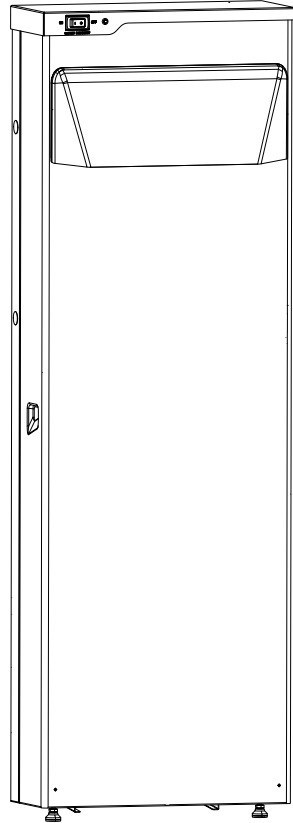


Installation and Owner's Manual

Generac PWRcell® Battery



012633



WARNING

Loss of life. This product is not intended to be used in a critical life support application. Failure to adhere to this warning could result in death or serious injury. (000209b)

Register your Generac product at:

<https://pwrfleet.generac.com>

1-888-GENERAC
(888-436-3722)

Para español, visita: <http://www.generac.com/service-support/product-support-lookup>

Pour le français, visiter: <http://www.generac.com/service-support/product-support-lookup>

SAVE THIS MANUAL FOR FUTURE REFERENCE

Use this page to record important information about your Generac Product

Record the information found on your unit data label on this page. See [Specifications](#).

When contacting an Independent Authorized Service Dealer (IASD) or Generac Customer Service, always supply the complete model number and serial number of the unit.

Operation and Maintenance: Proper maintenance and care of the energy storage system ensures a minimum number of problems and keeps operating expenses at a minimum. It is the operator's responsibility to perform all safety checks, to verify that all maintenance for safe operation is performed promptly, and to have the equipment checked periodically by an ASD. Normal maintenance, service, and replacement of parts are the responsibility of the owner / operator and, as such, are not considered defects in materials or workmanship within the terms of the warranty. Individual operating habits and usage may contribute to the need for additional maintenance or service.

Table 1 - Important Information

Description	Model Number	Serial Number	Date Purchased	Date Commissioned
Generac PWRcell® Battery				
Battery Module 1				
Battery Module 2				
Battery Module 3				
Battery Module 4				
Battery Module 5				
Battery Module 6				

 **WARNING**

CANCER AND REPRODUCTIVE HARM

www.P65Warnings.ca.gov

(000393a)

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Section 1: Safety Rules & General Information

Introduction

This installation manual provides instructions and recommendations for installing and commissioning the Generac PWRcell® Battery. The PWRcell Battery is designed to house compatible lithium ion battery modules, and connects directly to the PWRcell Inverter and other REbus™ compatible components of the PWRcell system.

This installation manual includes full details on installation, wiring, safety, inverter integration, and other key aspects of installing the battery. The companion document to this installation manual is the Generac PWRcell Battery Owner's Manual. See the Generac PWRcell Battery Owner's Manual for complete information on user-configurable features.

The information in this manual is accurate based on products produced at the time of publication. The manufacturer reserves the right to make technical updates, corrections, and product revisions at any time without notice.

Read This Manual Thoroughly



WARNING

Consult Manual. Read and understand manual completely before using product. Failure to completely understand manual and product could result in death or serious injury. (000100a)

If any section of this manual is not understood, contact the nearest Independent Authorized Service Dealer (IASD) or Generac Customer Service at 1-888-436-3722 (1-888-GENERAC), or visit www.generac.com for starting, operating, and servicing procedures. The owner is responsible for correct maintenance and safe use of the unit.

This manual must be used in conjunction with all other supporting product documentation supplied with the product.

SAVE THESE INSTRUCTIONS for future reference. This manual contains important instructions that must be followed during placement, operation, and maintenance of the unit and its components. Always supply this manual to any individual that will use this unit, and instruct them on how to correctly start, operate, and stop the unit in case of emergency.

Safety Rules

The manufacturer cannot anticipate every possible circumstance that might involve a hazard. The alerts in this manual, and on tags and decals affixed to the unit, are

not all inclusive. If using a procedure, work method, or operating technique that the manufacturer does not specifically recommend, verify that it is safe for others and does not render the equipment unsafe.

Throughout this publication, and on tags and decals affixed to the unit, DANGER, WARNING, CAUTION, and NOTE blocks are used to alert personnel to special instructions about a particular operation that may be hazardous if performed incorrectly or carelessly. Observe them carefully. Alert definitions are as follows:

DANGER

Indicates a hazardous situation which, if not avoided, will result in death or serious injury.

(000001)

WARNING

Indicates a hazardous situation which, if not avoided, could result in death or serious injury.

(000002)

CAUTION

Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

(000003)

NOTE: Notes contain additional information important to a procedure and will be found within the regular text of this manual.

These safety alerts cannot eliminate the hazards that they indicate. Common sense and strict compliance with the special instructions while performing the action or service are essential to preventing accidents.

How to Obtain Service

For assistance, contact the nearest Independent Authorized Service Dealer (IASD) or Generac Customer Service at 1-888-436-3722 (1-888-GENERAC), or visit www.generac.com.

When contacting Generac Customer Service about parts and service, always supply the complete model and serial number of the unit as given on its data decal located on the unit. Record the model and serial numbers in the spaces provided on the front cover of this manual.

General Hazards

⚠ DANGER

Loss of life. Property damage. Installation must always comply with applicable codes, standards, laws and regulations. Failure to do so will result in death or serious injury. (000190)



⚠ WARNING

Electrocution. Potentially lethal voltages are generated by this equipment. Render the equipment safe before attempting repairs or maintenance. Failure to do so could result in death or serious injury. (000187)

⚠ WARNING

Equipment damage. Only qualified service personnel may install, operate, and maintain this equipment. Failure to follow proper installation requirements could result in death, serious injury, and equipment or property damage. (000182a)

⚠ WARNING

Electric shock. Only a trained and licensed electrician should perform wiring and connections to unit. Failure to follow proper installation requirements could result in death, serious injury, and equipment or property damage. (000155a)

⚠ WARNING

Risk of injury. Do not operate or service this machine if not fully alert. Fatigue can impair the ability to operate or service this equipment and could result in death or serious injury. (000215a)



⚠ WARNING

Loss of life. This product is not intended to be used in a critical life support application. Failure to adhere to this warning could result in death or serious injury. (000209b)

⚠ CAUTION

Equipment damage. Connect only to REbus-compatible devices to the DC bus. Never connect to any other DC power source. Connecting to other DC power sources could result in equipment damage. (000598a)

- Connecting the PWRcell system to the electric utility grid must only be done after receiving prior approval from the utility company.
- Only competent, qualified personnel should install, operate, and service this equipment. Strictly comply to local, state, and national electrical and building codes. When using this equipment, comply with regulations established by the National Electrical Code (NEC), CSA Standard; the Occupational Safety and Health Administration (OSHA), or the local agency for workplace health and safety.
- Protection against lightning surges in accordance with local electric codes is the responsibility of the installer.

NOTE: Lightning damage is not covered by warranty.

- If working on energized equipment while standing on metal or concrete, place insulative mats over a dry wood platform. Work on this equipment only while standing on such insulative mats.
- Never work on this equipment while physically or mentally fatigued.
- Any voltage measurements should be performed with a meter that meets UL3111 safety standards, and meets or exceeds overvoltage class CAT III.

Electrical Hazards



⚠ DANGER

Electrocution. Never connect this unit to the electrical system of any building unless a licensed electrician has installed an approved transfer switch. Failure to do so will result in death or serious injury.

(000150)



⚠ DANGER

Electrocution. PWRcell Battery front cover should be removed by a qualified technician only. Removing the front cover could result in death, serious injury, equipment or property damage.

(000604)



⚠ DANGER

Electrocution. Do not wear jewelry while working on this equipment. Doing so will result in death or serious injury.

(000188)



⚠ DANGER

Electrocution. Water contact with a power source, if not avoided, will result in death or serious injury.

(000104)



⚠ DANGER

Electrocution. In the event of electrical accident, immediately shut power OFF. Use non-conductive implements to free victim from live conductor. Apply first aid and get medical help. Failure to do so will result in death or serious injury.

(000145)



⚠ DANGER

Electrocution. Turn battery disconnect OFF and de-energize REbus before touching terminals. Failure to do so will result in death, serious injury, equipment and property damage.

(000599)



⚠ DANGER

Electrocution. Turn utility supply OFF before working on utility connections of the transfer switch. Failure to do so will result in death or serious injury.

(000123)



⚠ DANGER

Electrocution. Verify electrical system is properly grounded before applying power. Failure to do so will result in death or serious injury.

(000152)



⚠ WARNING

Electrocution. Refer to local codes and standards for safety equipment required when working with a live electrical system. Failure to use required safety equipment could result in death or serious injury.

(000257)

⚠ CAUTION

Equipment damage. Exceeding rated voltage and current will damage the auxiliary contacts. Verify that voltage and current are within specification before energizing this equipment.

(000134a)

⚠ CAUTION

Equipment damage. Verify all conductors are tightened to the factory specified torque value. Failure to do so could result in damage to the switch base.

(000120)

Battery Hazards



⚠️ WARNING

Explosion. Do not dispose of batteries in a fire. Batteries are explosive. Electrolyte solution can cause burns and blindness. If electrolyte contacts skin or eyes, flush with water and seek immediate medical attention.

(000162)

⚠️ WARNING

Environmental Hazard. Always recycle batteries at an official recycling center in accordance with all local laws and regulations. Failure to do so could result in environmental damage, death, or serious injury.

(000228)

⚠️ CAUTION

Equipment damage. Use ONLY manufacturer approved battery modules. Using any other module could damage Generac PWRcell Battery and may void the warranty.

(000601)

⚠️ CAUTION

Ensure all battery modules installed in any single PWRcell Battery are the same type (EX or DCB). Connecting different battery types can result in equipment damage.

(000731a)

Always recycle batteries in accordance with local laws and regulations. Contact your local solid waste collection site or recycling facility to obtain information on local recycling processes. For more information on battery recycling, visit the Battery Council International website at: <http://batteryCouncil.org>.

Fire Hazards



⚠️ WARNING

Fire hazard. Never attempt to fight a fire yourself. Evacuate the building and contact emergency services. Inform dispatcher that lithium-ion batteries are in the building. Failure to do so could result in death, serious injury, or property or equipment damage.

(000603)



⚠️ WARNING

Fire and explosion. Installation must comply with all local, state, and national electrical building codes. Noncompliance could result in unsafe operation, equipment damage, death, or serious injury.

(000218)



⚠️ WARNING

Risk of Fire. Unit must be positioned in a manner that prevents combustible material accumulation underneath. Failure to do so could result in death or serious injury.

(000147)



⚠️ WARNING

Risk of fire. Do not crush, puncture, or subject battery units or modules to strong impacts. Failure to do so could result in death, serious injury, property damage, or equipment damage.

(000730)

General Rules

DANGER

Loss of life. Property damage. Installation must always comply with applicable codes, standards, laws and regulations. Failure to do so will result in death or serious injury. (000190)

WARNING

Loss of life. Only qualified personnel may install this battery. Installation of a PWRcell Battery by a homeowner is prohibited. Installation by unqualified personnel may result in death, serious injury, equipment or property damage. (000638a)

WARNING

Environmental Hazard. Always recycle batteries at an official recycling center in accordance with all local laws and regulations. Failure to do so could result in environmental damage, death, or serious injury. (000228)

- Follow all safety precautions in the owner's manual, installation guidelines manual, and other documents included with the equipment.
- Never energize a new system without opening all disconnects and breakers.
- Always consult local code for additional requirements for where unit is being installed.
- Incorrect installation can result in personal injury and damage to the unit. It may also result in the warranty being suspended or voided. All instructions listed below must be followed including location clearances and conduit sizes.

Before You Begin

- Contact your local utility provider for approval before installation. Install the battery in accordance with all utility installation requirements.
- Contact local inspector or city hall to be aware of all federal, state, and local codes which could impact installation. Secure all required permits before installing.
- Fully comply with all relevant NEC, NFPA, and OSHA standards, as well as all federal, state, and local building and electric codes. This unit must be installed in accordance with current NFPA and ICC standards, and any other federal, state, and local codes for minimum distances from other structures.

Standards Index



WARNING

Loss of life. This product is not intended to be used in a critical life support application. Failure to adhere to this warning could result in death or serious injury. (000209b)

Strictly comply with all applicable national, state, and local laws, as well as codes or regulations pertaining to the installation of the system. Use the most current version of applicable codes or standards relevant to local jurisdiction, equipment used, and installation site.

NOTE: Not all codes apply to all products and this list is not all-inclusive. In the absence of pertinent local laws and standards, the following publications may be used as a guide (these apply to localities which recognize NFPA and ICC).

1. National Fire Protection Association (NFPA) 70: The NATIONAL ELECTRIC CODE (NEC) *
2. NFPA 855: Standard for the Installation of Stationary Energy Storage Systems
3. NFPA 10: Standard for Portable Fire Extinguishers *
4. NFPA 70E: Standard For Electrical Safety In The Workplace *
5. NFPA 220: Standard on Types of Building Construction *
6. NFPA 5000: Building Code *
7. International Building Code **
8. International Fire Code
9. International Residential Code
10. Agricultural Wiring Handbook ***
11. Article X, NATIONAL BUILDING CODE
12. ASAE EP-364.2 Installation and Maintenance of Farm Standby Electric Power ****
13. NFPA 1 Fire Code

This list is not all-inclusive. Check with the Authority Having Local Jurisdiction (AHJ) for any local codes or standards which may be applicable to your jurisdiction. The above listed standards are available from the following Internet sources:

* www.nfpa.org

** www.iccsafe.org











*** www.nerc.org Rural Electricity Resource Council P.O. Box 309 Wilmington, OH 45177-0309

**** www.asabe.org American Society of Agricultural & Biological Engineers 2950 Niles Road, St. Joseph, MI 49085

Safety Precautions

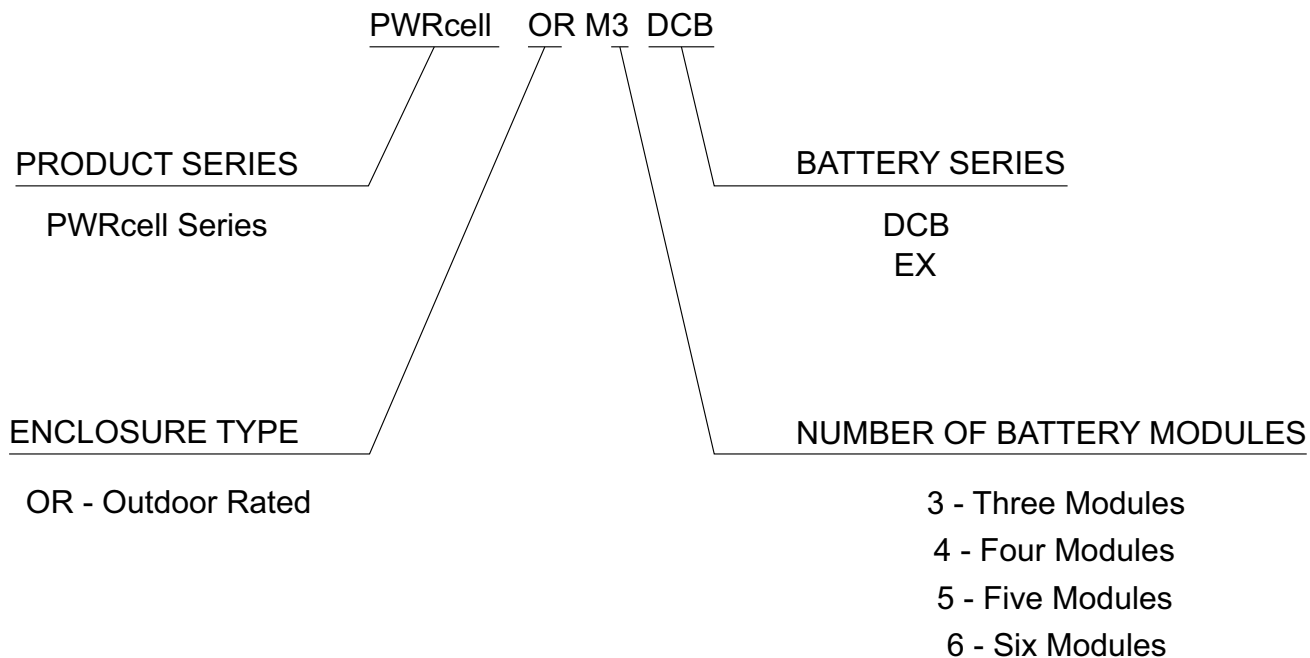
Symbols

Warning symbols are used to warn of the conditions that may cause severe injury or damage to equipment. The following table describes the warning symbols used in the equipment's markings and within this document.

	<p>This equipment contains high voltage which can cause electric shock resulting in severe injury.</p>
	<p>Ensure polarity of connections during assembly.</p>
	<p>Keep equipment away from open flame or ignition sources.</p>
	<p>Read the manual before installing and operating the equipment.</p>
	<p>The equipment is heavy enough to cause severe injury.</p>
	<p>The battery pack may leak corrosive electrolyte if damaged.</p>
	<p>The battery pack may explode if damaged.</p>
	<p>The equipment should not be disposed of in household waste.</p>
	<p>Physical injury or damage to equipment may occur if related requirements are not followed.</p>
	<p>Do not disassemble the equipment.</p>

Section 2: General Information

PWRcell Battery Naming Convention



012634

Specifications

CAUTION

Ensure all battery modules installed in any single PWRcell Battery are the same type (EX or DCB). Connecting different battery types can result in equipment damage.

