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USER MANUAL

Solinteg M2HT 25–50 kW Hybrid Inverter

Three-Phase High-Voltage Hybrid Inverter



M2HT-25K · 29.9K · 30K · 40K · 50K

User Manual

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AERL.COM.AU

AUSTRALIAN EDITION

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Revision	Effective	Audience	Power
1.0.2 (Australian edition)	11 / 2026	Licensed installers	25–50 kW, three-phase

PV input	Battery	Enclosure	Format
4 MPPT, up to 950 V	HV LFP, 150–840 V, 150 A	IP66, −30 to 60 °C	A4 · 77 pages

About This Manual

This manual covers the installation, electrical connection, commissioning, operation, maintenance and troubleshooting of the Solinteg M2HT 25–50 kW three-phase high-voltage hybrid inverter (the "inverter" in this manual). It applies to these models:

Model	Rated power
M2HT-25K-150	25 kW
M2HT-29.9K-150	29.9 kW
M2HT-30K-150	30 kW
M2HT-40K-150	40 kW
M2HT-50K-150	50 kW

Who This Manual Is For

This manual is for licensed electrical workers who install and maintain the inverter, and for system owners. Anyone installing, maintaining or troubleshooting the inverter must:

- be trained in installing and commissioning electrical systems, and in managing their hazards
- know this manual and the other system documents
- know the standards and regulations that apply on site. In Australia these include AS/NZS 3000, AS/NZS 4777.1, AS/NZS 4777.2, AS/NZS 5033 and AS/NZS 5139
- 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 inverter.

Safety Symbols

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.

Caution

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. Notes are not safety warnings.

About This Edition

This is AERL's Australian edition of the Solinteg M2HT 25–50K 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. Download the latest edition from aerl.com.au.

The warranty for this inverter is set out in the Solinteg M2HT Warranty, available from AERL.

Safety Instructions

Warranty exclusions, personal safety, electrical safety

01

1.1 Warranty Exclusions

Read this manual before you transport, store, install, operate or maintain the inverter, and follow its safety instructions and the labels on the equipment. The warranty does not cover damage caused by:

- improper transport, storage, installation or use
- installation or use by unqualified or untrained people
- failure to follow this manual and its safety warnings
- operation in an environment, or outside the limits, set out in this manual and the technical specifications
- unauthorised disassembly or modification of the product or its software, or opening the cover and replacing internal components
- lightning, earthquake, fire, storm or other force majeure events
- installation or operation that does not comply with local standards and regulations
- a product that is outside its warranty period.

1.2 Personal Safety

- Only trained, licensed electrical workers may install the inverter.
- Remove watches, bracelets, rings, necklaces and other conductive items before you work on the inverter.
- Never work on live equipment. Sparks and arcs from connecting or disconnecting live cables can cause fire or injury.
- Wear suitable personal protective equipment (PPE).
- Parts of the inverter can exceed 60 °C in operation. Let it cool before touching it.
- Install the inverter where children and animals cannot reach it.

1.3 Electrical Safety

- Follow this manual and make all electrical connections in accordance with local regulations.
- Isolate every supply before installation. Never work on live equipment.
- Connect the protective earth before anything else. When removing the inverter, disconnect the earth last.
- Select cables to suit local regulations and this manual. Connect them securely and tighten screws to the specified torque.
- A damaged cable must be replaced by a qualified person.
- Do not open the inverter's front cover. Opening it or replacing internal components may cause injury or damage and will void the warranty.
- Switch off the battery circuit breaker or main switch before working on the battery terminals. The battery is at high voltage.

Product Description

System overview, appearance, symbols on the inverter

02

The M2HT 25–50 kW is a three-phase hybrid (storage) inverter. It connects a PV array, a high-voltage lithium battery, loads and the grid, and manages the power flow between them.

2.1 System Overview

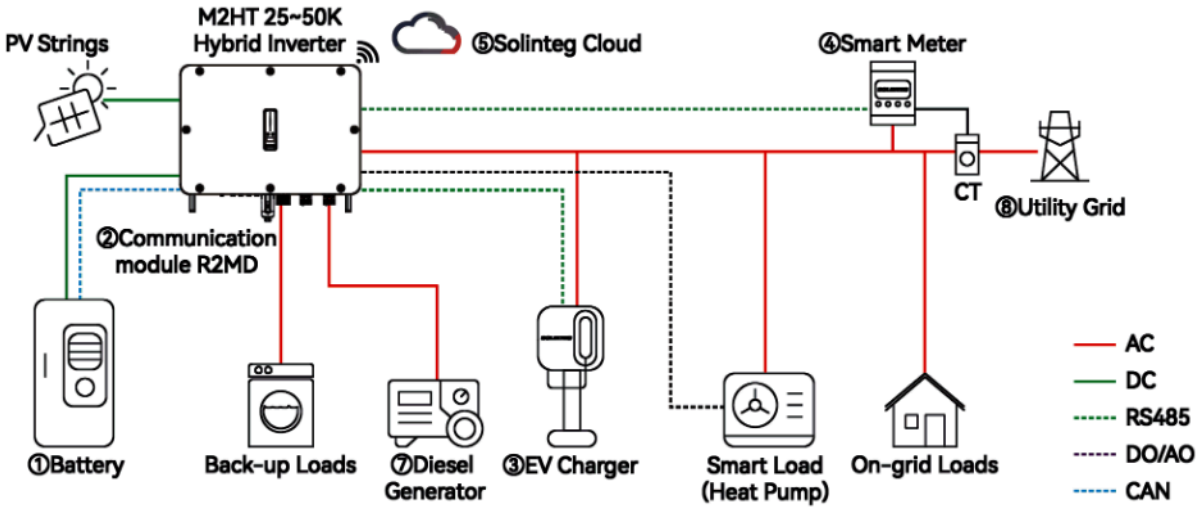


Figure 2.1 Typical system with the M2HT 25–50 kW hybrid inverter.

Equipment	Requirement
Battery	A high-voltage lithium iron phosphate (LFP) battery with BMS, from Solinteg's compatibility list. See the AERL Compatibility Guide (aerl.com.au).
Communication module	The Solinteg R2MD module, supplied with the inverter.
EV charger	A Solinteg ECA-series charger, if the inverter is to control it.
Smart meter	The Solinteg RMM smart meter, supplied with the inverter.
Monitoring	Solinteg Cloud and the IntegHub app.
Diesel generator	Optional. See the Solinteg M2HT 25–50 kW Paralleling & Generator Guide.

The inverter suits TN-S, TN-C, TN-C-S and TT earthing systems. On a TT system, the N-to-PE voltage should be below 30 V. In Australia, the MEN (TN-C-S) system applies.

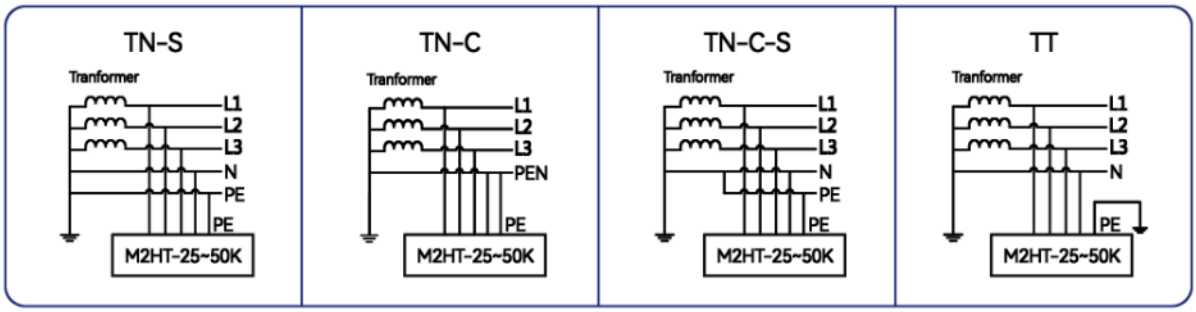


Figure 2.2 Applicable earthing systems.

2.2 Appearance

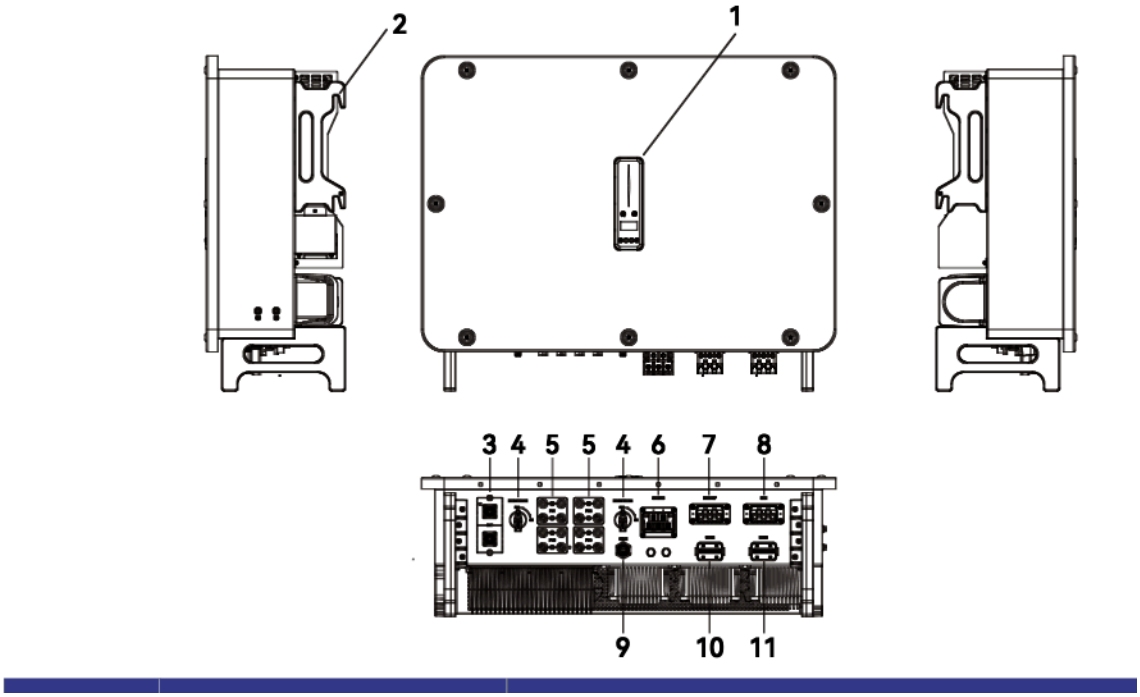


Figure 2.3 Inverter connections.

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 switches	Isolate the PV input
5	DC input terminals	PV connectors
6	On-grid output terminal	On-grid AC cable
7	Back-up output terminal	Back-up AC cable
8	Generator input terminal	Diesel generator AC cable

No.	Name	Description
9	COM1 port	Communication module (R2MD)
10	COM2 port	Multi-function communication connector
11	COM3 port	Multi-function communication connector (blue)

2.3 Symbols on the Inverter

Symbol	Meaning
TÜV, CE and UKCA marks	Certification marks
RCM mark	Complies with Australian and New Zealand electrical safety and EMC requirements
Crossed-out wheelie bin	Do not dispose of in general waste. Recycle as e-waste
Book	Read the instructions before installation
Warning triangle	Danger
Hot surface	Do not touch: hot during operation
10 min	Do not touch internal parts for 10 minutes after disconnecting the grid, battery and PV
Lightning bolt	Risk of electric shock
Earth	Protective earth terminal

2.4 Operation Modes

The inverter has six operation modes: General, Peak Shifting, Feed-in, Backup, Time of Use (ToU) and Off-grid. Set the mode on the inverter display, in Solinteg Cloud or in the IntegHub app.

In General, Peak Shifting, Feed-in, Backup and ToU modes, if the grid fails the inverter switches automatically to off-grid operation and supplies the back-up loads, provided the On/Off-grid switch setting is on. The operation mode itself does not change.

General mode

When there is enough PV, it supplies the loads first, then charges the battery, then exports to the grid (PV → loads → battery → grid). You can set export to 0 W where the network does not allow export. When PV is not enough, the battery discharges to the loads, and the grid makes up any shortfall or takes over when the battery reaches its end SOC.

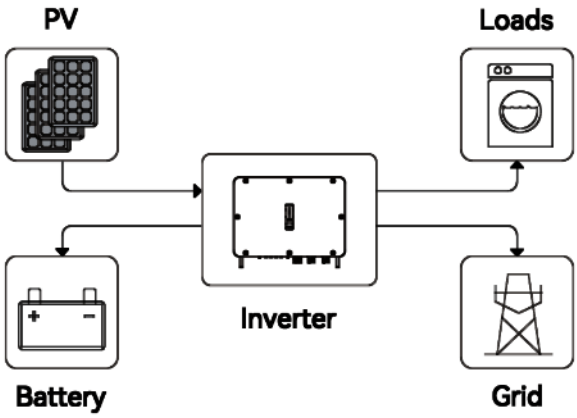


Figure 2.4 PV sufficient.

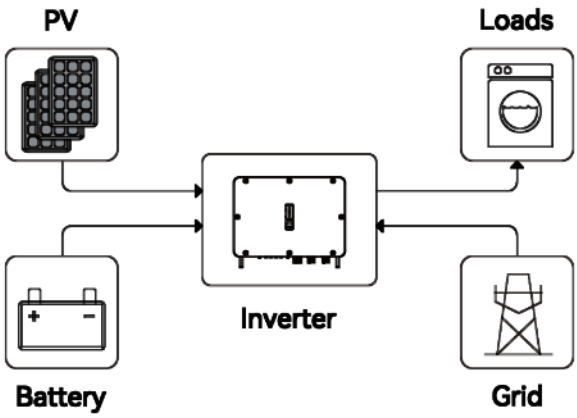


Figure 2.5 PV insufficient.

Peak Shifting mode

EXPmax (kVA) is the maximum power you want to import from the grid. PV supplies the loads, then the battery, then the grid. The loads are supplied from PV first, then from the grid up to EXPmax, then from the battery. Surplus PV or grid power charges the battery.

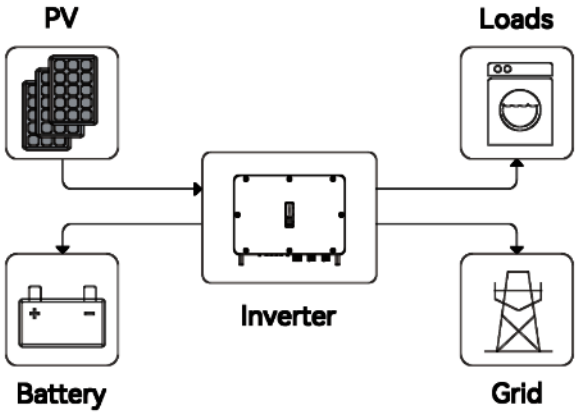


Figure 2.6 PV priority.

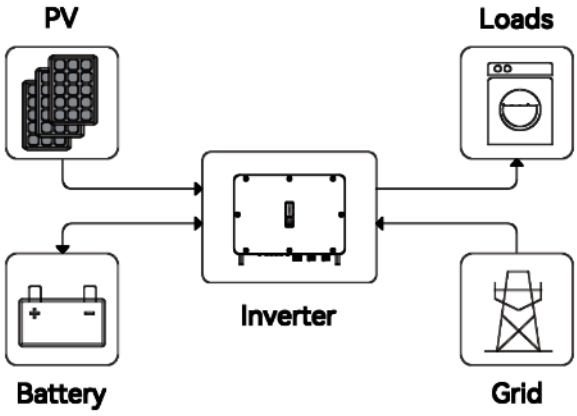


Figure 2.7 Load supply with EXPmax.

> **Caution**
> For Peak Shifting to work, the load above EXPmax must be within the inverter's maximum output power. Otherwise the inverter supplies only its maximum allowed power.

Feed-in mode

When there is enough PV, it supplies the loads first, then exports to the grid, then charges the battery (PV → loads → grid → battery). When PV is not enough, PV and the battery supply the loads together, and the grid makes up any shortfall.

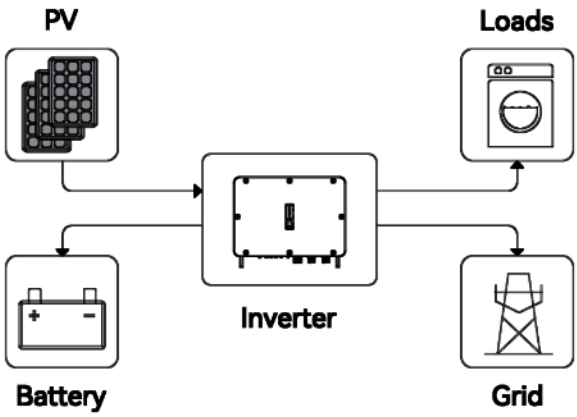


Figure 2.8 PV sufficient.

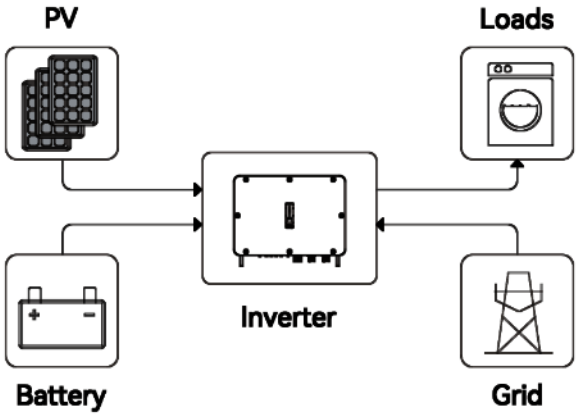


Figure 2.9 PV insufficient.

Backup mode

The inverter charges the battery from PV and the grid until it is full, and any surplus supplies the loads. The battery does not discharge while the grid is available. When the grid fails, PV and the battery supply the back-up loads.

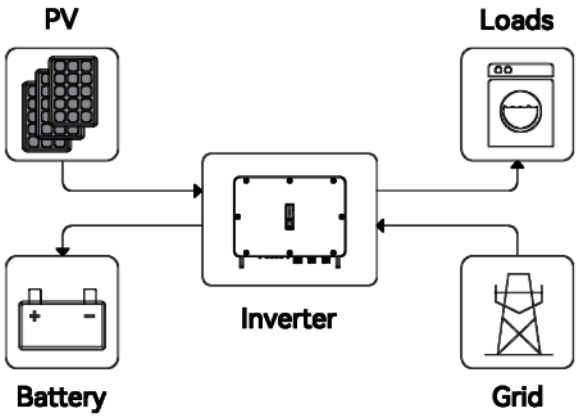


Figure 2.10 Grid available.

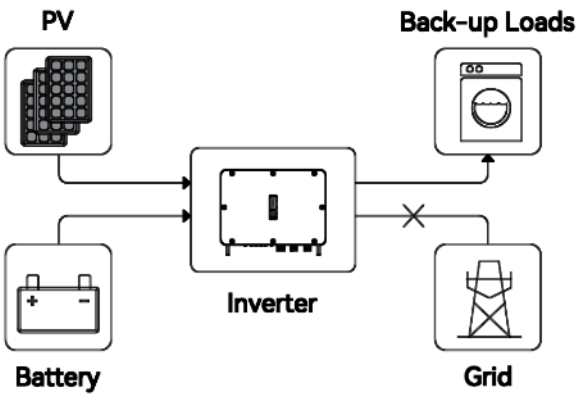


Figure 2.11 Grid failed.

Time of Use (ToU) mode

You set a different mode for each time period. The modes available in a ToU period are General, Battery Charge, PV Charging, Peak Shifting, Feed-in and Battery Discharge. General, Peak Shifting and Feed-in work as described above.

- **Battery Charge:** PV and the grid charge the battery, with an optional charge power limit and end SOC.
- **PV Charging:** only PV charges the battery, with an optional charge power limit and end SOC.
- **Battery Discharge:** the battery discharges, with an optional discharge power limit and end SOC.

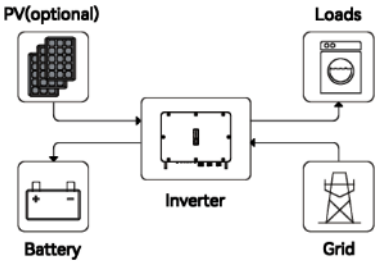


Figure 2.12 Battery charge.

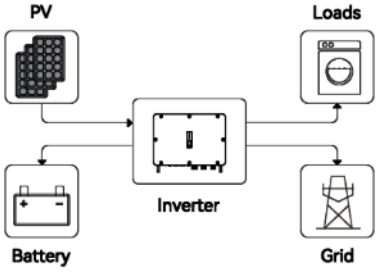


Figure 2.13 PV charging.

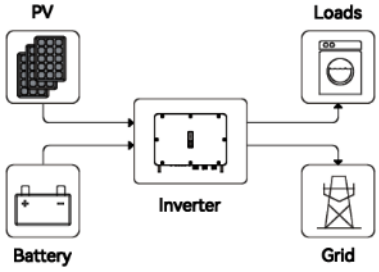


Figure 2.14 Battery discharge.

Off-grid mode

With no grid, PV supplies the back-up loads first and charges the battery with any surplus. When PV is not enough, the battery discharges to supply the back-up loads together with PV.

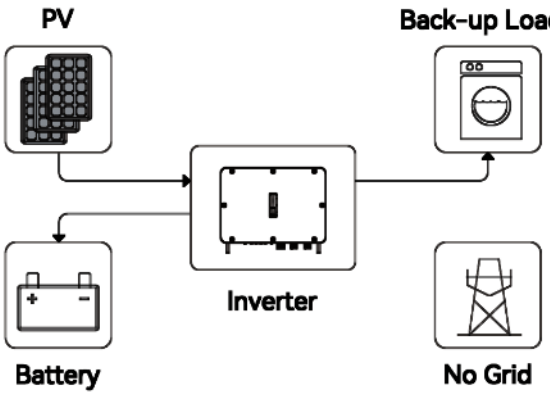


Figure 2.15 PV sufficient.

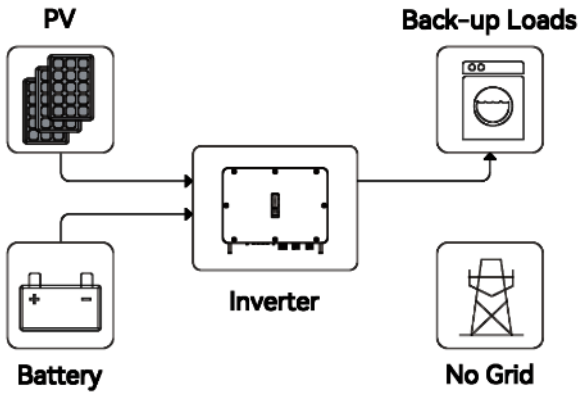


Figure 2.16 PV insufficient.

2.5 Back-Up and Off-Grid Use

Danger

The system is not suitable for life-support or other medical equipment. A power outage could be life-threatening.

Warning

Do not use the back-up supply for equipment or precision instruments that may fail or be damaged by an outage or power fluctuation. Before inspecting or maintaining the back-up circuit, switch off the back-up and on-grid breakers to isolate the loads and the inverter completely.

Caution

The inverter is not a conventional UPS. Never connect the back-up output to the grid. The back-up function will not work. In off-grid operation, the inverter stops the back-up supply when there is no energy available from PV or the battery.

A single inverter normally switches between on-grid and off-grid within 10 ms, but external factors can stop it switching. When using the back-up function:

1. Do not connect loads that need an uninterrupted supply to work reliably.
2. Do not connect more load than the back-up output can supply.
3. The battery current may be limited by temperature and other conditions.
4. Off-grid, the load's continuous power and its starting (inrush) current must both be within the inverter's off-grid capability. Avoid starting the following loads at the same time:

Load type	Examples	Why
High inrush current (motors)	Pumps, chainsaws	The starting current may exceed the inverter's peak capability, even if the running power is within its rating
Fluctuating power	Washing machines, blenders, rice cookers, ovens	The load power changes repeatedly
High harmonic current	Induction cooktops, hair dryers, heat guns, hammer drills	Non-sinusoidal current can distort the voltage

The back-up / off-grid peak output is **1.5 × rated output power for 10 seconds** on all models. If the overload protection operates, the inverter restarts. Repeated overloads lengthen the restart time, up to 2 minutes. Reduce the back-up load or remove loads with very high starting current.

2.6 Power Derating

The inverter reduces its output to protect itself, or as the grid requires, in conditions including:

- high ambient or internal temperature (derating usually starts above 45 °C ambient)
- high altitude
- grid overvoltage
- grid over-frequency.

