EGUANA

Model

Evolve LFP AU – 14 kWh
Evolve LFP AU – 28 kWh
Evolve LFP AU – 42 kWh

Grid Support Utility Interactive Inverter & Integrated Lithium Battery

For use only with battery model

- Pylontech US3000C

Revision History

Revision	Date	Status	Author	Comments
1.0	09.Jan.2023	Draft	RWM	Initial release.
2.0	07.Dec.2023	Update	ND	Updates based on field feedback

IMPORTANT SAFETY INSTRUCTIONS

SAVE THESE INSTRUCTIONS

This manual contains important instructions for the Evolve™ Home Energy Storage System – including the power control system (PCS) and base model battery cabinet installation and operation. This product is expandable with the addition of up to two more battery cabinets. The Eguana Evolve™ components described by this manual are intended to be used as part of an Energy Storage system and installed as per the local electrical code.

CAUTION: Hazardous Voltages! This inverter contains hazardous voltage and energy that may be lethal. It may only be installed by qualified personnel who have read this manual and are familiar with its operation and hazards. The following safety procedures should be followed:

Only connect the PCS cabinet to a compatible electrical service as defined in the model specifications. The PCS must be connected to a dedicated branch circuit in the main electrical panel.

An external disconnect switch shall be provided in the end installation by others for the AC Grid output circuit.

CAUTION! This equipment contains high energy lithium batteries. Qualified and trained personnel should

wear protective clothing and equipment when working inside the battery cabinet and/or with battery modules.

The PCS is compatible with the Pylontech US3000C battery only.

CAUTION! The batteries provided with this system must be charged only by the PCS included as part of the

energy storage system. Do not attempt to charge batteries with any other charger device or connect any devices directly to the DC battery bus.

Ensure proper electrical grounding in accordance with code requirements.

Ensure proper airflow path for active cooling.

Never operate system in a manner not described by this manual.

Only qualified personnel should service this product.

Ensure all covers are securely fastened after installation is complete.

This product must be stored indoors in an environmentally conditioned location prior to installation, protected from rain and exposure to any hazardous chemicals.

Do not attempt to operate this product if there is any physical evidence of damage to any of the cabinets or internal components.

CAUTION! This equipment is heavy. Mechanical lifts are recommended for safe installation.

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1 Safety

Throughout this manual, the following symbols will be used to highlight important information and procedures:

Symbol	Definition	Symbol	Definition
	***WARNING! A dangerous voltage or other condition exists. Use extreme caution when performing these tasks.***		Meter measurement required.
	***CAUTION!*** *This information is critical to the safe installation and or operation of the inverter. Follow these instructions closely.*		Torque rating critical to operation.
	NOTE: *This statement is important. Follow instructions closely.*		Login to the remote monitoring system for operating status

1.1 In case of emergency

In all cases:

If safe to do so, switch off the AC breakers (external to the system) for the system.

- Contact the fire department or other required emergency response team.
- Evacuate the area, and if applicable, follow your emergency evacuation plan if others are in proximity to the installed location.

In case of fire:

- When safe, use a fire extinguisher suitable for use; including A, B, and C dry chemical fire extinguishers or carbon dioxide extinguishers.

In case of flooding:

- Stay out of water if any part of the system or wiring is submerged.
- Do not attempt to operate batteries that have been submerged in water even after they have been dried.

In case of unusual noise, smell or smoke:

- If safe to do so, ventilate the area.

1.2 Battery module safety precautions

This product is integrated with Pyltontech US3000C series battery modules. Refer to the Pylontech product manual for complete safety instructions regarding handling of battery modules.

1.3 General safety precautions

Important! Installation, service, and operating personnel must read this document in its entirety, and observe all safety and installation procedures as described in this manual. Never operate system in a manner not described by this manual.

Only qualified personnel should service this product.

Ensure all covers are securely fastened after installation is complete.

Personal Protective Equipment (PPE) in compliance with local work place safety standards must be worn when working inside the cabinet.

Risks of Fire
Do not expose the system to temperatures exceeding 60 degrees Celsius.
Avoid installation in direct sunlight.
Do not store objects on top of the cabinet.
Do not obstruct the intake or exhaust of the forced airflow system.
Do not store combustible objects and corrosive chemicals directly adjacent to the system.
Risks of Shock
 **WARNING! Hazardous Voltages. The Inverter contains hazardous voltage and energy that may be lethal**. It may only be installed by qualified personnel who have read this manual and are familiar with its operation and hazards.
Only connect this product to a compatible electrical service as defined in the model specifications. This product must be connected to a dedicated branch circuit in the main electrical panel.
Ensure proper electrical grounding in accordance with code requirements.
 **CAUTION! Both AC and DC voltage sources are terminated inside this product. Each circuit must be individually disconnected before servicing.**
Risks of Damage
 **This system is compatible with the Pyltontech US3000C battery only.** Do not attempt to connect any other battery to the system.
Do not connect any other loads, charge controllers, or PV panels directly to the DC battery source.
Do not drop, tip, or puncture the cabinet during transport and installation. Visible damage to the cabinet and/or internal components should be reported to the manufacturer immediately.
Do not store this system for periods longer than six months without a battery maintenance charge. This may result in permanent damage to the batteries.

1.4 Environmental Protection- Disposal and Recycling

Do not dispose of the system or any of the components within the cabinet. Batteries, electronics, cables, and metal parts are recyclable. Consult your municipal waste management authority to determine required methods of component recycling.

2 Introduction

2.1 About this Manual – Target Audience

This manual is intended to be used by qualified service and installation personnel for the purposes of product installation. This product is permanently wired to the home electrical service, and must be installed by a licensed electrician only. This manual contains instructions for the installation and start up sequence of the Eguana Evolve™ home energy storage system; including the PCS and master battery cabinets, the energy meter, and Ethernet connection to a customer supplied internet router.

IMPORTANT! This manual makes frequent references to a utility interactive solar PV system as part of an AC coupled solar plus storage installation, which is independently supplied, installed, and operated from the ESS. It is the responsibility of the installer to ensure that any utility interactive PV system connected to a backup panel for micro-grid operation is compatible for use with a grid-forming battery inverter.

The energy management system supplied with this product can monitor the AC power output of an independently installed utility interactive solar PV inverter to operate energy savings algorithms applicable to the local electrical utility; either via CT monitoring, or via compatible communication protocols with a select list of PV inverter models. Consult Eguana Technologies for the most recent list of PV inverters with direct communication to the energy management system.

This product can supply limited backup power, and contains separate grid and load ports to isolate backup loads during a grid outage. When this product is not in service, backup loads are routed directly to the grid panel via the internal PCS bypass relay.

The AC output of an independently installed utility interactive solar PV inverter can be wired to the backup panel to support solar battery charging during backup operation.

The battery capacity of this system can be expanded by adding additional cabinets adjacent to the master battery cabinet. Expansion of battery capacity is not covered within the scope of this document.

2.2 Glossary

Term	Definition	Term	Definition
AC	Alternating Current	GND	Ground
ARC	Auto Recovery Circuit	LED	Light Emitting Diode
AS/NZS	Standards Australia	NC	Normally Closed
CEC	Clean Energy Council	NO	Normally Open
CPU	Central Processing Unit	PCS	Power Control System (Inverter)
DC	Direct Current	PE	Protective Earth
DRED	Demand Response Enabling Device	PV	Photo-Voltaic
DRM	Demand Response Mode	RF	Radio Frequency
EMS	Energy Management System	SOC	State Of Charge (Battery)
ESD	Electrostatic Discharge	SOH	State of Health (Battery)
ESS	Energy Storage System		

2.3 Initial Inspection of Material List

The system components supplied with the Eguana Evolve™ LFP AU are shown below. Each component should be inspected visually for any damage that may have been caused by shipment. If damage is present, please contact your local distributor.

Item	Eguana P/N	Description
1	ACB05-LP	PCS cabinet (and cover)
2	ACB05-PB	Battery Cabinet (and cover)
3	-	Wall mount bracket
4	US3000C	4 battery modules.
5	LFP AU install kit	Assembly parts kit, cables, CT's, and manuals.
6	801004709	Energy meter, 3 phase*

*The energy meter is supplied inside the PCS cabinet, but can be relocated to the electrical panel.

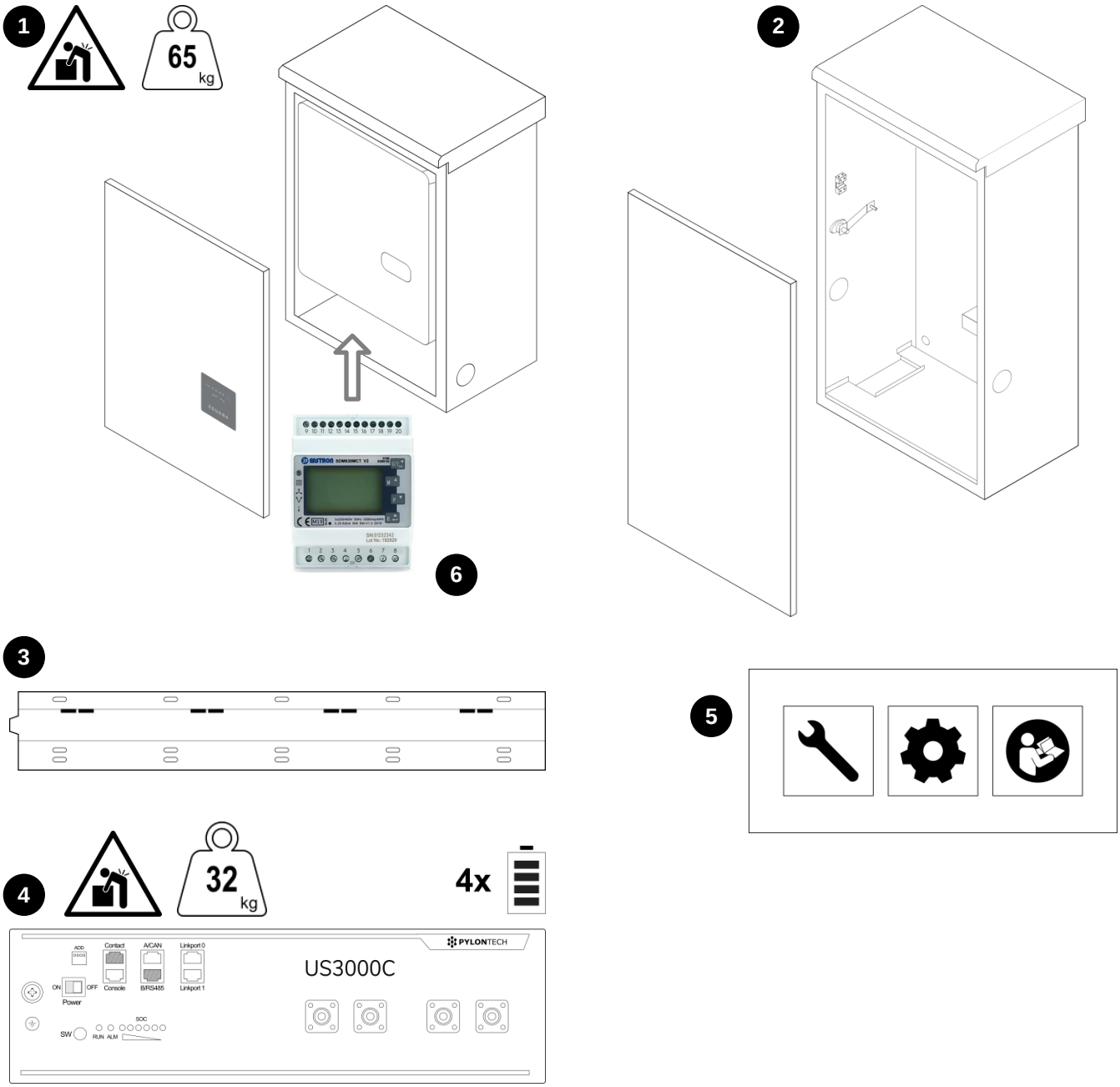


Figure 1: Evolve LFP AU materials list.

2.3.1 LFP AU install kit – mechanical parts and manuals

Item	Qty	Eguana P/N	Description
Battery Cabinet			
1	1	PB kit	Incl. cabinet coupler assembly, two levelling brackets, and two plugs
2	1	Breaker Assembly	DC breaker assembly
3	8	801003794	Adhesive backed battery module pads
4	1	801003757	Battery rack partition bracket (includes attached battery retaining clip 801003044)
PCS Cabinet			
5	1	LP kit	Incl. levelling bracket, cabinet coupler end plate, plug, and PCS-BMS communication cable. ***The PCS-BMS cable provided will match the battery type supplied with the equipment.***
6	3	-	Energy Meter CT's, 100A/40mA, split-core
-	1		Evolve LFP Installation and Startup Manual
-	1		Evolve LFP System Owner's Manual

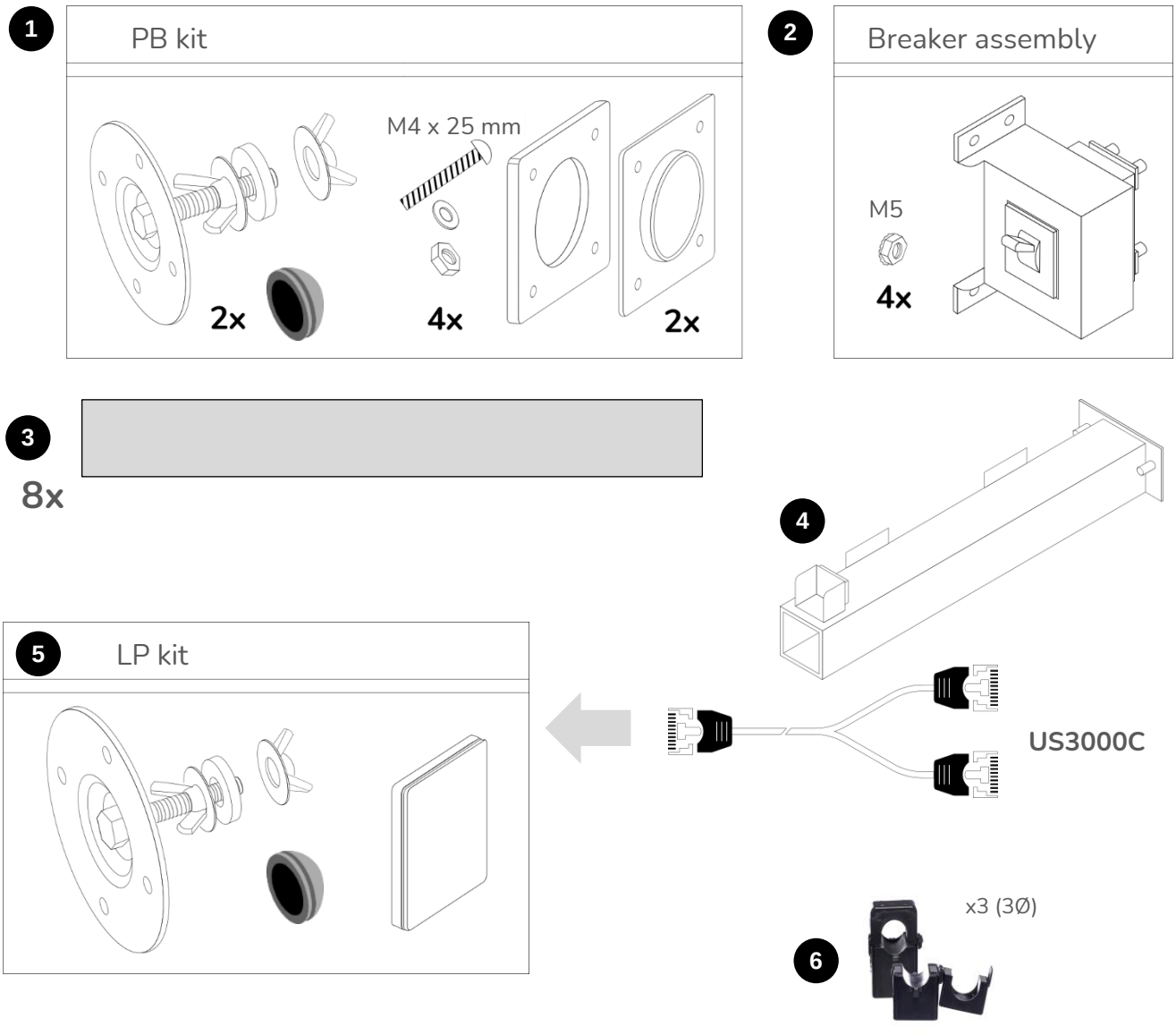


Figure 2: LFP AU install kit materials list.

