, the red fault indicator on the high-voltage box stays off and the green running indicator on the cabinet lights.
12	Once the high-voltage box has started, the inverter runs its grid self-test and starts on-grid operation.
13	Check that the loads are ready, then switch on load breaker QF5. The system supplies the loads and start-up is complete.

Note

*The first time the UPS is powered, press its power button to start it.

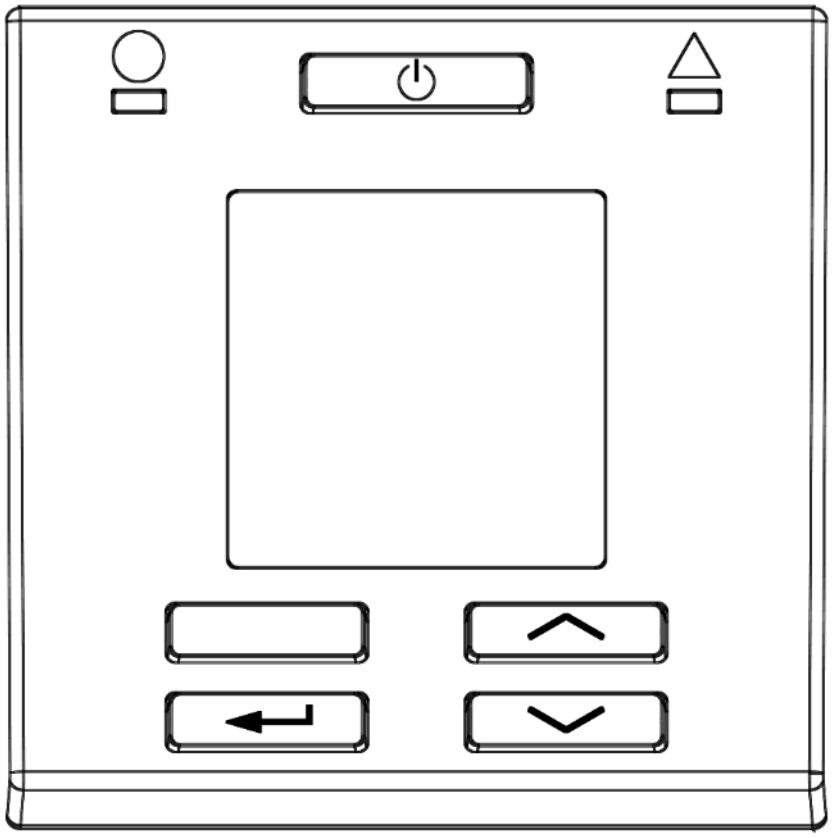


Figure 6.2 UPS front panel and power button.

> **Note**
> After start-up, check the cabinet status against the table below. If there is a fault alarm, follow section 7.3 or contact AERL support.

Status	Unit	Indication
System running normally	Energy storage cabinet	No audible or visual alarm White power indicator on steady Green running indicator on steady Red fault indicator off
System running normally	High-voltage box	Red fault indicator off

Shut-down

1. Switch off load breaker QF5. The supply to the loads stops.
2. Switch off the high-voltage box main switch QF1, AC supply breaker QF2 and DC supply breaker QF3, in that order. The DC system and inverter shut down, the high-voltage box control supply turns off, and the green running indicator goes out.
3. Switch off the auxiliary main breaker QF8 to turn off the control supply. Switch off the other breakers in the cabinet as needed.
4. Switch off bypass breaker QF6-1 to turn off the AC supply.
5. Switch off grid breaker QF4. The grid supply is off and the white power indicator goes out.

> **Note**
> In an emergency, press the emergency stop button on the door panel and switch off grid breaker QF4. If the site requires it, also switch off QF821 to cut the UPS output.

6.2 Operating Status

> **Notice**
> After start-up, check that the cabinet is running. If it fails to start, the site may lose power.

6.2.1 Cabinet indicators

The indicators on the cabinet door show its operating status.

