

EG4[®] WELDED 3-SLOT INDOOR CABINET

QUICK-START GUIDE



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1. TECHNICAL SPECIFICATIONS

| PHYSICAL SPECIFICATIONS | |
|--------------------------------------|---|
| CABINET DIMENSIONS (W×D×H) | 23.6×26.8×26.5 in. (600×680×673.1 mm) |
| DIMENSIONS WITH CASTERS (W×D×H) | 23.6×26.8×29.6 in. (600×680×751.8 mm) |
| TOP CABLE ENTRY/EXIT KNOCKOUTS | 1.6 in. (40.6 mm) |
| SIDE CABLE ENTRY/EXIT KNOCKOUTS | 2.5 in. (63.5 mm) |
| CABLE GLAND SIZE | 3/4 in. |
| MAX. NUMBER OF BATTERIES | 3 EG4® Server Rack Style |
| BATTERY CONNECTION BOLTS (IN BUSBAR) | M6-1.0x15 with a 10mm hex head (and Phillips head) |
| SYSTEM CONNECTION BOLTS (IN BUSBAR) | M8-1.25x15 with a 13mm hex head (and Phillips head) |
| BUSBAR TORQUE VALUE | 84 in. lbs. (9.5 Nm) |
| WEIGHT (INCLUDING CASTERS) | 168.9 lbs. (76.6kg) |
| CABINET MATERIAL | Heavy-duty steel |
| FINISH COLOR | Black: Powder-coated |
| ELECTRICAL SPECIFICATIONS | |
| MAX. BUSBAR CURRENT | 300A |
| ENERGY STORAGE CAPACITY | 5.12 – 15.36kWh |
| BUSBAR COVERS | Yes |
| BUSBAR HEAT SHRINK PROTECTION | Yes |
| WARRANTY | |
| STANDARD WARRANTY | 3 years |

2. ABBREVIATIONS

- AWG – American Wire Gauge
- A – Amps
- Ah – Amp hour(s)
- AC – Alternating Current
- AFCI – Arc-Fault Circuit Interrupter
- AHJ – Authority Having Jurisdiction
- kAIC – kilo-Amp Interrupting Capability
- ANSI – American National Standards Institute
- BAT – Battery
- BMS – Battery Management System
- COM – Communication
- CT – Current Transformer
- DC – Direct Current
- DIP – Dual In-line Package
- DOD – Depth of Discharge
- EG – Equipment Ground
- EGS – Equipment Grounding System
- EMC – Electromagnetic Compatibility
- EPS – Emergency Power System
- ESS – Energy Storage System
- E-Stop – Emergency Stop
- FCC – Federal Communication Commission
- GE – Grounding Electrode
- GEC – Grounding Electrode Conductor
- GFCI – Ground Fault Circuit Interrupter
- GFDI – Ground Fault Detector/Interrupter
- Imp – Maximum Power Point Current
- IEEE – Institute of Electrical and Electronic Engineers
- IP – Ingress Protection
- I_{sc} – Short-Circuit Current
- In-lbs. – Inch Pounds
- kW – Kilowatt
- kWh – Kilowatt-hour
- LCD – Liquid Crystal Display
- LFP – Lithium Iron Phosphate
- L1 – Line 1
- L2 – Line 2
- mm – Millimeters
- MPPT – Maximum Power Point Tracking
- mV – Millivolt
- N – Neutral
- NEC – National Electric Code
- NEMA – National Electrical Manufacturers Association
- NFPA – National Fire Prevention Association
- Nm – Newton Meters
- NOCT – Normal Operating Cell Temperature
- PC – Personal Computer
- PCB – Printed Circuit Board
- PE – Protective Earth
- PPE – Personal Protective Equipment
- PV – Photovoltaic
- RSD – Rapid Shut Down
- SCC – Standards Council of Canada
- SOC – State of Charge
- STC – Standard Testing Conditions
- UL – Underwriters Laboratories
- UPS – Uninterrupted Power Supply
- V – Volts
- VOC – Open-Circuit Voltage
- VMP – Voltage Maximum Power

3. BATTERY SAFETY

3.1 SAFETY INSTRUCTIONS

Before any work begins, carefully read all safety instructions, and always observe them when working on or with the battery. The installation must follow all applicable national or local standards and regulations. Consult with the local AHJ to obtain the proper permits and permissions before installation.

