CSS – OD /
Grid Tied Commercial Energy Storage Solution

Quick Installation Guide

Version 1.2

Legend and Safety Instructions

Legend

WARNING! This symbol denotes a hazard. It calls attention to a procedure that if not correctly performed or adhered to could result in injury or loss of life. Do not proceed beyond a warning note until the indicated conditions are fully understood and met.

CAUTION! Denotes a hazard. It calls attention to a procedure that, if not correctly performed or adhered to, could result in damage or destruction of the product. Do not proceed beyond a caution sign until the indicated conditions are fully understood and met.

This symbol indicates that this is the Protective Earth (PE) terminal that must be firmly grounded to ensure the safety of operators.

Safety Instructions

WARNING: RISK OF ELECTRIC SHOCK
DO NOT touch the wires, contacts, terminals, or any conductors connected to the grid circuit inside the equipment.
Failure to follow safety instructions could result in severe injury or death from electric shock.

WARNING: LETHAL HIGH VOLTAGES exist inside the product.

- Note and abide by all warning signs on the product.
- Observe the safety precautions listed in this manual and other related documents.

WARNING: Damaged Equipment Hazards

- Damaged equipment or system failure may cause electric shock or fire!
- Perform an initial visual inspection of the equipment for damage or other hazards before operation.
- Check whether other external devices or circuit connections are secure.
- Confirm that this equipment is in a safe state before operating it.

WARNING: This equipment must be installed by **licensed electrician** and qualified personnel only. The installation and wiring of this equipment must comply with all applicable national, state/provincial, local electrical codes and standards. Attempting installation by unqualified individuals could result in unsafe operation, code violations, personal injury/loss of life, or damage to the equipment.

WARNING: Battery Protection
DC HIGH VOLTAGE! ELECTRIC SHOCK HAZARD!
The battery in the system generates a high voltage when connected. Accidental contact can result in electric shock or life-threatening injuries.

WARNING: Ground Fault Protection

- When a ground fault occurs in the integrated PCS, there may be fatal high voltage in parts that are not originally charged. DANGEROUS IF ACCIDENTALLY TOUCHED!
- Before operation, ensure there is no ground fault in the system, and take relevant protective measures.

WARNING: Live Line Measurement

- There are high voltages in the equipment in the integrated PCS, and accidental touch may cause fatal electric shock hazards.
- During live measurement, take appropriate protection, such as wearing insulating gloves.
- There must be an accompanying person to ensure personal safety.

WARNING: Improper parameter settings

- Improper parameter settings may affect the normal function realization of internal devices.
- Only authorized professionals can set the parameters.

WARNING: Regulatory Compliance
The installation and various operations of the integrated PCS must comply with the relevant standards and regulations of the country/region where the project is located

Tools & Equipment Requirement

Personal Protective Equipment


Safety Rubber Shoes


Helmet


Rubber Gloves


Safety Clothing


Goggles

Required tools for Battery Cabinet 102.4 kWh & Battery Inverter 50 kW

WARNING! Use only insulated tools


Torque wrench with 7mm, 10mm, 17mm, 18mm, 19mm sockets


Wire Cutter


Crimping tool


Phillips screwdriver ⌀6 mm, L= 230 mm


Heat gun

Multimeter (≥ 1000 V_{DC})


Cable Stripper


Wire Stripper


Drill (⌀10 mm drill)


Box Cutter


Pipe Cutter


Ladder


Rubber Hammer

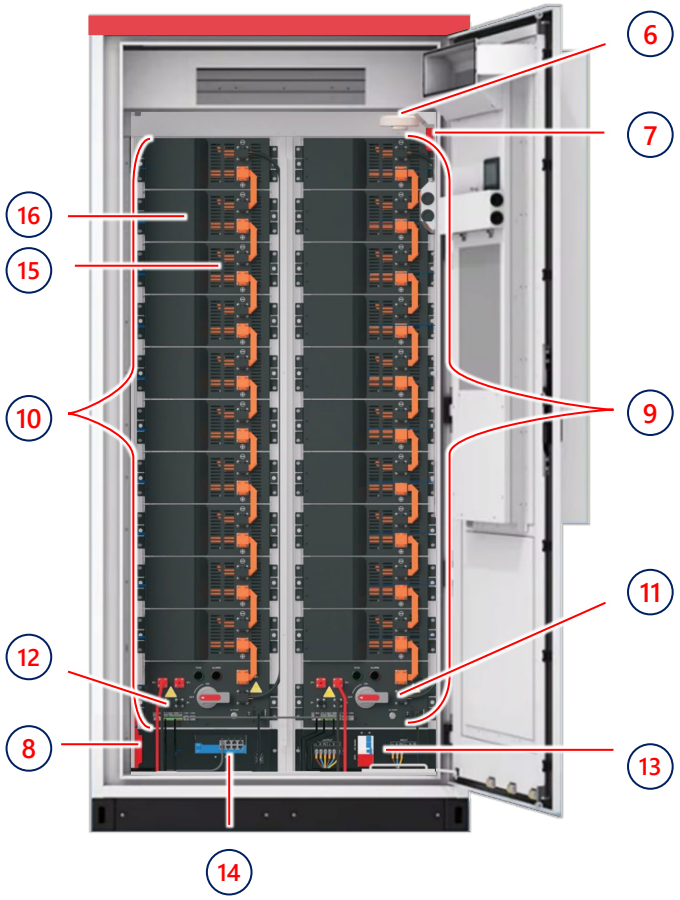

Slotted Screwdriver (10 mm slot)

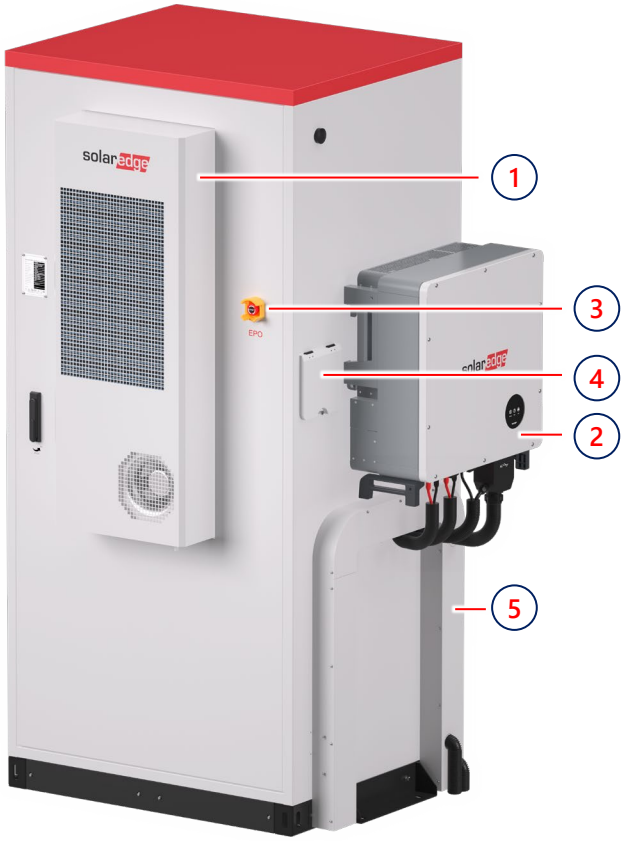

Slotted Screwdriver for Terminal Block Screws (2 mm slot)


Adjustable Wrench


Open-end torque wrench

General Description of Battery Cabinet & Battery Inverter





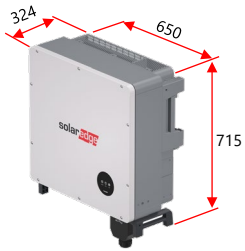
1. Battery Cabinet HVAC
2. Battery Inverter 50 kW
3. Emergency Power Off (EPO) switch
4. CSS Local Interface
5. Wiring Duct
6. Photoelectric Smoke Detector
7. Aerosol Fire Extinguisher 1
8. Aerosol Fire Extinguisher 2
9. Cluster 1 (10 EMs + CMU1)
10. Cluster 2 (10 EMs + CMU2)
11. Cluster Management Unit 1
12. Cluster Management Unit 2
13. AC Interface Box
14. Battery Cabinet Management Unit
15. Energy Module (x20)
16. Energy Module Management Unit

Dimensions and Weights

Battery Cabinet 102.4 kWh

1433 KG

Battery Inverter 50 kW



68 KG

Battery Inverter 50 kW Battery Cabinet 102.4 kWh

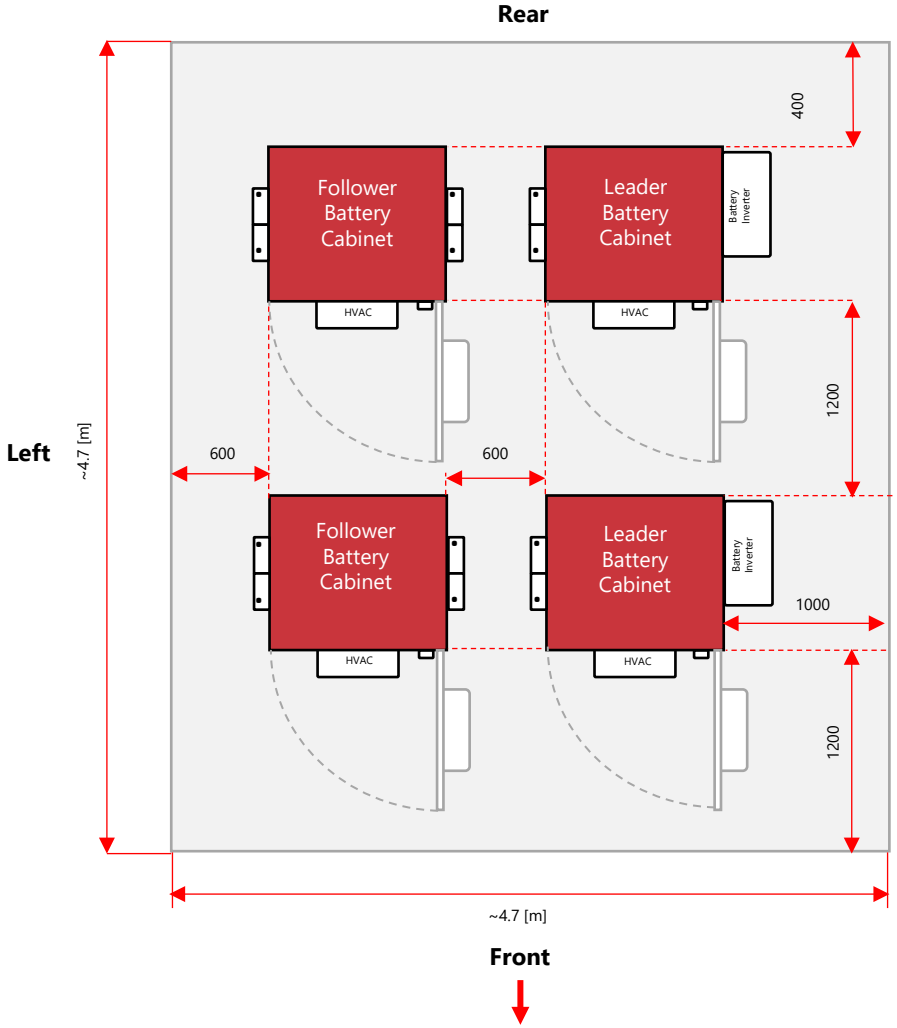
*Assembled Dimensions

1501 KG

All dimensions are in [mm]

Default Layout & Clearance Distances (Top & front View)

All dimensions w/o units are in [mm]



Battery Cabinet + Battery Inverter	
Direction	**Distance [mm]**
Front	1200
Rear	400
Right	1000
Left	600

NOTE!

- Local codes and regulations could extend the required clearances beyond what is specified in this manual
- Before proceeding with installation, consult with relevant authorities to ensure compliance with local regulations concerning clearance distances.

Environmental Conditions & Requirements

CAUTION

1. The installation, use, and operation of outdoor equipment and cables, including but not limited to the movement of equipment, operation of devices and cables, connection or disconnection of signal interfaces exposed to outdoor conditions, work at heights, and outdoor installations, are strictly prohibited during severe weather conditions such as lightning, rain, snow, or winds.
2. Avoid installing the equipment near underground facilities like underwater pipes and air outlets or in places prone to condensation. Additionally, steer clear of areas susceptible to water leakage, such as around air-conditioning outlets, vents, and outlet windows in the machine room. This will help prevent liquids from entering the equipment and causing malfunctions or short circuits.
3. Avoid installing the equipment in areas with poor geological conditions, such as rubbery or weak soil, waterlogged ground, or regions susceptible to land subsidence.
4. Do not place the equipment or operate in a flammable environment or an environment that contains explosive gas or smoke.
5. Avoid installing the battery cabinet in sandy environments.
6. Avoid installing the battery cabinet on unstable or vibrating foundations.
7. Do not install the battery cabinet in a working environment with metal conductive dust.
8. When the equipment is running, do not cover the vents or heat dissipation system to prevent fire due to high temperature.