(000731a)

Description	Units	PWRcell M3	PWRcell M4	PWRcell M5	PWRcell M6
Energy					
Usable Energy	kWh	9	12	15	18
Power					
Nominal Cont. Power*	kW	3.4	4.5	5.6	6.7
Max. AC Power**	kW	4.5	6	7.5	9
Nominal Cont. DC Current (Charge/Discharge)	A	11.6	15.5	19.4	23.3
Peak Motor Starting Current (2 sec)	A, RMS	25	33	42	50
Battery Modules					
Number	–	3	4	5	6
For DCB modules - DC Voltage (per module)	VDC	46.8 (39 – 52)			
For EX modules - DC Voltage (per module)	VDC	43.2 (36 – 49.8)			
Max Energy Output (per module)	kWh	3.0			
For DCB modules - Module Weight	lb (kg)	55 (25)			
For EX modules - Module Weight	lb (kg)	58 (26.3)			
REbus					
Communication Protocol	–	REbus DC nanogrid			
Voltage: Input/Output***	VDC	360 – 420			
Round-Trip Efficiency (DC to DC)	%	96.5			
Temperature					
Maximum Ambient Operating Temperature	°F (°C)	14 to 122 (-10 to 50)			
Optimal Ambient Operating Temperature	°F (°C)	41 to 104 (5 to 40)			
Installation Altitude					
Maximum Installation Altitude****	ft (m)	6,560 (2,000)			
Weight (without mounting brackets)					
Enclosure	lb (kg)	115 (52)			
Installed w/ DCB modules	lb (kg)	275 (125)	330 (150)	385 (174)	440 (199)
Installed w/ EX modules	lb (kg)	382 (173)	339 (154)	396 (179)	454 (206)
Compliance					
Safety	–	UL 9540, UL 1973, UL 1642, CSA 22.2 #107.1			
Seismic	–	IEEE693-High			
<p>*Average AC power over a complete discharge cycle. ** Peak performance, values provided for 104°F (40°C) *** 380 VDC Nominal ****Module warranty void if installed above limit. Note: Charge / Discharge rate may be reduced at temperature extremes. Specifications are subject to change without notice. Refer to the product specification sheet for complete list.</p>					

Battery Module Technical Data

Physical Characteristics	DCB Battery	EX Battery
Width	17.32 ± 0.08in (440 ± 2 mm)	
Length	17.72 ± 0.08in (450 ± 2 mm)	
Height	3.30 ± 0.08in (84 ± 2 mm)	3.46 ± 0.08in (88 ± 2 mm)
Weight	55.12 ± 0.1 lbs (25 ± 0.5 kg)	58.42 ± 0.1 lbs (26.5 ± 0.5 kg)
Electrical Characteristics	DCB Battery	EX Battery
Cell type	LiNiMnCo	
Usable Energy Capacity (Nominal)	3.0 kWh	
Usable Battery Capacity (Nominal)	64.1 Ah	69.4 Ah
Nominal Voltage	46.8 VDC	43.2 / 44.4 VDC**
Voltage Range	39 ~ 53.4VDC	33 ~ 50.4 VDC
Charge / Discharge Current (Nominal)*	12 A	27 A
Pulsed Charge / Discharge current (10 sec)*	24 A	40 A
DC Disconnect	Fuse	
Scalability (number of modules in series)	3 to 6	
Shelf life or maximum self-discharge rate	6 months maximum storage time	
BMS	DCB Battery	EX Battery
Monitoring parameters	System Voltage System Current Cell Voltage Cell temperature	
Communication	RS-485	
Operating Conditions	DCB Battery	EX Battery
Maximum Ambient Operating Temperature	14 to 122°F (-10 to 50°C)	
Optimal Ambient Operating Temperature	41 to 104°F (5 to 40°C)	
Storage Temperature	-4 to 104°F (-20 to 40°C)	-4 to 140°F (-20 to 60°C)
Altitude	Max. 6,560 ft (2,000 m)	
Cooling Strategy	Natural Convection	
Reliability & Certification	DCB Battery	EX Battery
Certificates	Cell: UL 1642	
	Battery Module: UL 1973	
Transportation	UN38.3	
Ingress Rating	IP20	
Emissions	FCC Part 15 Class B	
Environmental	Battery Directive 2013 / 56 / EU Reach	RoHS Directive 2011 / 65 / EU, Rechargeable Battery Recycling Act

* Values are listed for individual modules, refer to previous page for system-level performance values.

**EX Module G0080001 / Module G0080005.

Serial Number Location



Ensure all battery modules installed in any single PWRcell Battery are the same type (EX or DCB). Connecting different battery types can result in equipment damage.

(000731a)

Refer to **Figure 2-1** to locate serial numbers for the unit (A) and the individual battery modules (B). Record this information in **Table 1: Important Information** on the inside front cover of this manual so it is available if the tags are lost or damaged. When ordering parts or requesting assistance, you may be asked to provide this information.

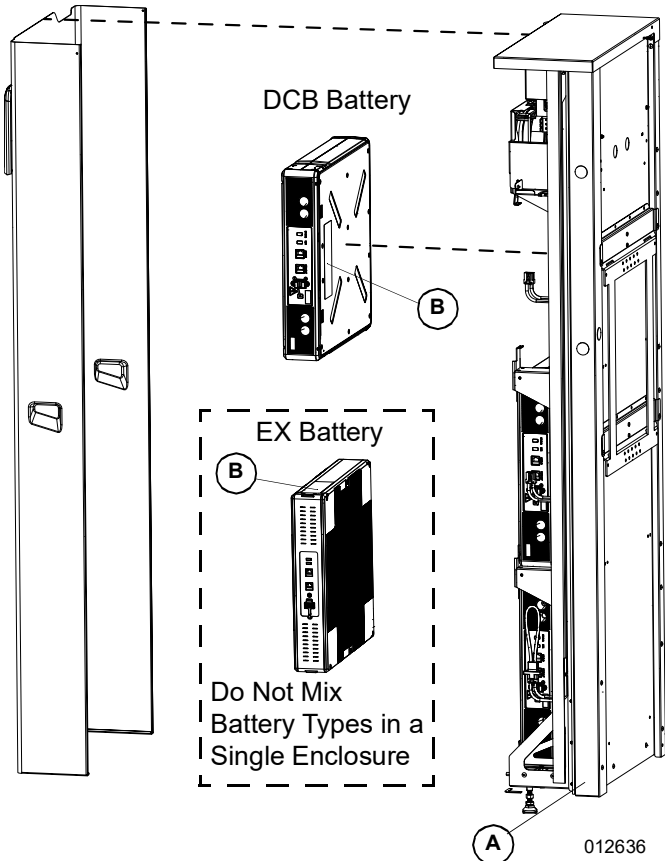


Figure 2-1. Serial Number Location

Unit Dimension

Indoor Installation Dimensions

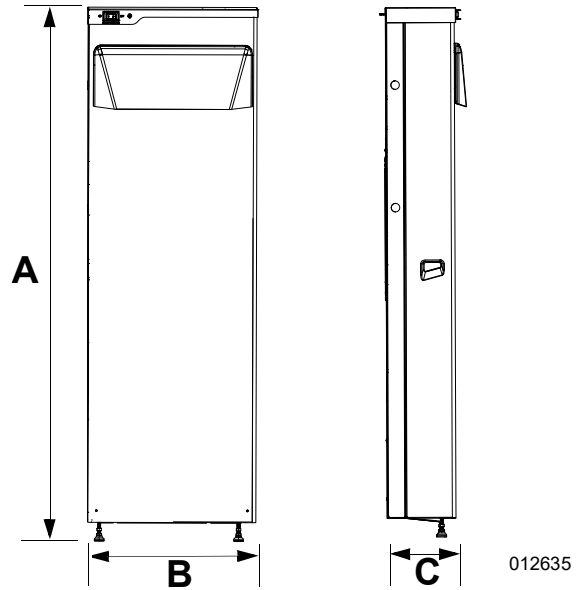


Figure 2-2. Unit Dimensions

A	68-3/8 in (1,737 mm)
B	22 in (558 mm)
C	9-7/8 in (251 mm)

Installation Dimensions with Foot Bracket Kit

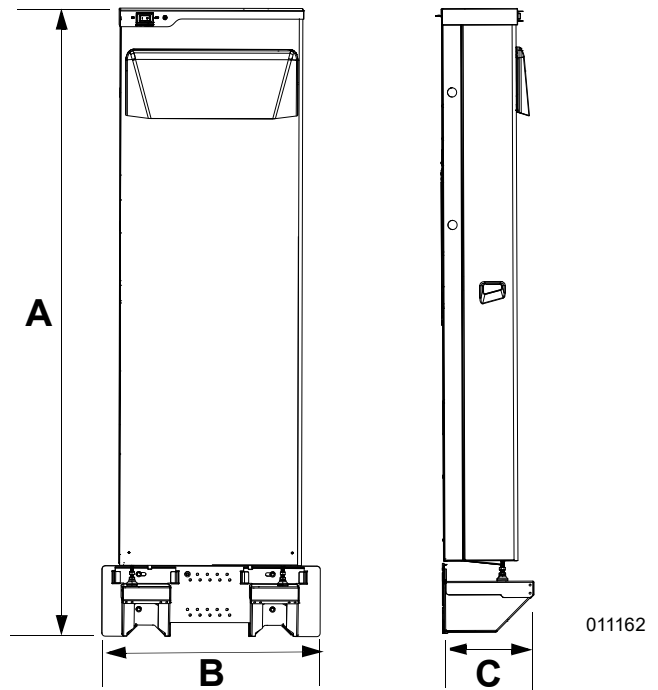


Figure 2-3. Unit Dimensions

A	73 3/16 in (1,859 mm)
B	26 1/8 in (663 mm)
C	11 in (279 mm)

About PWRcell Battery

The PWRcell Battery is the storage component of the PWRcell system. The battery can be used for grid-connected solar applications such as Self Supply, Rate Arbitrage, and Clean Backup Power. The battery is designed to work seamlessly with Generac PV Links and the PWRcell Inverter to form the PWRcell system for grid-tied solar-plus-storage.

All PWRcell products use the REbus 380 VDC nanogrid to connect to each other. The REbus nanogrid automates the flow of power to enable plug-and-play setup and operation of PWRcell equipment.

In [Figure 2-4](#), a REbus-compatible PWRcell Inverter (E)

is directly connected to PV Links (B) and PWRcell Battery (C) on DC (REbus) lines (D). To the right of the inverter are AC lines: 240 VAC or 208 VAC for grid and home loads, and essential load support. Load support varies by model and number of battery modules attached. Refer to [Specifications](#) for more information.

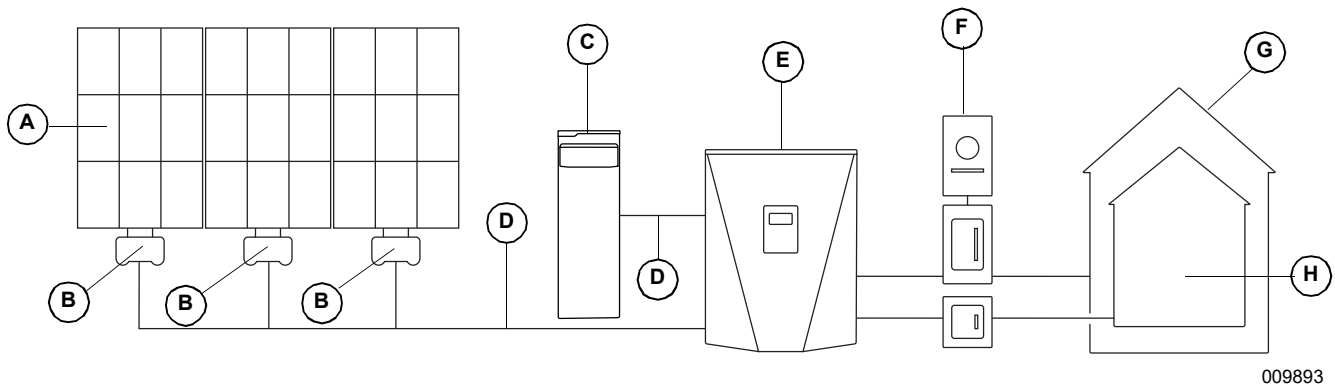


Figure 2-4. Generac PWRcell System Example.

- | | |
|-----------------------------|---------------------------|
| A Solar Panels | E PWRcell Inverter |
| B PV Link Optimizers | F Grid |
| C PWRcell Battery | G Loads |
| D REbus | H Protected Loads |

Component Locations

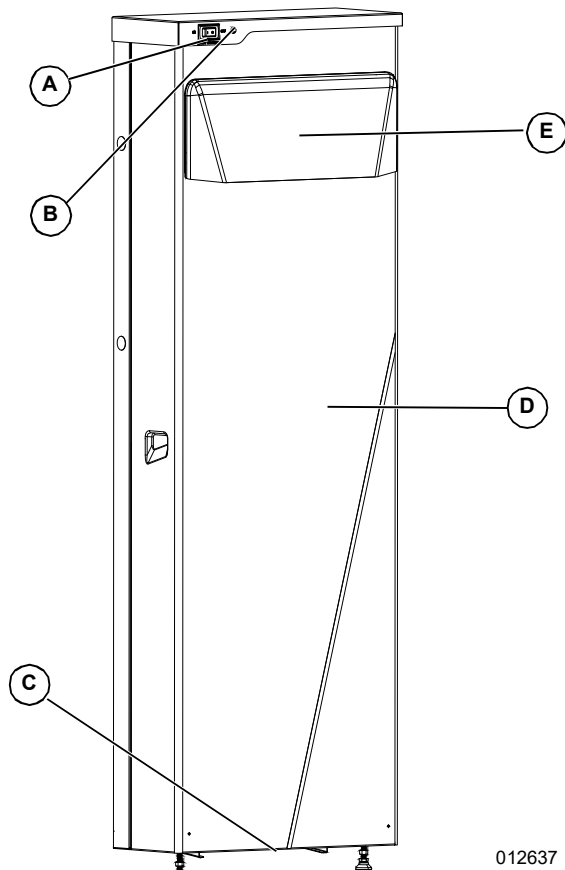


Figure 2-5. Component Locations

- A Battery Disconnect Switch
- B Battery Status LED
- C Intake Filter
- D Front Cover
- E Exhaust Vent

Battery Disconnect Switch



DANGER

Electrocution. Initiate a system-wide shutdown and turn the PWRcell DC Disconnect Switch OFF on all connected batteries before performing service. Failure to do so will result in death, serious injury, or equipment and property damage. (000600)

See [Figure 2-5](#). Battery Disconnect Switch (A) disconnects the battery stack from the battery monitoring system (BMS) electronics.

The Battery Disconnect Switch must be locked in the OFF position during installation. The switch bracket accepts a standard lockout / tagout lock.

NOTE: Turn Battery Disconnect Switch OFF and turn the REbus DC disconnect for the battery OFF at the inverter whenever the battery will be powered down and left inactive for an extended period of time.

Battery Status LED

See [Figure 2-5](#). The color and strobing interval of LED (B) communicates battery status.

Table 2-1. Battery Status LED

LED Color / Interval	Battery Status
Orange, solid	Disabled
Orange, strobe (2s)	Waiting
Green / Orange, alternating	Initializing
Green, solid	Charging
Green, rapid blinking (0.5s)	Discharging
Green, strobe (2s)	Standby
Red, rapid blinking (0.5s)	Error
Red, strobe (8s)	Sleeping

Section 3: Location and Compliance

Location and Clearances

The Generac PWRcell Battery may be located in suitable interior or exterior locations in accordance with these instructions and the locally adopted building and fire codes.

NOTE: The PWRcell Battery uses the surrounding ambient air for cooling purposes. Inadequate airflow can cause the PWRcell Battery to derate its power import and export for thermal management. If power derating is insufficient, due to an abnormally high ambient operating temperature, the battery will disconnect and enter a protective error state, requiring manual intervention to reconnect once temperatures cool. The PWRcell Battery does not require the installation and use of an external ventilation system.

NOTE: Consider year-round temperature extremes when choosing a location. In extreme climates, always install the battery in a conditioned space. Generac recommends installing the battery in a conditioned space regardless of climate.

NOTE: Do not expose the PWRcell Battery to extreme temperatures. See [Specifications](#) for recommended and acceptable operating temperatures. Operating the Generac PWRcell Battery outside of the recommended range may degrade performance.

Indoor Installation

- Attached garages separated from dwelling unit habitable spaces in accordance with locally adopted building code.
- Detached garages and accessory structures.
- Utility closets and storage or utility spaces.
- Basements.

When selecting an indoor installation site, consider the following:

- The PWRcell Battery is not permitted to be installed within the habitable space of a dwelling unit.
- Interconnected smoke detectors or heat detectors are to be provided in the residence in accordance with the locally adopted building and fire codes.
- The battery installation location must meet the working space requirements in NEC Article 110.26.
- Install only in clean, dry locations.
- If the room or space where the battery is to be installed is not finished or non-combustible, the wall and ceilings of the room or space are to be protected in accordance with the locally adopted building or fire codes.

- If installed in a garage or other location where the battery could be damaged by a vehicle, the battery must be protected by approved barriers that are installed in accordance with local building code.
- Do not allow bottom or front vents to become blocked.
- Multiple battery units must be separated by minimum 36 in (91.44 cm) between the units per NFPA 855.
- See [Table 3-1](#). Ensure minimum clearances are met.

NOTE: Refer to the local Building Code for permitted locations for commercial installations.

Table 3-1. Minimum Airspace Clearances

Indoor and Outdoor Installations		
Sides	2 in (5.08 cm)	Minimum 2 in (5.08 cm) on each side to operate cover.
Top	3 in (7.62 cm)	Minimum 3 in (7.62 cm) on top so installer can lift body onto mounting bracket.
Front	36 in (91.40 cm)	Minimum 36 in (91.40 cm) in front for maintenance / service in accordance with NEC Article 110.26.
Outdoor Installations Only		
Bottom	3 in (7.62 cm)	Minimum 3 in (76.62 mm) from grade (Use of the Lower Mounting Bracket Accessory required).

Outdoor Installation

When selecting a location, consider the following:

- Install in well-managed, protected locations only. When installed in a location where damage from vehicles, recreational vehicles or equipment, livestock, pedestrians, or other activity may occur, the battery must be protected by approved barriers in accordance with the locally adopted building or fire codes.
- This equipment is not suitable for installations outdoors in an extreme marine environment (docks, marinas, boats, and shipyards).
- Do not install where irrigation systems or other equipment will spray water onto the unit.
- Install only to flat, plumb (vertical) walls on sturdy, structurally sound buildings. Do not install on mobile homes or small, lightweight, temporary, or portable buildings that could be compromised by extreme weather conditions.
- Do not attempt to support the unit on soft, deformable surfaces or surfaces prone to move due to frost activity or subsidence.