2.3.2 Install kit – battery cables

Item	Qty	Eguana P/N	Description	Pylon p/n
1	2	801003790	DC- module jumper BLK 180 mm	WI0BSC1000B2
2	1	801003793	DC- module jumper BLK 400 mm	WI0CUS300004
3	2	801003798	DC- terminal jumper BLK 400 mm	WI0CUS300002
4	3	801003789	DC+ module jumper RED 180 mm	WI0BSC100001
5	1	801003796	DC+ terminal jumper RED 400 mm	WI0CUS300001
6	1	801003797	DC+ terminal jumper RED 700 mm	WI0PUS300001
7	2	801003792	BMS jumper short 210 mm	WI0SRJ458025
8	1	801003794	BMS jumper long 700 mm	WI0SUS300002
9	4	801003791	Chassis GND cable GRN/YEL 1 m	WI0GUS300001

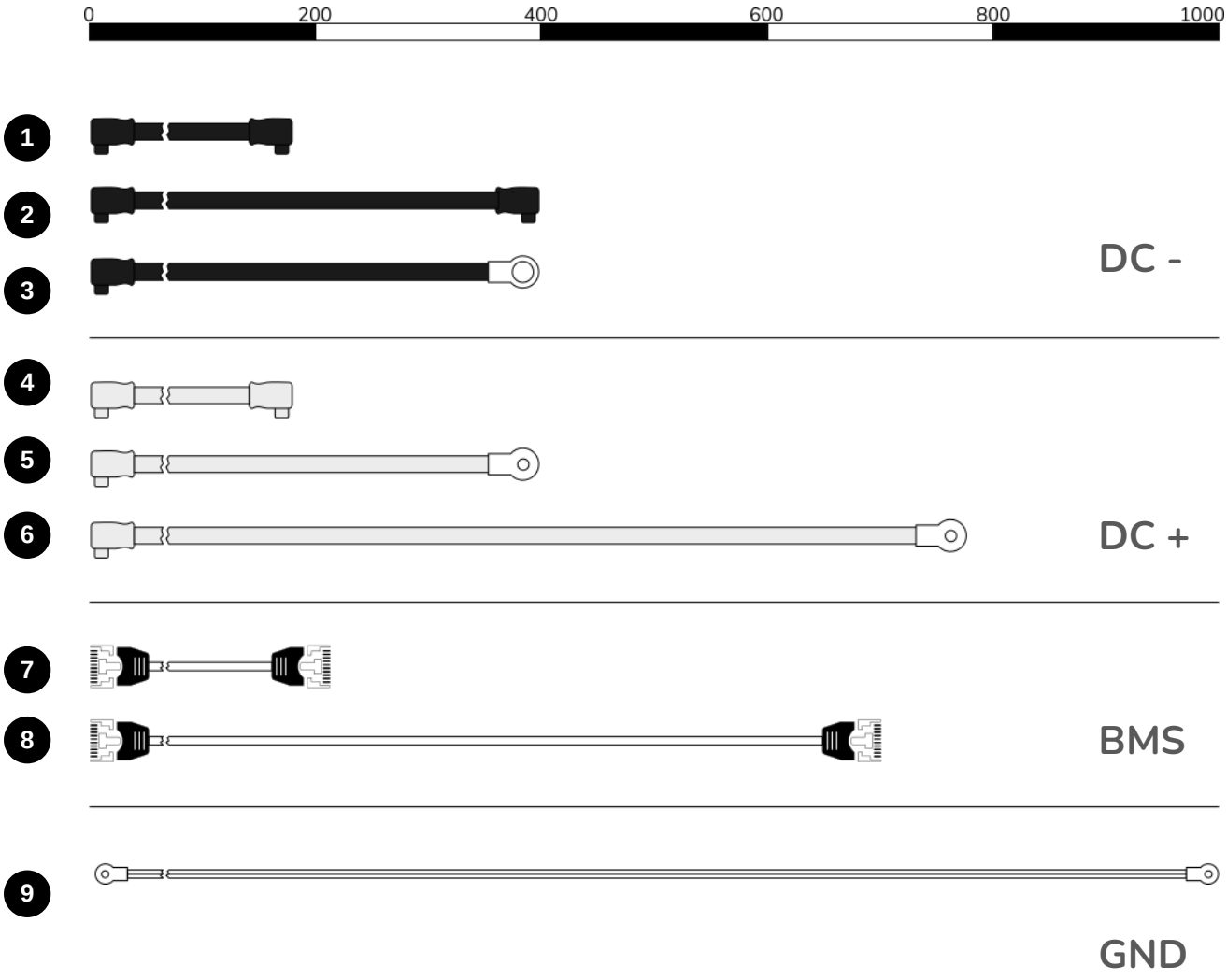


Figure 3: Battery cables materials list.

2.4 Special Tools & Hardware

In addition to standard tools, the following tools and hardware should be readily available for the installation.

- Torque wrench
- 17mm socket wrench (battery negative main power connection).
- 10mm socket wrench (battery +/- module power connections).
- 3/8” socket wrench (battery positive main power connection).
- RJ-45 crimp tool (EMS to PCS communication cable) and RJ-45 connectors.
- M8 mounting hardware for wall bracket (load bearing).

2.5 Inverter/DSP Firmware Version

The Inverter/DSP firmware version is displayed within the equipment device menu of the SwitchDin Smart Energy application, available both in IOS and Android. Open the application, then proceed to:
Unit >> Equipment (Devices) >> EguanaPCS >> Information: PCS. Field = Inverter/DSP Firmware version.

3 Installation Site Preparation

Before installing the Evolve home energy storage components, read all instructions and warnings in this manual.

CAUTION! All electrical installation work should be performed in accordance with local building and electrical codes.

WARNING! Isolate the PCS from all energy sources prior to electrical installation by means of disconnects, breakers or connectors. Failure to properly isolate either AC or DC sources may result in serious injury or death. This system will generate an AC voltage at the off-grid terminals when DC source is applied.

CAUTION! The PCS cabinet weighs up to 65 kg, and the battery cabinet weighs up to 145 kg. Handle with care. The wall must be load-bearing rated according to the local building code. Mechanical lifts are recommended to position cabinets on the wall bracket.

3.1 Locating the system

1. The installation location must comply with the environmental rating of the product. Refer to the environmental ratings in section 17.2 of this manual.

CAUTION! Do not install in direct sunlight. Battery performance is dependent upon operating ambient temperature. ***Radiant heat absorbed in direct sunlight will greatly reduce the performance of the battery and will prematurely cause degradation of the display indicator panel on the PCS cabinet.*** *The battery modules are rated for full power operation between -10C to +45C.*

2. The forced air cooling of the PCS cabinet is from bottom to top. Refer to figure 1 for recommended layout plan.
3. All inter-cabinet cabling is limited in length. Separating cabinets is not permitted.
4. Wall mounting hardware not included. The load-bearing wall bracket is provisioned for M8 hardware. Levelling brackets are provisioned for M5 hardware.

3.2 Installation Area Required to Wall Mount PCS and Battery:

The physical installation of the cabinets requires the layout planning and installation of the system components in the available installation space. The recommended installation height is driven by the viewing angle of the display panel on the PCS cabinet.

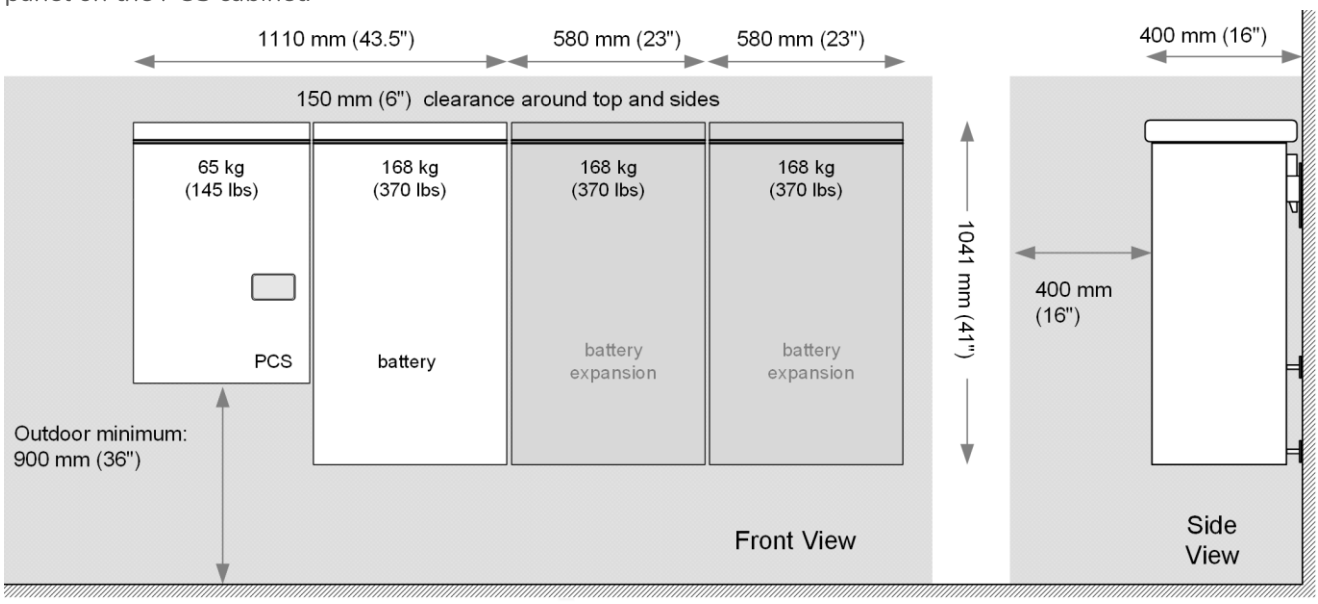


Figure 4: Installation clearances.

3.3 Installation plan – power and communication circuits

The following example outlines the conduit plan for power and communication circuits for the battery system. In this example, the PV inverter is coupled to a backup power sub-panel. The sub-panel may also be an isolated power bus within the main electrical panel.

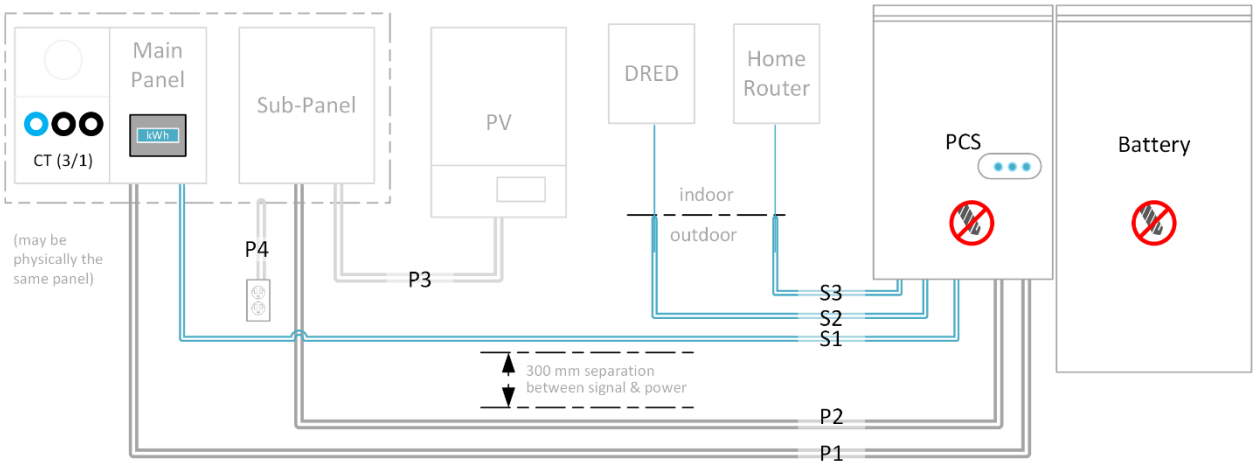


Figure 5: Installation plan.

Signal	Definition	Rating
P1	Grid power[-1]	10 kVA max (5 kVA battery + 5 kVA PV), 230 Vac, 1Ø
P2	Backup power	5 kVA max, 230 Vac, 1Ø only
P3	PV power (AC), coupled to backup	5 kVA max, AC, 1Ø only
P4	Home load circuits, backup power	16 A / 230 Vac, 1Ø only
S1	Energy meter (RS-485)[-2]	CAT-5, STP
S2	DRED device, Ethernet	CAT-5, UTP
S3	Home router, Ethernet	CAT-5, UTP

NOTES:

1- The battery system is rated 5 kVA maximum. Solar self consumption prevents battery power export, however, the grid power circuit must electrically accommodate the total of both battery and PV generation when PV is connected to the backup circuit.
2- The example above is shown with the energy meter relocated from the PCS to the main electrical panel. For installations where the energy meter is located within the PCS, the CT (current) and voltage sense wiring must be routed from the utility side of the electrical panel to the energy meter inputs. Refer to sections 7 and Appendix C for more details.

3.4 SLD - AC Coupled PV System with Back-up Power Operation

The single line diagram shown below is a representation of a typical installation configured for utility interactive and back-up power operation, with AC coupled PV connected to a critical load panel. This drawing is a guideline only, and is not a substitute for a code compliant installation. All components required for a code compliant installation are the responsibility of the licensed installer, including any additional circuit protection requirements not shown here.

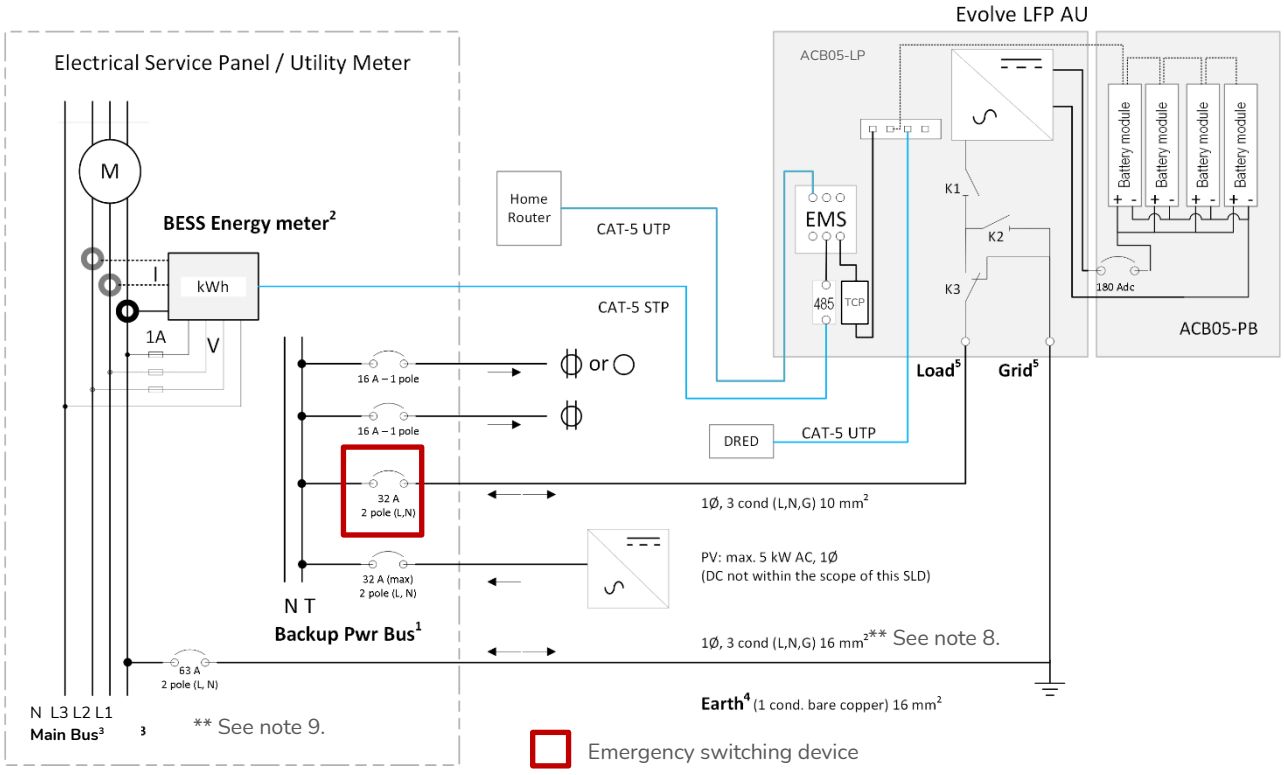


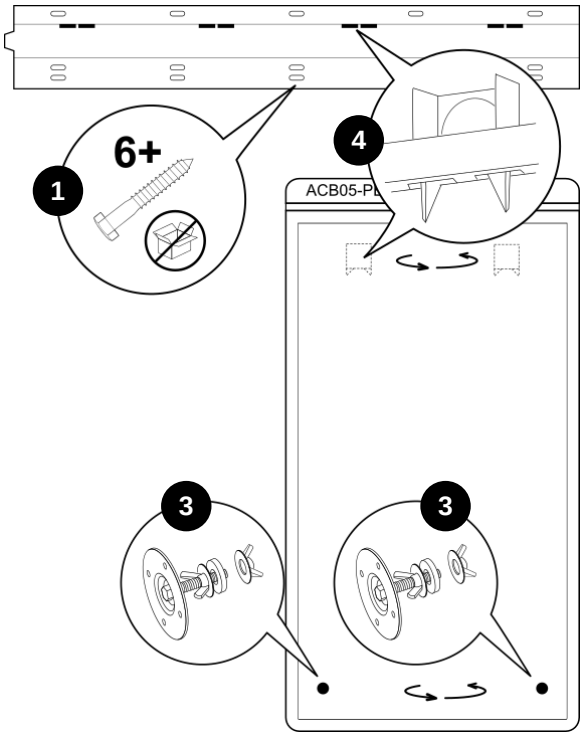
Figure 6: Single Line Diagram: Typical AC coupled PV system.