Transport, Unpacking and Storage

03

Transport and handling, packing list, storage

3.1 Transport and Handling

- Follow the caution labels on the packaging.
- The inverter weighs 89 kg (99 kg packed). Lift it with enough people to meet local manual-handling requirements: at least two, one on each side, holding the handles.
- Transport it in its original box.
- Wear protective gloves. When lifting, hold the handles and the base of the inverter, and keep it level so it cannot fall.

3.2 Packing List

The inverter is tested and inspected before shipping, but can still be damaged in transit. Inspect it on delivery. If anything is damaged or missing, contact AERL or the carrier and send photos.

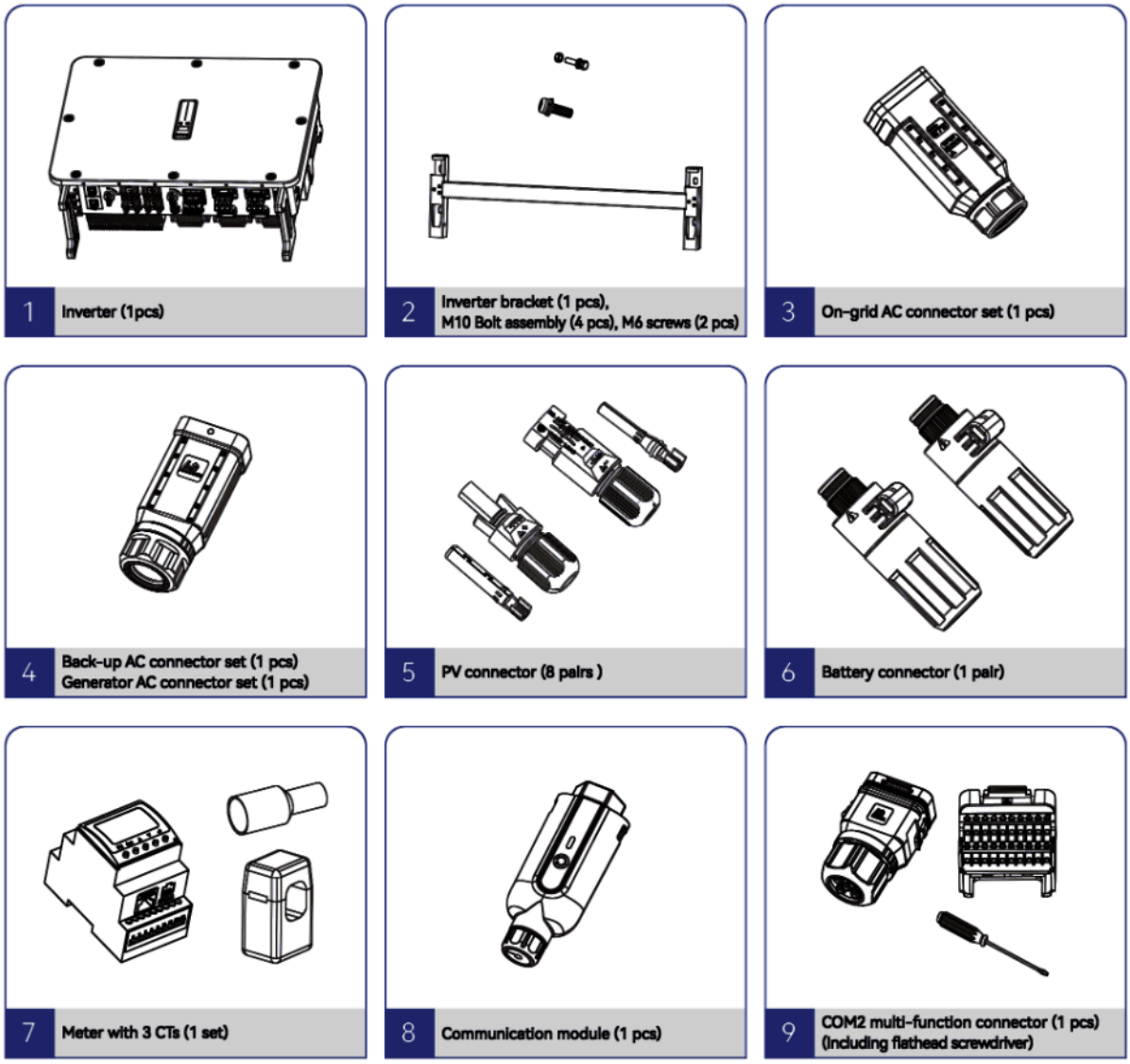


Figure 3.1 Packing list, items 1–9.

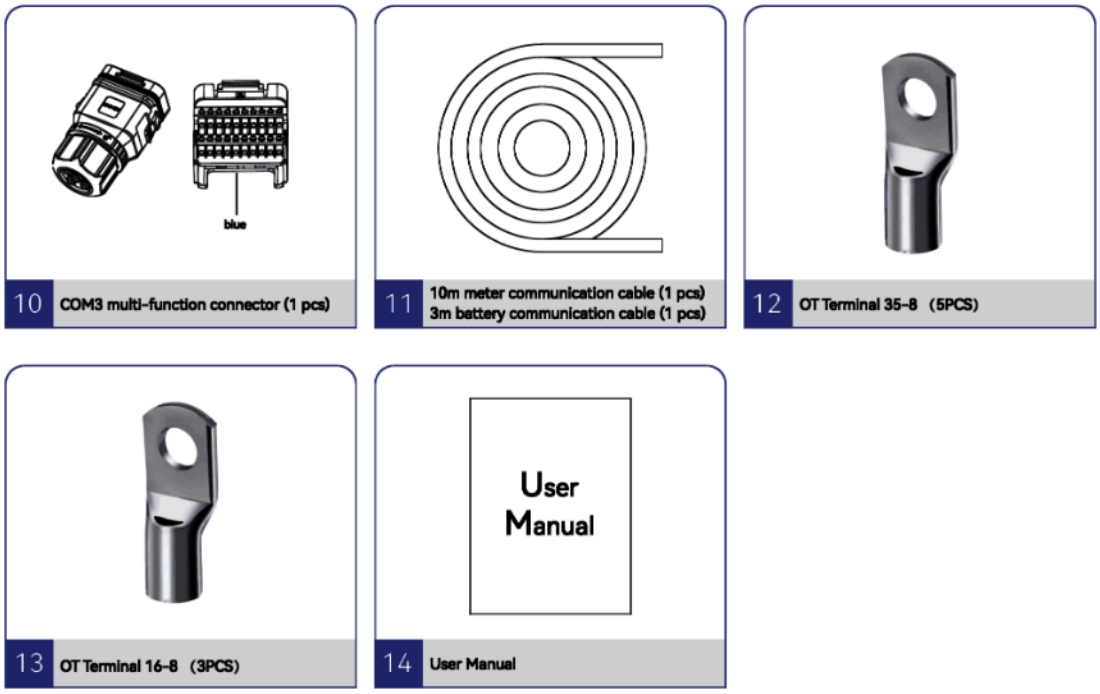


Figure 3.2 Packing list, items 10–14.

No.	Item	Qty
1	Inverter	1
2	Mounting bracket, M10 bolt assemblies, M6 screws	1, 4, 2
3	On-grid AC connector set	1
4	Back-up AC connector set and generator AC connector set	1 each
5	PV connectors	8 pairs
6	Battery connectors	1 pair
7	Smart meter with 3 CTs	1 set
8	Communication module (R2MD)	1
9	COM2 multi-function connector, with flat-blade screwdriver	1
10	COM3 multi-function connector (blue)	1
11	Meter communication cable (10 m) and battery communication cable (3 m)	1 each
12	OT lugs 35-8	5
13	OT lugs 16-8	3
14	User manual	1

3.3 Storage

- Store the inverter in its original packaging, indoors, out of the rain.
- Do not place heavy objects on it, or stack more than three layers.
- Storage temperature −30 to 60 °C; humidity below 90%.

Installation

Location, tools, moving the inverter, mounting the inverter

04

4.1 Location

- The enclosure is IP66, suitable for indoor and outdoor installation.
- Mount the inverter on a wall that can carry its weight (89 kg). Do not mount it on plasterboard or other walls with poor sound insulation.
- Install it at eye level for easy reading of the display and for maintenance, out of reach of children.
- Install it in a well-ventilated location, at −30 to 60 °C and 0–100% humidity, and no higher than 3000 m.
- Protect it from direct sun, rain and snow, for example with an awning.

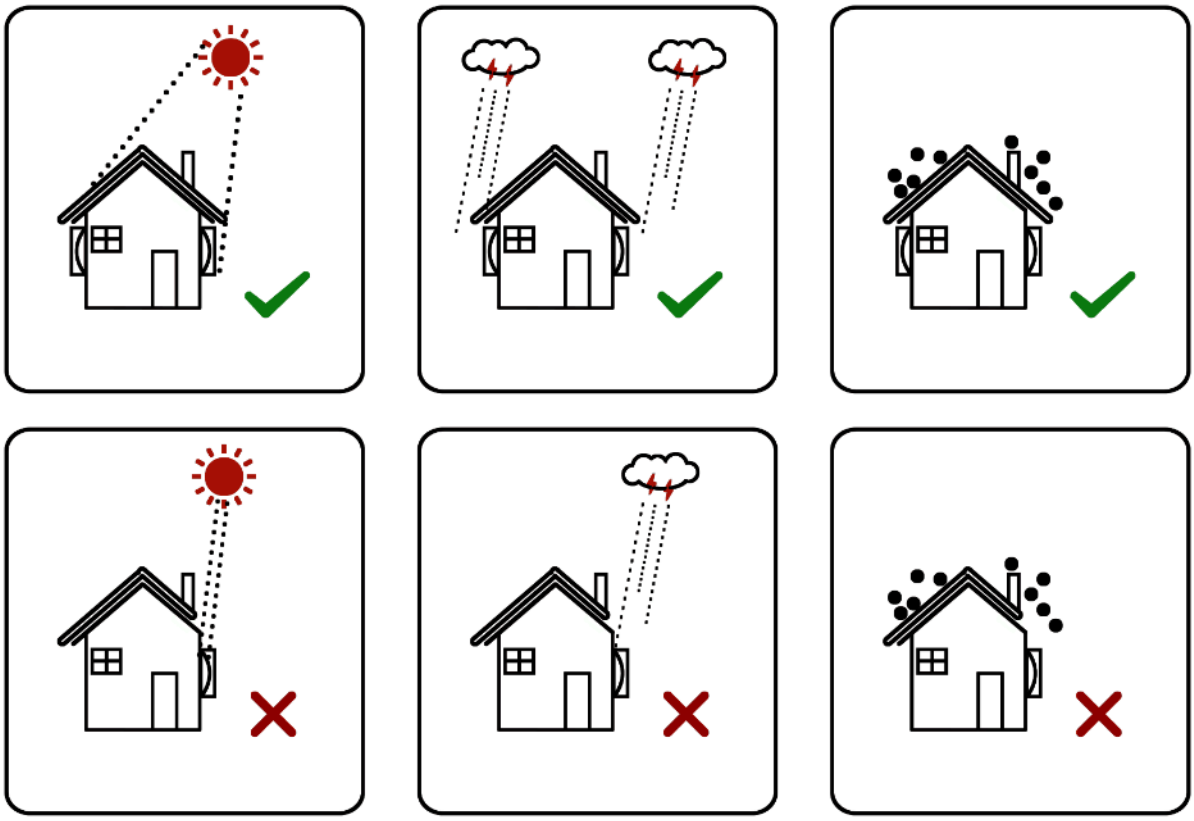


Figure 4.1 Choose a shaded, sheltered location.

Warning

Do not keep flammable or explosive materials near the inverter.

Clearances

Leave enough clearance around the inverter for cooling.

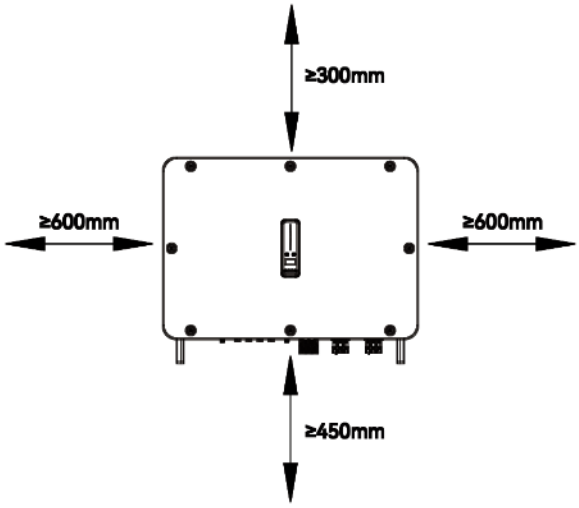


Figure 4.2 Single inverter.

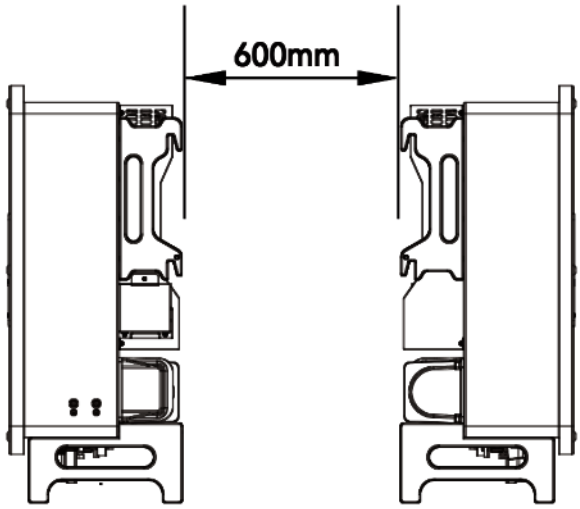


Figure 4.3 Inverters back to back: at least 600 mm.

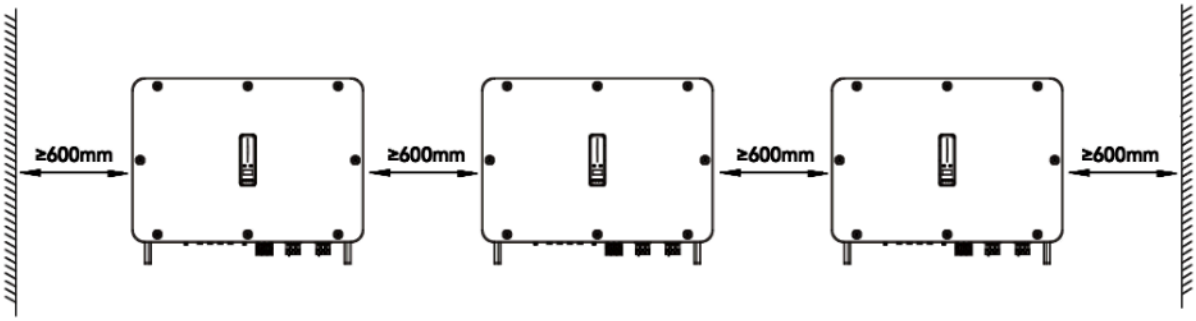


Figure 4.4 Several inverters side by side: at least 600 mm apart.

Mounting angle

Install the inverter vertically. Never install it horizontally, tilted forwards or backwards, or upside down.

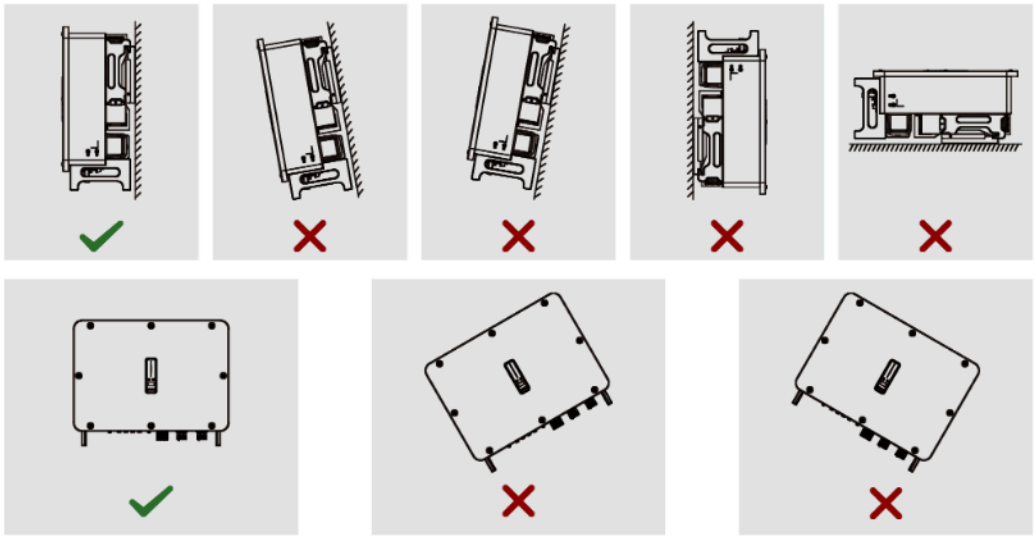


Figure 4.5 Mounting angle.

4.2 Tools

Wear PPE when installing. You will need an electric drill, electric screwdriver, hammer, Phillips screwdriver, tape measure, marker, spirit level, insulated gloves and safety glasses.

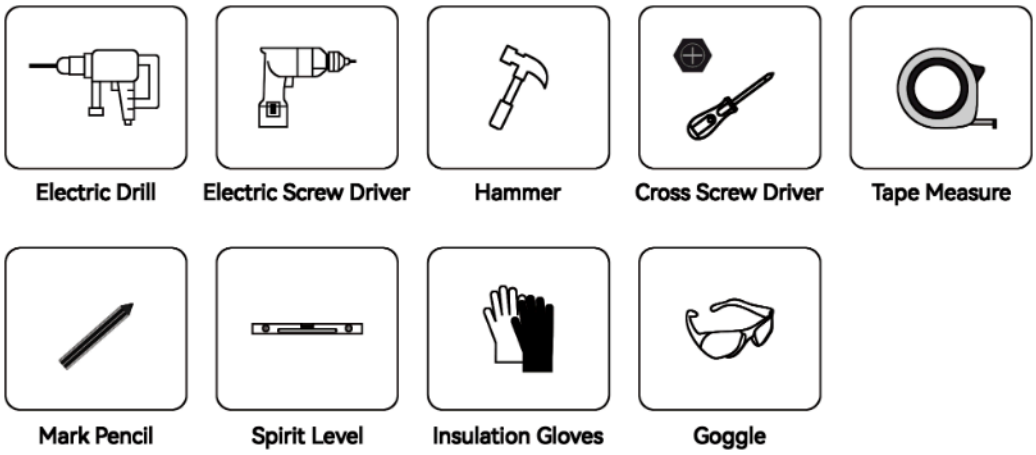


Figure 4.6 Installation tools.

4.3 Moving the Inverter

1	Take the inverter out of its box and move it to the installation position.
2	Fit the lifting handles through the 12 mm holes on each side, and carry the inverter by the handles.

3	To lift it onto the bracket, move the lower handles to the lower lifting position.
4	If the installation position is high, hoist the inverter with lifting gear through the 12 mm holes.

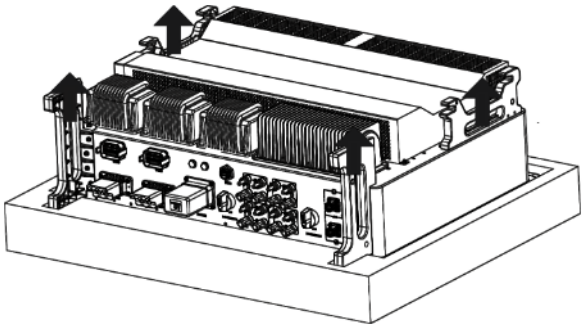


Figure 4.7 Removing the inverter from the box.

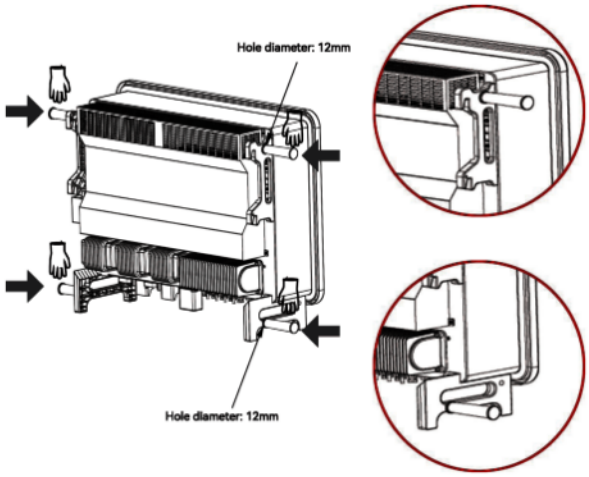


Figure 4.8 Fitting the lifting handles.

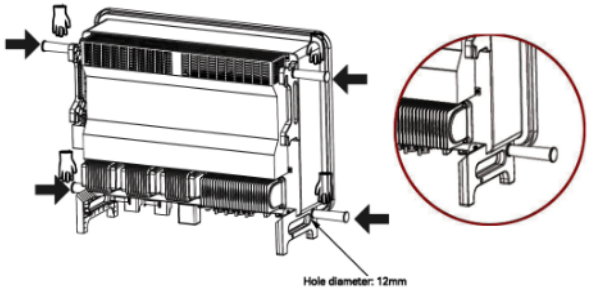


Figure 4.9 Lower handle position for lifting.

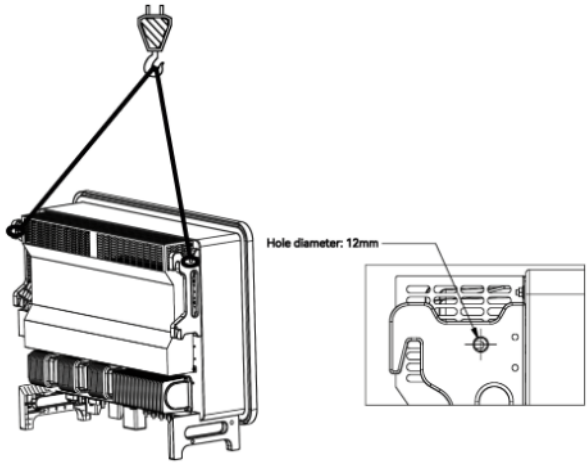


Figure 4.10 Hoisting the inverter.

4.4 Mounting the Inverter

1	Assemble the bracket, level it with a spirit level and mark the drilling positions (830 mm and 45 mm spacings, 130 mm as shown). Drill the holes with a hammer drill.
2	Fix the bracket to the wall with the bolts.
3	Lift the inverter and hang it on the bracket. Secure it with the M6 screws.

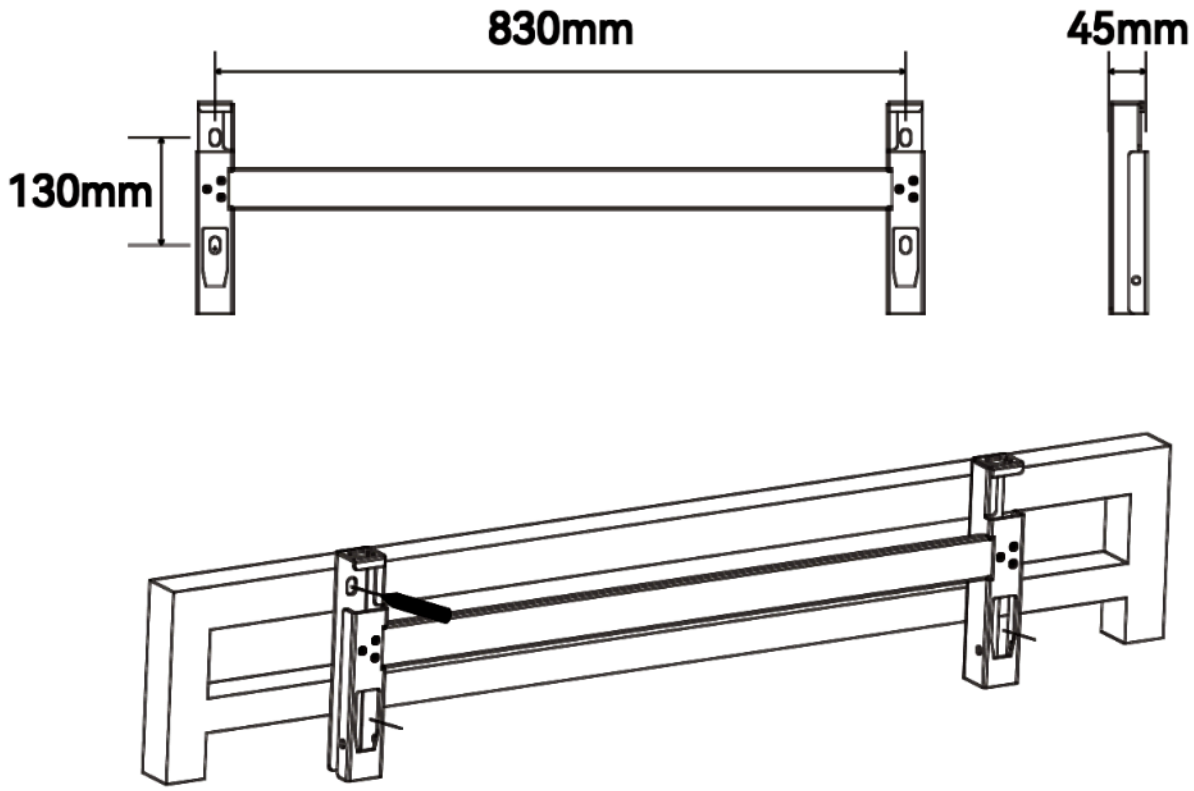


Figure 4.11 Bracket drilling dimensions.