- Do not install where leaves, snow, dirt, sand, or other debris may block the air intake at the base of the unit.
- Do not install where grass, vines, ivy, landscape plantings, or other vegetation may obscure access, block vents, or intrude into the unit.
- Do not install where excessive amounts of water from roof runoff, landscape irrigation, water sprinklers, or sump pump discharge could contact the enclosure.
- Do not install where water levels may rise and contact the unit.
- Do not install within 36 in (91.44 cm) of any door or window.
- The installation site must meet the outdoor working space requirements in NEC Article 110.26.
- The PWRcell Battery is not intended for use in mobile (RV) or portable applications.
- Multiple battery units must be separated by minimum 3 ft (91.44cm) between the units per NFPA 855.
- See [Table 3-1](#). Ensure minimum clearances are met.

Operating Temperature Range and Environmental Requirements

The PWRcell Battery can operate within the maximum ambient operating temperature range. For best performance, install the PWRcell Battery in an environment where ambient temperatures fall within the optimal operating temperature range. The PWRcell Battery will limit or halt charge / discharge power at extreme temperatures.

For hotter climates, install the battery out of direct sunlight. Exposure to temperatures above the optimal temperature range will impact battery performance.

For colder climates, install the battery in a conditioned space. Exposure to temperatures below the optimal ambient temperature range will impact battery performance.

Compliance

DANGER

Loss of life. Property damage. Installation must always comply with applicable codes, standards, laws and regulations. Failure to do so will result in death or serious injury. (000190)



WARNING

Electrocution. Refer to local codes and standards for safety equipment required when working with a live electrical system. Failure to use required safety equipment could result in death or serious injury. (000257)

WARNING

Equipment damage. Only qualified service personnel may install, operate, and maintain this equipment. Failure to follow proper installation requirements could result in death, serious injury, and equipment or property damage. (000182a)

Follow all instructions included in this manual and use appropriate practices for all product wiring and installation.

NOTE: It is the responsibility of the installer to ensure electrical worker safety, including conformance with lock-out/tagout procedures for servicing PWRcell equipment.

Section 4: Installing PWRcell Battery

Unboxing Battery Enclosure

1. Lay package on one of the long edges.
2. Remove top cardboard cap.
3. Remove Documentation and Hardware box and set aside in a safe place.
4. Remove cardboard sleeve.
5. Lay unit onto its back.
6. Remove bottom cardboard cap.
7. Remove the battery front cover by sliding cover toward the top of the unit, swinging cover bottom out, and pulling the cover down.
8. Set cover aside in a safe place.

NOTE: Do not adjust the feet at this time. The feet are shipped pre-positioned to ensure sufficient clearance for front cover.

Installing Battery Enclosure

⚠ WARNING

Personal injury. Use caution when handling heavy parts and battery modules. Lift heavy parts in teams if necessary. Failure to do so could result in death, serious injury, and equipment or property damage.

(000697)

⚠ WARNING

Personal injury. Install PWRcell Battery enclosure before installing battery modules within the enclosure. Failure to do so could result in death, serious injury, or equipment or property damage.

(000698b)

PWRcell Battery must be installed vertically using wall bracket provided. The PWRcell battery cannot be mounted horizontally. PWRcell Battery must also have its pre-installed adjustable feet supported from below. If installing the PWRcell Battery outdoors, the use of a Foot Bracket Accessory will be required.

Any installation where the battery will be elevated will require use of the Foot Bracket Accessory.

A to-scale installation template for critical mounting locations and requirements is located on the inside of the packaging.

See [Figure 4-8](#) for battery dimensions and knockout locations. See [Specifications](#) for unit weight.

Fastener Requirements

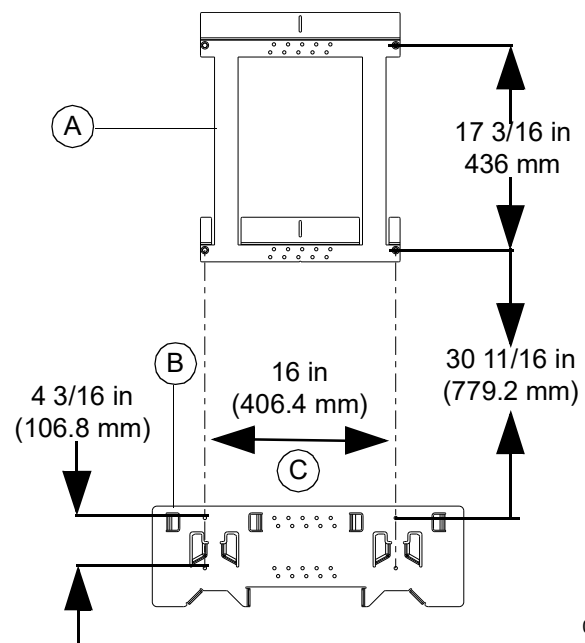
NOTE: The details below are minimum guidance. Consult local building codes and a licensed contractor to ensure the use of appropriate fasteners.

- Minimum 4 structural fasteners required for wall bracket, corrosion protected steel, diameter 1/4 in.

- Minimum 4 structural fasteners required for foot bracket. Use corrosion protected steel, diameter 1/4 in.
- Fastener head clearance 5/8 in tall, 7/8 in diameter.
- Use a flat washer between the fastener head and wall bracket if fastener is not a flanged head.
- All fasteners must be field supplied.
- Installer must ensure that fasteners selected are appropriately rated for this application.

Fastening Requirements

- All fasteners must engage 1 1/2 in (3.8 cm) with a structural member.
- If mounting into stud framing use a stud finder to locate the center of the stud.
- If mounting into stud framing, the bracket must be fastened to a minimum of two separate structural members.
- If mounting to a foundation or masonry, make sure fasteners are clear of any mortar joints.
- If stud is greater than 16 in (40.64 cm) on center, a cross brace must be used.
- If mounting on vinyl siding, unistruts must be used.
- Brackets must be level.
- Each horizontal brace requires a minimum of two fasteners.



011154

Figure 4-1. Foot Bracket and Wall Bracket Alignment

Installing Foot Bracket

NOTE: A template is included and will help locate the holes for both wall and foot brackets.

Mount foot bracket to wall with the following procedure:

- See [Figure 4-2](#). Install the foot bracket bottom edge to a minimum height of 3 in (7.62 cm) and a maximum height of 6 in (15.24 cm) to keep the Battery Disconnect Switch at a maximum height of 79 in (200.66 cm) above grade.
 - If greater height is desired, installation of an additional DC disconnect listed 30 A 600 V will be required for the battery to meet NEC 404.8(A).

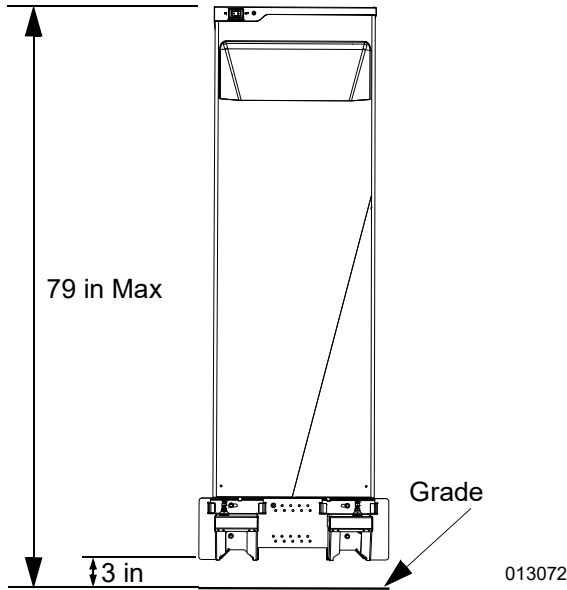


Figure 4-2. Foot Bracket Install Height

- See [Figure 4-3](#). Locate structural members to mount foot bracket (A). If structural members are greater than 16 in (40.64 cm) apart, install cross brace to ensure mounting to a solid structure.
- See [Figure 4-3](#). Install foot bracket (A) using lower holes with fasteners and washers (B) making sure bracket remains plumb and level.

NOTE: Do not install the top fasteners at this stage. This will inhibit installation of the stands.

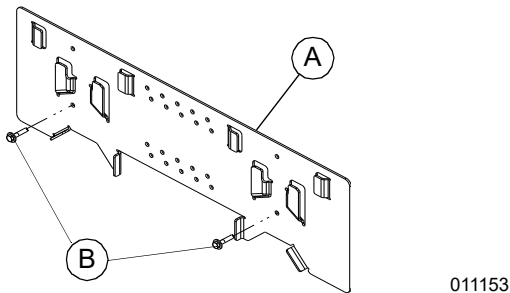


Figure 4-3. Install Foot Bracket

- See [Figure 4-4](#). Slide foot stands (C) onto foot bracket (A) making sure underside of pockets clear bottom bracket before engagement. Proper installa-

tion is achieved by lining up the top edge of foot bracket to the bottom edge of the stands.

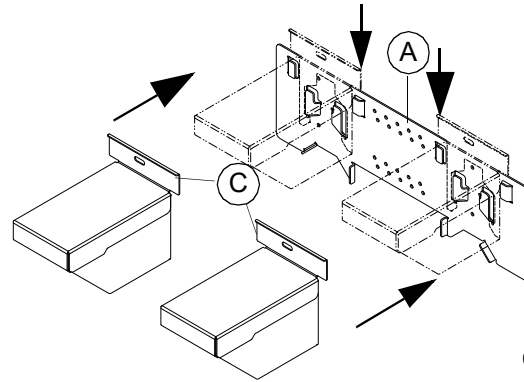


Figure 4-4. Insert Stands Onto Foot Bracket

- See [Figure 4-5](#). Use flat washers and fasteners (D) to secure top of foot bracket and stands.

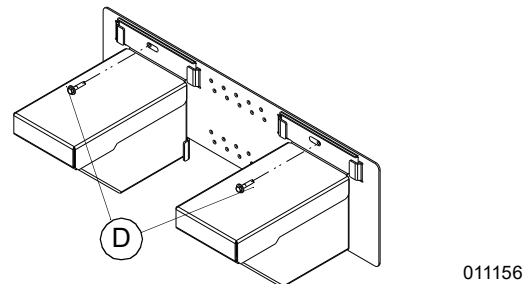


Figure 4-5. Install Top Fasteners Through Stands and Foot Bracket

Installing Wall Bracket

NOTE: Included with PWRcell Battery.

- See [Figure 4-6](#). Bottom edge (A) is 29-5/8 in (752 mm) off the floor for installations that are not elevated. See the following procedure for elevated installation.

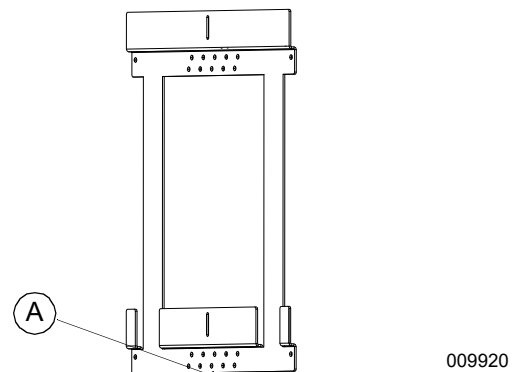
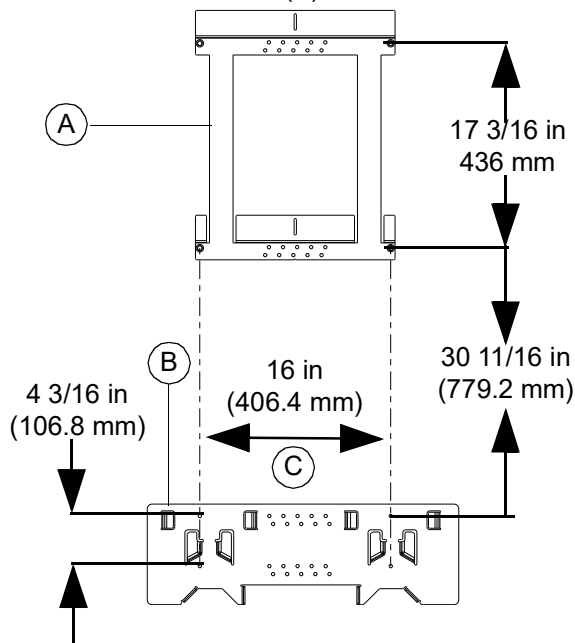


Figure 4-6. Wall Bracket

Mount Wall Bracket to wall with the following procedure:

- See [Figure 4-7](#). Project a vertical line up from the top mounting fastener in the foot bracket (B).
- Place a mark on the projected line 30 11/16 in (779.2 mm) above the top mounting fastener of the foot bracket (B).

3. Insert first fastener in the lower hole of the wall bracket (A) at the mark placed in step 2, leaving it partially loose until bracket is in alignment and plumb.
4. Level wall bracket (A) and double check alignment. Double check measurement of $30 \frac{11}{16}$ in (779.2 mm) is the same for the other lower mounting fastener in wall bracket (A). Make sure opposite wall bracket (A) fastener is in alignment for 16 in (40.64 cm) on center studs.
5. Install and tighten both lower wall bracket mounts.
6. Double check wall bracket (A) fasteners are in alignment with foot bracket (B) fasteners and wall bracket (A) is still plumb.
7. Install a minimum of two fasteners in the top holes of the wall bracket (A).



011154

Figure 4-7. Foot Bracket and Wall Bracket Alignment

Battery Knockout Locations

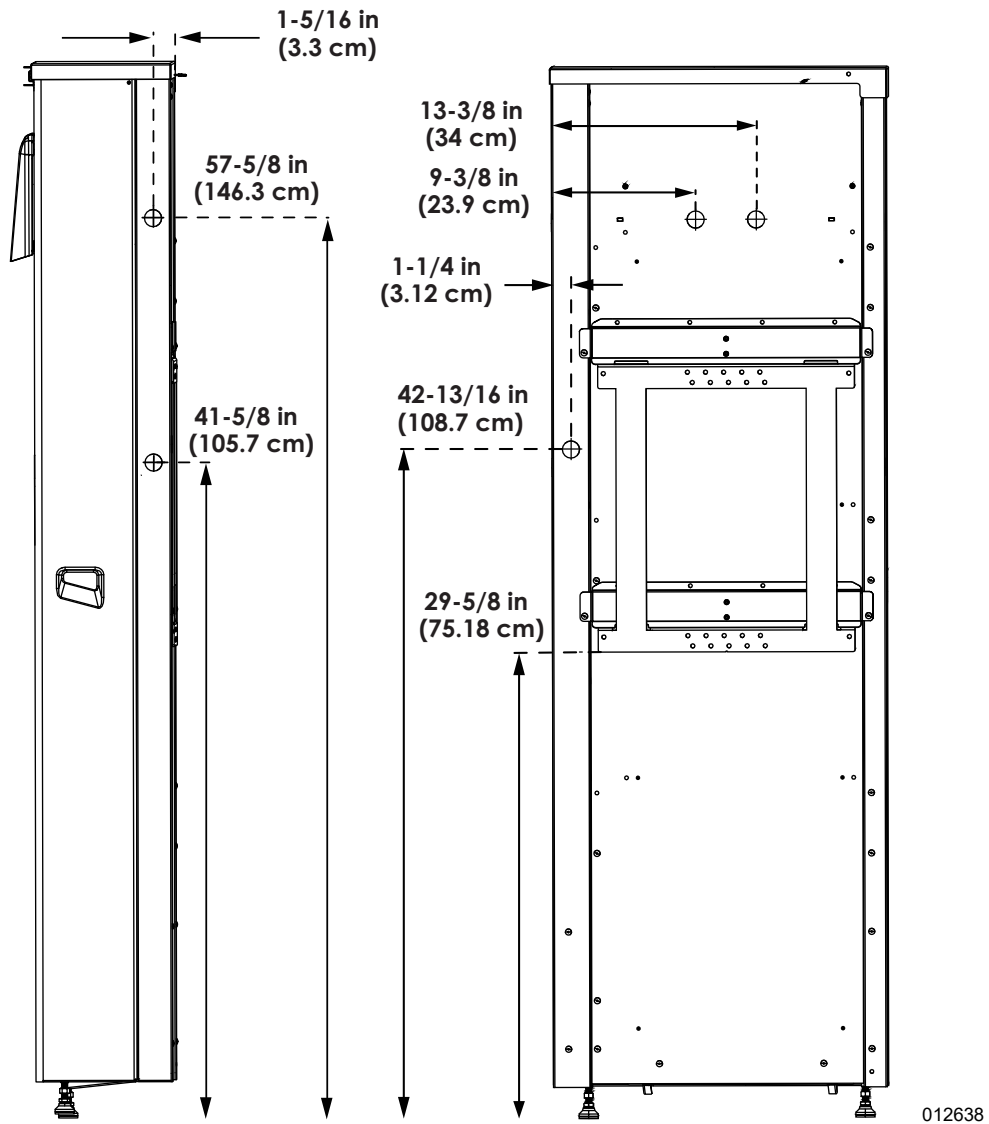


Figure 4-8. Battery Knockout Locations

Placing Chassis onto Bracket and Leveling Feet

1. See **Figure 4-9**. Lift body (A) onto bracket (B). Keep body tight to the wall while lowering body onto bracket. Verify bracket tabs (C) hook into body pockets (D).

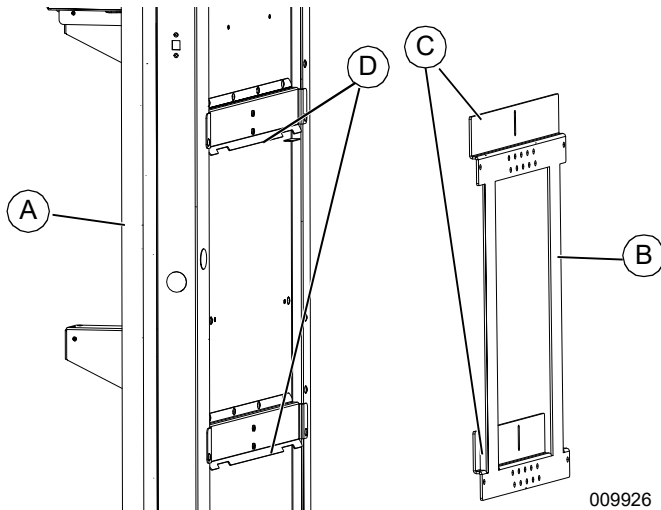


Figure 4-9. Mounting Bracket (1 of 2)

2. See **Figure 4-10**. Align body slots (E) with wall bracket holes (F).

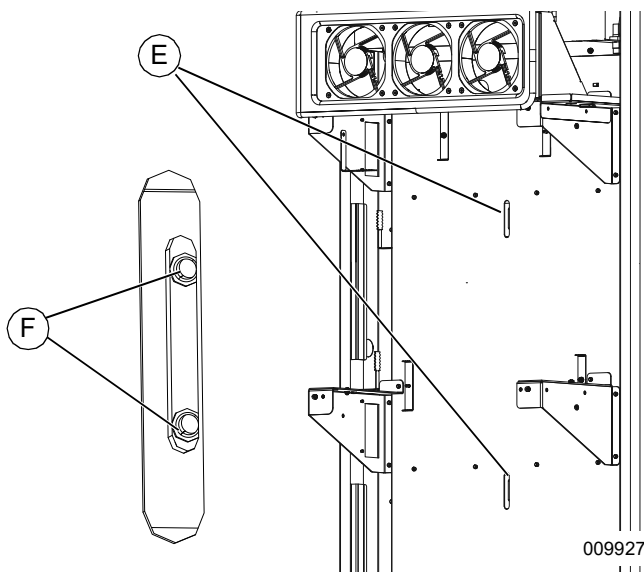


Figure 4-10. Mounting Bracket (2 of 2)

3. Fasten body to bracket with two included M4x8mm SEMS screws in each horizontal bracket brace.

NOTE: Start screws. Do not tighten.

