PowerNode™

POWERNODE™ NEXUS SITE DESIGN GUIDE

V2.1.2

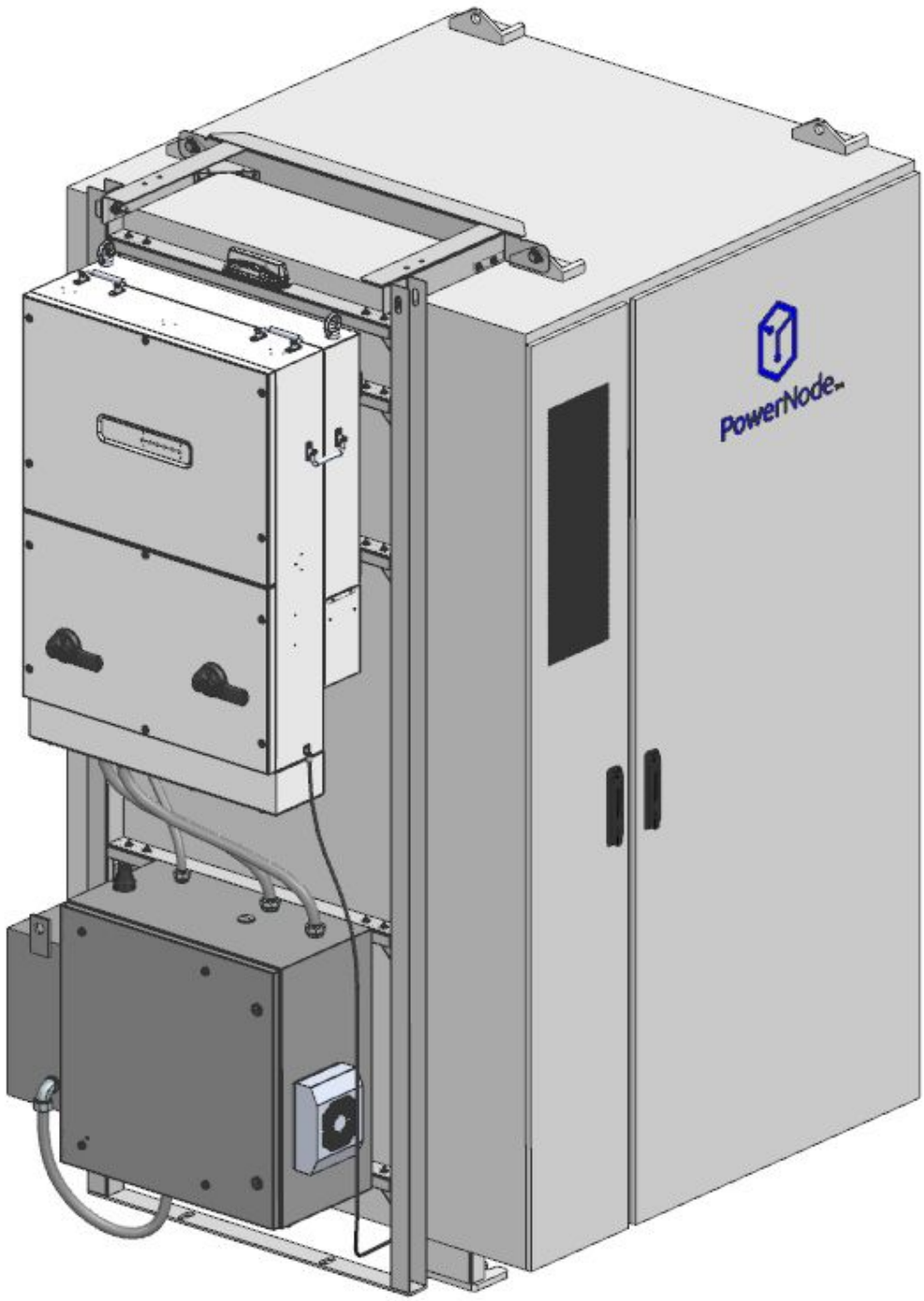


TABLE OF CONTENTS

TABLE OF CONTENTS

OVERVIEW

GENERAL PRECAUTIONS (1/3)

The precautions in this section must be followed at all times.

⚠ **DANGER!** Indicates a hazardous situation which, if not avoided, will result in injury or death.

⚠ **WARNING!** Indicates a hazardous situation which, if not avoided, may result in injury or death.

⚠ **WARNING!** All instructions in this document must be performed by qualified personnel authorized by Electric Era, with training dealing with high voltage equipment and lifting machinery where relevant.

⚠ **WARNING!** Read all relevant information from this manual, the CATL 280 Ah Liquid Cooling Rack User's Manual, and the PowerNode Nexus Commission, Operation, & Decommission Manual before performing any actions on PowerNode Nexus (PN Nexus). Any warnings found in those documents are also applicable when performing actions instructed in this document. Do not perform any action on the unit without having all of those documents.