CAUTION! For indoor installations ventilated room is required.

CAUTION!
CSS – OD solution must be installed:>2km from the sea, when installed in an outdoor location, or >1km when installed in indoor locations.

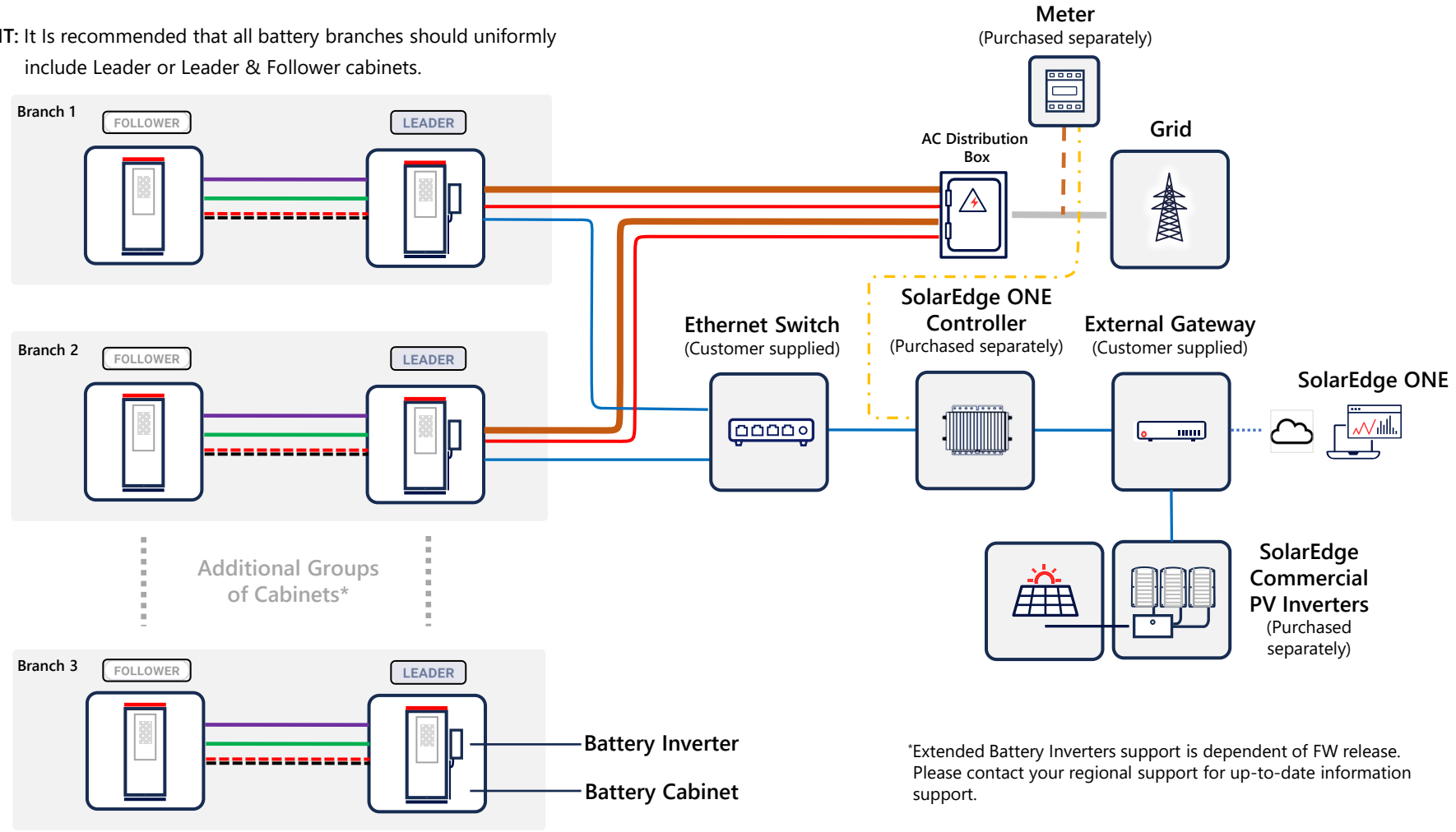
NOTE Battery Cabinet & Battery Inverter max noise is <65 dBA @ 1 meter distance.

CAUTION! When Installed in indoor locations consider heat dissipation values of all installed devices when choosing appropriate room / space for their installation.

Battery Cabinet	
Max Power	**Heat Dissipation**
50 kW	0.87 kWh 2970 BTU
Battery Inverter	
Max Power	**Heat Dissipation**
50 kW	1.5 kWh 5118 BTU

Site Power & Communication Layout

IMPORTANT: It Is recommended that all battery branches should uniformly include Leader or Leader & Follower cabinets.



*Extended Battery Inverters support is dependent of FW release. Please contact your regional support for up-to-date information support.

- Three Phase AC Cable, multi stranded class 5 or 6, 25-35 mm², 50 kW
- DC+ & DC- Power cables (x2)
- Single Phase Auxiliary AC Cable (not provided)
- CAN Comm. Cable (LAN)
- Modbus TCP Communication Cable (LAN)
- RS485 Comm. Cable (not provided)
- AC Aux. Cable

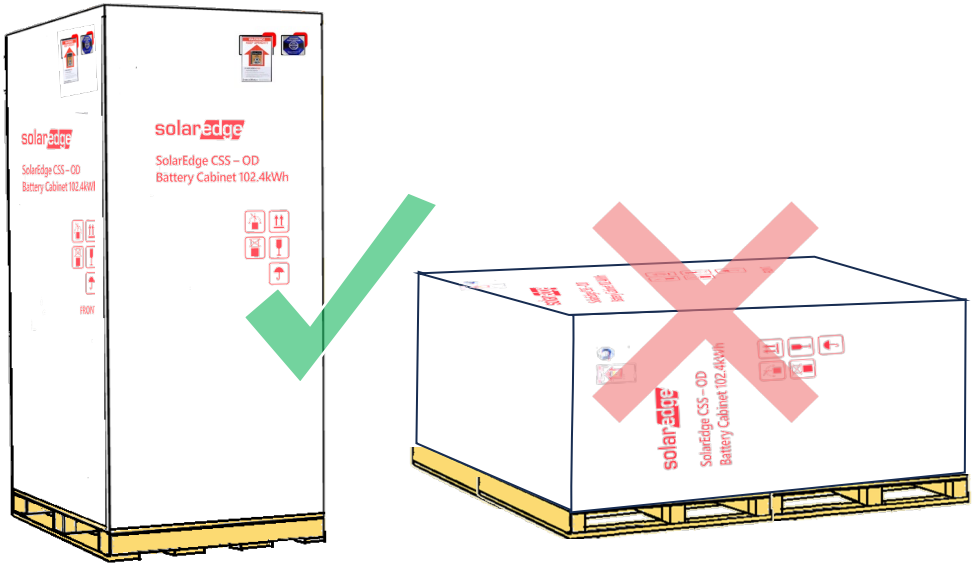
Handling and Inspection Before Unpacking

NOTES:

- Keep in upright position 
- Before opening, validate package integrity

IMPORTANT: Do not open damaged packages & contact SolarEdge to review the case.

NOTE: For SolarEdge commercial Battery storage and transportation guidelines refer to: https://knowledge-center.solaredge.com/sites/kc/files/se-commercial-battery-storage-transportation-and-storage-guideline-eng.pdf

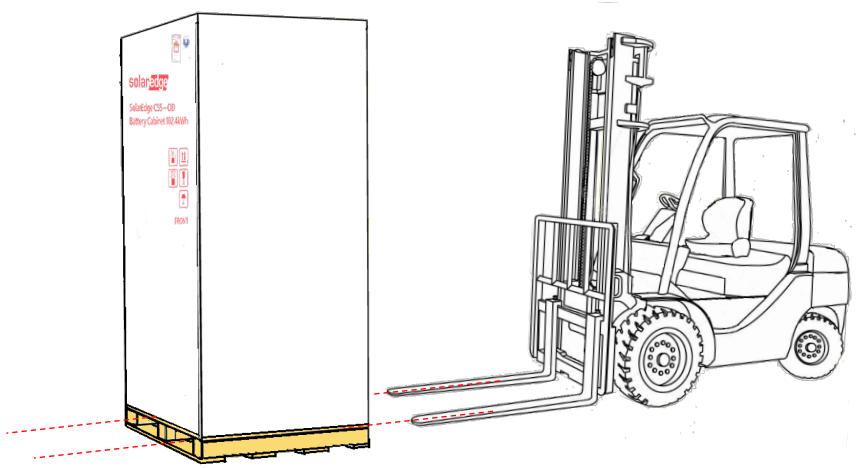


NOTES: For Battery Cabinet Package

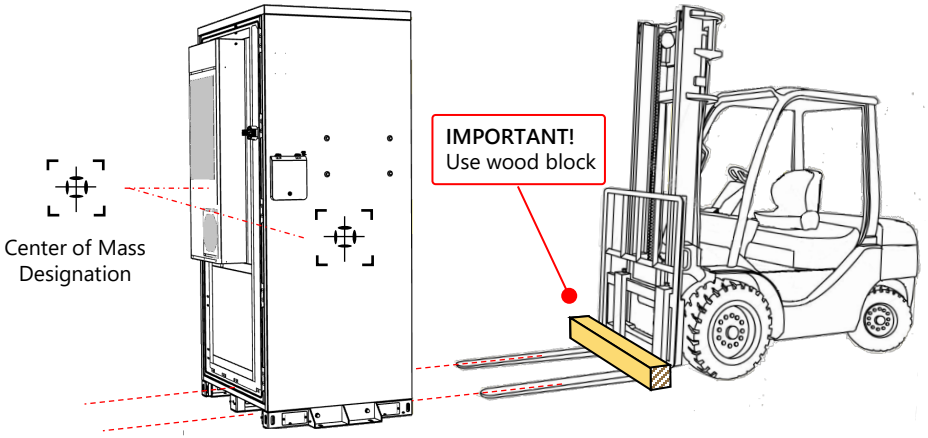
- Verify that the shock and tilt label sensors, on the front and right sides of the package, show green indication.
- When opening package, check the integrity of the fire safety solution. If aerosol gas was ejected due to any fault occurred during transportation the battery cabinet shall be replaced.
- If one of the sensors is red, please contact SolarEdge and do not open the package.

Battery Cabinet – Forklift Transportation Guidelines

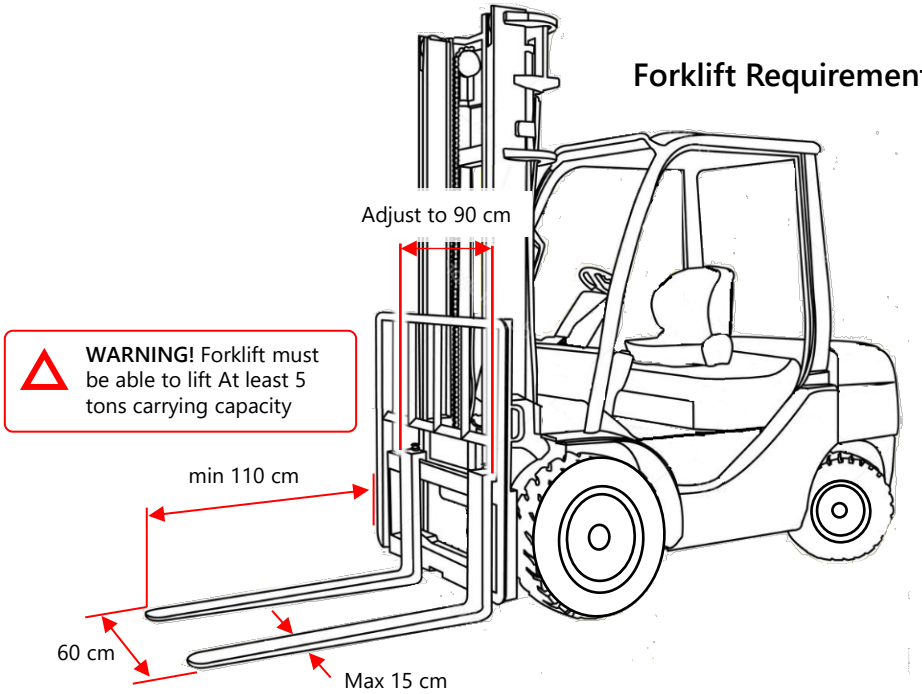
Transporting Battery Cabinet with the Wooden Box