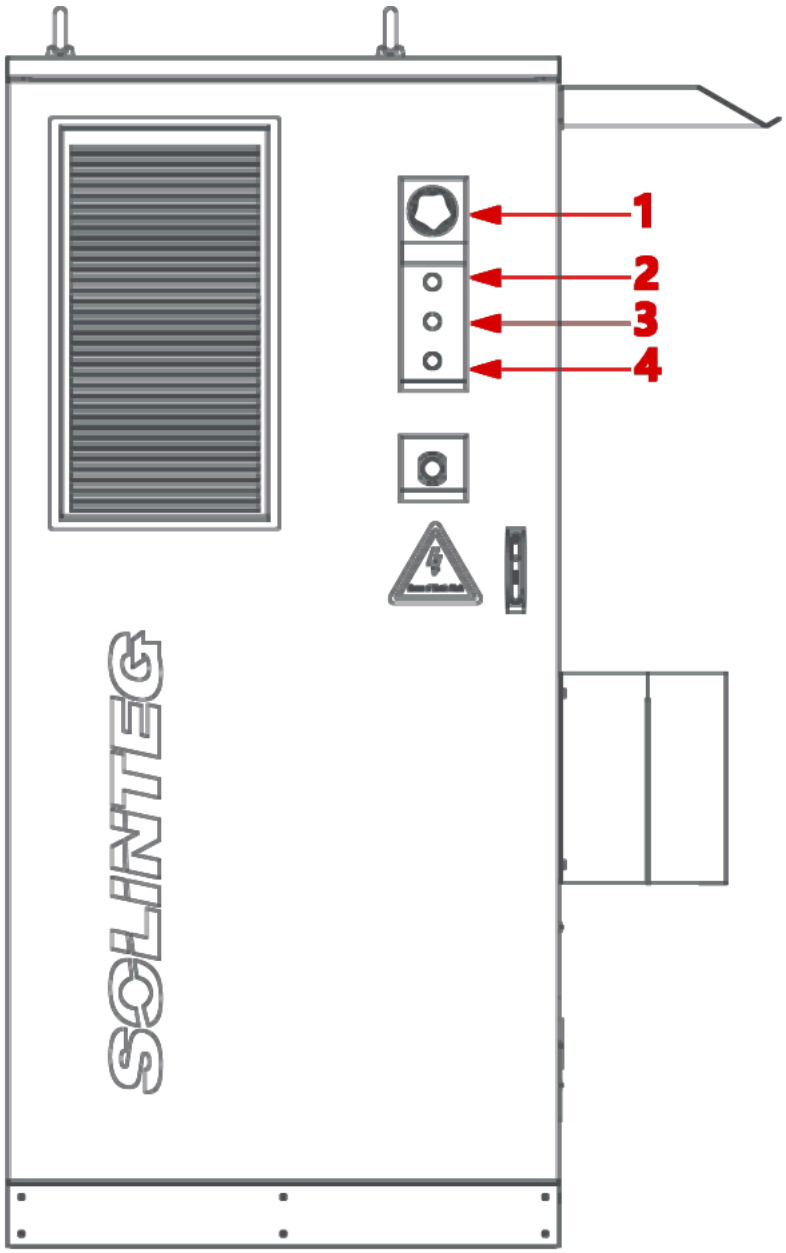


Figure 6.3 Cabinet status indicators.

No.	Indicator	Meaning
1	Audible and visual alarm	Sounds and flashes when the smoke sensor is triggered
2	Power (white)	On steady while grid power is present
3	Running (green)	On steady while the high-voltage box is in operation
4	Fault (red)	On steady when the cabinet has a fault

If an alarm occurs, check the alarm details in the monitoring data to identify the fault.

6.2.2 High-voltage box indicator

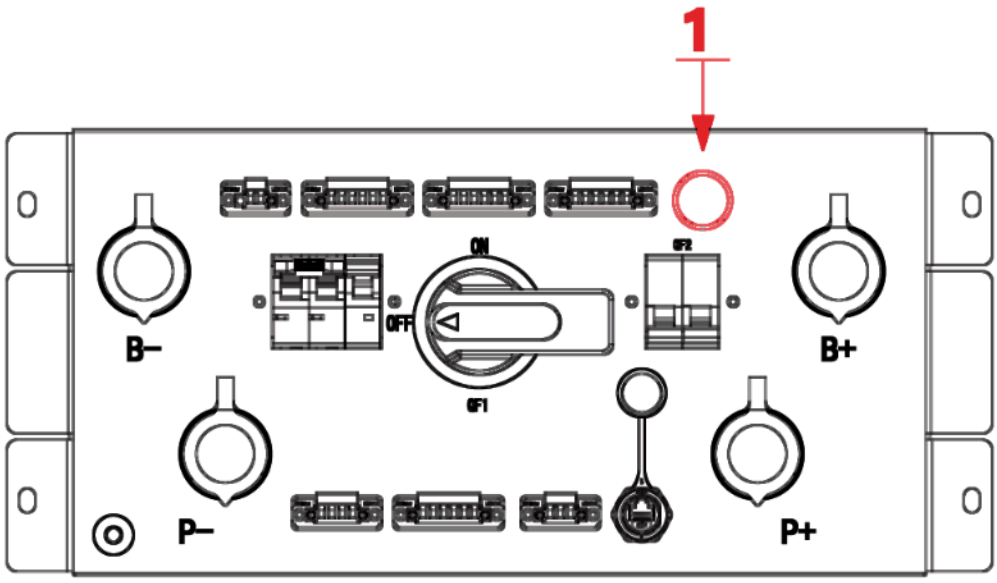


Figure 6.4 High-voltage box fault indicator.

No.	Indicator	Meaning
1	Fault (red)	On steady when there is a fire fault

6.2.3 Inverter indicators

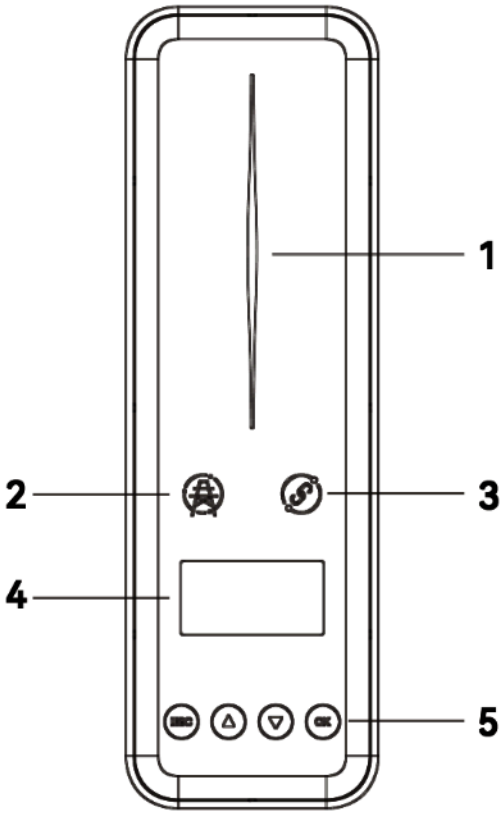


Figure 6.5 Inverter indicators, display and button.