⚠ **DANGER!** Wear personal protective equipment (PPE) as instructed by this document, the signage on the unit, the PowerNode Nexus Commission, Operation, and Decommission Manual, the CATL 280 Ah Liquid Cooling Rack User's Manual, regulations, and best safety practices.

⚠ **DANGER!** Stored energy is present in the inverters. After shutting down PN Nexus according to the "System and Source Shutdown" section of the PowerNode Nexus Commission, Operation, and Decommission Manual, do not remove the inverter front panel until 5 minutes have passed, and test exposed conductors for voltage to ensure internal capacitors have discharged.

⚠ **DANGER!** Do not open the DC Combiner without first shutting down PN Nexus according to the "System and Source Shutdown" section of the PowerNode Nexus Commission, Operation, and Decommission Manual, and test exposed conductors for voltage.

⚠ **DANGER!** Before connecting or disconnecting any electrical connections, first de-energize and lock out/tag out (LOTO) the system as per the "System and Source Shutdown" section of the PowerNode Nexus Commission, Operation, and Decommission Manual, and close and lock the battery rack right-side door.

⚠ **DANGER!** When the MSD covers are removed, do not open the Battery Rack right-side door without first shutting down & LOTO PN Nexus according to the "System and Source Shutdown" section of the PowerNode Nexus Commission, Operation, and Decommission Manual.

OVERVIEW

GENERAL PRECAUTIONS (2/3)

⚠ **DANGER!** If opening the Battery Rack right-side door when the MSD covers are removed or when making MSD connections, in addition to any other PPE required at the site, at minimum wear PPE for shock and arc flash according to the hazards listed below. Where more recently updated hazards at the site are available, wear PPE for actual site conditions. Do not wear metal jewelry.

- 22 inches Arc Flash Protection Boundary
- 2 cal/cm^2 Incident Energy Flash Risk at 16 inches
- 1000 VDC - Shock Risk- Covers/Doors Open
- 0 - Glove Class
- 42 inches - Limited Approach Boundary
- 12 inches - Restricted Approach Boundary

⚠ **DANGER!** Before connecting or disconnecting any electrical connections, first de-energize and lock out/tag out (LOTO) the system as per the “System and Source Shutdown” section of the PowerNode Nexus Commission, Operation, and Decommission Manual, and close and lock the Battery Rack right-side door.

⚠ **DANGER!** When the MSD covers are removed, do not open the Battery Rack right-side door without first shutting down & LOTO PN Nexus according to the “System and Source Shutdown” section of the PowerNode Nexus Commission, Operation, and Decommission Manual.

⚠ **WARNING!** Damage to PN Nexus may cause explosion and fire hazards. Fire may release toxic gas. Keep fire or sources of heat away from PN Nexus. Batteries may reignite after being extinguished. Keep fire, heat sources, corrosive agents, flammable gas, and conductive fluids and gas away from energy storage system. Refer to Safety Data Sheet (for CATL model name O552280-P) for further instructions on response to battery fire.

⚠ **DANGER!** Do not damage, open, or otherwise tamper with the battery modules.

⚠ **WARNING!** Do not leave PN Nexus unattended with any door unlocked or any panel removed. At sites with a Security Cage, also do not leave PN Nexus unattended without locking cage.

⚠ **DANGER!** Do not touch both pole terminals of PN Nexus simultaneously.

⚠ **WARNING!** Do not insert any foreign objects into any part of PowerNode Nexus.

⚠ **DANGER!** When cleaning the Battery Rack, do not wash the HV/LV connectors directly.

⚠ **WARNING!** Do not step on the top of PowerNode Nexus.

OVERVIEW

GENERAL PRECAUTIONS (3/3)

⚠️ **WARNING!** Do not use PN Nexus in series or parallel with other types of battery products.

⚠️ **WARNING!** Do not immerse PN Nexus or its components in fluids.

⚠️ **WARNING!** Do not allow precipitation such as rain, snow, or dusty/sandy wind to enter PN Nexus through open doors or removed covers. Do not let unmated connectors get wet or dirty.

⚠️ **WARNING!** PN Nexus must be installed in accordance with requirements in this document and in accordance with local electrical, building, fire, and other codes or utility requirements as applicable to the installation and equipment, by qualified service personnel in accordance with the installation instructions and appropriate practices.

⚠️ **WARNING!** In cases of uncertainty with regard to instructions, contact Electric Era with any questions. Do not proceed by guessing or trial-and-error.

OVERVIEW

SCOPE

This document includes information needed to prepare a site for installation of a PowerNode Nexus. References to supplementary documents are listed for any information not directly included in this document.

Note that “PowerNode Nexus” refers to the mechanically and electrically integrated set of CATL EnerOne Battery Rack, Dynapower MPS-125 EHV inverter, and PowerNode Control Enclosure.