4. Adjust feet as necessary to ensure the feet are carrying the weight of the unit.
5. Check unit for plumb side to side. Adjust feet as necessary ensure both stay in full contact with the floor.

IMPORTANT NOTE: Do not lift the body off the bracket by over lengthening the feet.

6. Verify there is minimum 1-3/4 in (4.45 cm) gap between the bottom of the body and the floor.
7. Tighten machine screws to bracket and torque to 13 in-lb (1.47 Nm).
8. Verify feet have not lifted from floor.
9. Tighten feet jam nuts to lock them in place.

Installing REbus Wiring



⚠ DANGER

Electrocution. Put the Generac PWRcell Inverter into Safety Shutdown before installing wiring. If there are any other batteries connected to REbus, toggle their front Battery Disconnect switches to OFF. Failure to do so will result in death or serious injury. (000606)

⚠ CAUTION

Equipment damage. Never connect REbus conductors to ground. Connecting REbus conductors to ground could result in equipment or property damage. (000607a)

⚠ CAUTION

Equipment damage. Connect only to REbus-compatible devices to the DC bus. Never connect to any other DC power source. Connecting to other DC power sources could result in equipment damage. (000598a)

When installing REbus wiring:

- Wiring must be installed in accordance with Article 706 in the NEC.
- Wiring must comply with local electrical codes.
- Wiring must be grounded according to local codes. When required, grounding is the responsibility of the installer. For proper REbus communication, ensure the chassis is securely bonded to the PWRcell Inverter via the grounding bar in the PWRcell Inverter wiring compartment.
- Wiring must be protected from exposed metal edges by using appropriate bushings, fittings, and restraints.
- Watertight conduit fittings are required for OR model.
- Wiring must adhere to the following specifications:

Table 4-1. Wiring Specifications

Specification	Min	Max	Units
Allowable wire size	10	6	AWG
Torque	13.3 (1.5)	15.9 (1.8)	lb-in (N-m)
Strip length	3/8 (10)		in (mm)
Temperature rating	90		C

To install REbus wiring:

1. See **Figure 4-11**. Install REbus conductors to their terminal blocks: RE+ to red (B), RE- to black (A).
2. Install equipment grounding conductor to green terminal block (C).
3. If required, route field wiring conductors through the grommet wiring chase baffle (D).

NOTE: Do not route wires around the baffle.

4. At the PWRcell Inverter, install RE+ and RE- conductors to any unused 30 A REbus DC disconnect.
5. Secure equipment grounding conductor to the PWRcell Inverter ground bar.

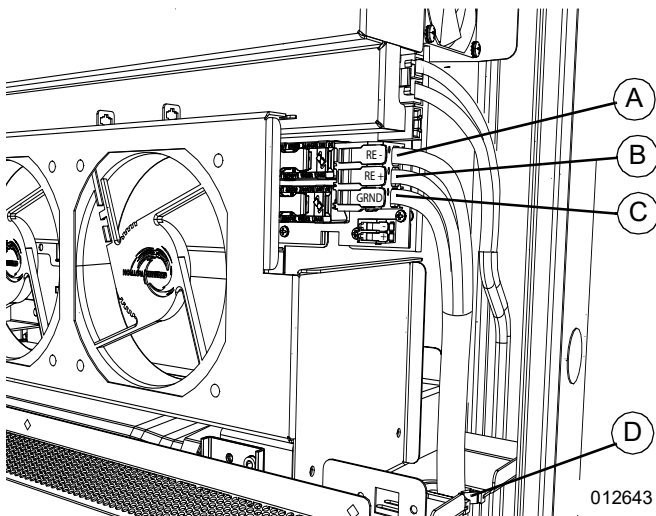


Figure 4-11. REbus Wiring

Note on DC Wiring and the NEC

Some electricians or installers may be unfamiliar with DC wiring in a residential setting. Note the following:

- NEC 215.12(C)(2) for correct DC wiring coloring.
- NEC 210.5(C)(2) for identification of DC conductors carrying more than 50 V.

Always adhere to applicable codes when marking and installing DC conductors.

See **Table 4-2**. For all REbus DC wiring observe the following coloring convention:

Table 4-2. REbus DC Wiring Coloring Convention

Wire	Color
REbus + (RE+)	Red
REbus - (RE-)	Black
Ground (GND)	Green

NOTE: Mark or flag all conductors as appropriate.

Remote Shutdown Switch Connections

NOTE: See **Figure 4-12**. The STOP terminals ship with a 14 AWG jumper (A) installed. Remove this jumper before installing an external shutdown switch.

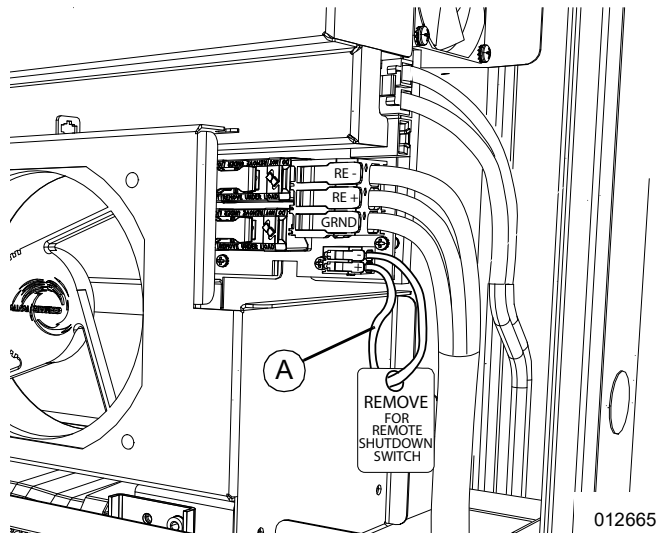


Figure 4-12. Remove Jumper

See **Figure 4-13**. Connect the wiring (B) to the external shutdown switch (field supplied) to battery STOP terminals. The STOP Terminals accept 20 to 12 AWG, solid or stranded wire. As shown, 14 AWG THWN (600 V) wiring can be used and run in the same conduit as the REbus wires.

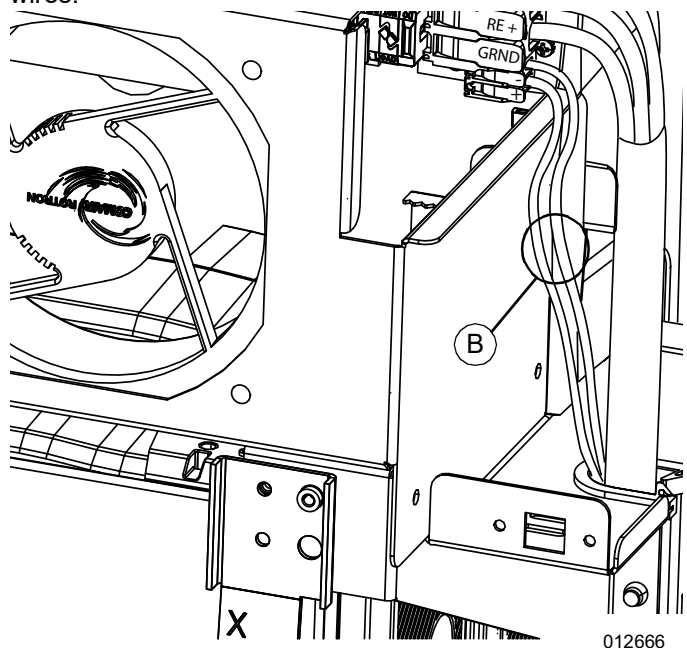


Figure 4-13. Connect To Remote Shutdown Switch

NOTE: Select a code compliant switch rated for STOP circuit voltage of 12 VDC minimum and current greater than or equal to 1 A. Switch must be listed and meet the requirements of Article 404 of NFPA 70. A suitable choice is Leviton 12021-21 Single-Pole Toggle Switch, 3 A, 24 V AC/DC.

- When the switch is in the OPEN or OFF position the remote shutdown will be activated. Switching to the CLOSED or ON position deactivates the remote shutdown.
- Installation of an external STOP switch does not disable the Battery Disconnect Switch mounted on the top of the battery front panel. Opening the Battery Disconnect Switch will cause the battery management unit (BMU) to open its contactors and isolate the battery stack from REbus, where REbus will still have voltage if the inverter is enabled. Opening the battery's STOP circuit with an external switch, however, will open the battery's contactors and initiate a system shutdown. Once a shutdown has been initiated, the inverter control panel must be used to exit the shutdown and return the system to normal functionality. The system cannot exit shutdown mode until the remote shutdown switch has been returned to the closed position.
- For PWRcell systems with multiple remote shutdown STOP circuits (multiple PWRcell devices) several configurations can be used.
 1. An isolated multi-pole, single-throw NC switch or button. Have the number of poles correspond with the number of STOP device inputs to be connected. Run a separate wire pair from each pole of the switch to the STOP inputs of each device. Polarity does not matter in this case.
 2. See [Figure 4-14](#). The STOP terminals and remote shutdown switch can be wired in one series circuit. In this case polarity matters. Wire the "STOP+" of first device to "STOP-" of second device. Then wire the two remaining "STOP" terminals to the remote shutdown switch.

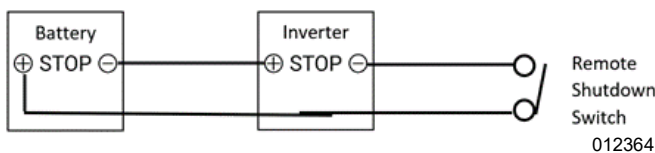


Figure 4-14. Remote Shutdown Switch Series Wiring

3. See [Figure 4-15](#). The STOP terminals and remote shutdown switch can be wired in parallel. In this case polarity matters. Wire the "STOP+" of first device to "STOP+" of second device. Wire the "STOP-" of first device to "STOP-" of second device. From either device, run a wire pair from the STOP terminals to the remote shutdown switch.

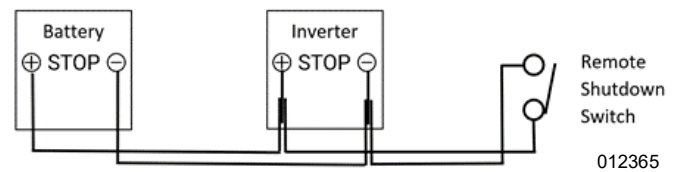


Figure 4-15. Remote Shutdown Switch Parallel Wiring

IMPORTANT NOTE: If polarity is wired incorrectly, neither device will see a STOP condition and it will not be possible to shutdown either device via the STOP terminals until the wiring is corrected.

NOTE: Test the remote shutdown switch operation after installation. Enable all PWRcell devices connected to the remote shutdown switch. Initiate a remote shutdown by opening the remote shutdown switch. Verify the system has shutdown. After verification, disengage the remote shutdown by closing remote shutdown switch.

NOTE: Local codes may require special labeling, indicators, or other features. Requirements can vary by region, so consult a local code enforcement officer for guidance.

Connecting Blackstart Battery

See [Figure 4-16](#). Connect blackstart battery lead to positive battery terminal (E).

NOTE: The negative lead is already connected to terminal (F).

NOTE: Do not leave blackstart battery connected if PWRcell Battery is not connected to REbus. Blackstart battery will enter a sleep mode and discharge to support the unit.

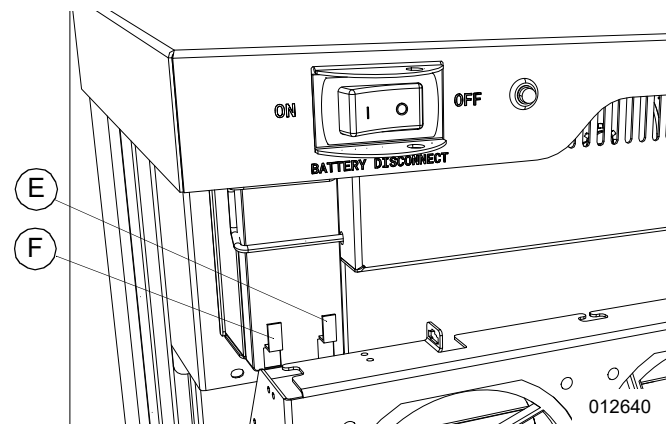


Figure 4-16. Blackstart Battery Connections

Module Dimensions

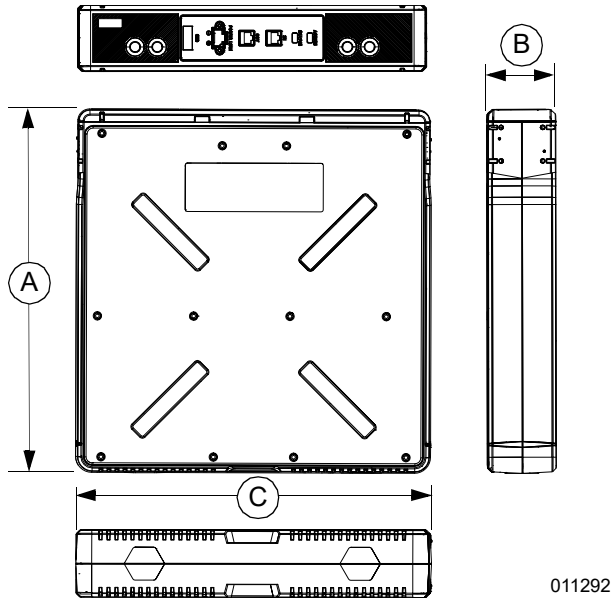


Figure 4-17. DCB Module Outline Dimensions

A	17.72 ± 0.08 in (450 mm ± 2)
B	3.31 ± 0.08 in (84 mm ± 2)
C	17.32 ± 0.08 in (440 mm ± 2)

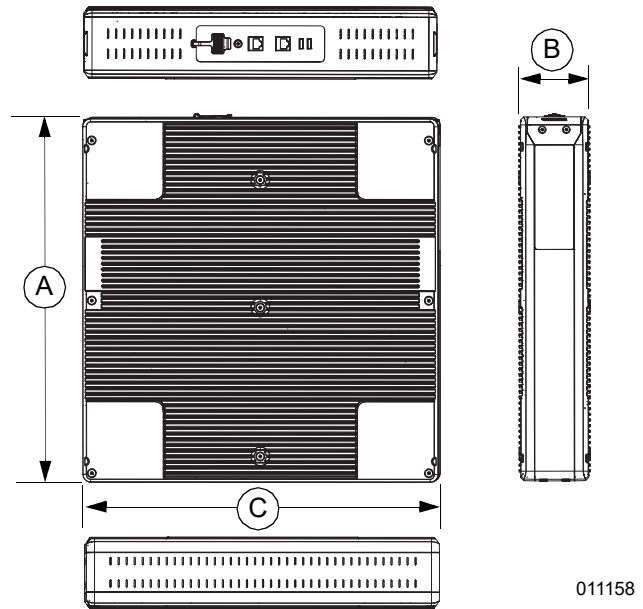


Figure 4-18. EX Module Outline Dimensions

A	17.72 ± 0.08 in (450 mm ± 2)
B	3.46 ± 0.08 in (88 mm ± 2)
C	17.32 ± 0.08 in (440 mm ± 2)

Installing Battery Modules

CAUTION

Ensure all battery modules installed in any single PWRcell Battery are the same type (EX or DCB). Connecting different battery types can result in equipment damage.

(000731a)

- Record battery module serial numbers prior to installation in **Table 1: Important Information** located in the inside front cover of this manual.
- When installing battery modules, install top rear module first, regardless of configuration.
- See **Figure 4-19** for the order of battery module and spacer installation for PWRcell M3 (B), PWRcell M4 (C), PWRcell M5 (D), and PWRcell M6 (E).

NOTE: Module spacers (F) are required on PWRcell M3 (B) and M5 (D) configurations.

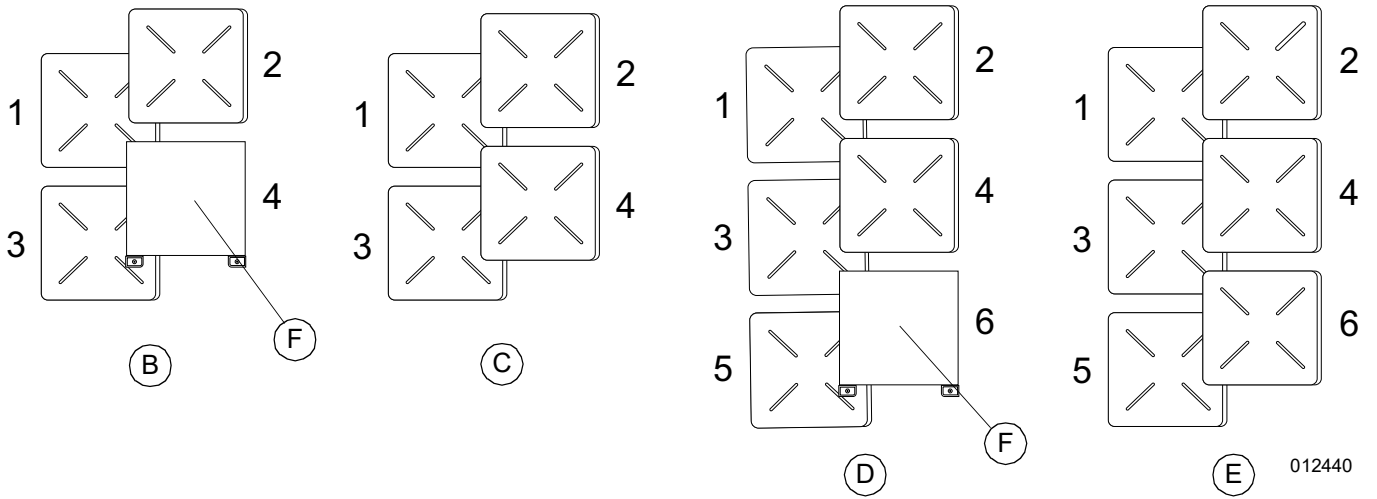


Figure 4-19. Battery Module / Spacer Order of Installation

Installing Rear Modules

1. See [Figure 4-20](#). Angle top of battery module (G) under and behind bracket lip (H).

IMPORTANT NOTE: Battery module ports (I) must face the right side of the PWRcell Battery body with the COM ports above the power port.