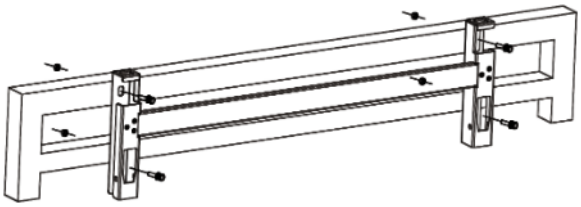


Figure 4.12 Fixing the bracket.

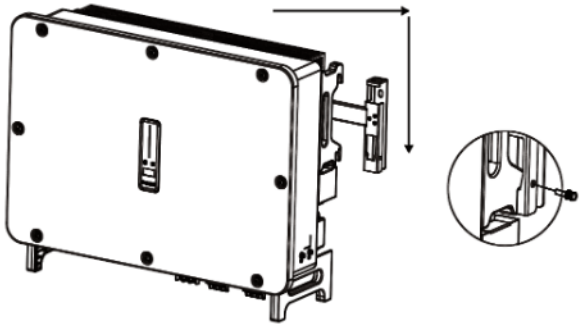


Figure 4.13 Hanging the inverter.

4.5 Earthing

Connect the inverter to the earth bar with a PE conductor. Always connect the PE conductor before any other cable.

> **Danger**
> Never use the neutral as the protective earth for the inverter enclosure. Doing so can cause electric shock.

> **Caution**
> A reliable earth improves surge immunity and EMC performance. In a multi-inverter system, connect every inverter's PE conductor to the same earth bar for equipotential bonding.

1	The external earth terminal is at the lower right of the inverter.
2	Crimp an OT lug onto the PE conductor, and fix it to the inverter's earth stud. Connect the other end to the earth bar.

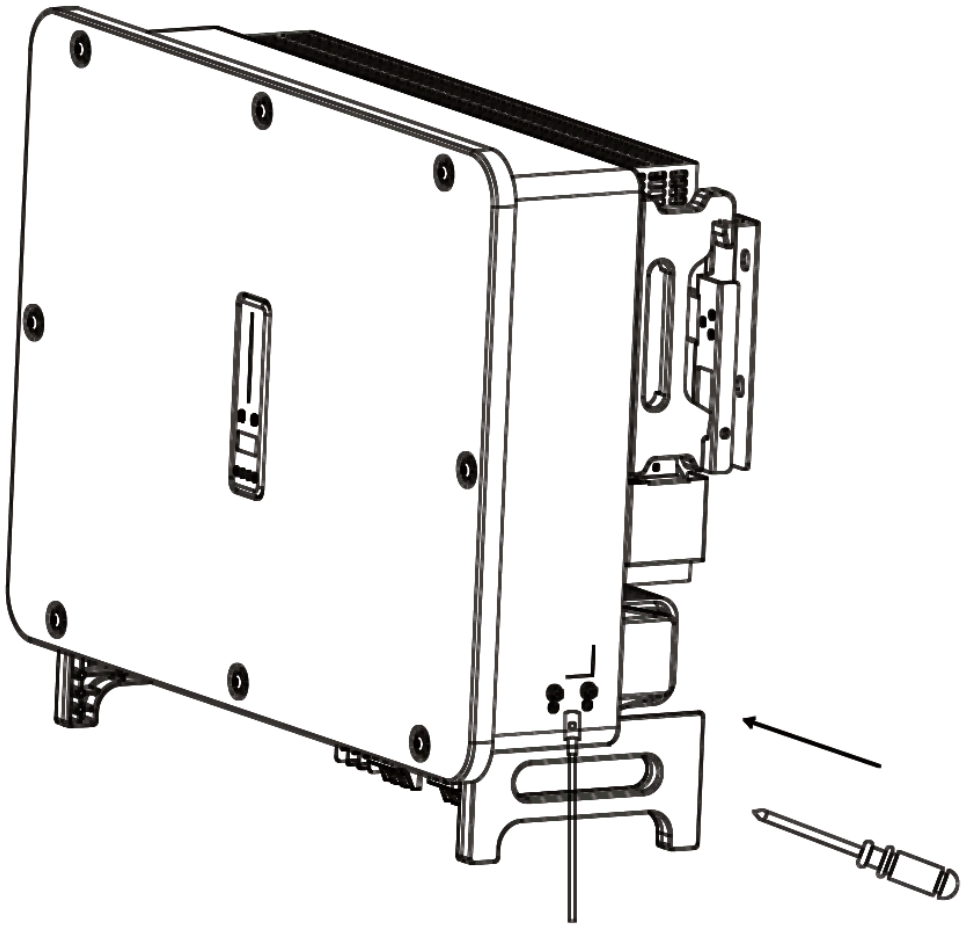


Figure 4.14 External earth connection.

Electrical Connection

05

Safety, wiring diagrams, tools and materials, AC connection

5.1 Safety

Danger

Make sure the AC and DC sides are fully isolated before working on the inverter. In sunlight, the PV array produces dangerous DC voltage. Follow these instructions exactly. The PV string voltage must never exceed the inverter's maximum DC input voltage. Damage caused by PV overvoltage is not covered by the warranty. Never use the neutral as the protective earth for the inverter enclosure.

Warning

Never earth the positive or negative pole of a PV string. This will seriously damage the inverter. The inverter is not suitable for functionally earthed PV arrays as described in AS/NZS 5033. Static electricity can damage the electronics. Take anti-static precautions during installation and maintenance.

Caution

Use only the terminals supplied in the accessory kit. Damage caused by other terminals is not covered. Tighten every cable gland securely. Damage from water or dust entering through a poorly fitted connector voids the warranty. If the back-up load is too large, the inverter protects itself and stops its AC output. Remove some of the load and restart the inverter.

5.2 Wiring Diagrams

The diagrams show the structure of a system with the RMM smart meter. Install and wire every system in accordance with local standards.

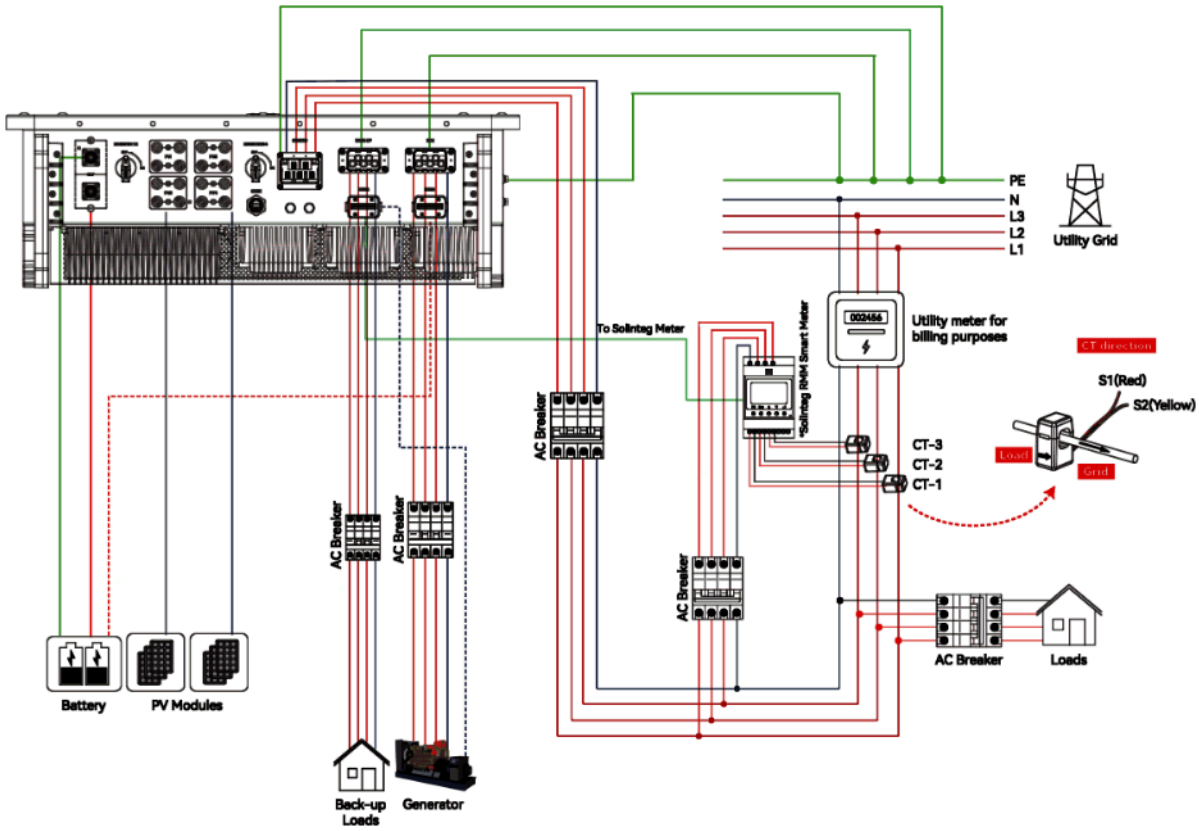


Figure 5.1 System connection diagram.

Australia and New Zealand

In Australia and New Zealand, the neutral must not be isolated or switched, and the neutrals of the grid side and the back-up side must be connected together in accordance with AS/NZS 3000. Otherwise the back-up function will not work.

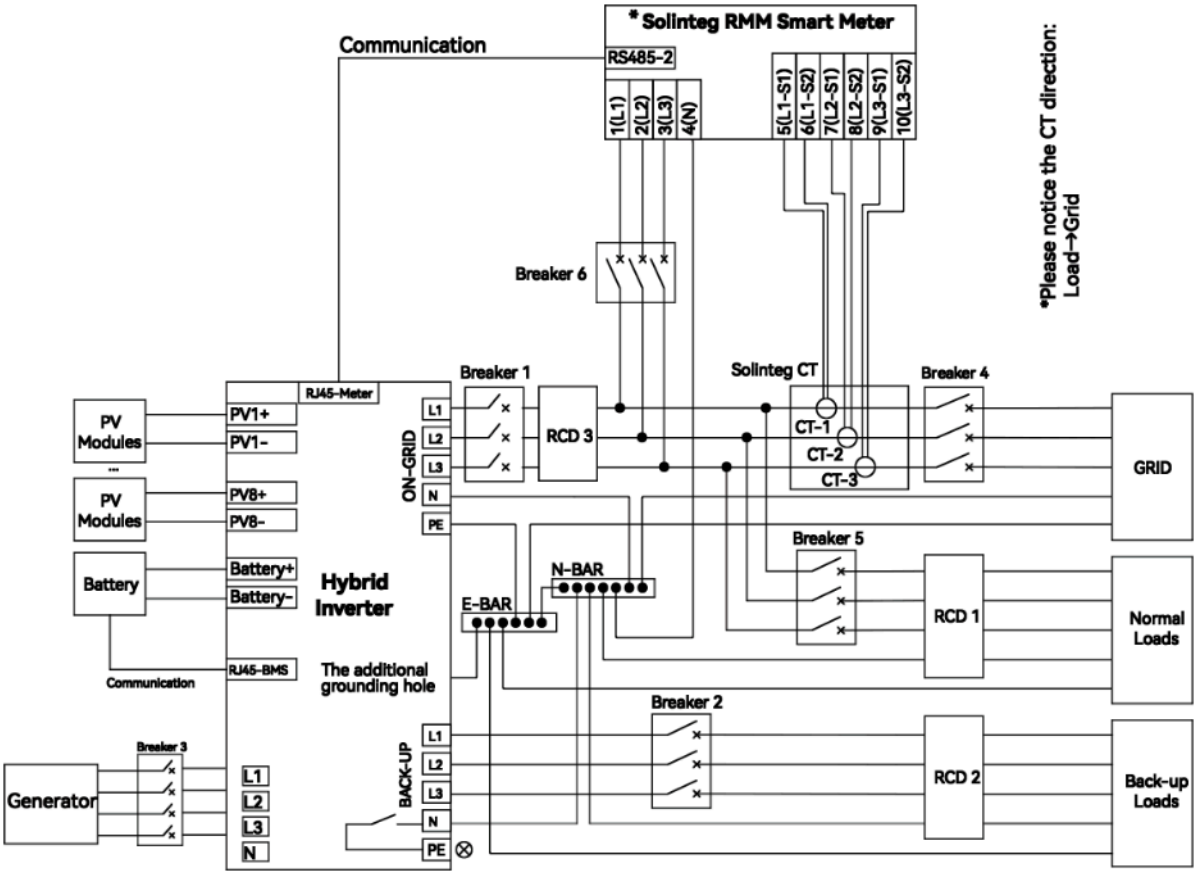


Figure 5.2 Electrical connection diagram for Australia and New Zealand.

Breakers and RCDs

The inverter has built-in residual current monitoring and disconnects from the grid if the fault current exceeds its limit. If an external RCD is required, use type A. The table gives recommendations; select devices to suit the site and local regulations.

Device	M2HT-25K	M2HT-29.9K / 30K	M2HT-40K	M2HT-50K
Breaker 1 (on-grid)	100 A / 400 V AC	125 A / 400 V AC	160 A / 400 V AC	160 A / 400 V AC
Breaker 2 (grid supply)	100 A / 400 V AC	125 A / 400 V AC	160 A / 400 V AC	160 A / 400 V AC
Breaker 3 (back-up)	63 A / 400 V AC	80 A / 400 V AC	100 A / 400 V AC	125 A / 400 V AC
Breaker 6 (meter)	6 A / 400 V AC	6 A / 400 V AC	6 A / 400 V AC	6 A / 400 V AC

Device	M2HT-25K	M2HT-29.9K / 30K	M2HT-40K	M2HT-50K
RCD 1 and RCD 2	30 mA type A	30 mA type A	30 mA type A	30 mA type A
RCD 3	300 mA type A	300 mA type A	400 mA type A	500 mA type A
Conditional short-circuit current	10 kA	10 kA	10 kA	10 kA
Minimum prospective short-circuit current	1 kA	1.25 kA	1.6 kA	1.6 kA

Breaker 4 (main switchboard) is sized to suit the site loads and inverter capacity, and breaker 5 to suit the normal loads. Short-circuit values are to IEC 62477.

N-PE check

Some countries require the back-up neutral to be earthed when the inverter operates off-grid. With the N-PE Check setting on, the inverter links N to PE in off-grid operation and disconnects the link in on-grid operation. In Australia, the MEN link in the switchboard normally provides this. Set N-PE Check to suit the installation design.

5.3 Tools and Materials

You need the inverter accessory kit, and wire strippers, side cutters, crimping tools (including an RJ45 crimper), a multimeter with a DC range above 1100 V, screwdrivers and an Allen socket wrench. Supply AC, DC, communication and earth cables to suit the site.

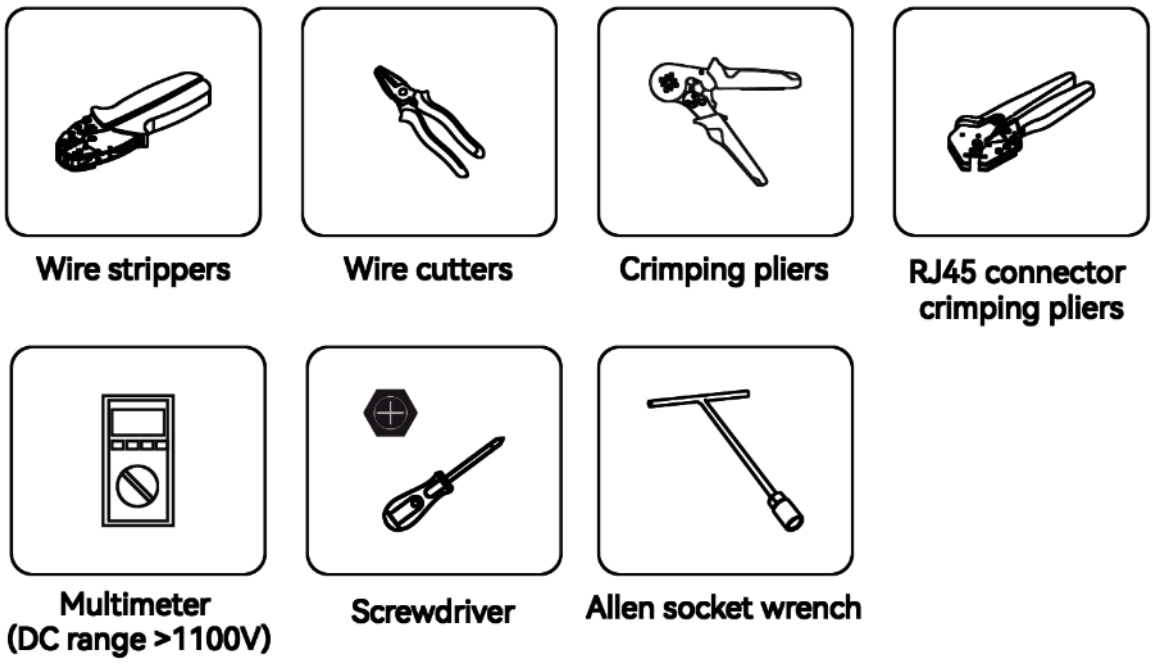


Figure 5.3 Wiring tools.

5.4 AC Connection

> **Warning**
> Isolate every AC and DC supply before connecting the AC cables. Connect the phases in the correct order, as marked on the AC connectors.

> **Note**
> Each of the on-grid and back-up outputs needs its own AC breaker. Do not connect loads directly to the inverter. Fit RCDs on the AC side as local regulations require. The inverter suits three-phase grids of 380/400/415 V, 50/60 Hz. Connect to the grid only with the approval of the local network service provider.

Cables

Cable	Outside diameter	Conductor size
On-grid: 5-core AC cable	20–37 mm	16–50 mm²
Back-up and generator: 5-core AC cable	20–30 mm	10–25 mm² flexible, 10–35 mm² rigid

> **Before you wire the AC side**
> High voltage may be present in the inverter. Check that every cable is dead before connecting it, and do not switch on any AC breaker until all connections are complete.

On-grid AC cable

1. The recommended cable diameter is 20–24 mm. Remove seal insert parts to suit a larger 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. Strip 95–100 mm of the outer sheath, and 20–25 mm of insulation from each L1, L2, L3, N and PE core. We recommend cutting the phase cores 15 mm shorter than N and PE.

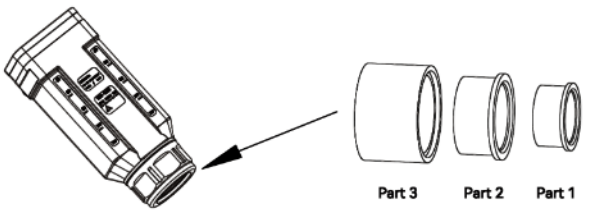


Figure 5.4 Seal insert parts.

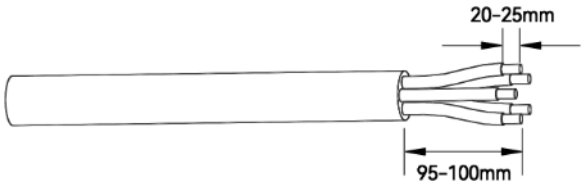


Figure 5.5 Strip lengths.

3	Thread the cable through the locknut, seal and housing, in that order.
4	Crimp the OT lugs onto the cores.
5	Remove the nuts, fit the L1, L2 and L3 lugs in order and tighten to 3.8 ± 0.1 N·m.

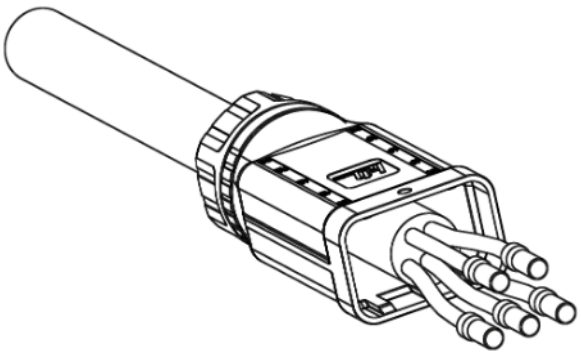


Figure 5.6 Threading the cable.

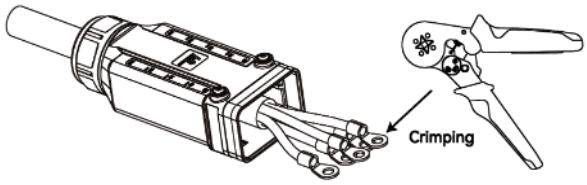


Figure 5.7 Crimping the lugs.

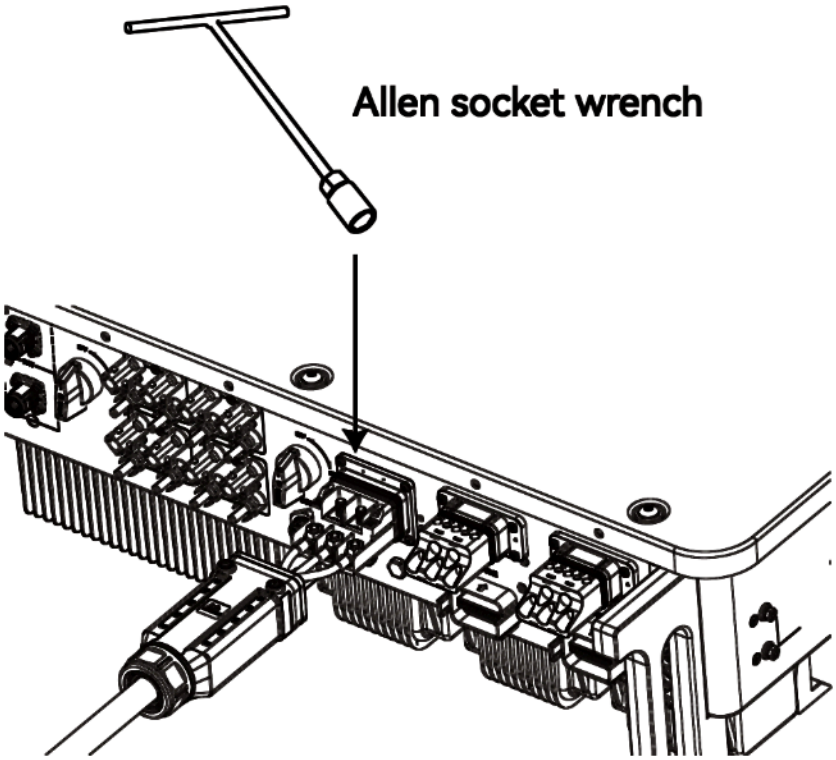
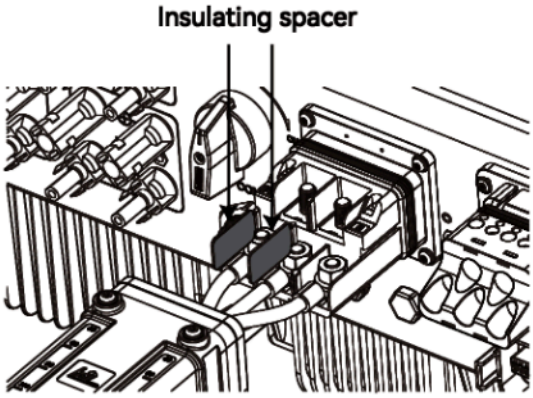


Figure 5.8 Fitting the phase lugs.