NOTES

1. The backup power bus must be electrically isolated from the main electrical bus. Do not tap the neutral wires of the main and backup buses. A separate line, neutral, and ground must be run to each of the load and grid ports of the battery system. Refer to the installation manual for wiring details.
2. Energy meter supports 1Ø and 3Ø configuration. In the above case, the energy meter was removed from the PCS cabinet and relocated to the main panel.
3. 3Ø service shown. For 1Ø service, do not populate L2, L3 ph components.
4. The battery system must be earth bonded to the building ground to meet lightning protection requirements.
5. The battery system load and grid ports are independently controlled circuits. Should the electrical code require additional "line-of-sight" disconnects, a separate disconnect must be used for each of the grid and load ports. The disconnects and/or circuit breakers must operate independently of each other, and not be ganged.
6. The PCS provides galvanic separation of AC and DC sources. Overcurrent protection devices, RCD Type A (300 mA), are sufficient for protection of both AC Grid and AC load ports.
7. Total AC nameplate of PV not to exceed 5 kW. String inverter shown for simplicity. Multiple AC strings of micro-inverters permitted. Any additional PV installed on the grid side of the battery system operates independently from the battery system, and is only limited by the interconnection requirements of the utility service provider.
8. The maximum conductor size permitted for the PCS grid port is 16 mm^2, and maximum breaker rating of 63 Amp to protect the internal circuits of the PCS. The ESS breaker rating and conductor size can be reduced, however, these parameters are subject to the total possible continuous output current of combined PV and ESS generation at the ESS grid breaker in the main electrical panel. Variables that determine conductor sizing include; PV continuous output current rating connected to the ESS load terminal, total self-supply current to the main electrical panel (load connected PV plus ESS output), and length of run from the ESS grid port to the main electrical panel (voltage drop). Conductor sizing is the responsibility of the installer as per the actual installation, compliant to local / national electrical codes. Refer to the technical data in section 17.1 for Maximum AC fault current and duration (short circuit).
9. The PCS short circuit withstand capacity is rated at 10 kA (1 second). Circuit protection must not exceed this rating.

*DRED: Australia only.

4 PCS and Battery Cabinet Wall-Mounting Instructions



1. Mount the wall bracket to the wall. Use the available slot pattern to mount to a load-bearing structure rated for the weight of the final system. The slots accommodate a M8 (5/16") bolt diameter.

   IMPORTANT! Wall-stud mounting: A minimum of three wall studs spanned within the width of the mounting bracket are required. A minimum of two mounting bolts are required per stud (top/bottom).

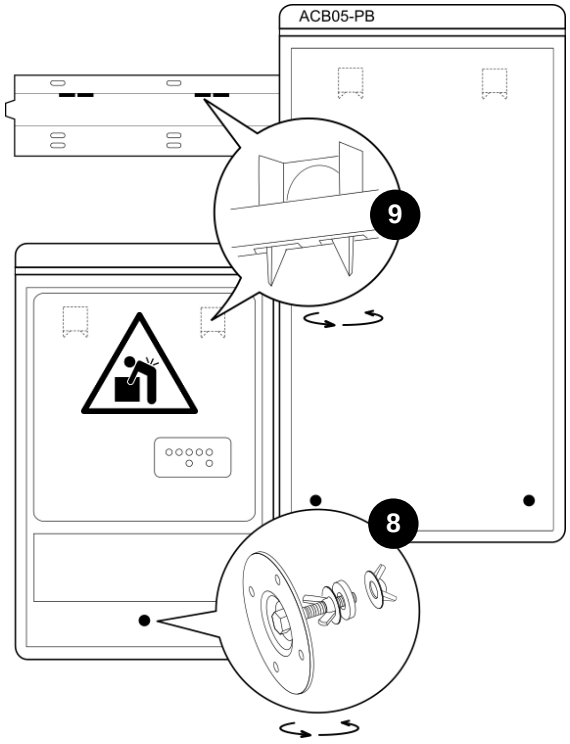
2. (not shown) Remove the battery cabinet from the packaging, and stand the cabinet upright. Remove the front cover.

3. Mount the two leveling brackets to the back side of the cabinet. Each side of the cabinet must have a rubber washer in direct contact with the cabinet wall.

4. Lift the battery cabinet onto the wall mount bracket, aligning the wall hooks at the rear of the cabinet with the slots on the load-bearing face of the bracket.

5. Slide the battery cabinet towards the right end of the bracket to allow for clearance for the PCS cabinet.

6. From the rear side of the cabinet, adjust the outer wingnuts on the levelling brackets until the cabinet is vertically plumb (level) to the wall.



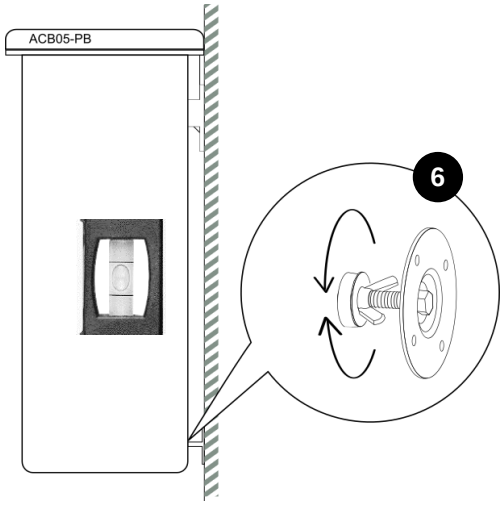


Figure 7: Installation instructions.

7. Remove the PCS cabinet from its packaging and stand upright. (not shown). Remove the front cover.

8. Assemble and mount the single lower-center leveling bracket as shown in steps 3 and 4 above.

CAUTION! The PCS cabinet is heavy. Mechanical lift or two persons recommended.

9. Lift the PCS cabinet onto the wall mounting bracket.

10. Slide the PCS cabinet to the left such that it aligns with the alignment tab on the mounting bracket.

11. From the rear side of the cabinet, adjust the outer wingnut on the single levelling bracket until the cabinet is vertically plumb (level) to the wall. (see image – step 6).

12. Insert the PCS cabinet coupling gasket between the two cabinets (lower-front). Slide the battery cabinet towards the left until mating to the gasket.

13. Place the coupling plate inside the PCS cabinet and insert the four mounting bolts and washers through to the battery cabinet side.

14. Place star washers on the bolts on the battery side of the cabinet.

15. Mount the battery cabinet side coupling plate, and fasten with the lock nuts. Torque to 10 – 15 in-lbs.

WARNING! *The mounting bolts of the flange assembly are required to be fully secured, as they provide the chassis grounding for the battery cabinet. Torque nuts as specified in the specification tables provided in this manual.*

16. **Continuity test:** Check the continuity between the cabinets using an Ohm meter. The test reading must be zero Ohms at a bare metal point inside each of the PCS and battery cabinets.

17. Install the cabinet coupler end plate (see- LP kit) to seal the hole on the battery cabinet.

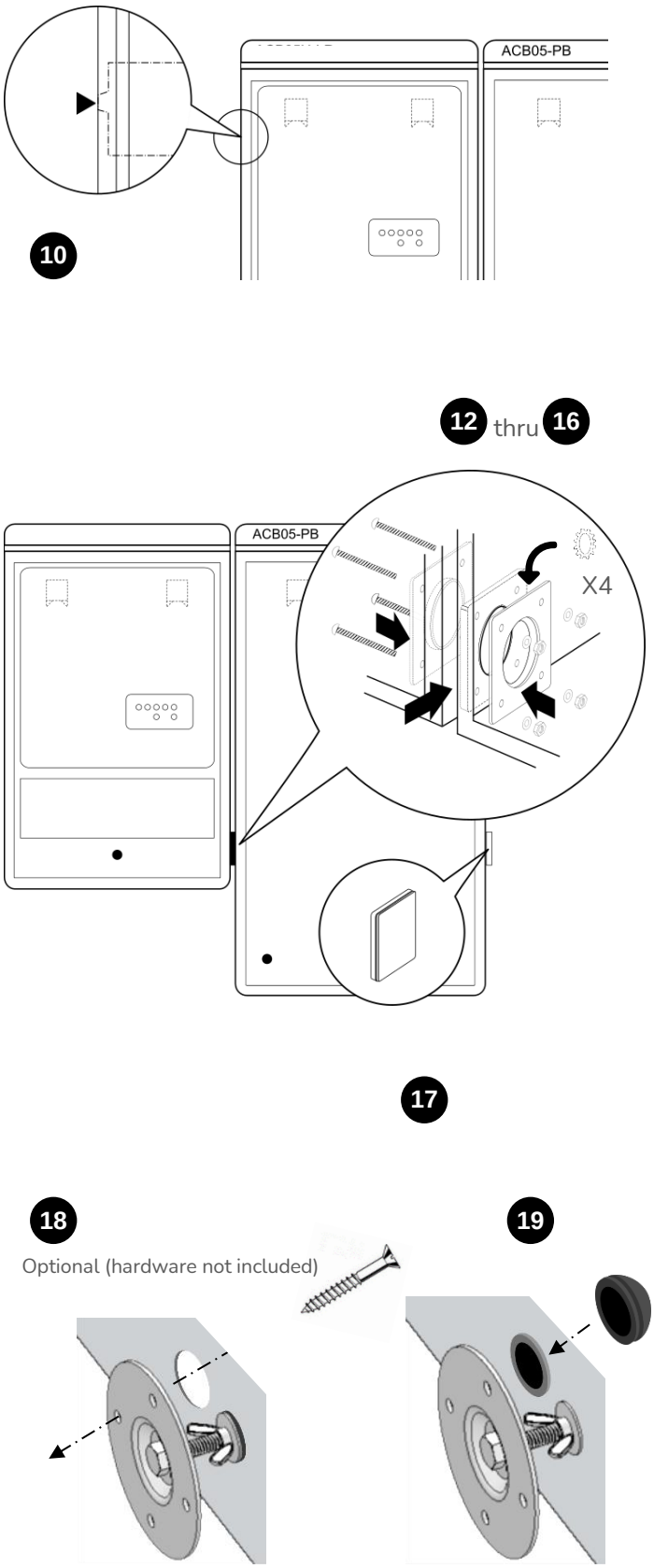


Figure 8: Installation instructions.

18. Optional: (This is not a load bearing anchor – anchored conduit runs to the PCS are satisfactory). Install screws in leveling plates for PCS and battery cabinets by inserting a screwdriver through the hole on the backside of the cabinets.

19. Plug hole on back of cabinet using by inserting the hole plug from the front side.

5 Battery Module Assembly

The following instructions include:

- Preparation and assembly of the battery cabinet modules and internal wiring.
- Interconnection of the PCS DC and communication cables to the battery cabinet.

Note: *Overcurrent protection of the DC source is provided internally as part of the integrated battery system. No external DC disconnect is required.*

5.1 Battery cabinet ground bus

CAUTION! A torque wrench is required to ensure the power cables are terminated to their specifications. Over-torque can damage the DC breaker and/or strip the threads on the copper bus bar posts. Under-torque can result in an arc fault hazard, and risk of fire. Damage as a result of improper termination is not covered by the manufacturer warranty.

1. Mount the four ground wires provided in the battery module grounding kit into the 4-position ground distribution block.

5.2 DC negative power terminal assembly

Ref	P/N	Description	Pylon p/n label
A3	#3798	DC- terminal jumper BLK 400 mm	WI0CUS300002
P-	#2925	PCS DC- power cable	-

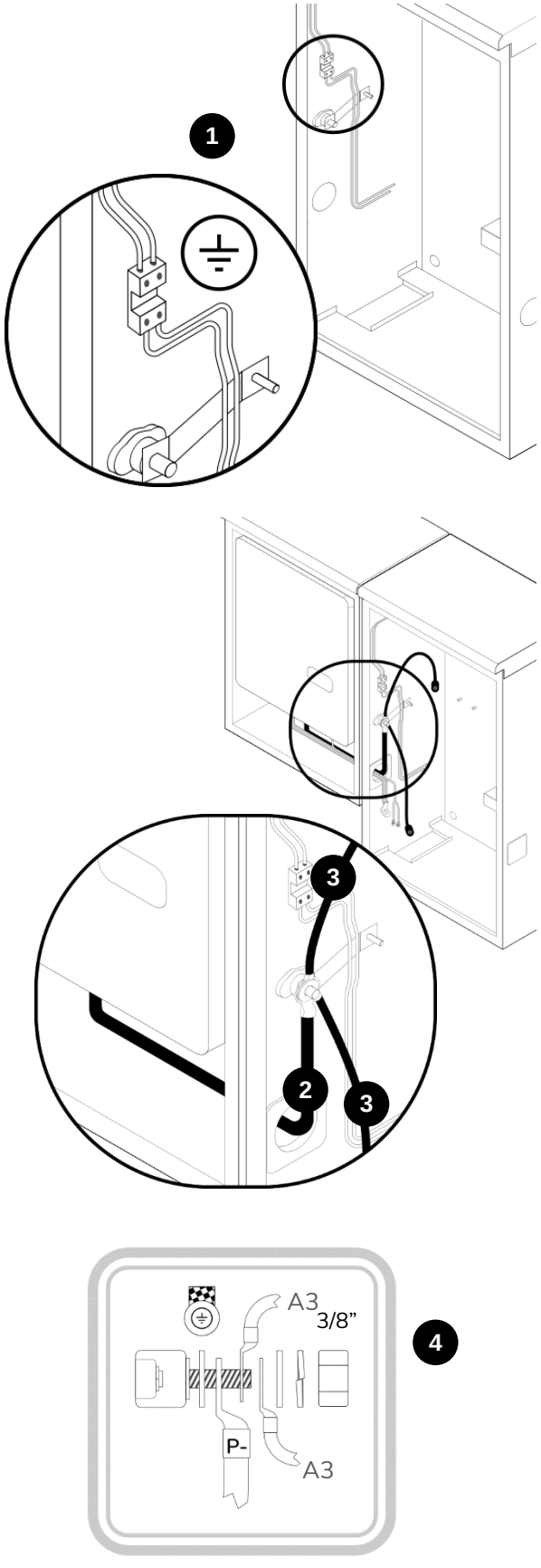


Figure 9: Battery module cable installation.

2. Route the DC negative power cable from the PCS through the cabinet port and mount to the DC negative power terminal.

3. Mount the two DC negative battery module power cables, referenced A3, (as provided in the battery cable kit) to the DC negative power terminal.
Offset each power lug so that a flush electrical contact is made between each of the lugs.