2. Slide bottom of module to back of PWRcell Battery chassis (J).
3. Push bottom of module against grounding clips (K).

NOTE: Grounding clips are designed to contact and bite into the battery module case to provide an equipment grounding connection.

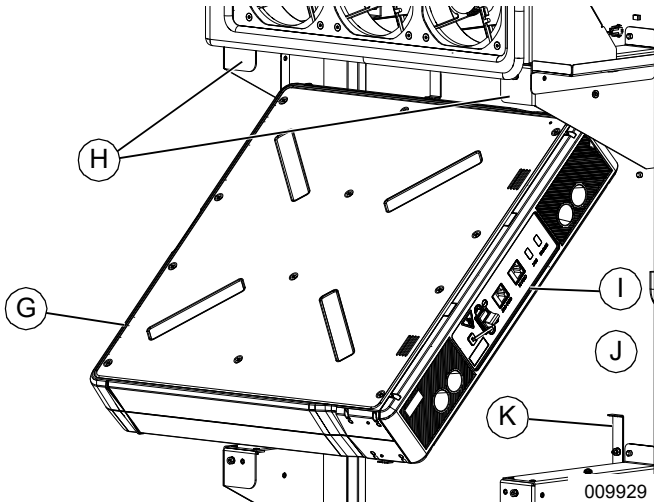


Figure 4-20. Installing Rear Battery Modules

Installing Grounding Tabs

1. See [Figure 4-21](#). Install two L-shaped grounding tabs (L) at the bottom of the module on both sides.
2. Fasten each grounding tab with a M4x8 mm SEMS screw (M) torque to 13 in-lb (1.47 Nm).

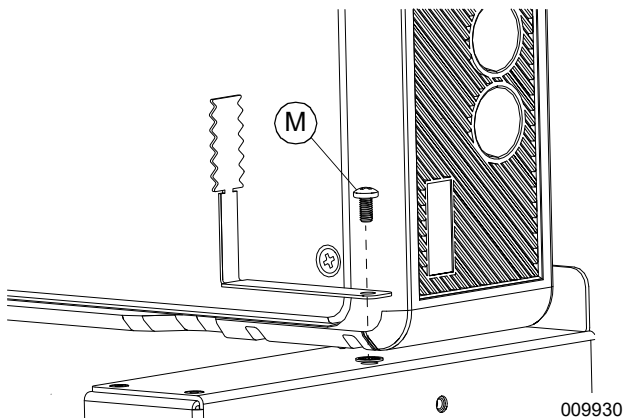


Figure 4-21. Installing Bottom Grounding Tabs

3. See [Figure 4-22](#). Install grounding tabs (L) at the top of the module on both sides.
4. Fasten each grounding tab with a M4x8 mm SEMS screw (M) and torque to 13 in-lb (1.47 Nm).

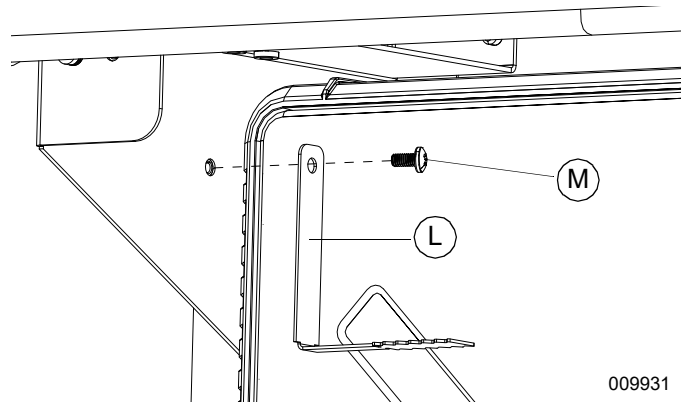


Figure 4-22. Installing Top Grounding Tabs

Installing Front Modules

See [Figure 4-23](#). Install front battery modules (N) using the same procedure as used on the rear modules. See [Figure 4-19. Battery Module / Spacer Order of Installation](#).

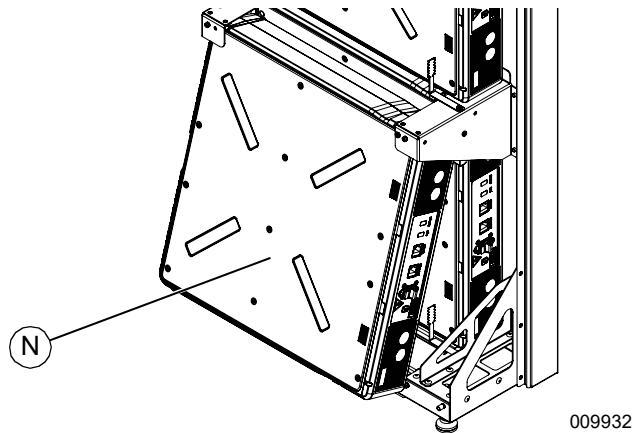
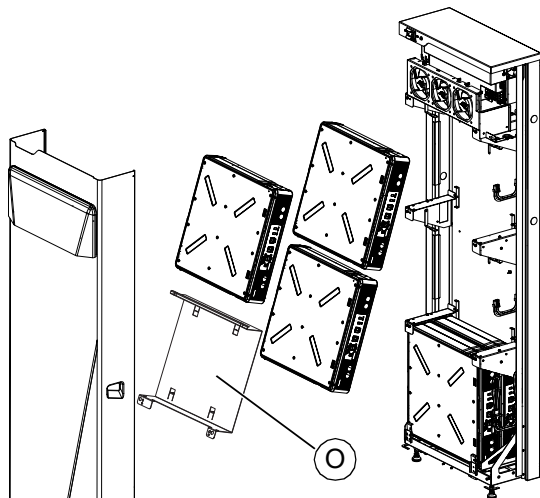


Figure 4-23. Installing Front Battery Modules

Installing Module Spacer (PWRcell M3 and PWRcell M5 only)

See [Figure 4-24](#). Module spacers (O) must be installed on any single module shelf.



012641

Figure 4-24. Module Spacer

PWRcell Battery modules and upgrade kits can be obtained by contacting Generac Customer Service at 1-888-436-3722 (1-888-GENERAC), or www.generac.com.

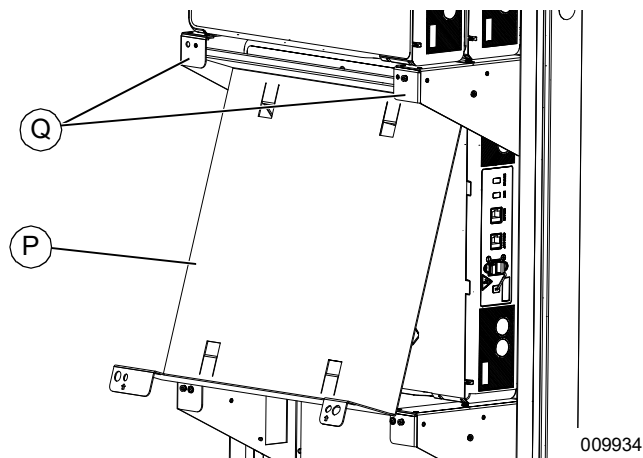
NOTE: Kits must be installed by a qualified individual.

Table 5 – Module Spacer Kit

Module Spacer Kit	Part Number
Generac PWRcell Spacer Kit	APKE00008

To install module spacer:

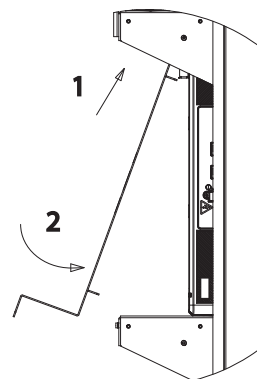
1. See **Figure 4-25**. Angle top of spacer (P) under and behind bracket lip (Q).



009934

Figure 4-25. Installing Module Spacer (1 of 3)

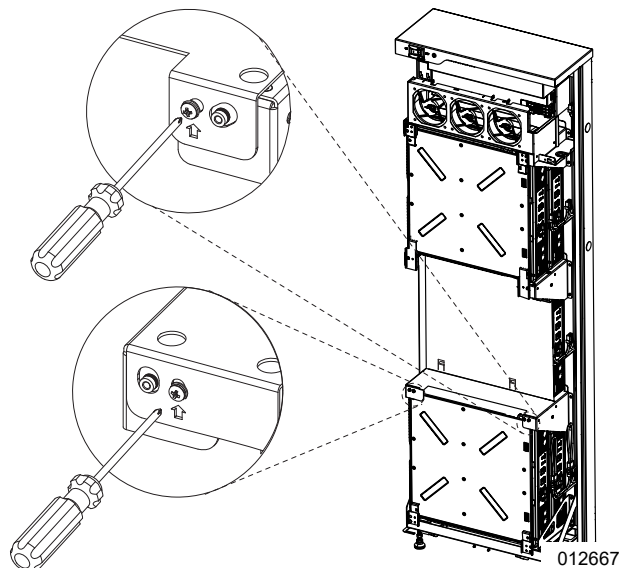
2. See **Figure 4-26**. Slide spacer up between brackets.
3. Push bottom of spacer in.



009935

Figure 4-26. Installing Module Spacer (2 of 3)

4. See **Figure 4-27**. Secure spacer with two M4X8 SEMS screws and torque to 13 in-lb (1.47 Nm).

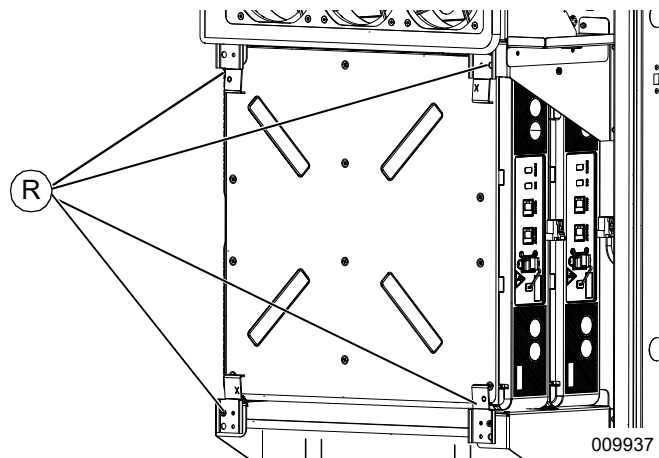


012667

Figure 4-27. Installing Module Spacer (3 of 3)

Installing Retention Clips

See **Figure 4-28**. All front battery modules must be secured with retention clips (R).



009937

Figure 4-28. Retention Clips (1 of 3)

See **Figure 4-29**. Note that there are three types of retainer clips: double retention clips (U), single retention clips marked O (T) and single retention clips marked X (S).

- Install single retention clips (T) (S) at the top and bottom of the stack.
- Install double retention clips (U) between rows of modules.

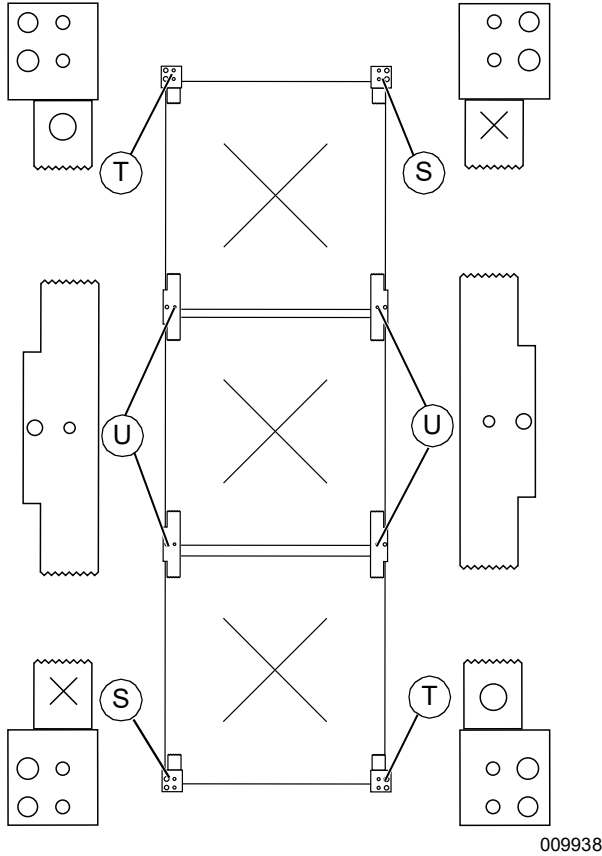


Figure 4-29. Installing Retention Clips (2 of 3)

To install retention clips:

1. See **Figure 4-30**. Align holes in retention clip (V) with stud (W) and mounting hole (X).

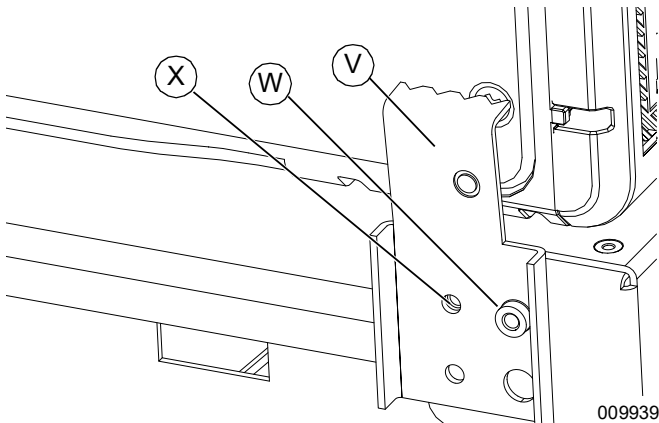


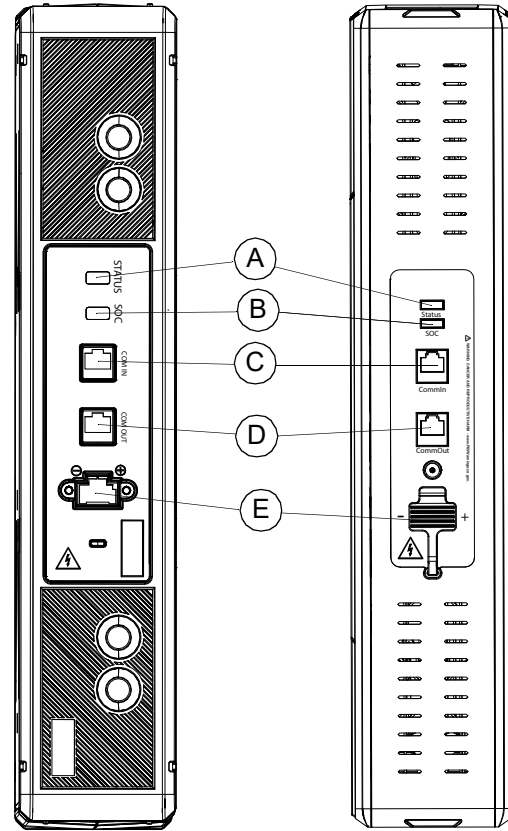
Figure 4-30. Retention Clips (3 of 3)

2. Apply gentle pressure to ensure all grounding tabs and clips make firm contact with case.

3. Secure retention clip to bracket with a M4X8 mm screw and torque to 13 in-lb (1.47 Nm).

Connecting COM Cables

See **Figure 4-31** for a description of the module connections and indicator lights.



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Figure 4-31. DCB (left) and EX Module (right) Connections

A	Status LED
B	SoC LED
C	CommIn Port
D	CommOut Port
E	Battery Connection Power Port

1. See **Figure 4-32**. Locate multicolored CAT 5 cables attached to battery power cable harness on body (Y) and top, rear battery module (Z).
2. Connect Gray CAT 5 cable to battery module COM IN (A)
3. Connect Black CAT 5 jumper to battery module COM OUT (B).

NOTE: Black CAT 5 jumper is found in hardware kit.

4. Connect the other end of Black CAT 5 jumper to COM IN port (D) on front battery module (C).

5. Connect Blue CAT 5 cable to COM OUT port (E).
6. Connect the other end of Blue CAT 5 cable to COM IN port (G) on lower, rear battery module (F).