6	Fit the insulating spacer into its hole in the connector insert.
7	Fit the N/PE insulating spacer into its hole.
8	Fit the N and PE lugs and tighten to 3.8 ± 0.1 N·m.



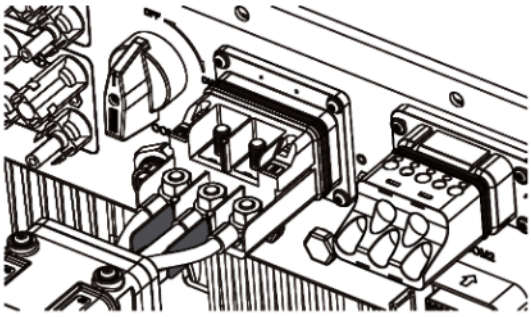


Figure 5.9 Fitting the insulating spacers.

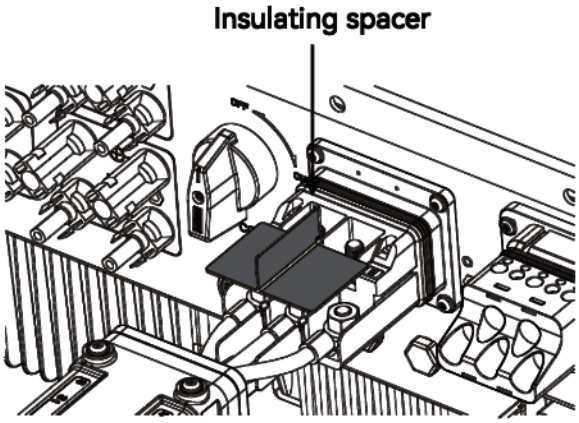


Figure 5.10 N/PE insulating spacer.

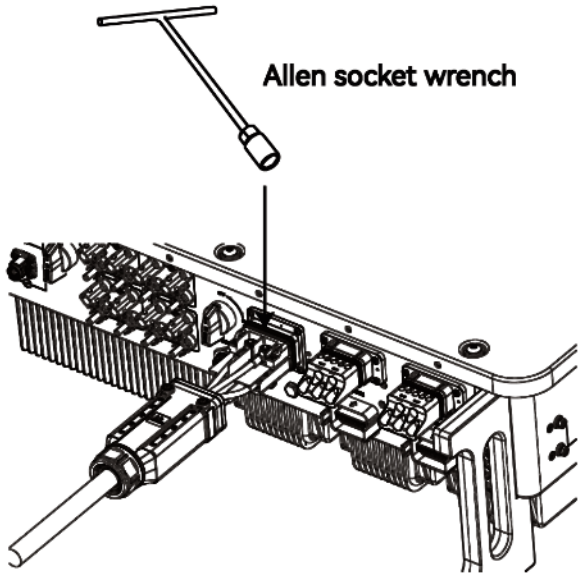


Figure 5.11 Tightening N and PE.

9	Push the housing onto the connector insert and tighten the Phillips screws.
10	Tighten the nut with an open-ended spanner to 10.0 ± 0.1 N·m.

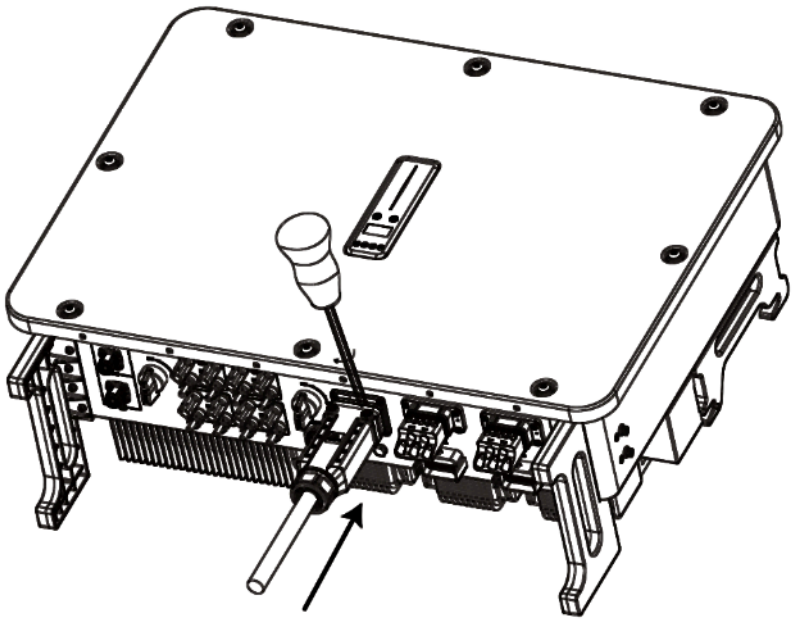


Figure 5.12 Connecting the on-grid cable.

Back-up and generator AC cables

> **Note**
> Do not confuse the back-up and generator cables when connecting them to the inverter.

1. Remove the plug from the AC terminal.
2. The recommended cable diameter is 20–24 mm. If it is larger than 24 mm, remove part 1 of the seal insert.
3. Strip 95–100 mm of the outer sheath, and 15 mm of insulation from each core.

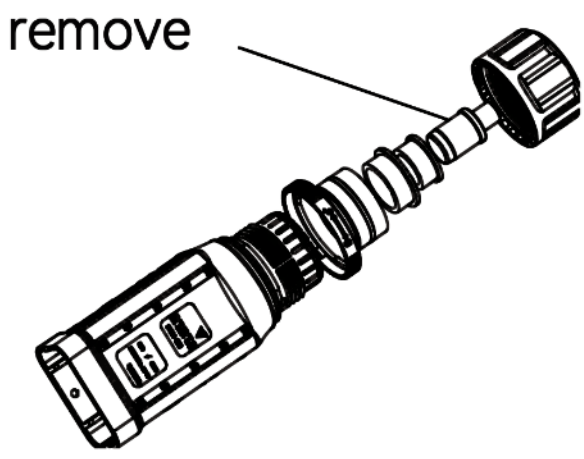


Figure 5.13 Removing the plug.

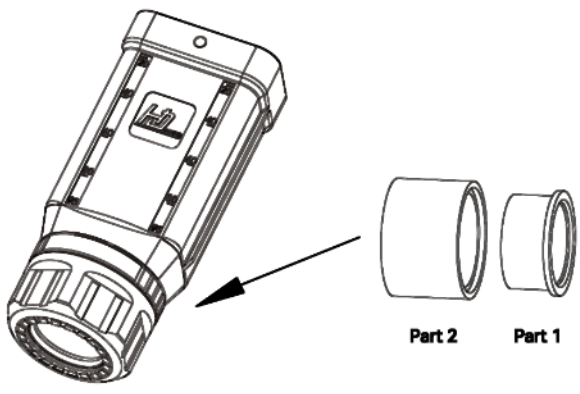


Figure 5.14 Seal insert parts.

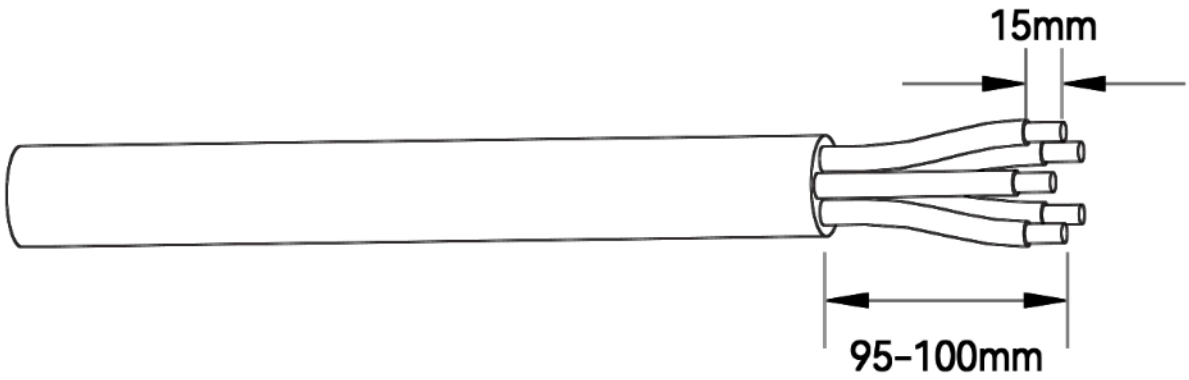


Figure 5.15 Strip lengths.

4 Thread the cable through the locknut and housing. Fit bootlace ferrules to multi-strand cores.

5 Insert the cores into the connector insert in the marked order, checking through the sight hole that each is fully in. Tighten the terminal screws to 5 ± 0.1 N·m.

Warning

Make sure the ferrules are clamped tightly, so they cannot loosen over time.

6 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.

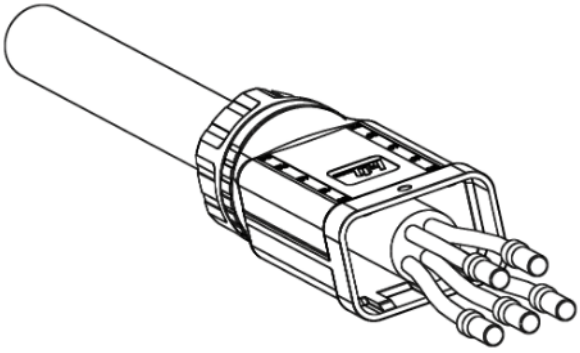


Figure 5.16 Threading the cable.

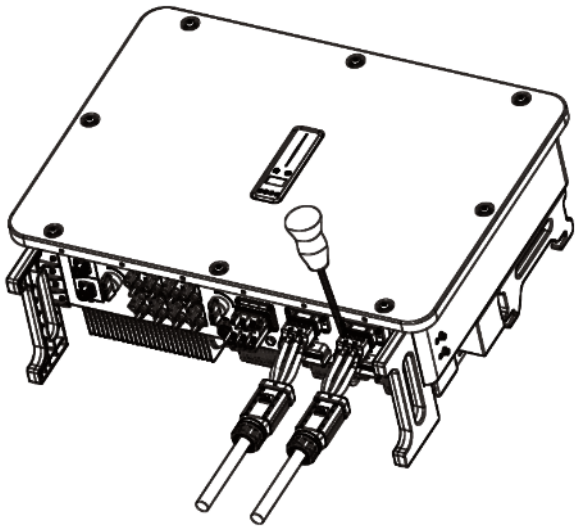


Figure 5.17 Connecting the cores.

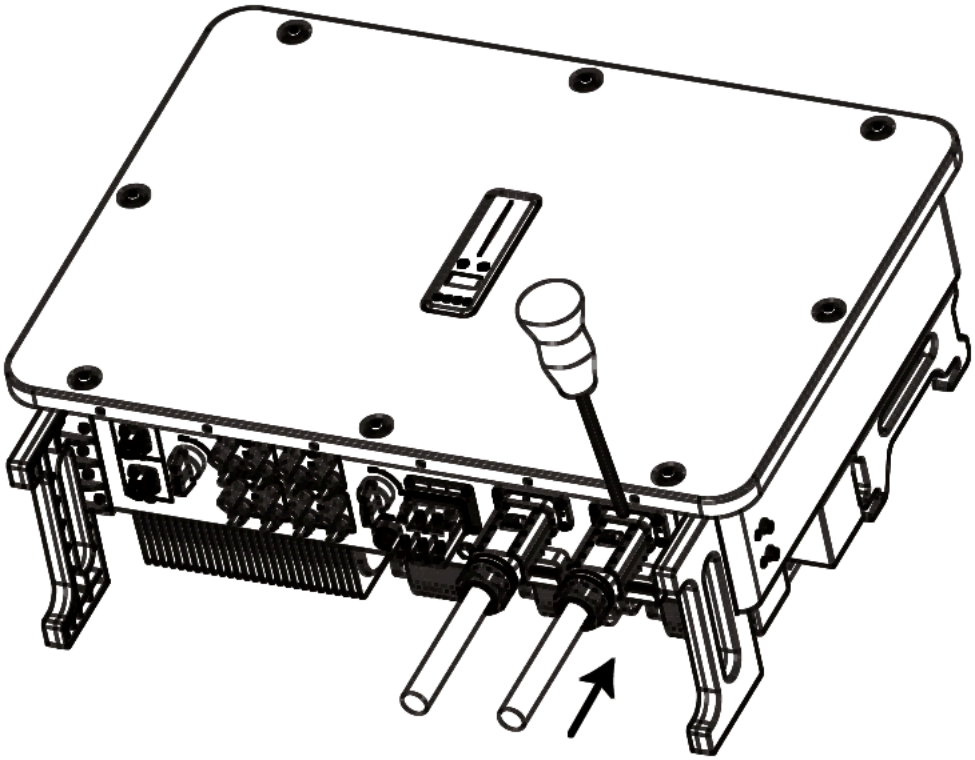


Figure 5.18 Connecting the back-up cable.

5.5 PV Connection

Danger

In sunlight, the PV array produces dangerous DC voltage.

Warning

Check the polarity of each string before connecting it. The maximum operating PV input voltage is **950 V**. Between 950 V and 1000 V the inverter goes to standby. **Above 1000 V the inverter will be damaged.** Make sure the PV connectors are fully mated, to prevent overheating or arcing.

Note

The modules on one MPPT should be the same brand and model, at the same tilt and orientation, with the same string voltage. Otherwise energy yield may be reduced.

Cables and DC isolation

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

Where an external DC isolator is required, it must be certified to AS 60947.3:2018 and AS/NZS IEC 60947.1:2020 in Australia and New Zealand. Select it to suit the inverter's maximum DC short-circuit current (50 A per MPPT).

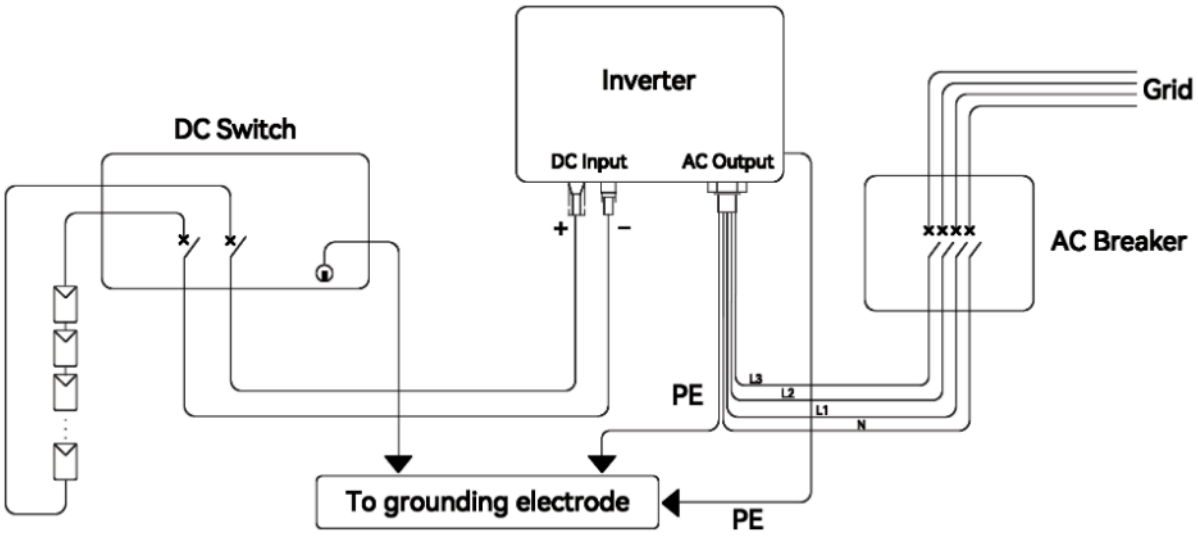


Figure 5.19 External DC isolator arrangement.

Assembling the PV connectors

1	Strip 7 mm of insulation from the DC cable.
2	Take the PV connectors apart.
3	Push the cable through the connector nut into the metal contact, and crimp it with a suitable tool (Phoenix CRIMPFOX-RC 10 recommended). Tug the cable to check the crimp.
4	Push the contacts into the positive and negative connector housings until they lock. Tug the cable to check.
5	Tighten the nut fully with an open-ended spanner to seal the connector.



Figure 5.20 Strip length.



Figure 5.21 Connector parts.

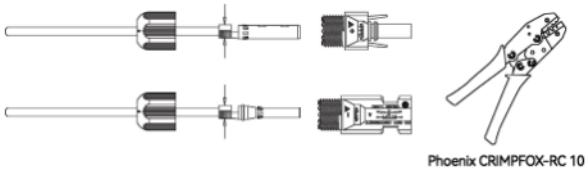


Figure 5.22 Crimping the contact.

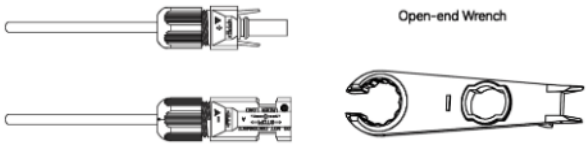


Figure 5.23 Assembling the connector.

Connecting the PV strings

1	Turn the DC switch to OFF.
2	Check the polarity and open-circuit voltage of each string. It must not exceed 950 V.
3	Plug the positive and negative connectors into the inverter's DC inputs until they click.
4	Fit caps to unused PV inputs.

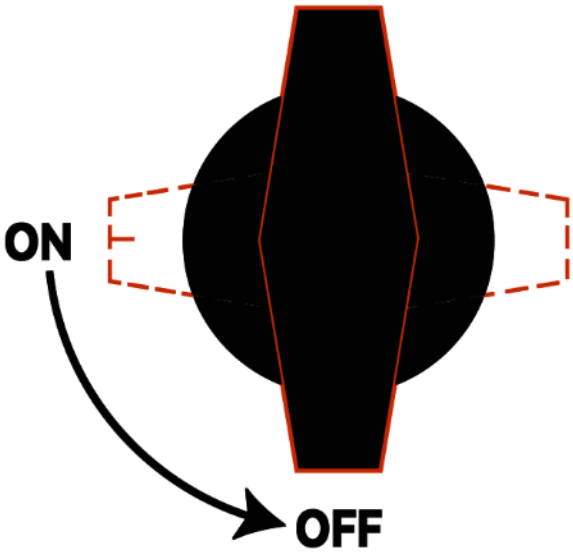


Figure 5.24 DC switch OFF.

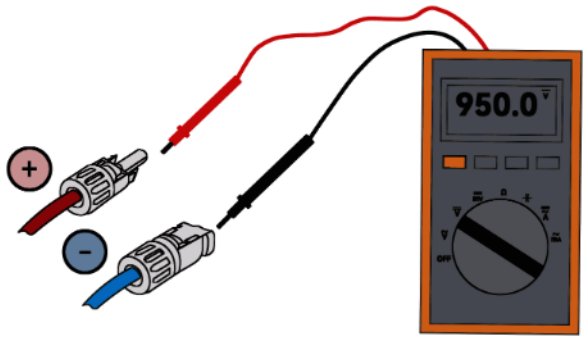


Figure 5.25 Checking the string voltage.

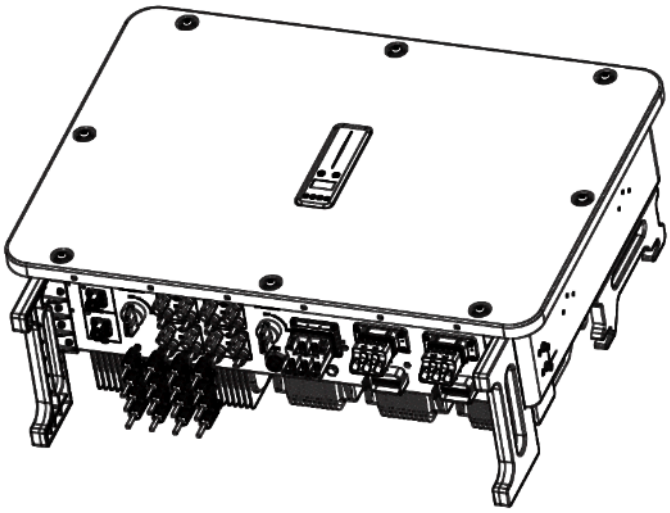


Figure 5.26 Connecting the PV strings.

5.6 Battery Connection

This section covers the inverter side only. For the battery side, follow the battery manufacturer's instructions.

> **Warning**
> Before connecting the battery, switch off the AC breakers and the battery breaker, and turn the inverter DC switch to OFF. Check the polarity before connecting.

> **Caution**
> The maximum battery voltage is **840 V**. Measure the battery voltage before connecting it, and never connect a battery above 840 V. Fit fuses in both the positive and negative battery conductors.

> **Note**
> The inverter cannot operate off-grid without a battery. The inverter works only with batteries on Solinteg's compatibility list: high-voltage LFP batteries with a BMS. See the AERL Compatibility Guide (aerl.com.au).

Cable	Outside diameter	Conductor size
Battery DC cable	13 ± 0.5 mm	50 mm²

1. Strip 16.5 mm of insulation from the battery cable.
2. Take the battery connector apart.

3	Push the cable into the metal contact and crimp it with a hydraulic crimping tool. Tug the cable to check the crimp.
4	Tighten the nut fully with an open-ended spanner to seal the connector.
5	Plug the positive and negative connectors into the inverter's battery terminals until they click.
6	To unplug a connector, press its release with a screwdriver, then pull it out.



Figure 5.27 Strip length.

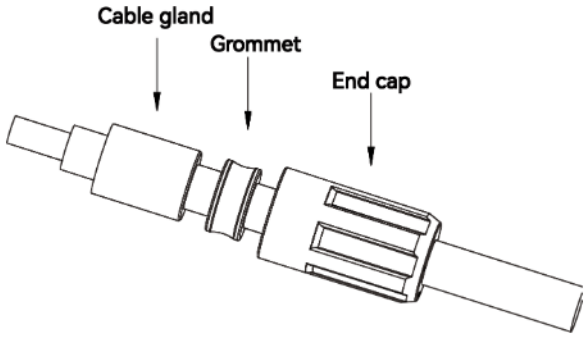


Figure 5.28 Connector parts.

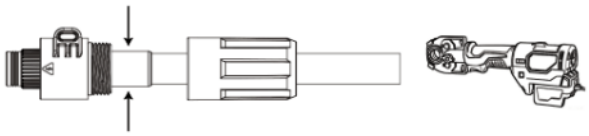


Figure 5.29 Crimping.

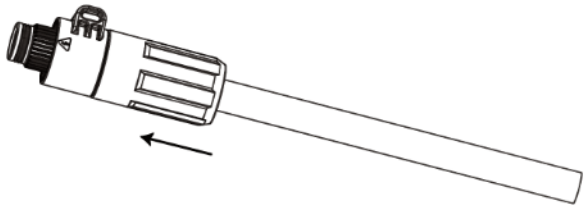


Figure 5.30 Tightening the nut.

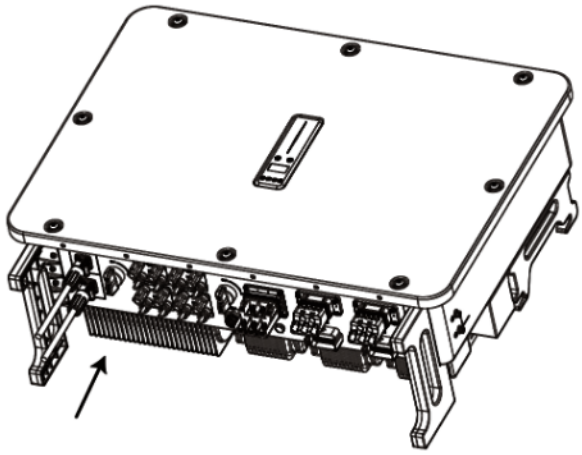


Figure 5.31 Connecting to the inverter.

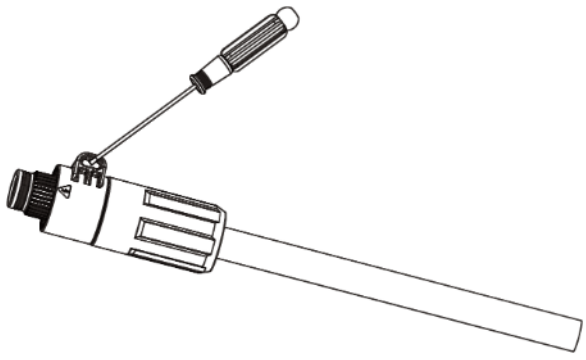


Figure 5.32 Releasing a connector.

The battery communication cable is covered in section 5.9.