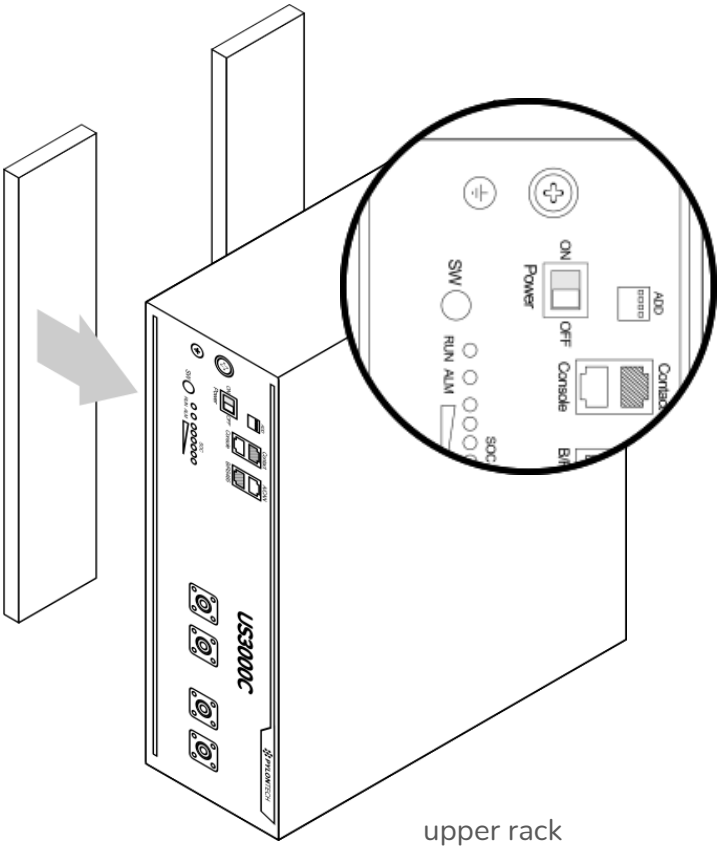
4. Secure the DC negative power cables to the power terminal using the washer, lock washer, and hex nut provided. Torque the nut to 35 in/lbs.

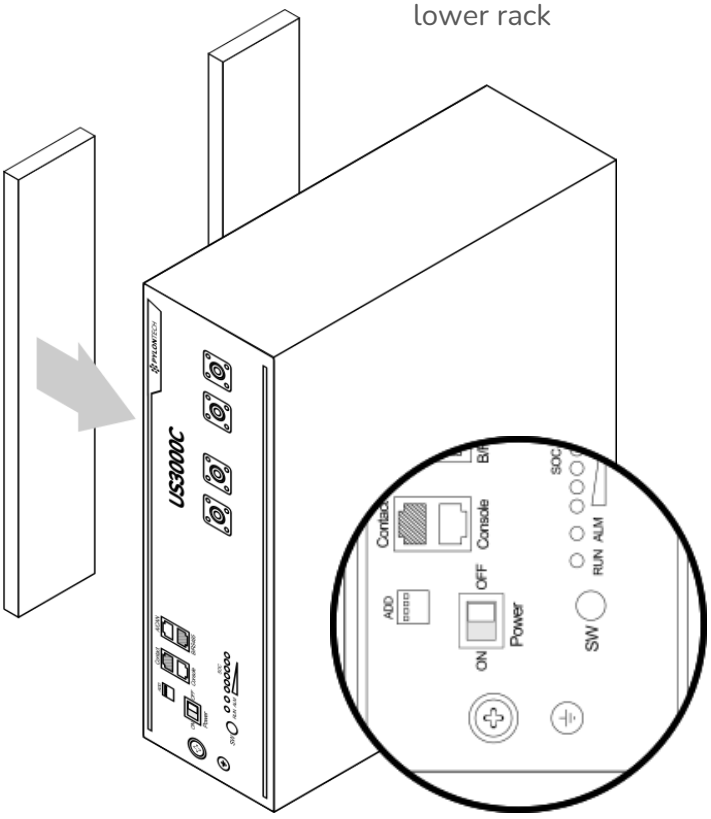
5.3 Preparing battery modules for installation

The PCS cabinet is not shown in the following steps.

CAUTION! Ensure the battery module power switches are in the OFF position throughout the following procedure.

Note: Observe the rotation of the modules on the lower and upper racks. The lower rack is rotated such that the chassis ground terminal is at the bottom of the module, while the upper rack chassis ground terminal is at the top.





1. (not shown) Remove a battery from its packaging. Remove the rackmount ears, if supplied with the battery.

2. Attach two adhesive-backed module pads (included in the battery module hardware kit) to the battery modules as shown. For the lower rack of modules, the pads are installed on the top face of the battery. For the upper rack, the pads are installed on the bottom face of the battery.

Figure 10: Battery module spacer preparation.

5.4 Mounting and grounding the battery modules in the battery cabinet

1. Slide the lower rack battery into the cabinet as shown, and connect the ground cable to the ring terminal ground connector on the battery module as shown.
2. Push the module inward until making contact with the rear face of the cabinet.
3. Repeat steps 1 and 2 above with the 2nd lower rack module.
4. Mount the lower rack retaining clip.
5. Install the battery rack partition bracket as shown using the two M5 keps nuts provided.

Note: Remove the retaining clip from the bracket if mounted on the partition bracket before proceeding with the following steps:

6. Repeat steps 1 thru 3 above with the upper level battery rack.
7. Mount the two upper rack retaining clips.

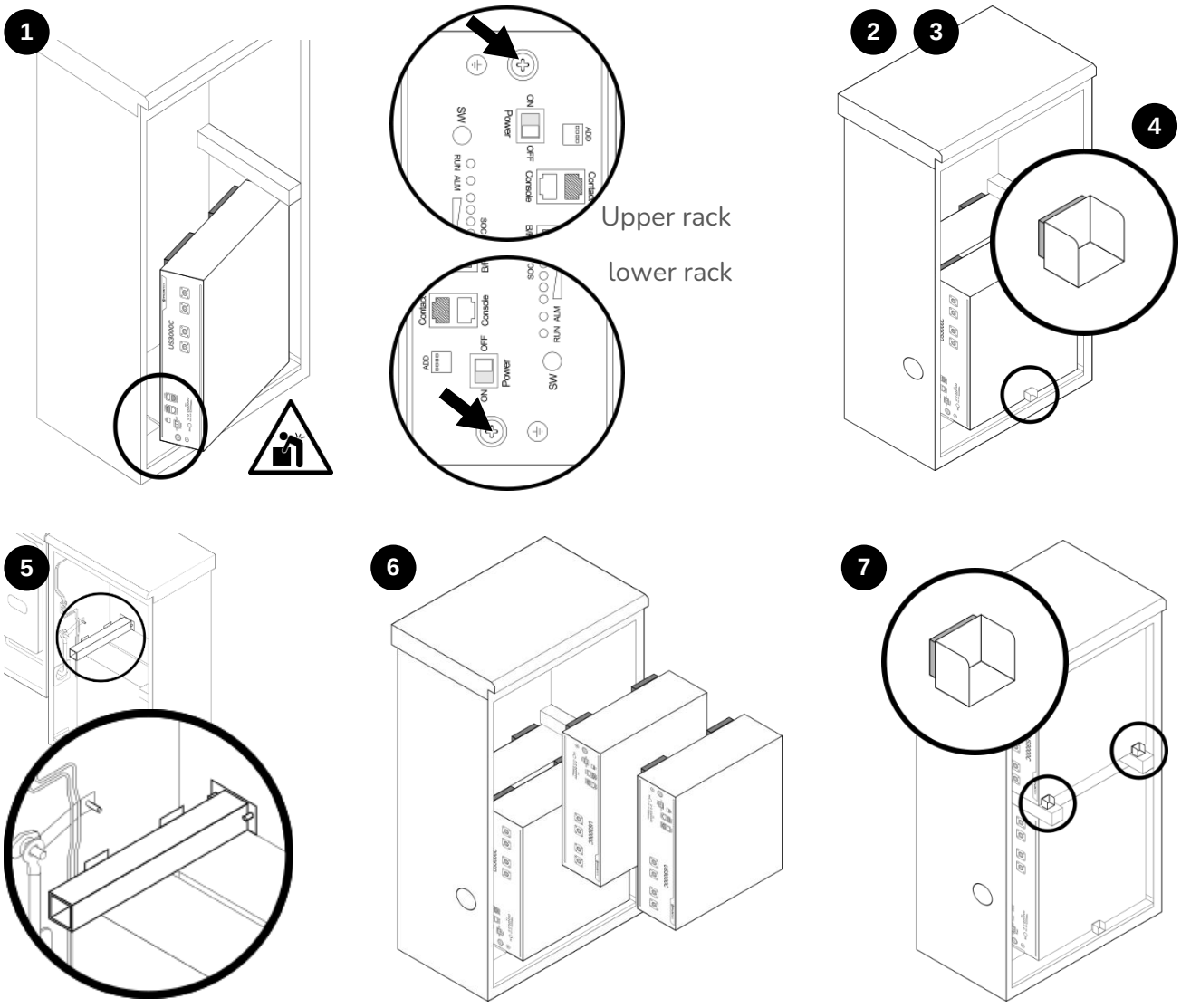


Figure 12: Battery module installation.

5.5 Wiring the battery modules

Follow the battery module power and communication jumper wiring below.

Ref	P/N	Description	Pylon p/n label
A1	#3790	DC- module jumper BLK 180 mm	WI0BSC1000B2
A2	#3793	DC- module jumper BLK 400 mm	WI0CUS300004
B1	#3789	DC+ module jumper RED 180 mm	WI0BSC100001
B2	#3796	DC+ breaker cable RED 400 mm	WI0CUS300001
C1	#3792	BMS jumper short 210 mm	WI0SRJ458025
C2	#3794	BMS jumper long 700 mm	WI0SUS300002

5.5.1 Battery module DC -/+ jumper cable wiring

Install the cables in the following sequence as shown.

1. Terminate the two DC- module jumper cables referenced A1.
2. Terminate the DC- module jumper cable referenced A2.
3. Terminate the two DC+ module jumper cables referenced B1.
4. Terminate the DC+ module jumper cable referenced B2.

5.5.2 BMS communication jumper cable wiring

Install the cables in the following sequence.

IMPORTANT! All module interconnecting BMS jumpers terminate at the [Linkport] terminals. Note the Linkport reference, 0 an 1, for each port connection.

1. Terminate the BMS jumper cable C2 between batteries #2 - 3.
2. Terminate the BMS jumper cables C1 between batteries #1-2 and #3-4.

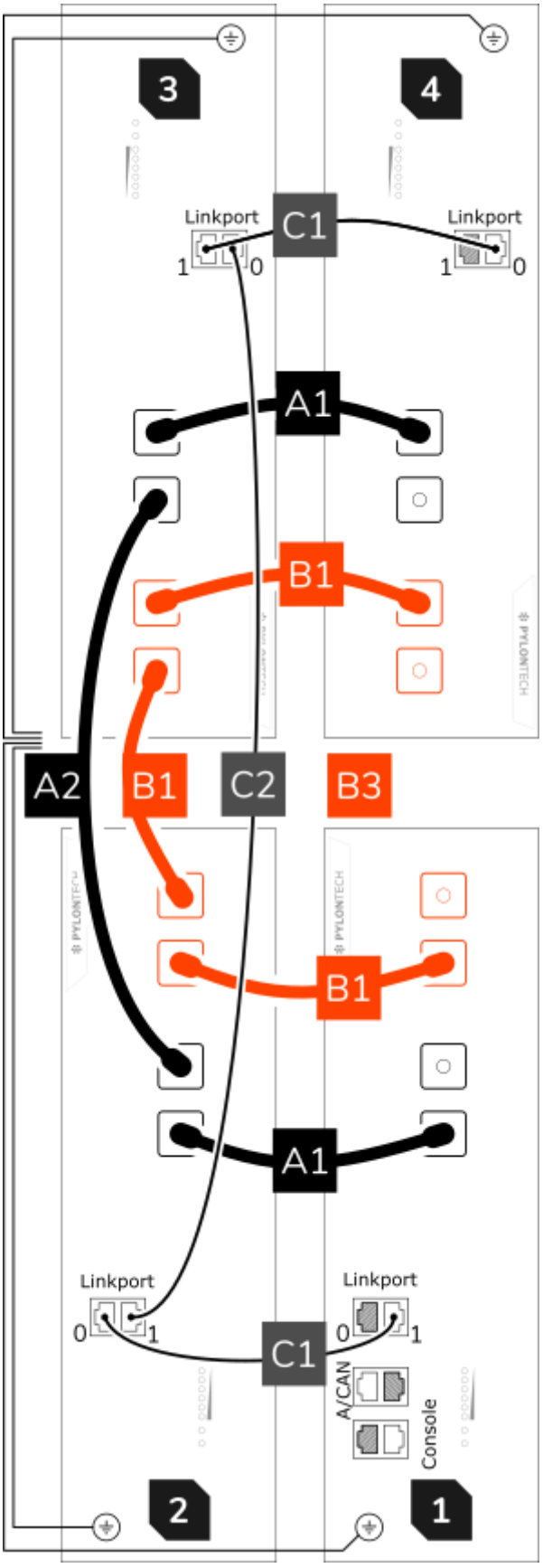


Figure 13: Battery module power wiring.

5.5.3 PCS to BMS communication cable

This cable is specific to the battery model. Refer to the instruction that applies only to the battery module suppled.

1. Terminate the PCS-BMS cable in battery #1 as shown in figure 11. This battery is herein referred to as the "Master" battery module. All other modules sync to the master.

    2. Model US3000C: Terminate the PCS – BMS / Console Y cable jumper in the [A/CAN] and [Console] ports of battery #1.

3. Route the other end of the cable through the PCS port hole and terminate in the cable in the [BMS OUT] port as shown in figure 11.
4. Terminate the two BMS jumper cables referenced C1 between batteries #1-2 and #3-4.

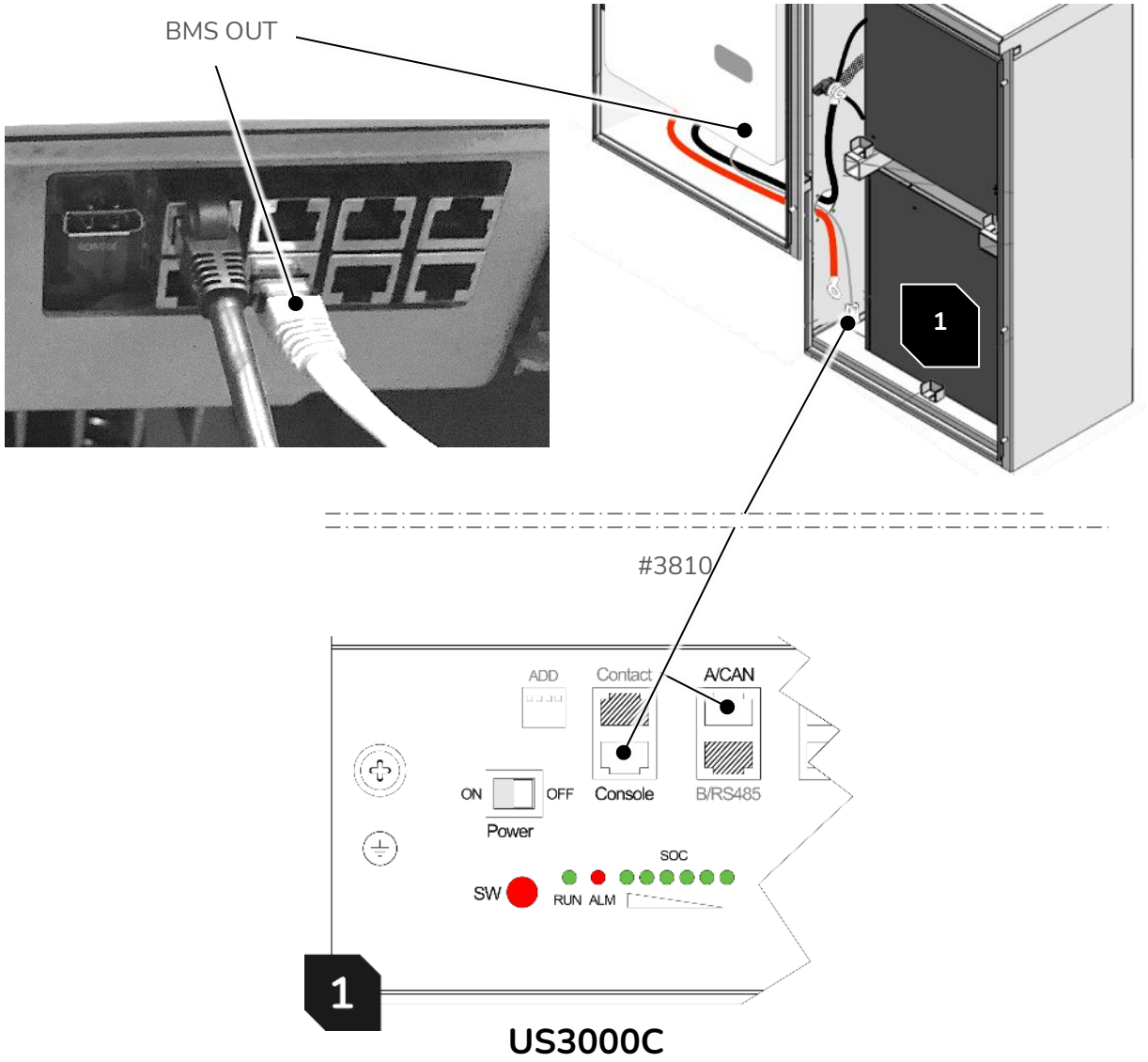


Figure 14: Battery module communication wiring.