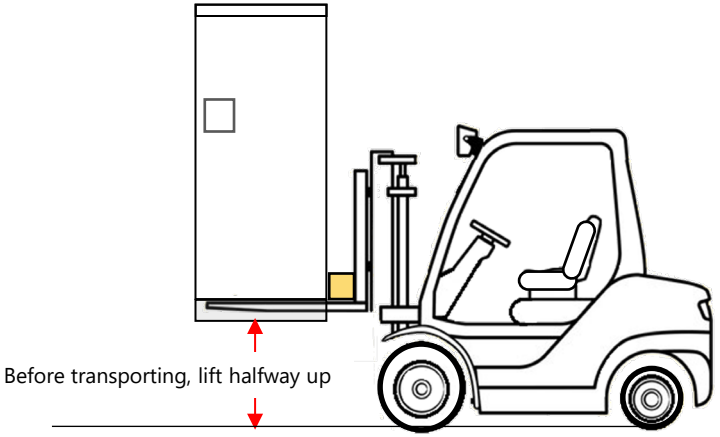


Transporting Battery Cabinet Standalone



Forklift Requirements





Cabinet Transportation – Crane Lifting Guidelines

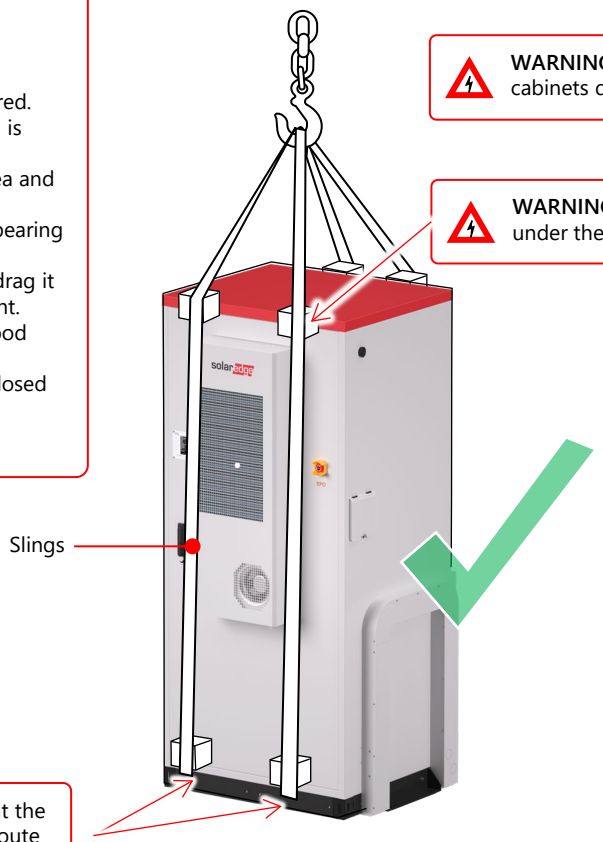
HOISTING REQUIRMENTS

WARNING!

1. A trained and qualified lifting personnel is required.
2. Do not operate a hoist if severe weather or wind is apparent when conducting hoisting outdoors.
3. Keep unauthorized people from entering the area and standing under crane boom.
4. Ensure that the crane and slings meet the load-bearing requirements.
5. To prevent the cabinet from scratching, do not drag it when installing and removing hoisting equipment.
6. Check to ensure that the hoisting tools are in good condition.
7. Ensure that all the doors of the equipment are closed and locked during transportation.

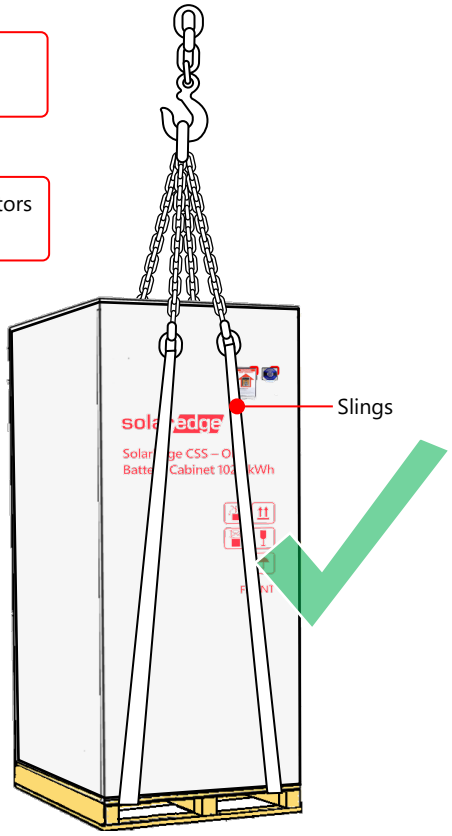
WARNING! Do not tilt the cabinets during transportation.

WARNING! Use edge protectors under the lifting straps.

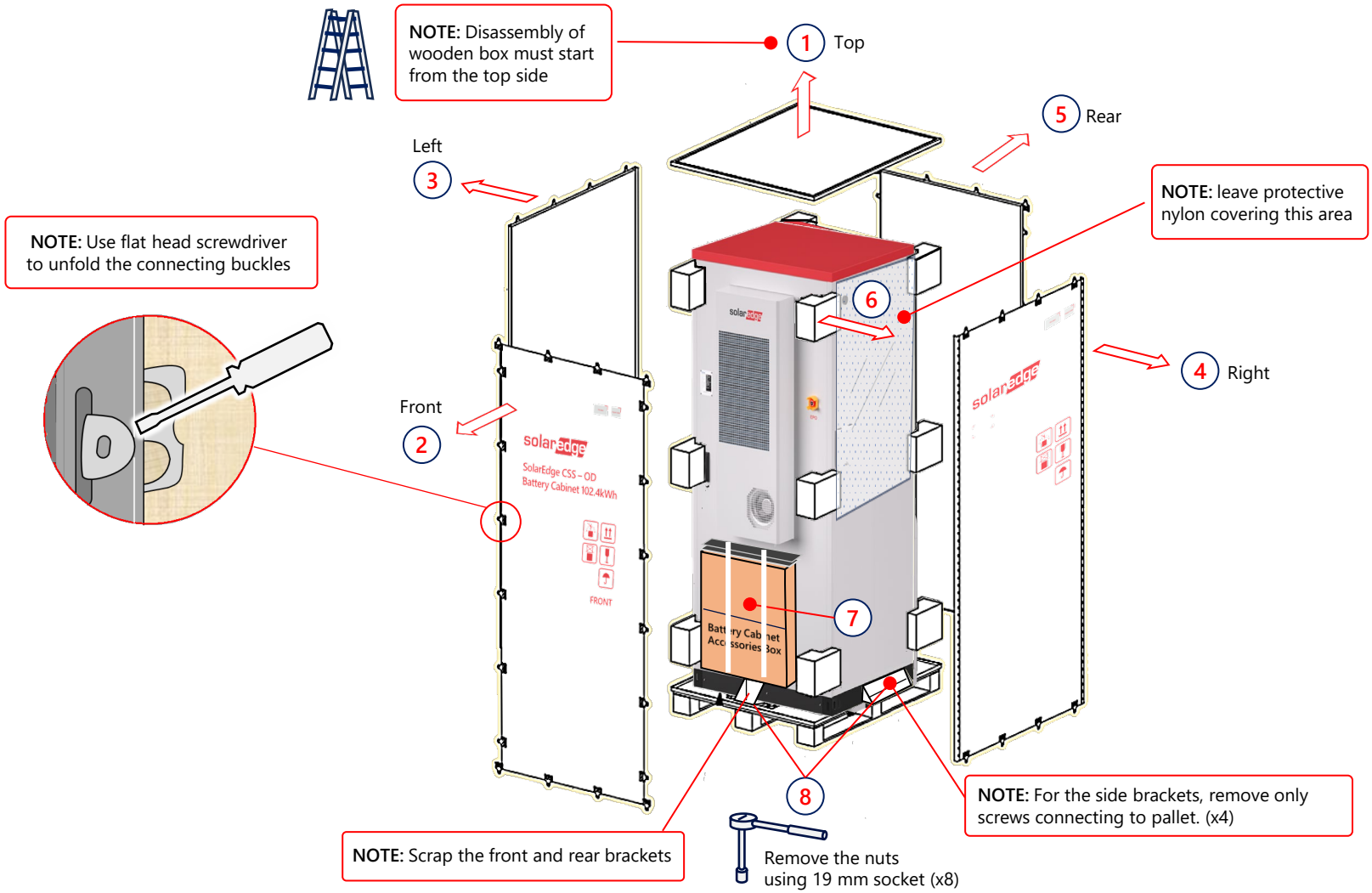


WARNING! Use the slots at the bottom of the cabinet to route the lifting straps.

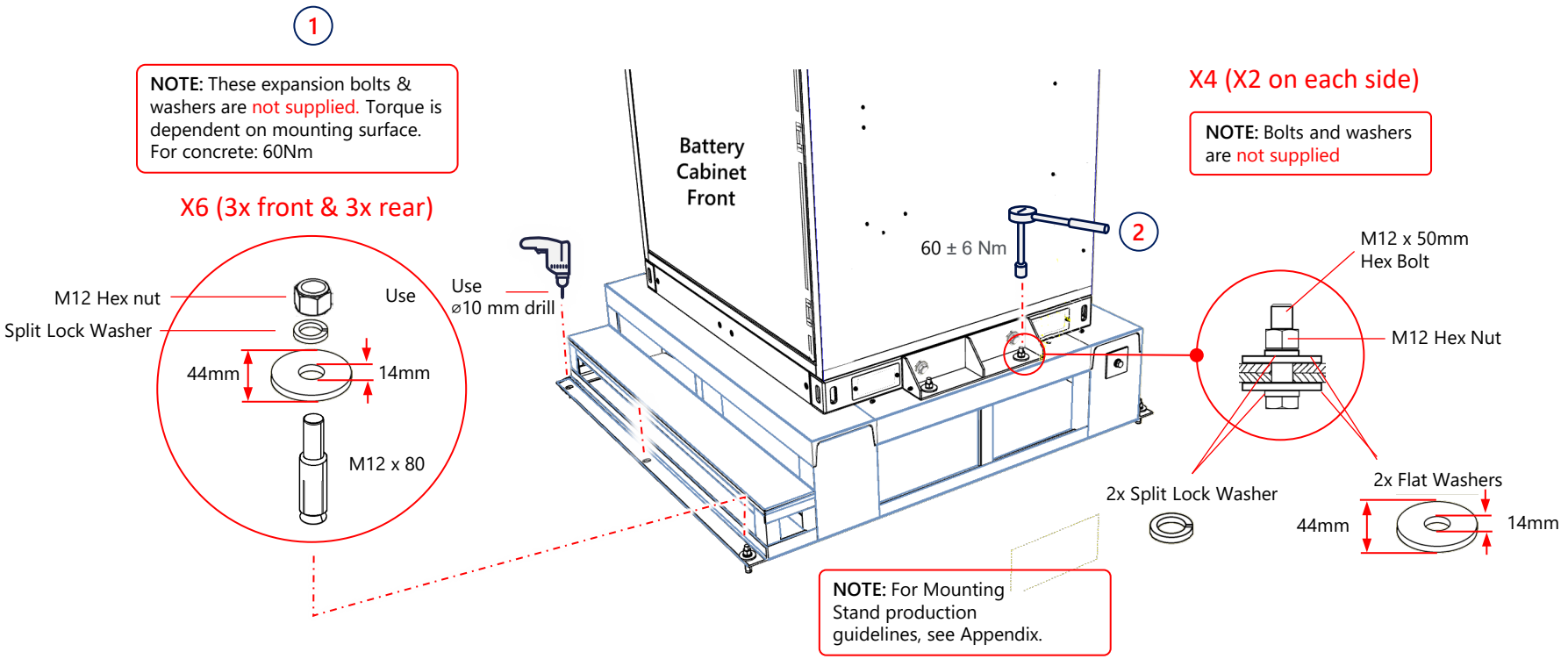
Standalone Battery Cabinet Crane Transportation



Packaged Battery Cabinet Crane Transportation


NOTE: Disassembly of wooden box must start from the top side
1 Top
5 Rear
Left
3
NOTE: leave protective nylon covering this area
NOTE: Use flat head screwdriver to unfold the connecting buckles
6
4 Right
Front
2
SolarEdge CSS – OD
Battery Cabinet 102.4kWh
FRONT
7
8
NOTE: Scrap the front and rear brackets
Remove the nuts using 19 mm socket (x8)
NOTE: For the side brackets, remove only screws connecting to pallet. (x4)

Mounting Battery Cabinet on a Mounting Stand



IMPORTANT NOTE!