Incorrect installation may cause:

- *Injury or death to the installer, operator or third party*
- *Damage to the battery or other attached equipment*

3.2 IMPORTANT SAFETY NOTIFICATIONS



DANGER: Hazardous Voltage Circuits!
AVERTISSEMENT! Circuits à tension élevée!

There are various safety concerns that must be carefully observed before, during, and after the installation, as well as during future operation and maintenance. The following are important safety notifications for the installer and any end users of this product under normal operating conditions.

1. **Do not disassemble the battery.** Contact the distributor for any issues that need repair for more information and proper handling instructions. Incorrect servicing or re-assembly may result in a risk of electric shock or fire and void the warranty.
2. **Never short-circuit DC inputs.** Short-circuiting the battery may result in a risk of electric shock or fire and can lead to severe injury or death and/or permanent damage to the unit and/or any connected equipment.
3. **Use caution when working with metal tools on or around batteries and systems.** **Risk** of electrical arcs and/or short circuiting of equipment can lead to severe injury or death and equipment damage.
4. **Beware of high battery current.** Ensure that the battery module breakers and/or on/off switches are in the “open” or “off” position before installing or working on the battery. Use a voltmeter to confirm there is no voltage present to avoid electric shock.
5. **Do not make any connections or disconnections to the system while the batteries are operating.** Damage to system components or risk of electrical shock may occur if working with energized batteries.
6. Make sure the battery and rack are properly grounded.
7. An installer should make sure to be well protected by reasonable and professional insulative equipment [e.g., personal protective equipment (PPE)].
8. Before installing, operating, or maintaining the system, it is important to inspect all existing wiring to ensure it meets the appropriate specifications and conditions for use.
9. Ensure that the battery and system component connections are secure and proper to prevent damage or injuries caused by improper installation.



WARNING: TO REDUCE THE RISK OF INJURY, READ ALL INSTRUCTIONS!

All work on this product (system design, installation, operation, setting, configuration, and maintenance) must be carried out by qualified personnel. To reduce the risk of electric shock, do not perform any servicing other than those specified in the operating instructions unless qualified to do so.

1. Read all instructions before commencing installation. For electrical work, follow all local and national wiring standards, regulations, and these installation instructions. All wiring should be in accordance with the National Electrical Code (NEC), ANSI/NFPA 70.
2. The battery and system can connect with the utility grid only if the utility provider permits. Consult with the local AHJ before installing this product for any additional regulations and requirements for the area.
3. All warning labels and nameplates on this battery should be clearly visible and must not be removed or covered.
4. The installer should consider the safety of future users when choosing the battery's correct position and location as specified in this manual.
5. Keep children away from touching or misusing the battery and relevant systems.

The battery is designed to stop charging when reaching the low threshold of 32°F. If charging current is observed when the internal battery temperature is below 32°F, disconnect battery immediately and consult distributor.

DISCLAIMER

EG4 reserves the right to make changes to the material herein at any time without notice. Please refer to www.eg4electronics.com for the most updated version of our manuals/spec sheets.

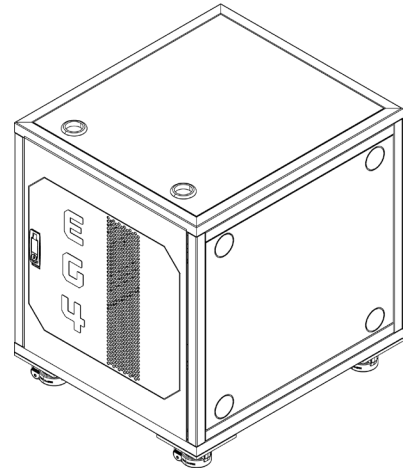


4. BRIEF INTRODUCTION

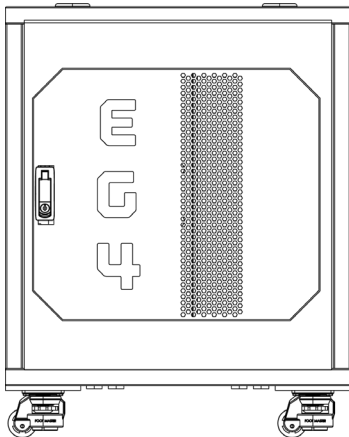
4.1 PRODUCT DESCRIPTION

The EG4® Welded Indoor Cabinet is a great addition to a new or expanding an Energy Storage System (ESS). Made of high-quality steel with a powder coat finish, this durable unit is resistant to wear and tear over time and is perfect for housing EG4 server rack batteries. It features a locking door handle to prevent unauthorized access and heavy-duty swivel casters with adjustable feet making it simple to move and easy to level and fix in place.