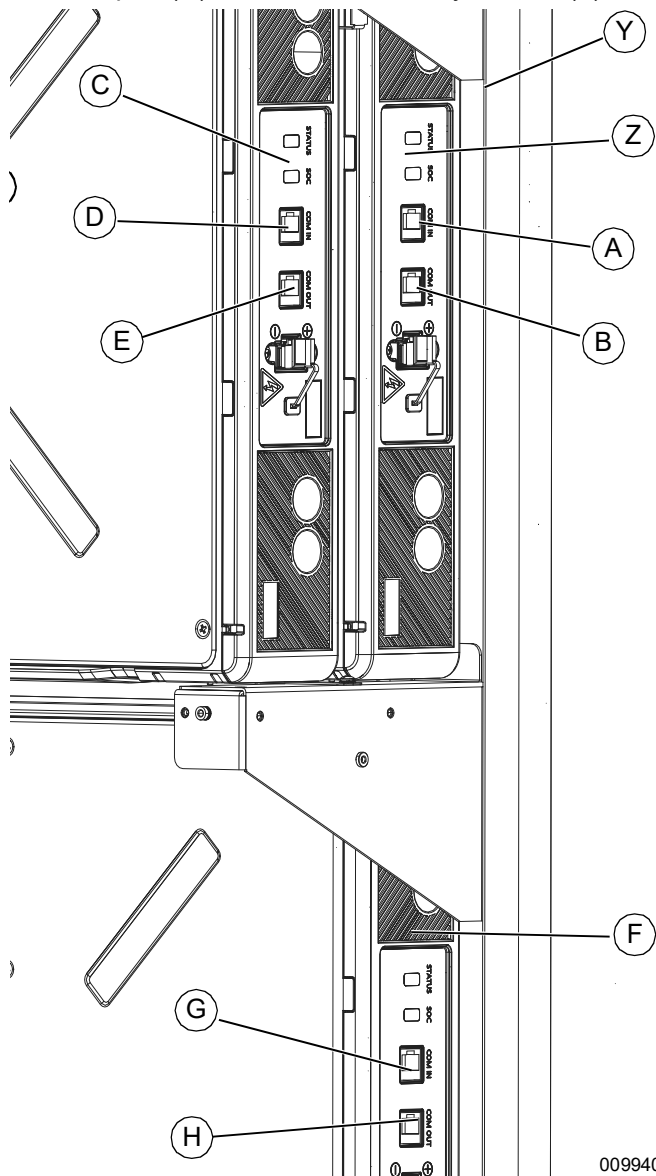


Figure 4-32. Module COM Cabling (1 of 2)

7. See **Figure 4-33**. Continue connecting the remaining battery modules. While installing CAT 5 cables:
 - Work from top to bottom.
 - Connect battery modules sharing a shelf with a black jumper cable (L) going from the rear battery COM OUT port to the front battery COM IN port.
 - Do not install a CAT 5 cable to the last battery module's COM OUT port (M).
 - Remaining COM cables can be left disconnected.
 - Unused CAT 5 jumpers should be kept in safe place for future module upgrades.

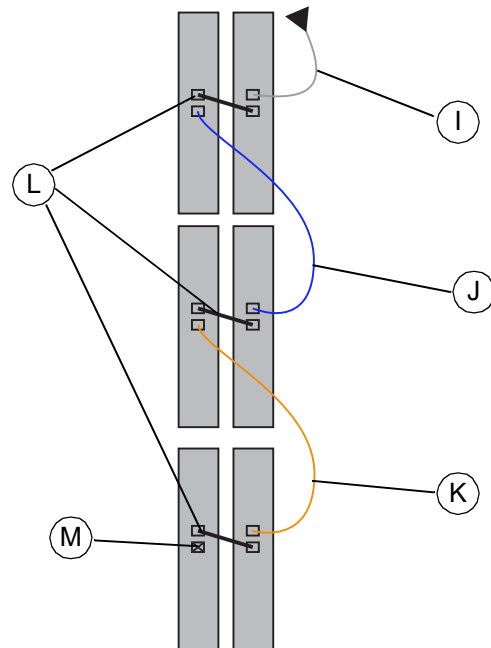


Figure 4-33. Module COM Cabling (2 of 2)

- I Gray CAT 5
- J Blue CAT 5
- K Orange CAT 5
- L Black CAT 5 Jumpers

Connecting Battery Power Cables



⚠ DANGER

Electrocution. Never reach into port or touch battery terminals with hands or tools. Doing so will result in death, serious injury, equipment or property damage.

(000639)

1. See **Figure 4-34**. Remove gray rubber cap (A) from each module power port.
2. Plug black power cable connectors into battery module power ports (B).

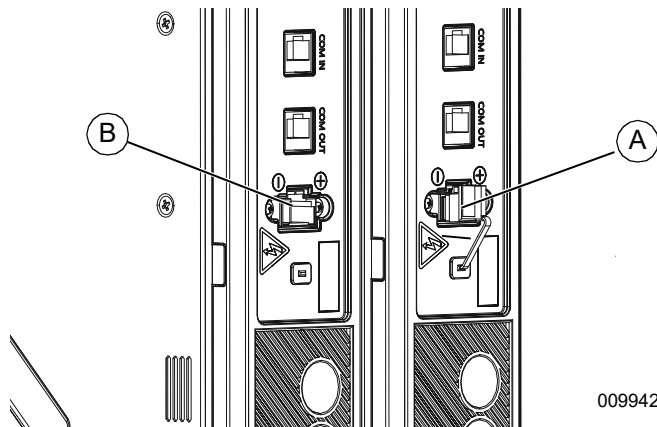


Figure 4-34. Power Cable Ports

- See [Figure 4-35](#). Install loop jumper (C) on every unused power cord connector (D).

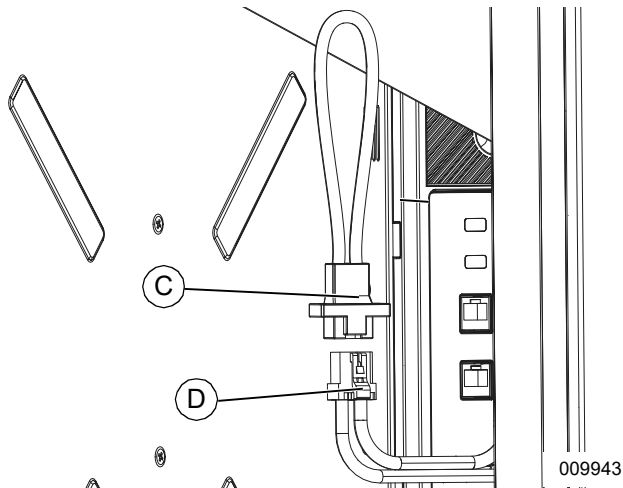


Figure 4-35. Installing Loop Jumper

- See [Figure 4-36](#). Tie unused loop jumpers (E) to wiring chase baffle slot (F) for future use.

NOTE: If a battery module needs to be replaced, spare loop jumpers can be used to keep PWRcell Battery running until the replacement battery module gets installed.

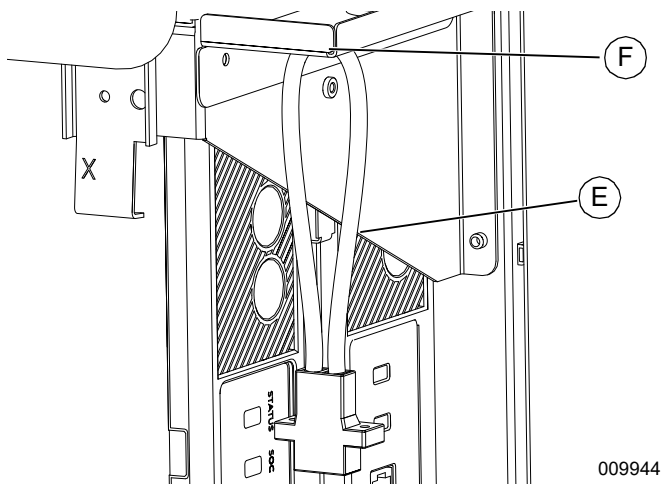


Figure 4-36. Unused Loop Jumpers

Installing Cover

- See [Figure 4-37](#). Place cover (A) upright in front of unit.
- Verify all cables are tucked in and clear of frame.
- Slide cover straight back until it engages with body (B).
- Verify all angled guides are tucked inside body. The back edges of the cover should be against the rubber gasket along their entire length (C).

NOTE: Do not force cover into place.

- Lift straight up. Pins on cover will automatically engage and hold the top of the cover in place.
- Gently push in on the bottom of the cover. This will lock the bottom of the cover in place.
- Install two M4X16 mm screws (D) and torque to 13 in-lb (1.47 Nm).

To remove the cover:

- See [Figure 4-37](#). Remove the two M4X16 mm SEM (D) securing cover (A) to body (B).
- Lift cover up.
- Pull cover bottom out slightly and lower to the floor.

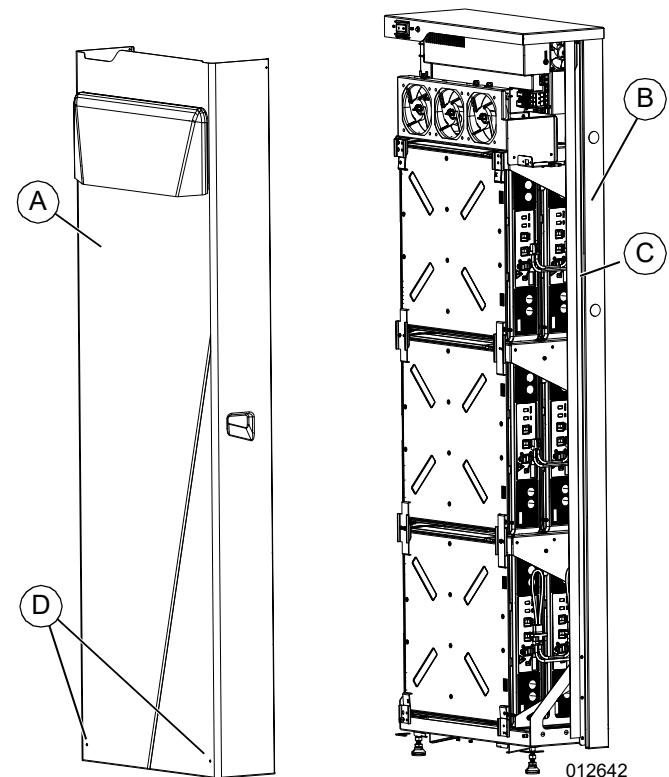


Figure 4-37. Installing Front Cover

Upgrading PWRcell Battery

See [Figure 4-37](#). Inside of the PWRcell Battery, battery modules are stacked 2-deep on three levels, allowing for up to 6 modules to be connected in a series. In systems with less than 6 modules, a PWRcell Battery can be upgraded with additional modules.

Whenever upgrading a PWRcell Battery with additional modules:

- A Vset Function must be performed. See [Using Vset Function](#).
- A module spacer must be installed on any single module shelf. See [Installing Module Spacer \(PWRcell M3 and PWRcell M5 only\)](#).

Using Vset Function



DANGER

Electrocution. Never reach into port or touch battery terminals with hands or tools. Doing so will result in death, serious injury, equipment or property damage. (000639)

CAUTION

Ensure all battery modules installed in any single PWRcell Battery are the same type (EX or DCB). Connecting different battery types can result in equipment damage. (000731a)

NOTE: Perform Vset before installing new modules.

NOTE: To perform Vset, the existing battery modules must be at higher voltages than the new modules. Vset procedure works by discharging existing battery modules to match new module voltage(s).

1. Ensure inverter system is set to Priority Backup or Clean Backup system mode.
2. Prior to installing, measure the voltage of each new battery module at the module main power terminals using a digital multi-meter and record the voltage values for each.

NOTE: If installing more than one module, where those module's voltages differ by more than 300 mV (0.3 Volts) from each other, perform the Vset procedure individually for each module to ensure proper cell balancing.

3. Navigate to the PWRcell Battery device page and press the center button to access the main menu; then select 'Mod. Settings.'
4. Navigate to the last setting, 'Module Vset', and select using the center button.
5. Enter the voltage value measured from the new module(s) if different from the default value and 'Save' changes.
6. From the PWRcell Battery device page, press the center button.

7. Select 'Start Vset' from the PWRcell Battery main menu.
8. The battery will start discharging. Look for the Battery Status LED to be green, rapid flashing.

NOTE: The system will automatically stop discharging and disable the battery once the existing modules discharge to the voltage set.

9. Once Vset has finished, check existing module voltages at their module main power terminals with a digital multi-meter to ensure they match the voltages of the new module(s).
10. Add the new battery module(s) to the stack by connecting the battery power harness and appropriate Cat 5 communication cables. See [Installing Battery Modules](#) for more information.

Maximizing Battery Capacity After Upgrade

To maximize battery capacity after adding new battery modules, allow the battery to charge to 100%. Leave the system set to Priority Backup or Clean Backup system mode for several days to allow the battery cells to balance.

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Section 5: Commissioning

General Information

NOTE: Register the PWRcell Inverter for commissioning at <https://pwrfleet.generac.com>.

Before commissioning PWRcell Battery verify all wiring is correct and secure and that the front cover is securely in place. For more information, see:

- [Installing REbus Wiring](#)
- [Installing Battery Modules](#)
- [Installing Retention Clips](#)
- [Connecting Battery Power Cables](#)
- [Installing Cover](#)

PWRcell systems installed in one and two family dwelling units shall be commissioned as follows:

1. Verify system is installed in accordance with the installation instructions in this manual and all local code requirements.
2. Provide a copy of the PWRcell Battery installation and owner's manual to the system owner.
3. Provide training to the system owner on the proper operation and maintenance of the battery.
4. Provide a label on the installed system containing contact information for the qualified maintenance and services providers.

NOTE: See the Generac PWRcell Inverter Installation and Owner's Manual for complete information on enabling the inverter and using the display and keypad, as well as information on the different operational modes and their uses.

Commissioning Procedure

For complete system commissioning, please reference the Quick Start Commissioning guide included with the PWRcell Inverter, and reference the PWRcell Inverter Installation and Owner's Manual.

For multi-inverter system commissioning, stop here and reference Multi-Inverter System Commissioning in the PWRcell Inverter Installation and Owner's Manual.

Commissioning the PWRcell Battery REbus device:

1. Turn the REbus DC disconnect for the PWRcell Battery to the ON position at the inverter.
2. Enable the inverter from the PWRcell Inverter device page, using the inverter control panel.

NOTE: Enabling the PWRcell Inverter builds voltage on REbus allowing for device communications.

Configure Battery

1. Using the left or right arrow keys on the inverter control panel, navigate to the PWRcell Battery device page and press the center button.
2. Select 'Mod. Settings' to access battery setpoints.
3. Configure Mod. Settings setpoints as desired. See [Table 6-3](#) for a description of settings.

NOTE: For installations relying on AC Coupled PV, do not change MaxSoCAbs from a value of 100.

Enable Battery

1. Turn the PWRcell Battery Disconnect ON.
2. Select Enable and confirm on the PWRcell Inverter control panel device page.

NOTE: PWRcell Battery will auto-detect the number of battery modules.

Confirm Island Mode is Enabled

1. Using the inverter control panel, select Mod. Settings on the PWRcell Inverter device page.
2. Ensure 'Enalstanding' is set to 'on'.
3. If using an external automatic transfer switch, refer to the Generac PWRcell Inverter Installation Manual and the PWRcell ATS Manual for switch wiring and configuration.

IMPORTANT NOTE: Island Mode must be enabled for inverter to provide backup power during outages.

Operating Modes, Charging Parameters, and Setpoints

The PWRcell Battery's internal control electronics come preprogrammed for the safe and effective charge and discharge of the battery modules.

The PWRcell System supports multiple storage interactive system modes. For complete information on the different system modes and how to select them, see the Generac PWRcell Inverter Installation and Owner's Manual.

Reference [Table 6-3](#) for a detailed list of PWRcell [Battery Settings](#).

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Section 6: User's Guide

Component Locations

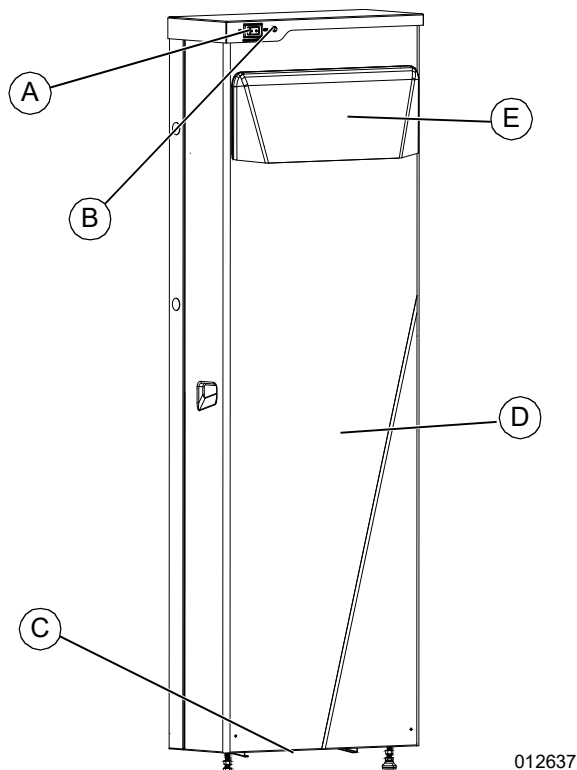


Figure 6-1. Component Locations

- A Battery Disconnect Switch
- B Battery Status LED
- C Intake Filter
- D Front Cover
- E Exhaust Vent

Battery Status LED

See [Figure 6-1](#). The color and strobing interval of LED (B) communicates battery status.

Table 6-1. Battery Status LED

LED Color / Interval	Battery Status
Orange, solid	Disabled
Orange, strobe (2s)	Waiting
Green / Orange, alternating	Initializing
Green, solid	Charging
Green, rapid blinking (0.5s)	Discharging
Green, strobe (2s)	Standby
Red, rapid blinking (0.5s)	Error
Red, strobe (8s)	Sleeping

Communication

All communication between REbus devices takes place over the REbus conductors using Power Line Carrier (PLC) communication. No additional communication wiring or equipment is required for communication between a PWRcell Inverter, PV array, and / or other REbus enabled batteries.

System Operational Modes

The PWRcell system has several operational modes available for various installation configurations, markets, and applications. Operational modes are selected through the PWRcell Inverter control panel. The inverter prioritizes the distribution of power differently based on the selected operational mode.

See the Generac PWRcell Inverter Installation and Owner's Manual for complete instructions on configuring the entire system for each operational mode.

Inverter Control Panel

See [Figure 6-2](#). The battery is controlled through the PWRcell Inverter control panel. Use the inverter control panel to enable or disable the battery, and to set the operational mode for the system. See the Generac PWRcell Inverter Installation and Owner's Manual for more information on settings and display screens.

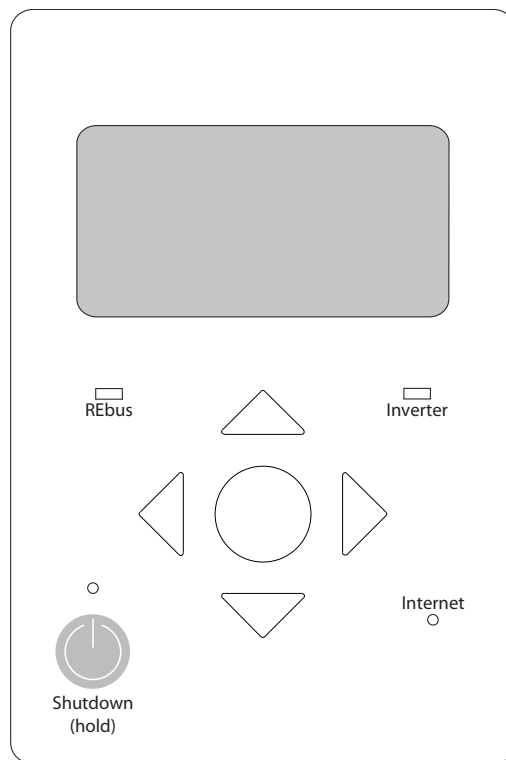


Figure 6-2. Inverter Control Panel

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Battery State of Charge (SoC) Setpoints

There are four user-adjustable setpoints related to the battery state of charge (SoC): Min Absolute, Max Absolute, Min Reserve, and Max Reserve. These setpoints are adjusted through the inverter control panel.