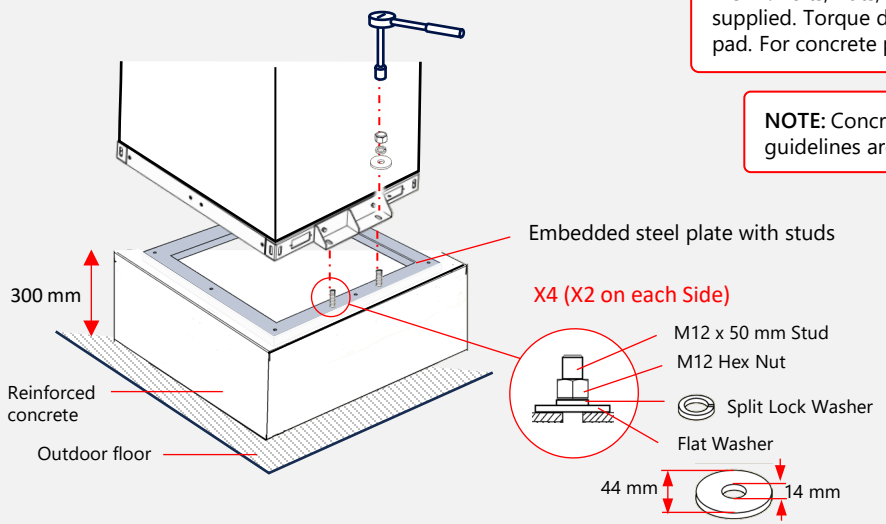
1. Open Mounting Stand provided by the customer.
2. General dimensions & requirements of the Mounting Stand are provided in Appendix A.
3. The customer's civil engineer shall review and approve the structure provided by the customer (open Mounting Stand).

Mounting Battery Cabinet on a Concrete Platform Base

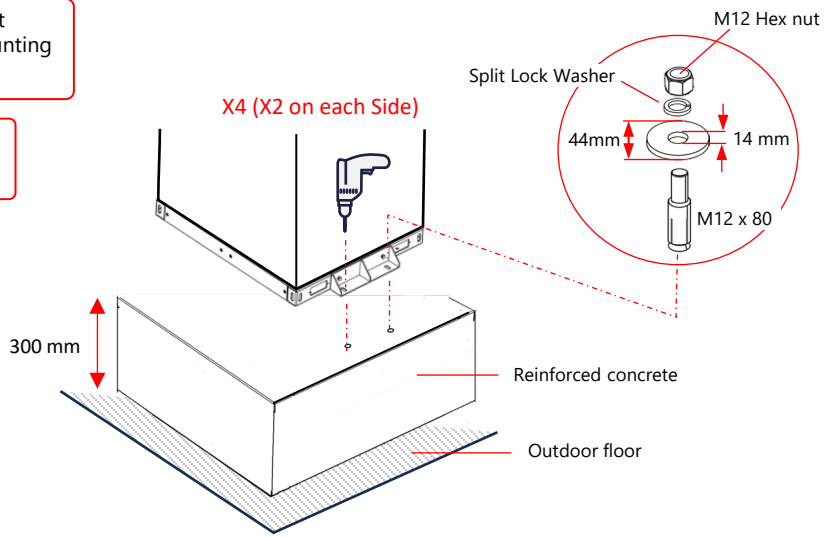
Option 1: Unified Concrete Platform Base with Embedded Steel Plate with Studs

NOTE: Bolts, nuts, and washers are not supplied. Torque depends on the mounting pad. For concrete pads use 60 Nm.

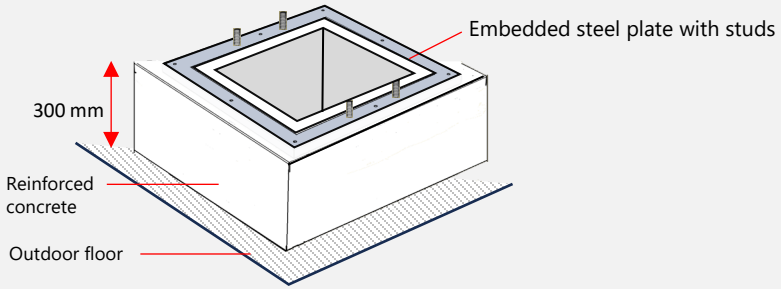
NOTE: Concrete pad guidelines are in Appendix A



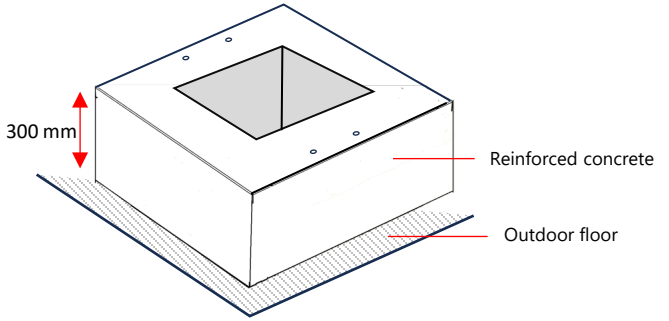
Option 3: Unified Concrete Platform Base with Drilling Occurs on Site



Option 2: Hollow Concrete Platform Base with Embedded Steel Plate with Studs



Option 4: Hollow Concrete Platform Base with Drilling Occurs on Site



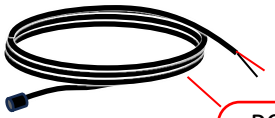
Part Kits 1-5

Battery Cabinet Package Contents (Inside Accessories Box)

Battery Cabinet (Cluster 1)
to Battery Inverter DC Cables (3m) (A)

Battery Cabinet (Cluster 2)
to Battery Inverter DC Cables (3.5m) (B)

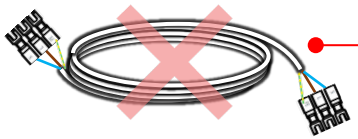
Battery Cabinet to
Battery Inverter
CAN cables (3.5m) (C)



Battery Cabinet to Battery
Inverter RS485 cable (3.5m) (D)

PE cable (0.7m) (E)

Battery Cabinet to BUI100
AC Auxiliary Cable (10m)

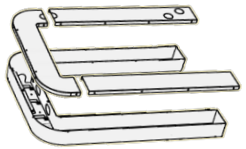


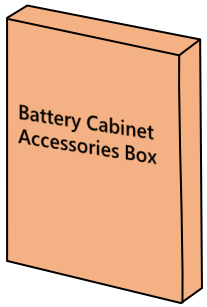
NOTE: THIS PROVIDED CABLE
SHOULD NOT BE USED

NOTE: THIS PROVIDED CABLE
SHOULD NOT BE USED

Battery Cabinet to BUI100
Modbus TCP Cable (10m)

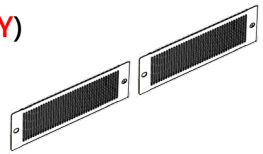
Battery Cabinet
Wiring Duct (G)





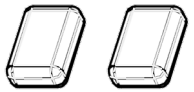
PAY ATTENTION!
All Cables are marked
with a designation label

Forklift Slots Covers (x4) (Y)
(Outside Accessories Box)



Battery Cabinet Package Contents (Inside Battery Cabinet)

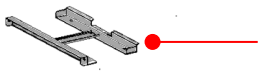
Sealant (x2) (H)



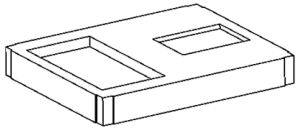
Corrugated Plastic Conduit ⌀34.5 mm (I)

Corrugated Plastic Conduit ⌀21 mm (J)

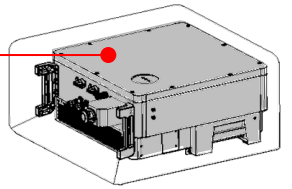
Battery Inverter Package Contents

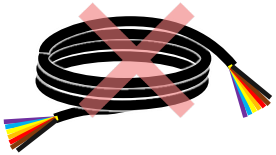


Battery Inverter Mounting Bracket (K)

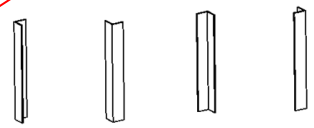


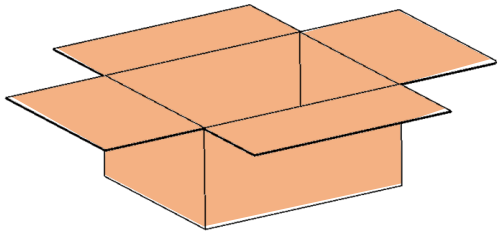
Battery Inverter





NOTE: THESE PROVIDED CABLES SHOULD NOT BE USED

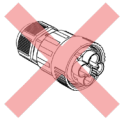




NOTE: THIS PROVIDED CABLE SHOULD NOT BE USED

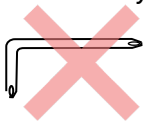
NOTE: THIS PROVIDED TOOL SHOULD NOT BE USED

DC-Bus Connector (N)



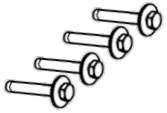
Communication Cable Connector (O)

Right-angled Torx Star Allen key (P)



Bracket Mounting Screws (x4) (Q)

17mm x 30



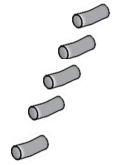
Bracket Lock Screws (x2)(R)

10mm x 16

M6 Lugs (x5) (S)

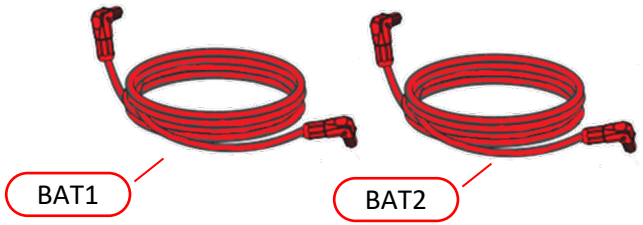
NOTE: These lugs are compatible with class 2 wires. Please ensure you provide your own lugs if class 5 or 6 wires are used on site.

Cables Shrinks (x5) (T)



Cabling Extension Kit* Package Contents

DC+ Paralleling
Cables (x2) (5m) (U)

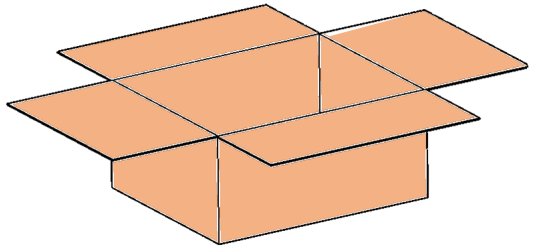


DC- Paralleling
Cables (x2) (5m) (V)

AC Auxiliary
Cable (x1) (5m) (W)

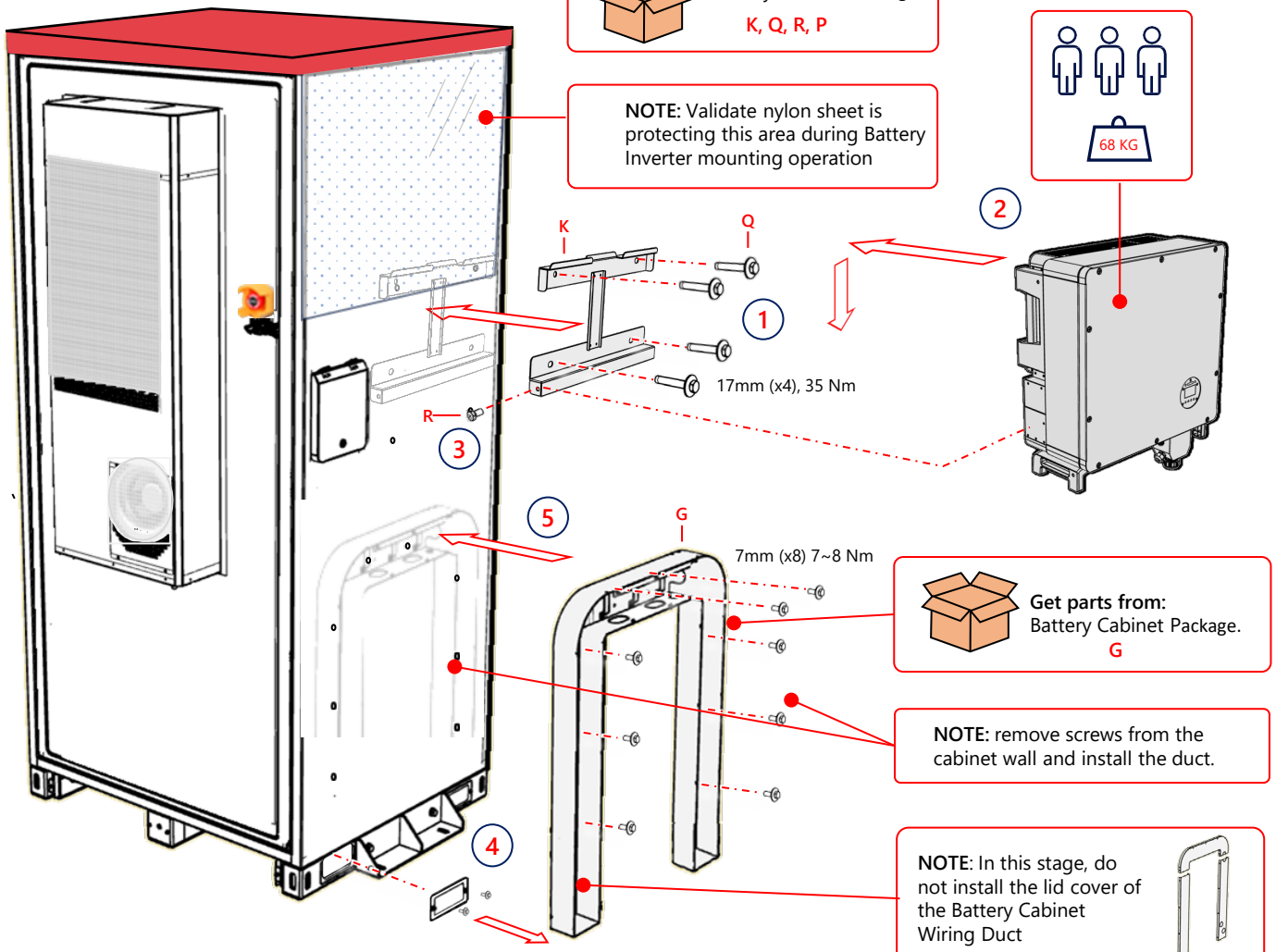
Modbus TCP
Cable (Ethernet) (x1) (5m) (X)