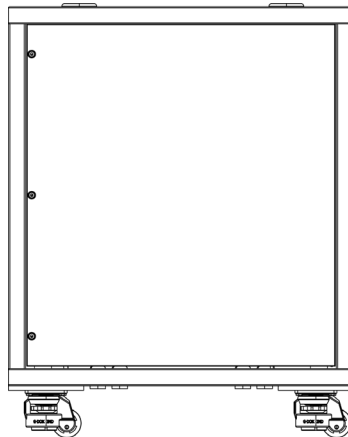
Designed to facilitate efficient installation, maintenance, and troubleshooting, this purpose-built cabinet is ideal for arranging batteries in a compact space. The integrated positive and negative busbars support up to 300 DC Amps for increased energy density and the multiple cable entry/exit locations on the top, sides, and bottom of the cabinet provide maximum configuration and installation flexibility.



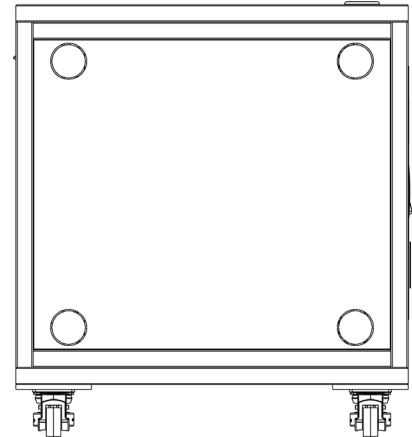
Isometric View



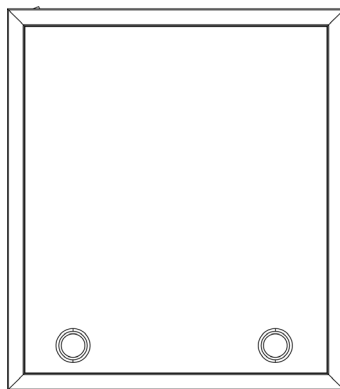
Front View



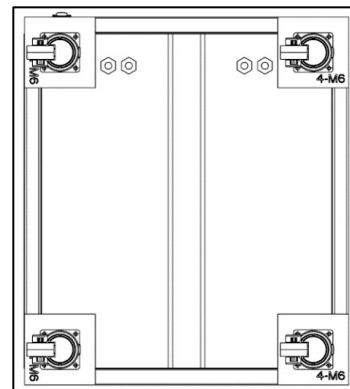
Back View



Side View

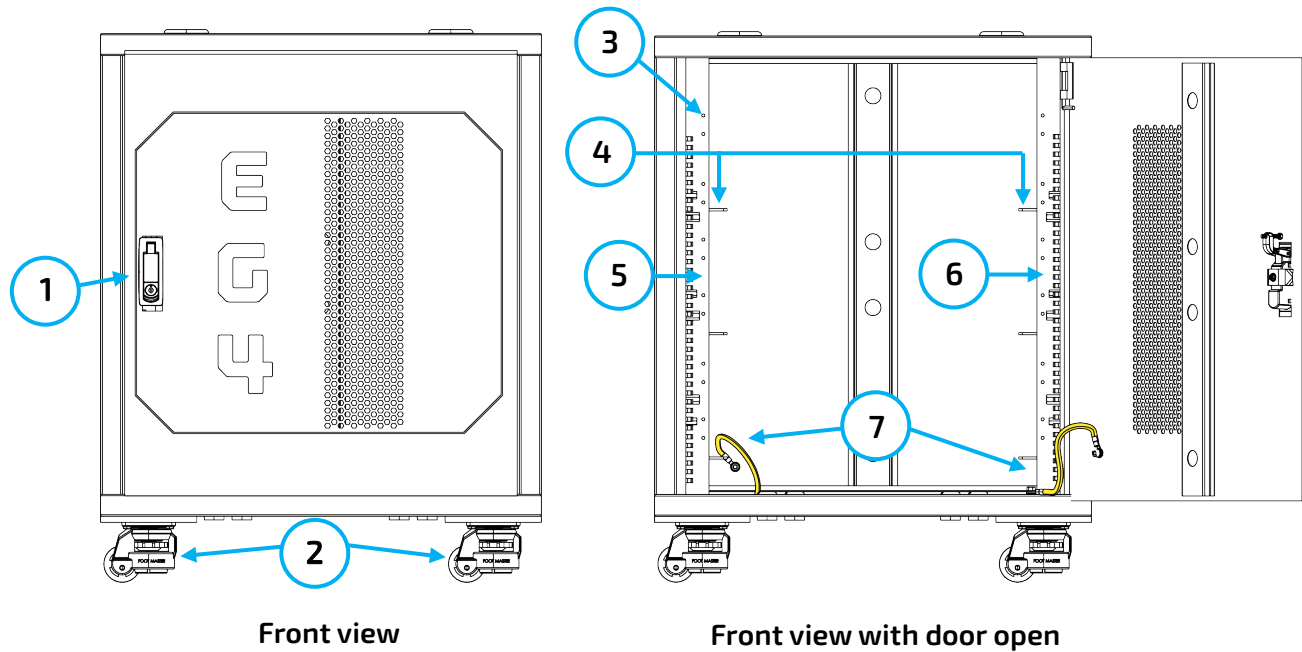


Top View

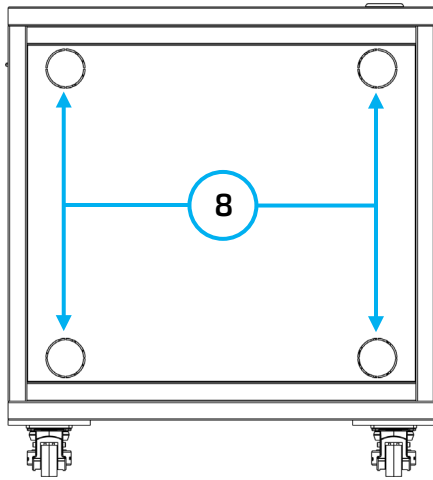


Bottom View

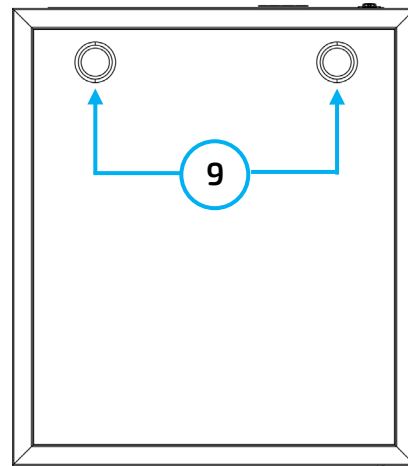
4.2 OVERVIEW OF SYSTEM COMPONENTS



| No. | Item | Description |
|-----|--------------------------|---|
| 1 | Handle with Lock | Press on the “Push” button and turn handle counterclockwise to open the door |
| 2 | Swivel Casters | Four heavy duty swivel casters with adjustable feet |
| 3 | Battery Securing Bolts | (24) M6-1.0x10, Phillips head screws provided to secure batteries in the cabinet |