Table 6-2. Battery State of Charge Setpoints

Setpoint	Behavior
Min Absolute SoC	<p>Shut off point where the battery stops discharging during a utility service interruption. When battery SoC reaches this value, the battery will go to sleep. The battery will charge again as soon as power is available on REbus. If the grid is not present and the system was islanding, the system will perform a Power Search every hour for four minutes. See Power Search.</p> <ul style="list-style-type: none"> • Default value is 2%. • If this setpoint is lowered, the system can provide more energy before it goes to sleep, but the Power Search reserve will be smaller. <p>If this setpoint is raised, the system will go to sleep sooner during an outage, but the Power Search reserve will be larger.</p>
Max Absolute SoC	<p>Maximum percent the battery can charge to. When battery SoC reaches this value, the battery will not charge from any source.</p> <ul style="list-style-type: none"> • Default value is 100%. <p>Lowering this setpoint reduces usable capacity and is not recommended.</p>
Min Reserve SoC	<p>Manages the reserve of power guaranteed to be available for local loads in the event of a utility service interruption while operating in Self Supply system mode. When battery SoC drops to this setpoint, the battery will stop discharging to power local loads, retaining the minimum reserve for backup power in the event of a utility service interruption.</p> <ul style="list-style-type: none"> • Default value is 30%. • Lowering this setpoint increases battery capacity available for Self Supply, but decreases the capacity reserved for backup power in the event of a service interruption. • Raising this setpoint decreases battery capacity available for Self Supply, but increases capacity reserved for backup power in case of a utility service interruption.
Max Reserve SoC	<p>Manages battery capacity by prioritizing where PV power goes. When battery SoC reaches this value, PV power is diverted from charging the battery to powering local loads and export to the grid, saving battery capacity available for charging at a later time. When excess power is not needed by local loads and can not be exported to the grid, this extra capacity can be used to absorb peak PV to mitigate potential clipping.</p> <ul style="list-style-type: none"> • Default value is 100%. <p>Changing this value is only recommended for appropriately sized systems.</p>

Adjusting SoC Setpoints

SoC setpoints are adjusted using the inverter control panel. See the Generac PWRcell Inverter Installation and Owner's Manual for additional information regarding inverter control panel operation.

To adjust SoC setpoints:

1. Use the left and right arrows to access the battery device page, and press center button to enter the battery menu.
2. Use the up and down arrows to highlight Mod. Settings, and press center button to enter the Mod. Settings menu.
3. Use up and down arrows to highlight the desired setpoint, and press center button to select.
4. Use up and down arrows to adjust setpoint value.
5. Press center button to deselect the setpoint.
6. Use down arrow to scroll to the bottom of the list and select Save.

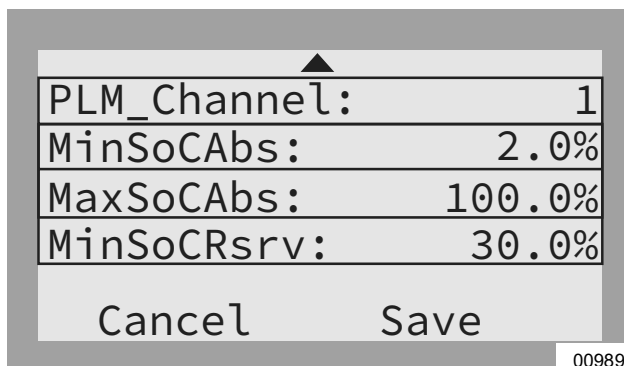


Figure 6-3. SoC Setpoint Screen Example

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Battery Settings

Table 6-3. Battery Settings

Setpoint	Range	Default	Description
PLM Channel	1 – 12	1	Channel for REbus communications. All devices in a system must use the same channel (except REbus Beacon).
MinSoCAbs	0 – 20%	2	Minimum state of charge (SOC) absolute- this is the percentage of charge the battery will discharge to while the system is islanded.
MaxSoCAbs	10 – 100%	100	Maximum state of charge (SOC) absolute- this is the percentage of charge the battery will charge to.
MinSoCRsrv	0 – 90%	30	Minimum state of charge (SOC) reserve- this is the percentage of charge the battery will discharge to using Self-Supply Mode.
MaxSoCRsrv	10 – 100%	100	Maximum state of charge (SOC) reserve- when battery SoC reaches this value, PV power is diverted from charging the battery to powering local loads saving battery capacity for future charging. When excess power might otherwise be clipped, this extra capacity can be used to absorb peak PV.
DschgCurLim	0 – 35 Amps	35	The battery stack will discharge to the BMU up to this current limit continuously before converting onto REbus.
ChgCurLim	0 – 35 Amps	35	The battery stack will charge up to this current limit continuously after power has been converted from REbus.
Sleep Time	1 – 720 Minutes	60	Length of time the battery will sleep for upon reaching its MinSocAbsl while islanded. Battery will wake up every hour for four minutes to power search.
PowSrch Time	10 – 900 Seconds	240	Power search setting is the length of time the battery will wake up from sleeping to search for PV power on REbus for charging.
Module Vset	40.0 – 55 Volts	46.5	Voltage level the battery will drain its modules to upon initiating the Vset procedure. See Vset Procedure.

Island Mode

In the event of a grid outage, the PWRcell Inverter enters Island Mode. While in Island Mode, the inverter disconnects from the utility grid and powers the building from the REbus nanogrid.

In a typical solar-plus-storage configuration, this means all REbus-connected batteries will work together with the PV links to supply power to REbus. The inverter will pull power from REbus to provide AC power to protected loads.

NOTE: To enter Island Mode, the inverter setpoint, 'Enalstanding', must be set to 'on' (default value) and the system mode can not be set to Grid Tie. See the Generac PWRcell Inverter Installation and Owner's Manual for more information.

NOTE: If Enalstanding is set to "off" when an outage occurs, the inverter will disconnect from the grid and enter Standby state if DC power is available from REbus devices. If DC power is not available from REbus devices, the inverter will de-energize. The inverter will not send power to local loads in this state.

Sleep Mode

While in Island Mode, the battery charges from REbus when PV power is greater than local load demand. Once PV power drops below local load demand, the battery will discharge to supplement powering protected loads, lowering its state of charge (SoC). Once the battery SoC reaches the Min Absolute setpoint, the system enters Sleep Mode. In Sleep Mode, the inverter will power down and the protected loads will lose power. See [Battery State of Charge \(SoC\) Setpoints](#) for more information.

Power Search



▲ DANGER

Electrocution. Turn battery disconnect OFF and de-energize REbus before touching terminals. Failure to do so will result in death, serious injury, equipment and property damage.

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While in Sleep Mode, the battery performs Power Searches at regular intervals. See [Table 6-4](#).

During a Power Search, the battery wakes up, powers the REbus nanogrid, and scans for potential sources of power. If a PV Link or another source of power is available, the battery will begin charging. Once the battery SoC is 5% above the Min Absolute SoC setpoint, the PWRcell system will resume exporting power to support backup loads when islanded. If Power Search does not discover other sources of power, the battery returns to sleep to conserve energy.

The length of time Power Search keeps REbus energized before returning to sleep and the Power Search interval are user-adjustable and are set on the inverter control panel.

Table 6-4. Default Power Search Values

Setpoint	Description	Default
Sleep Time	Minutes between Power Searches	60 min
PowSrch Time	Minutes Power Search keeps REbus energized	4 min

The battery can only perform a Power Search a certain number of times before it runs out of energy completely. The number of searches available is dependent on the value of the Min Absolute Soc setpoint. Once the battery depletes its Power Search reserve, the battery will not energize the REbus nanogrid on its own. Another source of power is required to energize REbus and charge the battery.

See [Battery State of Charge \(SoC\) Setpoints](#) for more information.

NOTE: Turn Battery Disconnect OFF and turn the REbus DC disconnect for the battery OFF at the inverter whenever the PWRcell Battery or Inverter will be powered down and left inactive for long periods of time.

System Recovery During a Utility Grid Outage

If during a utility service interruption, the PWRcell system stops powering backup loads, refer to [Table 6-5](#).

NOTE: Please read sections on [Island Mode](#), [Sleep Mode](#), and [Power Search](#) for complete understanding of system performance during a utility grid outage.

Table 6-5. System Recovery

Problem	Possible Cause	Solution
During an extended grid outage the system turned off.	The battery may have discharged to its Minimum State of Charge (SoC) and gone to sleep. See Island Mode .	Wait until grid power returns or until the sun rises. In an extended outage, the battery will perform a power search every hour for four minutes (default). Once solar power is detected during a power search, the battery will keep the system awake and begin charging / powering loads. See Power Search . Reference Battery Status LED .
Utility grid power went out; backup loads are not being powered.	This could be due to an overload condition where having too many house loads on at one time has caused the inverter to protect itself by purposely blacking out.	Inverter LED will be alternating on a 3 second interval - blinking green, then solid red. The home screen and the inverter device page will show "Islanded" or "Islanding" alternating with "Island Overload." Reduce house loads to recover from this condition.
	The battery may not have been properly connected or fully commissioned prior to the outage. Reference the Battery Status LED for confirmation of battery state/ functionality.	Contact your authorized Generac PWRcell dealer for service.
Utility grid power went out; backup loads were not powered; red shutdown button was pressed on the inverter.	The system may have experienced an overload condition from having too many house loads on at one time. The inverter will purposely black-out to protect itself if such a condition occurs.	If the red shutdown button was pressed, or the battery was disabled in Island Mode and the system has shut off, reference System Blackstart to manually enable the battery and restart the system.

System Blackstart

By manually enabling the battery using the Battery Disconnect Switch, it is possible to perform what is called a Blackstart on the PWRcell system.

IMPORTANT: Performing a Blackstart of the system will cancel a Shutdown initiated at the inverter and re-energize REbus DC wiring.

NOTE: Blackstart battery voltage must be 13 V or greater to power the system. See [Service](#) for more information.

See [Figure 6-4](#). If LED (B) goes to solid orange after 3 seconds when the Battery Disconnect Switch is turned ON, the battery is disabled. If the LED goes to green, it is already enabled and does not require a Blackstart. See [Battery Status LED](#) for more information.

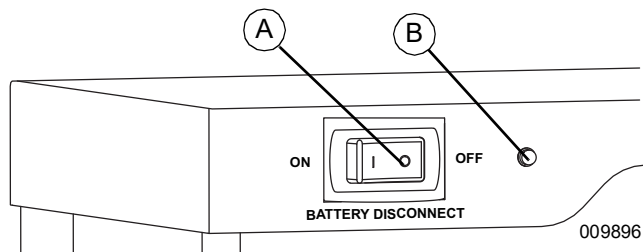


Figure 6-4. Blackstart

PWRcell Battery can be disabled if:

- Disabled by a user from the inverter screen.
- A Shutdown was initiated at the inverter using the red Shutdown button.
- A Shutdown was initiated by opening the remote switch connected to the battery STOP terminals.
- The battery reached a critically low state of charge and no REbus voltage was present.

NOTE: To avoid the need for a manual enable, keep the battery enabled, connected to REbus, and keep Battery Disconnect ON.

To perform a manual enable

1. Turn Battery Disconnect (A) ON.
2. If the unit is disabled, LED (B) will light orange for 7 seconds.
3. While the LED is still orange, turn Battery Disconnect OFF.
4. Perform steps 1 – 3 three times in total.
5. Turn Battery Disconnect ON for a fourth time and leave it ON.
6. The LED will alternate between green and orange indicating that it is initializing.

If the battery has sufficient charge, LED (B) will light green (or green strobe) to indicate the battery is enabled. The inverter screen should illuminate. At this time, it will be necessary to enable the inverter and other connected REbus devices.

NOTE: When a Shutdown is initiated on a PWRcell system in Island mode, all communicating REbus devices will disable and power off. The Shutdown is not considered to be actively maintained in this case, and a manual enable can be used to Blackstart the PWRcell system and clear the Shutdown state.

NOTE: Local code adoption may require the installation of additional DC disconnection means between battery and inverter which can impact the ability to Blackstart a system if disconnect means is in OPEN or OFF position.

NOTE: Generac does not currently support autonomous, off grid installations with PWRcell equipment.

Section 7: Troubleshooting

General Troubleshooting

Some common problems are listed in the table below. This information is intended to be a verification that simple causes can be located and fixed. It does not cover all potential issues. Procedures requiring in-depth knowledge or skills should be referred to an Independent Authorized Service Dealer.

Table 7-1. General Troubleshooting Guide

Problem	Possible Cause	Solution
Battery remains in Waiting state, or shows "Battery Not Ready"	Battery Disconnect Switch is OFF	Turn battery disconnect switch ON.
	Battery stack voltage is zero volts / incomplete series connection	Measure stack voltage using digital multi-meter at screw terminals on either side of fuse blocks or at main power harness connector. If zero volts measured, ensure looped jumpers are installed at any vacant module positions, and ensure power plugs are fully seated at each battery module.
	Battery comms cables are out of sequence or not fully connected	Double check Cat 5 sequence from module to module. Make sure module is not upside down. Ensure Cat 5 cables are fully seated.
	Battery fuse(s) are blown	Unplug one battery module before opening fuse holders. Remove fuses and test each fuse for continuity using a digital multi-meter.
Battery not recognized by inverter	Inverter disabled	Enable inverter.
	REbus not operating	Verify REbus voltage on the home screen of the inverter control panel.
	DC disconnect OFF	Verify inverter is disabled, then turn DC disconnect ON.
	Loose connection	Verify connections are secure.
	Insufficient voltage	Measure voltage at the REbus terminals; there should be at least 360V between RE+ and RE-.
	Inverter and battery not using same PLM channel	Set inverter and battery to same PLM channel.

If problems persist, contact the nearest Independent Authorized Service Dealer (IASD) or Generac Customer Service at 1-888-436-3722 (1-888-GENERAC).

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Section 8: Maintenance

General Upkeep

- Keep the area around the PWRcell Battery neat and clean at all times. Ensure surrounding area is free of snow, sand, leaves, branches, pet hair, or other debris that could obstruct airflow in or out of the unit.
- Do not store items on top of, under, leaning against, or propped up where they might fall on the PWRcell Battery.
- Do not allow irrigation sprinklers or other water sources to spray or flood the unit.

Accessories

Touch-Up Paint Kit

Maintains the look and integrity of the battery enclosure.

For more information, contact the nearest Independent Authorized Service Dealer (IASD) or Generac Customer Service at 1-888-436-3722 (1-888-GENERAC), or visit www.generac.com.

Maintenance



⚠ DANGER

Electrocution. PWRcell Battery front cover should be removed by a qualified technician only. Removing the front cover could result in death, serious injury, equipment or property damage.

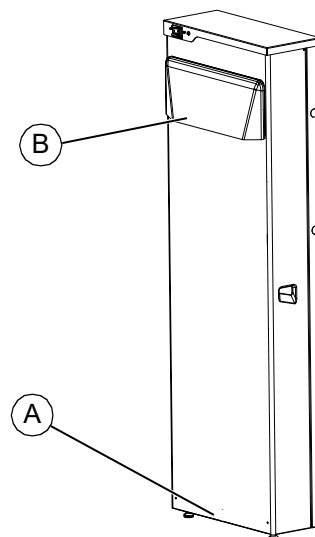
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- Clean the exterior of the enclosure with a soft cloth.
- Ensure surrounding area is free of snow, sand, leaves, branches, pet hair, or other debris that could obstruct airflow in or out of the unit.
- Inspect the unit. Look for conditions that could hinder performance or safety, such as (but not limited to):
 - Blocked vents.
 - Dirty intake filter.
 - Loose / missing hardware.
 - Loose or broken electrical connections.

NOTE: The Blackstart battery should be inspected annually by a qualified installer or technician. See [Service](#) for more information.

Inspecting Vents

See [Figure 8-1](#). Verify intake vent (A) and exhaust vent (B) are clear at all times.



011035

Figure 8-1. Intake Vent and Exhaust Vent

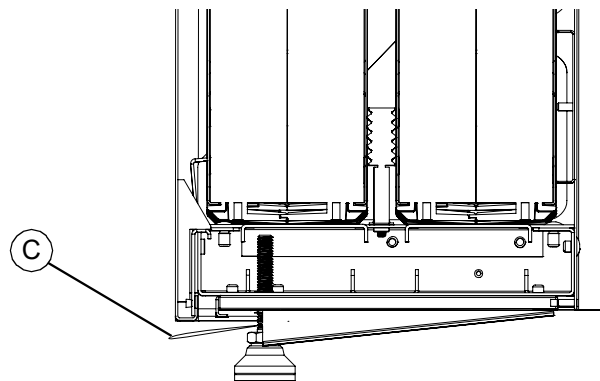
Cleaning Intake Filter

1. See [Figure 8-2](#). Grasp pull tab (C) and push frame back to compress retention springs.
2. Pull tab down and out.
3. Slide filter out.
4. Clean filter with a vacuum cleaner, compressed air, or water.

NOTE: Allow filter to dry before reinstalling.

5. Reinstall filter.

If intake filter is damaged or becomes difficult to clean, contact the nearest Independent Authorized Service Dealer (IASD) or Generac Customer Service at 1-888-GENERAC (1-888-436-3722) or visit www.generac.com for a replacement filter.



009897

Figure 8-2. Cleaning Intake Filter

Cleaning Outlet Vent

Clean outlet vent (A) with dry cloth or shop vacuum.