PAY ATTENTION!
All Cables are marked with a designation label

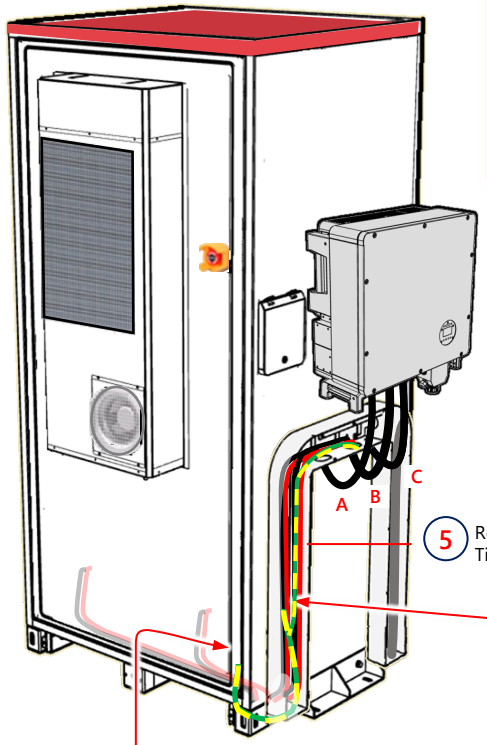


*This kit is ordered separately for 2:1 installations

Mounting the Battery Inverter onto the Battery Cabinet

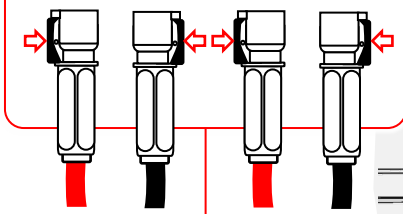


Battery Cabinet & Battery Inverter PE Wiring Management



5 Route using Tie-Wraps

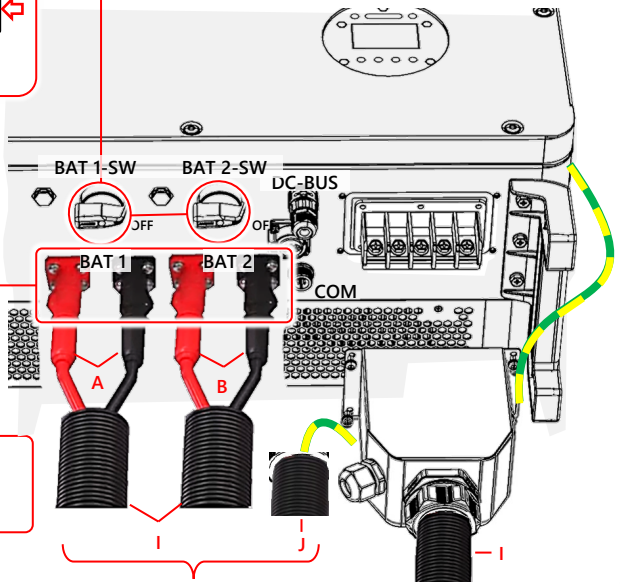
IMPORTANT! Make sure that the locking tabs are in the following positions.



WARNING! HAZARD OF ELECTRIC SHOCK. DISCONNECT POWER BEFORE INSTALLATION OR SERVICE – TURN SWITCHS TO **OFF**

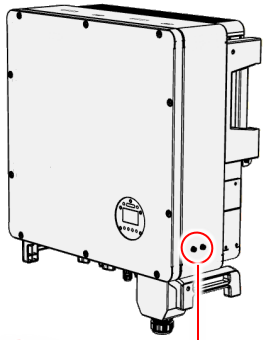
Get parts from:
Battery Cabinet Package
A, B, E, I, J

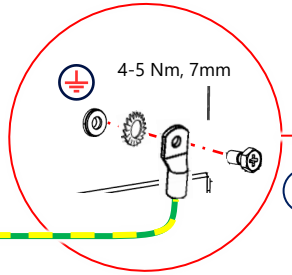
Battery Inverter



NOTE: Cut the corrugated tubes to the required length.

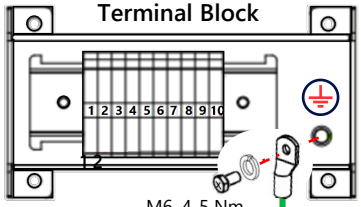
4 Detailed wiring is provided on the next 2 pages





25 mm², M8 lug
(Not supplied)