| 4 | Horizontal Battery Rails | One pair of horizontal rails for each of the three battery slots |
| 5 | Positive Bus Bar | 31.7 in. (805mm) 300A busbar mounted in Panduit wiring duct |
| 6 | Negative Bus Bar | 31.7 in. (805mm) 300A busbar mounted in Panduit wiring duct |
| 7 | Cabinet Ground Fasteners | Cabinet Ground Fasteners are two M6-1.0x15 studs, each with a 10mm nut in the floor of the cabinet (one in the front-right and one in the back-left). There is a 10 AWG yellow/green wire from each stud to the cabinet door and back panel |



Side View



Top View

| No. | Item | Description |
|-----|---------------------------|---------------------------|
| 8 | Side Knockouts (Large) | 2in. Knockouts (x4) |
| 9 | Top Side Grommets (Large) | 2in. Rubber Grommets (x2) |

5. LOCATION FOR STORAGE

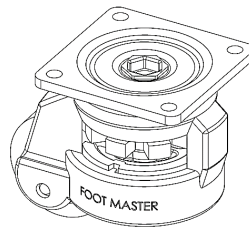
The installation location for the EG4® battery cabinet can greatly affect the health of the batteries. Keep the cabinet away from locations where it may get wet or locations with high humidity. Install the cabinet away from combustible materials. Please refer to the battery manual for optimal temperature ranges.