No.	Indicator	Colour	State	Meaning
1	Power and alarm	—	Off	No power
1	Power and alarm	Blue	Fast flashing	Inverter is running its self-test
1	Power and alarm	Blue	Slow flashing	Inverter is waiting
1	Power and alarm	Blue	Breathing	Inverter is operating normally
1	Power and alarm	Orange	Breathing	Low battery: the battery is close to its SOC protection limit
1	Power and alarm	Red	On	Alarm or fault. Check the fault on the display
2	Grid	—	Off	Grid lost
2	Grid	—	Slow flashing	Grid detected, but the inverter is not operating on-grid
2	Grid	—	On	Inverter is operating on-grid
3	Communication	Green	On	Communication is normal
3	Communication	Green	Flashing	Communicating with an EMS or the master inverter over RS485 or CAN
3	Communication	Orange	On	No communication with the Solinteg smart meter
3	Communication	Red	On	No communication with the BMS
4	Display	—	—	Shows operating status and settings. Turns off to save power; press the button to wake it
5	Button	—	—	Changes the displayed information and sets parameters

6.2.4 Adding the system in the IntegHub app

Scan a code to install the free Solinteg IntegHub app, or search for **IntegHub** in Google Play or the App Store.

Get the IntegHub app

Android
Google Play

iPhone
App Store

1. Log in to the IntegHub app and create a plant by following the prompts.
2. On the **Plants** screen, open the plant you want to add devices to.
3. In the plant, tap **Devices**, then tap **+** at the top right.

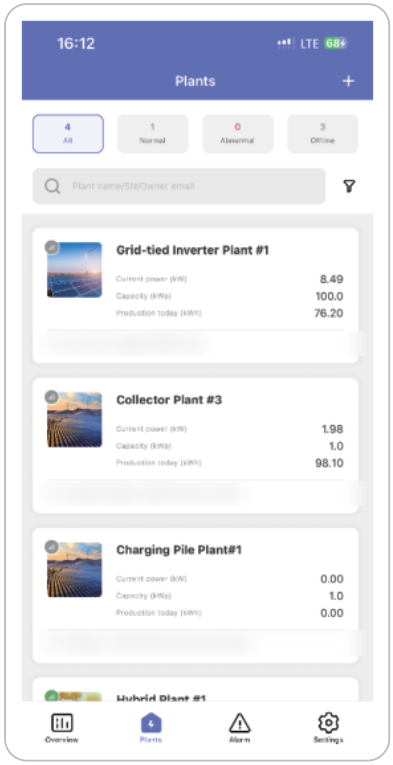


Figure 6.6 Plants screen.



Figure 6.7 Adding a device.

4. Tap **Scan to add** and scan the QR code or serial number on the inverter rating plate.
5. Tap **Enable Bluetooth** to turn on your phone's Bluetooth. The app scans for nearby devices. (If you tapped **Add devices manually** in step 3, the app goes straight to this screen.)



Figure 6.8 Scanning the inverter QR code.

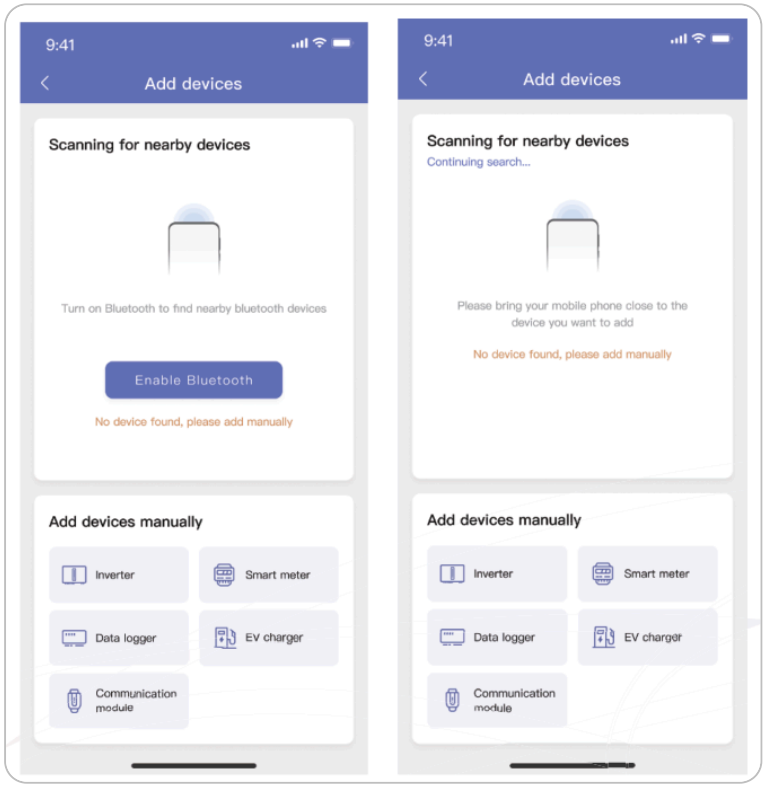


Figure 6.9 Searching for nearby devices over Bluetooth.

6	The app lists the devices it finds. Select the device to add.
7	Choose how the inverter connects to the internet: Wi-Fi or LAN.

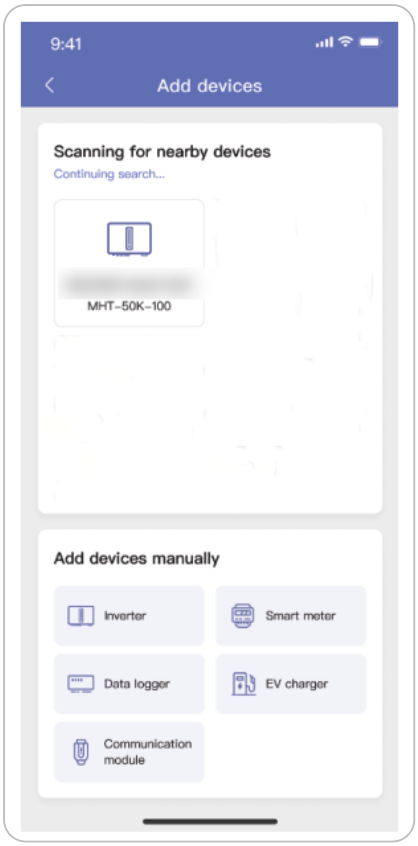


Figure 6.10 Selecting the device.