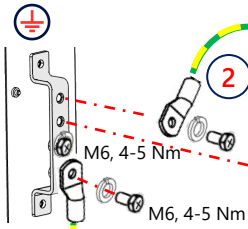
Terminal Block



1

E

Equipotential Busbar

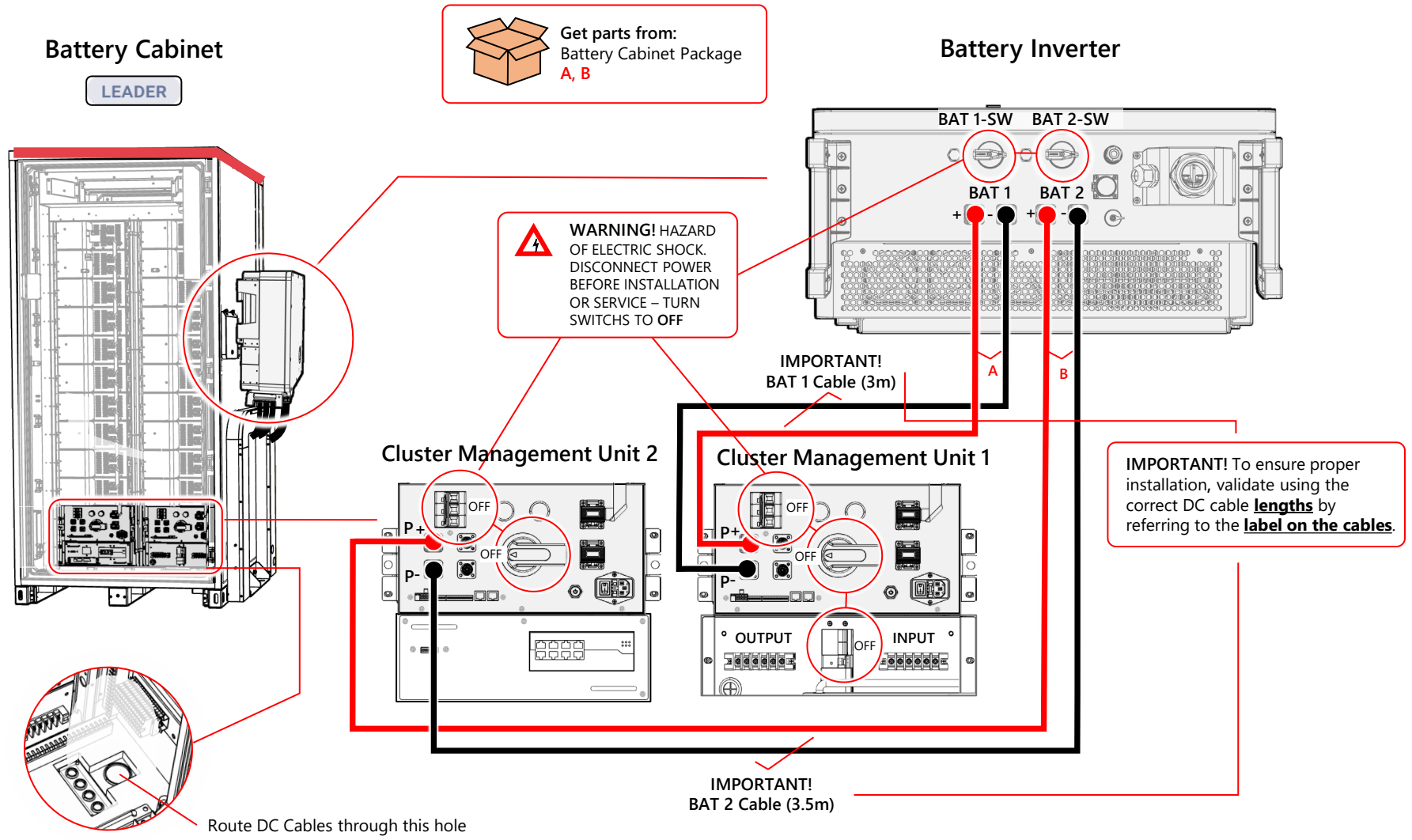


2 M8, 18-23 Nm

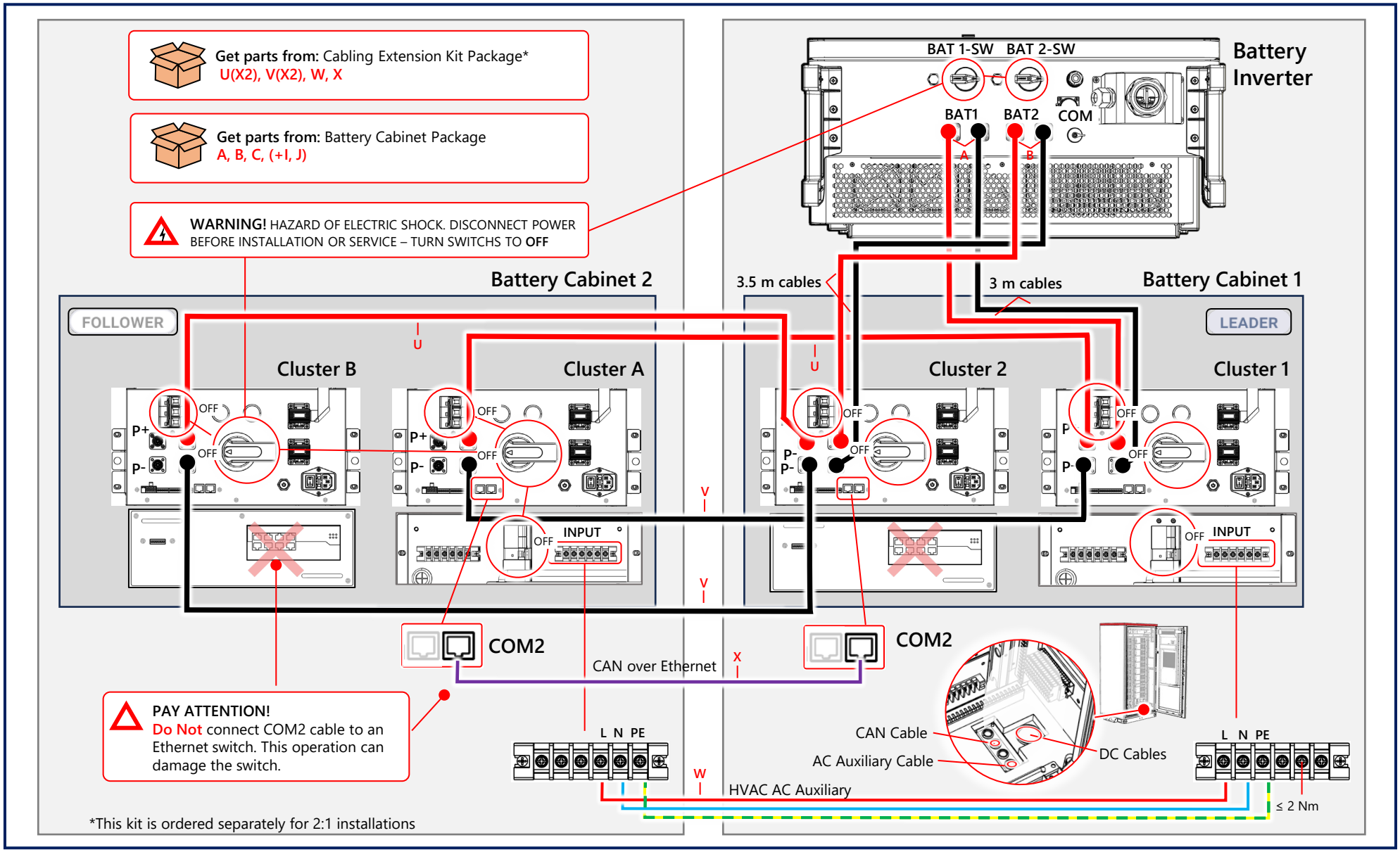
3 M8, 18-23 Nm

Site Ground

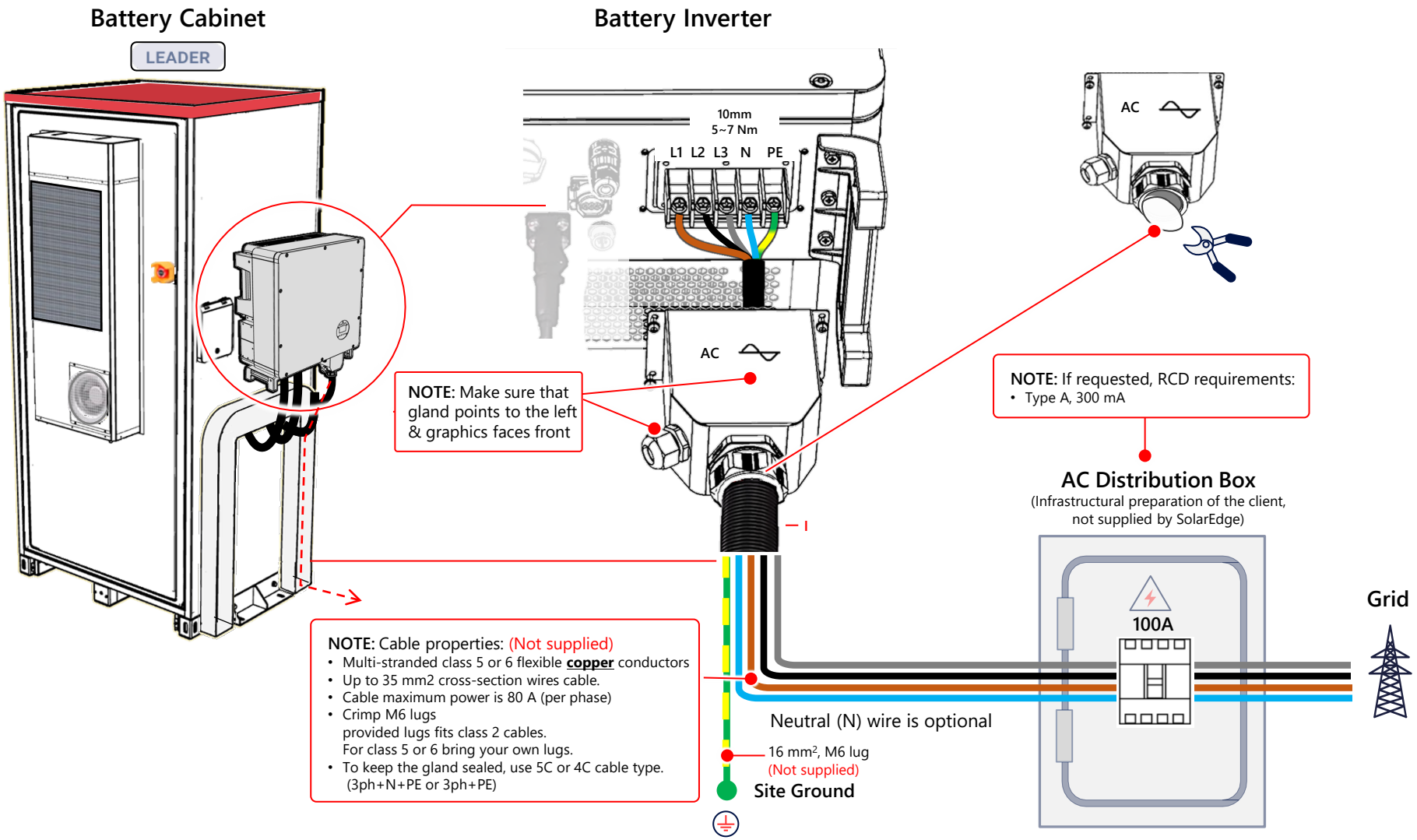
Wiring Single Battery Cabinet to Battery Inverter



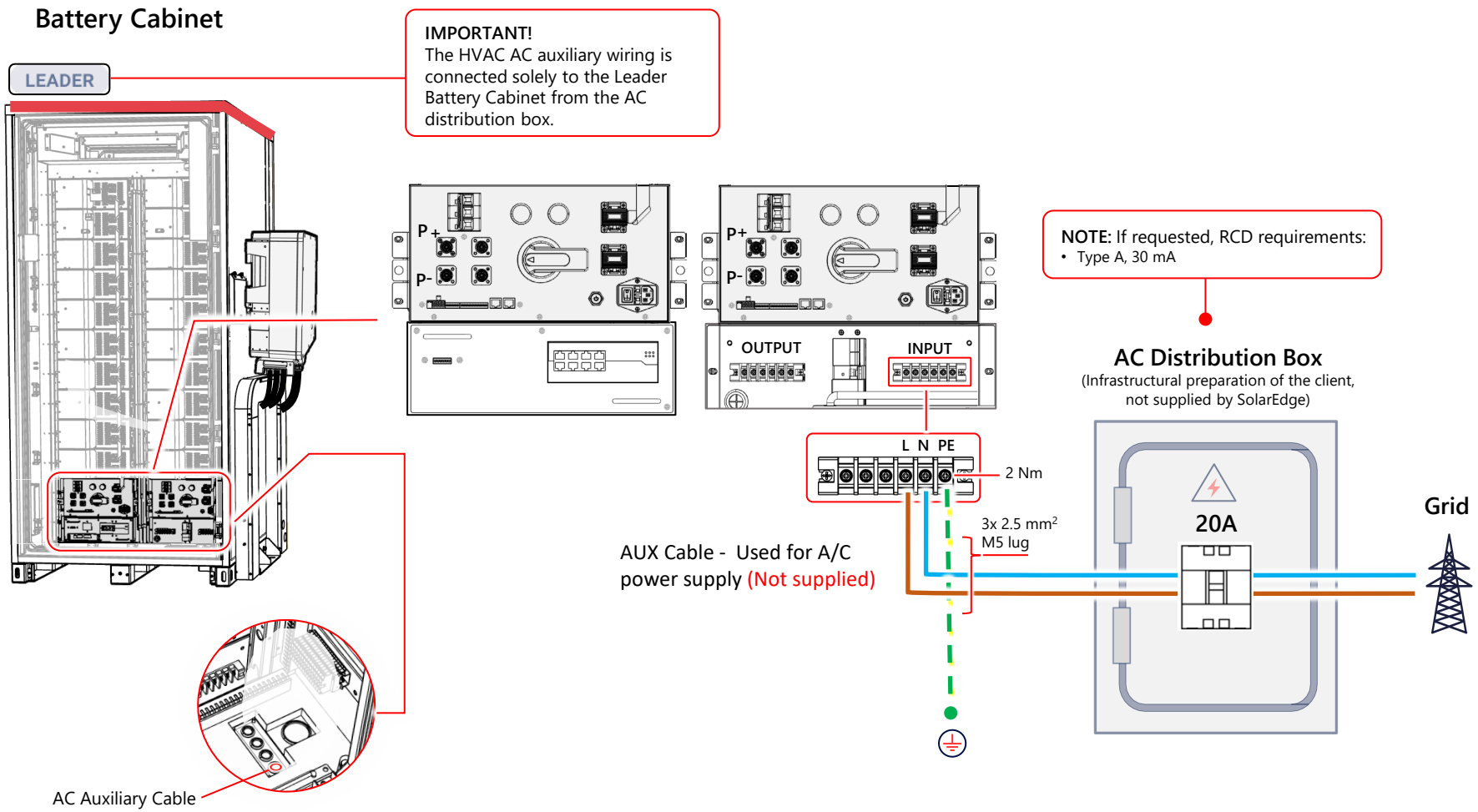
Wiring two Battery Cabinets to Battery Inverter



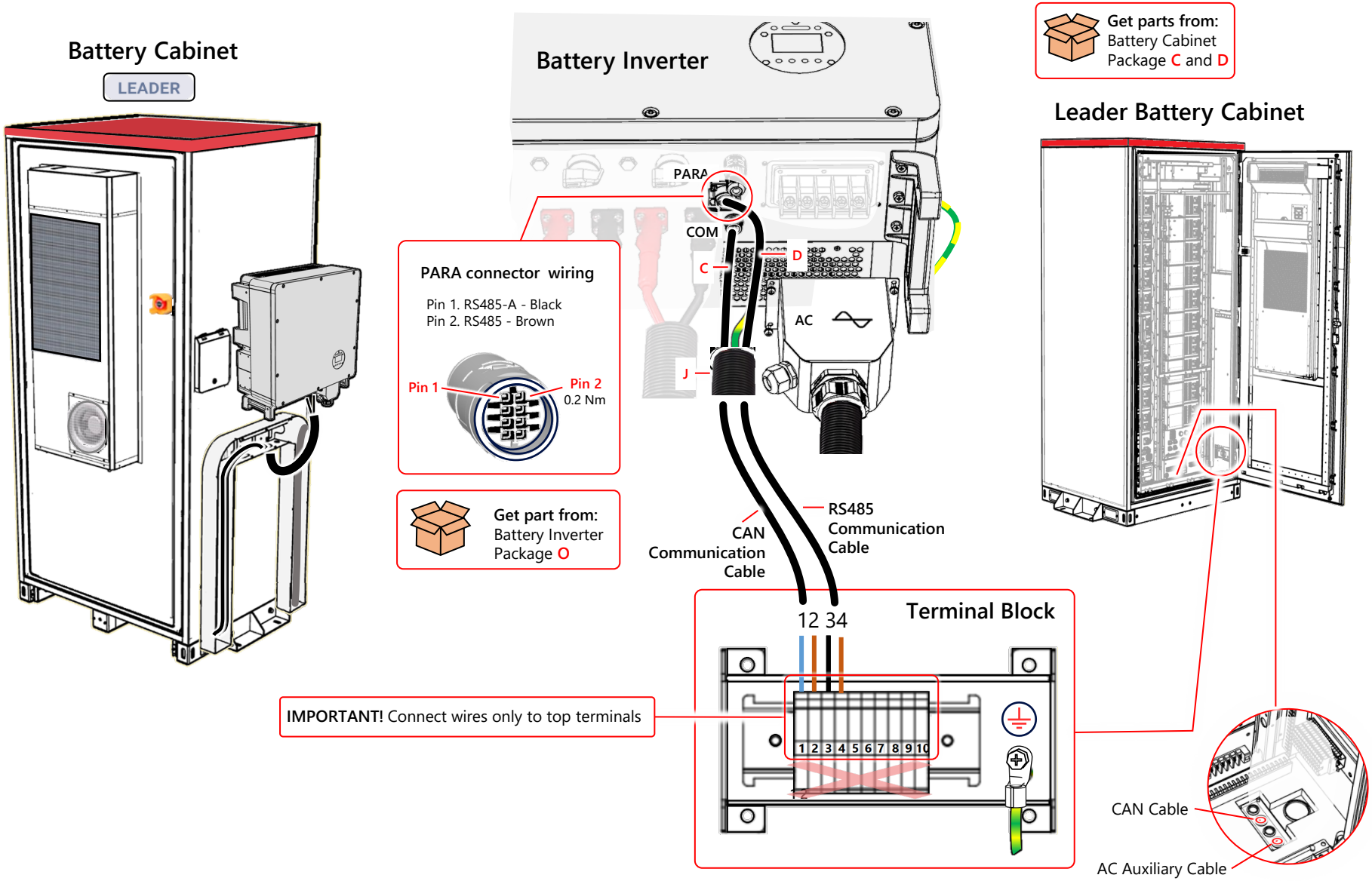
Wiring Battery Inverter to the Grid



Wiring Auxiliary AC Power to Battery Cabinets HVAC

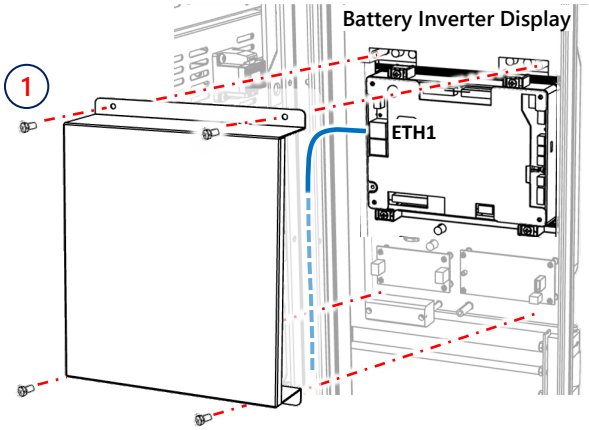


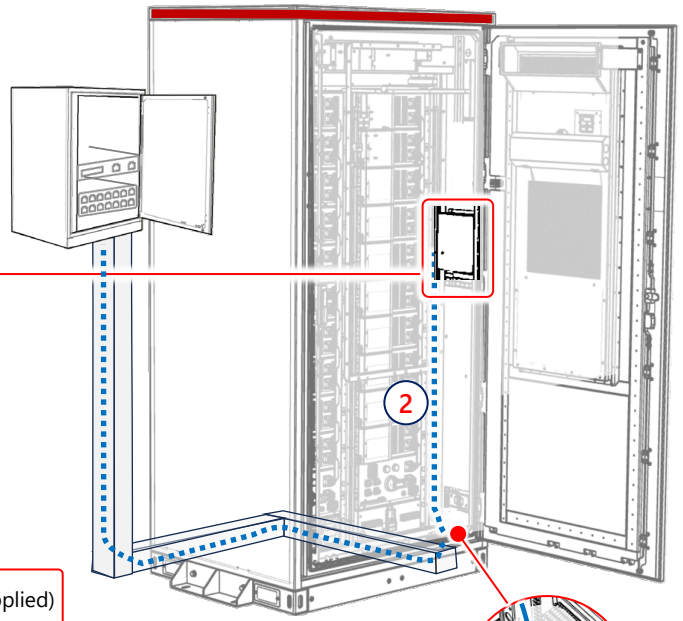
Wiring Communication between Battery Cabinet & Battery Inverter