5.6 DC- battery module to cabinet DC- connections

Note: This is a continuation from section 5.2. The cables referenced A3 should already be terminated at the cabinet DC- terminal.

Ref	P/N	Description	Pylon p/n label
A3	#3798	DC- terminal jumper BLK 400 mm	WI0CUS300002

1. Connect the DC- power cables referenced A3 to the DC- terminals of batteries 1 and 4 as shown.

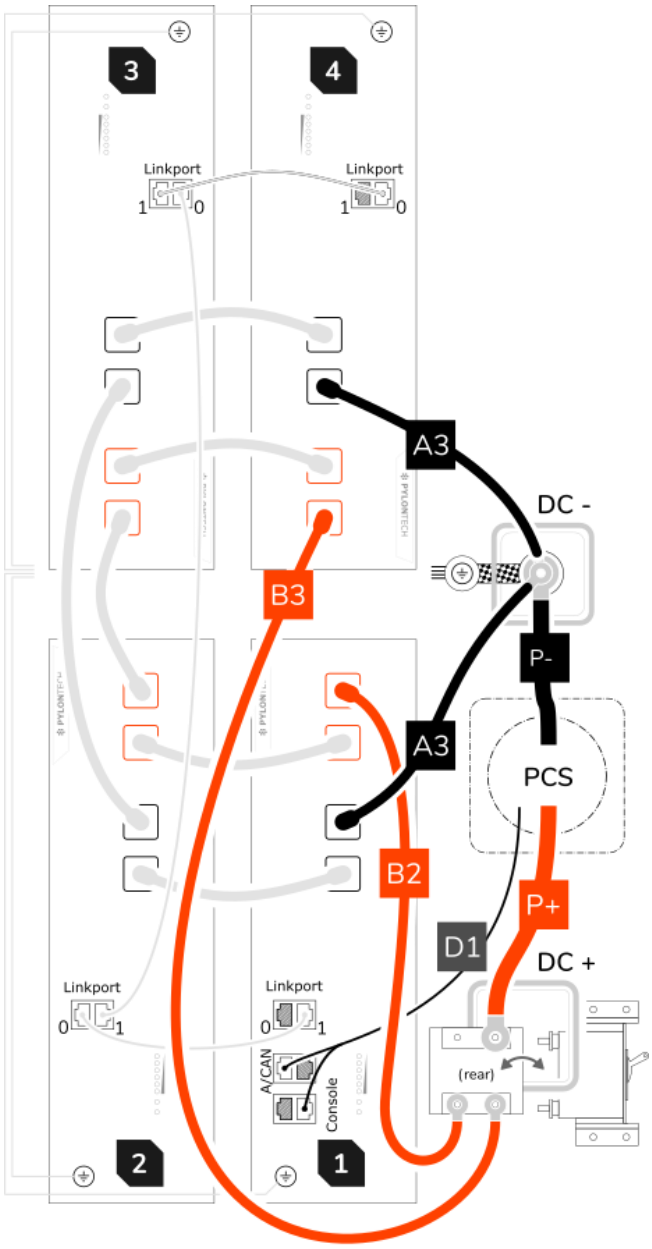


Figure 15: Battery cabinet to PCS cabinet DC wiring.

5.7 PCS DC+ power and breaker assembly wiring

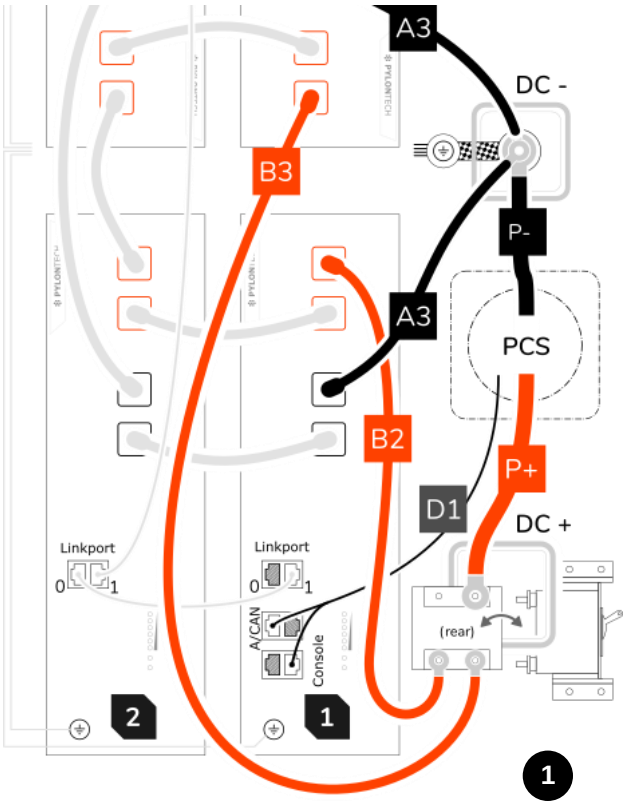
Ref	P/N	Description	Pylon p/n label
B2	#3796	DC+ breaker cable RED 400 mm	WI0CUS300001
B3	#3797	DC+ breaker cable RED 780 mm	WI0PUS300001
P+	#2923	PCS DC+ power cable	-

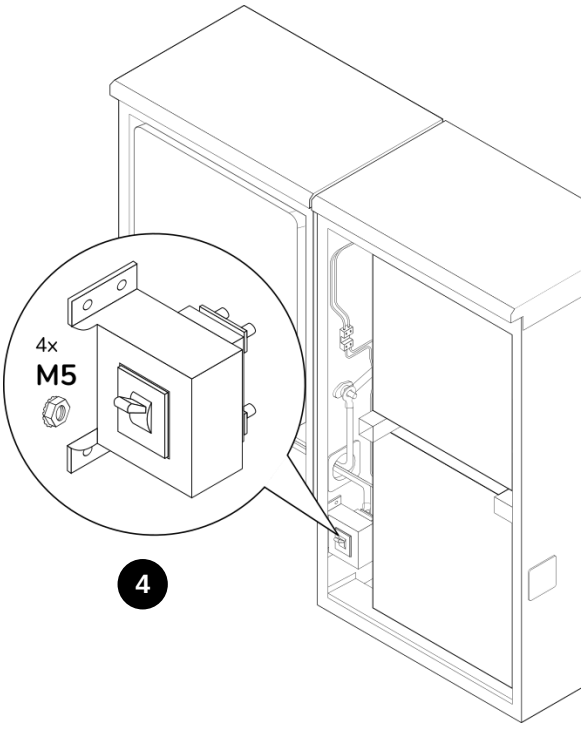
1. Route the PCS DC+ power cable from the PCS through the cabinet coupling port.

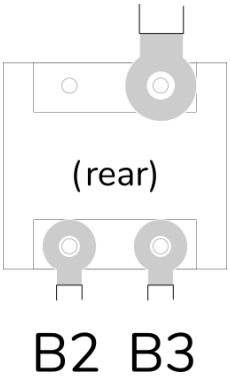
2. Terminate the PCS DC+ cable, referenced [P+], at the top right busbar terminal of the DC breaker as shown. Torque to 15 in/lbs.

3. Terminate the DC+ power cables referenced B2 and B3 at the lower battery DC+ power posts as shown. Mount only one cable per post

4. Mount the breaker assembly to the cabinet wall using the hardware provided.







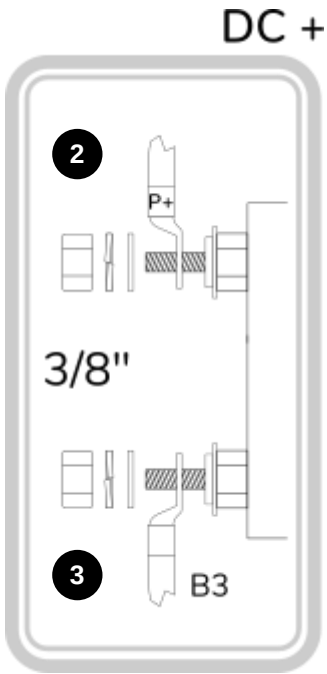


Figure 16: Battery DC breaker wiring.

6 System Electrical Wiring

Note: This product is capable of providing utility interactive and islanded back up power, and can be AC coupled to a utility interactive photovoltaic inverter. Wiring methods must be in accordance with local electrical codes. The installer is responsible for ensuring that over-current protection is installed and sized appropriately for the AC grid and off-grid output circuits, in accordance with the AS/NSZ electrical code.

All field wiring connections to the battery system are at the PCS cabinet only. The diagram (left) indicates the knockout locations for conduit entry into the PCS; categorized as AC power and signal level circuits.

IMPORTANT! Drilling holes anywhere in the battery or PCS cabinet renders the warranty null and void. Use the knockouts provided at the bottom face of the PCS cabinet only! Do not drill holes anywhere in the battery system. Use conduit fitting reducers, if applicable.

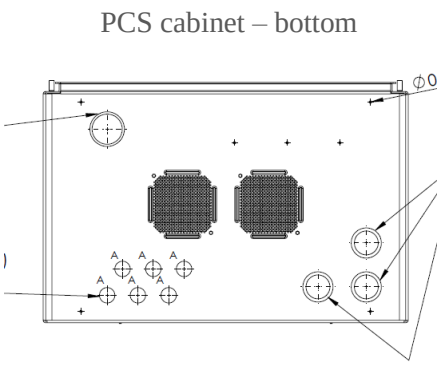


Figure 17: PCS knockout pattern.

6.1 AC power connections

This battery system contains two independent AC power connection ports; one port dedicated for an electrical utility connection, marked “AC Grid”, the other port dedicated for backup operation, marked “AC load”. This product’s primary application is intended for utility interconnection, and must be connected to a utility electrical service supplying single phase 230 Vac / 50 Hz. The backup operation of this product is a secondary application, and is intended to supply a limited subset of the home’ electrical loads. The system is not intended for whole home backup. It is also not intended for off-grid only operation.

Note: The PCS provides galvanic separation between AC and DC Sources. RCD protective devices of Type

A are sufficient for use as circuit over-current protection for both AC Grid and AC Load ports.

CAUTION! To reduce the risk of fire, connect only to a dedicated circuit provided with appropriate branch circuit over-current protection in accordance with local electrical codes.

WARNING! Improper connection of the wiring panel may result in equipment damage and cause personal injury. *Disconnect all AC and DC Sources prior to installation.*

CAUTION! The AC grid and load ports are independent circuits, controlled internally by an automatic bypass and transfer switch. Each port must be connected to electrically isolated panels. *Tapping line or neutral wires from the main electrical panel to the backup panel will result in permanent damage to the product. Neutral continuity is maintained internal to the PCS.*

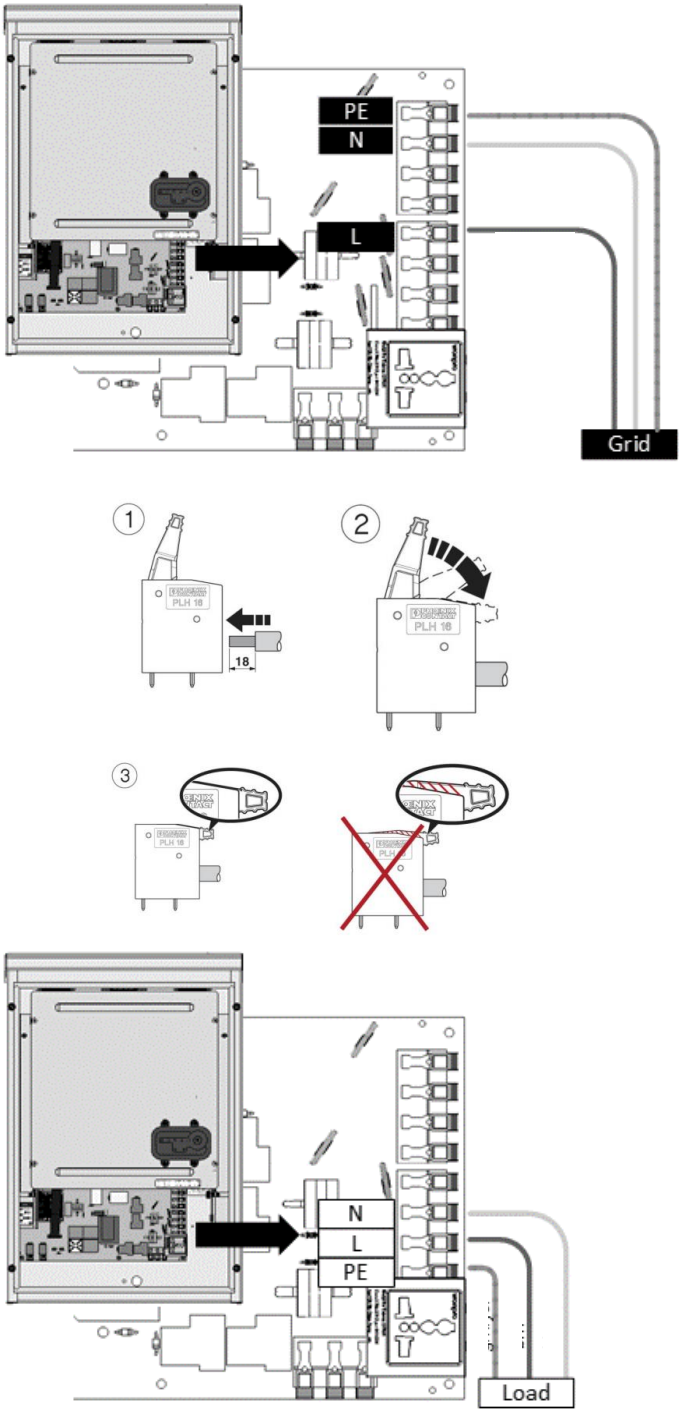


Figure 18: Wiring the PCS AC grid and load ports.

1. **AC Grid Port:** Open the spring clamp terminals on the AC circuit board at the port marked “AC Grid”.
2. Terminate the AC grid connection wires as follows: “L_Grid” = Line, “N_Grid” = Neutral, and “PE” = Ground
3. Close the spring clamp terminals, ensuring levers are fully engaged.
4. **AC Load Port:** Open the spring clamp terminals on the AC circuit board at the port marked “AC Load”.
5. Terminate the wires at “L_AC load” (Line), “N_AC load” (neutral), and “PE_AC load” (protective earth).
6. Close the spring clamp terminals, ensuring levers are fully engaged.

6.2 Chassis Grounding

In this section, “Chassis Ground” is referred to as “ground” or “grounding” unless otherwise mentioned.
The PCS cabinet is shipped with ungrounded DC power terminals within the inverter. When terminated to the batteries, the DC bus is configured for DC negative to ground.

AC Grid Earthing System: The AC power grounding is achieved through the PE terminals of the AC grid connectors on the AC Filter Board, as shown in section 6.1. The PCS is configured by default for a TN earthing system.

Note: The field ground wire rating applies to the AC circuit only. The DC source loop is internal to the battery cabinet, and is rated accordingly.

Lightning Grounding: The inverter has built-in lightning protection. In order for the lightning protection to be effective, the grounding for lightning currents must be provided via low impedance path from the PCS PE terminal to the building Ground/Earthing point.

7 Energy meter installation

The energy management system’s solar self-consumption algorithm requires the connection of an energy meter at the customer’s main electrical panel. The meter must be installed and configured according to the electrical service; either single phase or three phase. Refer to the energy meter manufacturer’s installation manual supplied with the system for full installation details and safety information.

Note: Refer to Appendix C for wiring diagrams specific to the manufacturer and model of the energy meter supplied with the system.

The energy meter is supplied inside the PCS cabinet. It can be relocated within or adjacent to the main electrical panel to simplify the current and voltage wiring. Energy meters supplied with the home storage system are DIN rail mounted. Use existing DIN rail space within the electrical panel, or add DIN rail as required.

7.1 Electrical connections – voltage measurement / power supply

The energy meter provided is line powered from the electrical service. An in-line fuse, rated 1 Amp / 250 VAC, is required on the voltage line input to the meter. For three phase service, fuses are required on the V1, V2, and V3 input terminals. The voltage inputs can be connected anywhere on the load side of the main service disconnect breaker. For three phase systems, phase rotation is automatically configured by the meter. Refer to Appendix C for wiring details.