Figure 6.11 Choosing Wi-Fi or LAN.

8 For Wi-Fi, select the network and enter its password. Tap **Next** to continue, or **Setup later** to do this later.

9 For LAN, DHCP is on by default. To set a static address, turn DHCP off and enter the IP address, subnet mask, gateway and DNS server. Tap **Next** to continue, or **Setup later**.

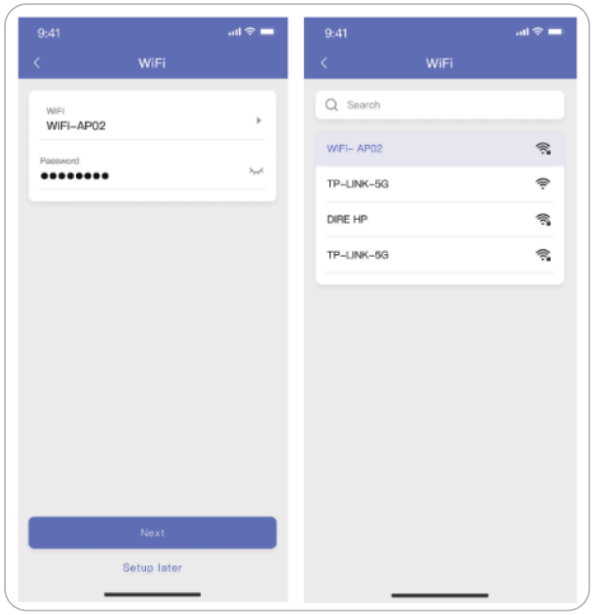


Figure 6.12 Wi-Fi settings.

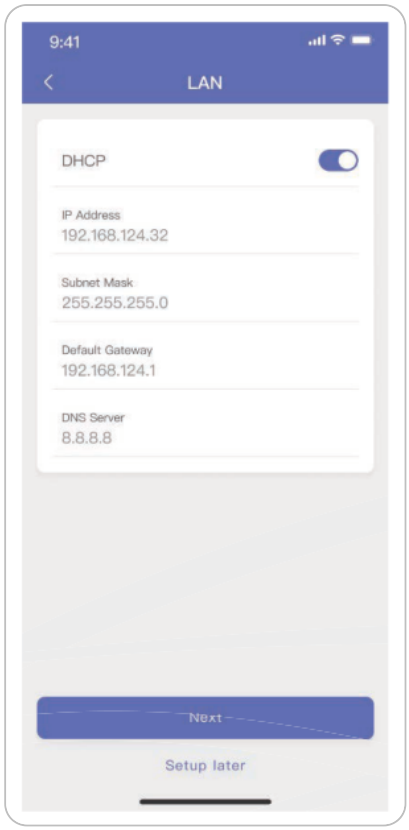


Figure 6.13 LAN settings.