5.7 Smart Meter and CTs

The system needs the Solinteg RMM smart meter and CTs for load monitoring, export limiting and power management. Both are supplied with the inverter, with the CTs pre-wired to the meter; do not disconnect them. The CT leads are 2 m long.

Install the meter in the switchboard or another suitable location out of reach of children. Fit the CTs on the phase conductors between the grid and the on-grid loads, with the arrows pointing from the loads to the grid.

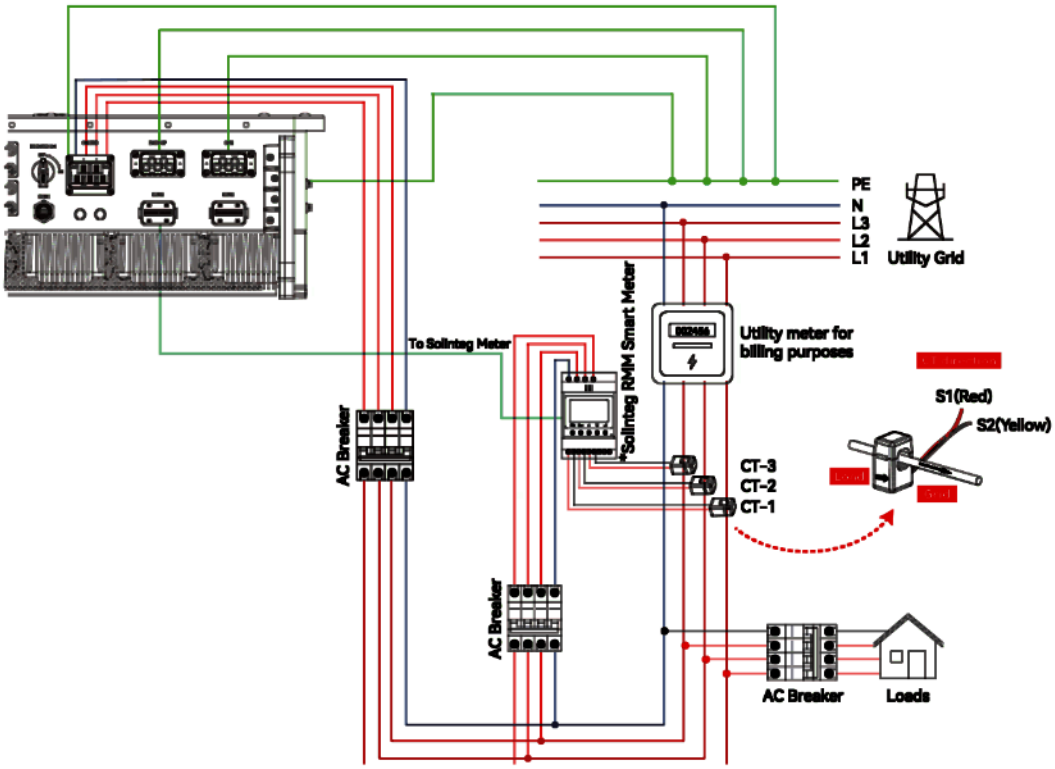


Figure 5.33 Smart meter and CT connection.

> **Note**
> Use only smart meters compatible with Solinteg systems. Fit a circuit breaker in the meter's AC supply. Install each CT with its arrow pointing from the loads to the grid.

Terminal	Signal	Function
1, 2, 3, 4	UL1, UL2, UL3, UN	Grid voltage sensing
5, 6	IL1 S1, IL1 S2	CT 1
7, 8	IL2 S1, IL2 S2	CT 2
9, 10	IL3 S1, IL3 S2	CT 3
11	PE	Earth
RS485-2	A, B	Communication with the inverter

CT model	Inside diameter	Rated current	Ratio
D16-120A	16 mm	120 A	1200:1
D24-200A	24 mm	200 A	2000:1
D35-300A	35 mm	300 A	3000:1

Choose the CT to suit the load and the inverter rating when ordering. The RMM-5A meter needs separately purchased 5 A CTs; see its manual.

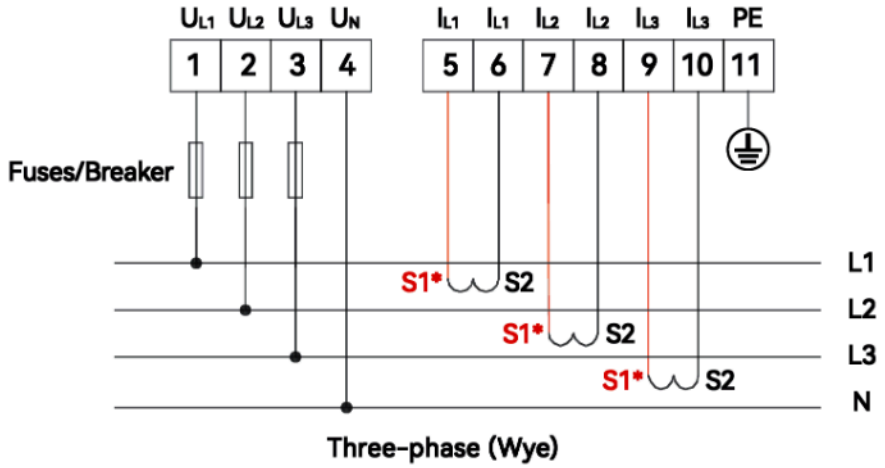


Figure 5.34 Meter terminal wiring, three-phase.

5.8 Communication Module

The inverter works only with the Solinteg R2MD communication module, supplied in the accessory box.

1	Unscrew and remove the cover from the COM1 port at the bottom of the inverter.
2	Push the R2MD fully into the COM1 USB socket, and turn the nut until it clicks.

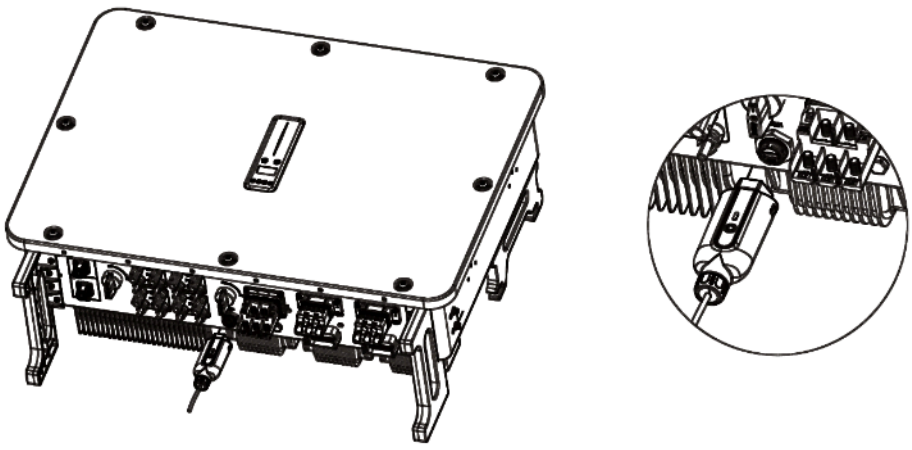


Figure 5.35 Fitting the communication module.

5.9 Communication Ports

The inverter communicates with other devices through the COM2 and COM3 multi-function connectors.

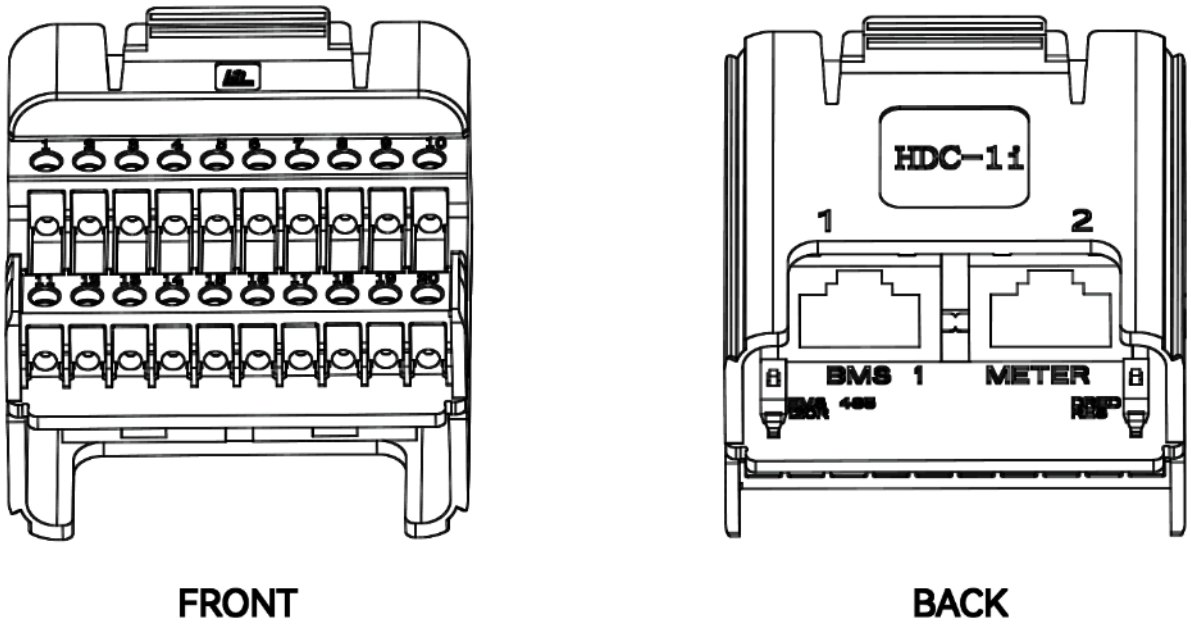


Figure 5.36 COM2 connector, front and back.

COM2 pin	Signal	Function
1–6	REF/0, COM/0, D1/5, D2/6, D3/7, D4/8	DRED connection (Australia and New Zealand)
7, 8	DO3 NO, COM	Reserved
9, 10	BK NC, COM	EDA back-up box
11, 12	DO1 NO, COM	Diesel generator start or smart-load control (optional)
13, 14	DO2 NO, COM	Reserved
15, 16	EMS STOP IN+, IN−	Emergency stop (NO or NC, optional)
17, 18	DI1 IN+, IN−	ATS position input
19, 20	EMS 485 A, B	External EMS
RJ45	BMS 1	Battery communication
RJ45	METER	RMM smart meter
DIP	EMS 485 120R	EMS termination resistor
DIP	DRED RES	10 kΩ DRED detection resistor. Turn OFF when using DRED

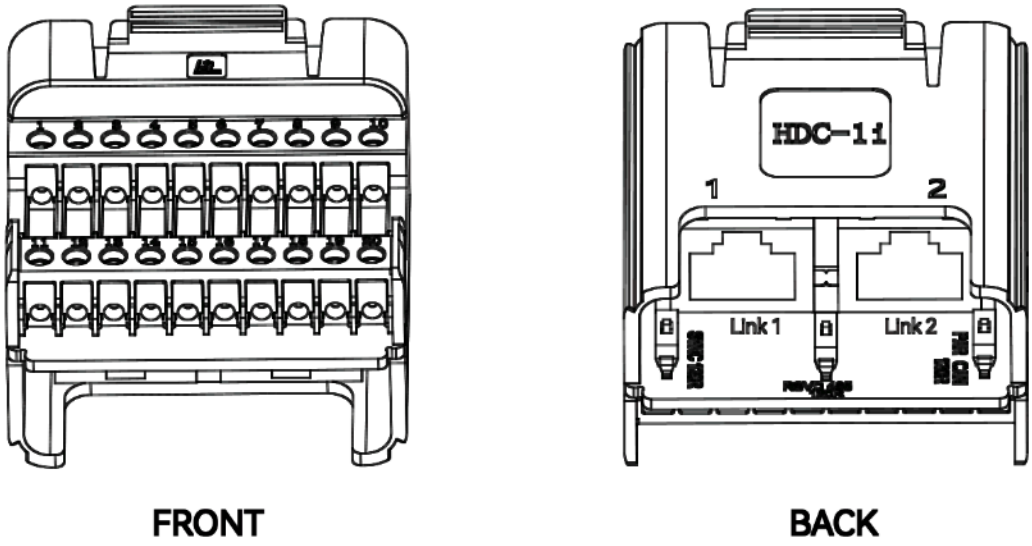


Figure 5.37 COM3 connector, front and back.

COM3 pin	Signal	Function
1, 2	DI2 IN+, IN−	Reserved
3, 4	RSVD 485 A, B	Reserved
5, 6	CPS 12V+, −	12 V output
7, 8	12V+, −	12 V output
9, 10	SVD3, SVD4	Reserved
11–16	CT-L1/L2/L3 S1, S2	Reserved
17, 18	EV 485 A, B	EV charger
19, 20	BMS 2 H, L	Reserved
RJ45	Solink/Link 1 and 2	Parallel communication between inverters, or other devices
DIP	SYNC 120R	Parallel sync termination. ON at the first and last inverter only
DIP	PAR CAN 120R	Parallel CAN termination. ON at the first and last inverter only
DIP	RSVD 485 120R	Reserved

RJ45 pin	Colour	BMS 1	METER	Solink 1 and 2
1	White/orange	—	—	Sync+
2	Orange	—	—	Sync−
3	White/green	Encode_B	—	12V−
4	Blue	CANH_B	—	CANH_P
5	White/blue	CANL_B	—	CANL_P
6	Green	Encode_A	—	12V−

RJ45 pin	Colour	BMS 1	METER	Solink 1 and 2
7	White/brown	CANL_Debug	485 B2	12V+
8	Brown	CANH_Debug	485 A2	12V+

> **Notice**
> COM2 and COM3 look alike. COM3 is blue.

Assembling the connector

1. Unscrew the swivel nut from the connector.
2. Press the release and take out the terminal block.
3. Remove the seal and pass the cable through the gland.

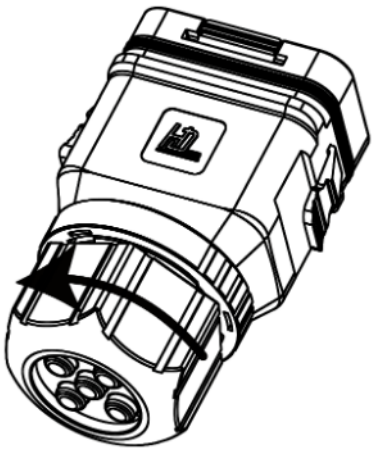


Figure 5.38 Unscrewing the swivel nut.

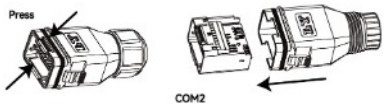


Figure 5.39 Removing the terminal block.

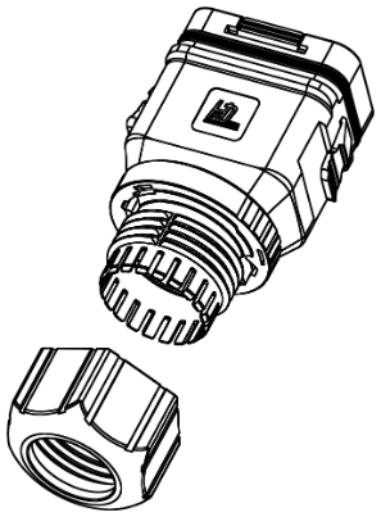


Figure 5.40 Passing the cable through.

Terminal block wiring

1. Pass the cable through the swivel nut and housing. Strip 55 mm of sheath and 8 mm of insulation. Cores 0.5–1.5 mm².
2. For multi-strand cores, twist each core by hand and fit a pin ferrule. Skip this for solid cores.

3	Connect each core to its terminal and tighten to 1.2 ± 0.1 N·m.
4	Tug each core to check it, then push the terminal block into the connector until it clicks.

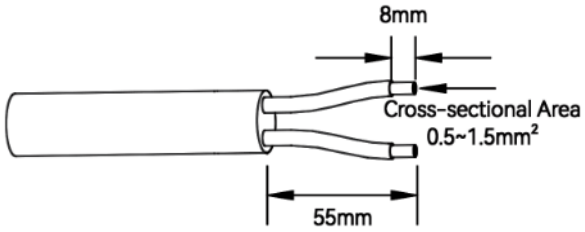


Figure 5.41 Strip lengths.

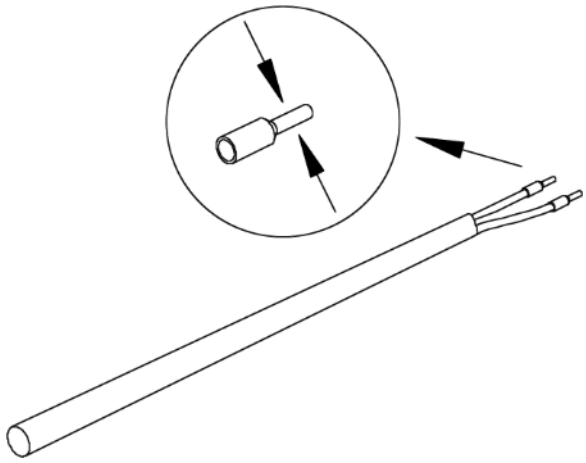


Figure 5.42 Twisting the cores.

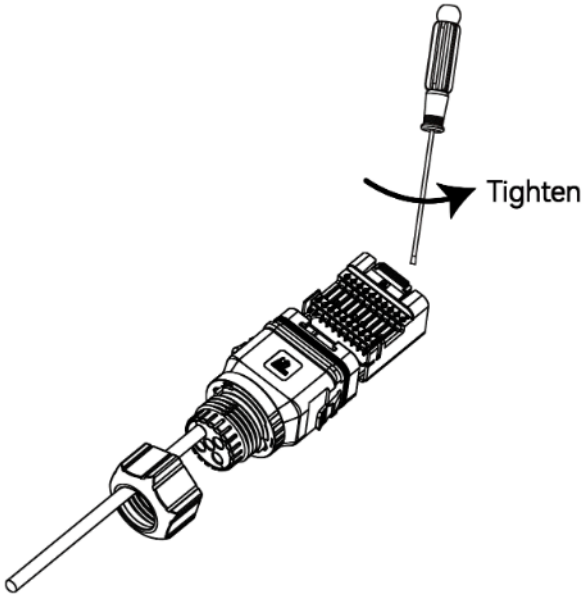


Figure 5.43 Tightening the terminals.

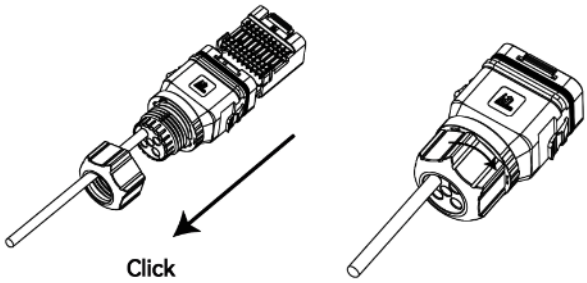


Figure 5.44 Fitting the terminal block.

RJ45 wiring

1	Crimp an RJ45 plug onto the cable.
2	Pass the plug through the swivel nut and into the open side of the rubber seal, and plug it into the RJ45 socket on the terminal block.

3 Connect the other end to the external device, then plug the COM2 and COM3 connectors into their ports on the inverter.

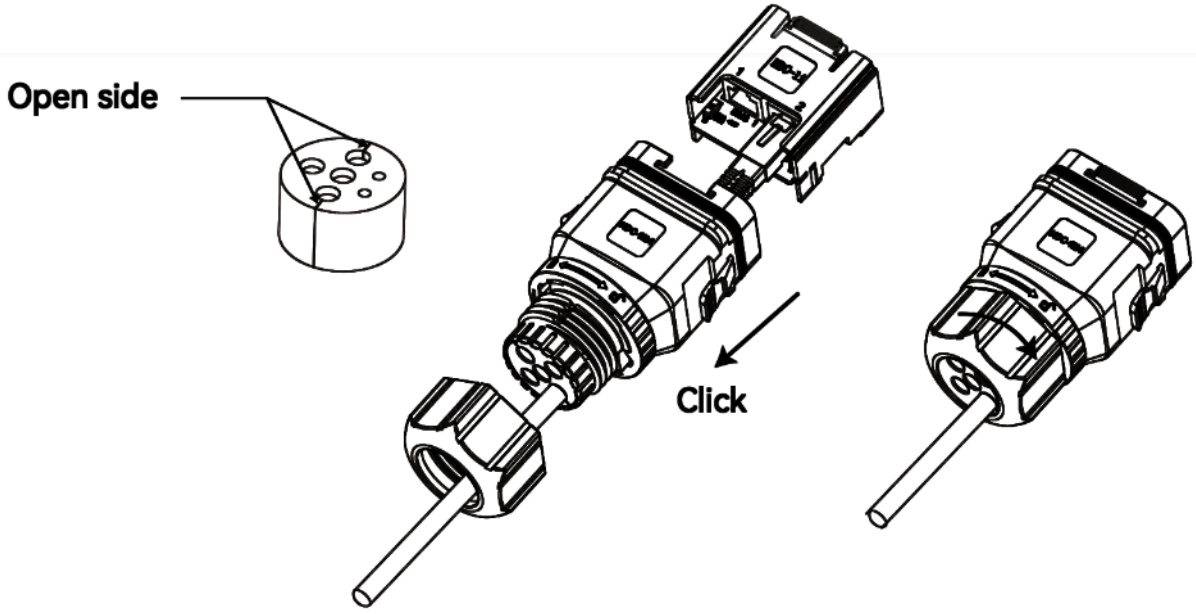


Figure 5.45 Fitting the RJ45 plug.

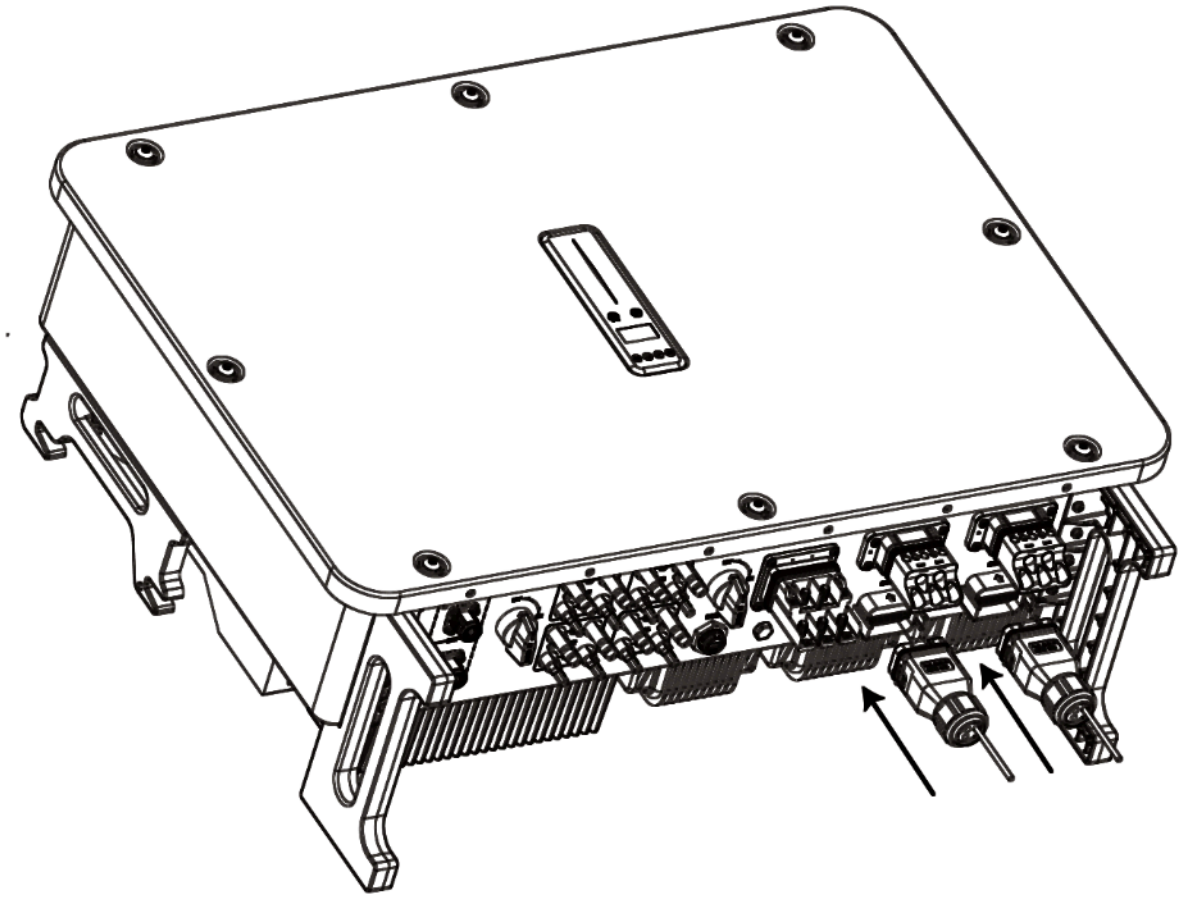


Figure 5.46 Plugging COM2 and COM3 into the inverter.