7.2 CT (current transformer) connections

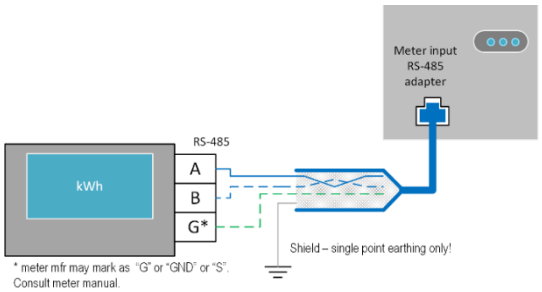
Note: Observe the current flow direction of the CT. The direction of flow must be away from the utility meter. For three phase systems, phase rotation is automatically configured by the meter.

CAUTION! Handle CTs with care. Always terminate the CTs at the meter inputs prior to clamping the core onto a hot wire.

CT’s supplied with the meter are provided with standard 2.4 meter length wires. They can be extended up to 15 meters using 0.75 mm^2 UTP cable. The CTs must be mounted on the primary electrical bus, between the main service breaker disconnect and the utility’s energy meter. This is important to ensure all loads and generation are captured for optimum performance of the solar self consumption control algorithms.

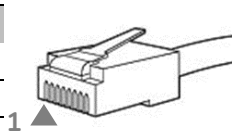
7.3 RS-485 communication connection

The battery system communicates with the meter using the Modbus protocol over an RS-485 network. A 10 meter patch cable is supplied with the equipment. Should a longer cable be necessary, shielded twisted pair cable is required.



Note: Shield wire connected to earthing terminal at a single point only. Terminate the cable as shown (TIA/EIA 568B standard):

Signal	RJ-45 Pin	Wire color
GND	3	green/white
A	4	blue
B	5	blue/white



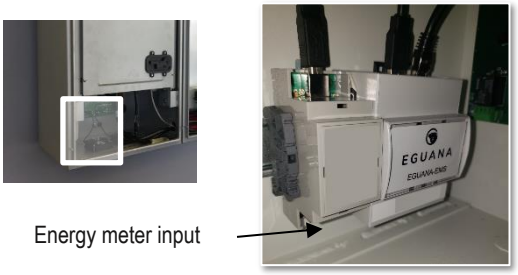


Figure 19: Meter comunication connection.

8 Droplet Ethernet connection to Home Router

The Ethernet wiring from the battery system must be connected to a customer supplied router. A permanent Ethernet connection to the battery system requires external wiring. Compliance with local electrical code is the responsibility of the installer. Conduit and fittings connected to this equipment must ensure compliance with the IEC environmental rating as per the equipment ratings.

8.1 Ethernet cable connection

The Ethernet connection is a standard RJ-45 straight through configuration. Standard EIA/TIA termination practices are recommended.

1. Remove the knockout dedicated for the Ethernet connection.
2. Secure the communication cable strain relief (conduit fitting, if applicable).
3. Terminate the routed cable as a straight-through Ethernet connection.
4. Test the cable prior to connection.
5. Connect the cable to the Droplet's Ethernet port as shown.

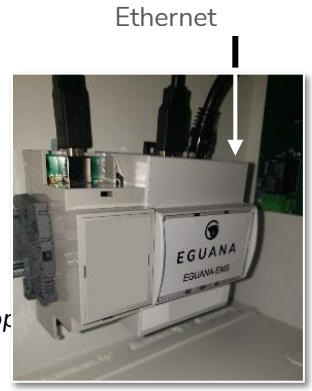


Figure 20: Drop

9 DRED Device Connection

1. Connect the DRED device to the DRM Port at as shown.

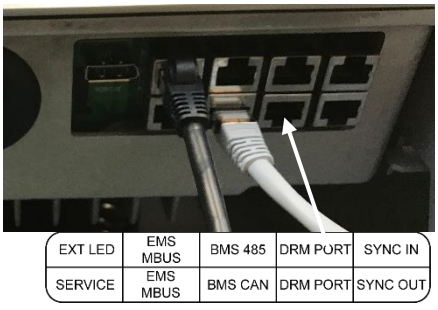


Figure 21: DRED device connections.

10 Battery module BMS definitions and operating states

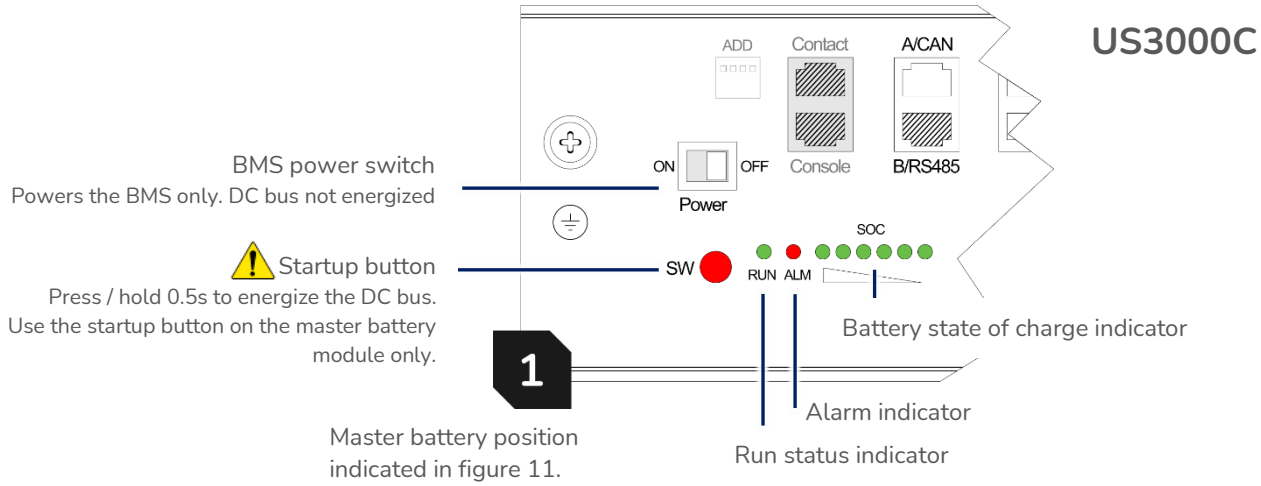


Figure 22: Pylontech US3000C BMS face plate.

Condition	RUN	ALM	SOC. SOC	Each LED represents 16.7%
Power ON	●	●	● ● ● ● ● ●	Initializing after BMS power switch ON
Idle / Normal	◎	○	○ ○ ○ ○ ○ ○	
Charge	●	○	○ ○ ○ ◎ ● ●	Highest SOC flashes. ex) 50%.
Discharge	◎	○	○ ○ ○ ○ ● ●	Show SOC. ex) 33%.
Alarm		◎		All other LEDs as per operating condition.
System error/ Protect mode	○	●	○ ○ ○ ○ ○ ○	DC bus not energized.

◎ Blink

◎ Flash

● Solid

11 Start-up Sequence

CAUTION! Powering the ESS requires a specific start-up procedure. Please follow the steps below.

CAUTION! If the battery disconnect has been placed in the OFF position at any time during operation, wait one minute before returning to the ON position. Rapid cycling (less than one minute) of the battery disconnect can cause damage to the pre-charge circuit.

CAUTION! During the first start-up sequence after installation, the battery modules may require a battery maintenance cycle to balance the SOC. This maintenance cycle requires a grid connection so that the PCS can be commanded to charge the batteries. The PCS battery SOC alarm light will flash yellow if maintenance and/or other battery faults are present. This procedure may take from a few minutes to a few hours, depending on the difference in battery module SOC.

1. Turn ON the BMS power switch to all battery modules in the cabinet.
2. Press and hold the Start button on the master battery module for 0.5 seconds. The master battery is the lower-front module in the battery cabinet. Wait for the battery module to initialize to the normal/idle state. See also figure 10, module position 1 for reference.
3. Turn ON the battery disconnect.
4. Turn ON the AC source disconnect and/or breaker at the electrical panel.

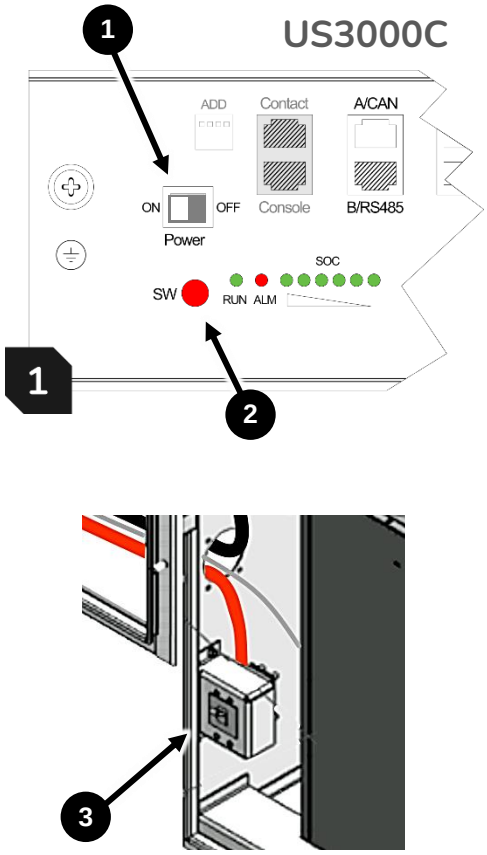


Figure 23: Startup procedure.

11.1 Shutdown Sequence

1. Press and hold the service button for 10 seconds. All lights on the panel will flash rapidly.

2. Shut off the BESS AC grid disconnect.
3. Wait 20 minutes for the BESS to de-energize. Shut down is complete when all panel lights are OFF. Service personnel only! Alternate to step 3 above: remove the front cover of the battery, and press and hold the power button on the master battery for 5 seconds to de-energize the battery modules. Confirm all module panel lights are OFF.

12 Operation

EMS

The Evolve home energy storage system is fully automated. The EMS will be programmed to connect the system to the grid after AC and DC sources are applied. Refer to the user interface manual for system monitoring and operation status. The operating states can also be viewed on the PCS display panel.

12.1 Updating the PCS factory regional settings

The PCS within the BESS is factory configured for Australia – Region A. For installations in any other region, the PCS settings file must be updated accordingly using a separate software application. Contact support at Eguana Technologies Pty to obtain the ECI software. Refer to the Eguana ECI manual for further instructions. PCS settings are not available in the EMS monitoring app.

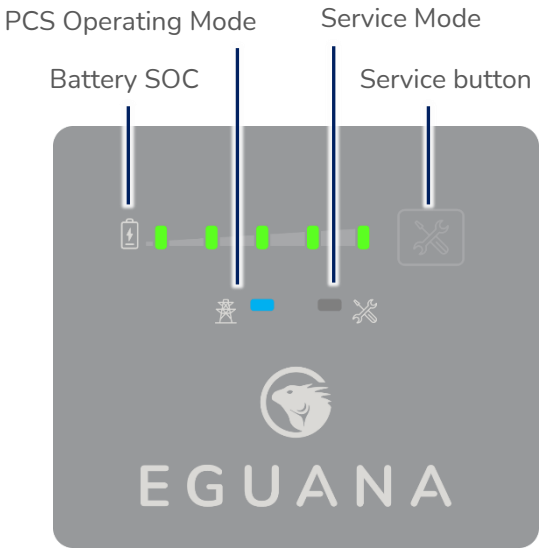


Figure 24: PCS display panel.

13 PCS Display Panel

13.1 LED Display Indicators

The PCS cabinet is equipped with a display panel that provides indication of the following:

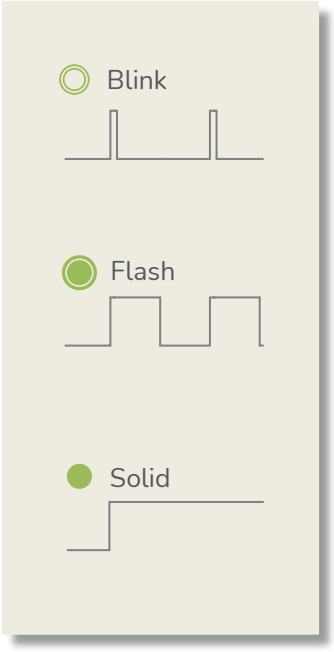
- Battery Operating State
- PCS Operating State
- (out of) Service Indicator

Refer to the following section for a complete definition of indicator states.

13.2 PCS display panel indicator summary.

The LEDs on the PCS identify operating states by both display mode and color.

LED	Mode	Definition
	●●●●●	State of charge. Each LED represents 20% SOC. Solid = battery idle.
	○○◉○○	Charge = flash right. Discharge = flash left.
	●○○○○	Low battery.
	●○○○○	DC ground fault.
	◎	Sleep / Standby mode.
	●	Grid timing mode.
	◉	Grid synchronization mode. Ten second test before grid connect mode.
	●	Grid connected mode.
	●	System OK.
	●	System out of service.
	◉	User initiated service mode.



13.3 Service Button

The service button can be used to place the system into or out of service mode, as well as cycle through various operating modes. If the system has gone into service mode, the user can attempt to bring the system back into normal operation using the service button.

Note: It is recommended to login to the EMS via web browser and retrieve the service code from the system prior to attempting to clear the service mode.

Observed state	Action	Service button command
Service light on	Exit service mode	Press and hold 5 seconds

Refer to *section 15 – Troubleshooting* if the service button does not perform the action requested.

13.4 Backup Power Operation

This system will provide backup power to dedicated electrical circuits within the home via a permanently wired electrical sub-panel, referred to as the backup panel. Backup power is limited in rating and duration, both of which are dependent on the nature of the loads connected to the system, and the availability of the solar PV supply. This system is designed to reliably provide power to a refrigerator, home lighting, home electronics, and small appliances.

NOTE: This product is not an uninterrupted power source (UPS). Following a utility outage, a four second power interruption will occur before the backup power source commences. As a result of this interruption, a desktop or portable UPS is recommended if continuous operation is desired for any electronic devices.

IMPORTANT! Surge rated loads, i.e., power tools, portable air conditioners, may cause an overload shutdown. Equipment of this type that is connected to the backup panel should be inspected and tested regularly as per manufacturer suggested schedules. Permanent damage to the battery system and/or your equipment may occur if exposed to chronic overloading cycles.

IMPORTANT! Portable extension cords connected to a backup circuit should be limited to 10 meters.

IMPORTANT! This product does not support automatic gas generator integration. Do not attempt to connect a gas generator to the battery system. If generator support is required, consult your installer regarding a separate manual transfer to your backup electrical panel.

NOTE: The power output / surge rating will be further limited when the battery is below 10% SOC.

13.4.1 Backup Power Display Modes

Display	Definition
	Battery status LEDs indicate the following: • Charge = flash right. Discharge = flash left. • PCS and service lights off.
	Low SOC shutdown in backup mode. See section 13.5 to restart the system.
	Low SOC shutdown initiated while out of service. See troubleshooting – section 15, *"service light on in backup mode"*.

13.5 Off-grid mode: Restarting the battery system after low battery shutdown

The system will shut down when the battery reaches a critically low-level during backup operation.
To restart the system:

IMPORTANT! If the battery system is installed without a PV system connected to the backup panel, do not attempt to restart it. For systems with backup panel connected PV, ensure there is direct sunlight for the solar PV system to charge the battery before restarting the system. Wait for the utility power to return.

1. Press and hold the service button on the front of the display panel for 5 seconds. 

The backup power will restart, allowing the PV system to energize and charge* the battery. The system will continue to operate if the battery charges to its minimal normal operating range. If the battery does not charge within 15 minutes of restart, the system will shut down to preserve the battery.
***Australia – the PV system begins to generate one minute after being enerized.**

Note: De-energize any home loads by shutting off the circuit breakers in the eletrical switchboard to increase the charge rate of the battery from the solar PV array. Do not shut off the PV or battery circuits. **It is strongly recommended to charge the battery to a minimum of 10% state-of-charge before energizing any home loads.**

The charge rate of the battery is dependent upon the available solar PV output. As a rule, the battery will charge to 10% SOC at the following rates:

PV output, kW	10% Charge duration, minutes
1	120
2	60
5	20

14 Maintenance

The Evolve home energy storage system is a maintenance free product. Regularly scheduled inspection of the airflow path for the active cooling fans on the bottom side of the PCS cabinet is all that is required. This inspection should occur on an annual basis or coincide with PV inspection.

If the fan ventilation holes are obstructed with dust / debris, a soft-bristled brush can be used to wipe them clean. For heavy soiling use a soft, dry brush. Do not use any solvents, scouring, or corrosive materials to clean the unit. Never remove or unplug connections or plugs during cleaning.

15 Troubleshooting

System faults are reported and logged in the monitoring system. All fault logs are also accessible remotely.

IMPORTANT! Contact the system installer immediately if any of the following conditions are present on the front display of the inverter panel.