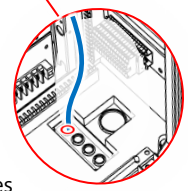


Connecting Multiple Battery Inverters to SolarEdge ONE Controller

Leader Battery Inverter







SolarEdge ONE Controller

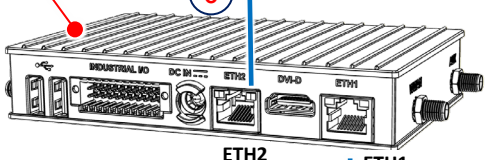
The SolarEdge ONE Controller is purchased separately and connects the battery cabinet to the cloud via a customer-provided local gateway.

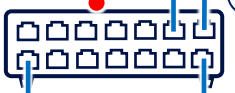
Unmanaged Ethernet Switch (Customer supplied)

- Minimum100 Mbps (Recommended 1000 Mbps)
- Minimum 11 RJ45 ports (Recommended 16 ports)
- Recommended DIN rail mounting
- Recommended Industrial-grade switch, fanless design, with port link indications

Modbus TCP-LAN communication cables (Customer supplied)

3





Up to 10 CSS OD Cabinets

(The number of supported cabinets may depend on future product releases)

(Customer supplied)

(Customer supplied)

SolarEdge ONE

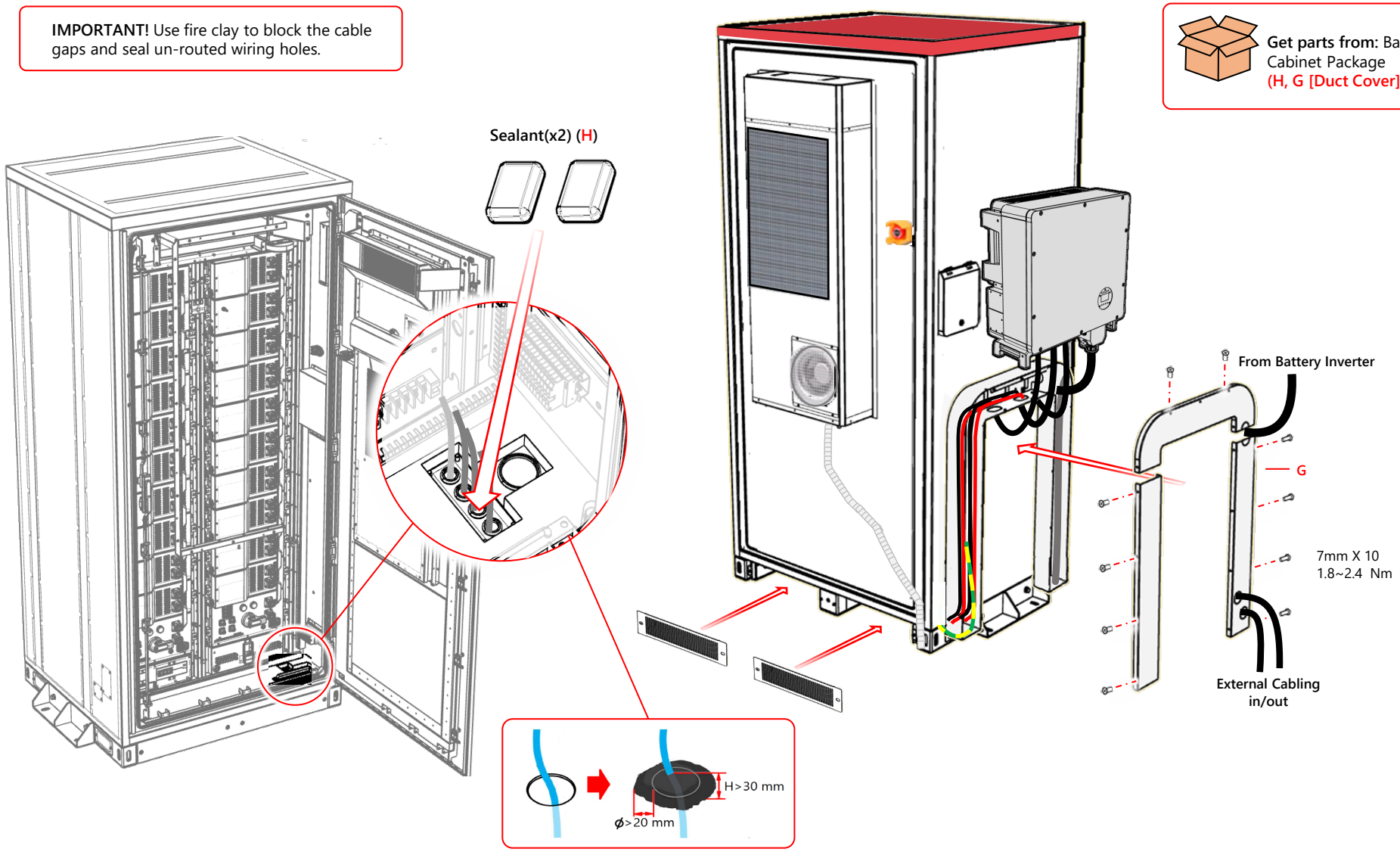
Internet Router (Customer supplied)

7

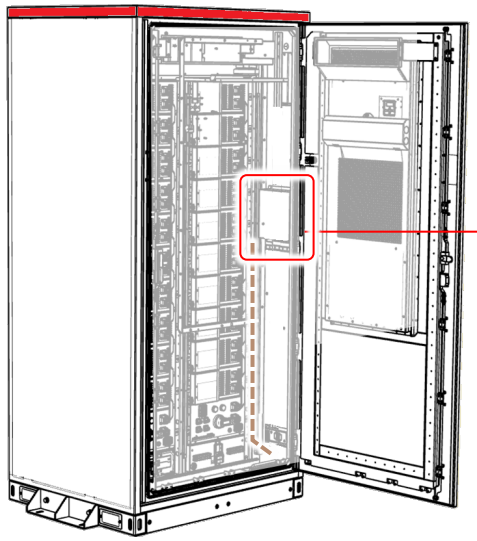
Sealing and Closing Wiring Duct Lid and Panels

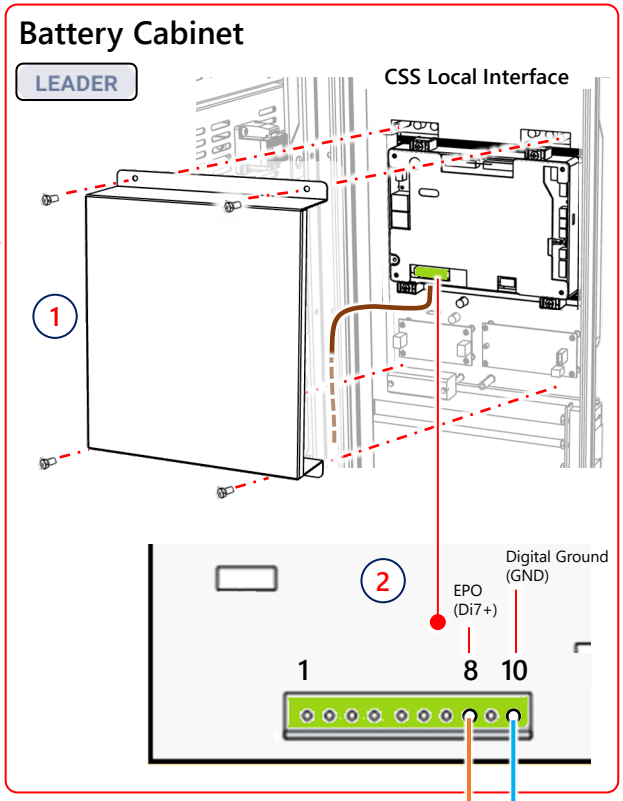
IMPORTANT! Use fire clay to block the cable gaps and seal un-routed wiring holes.

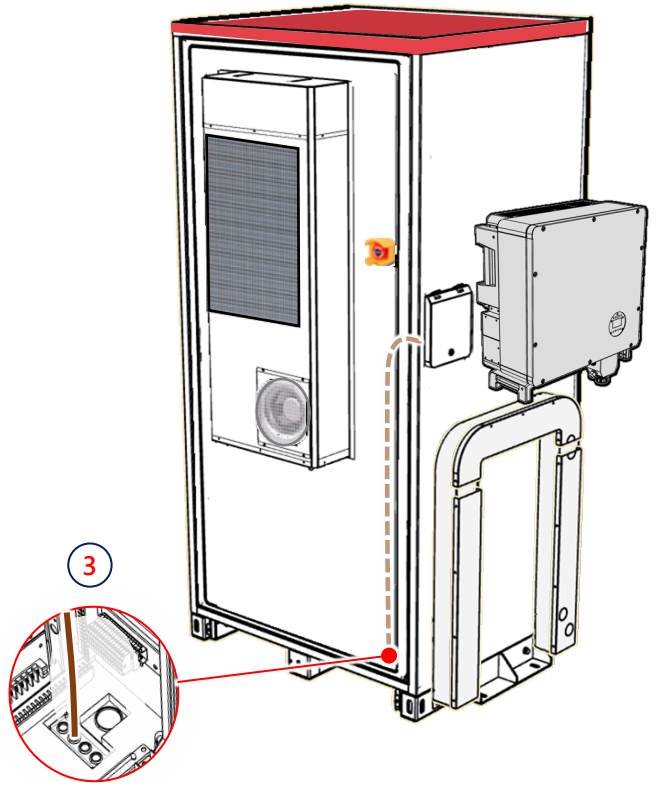
Get parts from: Battery Cabinet Package (H, G [Duct Cover])



Wiring Remote EPO Push-button to Battery Cabinets & Battery Inverters (Optional)

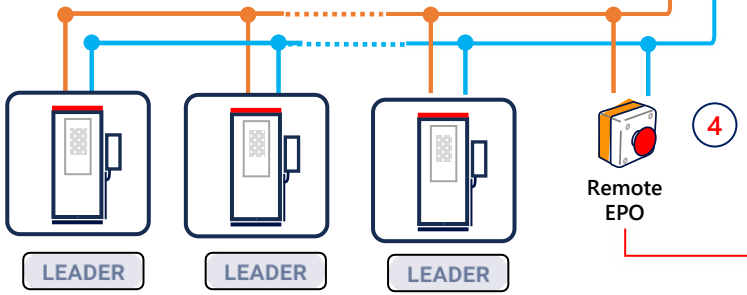






Follow Wiring Procedure

- Connect Remote EPO to the Battery Cabinet Leader using the digital I/O provided in the CSS Local Interface: pin 8 and 10
- Wire all battery cabinet leaders on site with the same method.
- Do not add any additional wiring to 'Follower' batteries.