Meter communication

The inverter communicates with the RMM meter over RS485 through the METER RJ45 port (pins 7 and 8). The cable is supplied.

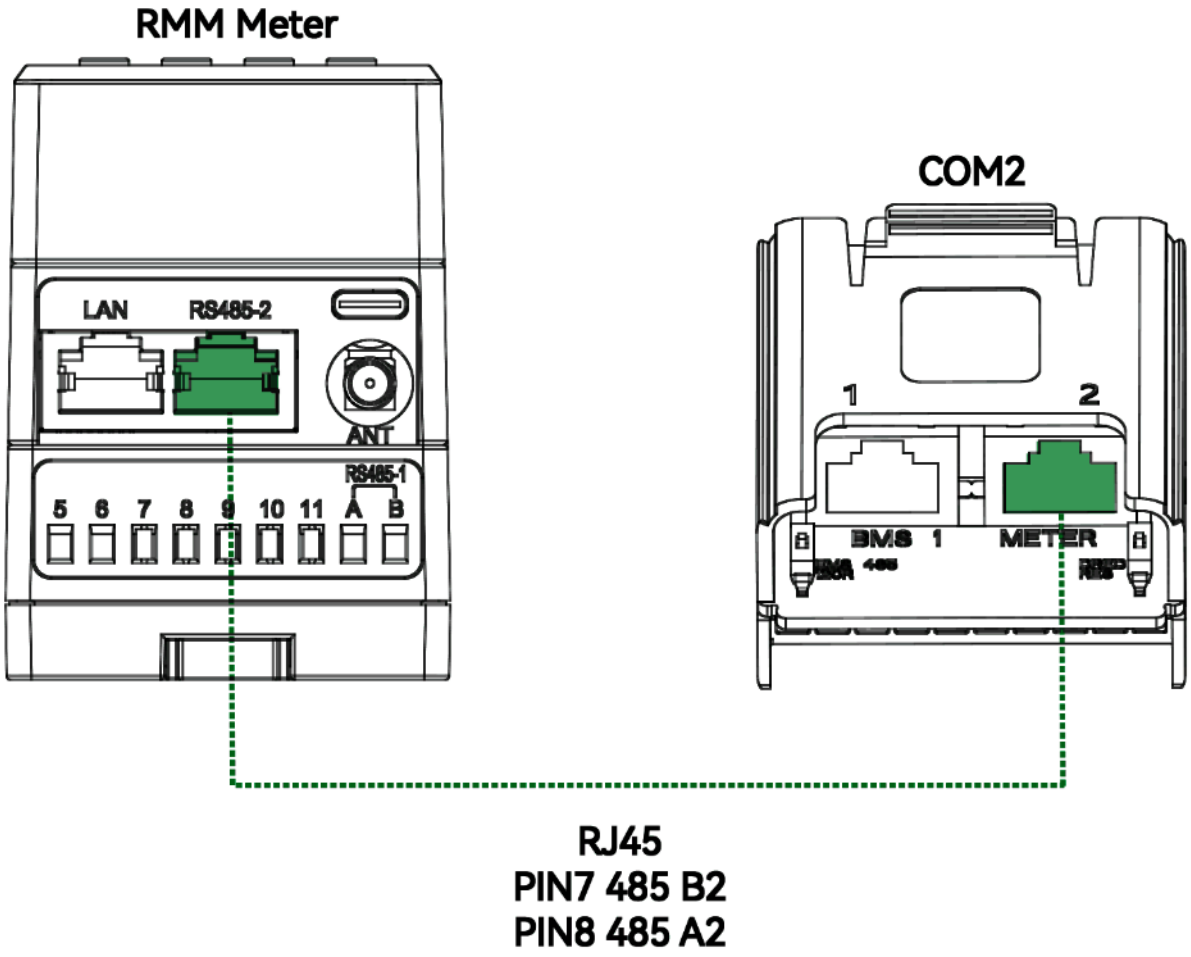


Figure 5.47 Meter communication wiring.

Battery communication

The inverter communicates with the battery BMS over CAN through the **BMS 1** RJ45 port (pin 4 CANH, pin 5 CANL). BMS 2 is not used.

> **Caution**
> Do not earth unused battery communication cores or connect them to other equipment.

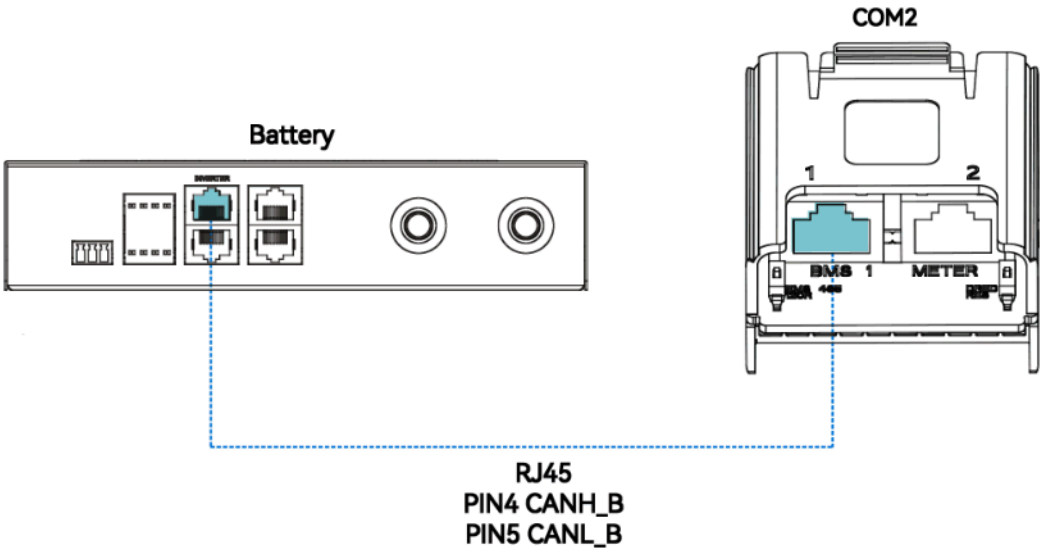


Figure 5.48 Battery communication wiring.

EV charger communication

The inverter communicates with a Solinteg ECA-series EV charger over RS485 (COM3 pins 17 and 18). Earth the charger properly, or communication will be affected.

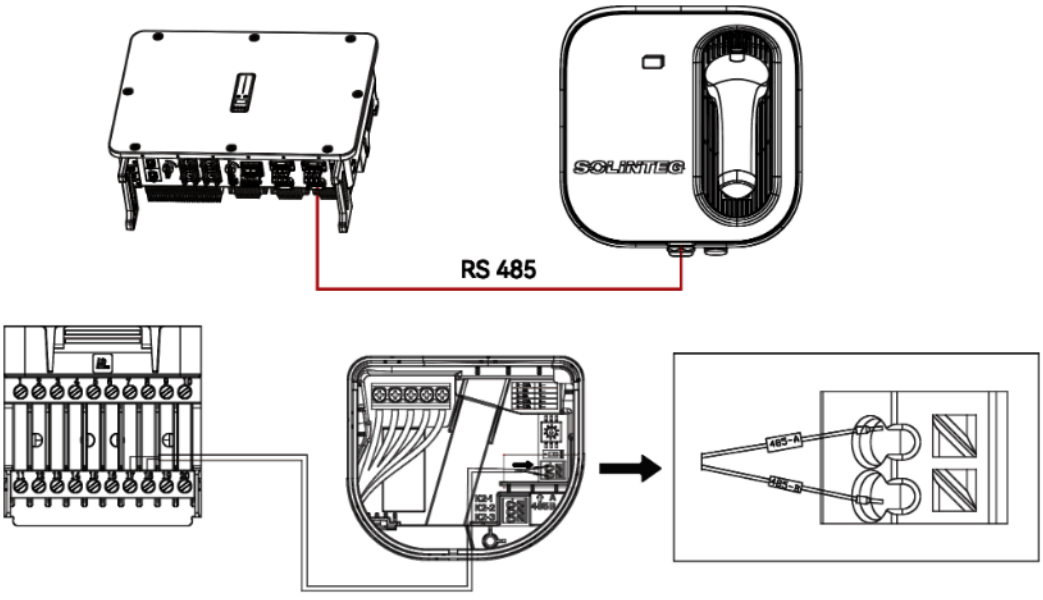


Figure 5.49 EV charger communication.

Demand response (DRED)

The inverter supports the demand response modes of AS/NZS 4777.2 through a demand response enabling device (DRED), connected to COM2 pins 1–6. The DRED is not supplied. DRED and ripple control cannot be used at the same time.

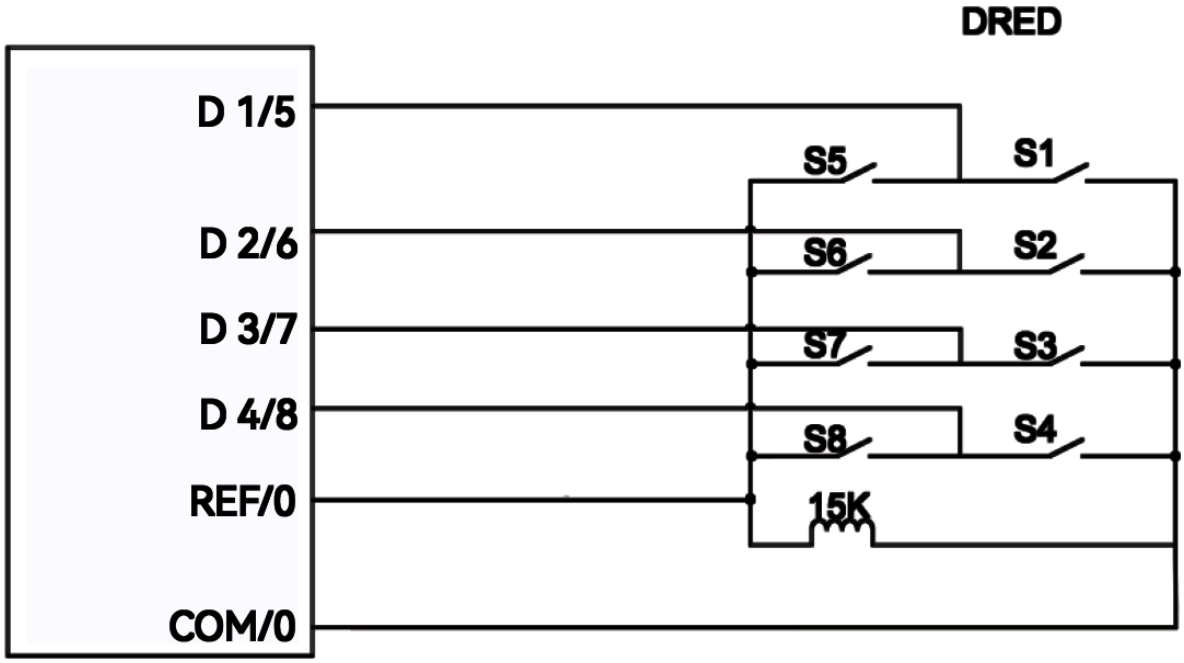


Figure 5.50 DRED wiring.

Mode	Function
DRM 0	Operate the disconnection device
DRM 1	Do not consume power
DRM 2	Do not consume more than 50% of rated power
DRM 3	Do not consume more than 75% of rated power, and source reactive power if capable
DRM 4	Increase power consumption (subject to other active DRMs)
DRM 5	Do not generate power
DRM 6	Do not generate more than 50% of rated power
DRM 7	Do not generate more than 75% of rated power, and sink reactive power if capable
DRM 8	Increase power generation (subject to other active DRMs)
Priority	DRM 1 > 2 > 3 > 4; DRM 5 > 6 > 7 > 8

Note

When using DRED, set the DRED RES detection resistor switch to OFF, and set DI Ctrl to DRM (section 7.6). The ripple control (RCR) and German §14a functions described in Solinteg's manual are not used in Australia.

Emergency stop

An external emergency stop switch (not supplied) can be connected to COM2 pins 15 and 16. When it operates, the inverter stops its AC output. Set the contact type (NO or NC) on the inverter display.

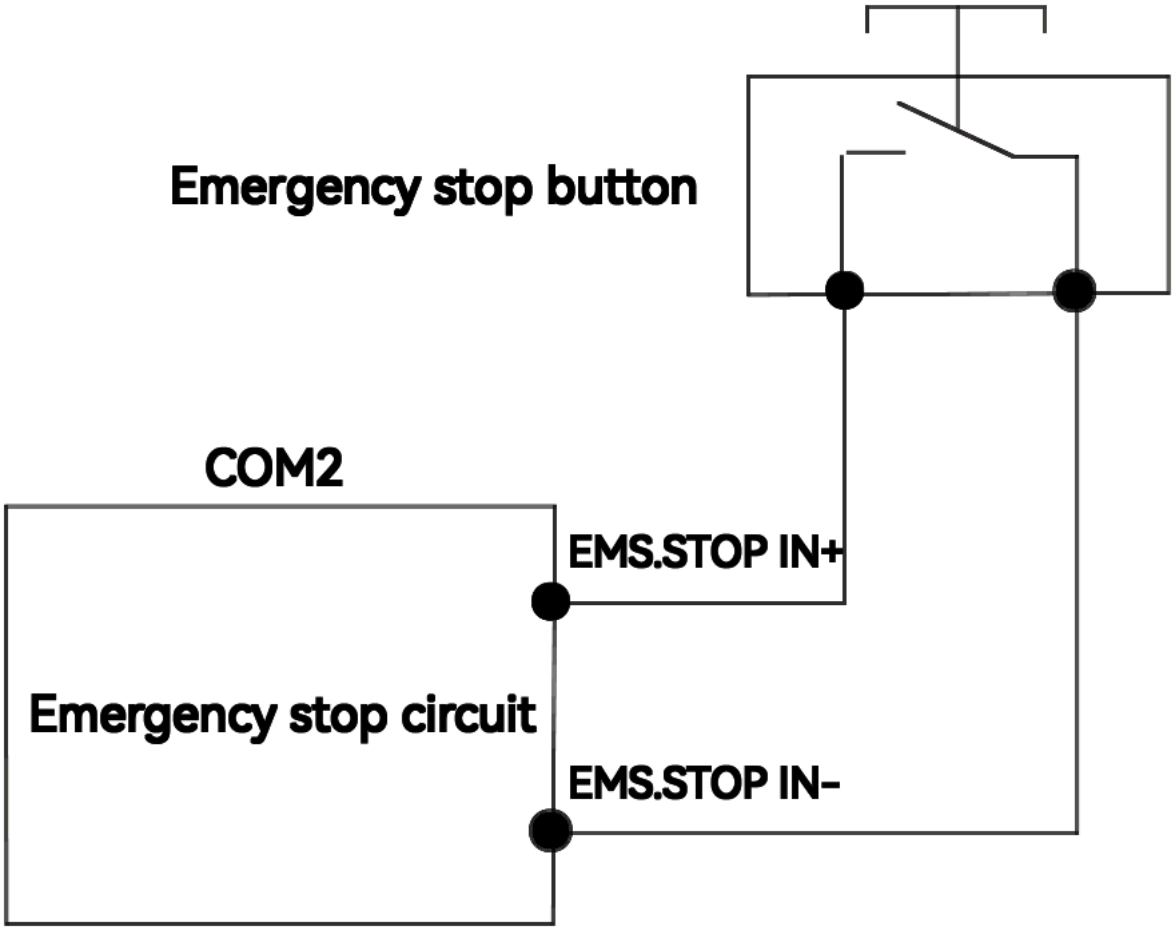


Figure 5.51 Emergency stop wiring.

Load control

With Solinteg's additional control device, the inverter can control loads, including SG Ready heat pumps. Contact AERL for details. The DO dry contacts are rated at 30 V DC, 1 A maximum.

5.10 Parallel Systems

See the Solinteg M2HT 25–50 kW Paralleling & Generator Guide, and contact AERL when designing a multi-inverter system.

A parallel system must meet these conditions:

1. All inverters must be the same model and rating.
2. One inverter is the master and the others are slaves, set on the display or the monitoring platform.
3. The master communicates with the smart meter over RS485. The inverters communicate with each other over CAN.
4. Every inverter needs its own communication module.
5. Breakers must be fitted on every inverter's on-grid and back-up outputs.
6. The SYNC 120R and PAR CAN 120R termination switches must be ON at the first and last inverters.
7. On/off-grid parallel also needs the Solinteg EDA back-up box, controlled by the master through its DO port.

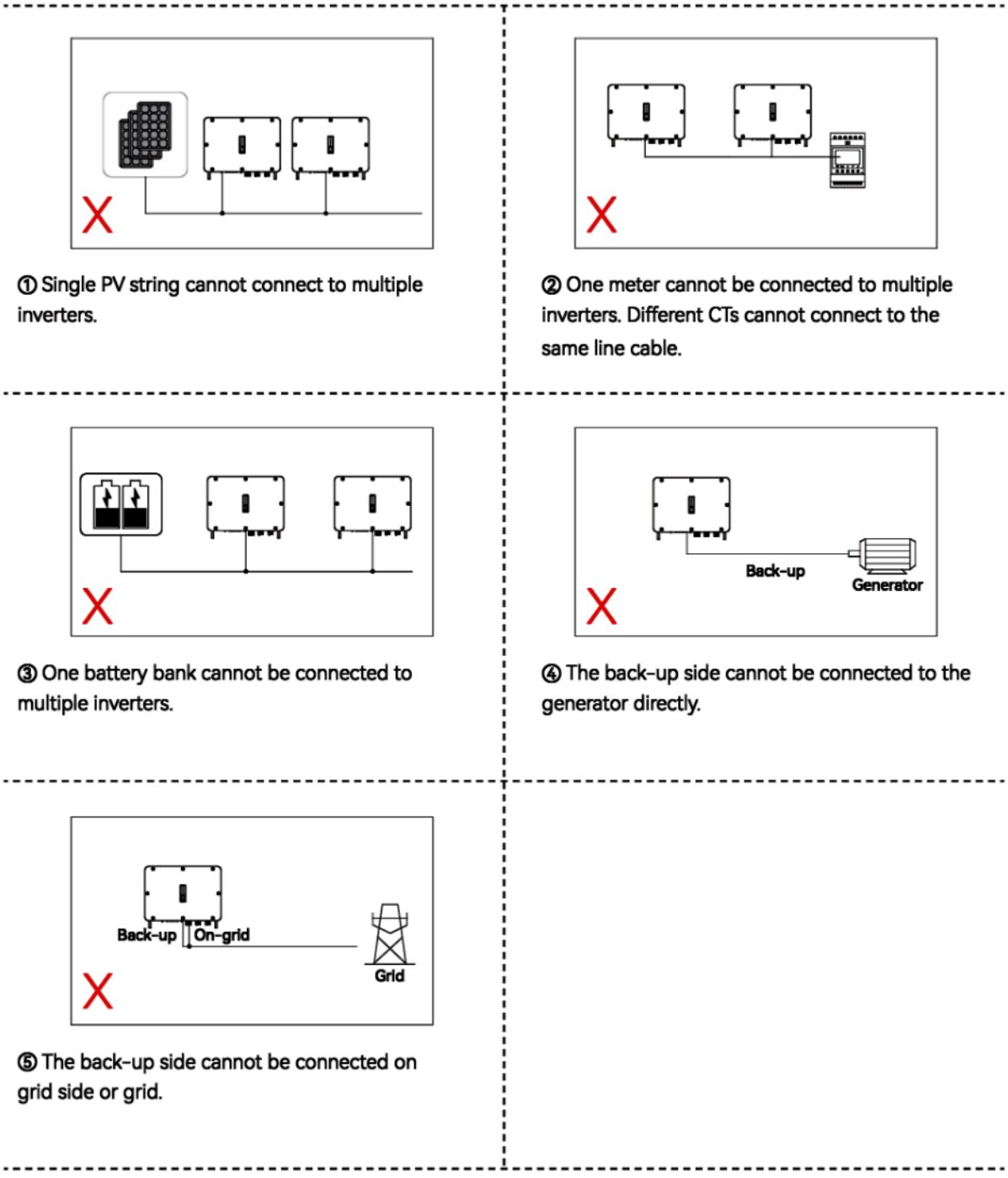


Figure 5.52 Wiring that must be avoided in parallel systems.

The figure shows what must not be done: one PV string to several inverters; one meter to several inverters, or several CTs on the same conductor; one battery bank to several inverters; the back-up side directly to a generator; or the back-up side to the on-grid side or the grid.

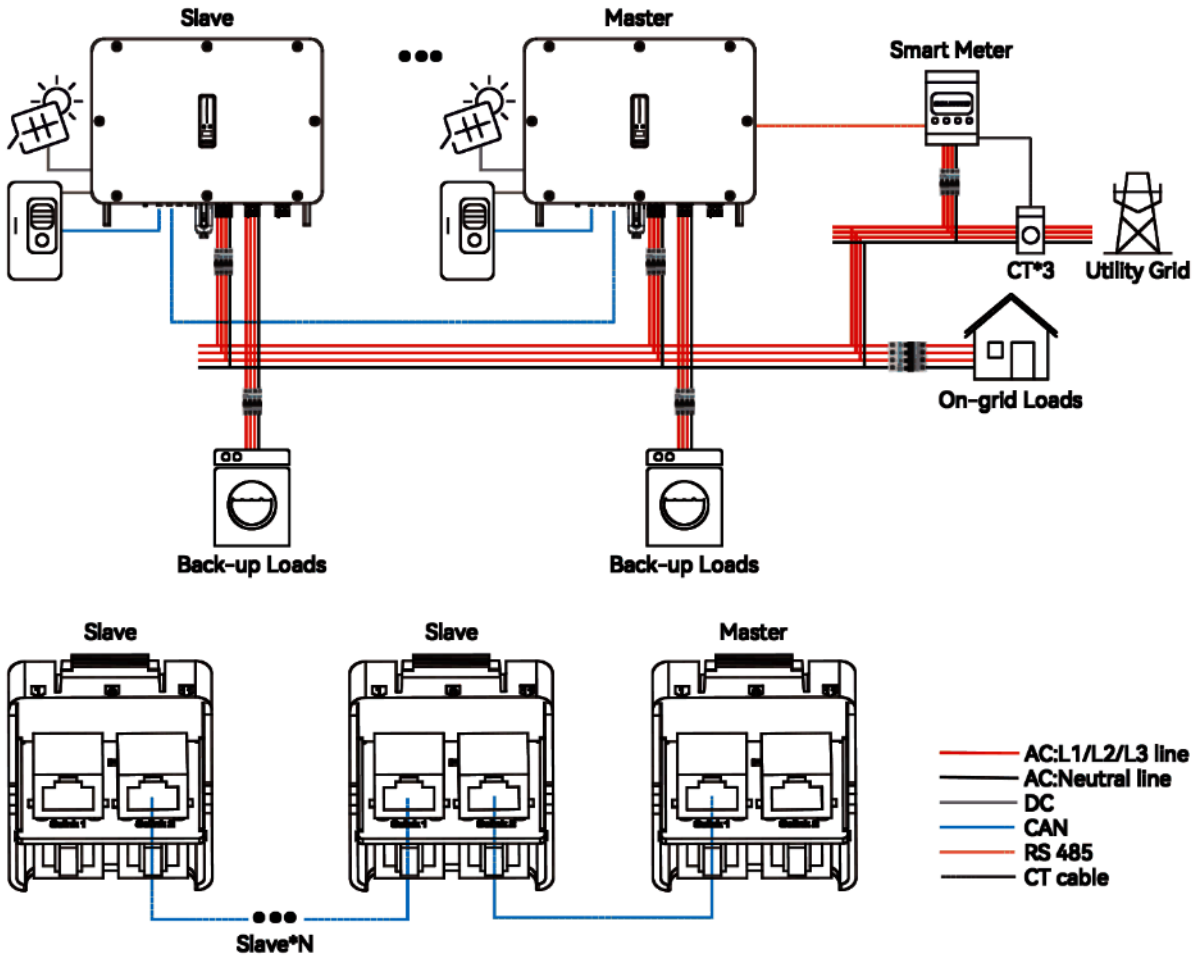


Figure 5.53 On-grid parallel system.