10 The app configures the network in three steps. If a step fails, the app shows the reason.

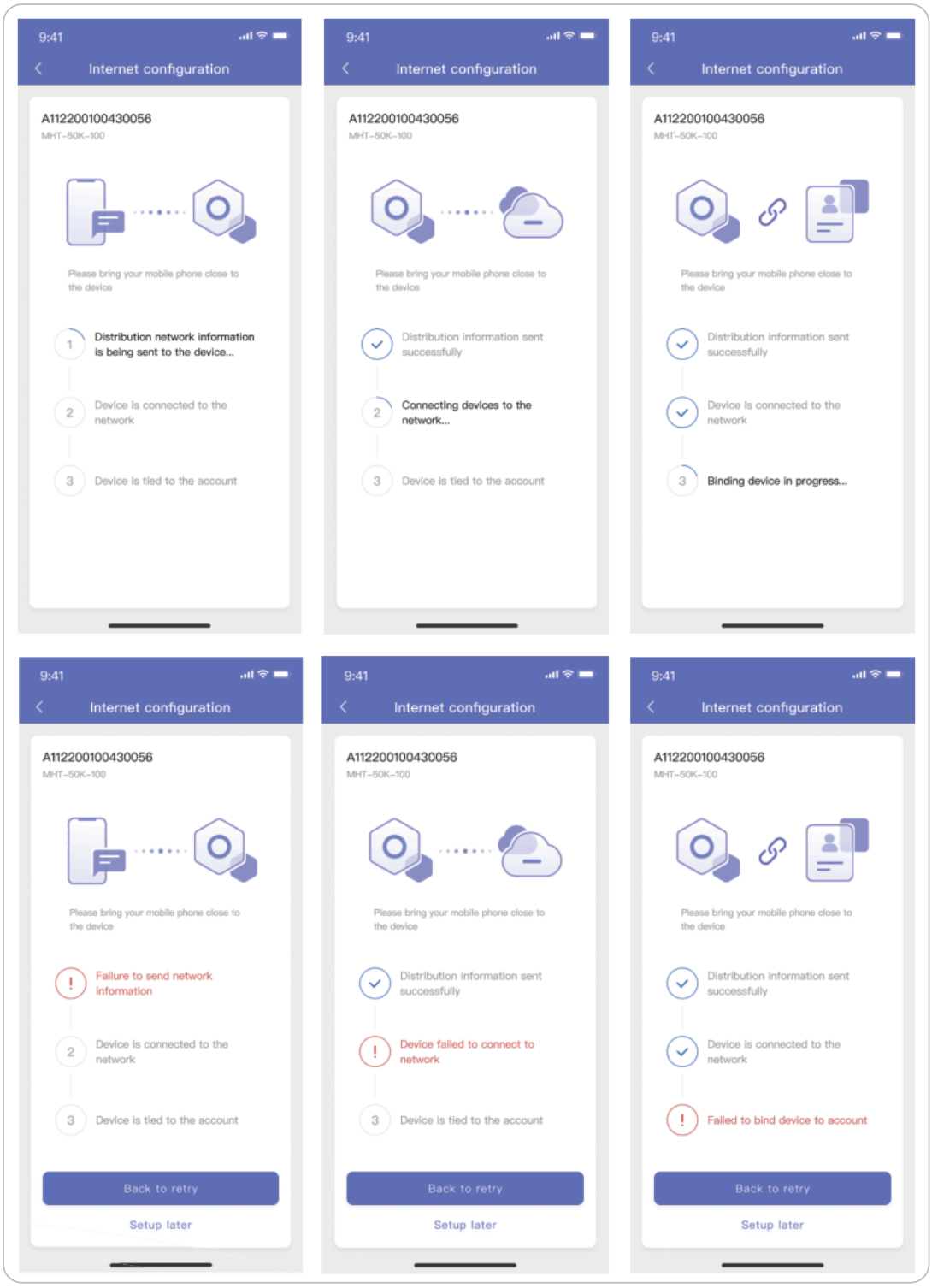


Figure 6.14 Network configuration progress.

11	When configuration finishes, tap **Complete**.
12	You can now add the device. Tap the edit button to rename it, then tap **Confirm**.
13	Open the device to see its name, serial number, type, model, connection (Wi-Fi or LAN), IP address, MAC address, inverter firmware versions and the date it was connected.

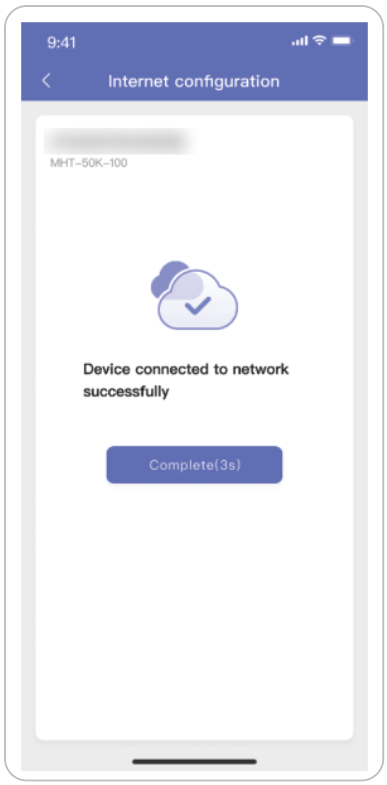


Figure 6.15 Configuration complete.



Figure 6.16 Naming the device.

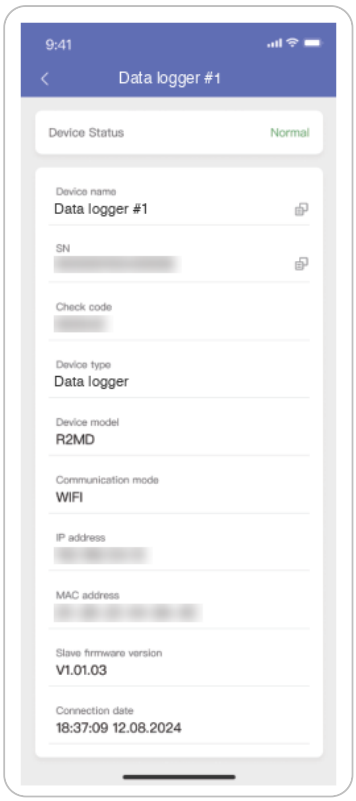


Figure 6.17 Device details.

Maintenance and Troubleshooting

07

Maintenance, fire-protection system inspection

7.1 Maintenance

Inspect and maintain the equipment regularly so it keeps working properly. Where the environment or operating conditions are harsh, maintain it more often. Maintenance must be carried out by qualified people.

Item	What to check	Interval
Operating environment	Temperature, humidity, corrosion and dust around the equipment Ventilation, and any water around the equipment	3 months
Operating status	Cabinet indicators, and alarms in the monitoring app Any unusual noise, smell or heat	1 month
Cleaning	Dust inside the equipment Air-conditioner inlet and outlet are clear	3 months
Enclosure	Damage to the enclosure Corrosion of structural parts	3 months
Electrical connections	Cable connections are secure Components are securely mounted No signs of arcing or tracking on component surfaces	6 months
Battery packs	No rattling, deformation or leaks In storage: no more than six months between top-up charges, and SOC never below 10%	1 month
Fire-protection equipment	Service and replacement by qualified people to local fire requirements	As required locally
Cables	If a cable at the side cable panel is damaged, have it replaced by a qualified person with cable to the specification in section 5.1.2	As required

Paint repair

The cabinet paint may be damaged by knocks during handling, transport and installation. Repair it as follows.

1. Choose a paint or touch-up spray to match the colour code. Prepare brushes, sandpaper, anhydrous ethanol, cotton cloths, masking tape and plastic sheet.
2. Mask around the damaged area with tape and plastic sheet so paint does not get on the rest of the cabinet.
3. Lightly sand the damaged area to remove rust and dirt.
4. Wipe the area with a cotton cloth dampened with anhydrous ethanol, then wipe it dry.
5. Brush or spray paint evenly over the damaged area until it is completely covered.

Note

If the damaged area is large, contact a professional for repair.

7.2 Fire-Protection System Inspection

Danger

Only qualified people may inspect the fire-protection system. A failed fire-protection system can cause injury, death or damage. Use proper fire-detection test equipment, so the smoke and temperature sensors are not contaminated. **Before any fire-detection test, disconnect the fire test terminal in the cabinet.** Otherwise the extinguisher will discharge and damage the equipment.