6. PACKING LIST

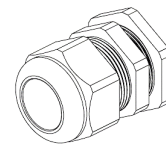
The following items will arrive inside the 3-slot welded cabinet box:



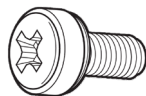
Keys (x2)



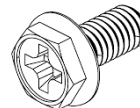
Swivel Casters (x4)



Wire Glands (x16)



M6-1.0x10
Phillips Screws (x24)



M6-1.0x10
Phillips hex head bolts (x16)

7. TOOLS NEEDED FOR INSTALLATION

The tools required may vary depending on how the batteries are installed. Typically, the following tools are needed to install the casters and the batteries into the EG4® battery cabinet. These items are not included with the cabinet:

- 10mm socket and ratchet with extension
- Phillips head screwdriver
- Torque wrench

7.1 REQUIREMENTS FOR INSTALLATION

- Avoid exposing the cabinet to conductive materials, such as water, strong oxidizers, and strong acids.
- It is not recommended to place an operational cabinet in direct sunlight to avoid overheating.
- When working with the cabinet, keep all flammable materials out of the working area.
- Follow all local requirements for earthquake safety and anchoring.
- Before installing the batteries, inspect them for signs of damage. Never use damaged or bloated batteries. Please contact the distributor if a battery is received in this state or experiences this issue.
- Use caution when installing the batteries to avoid damaging the battery casing or connections.



DANGER! When adding or removing a battery from any rack, cabinet, or busbar, turn off ALL batteries. Then use a voltmeter to confirm there is no DC voltage present. This will prevent users from encountering live (powered) busbars by accident. **Failure to do so can result in severe injury and/or death.**

The 6 AWG red and black cables included with EG4® server rack batteries are intended only for the connection from the battery to the battery cabinet busbars.

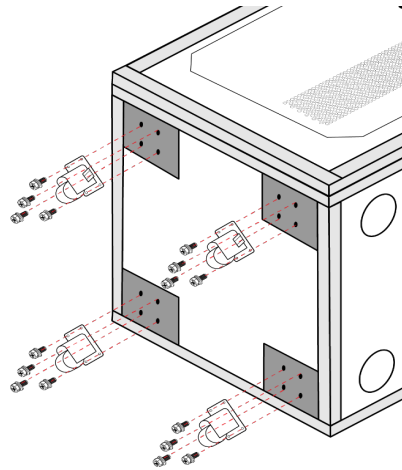
The busbar is intended for a max of 300A (along with any 48V EG4 accessories).

Cable sizing from the battery cabinet to the remainder of the ESS is dependent on multiple factors including the system maximum current draw, distance between the battery cabinet and ESS, location, temperature, etc.

Under engineering supervision, conductor ampacities should be calculated to ensure compliance with NEC 310.15(C). Where ambient temperature is above 86°F (30°C), cable size must be increased according to NEC 310.

8. INSTALLING THE CASTERS ON THE CABINET

1. Before installing the batteries into the cabinet, carefully remove all items from inside the cabinet and lay it on its back, preferably on a clean surface or a furniture blanket.
2. Attach the casters to the bottom of the cabinet using the included sixteen M6-1.0x10 Phillips hex head bolts included with the cabinet, and a 10mm socket and ratchet, or Phillips head screwdriver. (See image below)

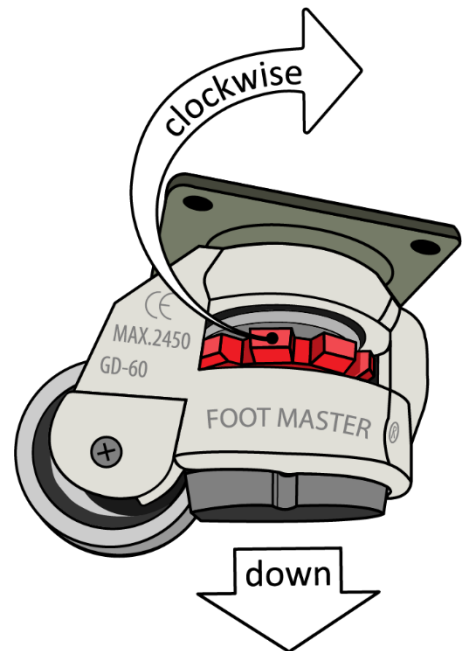


3. After installing and securing all 4 casters, stand the cabinet upright and roll it into the location in which it will remain.
4. Rotate the red gear located on each caster clockwise to raise the wheels off the floor and level the cabinet. (See image to the right)