Condition	Definition
Service light ON in grid mode	System is prevented from normal operation due to internal fault. Notify service personnel.
Service light ON in backup mode	If the system faults into service in backup operating mode, there may be an overload condition which prevents the system from operating safely. If the battery charge level is greater than 20% (one or more Green LEDs), reduce the load by shutting off circuits in the backup electrical panel, then press and hold the service button 5 seconds to resume backup power operation. If the battery low SOC shutdown mode is displayed, shut off all load circuits (keep PV ON) in the backup panel, and do not attempt to resume backup operation until adequate sunlight is present to provide a solar charge of the battery.
All panel lights flashing	System is attempting to communicate with the battery modules. Notify service personnel if this condition persists more than 30 minutes.
All panel lights OFF	This indicates loss of both AC and DC power sources to the PCS. Check the circuit breaker in the main electrical panel for the energy storage system.
Online monitoring system not accessible	Check the internet connection. Check power to the energy management system via the orange indicator light on the right side of the panel. Note: the energy management system may lose power after an extended utility outage where there is not enough solar generation to maintain battery system power. Note: monitoring system servers may occasionally be down for service. If first attempts are not successfully, try again the following day before contacting your installer.

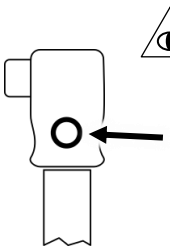
16 System Decommissioning Procedure

1. Disconnect all live AC and DC energy sources to the energy storage system.
2. Remove all energy storage system components in the reverse order of the installation procedure.
3. Remove all unused cabling, conduit, and circuit protection equipment that was installed as part of the energy storage system.

Refer to section 1.4 for disposal and recycling of the energy storage system equipment and components.

16.1 Serviceable Parts – Battery module removal/replacement

The battery modules within the battery cabinet are removable and/or replaceable. To replace or remove the battery modules, follow the reverse instructions in section 5 of this manual.



DC module jumper cables
Press & hold the lock button to release the cable from the battery terminal.

17 Technical Data

17.1 PCS cabinet data

Model	ACB05-PE
Electrical & performance data, AC	
Grid voltage	230 / 240 Vac
Grid frequency	50 Hz
Maximum continuous operating current	21.7 Amps (@230V) / 20.8 Amps (@240V)
Maximum continuous operating power	5000 VA
Power factor, nominal (range)	> 0.99 (0.8 lead to 0.8 lag)
Efficiency, % peak (average)	96 (94.5)
Maximum AC fault current and duration (short circuit)	248 Apk, 7.97 Arms for 0 to 50ms
Inrush current	0 Amps
Galvanic isolation	transformer
AC connections, number (type)	2 (grid, backup)
Maximum output overcurrent rating, grid & backup	63A maximum
Grid withstand short circuit capability	10kA, 1 second
PV solar coupling method	AC only (PV inverter not included)
PV power limit, AC only, backup connection	5000 VA
PCS self-consumption power, sleep (operating)	6.4 W (30 W)
Backup power surge rating	170 %, 3 seconds
Lightning protection	IEEE 62.41.2, location category B, low exposure
Active anti-islanding method	Sandia frequency shift
Protective Class (I, II, or III)	Class I
Over-Voltage Category (OVC I, II, III, or IV)	OVC III
Inverter topology type	Isolated
Electrical data, DC	
Nominal DC Voltage / DC Voltage range	48 V / 40 to 66 V
Maximum DC Current	Discharge = 125 A / charge = 100
Storage Type	Lithium, Lead Acid, other
General data	
Width / Depth / Height	529 mm / 397 mm / 783 mm
Weight	65 kg
Installation type	Wall-mount (upright)
PV solar coupling method	AC only (PV inverter not included)
DRED device support	DRM 0, 1, 2, 4, 5, 6, 8
Ground fault monitoring	DC negative grounded
Lightning protection	IEEE 62.41.2, location category B, low exposure
Display	LED: battery SOC, grid connect state, service
Environmental data	
Ingress protection rating	IP34
Pollution Degree	3
Cooling method	Fan, thermostat control
Ambient temperature, relative humidity, altitude	-40 °C to +50 °C, 95%, 2000 m

Testing to Section 5 of AS/NZS 4777.2:2020 for multiple inverter combinations has not been conducted.The PCS AC and DC sources are galvanically isolated. As a result, there is no earth fault indication.

17.1.1 PCS Regional Settings – Factory Default

The PCS is shipped with factory default settings for the Australia 'A' region. Approval for factory settings changes must be requested and delivered in writing from the manufacturer. Settings changes require special equipment and software that is softkey protected. Consult Eguana Technologies for further details.

17.2 Battery cabinet data

Model	**ACB05-PB**
Electrical and performance data	
Battery module, manufacturer	Pylontech
Model	US3000C
Chemistry	Lithium phosphate
Rated energy per module (usable)	3.55 kWh (3.2 kWh)
Number of modules per cabinet	4
DC voltage operating range	42.0 to 58.8 Vdc
Battery lifetime energy guarantee, per module	60% capacity after 10 years
Circuit protection, integrated	Breaker, 180 Adc, positive pole
General data	
Width / Depth / Height	572 mm / 397 mm / 1041 mm
Weight, including two battery modules	145 kg
Installation type	Wall-mount (upright)
Environmental data	
Ingress protection rating	IP34
Pollution Degree	3
Cooling method	Natural convection
Ambient temperature, relative humidity, altitude	-10 °C to +45 °C, 95%, 2000 m

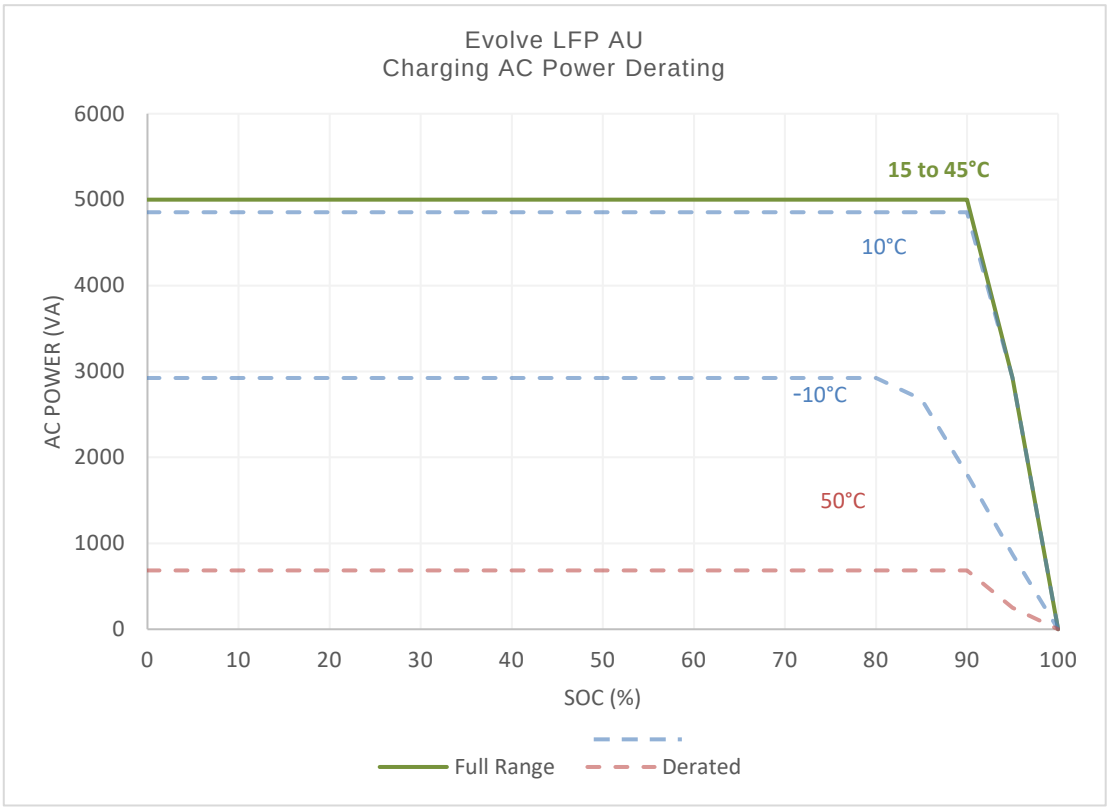
17.3 Wire and torque ratings

Use solid copper only, 90 °C or higher rating

PCS (AC)	# conductors	SI	Torque
AC grid	2 conductor + PE	10 mm^2 to 16 mm^2	Push-lock, spring cage
AC load	2 conductor + PE	10 mm^2 to 16 mm^2	Push-lock, spring cage
Ground Lug	1 conductor	16 mm^2	5.0 Nm

Battery (DC)	# conductors	SI	Torque
PCS battery + lug	included	70 mm^2	4.0 Nm
PCS battery - lug	included	70 mm^2	6.8 Nm
Ground Lug	included	70 mm^2	5.7 Nm
Battery module (+/-)	included	50 mm^2	4.2 Nm
Ground Lug (field connection)	1 conductor	16 mm^2 to 70 mm^2	6.8 Nm

17.4 Thermal performance: Charge / Discharge Curves



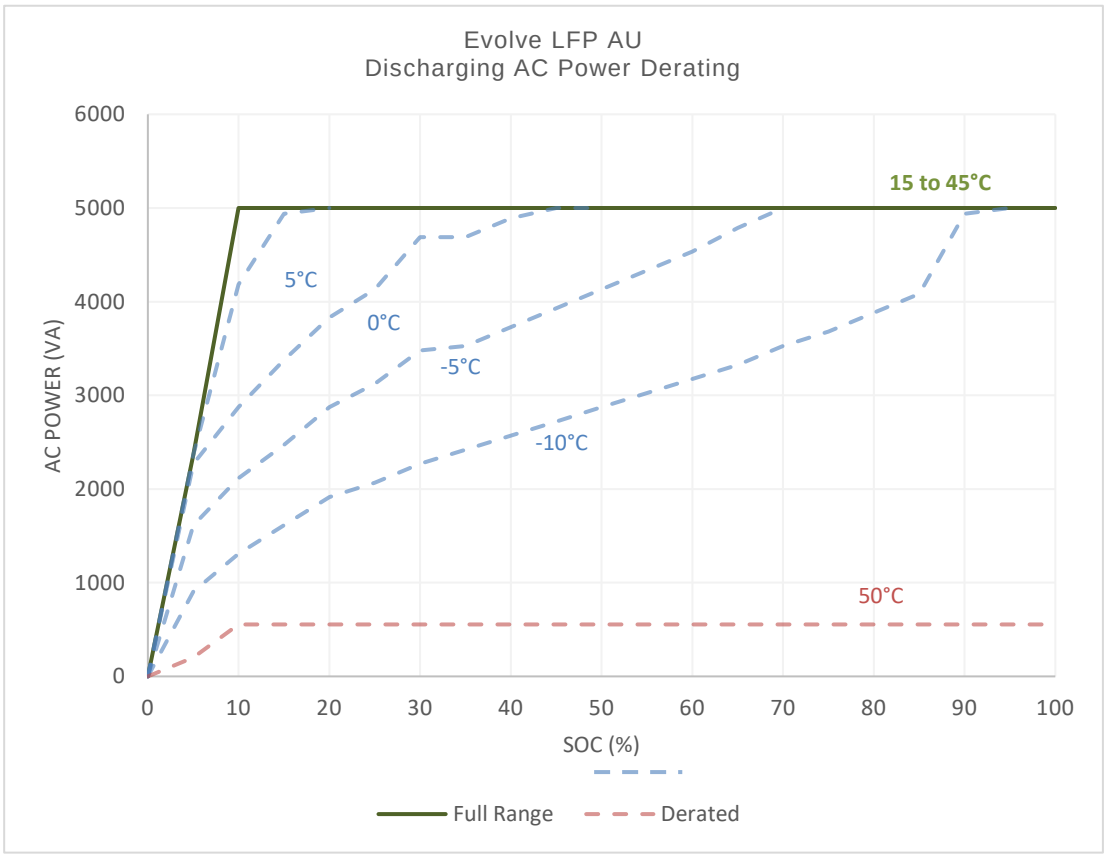


Figure 25: Energy storage system thermal derated charge and discharge curves with base (13 kWh) battery cabinet.

Appendix A: Battery Expansion Cabinet Installation – batteries #5 to #8

The Evolve LFP AU system supports up to two additional expansion cabinets. Where duplicated, the mechanical assembly and wiring instructions will be referenced to previous sections within this document. All instructions specific to the first expansion cabinet are documented below, with battery modules numbered 5 to 8 inclusively. Startup and operation remain unchanged.

A.1 Initial Inspection of Material List – top level system components

The system components supplied are shown below. Each component should be inspected visually for any damage that may have been caused by shipment. If damage is present, please contact your local distributor.

A.1.1 LFP AU battery expansion materials list.

Item	Eguana P/N	Description
1	ACB05-PB	Battery Cabinet (and cover)
2	-	Expansion wall mount bracket
3	US3000C	4 battery modules.
4	LFP expansion install kit	Assembly parts kit and cables.

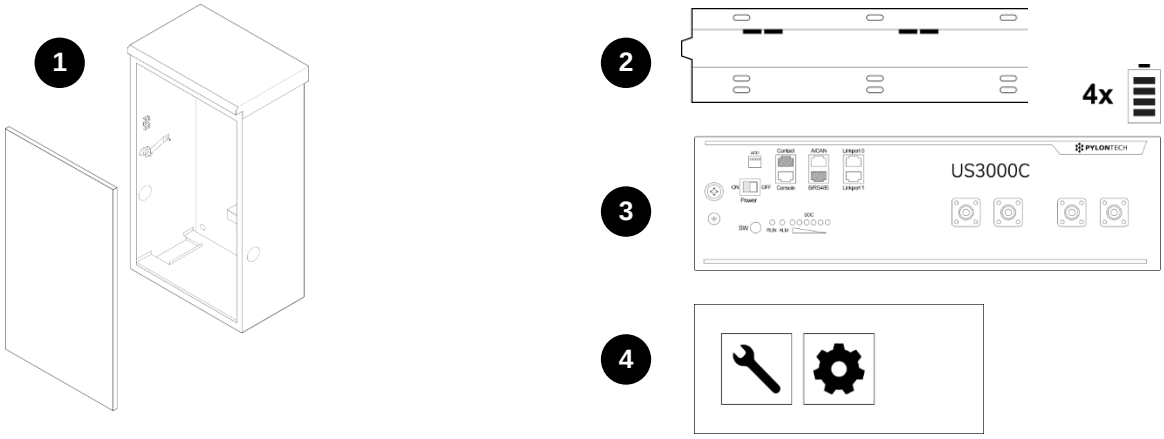


Figure 26: Expansion cabinet materials list.

A.1.2 Expansion install kit – mechanical parts

Item	Qty	Eguana P/N	Description
1	1	PB kit	Incl. cabinet coupler assembly, two levelling brackets, and two plugs
2	8	-	Adhesive backed battery module pads
3	1	-	Battery rack partition bracket (includes attached battery retaining clip)

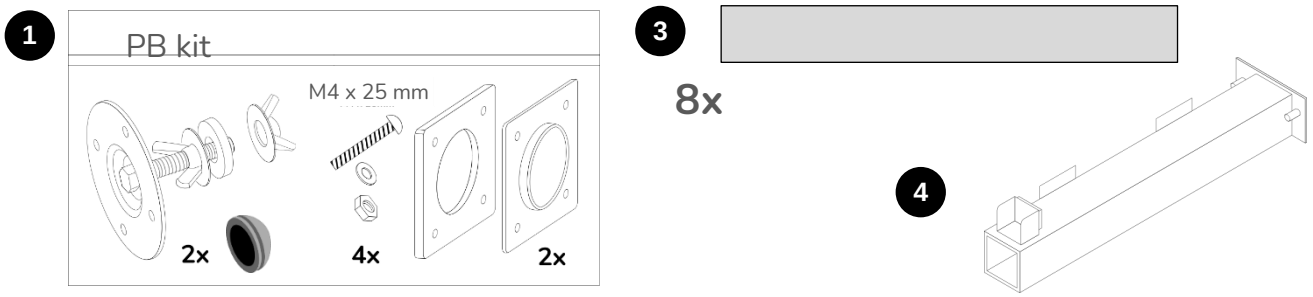


Figure 27: Expansion cabinet hardware kit.