1. Lift the lever of the fire-detection quick-connect terminal at the top right of the cabinet and pull out the wire below it.
2. Following local fire-protection requirements, test the detectors with a combined smoke and heat tester until the trigger condition is reached.
3. The cabinet's audible and visual alarm should activate. If it does, the smoke and temperature detection is working.

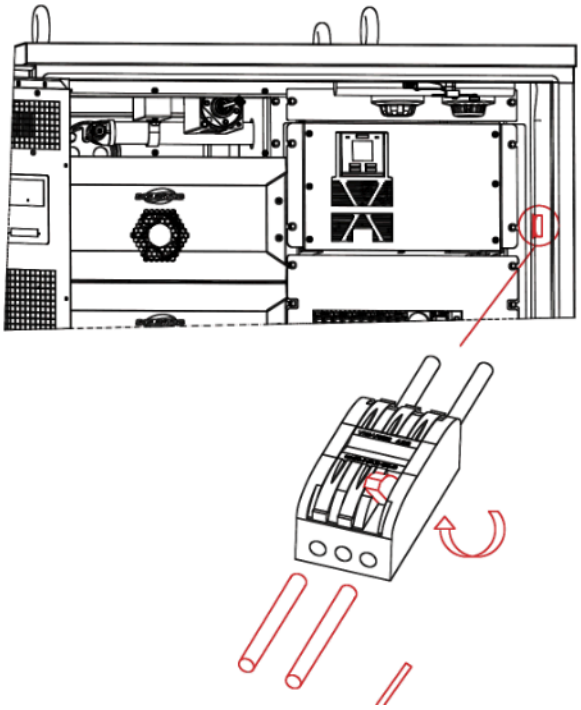


Figure 7.1 Disconnecting the fire test terminal.

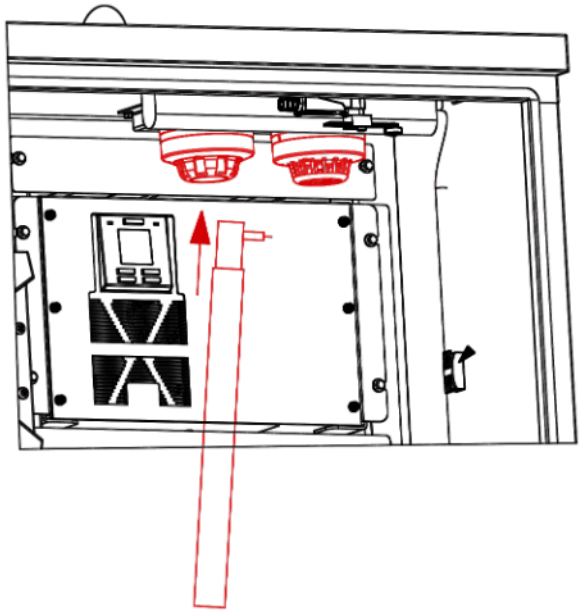


Figure 7.2 Testing the detectors.

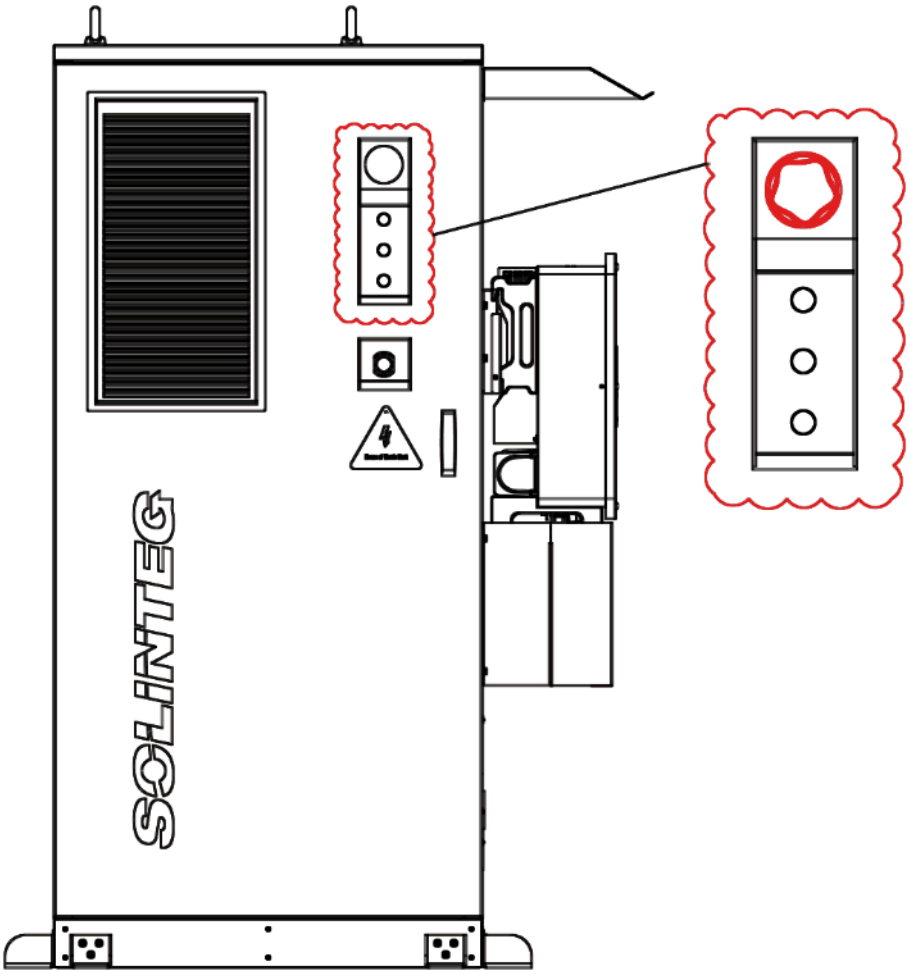


Figure 7.3 Audible and visual alarm.