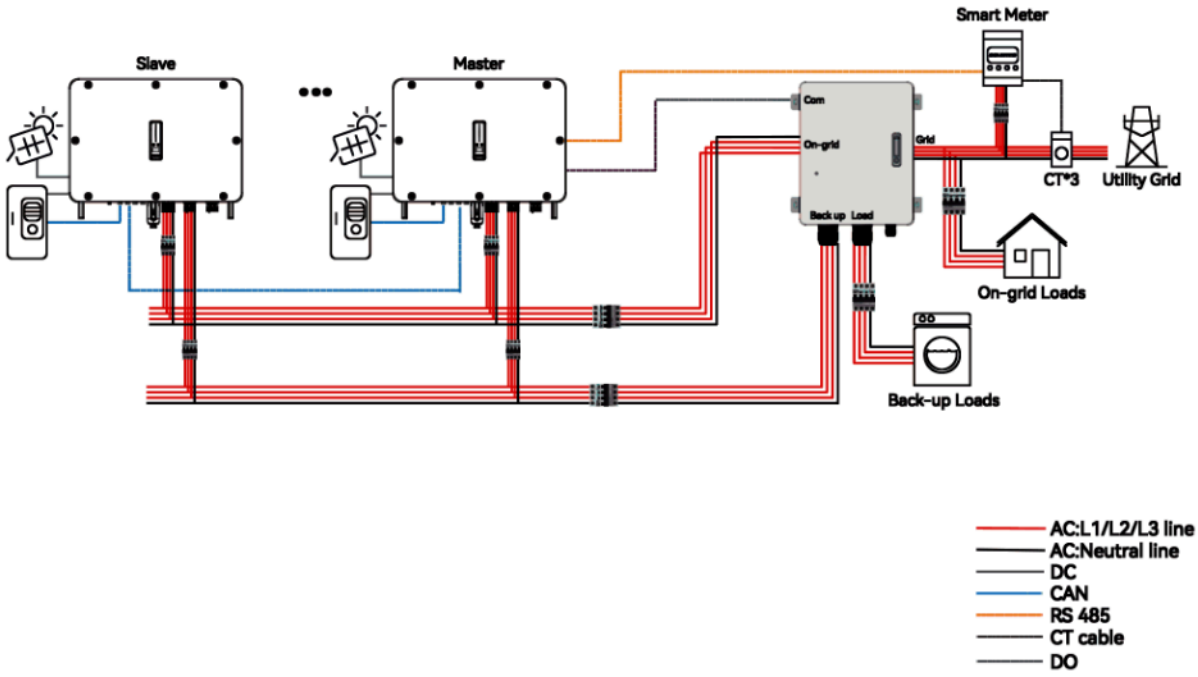


Figure 5.54 On/off-grid parallel system.

Commissioning

06

App, checks before start-up, start-up, shut-down

6.1 App

Install the latest Solinteg IntegHub app and register an account, or use the account details from your installer or AERL. The app also configures the inverter locally over Bluetooth.

Get the IntegHub app

Android
Google Play

iPhone
App Store

Web monitoring: www.solinteg-cloud.com

6.2 Checks Before Start-Up

1	All equipment is securely installed.
2	The DC switch and AC breakers are OFF.
3	The earth, AC, DC and communication cables are correctly and securely connected.
4	Unused terminals are sealed.
5	No tools or other objects are left on the inverter or in the switchboard.
6	The AC breakers meet this manual and local standards.
7	All warning labels are in place and legible.

6.3 Start-Up

1. Switch on the AC breaker.
2. Switch on the battery, and power up the battery pack if required.
3. Turn on the DC switch (built into the inverter, or external). Wait 5 minutes.
4. The inverter starts when the PV and grid meet its start-up conditions. Connecting to the grid can take several minutes, depending on the safety code and the grid.
5. Check the indicators to confirm the inverter is operating normally.
6. Set up the network connection and other settings in the IntegHub app (see the R2MD quick installation guide).

If the inverter does not start

Check the safety code: select the AS/NZS 4777.2 region setting required by your network service provider. Check the battery ID matches the battery fitted.

CT auto test

The inverter can check the CT direction and phase sequence. Run the test from the app once the system is installed.

SOC reset

With SOC Reset on, the inverter charges the battery fully to calibrate its SOC, then turns the function off. We recommend a calibration at commissioning and periodically after that.

6.4 Shut-Down

1	Stop the inverter from the app or the display.
2	Switch off the grid and load breakers.
3	Switch off the battery and the battery-side DC breaker, if fitted.
4	Wait 30 seconds, then turn the inverter DC switch OFF. The capacitors stay charged: wait 10 minutes before working on the inverter.

To restart, switch on the AC breaker, battery breaker, battery and DC switch, in that order. If the inverter is to be out of service, a licensed electrical worker should disconnect the AC and DC cables.

Operation

Indicators, display and button, main screen, settings menu

07

7.1 Indicators, Display and Button

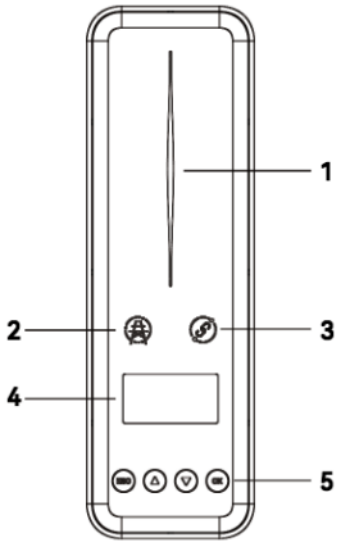


Figure 7.1 Indicators, display and button.

No.	Indicator	Colour	State	Meaning
1	Power and alarm	—	Off	No power
1	Power and alarm	Blue	Fast flashing	Self-test
1	Power and alarm	Blue	Slow flashing	Waiting
1	Power and alarm	Blue	Breathing	Operating normally
1	Power and alarm	Orange	Breathing	Low battery: close to the SOC protection limit
1	Power and alarm	Red	On	Alarm or fault. Check the display
2	Grid	—	Off	Grid lost
2	Grid	—	Slow flashing	Grid detected, not operating on-grid
2	Grid	—	On	Operating on-grid
3	Communication	Green	On	Communication normal
3	Communication	Green	Flashing	Communicating with an EMS or the master inverter

No.	Indicator	Colour	State	Meaning
3	Communication	Orange	On	No communication with the smart meter
3	Communication	Red	On	No communication with the BMS
4	Display	—	—	Status and settings. Switches off to save power; press the button to wake it
5	Button	—	—	Changes the display and sets parameters

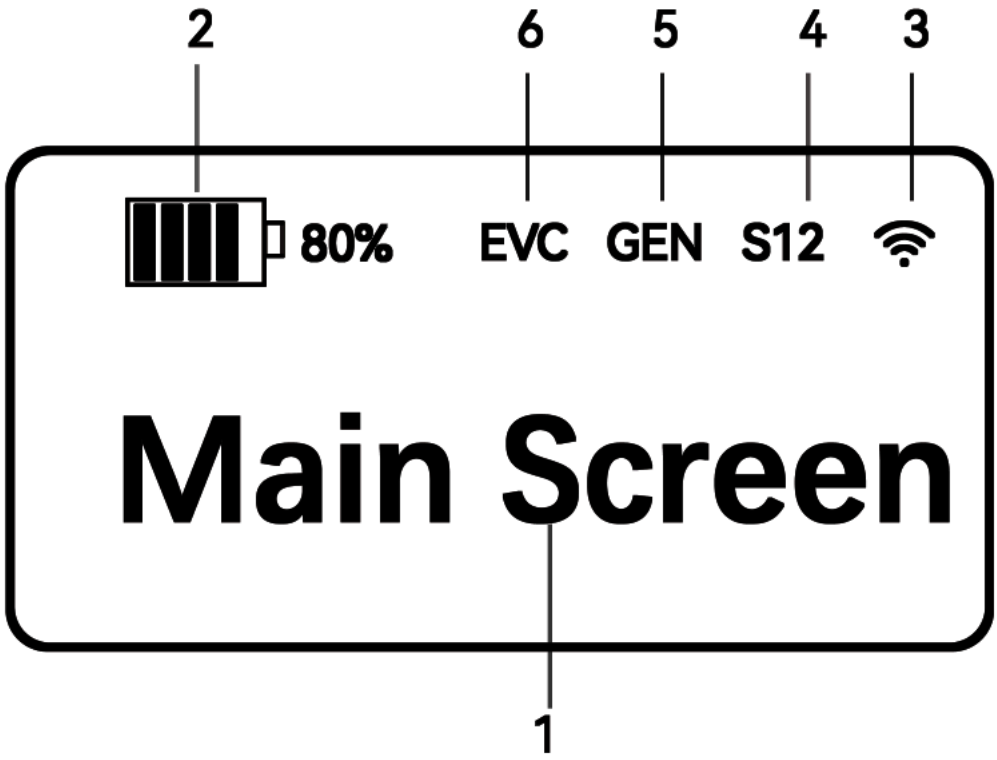


Figure 7.2 OLED main screen.

The main screen shows (1) the inverter information, status and settings, (2) battery SOC, (3) the communication method, (4) the status code (section 8.1), (5) generator running and (6) EV charger connected.

Button	Name	Function
ESC	Escape	Exit, go back or cancel. Hold for 3 s to restart the display
▲	Up	Move up or increase a value
▼	Down	Move down
OK	Enter	Open a menu, confirm or edit

7.2 Main Screen

The main screen cycles through the inverter status (Waiting, Checking, On-Grid, Off-Grid, Fault Info, FW Updating), PV values for each MPPT and battery values for each battery input.

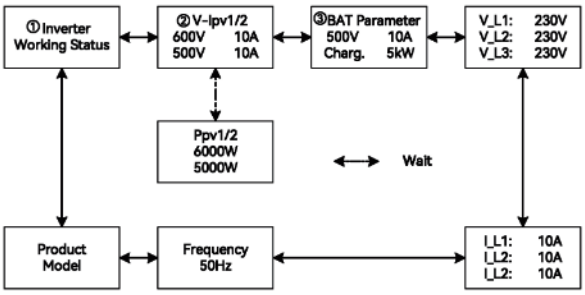


Figure 7.3 On-grid status.

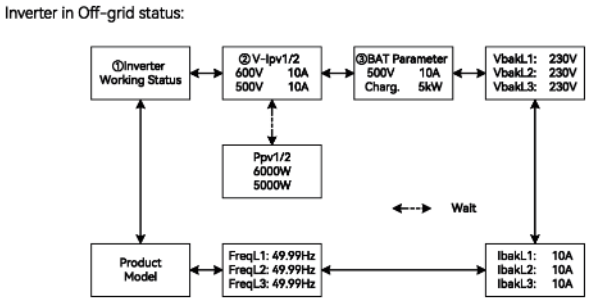


Figure 7.4 Off-grid status.

Item	Description
V-Ipv1/2, Ppv1/2	PV voltage, current and power of each MPPT
BAT, Charg., Dischg.	Battery values, charging, discharging
V_L1/L2/L3, I_L1/L2/L3, Frequency	Output voltage, current and frequency (on-grid)
VbakL1/L2/L3, IbakL1/L2/L3, FreqL1/L2/L3	Output voltage, current and frequency (off-grid)
Fault Info, FW Updating	Fault information, firmware updating

7.3 Settings Menu

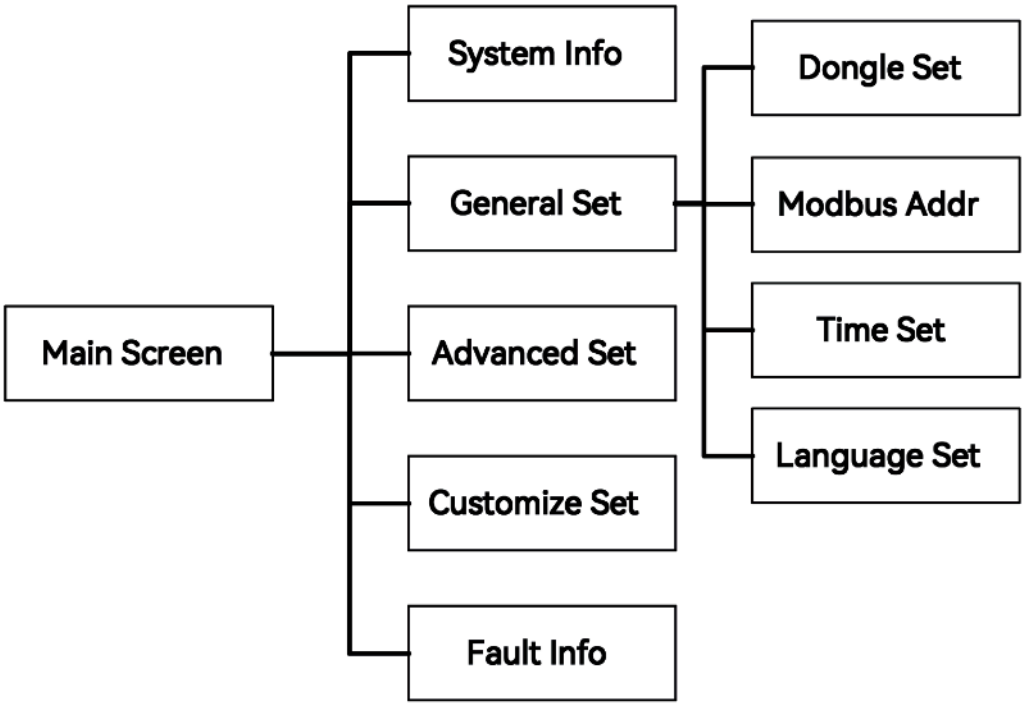


Figure 7.5 Settings menu structure.

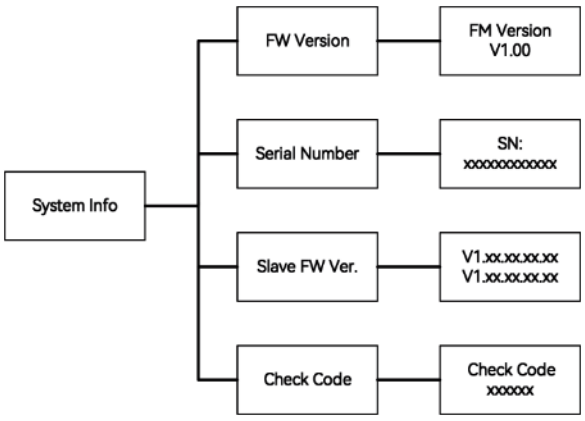


Figure 7.6 System Info.

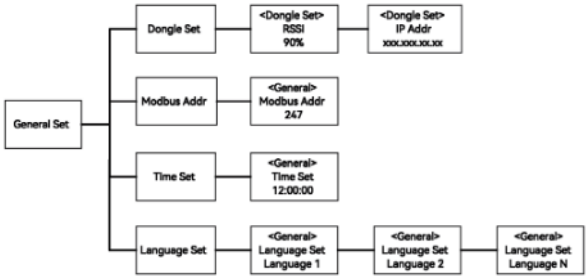


Figure 7.7 General Set.

System Info shows the firmware version, serial number, slave firmware versions and check code. **General Set** shows Wi-Fi signal strength and sets the IP address (LAN, DHCP off), Modbus address, clock and display language. After changing a setting, select Yes to save or No to cancel.

Advanced Set is password protected. Contact AERL support for the password. Its main settings are:

Setting	Function
Safety Set	Safety code. In Australia, the AS/NZS 4777.2 region required by the network service provider
Batt_Conn, BAT1/BAT2 Set, BAT2 Sync	Battery inputs: independent or parallel, settings for each, and copying battery 1's settings to battery 2
Battery_ID Set	Battery model. Must match the battery, or BMS communication fails
OnGrid SOCProt / EndSOC	On-grid SOC protection and end-of-discharge SOC
OffGrid SOCProt / EndSOC	Off-grid SOC protection and end-of-discharge SOC
Work Mode	Operation mode (section 2.4)
Export Limit, Power to grid	Export limiting on/off, and the export limit
ExpLimitDevice, CT Ratio	Meter, CT or no device for export limiting; CT ratio
ExpLimit Mode	SingleSeparated limits each phase; Total Phase limits the three-phase total (one or two phases may still export)
Export Ctrl	If meter or datalogger communication is lost: Hard stops AC output; Soft limits output to the export setting
Reactive Mode, Power Factor, Fixed Q	Reactive power mode and settings (section 7.4)
P(U)	Volt-watt response (section 7.5)

Setting	Function
On-OffGrid SW	Off-grid switching on/off. If off, there is no back-up output when the grid fails. With it on, HVRT and LVRT are disabled
Relax OffGrid	Less sensitive on/off-grid switching, for unstable grids
Offgrid ReConn	Restart delay after an off-grid overload
Import Limit, PowerFromGrid	Grid import limiting on/off, and the import limit
Unbalan.Output	Unbalanced three-phase output on/off
System Maint.	Restart, stop (bypass kept if enabled), start up, factory reset
Phase Sequence	Auto, positive or negative
SysBlackStart	Black start on/off
Multi-INV Role / No. / Addr	Parallel role (master, slave, independent), number of units (2–10) and slave address (1–9)
SOC Reset	SOC calibration charge (section 6.3)
MPPT Parallel	Parallel MPPT inputs on/off
MaxOutputSet	Rated, Overload (1.1 × rated) or Underload
N-PE Check	Back-up N-PE link in off-grid operation (section 5.2)
Shadow Scan	MPPT shadow scan on/off
DI Ctrl	Off, DRM or RCR (section 7.6)
Emergency Stop	Off, NC or NO
CommsWatchDog	Slave stops AC output if it loses communication with the master
BMS_ISO	Battery insulation check on/off
Password Set	Change the password

Customize Set holds settings for special cases. Change them only on AERL's advice:

Setting	Function
GridRecovB Dly	Delays the back-up output by 500 ms when the grid returns, for non-self-resetting ATSs on both grid and back-up
GridRecovChk	Turns off the grid-recovery self-check, for unstable grids where it interrupts the back-up supply
Back-upBoxDetc	Monitors the EDA back-up box. Automatic in off-grid parallel; turn on manually for a single inverter with a back-up box
GridLostB DlyS / DlyT	Delays the back-up output after grid loss (1–600 s), to help start heavy inrush loads
Active Balance	Balances the grid-port phases when there is no PV or battery
GFCI Prot	Leakage current protection. Turn off only if safe, with other leakage protection fitted

Setting	Function
Active Island	Active anti-islanding disturbance (for testing only). Passive islanding protection is unaffected
OffGridParPowD	Off-grid parallel power sharing. Must be on for off-grid parallel

7.4 Reactive Power

The inverter can regulate reactive power. The modes are enabled through the configuration software, and some are on by default for Australia. Contact AERL to change the defaults.

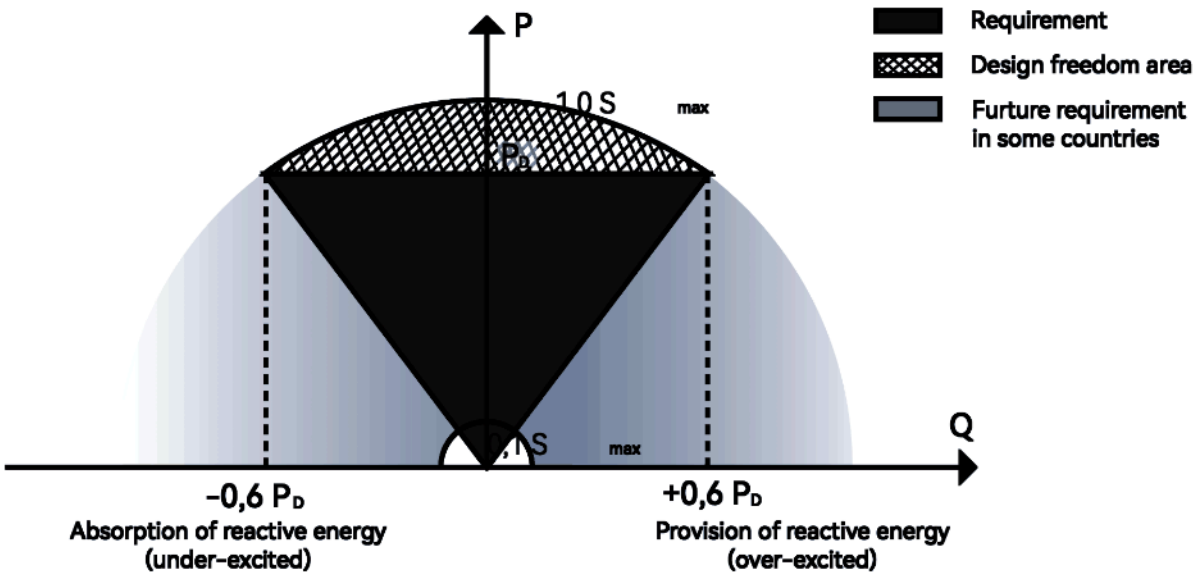


Figure 7.8 Reactive power capability.

Mode	Function
Off	Power factor fixed at 1.000
PF	Fixed power factor, 0.8 leading to 0.8 lagging (leading: sourcing reactive power; lagging: absorbing)
Qt	Fixed reactive power, −60% to +60% of rated power
Cosφ(P)	Power factor varies with output power
Q(U)	Reactive power varies with grid voltage (volt-var)

Cosφ(P) setting	Description	Range
P1, P2, P3	Output power at points A, B and C	10–100%, 20–100%, 20–100%
K1, K2, K3	Power factor at points A, B and C	0.8–1
Enter / Exit voltage	Voltage that activates / deactivates the function	100–110% / 90–100%

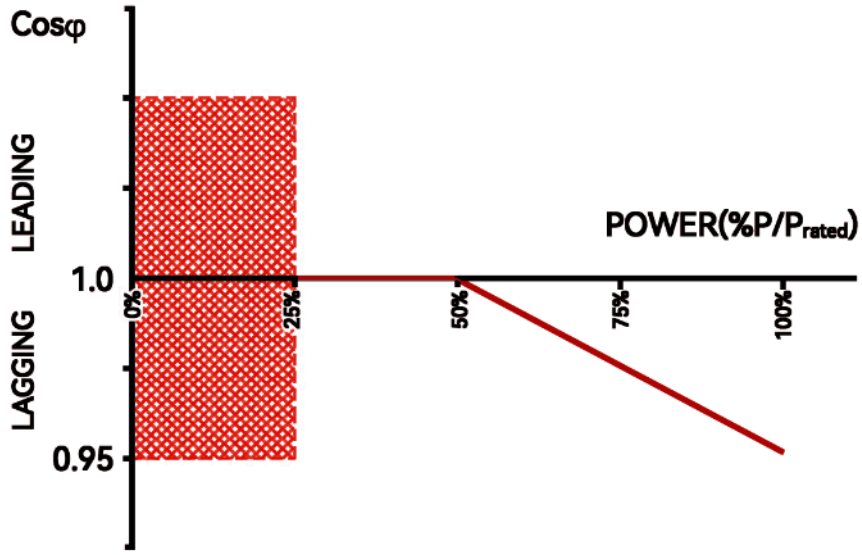


Figure 7.9 Cosφ(P) curve.

Q(U) setting	Description	Range
QU_V1, QU_V2	Grid voltage at points 1 and 2	80–100%
QU_V3, QU_V4	Grid voltage at points 3 and 4	100–120%
QU_Q1	Q/Sn at point 1	0 to 60%
QU_Q2, QU_Q3	Q/Sn at points 2 and 3	−60% to 60%
QU_Q4	Q/Sn at point 4	0 to −60%
Enter / Exit power	Active power that activates / deactivates the function	20–100% / 1–20%

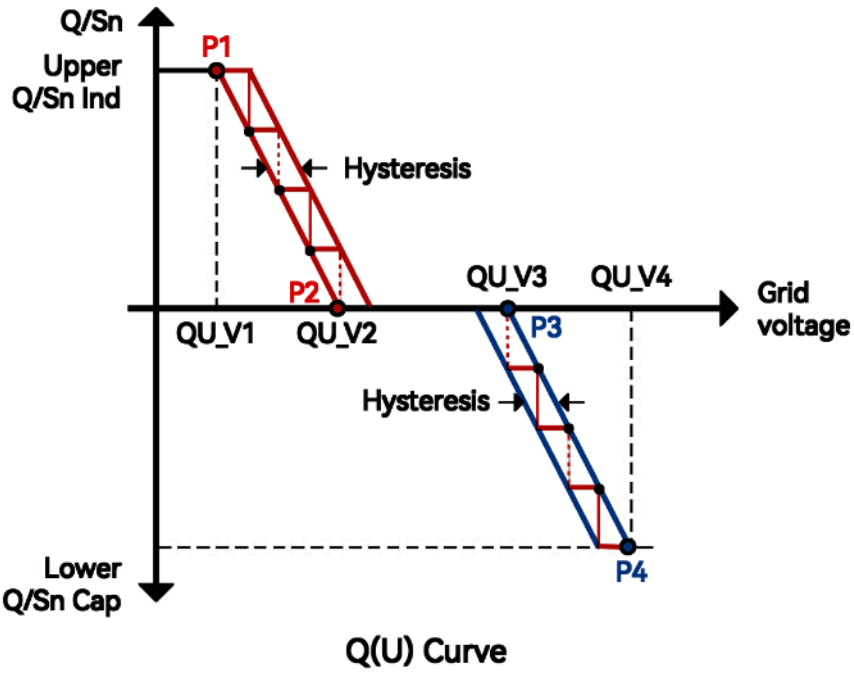


Figure 7.10 Q(U) curve.