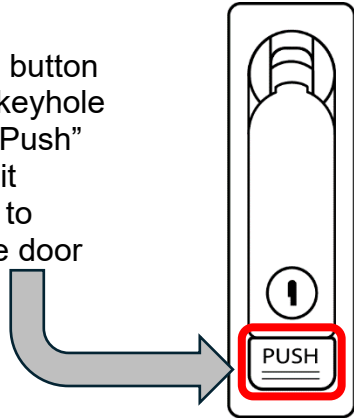
REMINDER:

It is strongly advised that the caster wheels be utilized solely for moving the cabinet. When the cabinet is stationary, the caster feet should be down supporting the weight of the cabinet.

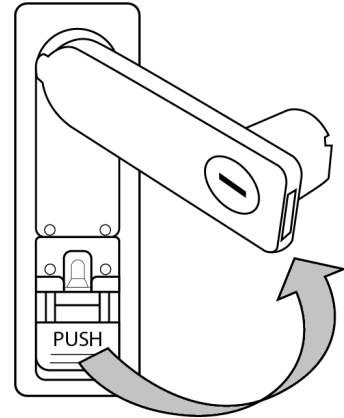


8.1 OPENING AND LOCKING THE CABINET

1. Locate the button under the keyhole that says "Push" and press it downward to release the door handle.

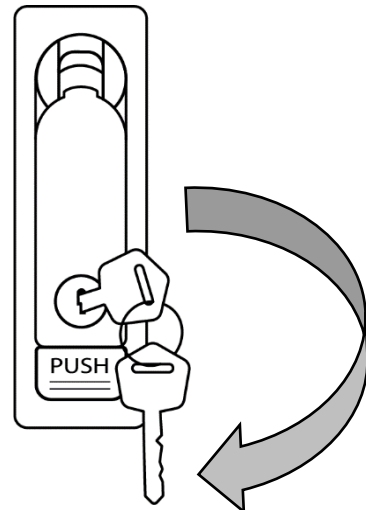


2. Turn the door handle counterclockwise 90° and pull to open the door.



3. Push the door closed and rotate the handle clockwise to the closed position. Push the handle into the door until it is flush as shown in step 1 above.
4. Insert the key and turn clockwise 180° to lock the door handle.
5. Test the lock by pressing the "Push" button. The handle should not fully extend.

Note: There is play in the handle. When conducting this test, the handle may release slightly, but the door will not open. Simply press the handle back down into the flush position.



9. BATTERY INSTALLATION INFORMATION

9.1 EXAMPLE CABINET CONFIGURATION

For demonstration purposes, the image below shows a fully populated EG4® Welded Indoor Cabinet with three EG4 48V batteries.

Batteries:

There is one EG4-LL V2 48V/100Ah batteries (top), one EG4-LL V1 48V/100Ah battery, and one EG4 LifePower4 48V/100Ah server rack battery (bottom). These batteries have been connected in parallel using the integrated busbars. This maintains the appropriate 48V system voltage while increasing the discharge rating of this battery bank to 300Ah. In addition, the potential DC output amperage of the rack now approaches 300 amps, ~100amps per battery.

Battery Cables:

The 6 AWG battery cables required to connect each battery to the internal positive and negative busbars are included with the EG4 batteries. Be sure to choose the correct size cables to connect the cabinet busbars to the remainder of the ESS. Refer to an NEC approved ampacity chart for specifications. **Always use the proper torque to fasten DC power cable connections [84 in-lbs. (9.5 Nm)].**