7.3 Alarms and Troubleshooting

Troubleshooting must be carried out by qualified people in accordance with local requirements. Where the table says to contact AERL support, call 1800 950 865 or email support@aerl.com.au.

Codes starting with **E** are protection faults. The battery stops to protect itself. Codes starting with **I** are alarms and codes starting with **W** are warnings. The system keeps running, but the condition needs attention.

Code	Name	Cause	Action
E400	BMS communication	No communication between the controller and the inverter	1. Check that the correct battery type is selected in the inverter. 2. Check the battery operating status. 3. Check the communication connection between the inverter and the BMS. 4. Check the wiring order (pinout) of the communication cable.
E431	Battery voltage abnormal	The battery voltage measured by the inverter differs from the value reported by the BMS by more than 100 V	1. Check that the power cables are connected correctly. 2. Check the power cables for leakage or damage. 3. Check for battery alarms or protection. 4. Clear the problem, then restart the battery. If it persists, contact AERL support.
E432	Battery parallel number abnormal	The number of battery clusters detected in parallel differs from the configured target	1. Check the target number. If it is wrong, correct it. 2. Check for communication faults between the batteries or clusters and the inverter. Fix them, then re-run the paralleling process. 3. Check that every cluster is powered. If not, switch on the DC breaker of each battery or cluster and re-run the paralleling process. 4. Check every cluster for alarms or protection. Clear them, then re-run the paralleling process. 5. Check that the voltage difference between batteries or clusters is no more than 2.5 V. If not, charge or discharge them until it is, then re-run the paralleling process.
E401	Low SOC	The battery is over-discharged (SOC below 5% or the set value)	1. Check the communication and power connections between the battery and the inverter. 2. Check the inverter's connections to PV, the grid and the generator. 3. Check whether the load is too large.
E402	Low SOH	The battery state of health is too low	1. Check whether the battery has gone a long time without a complete charge–discharge cycle. 2. Check for performance differences between cells. 3. Check for performance differences between batteries.

Code	Name	Cause	Action
E403	BMS sleeping	A threshold was reached and the BMS went to sleep	1. Check that the grid or PV can supply stable power for long enough. 2. Check the power connection between the battery and the inverter.
E404	Battery voltage sensor fault	Possible fault in the battery voltage sensing	1. Restart the battery. 2. If it persists, contact AERL support.
E405	Battery temperature sensor fault	Possible fault in the battery temperature sensing	1. Restart the battery. 2. If it persists, contact AERL support.
E406	Battery internal communication fault	Possible fault in the battery's internal communication circuit	1. Check the communication cable between the battery modules and the controller. 2. Restart the battery. If it persists, contact AERL support.
E407	Input overvoltage	The voltage at the battery input is too high	1. Check that the power cables are not connected to another source. 2. Check the inverter for a fault.
E408	Input reverse polarity	The input polarity is reversed	1. Check whether the power cables are connected the wrong way round. 2. Check the inverter for a fault.
E409	Battery relay fault	Possible fault in the battery relay	1. Restart the battery. 2. If it persists, contact AERL support.
E410	Damaged cell	A cell voltage is below 2.0 V	1. Restart the battery. 2. If it persists, contact AERL support.
E411	Shut-down circuit fault	The system cannot switch off completely	1. Restart the battery. 2. If it persists, contact AERL support.
E412	BMIC fault	The sensing chip is faulty	1. Restart the battery. 2. If it persists, contact AERL support.
E413	Battery internal bus fault	The battery's internal bus is faulty	1. Restart the battery. 2. If it persists, contact AERL support.
E414	Self-test fault	The self-test failed	1. Restart the battery. 2. If it persists, contact AERL support.
E415	Safety function fault	The chip self-test failed	1. Restart the battery. 2. If it persists, contact AERL support.
E416	Insulation fault	Insulation resistance is too low	1. Shut down the whole system. 2. Check the equipment, cables and terminals for damage or breaks. 3. Check for short circuits caused by foreign objects. 4. Clear the problem, then restart the battery. If it persists, contact AERL support.

The following conditions each have three levels: protection (E), alarm (I) and warning (W).

Codes	Name	Cause	Action
E417 **I400** **W400**	Cell undervoltage	A cell voltage is too low	1. Check the inverter for a fault or incorrect setting that prevents forced charging or lets the battery keep discharging. 2. Check whether the external source (PV, grid or generator) has stopped, which prevents forced charging. 3. Charge the battery immediately (for E417, restart the battery first). 4. I400/W400: check for a large voltage difference between cells. If there is one, fully charge and discharge the battery several times (more than 10 cycles). If it persists, contact AERL support.
E418 **I401** **W401**	Cell overvoltage	A cell voltage is too high	1. Check the inverter for a fault or incorrect setting that ignores the charge voltage limit or prevents forced discharging. 2. Check the settings and configuration. 3. Discharge the battery immediately (for E418, restart the battery first). 4. I401/W401: check for a large voltage difference between cells. If there is one, fully charge and discharge the battery several times (more than 10 cycles). If it persists, contact AERL support.
E419 **I402** **W402**	Cluster undervoltage	The battery cluster voltage is too low	1. Check the inverter for a fault or incorrect setting that prevents forced charging or lets the battery keep discharging. 2. Check whether the external source (PV, grid or generator) has stopped. 3. Check whether the load is too large. 4. Charge the battery immediately (for E419, restart the battery first).
E420 **I403** **W403**	Cluster overvoltage	The battery cluster voltage is too high	1. Check the inverter for a fault or incorrect setting that ignores the charge voltage limit or prevents forced discharging. 2. Check the settings and configuration. 3. Discharge the battery immediately (for E420, restart the battery first).
E427 **I410** **W410**	Module undervoltage	A battery module voltage is too low	1. Check the inverter for a fault or incorrect setting that prevents forced charging or lets the battery keep discharging. 2. Check whether the external source has stopped, or the load is too large. 3. Charge the battery immediately (for E427, restart the battery first).