7.5 Active Power: Volt-Watt (P(U))

The output power reduces as the grid voltage rises. P(U) is the volt-watt power quality response mode of AS/NZS 4777.2 and is on by default for Australia.

Setting	Description	Range
PU_V1, PU_V2	Grid voltage at points 1 and 2	100–120%
PU_P1, PU_P2	P/Sn at points 1 and 2	0–100%
PU(τ)	Time constant	0–60 s

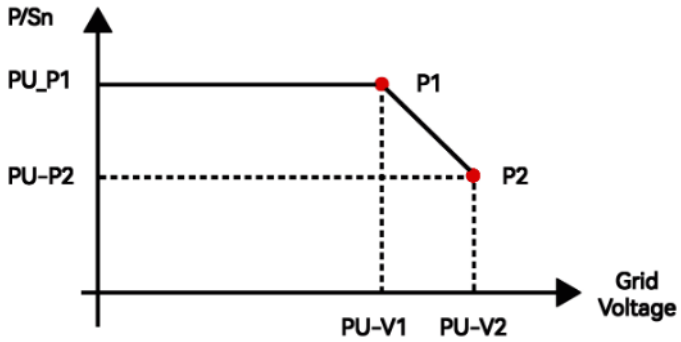


Figure 7.11 P(U) curve.

7.6 Firmware Version, Grid Settings and DRED

Firmware version: Main Screen → System Info → FW Version.

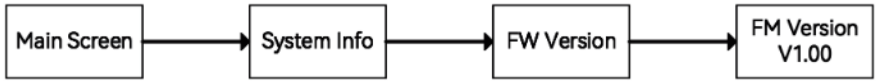


Figure 7.12 Checking the firmware version.

Grid settings in Solinteg Cloud: you can check and adjust the safety code, protection settings, reactive power modes and P(U) through the monitoring platform.

1. In **Devices → Device list**, click **Configure** for the inverter.
2. Under **Basic parameters**, check **Safety code settings**.
3. Under **Grid Connection Parameter**, check the **Protection Parameters** and **Grid Connection Parameter** settings.
4. Under **Reactive power control**, check **Reactive mode**.
5. Under **Voltage related active power P(U)**, check the P(U) settings.
6. After changing settings, click **Set** and enter the password.

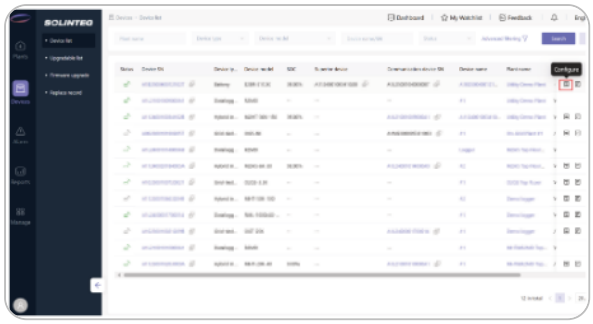


Figure 7.13 Device list.

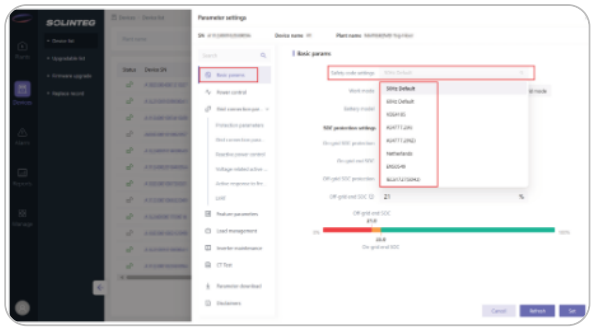


Figure 7.14 Safety code settings.

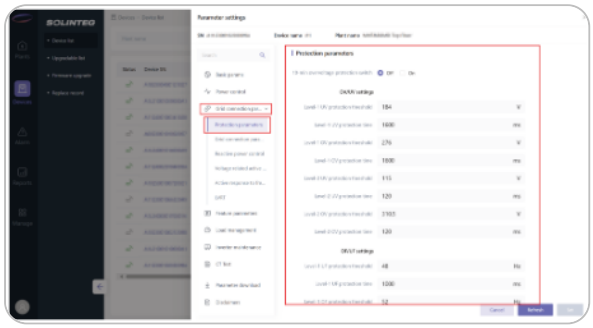


Figure 7.15 Protection parameters.

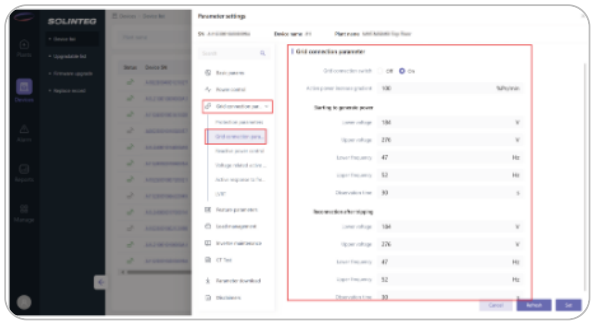


Figure 7.16 Grid connection parameters.

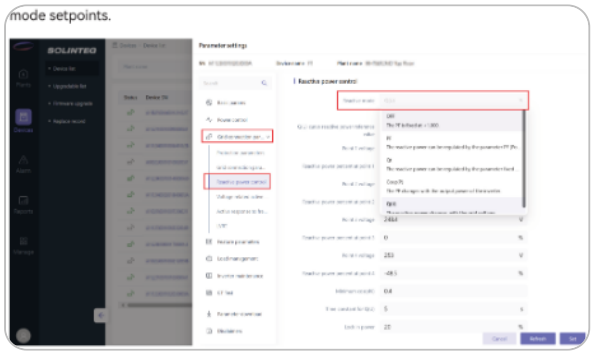


Figure 7.17 Reactive mode.

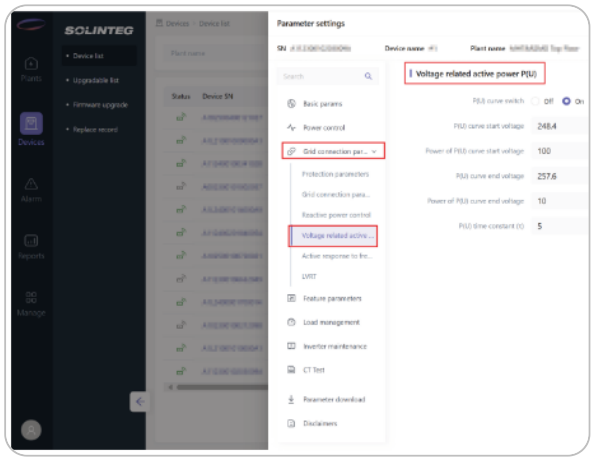


Figure 7.18 P(U) settings.

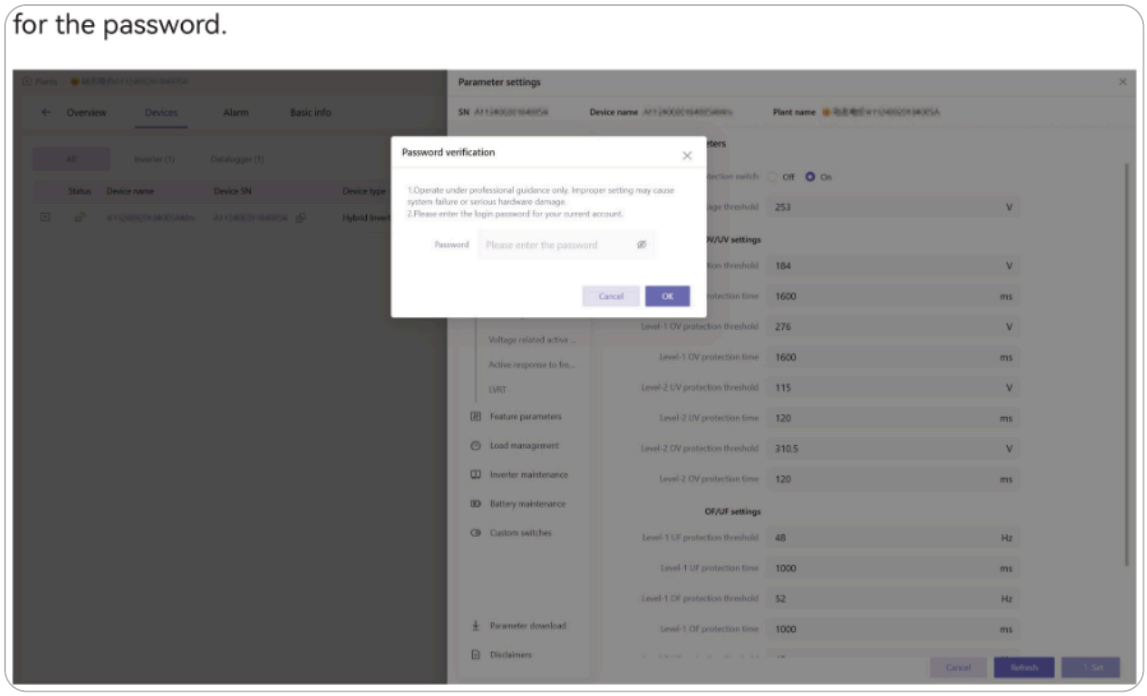


Figure 7.19 Password entry.

> **Caution**
> Changing the safety code, protection settings, or reactive or active power modes needs a password. Once set at commissioning, these settings are locked. Contact AERL support for the password.

DRED: on the display, open Advanced Settings, enter the password and set **DI Ctrl** to **DRM**.

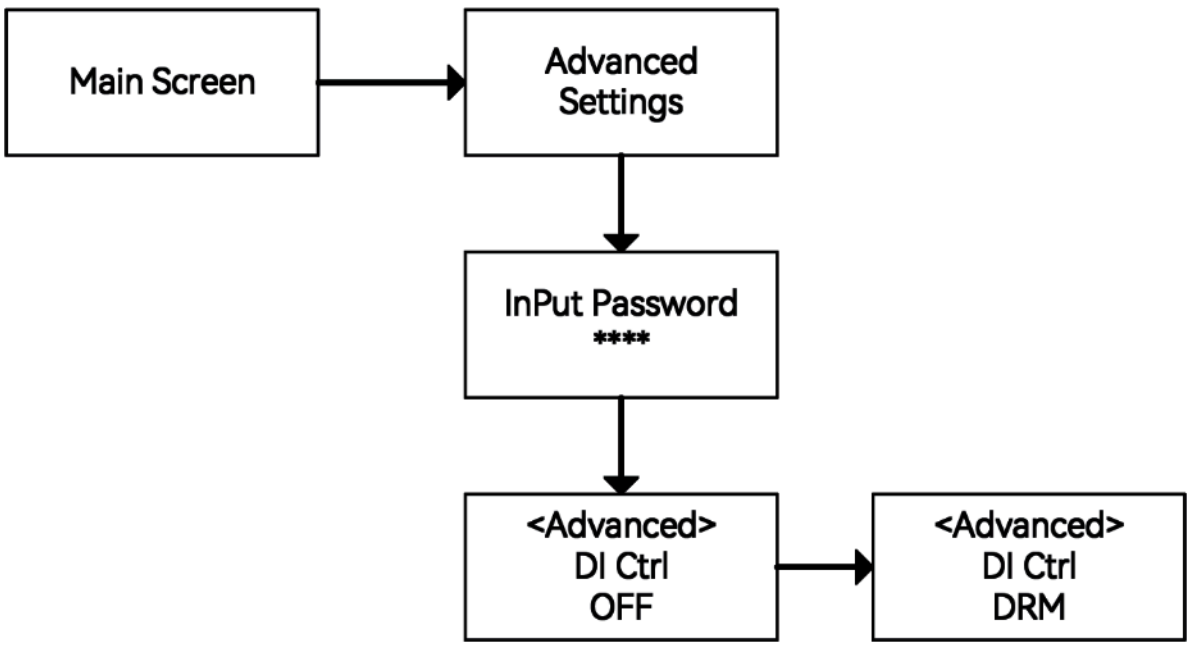


Figure 7.20 Enabling DRED.

Troubleshooting

Status codes, Fault messages

08

8.1 Status Codes

Code	Meaning
S01	Work mode not set
S02	Emergency stop active
S03	DC conditions not met
S04	Grid voltage or frequency out of range
S05	Off-grid switch not enabled, off-grid
S06	No battery, off-grid
S07	Stopped by command
S08	SOC low and no PV input
S09	Lost communication with a slave inverter (parallel)
S10	Lost meter communication under hard export control
S11	Waiting for bypass
S12	Updating, standby
S13	Diesel generator fault
S15	Off-grid
S16	Updating, clearing flag
S17	Power limited by command
S18	Power limited: over-frequency
S19	Power limited: over-temperature
S20	Power limited: over-current
S21	Power limited: reactive power
S22	Power limited: export limit
S23	Soft start (slow loading)
S24	Power limited: overvoltage
S25	Power limited: system
S26	Power limited: EMS command
S32	PV power limited

8.2 Fault Messages

When a fault occurs, the display shows a message and the inverter may stop exporting. Where the table says to contact support, call AERL on 1800 950 865 or email support@aerl.com.au.

Message	Cause	Action
DC BUS Over Voltage	DC bus voltage above the upper limit	1. Check whether the DC input voltage is above the limit. 2. Restart the inverter. 3. Contact AERL support.
DC BUS Voltage Unbalance	Current oscillation unbalancing the DC bus, or a damaged IGBT	1. Restart the inverter. 2. Contact AERL support.
DC BUS Voltage Low	Back-up load above capacity	1. Reduce the back-up load. 2. Check the battery's load capacity.
AC Current Sensor Fault	Current sensing circuit fault	1. Restart the inverter. 2. Contact AERL support.
E2 Fault	EEPROM fault	1. Restart the inverter. 2. Contact AERL support.
FLASH Fault	Internal storage fault, for example from a strong magnetic field	1. Restart the inverter. 2. Contact AERL support.
SCI Fault	Internal communication (DSP–ARM) failed, for example from a strong magnetic field	1. Restart the inverter. 2. Contact AERL support.
SPI Fault	DSP communication interrupted	1. Restart the inverter. 2. Contact AERL support.
Comm. Sampling Fault	AD sampling interrupted	1. Restart the inverter. 2. Contact AERL support.
Relay Fault	Relay fault	1. Restart the inverter. 2. Contact AERL support.
HW Fault	Unknown hardware fault	1. Restart the inverter. 2. Contact AERL support.
PV Power Low	Not enough PV, or battery output limited	1. Check the PV wiring. 2. Check the battery status.
PV Over Voltage	PV input voltage above the limit	Reduce the number of modules so each string's open-circuit voltage is below the inverter's maximum input voltage.
ISO Over Limitation	DC insulation resistance to earth too low	1. Check the PV modules, cables and connectors for water or damage. 2. Measure the DC insulation resistance with an insulation tester. It must be at least 500 kΩ. 3. Contact AERL support.

Message	Cause	Action
GFCI Fault	Earth leakage current above the limit	1. Restart the inverter. 2. Check the PV modules, cables and connectors for water or damage. 3. Contact AERL support.
GFCI Sensor Fault	Leakage current sensor fault	1. Restart the inverter. 2. Contact AERL support.
DCI Fault	DC injection above the limit	1. Restart the inverter. 2. Contact AERL support.
BAT Voltage Fault	Battery voltage above the limit	1. Check whether the battery voltage is out of range. 2. Check whether the battery shut down when the fault occurred.
BAT Power Low	Abnormal BMS status	Check the battery status.
BAT Invalid	No battery connected, or BMS fault	Check the BMS status.
BMS Comm Fault	No communication between the inverter and the BMS	1. Check the battery ID setting. 2. Check the BMS communication connection (BMS 1). 3. Check the battery status.
Meter Comm Fault	No communication between the inverter and the meter	1. Check the meter communication connection. 2. Check the meter is a compatible model.
Grid Voltage Fault	Grid voltage outside the safety code limits	1. Check the safety code. 2. Check the AC wiring. 3. Check for voltage rise from high AC cable impedance; if so, use a larger cable. 4. Widen the voltage limits only with the network service provider's permission.
Grid Frequency Fault	Grid frequency outside the safety code limits. Recovers automatically after occasional fluctuations	1. Check the safety code. 2. Widen the frequency limits only with the network service provider's permission.
Mains Lost	Grid outage, or AC breaker or circuit open	1. Check whether the grid supply is lost. 2. Check the AC wiring and breakers.
Phase Lock Fault	Abnormal grid phase sequence, or voltage sampling fault	1. Check the AC wiring. 2. Contact AERL support.
BAK Voltage Fault	Voltage on the back-up output, or back-up relay fault	1. Check whether the back-up side is connected to a supply. 2. Restart the inverter.
Backup Load Fault	Back-up load above capacity	1. Reduce the back-up load. 2. Check the battery's load capacity.

Message	Cause	Action
Inverter Over Current	Abnormal back-up load in off-grid operation	1. Check for inrush or excessive back-up load. 2. Check the back-up side for a short circuit.
Inverter Over Voltage	Back-up voltage above the limit off-grid, or internal fault	1. Check for inrush or excessive back-up load. 2. Check the back-up side for a short circuit.
N-PE Check Fault	Back-up earth loose or poorly connected	1. Check the earth wiring. 2. If the N-PE link is not needed, turn N-PE Check off.
Over Temperature	Internal temperature too high	1. Check that the location is well ventilated. 2. Switch the inverter off to cool, then restart it. 3. Contact AERL support.
Internal Fan Fault	Internal fan fault or low supply	1. Restart the inverter. 2. Contact AERL support.
External Fan Fault	External fan broken, blocked or low supply	Check the fan for obstructions and clean it if needed. If the fault persists, contact AERL support.

Maintenance

Inverter maintenance, battery maintenance, earth Fault alarm

09

9.1 Inverter Maintenance

Before any maintenance

1. Stop the inverter from the display or the app.
2. Switch off all AC breakers.
3. Turn the inverter DC switch OFF.
4. Switch off the battery and the battery-side DC breaker, if fitted.
5. Wait 10 minutes for the capacitors to discharge.
6. Check that all indicators are off.

Warning

Keep unauthorised people away, with a temporary sign or barrier, during electrical work and maintenance. In bypass, the grid supplies the loads directly. Do not work on the DC side in bypass: stop the inverter and turn the DC switch off first.

Caution

Do not replace internal components. Contact AERL for service.

Item	Check	Interval
Cleaning	Dust or debris on the heat sink and air inlets and outlets	6–12 months
Electrical connections	Cables are securely connected	6–12 months
Seals	All terminals and ports are sealed. Reseal any cable entry that is ageing or unsealed	Yearly

9.2 Battery Maintenance

Battery installation and maintenance must be done or supervised by people competent with batteries. Follow the battery supplier's instructions.

> **Warning**
>
> Never put a battery in a fire: it may explode. Never open or break a battery: the electrolyte is harmful. Remove metal items, use insulated tools, and switch off the battery DC breaker before connecting or disconnecting battery terminals. If the battery is unintentionally earthed, remove the earth connection before working on it.

9.3 Earth Fault Alarm

If the PV array develops an earth fault, the inverter alarms until the fault is cleared, as AS/NZS 5033 requires:

- the red indicator stays on, and the display shows **ISO Over Limitation** or **GFCI Fault**
- Solinteg Cloud and the IntegHub app show a warning, which can also be sent by email.

> **Caution**
>
> Install the inverter where the alarm indicator will be noticed, or set up email alerts.

Common Questions 10

Is there back-up output without a battery?

Yes, while the grid is present. No, when the grid is down: off-grid operation needs a battery.

Can the inverter be used off-grid?

Yes, provided a battery is connected.

Can low-voltage batteries be connected?

No. Only high-voltage lithium (LFP) batteries compatible with the M2HT 25–50K can be connected.

Can high-current PV modules be connected?

Yes. Each PV string input accepts up to 20 A, so modules of 18 A or more can be used.

Does the inverter have overload capability?

On-grid, set MaxOutputSet to Overload for 1.1 × rated output. Off-grid, the back-up peak output is 1.5 × rated output for 10 seconds.

Technical Data

Values that differ by model, values common to all models

11

11.1 Values That Differ by Model

Model	25K	29.9K	30K	40K	50K
MPPT voltage range at rated power (V)	200–850	200–850	200–850	265–850	330–850
Rated / max. output power, on-grid and back-up (kW)	25.0	29.9	30.0	40.0	50.0
Rated / max. apparent power (kVA)	25.0	29.9	30.0	40.0	50.0
Rated output current at 220 / 230 V (A)	37.9 / 36.2	45.3 / 43.3	45.5 / 43.5	60.6 / 58.0	75.8 / 72.5
Max. output current (A)	37.9	45.3	45.5	60.6	75.8
Max. battery charging power from grid (kW)	25.0	30.0	30.0	40.0	50.0
Max. grid input apparent power (kVA)**	50.0	60.0	60.0	80.0	80.0
Max. grid input current (A)	75.8	90.9	90.9	121.2	121.2
Generator: max. input apparent power (kVA)	30.0	36.0	36.0	48.0	60.0
Generator: max. input current (A)	45.5	54.5	54.5	72.7	90.9

Model names are M2HT-xxK-150.

11.2 Values Common to All Models

Parameter	Value
PV input	
Start-up voltage	135 V
Max. PV input voltage	1000 V*
Rated PV input voltage	620 V
Operating voltage range	200–950 V*
MPPTs × inputs per MPPT	4 × 2
Max. input current per MPPT	40 A
Max. short-circuit current per MPPT	50 A

Parameter	Value
Backfeed current to the array	0 A
Battery	
Battery type	Lithium (LFP) with BMS
Communication	CAN
Voltage range	150–840 V
Max. charge / discharge current	150 A
Short-circuit current rating, battery input	350 A
AC	
Rated voltage	3L/N/PE, 220/380 V or 230/400 V
Rated frequency	50/60 Hz
Power factor	0.8 leading to 0.8 lagging
Current THD	< 3% at rated power
DC injection	< 0.5% In
Back-up peak output	1.5 × rated power, 10 s
On/off-grid switching time	< 10 ms
Back-up voltage THD	< 3% (linear load)
Efficiency	
MPPT efficiency	99.9%
Max. efficiency	97.8%
European efficiency	97.4%
Protection	
Integrated	DC reverse polarity, battery reverse connection, insulation resistance, surge (DC and AC type II), over-temperature, residual current, islanding, AC overvoltage, overload, AC short circuit
General	
Overvoltage category	II (PV, battery), III (mains)
Dimensions (W × H × D)	919 × 739 × 305 mm
Weight	89 kg
Ingress protection / protective class	IP66 / class I

Parameter	Value
Standby consumption	< 40 W
Topology	Transformerless
Operating temperature	−30 to 60 °C
Relative humidity	0–100%
Max. altitude	3000 m
Cooling / noise	Smart fan / < 65 dB
Display / communication	OLED and LED / CAN, RS485

* Maximum operating PV voltage is 950 V. Between 950 V and 1000 V the inverter stops operating. Above 1000 V the inverter will be damaged.

** Maximum power imported from the grid to supply the back-up loads and charge the battery.

Technical Support

AERL technical support

12

Contact AERL for help with installation, commissioning, settings passwords, faults, firmware, warranty and spare parts for the M2HT 25–50 kW in Australia.

12.1 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 inverter model and serial number
- the installation date
- the fault code or message, and when it occurred
- a short description of the problem and what you have already checked.

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
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Phone
1800 950 865