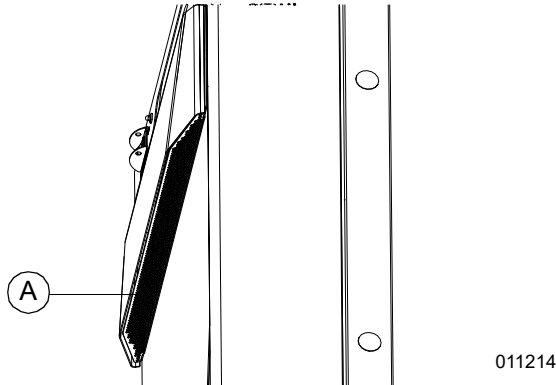


Figure 8-3. Cleaning Outlet Vent

Service



⚠ DANGER

Electrocution. PWRcell Battery front cover should be removed by a qualified technician only. Removing the front cover could result in death, serious injury, equipment or property damage.

(000604)



⚠ DANGER

Electrocution. Turn battery disconnect OFF and de-energize REbus before touching terminals. Failure to do so will result in death, serious injury, equipment and property damage.

(000599)



⚠ DANGER

Electrocution. Initiate a system-wide shutdown and turn the PWRcell DC Disconnect Switch OFF on all connected batteries before performing service. Failure to do so will result in death, serious injury, or equipment and property damage.

(000600)

The PWRcell Battery contains a Blackstart battery used for restoring the system to an operational state after an extended outage where no power source is available to recharge the Li-Ion batteries. Generac Power Systems Inc. recommends that the Blackstart battery condition and state of charge be inspected annually by a qualified installer or technician and replaced after 5 years to ensure proper operation. This operation range is 13.0 V - 13.6 V. Replace if below 13.0 V.

If you are experiencing a problem with this product, contact a qualified installer or technician for appropriate service. Qualified persons may refer to the Generac PWRcell Battery Installation Manual for information on replacing the internal fuses and other troubleshooting.

Decommissioning

⚠ WARNING

Environmental Hazard. Always recycle batteries at an official recycling center in accordance with all local laws and regulations. Failure to do so could result in environmental damage, death, or serious injury. (000228)

⚠ WARNING

Environmental Hazard. Decommissioning must be performed by qualified personnel. Decommissioning performed by unqualified personnel could result in environmental damage, death, or serious injury. (000654)

PWRcell Battery modules will be required to be decommissioned at the battery module end of life stage or if the PWRcell Battery will be removed from the premises in accordance with these instructions, the requirements in NFPA 855, and all applicable code requirements. The authority having jurisdiction (AHJ) shall be notified prior to the decommissioning of the battery.

Decommissioning Plan.

The owner of the PWRcell Battery and the qualified Generac Service Dealer shall prepare a written decommissioning plan that provides the overview of the decommissioning process developed specifically for the battery that is to be decommissioned. The decommissioning plan shall provide the requirements and methods necessary to safely discharge the stranded energy in battery modules and the proper removal from the installation site including the transportation and recycling process for the battery modules.

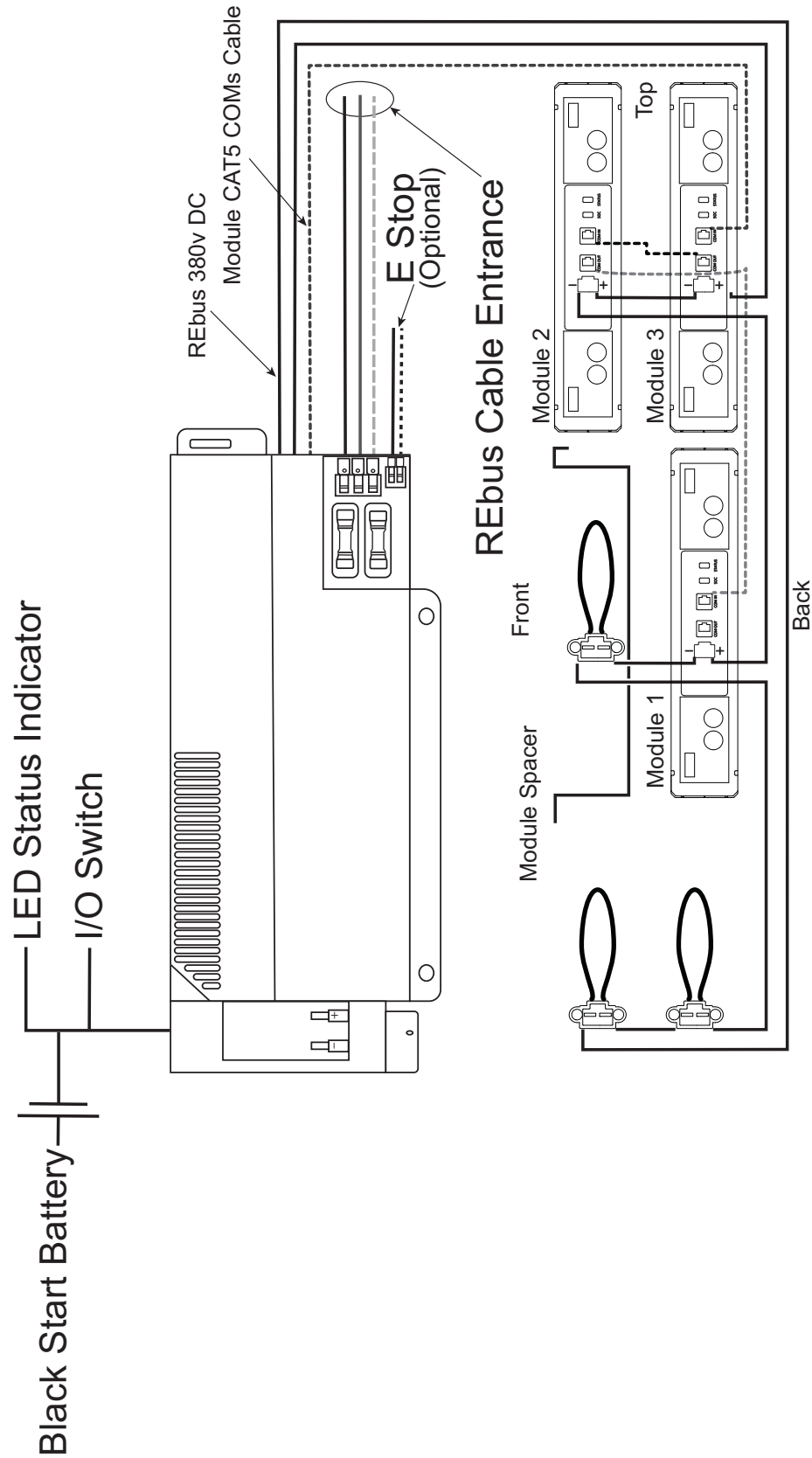
After the battery has been decommissioned, a decommissioning report shall be prepared by the owner of the system and the qualified Generac Service Dealer indicating the date the battery was decommissioned, the final results of the decommissioning process, any issues that were identified during the decommissioning process, and the required measures taken to resolve those issues.

Battery Recycling

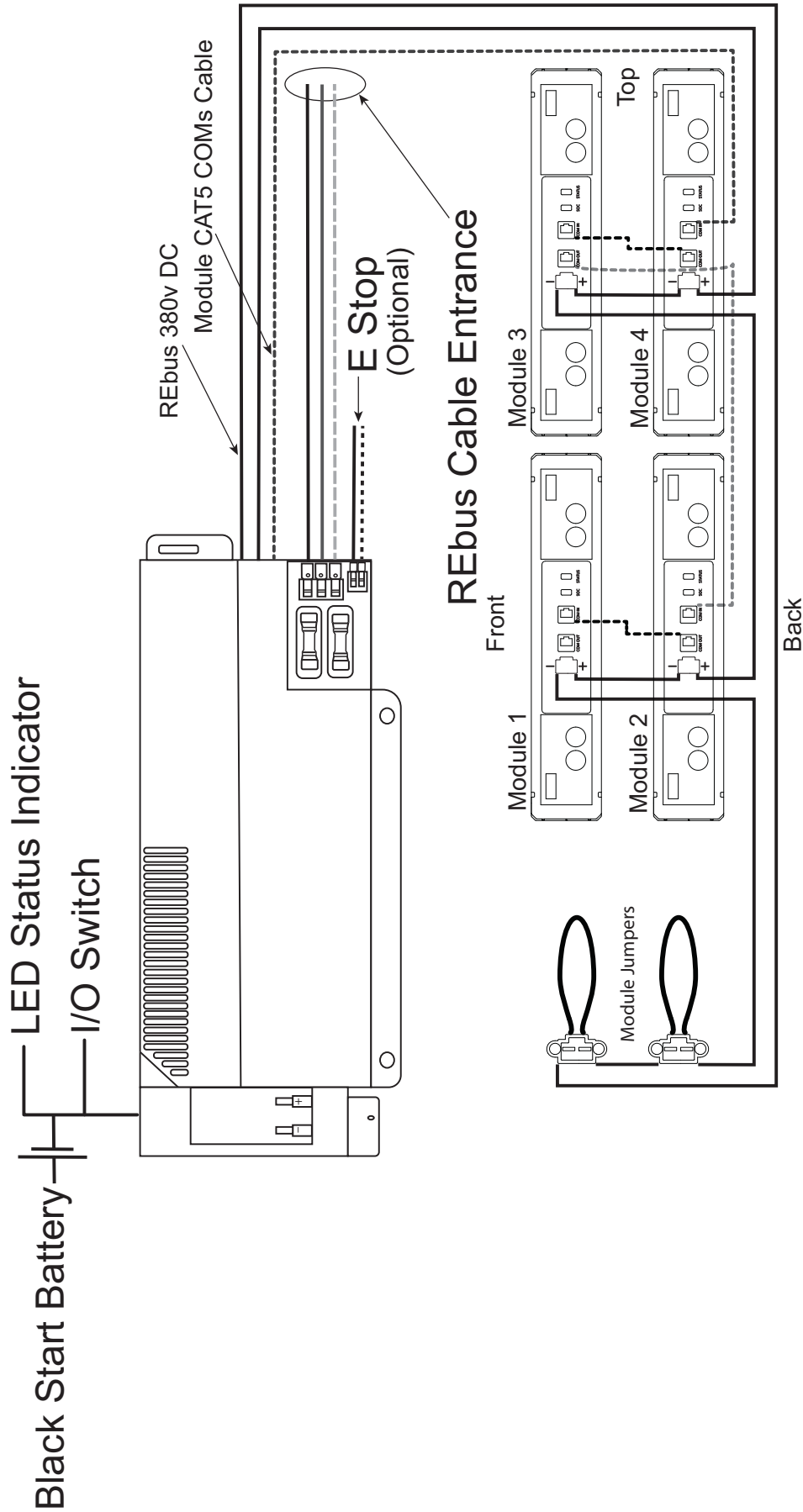
Always recycle batteries in accordance with local laws and regulations. Contact your local solid waste collection site or recycling facility to obtain information on local recycling processes. For more information on battery recycling, visit the Battery Council International website at: <http://batteryCouncil.org>.

Section 9: Wiring Diagrams

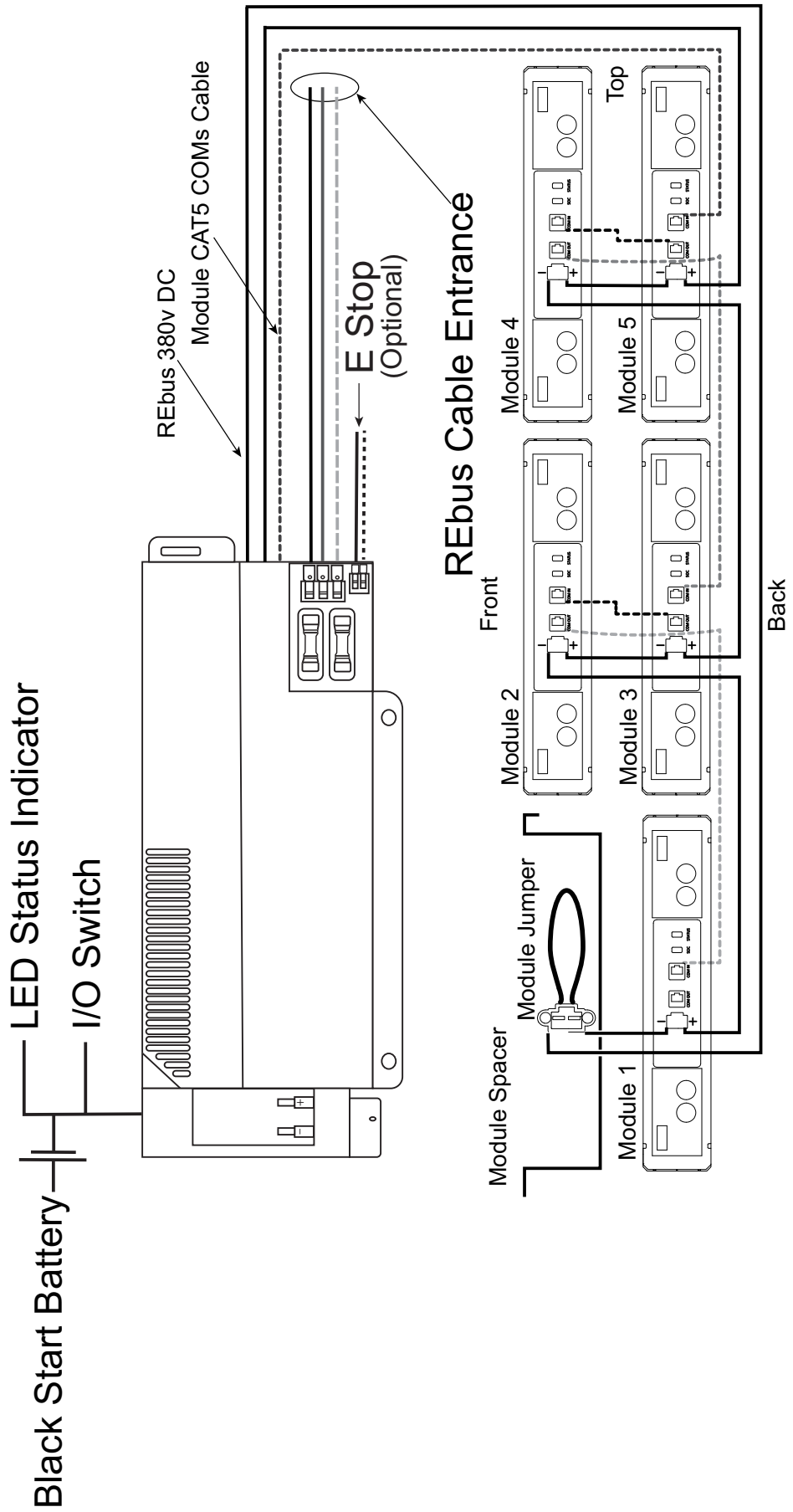
PWRcell M3



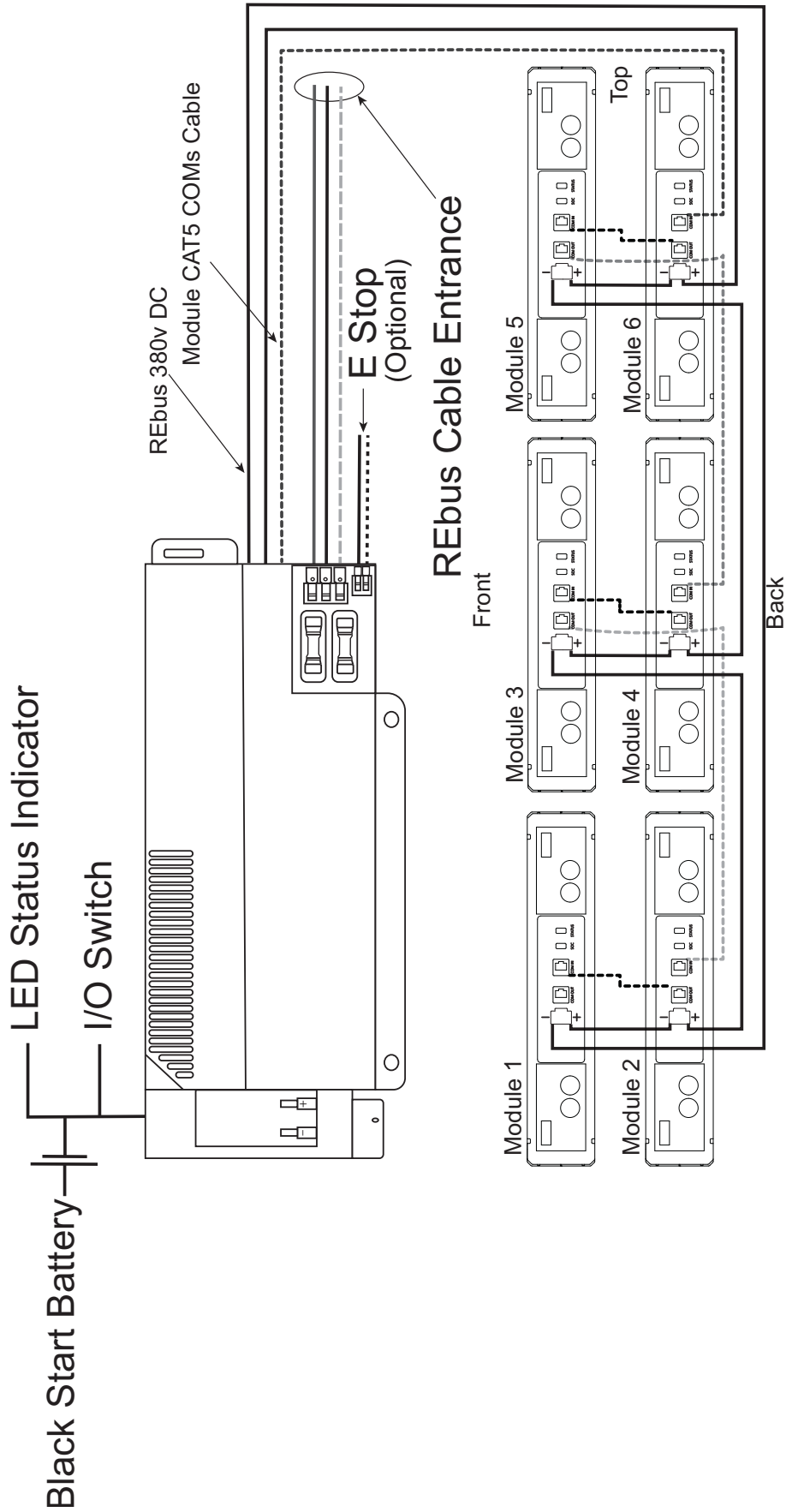
PWRcell M4



PWRcell M5



PWRcell M6



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