A.1.3 Expansion kit – battery cables

Item	Qty	Eguana P/N	Description	Pylon p/n
1	2	801003790	DC- module jumper BLK 180 mm (2 spare)	WI0BSC1000B2
2	1	801003793	DC- module jumper BLK 400 mm	WI0CUS300004
3	1	801003801	DC- module jumper BLK 1100 mm	WI0CUS300008
4	1	801003802	DC- terminal jumper BLK 1200 mm	WI0CUS300006
5	3	801003789	DC+ module jumper RED 180 mm (1 spare)	WI0BSC100001
6	2	801003800	DC+ module jumper RED 1100 mm	WI0CUS300007
7	2	801003799	DC+ terminal jumper RED 1200 mm	WI0CUS300005
8	2	801003792	BMS jumper short 210 mm	WI0SRJ458025
9	1	801003794	BMS jumper medium 700 mm	WI0SUS300002
10	1	801003795	BMS jumper long 1500 mm	WI0SRJ45815M
11	4	801003791	Chassis GND cable GRN/YEL 1 m	WI0GUS300001

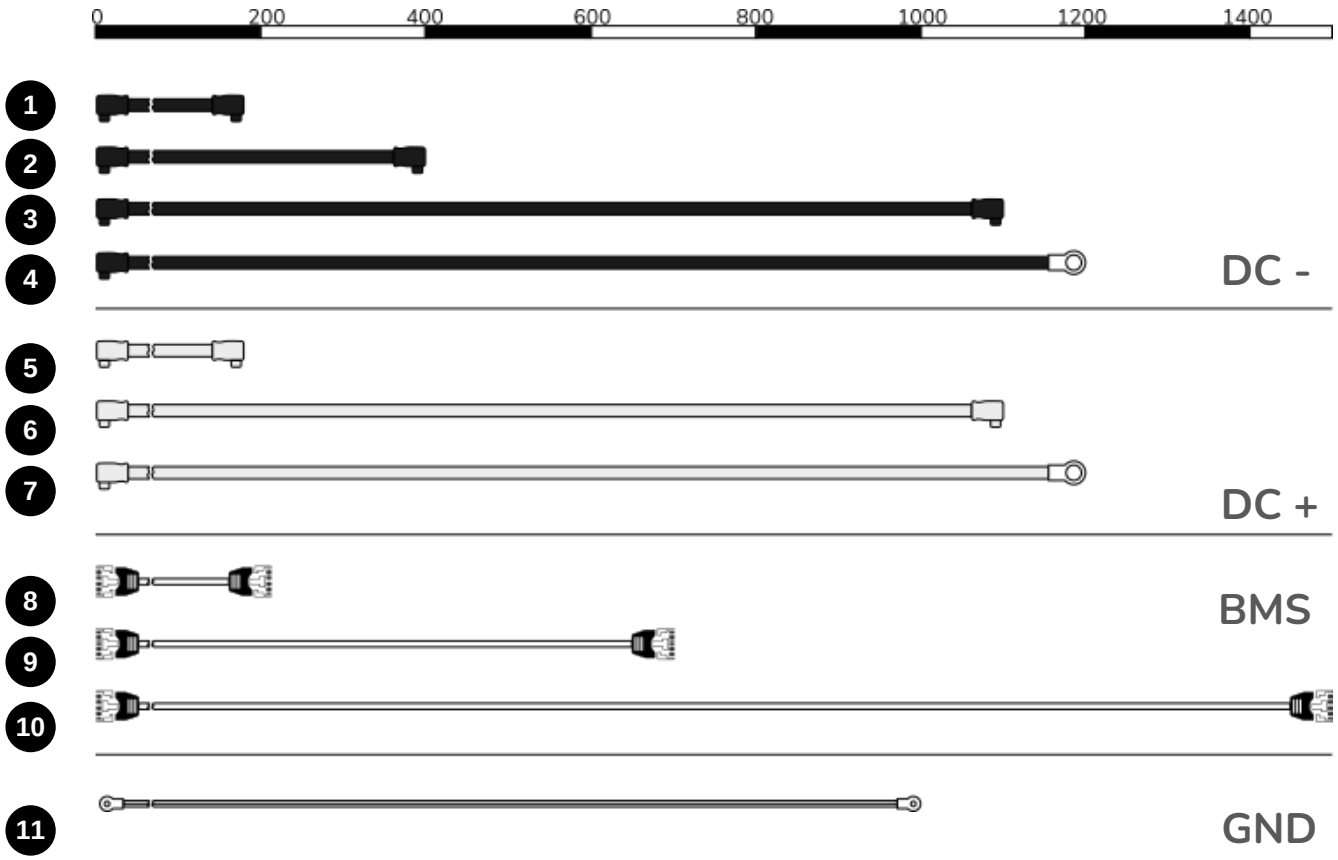


Figure 28: Expansion cabinet cable kit.

A.2 Wall bracket installation

The expansion cabinet is included with a wall bracket extension that is secured to the base system's bracket.

4. Align the expansion bracket to the base bracket and secure with the mounting hardware provided.

2. IMPORTANT! Secure the bracket to the wall using a minimum of four M8 lag bolts in atleast two wall studs.

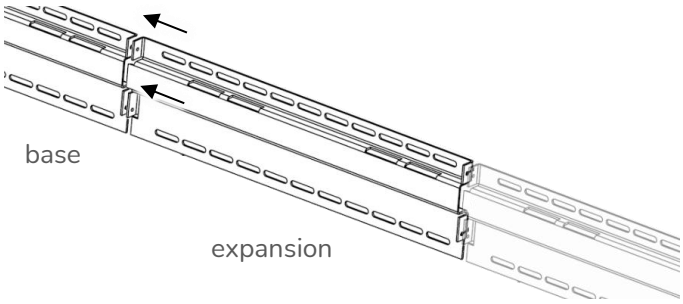


Figure 29: Expansion wall bracket installation.

A.3 Mounting the cabinet to the wall

1. Remove the cabinet coupling end plate from the lower right side of the base battery cabinet and install it on the lower right port hole of the expansion cabinet.
2. Follow the cabinet installation instructions in section 4 to secure the cabinet to the wall.

A.4 Battery module assembly

1. Follow the assembly instructions in section 5.3 through 5.5.
2. See section 5.5 (figure 13) – remove the lower DC- cable (referenced A3) from the DC- terminal and replace with the cable referenced A5 in figure 30 below.

A.5 Battery module wiring

Ref	P/N	Description	Pylon p/n
A4	#3801	DC- jumper cable BLK 1100 mm	WI0CUS300008
A5	#3802	DC- terminal cable BLK 1200 mm	WI0CUS300006
B4	#3800	DC+ jumper cable RED 1100 mm	WI0CUS300007
B5	#3799	DC+ breaker cable RED 1200 mm	WI0CUS300005
C3	#3795	BMS jumper cable 1500 mm	WI0SRJ45815M

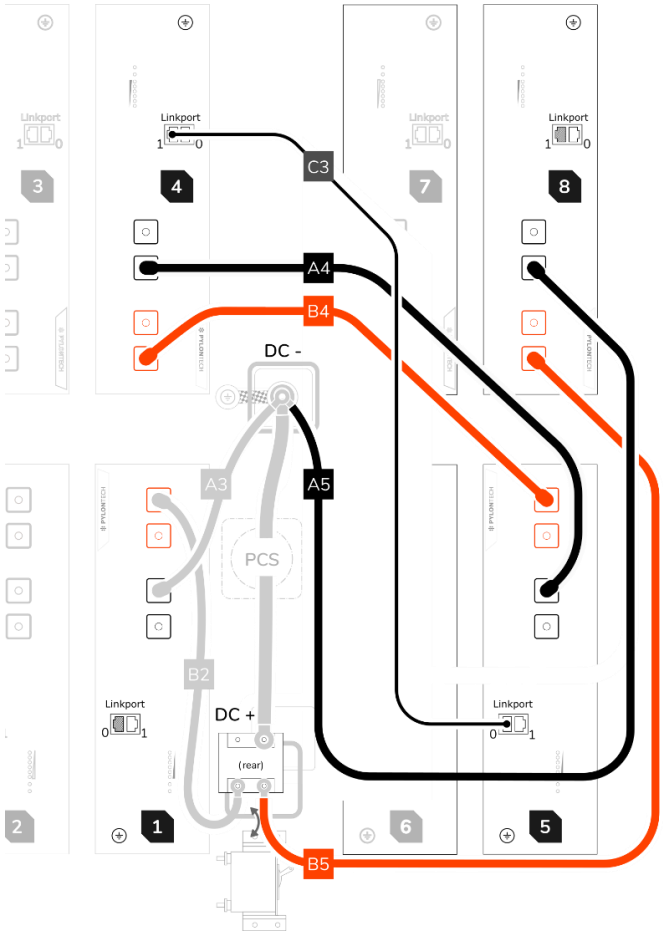


Figure 30: Expansion cabinet DC wiring.

1. Connect the internal power and communication jumper cables as shown in sections 5.5.1 and 5.5.2. Note the relative position of batteries 5 thru 8 as they mirror batteries 1 thru 4.
2. Route the A4 & B4 DC power cables through the coupling port and terminate them at battery #5.
3. Remove the DC+ breaker assembly.
4. Remove the B3 DC+ cable (section 5.6, figure 15) and replace it with the B5 cable(shown right). Torque to 15 in-lbs.
5. Mount the DC+ breaker assembly.
6. Route the C3 BMS jumper cable through the cabinet coupling port and terminate at the link port terminals at battery #4 and #5.

Appendix B: Electrical Block Diagram – Internal

The following table / diagram defines the internal electrical wiring of the Evolve LFP system, including the base and two additional expansion battery cabinets. The diagram is for illustrative purposes and does not reflect the actual physical orientation of the battery modules within the cabinets.

Ref	P/N	Description
A1	#3790	DC- module jumper BLK 180 mm
A2	#3793	DC- module jumper BLK 400 mm
A3	#3798	DC- terminal jumper BLK 400 mm
A3*	#3798	DC- terminal jumper BLK 400 mm
A4*	#3801	DC- jumper cable BLK 1100 mm
A5*	#3802	DC- terminal cable BLK 1200 mm
A6*		TBD
C1	#3792	BMS jumper short 210 mm
C2	#3794	BMS jumper long 700 mm
C3	#3795	BMS jumper cable 1500 mm

Ref	P/N	Description
B1	#3789	DC+ module jumper RED 180 mm
B2	#3796	DC+ breaker cable RED 400 mm
B3*	#3797	DC+ breaker cable RED 780 mm
B4*	#3800	DC+ jumper cable RED 1100 mm
B5*	#3799	DC+ breaker cable RED 1200 mm
B6*		TBD
D1	#3810	PCS-BMS “Y” CAN/Console 3000C
D1	#3797	PCS-BMS CAN only 3000 (not shown)
P-	#2925	PCS DC- power cable
P+	#2923	PCS DC+ power cable

Note: DC power cables marked by an asterisk (*) in the table above indicate required modifications to the cable set used in the base battery cabinet. Only one set of “home run” DC power cables is used per complete system. For example: adding one expansion battery cabinet requires the replacement of [A3] / [B3] with [A5] / [B5] “home run” cables, and the addition of [A4] / [B4] “daisy chain” jumper cables.
Note: Battery module ground cables are one per battery, with a “home run” to the cabinet chassis ground terminal.

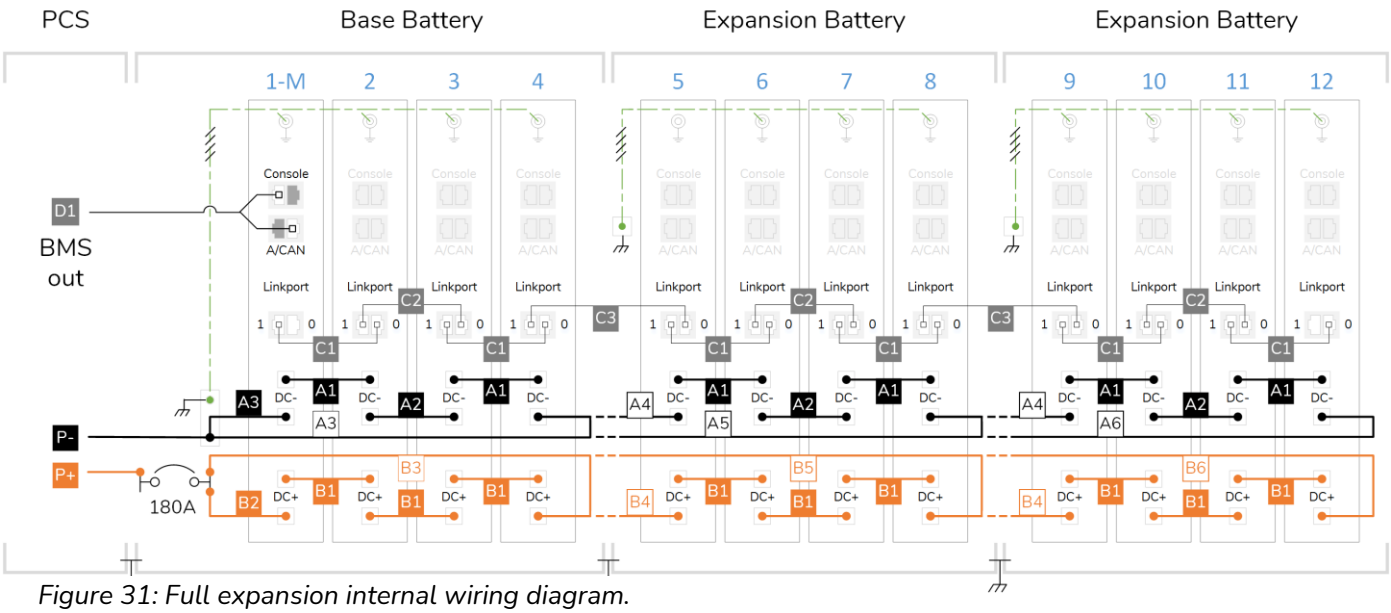
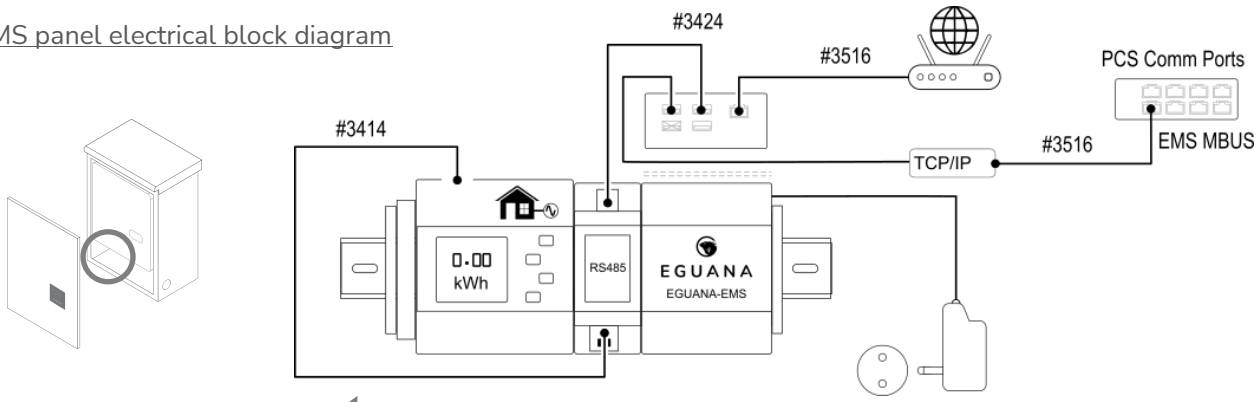


Figure 31: Full expansion internal wiring diagram.

Appendix C: Energy Meter Wiring Diagrams

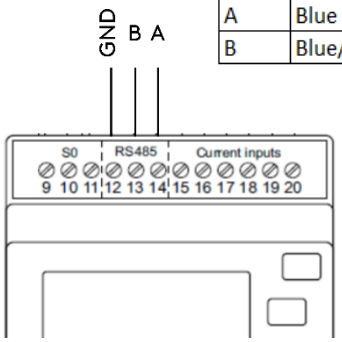
C.1 Eastron SDM630MCT-40mA

EMS panel electrical block diagram



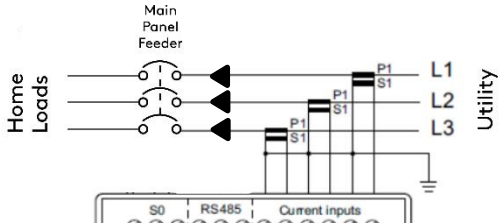
Signal	Wire colour
GND	Green/White
A	Blue
B	Blue/White

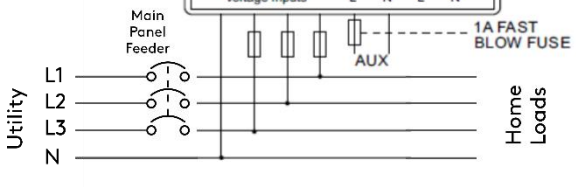
Signal	Wire colour
S1	White
S2	Black



RS-485 communication wiring

CT wiring





Voltage sense wiring