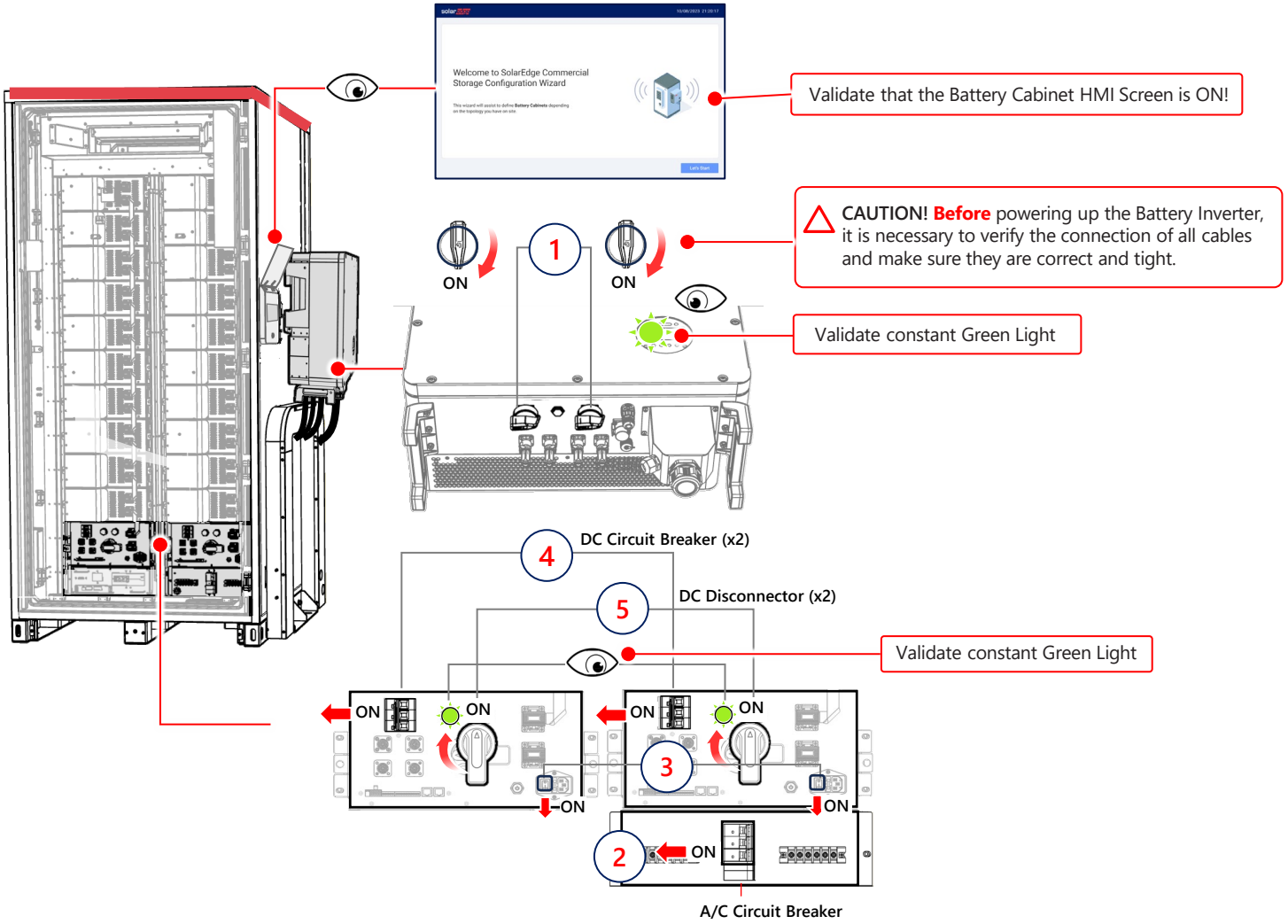


Remote EPO Requirements

- Use only passive Normally Open (N.O), EPO push-button
- The EPO push-button of the Leader Inverter trips all Follower Battery Cabinet(s).
- Recovery duration is 1 second

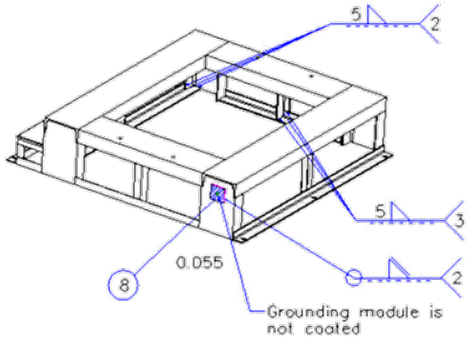
Power Up Sequence

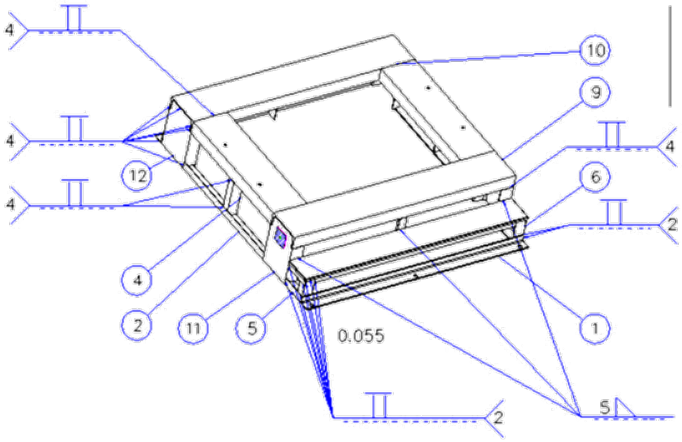
Follow the numbered steps to power up the system

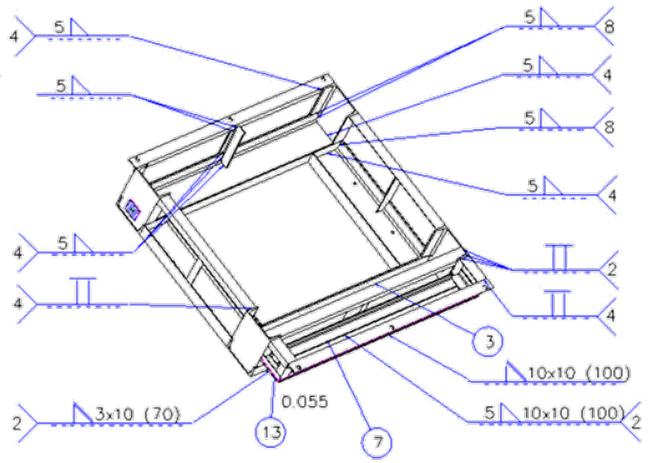


Appendix A
Construction Details

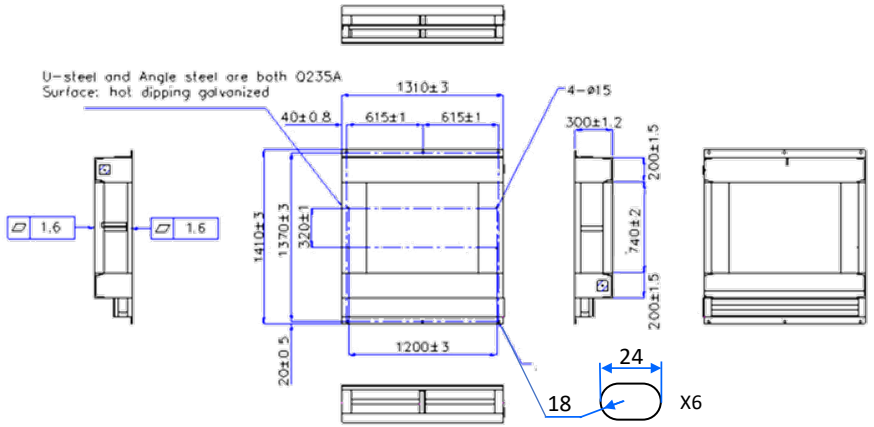
Battery Cabinet Mounting Stand Production Guidelines







No	Part Name	qty
13	footboard	1
12	U-steel D	2
11	U-steel C	2
10	U-steel B	2
9	U-steel A	2
8	Stainless steel grounding module	2
7	Unequal Angle steel G	2
6	Unequal Angle steel F	2
5	Unequal Angle steel	4
4	Unequal Angle steel D	4
3	Unequal Angle steel C	1
2	Unequal Angle steel	2
1	Unequal Angle steel A	2



Technical Requirements:

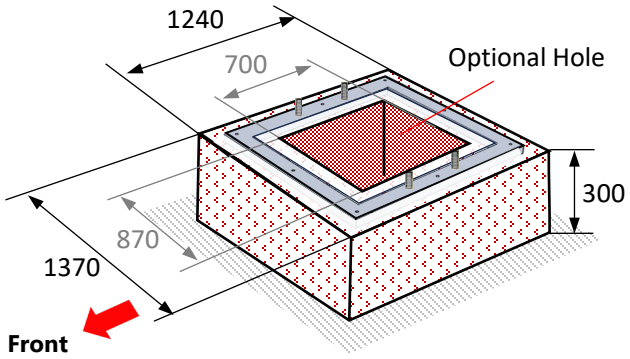
1. Solid welding, no virtual welding.
2. After welding, except for welding slag, the outer surface of the parts is polished and smooth.
3. Spray protection according to the requirements of the drawing, all stud end faces and threads need spray protection.
4. No dimensioned tolerance according to GB/T 1804-M processing.
5. The unmarked position tolerance shall be executed in GB/T 1184-K class.
6. With* number is an important size, need to focus on inspection.
7. For other dimensions not specified, refer to the 2D/3D drawing.

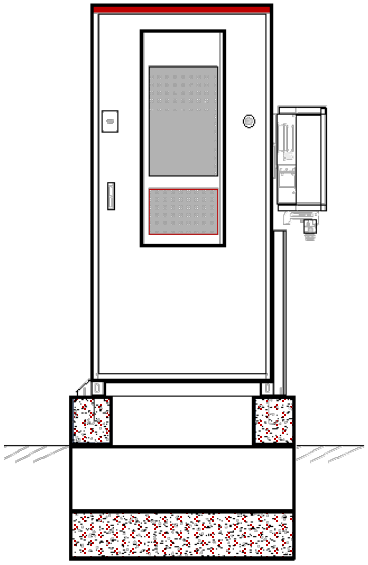
Battery Cabinet Concrete Platform Base Guidelines

IMPORTANT NOTES!

1. Battery Cabinet must be installed on a reinforced concrete platform base.
2. Dig a trench or reserve a cable entry hole by considering the electrical wiring of the equipment before construction of the foundation.
3. The foundation must be made of non-combustible materials.
4. The bearing capacity of the foundation shall be > 3 t.
5. When designing and manufacturing the embedded steel plates for the battery cabinet, it is necessary to consider that there must be a reliable connection (reinforcement hook) between the embedded steel plate and the concrete base.
6. When molding the concrete pad, it shall protrude below the ground as minimum of 400 mm.
7. The height of the concrete pad above the ground shall be at least 300 mm.
8. Concrete base surface smoothness shall be ≤ 3mm.
9. The upper surface tolerance of the foundation shall be ±5mm.
10. The concrete pad shall prevent rainwater accumulation on top of it. The foundation construction should meet the drainage requirements for maximum volume of rainfall in the locality, and the discharged water needs to be treated in accordance with local laws and regulations.
11. The foundation drawing is only for reference and cannot be regarded as the final construction drawing. Operators shall recheck the basic parameters according to the environment, geological conditions, seismic requirements, etc. of the installation site.

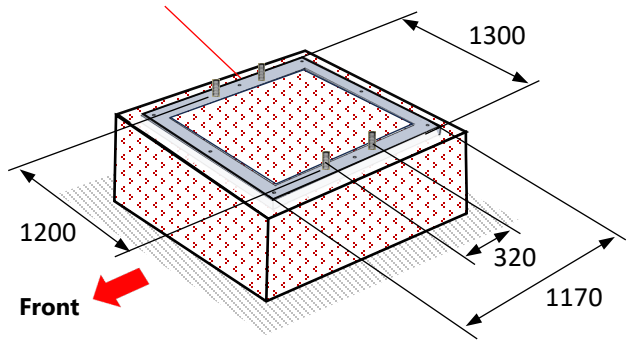
Concrete Platform Base

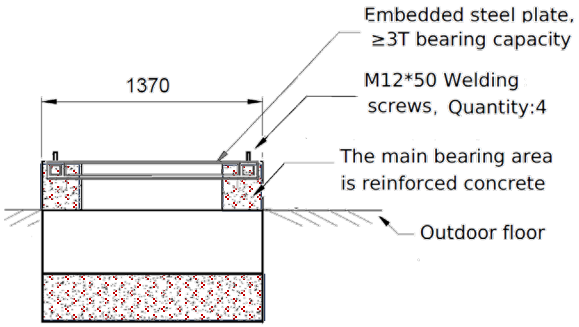




Embedded Steel Plate with Studs

Embedded Steel Plate 100 / 10





All dimensions are in mm

Support Contact Information
If you have technical problems concerning SolarEdge products, please contact us:
https://www.solaredge.com/service/support