Codes	Name	Cause	Action
E428 **I411** **W411**	Module overvoltage	A battery module voltage is too high	1. Check the inverter for a fault or incorrect setting that ignores the charge voltage limit or prevents forced discharging. 2. Check the settings and configuration. 3. Discharge the battery immediately (for E428, restart the battery first).
E421 **I404** **W404**	Charge undertemperature	The battery is too cold to charge	1. Check that the battery temperature reading is plausible. 2. Check the temperature sensors for a fault. 3. Raise the ambient temperature to warm the battery (for E421, then restart the battery).
E422 **I405** **W405**	Charge overtemperature	The battery is too hot to charge	1. Check that the battery temperature reading is plausible. 2. Check the temperature sensors for a fault. 3. Lower the ambient temperature to cool the battery, or reduce the charge current (for E422, then restart the battery).
E423 **I406** **W406**	Discharge undertemperature	The battery is too cold to discharge	1. Check that the battery temperature reading is plausible. 2. Check the temperature sensors for a fault. 3. Raise the ambient temperature to warm the battery (for E423, then restart the battery).
E424 **I407** **W407**	Discharge overtemperature	The battery is too hot to discharge	1. Check that the battery temperature reading is plausible. 2. Check the temperature sensors for a fault. 3. Lower the ambient temperature to cool the battery, or reduce the discharge current (for E424, then restart the battery).
E425 **I408** **W408**	Charge overcurrent	The charge current is too high	1. Check whether the battery's current limit has been reduced because of temperature, SOC or similar. 2. Check whether the inverter is charging above the current limit. 3. Check or correct the inverter configuration, then restart the battery.
E426 **I409** **W409**	Discharge overcurrent	The discharge current is too high	1. Check whether the battery's current limit has been reduced because of temperature, SOC or similar. 2. Check whether the inverter is discharging above the current limit. 3. Check or correct the inverter configuration, then restart the battery.

Codes	Name	Cause	Action
E429 **I412**	Terminal overtemperature	A terminal temperature is too high	1. Check that the terminal temperature reading is plausible. 2. Check the temperature sensors for a fault. 3. Lower the ambient temperature to cool the terminal, then restart the battery.
E430 **I414**	Leakage current	Leakage current is too high	1. Shut down the whole system. 2. Check the equipment, cables and terminals for damage or breaks. 3. Check for short circuits caused by foreign objects. 4. Clear the problem, then restart the battery.

Code	Name	Cause	Action
I413	Fan fault	A battery module fan is faulty	1. Turn off the battery and check that the fan power cable is connected correctly. 2. Contact AERL support.
W412	BMU offline	A BMU in a battery module is offline	Turn off the battery and contact AERL support.
W413	BMCU offline	The BMCU in the controller is offline	Turn off the battery and contact AERL support.
W414	Module serial number changed	A battery module has been changed	1. Check whether a battery module has been removed or added. 2. Check that all modules had the same SOC and voltage when they were added. 3. Contact your installer or AERL support to confirm and clear the warning.
W415	Cluster voltage change	The cluster voltage changed too much within 2 s	1. Check that the power cables are connected correctly. 2. Check for abnormal changes in voltage and SOC. 3. Clear the problem, then restart the battery. If it persists, contact AERL support.
W416	Cluster voltage difference	There is a large voltage difference between clusters	1. Check that the power cables are connected correctly. 2. Check for abnormal changes in voltage and SOC. 3. Check that every cluster has the same battery model and number of modules. 4. Clear the problem, then restart the battery. If it persists, contact AERL support.
W417	Module voltage difference	There is a large voltage difference between battery modules	1. Check that the power cables are connected correctly. 2. Check for abnormal changes in voltage and SOC. 3. Clear the problem, then restart the battery. If it persists, contact AERL support.

Disposal and Support

Disposal, technical support

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8.1 Disposal

The cabinet contains lithium-ion batteries. Do not dispose of it in general waste. Dispose of the cabinet and its batteries through a licensed e-waste or battery recycler, in accordance with the requirements of your state or territory environmental regulator. Contact AERL for advice on returning or recycling batteries.

8.2 Technical Support

Contact AERL for help with installation, commissioning, alarms, warranty and spare parts for the All-In-One in Australia.

AERL technical support

- **Phone:** 1800 950 865
- **Email:** support@aerl.com.au
- **Web:** aerl.com.au
- **Address:** AERL, 1/75 Bluestone Circuit, Seventeen Mile Rocks QLD 4073, Australia

When you contact AERL, have the following ready:

- the All-In-One model (AIO-25K to AIO-50K), and the cabinet model and serial number from the rating plate
- the inverter model, serial number and firmware versions (in the IntegHub app, under device details)
- the alarm or fault codes shown, and when they occurred
- a short description of the problem and what you have already checked
- photos of the installation and indicators, if relevant.

MANUFACTURED BY SOLINTEG
SUPPLIED AND SUPPORTED IN AUSTRALIA BY AERL

Australian Energy Research Laboratories

ADDRESS

1/75 Bluestone Circuit
Seventeen Mile Rocks QLD 4073
Australia

CONTACT

sales@aerl.com.au
support@aerl.com.au

aerl.com.au

Phone
1800 950 865