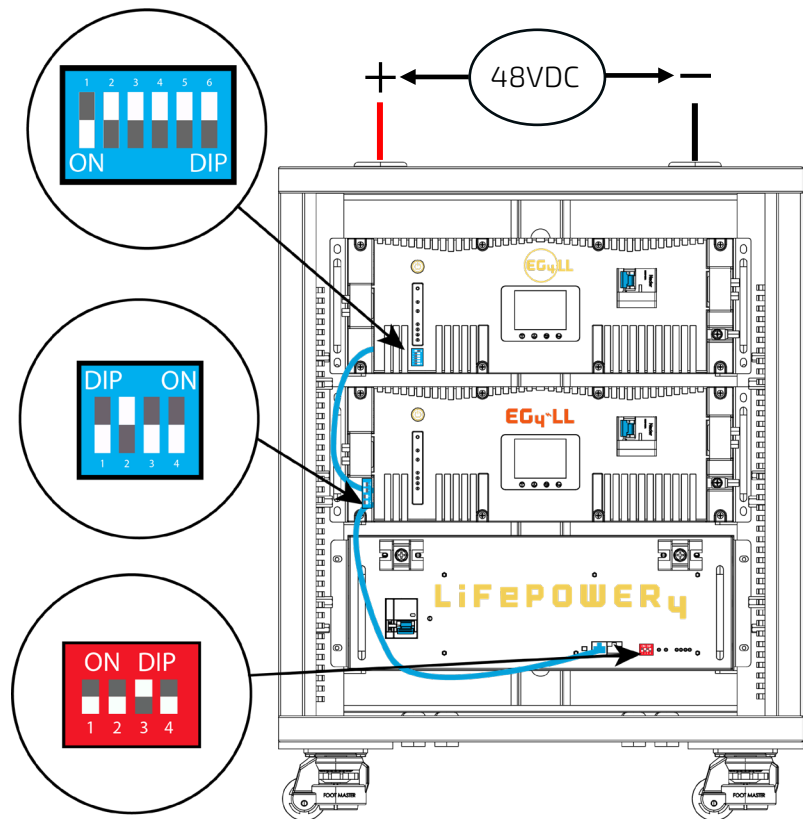
DIP Switches:

The DIP switches are set according to each battery's individual requirements. In this example, the top battery acts as master to the bottom two batteries.

Communications Cables:

The blue communications cables are daisy-chained to allow all three batteries to share information with the ESS inverter. In this example, the top master battery connects to the ESS and is daisy-chained to the slave batteries below it.

For more details surrounding paralleling of multiple battery models, scan the QR code.



9.2 BATTERY INSTALLATION

Before installing any batteries into the cabinet, verify the cabinet is properly grounded to the system's earth ground. Ensure the casters have been raised off the floor and the cabinet is resting on the adjustable rubber feet integrated into the casters (see section 8, step 4). This will prevent the cabinet from moving while installing the batteries. Also note that the batteries are very heavy. Please use the team lift technique while installing batteries to prevent injury to personnel and/or damage to equipment.

1. Beginning with the bottom cabinet slot and progressing upward, insert the batteries into the cabinet one at a time. Slide each battery into the cabinet until the battery is firmly seated in the slot before progressing to the next battery. Secure each battery to the cabinet rails with four of the M6-1.0x10 Phillips screws included with the cabinet. These screws require a Phillips head screwdriver.
2. Use the M6-1.0x15 Phillips hex head bolts included in the cabinet busbars and the 6 AWG red and black DC battery cables included with the EG4 batteries to connect each battery to the internal positive and negative busbars, respectively. These bolts require a 10mm socket.
3. **DO NOT** simply finger tighten the battery or busbar terminal bolts. Both require a specific torque to ensure they do not come loose during operation [84 in-lbs. (9.5 Nm)]. Failure to properly torque the terminal bolts can result in serious damage and will void the warranty.
4. To ensure no connection errors, clearly identify the location of the Energy Storage System's (ESS) positive and negative terminals—normally on the system inverter. Once the system polarity is verified, connect the main cabinet positive (red) and negative (black) cables to the ESS using a properly sized fuse/breaker between the battery cabinet and the inverter. Attach the main DC power cables to the cabinet busbars using the M8-1.25x15 Phillips hex head bolts included in the busbars. These bolts require a 13mm socket. Always use the proper torque to fasten DC power cable connections [180 in-lbs. (20.34 Nm)].

10. TROUBLESHOOTING AND MAINTENANCE

- Check cable connections to avoid loose or damaged cables from interfering with network connectivity. **Always** use the proper torque to fasten DC power cable connections
- Inspect the cabinet for physical damage such as dents or scratches that may require repairs to maintain structural integrity
- Ensure the cabinet remains free of any foreign objects or materials



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