BATTERY RACK DETAILS & INSTRUCTIONS

For any details and instructions not included in this document that pertain to the Battery Rack (CATL EnerOne) in its standalone state without integration of the complete PowerNode Nexus, refer to:

- For high-level specs, see “Product Specification: Outdoor Liquid Cooling Rack” with a battery rack module quantity of 5
- For all other details & instructions, see “CATL 280 Ah Liquid Cooling Rack User’s Manual (O852280-E/ O852280-P)”
    - Note: The CATL model used for PowerNode Nexus is O552280-P. This differs from model O852280-P by having 5 modules of 8, and thus lower weight, nominal voltage, and energy, but site design and operating instructions are otherwise equivalent.

Where there is conflict between any of these documents, contact Electric Era.

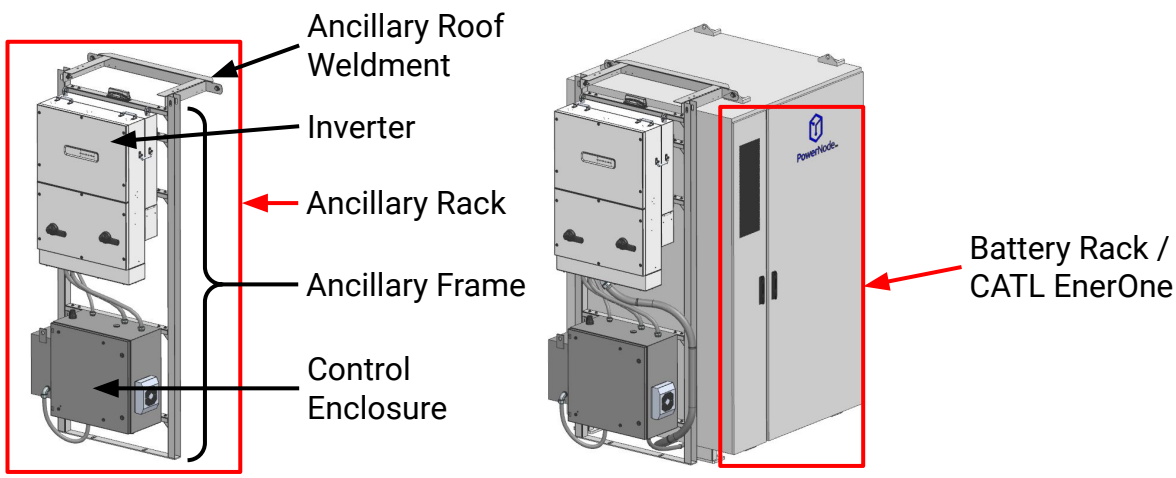
ELECTRIC ERA CONTACT INFORMATION

Electric Era general support phone number: 1-(507)-702-0312

Contact Electric Era with any questions in cases of uncertainty with regard to instructions.

OVERVIEW

POWERNODE NEXUS SUBCOMPONENTS



POWERNODE NEXUS SUBCOMPONENT CERTIFICATIONS

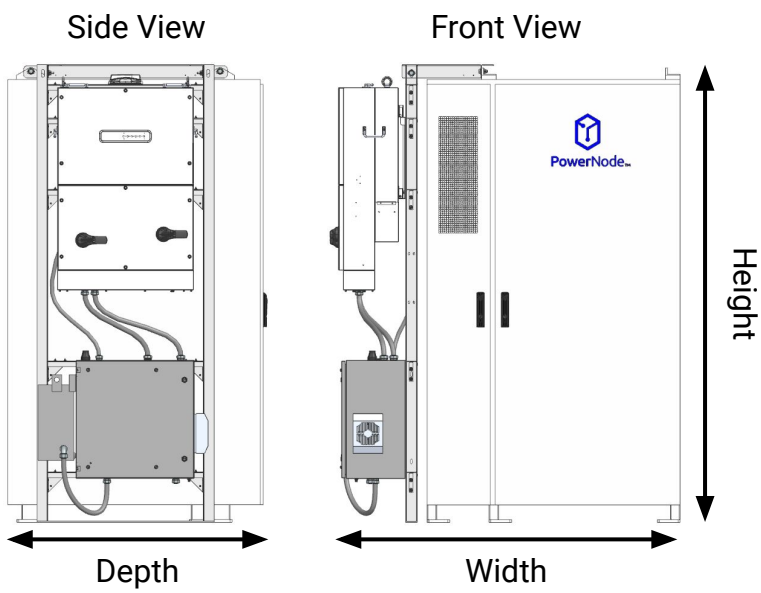
Name / Description	Manufacturer / Trademark	Type / Model	Mark(s) of Conformity
Battery Energy Storage System Components			
Battery Rack, outdoor, Lithium Iron Phosphate, 5-module, 232.9 kWh	CATL (Contemporary Amperex Technology Co., Ltd.)	EnerOne O552280-P	UL 1973, cTUVus Certificate No. U14 004951 0008 Rev. 01
Inverter Components			
Inverter, 125kW continuous, 480VAC	Dynapower Co., LLC	MPS-125EHV	UL 1741, IEEE 1547-2003, cETLus Control No. 4010786
Control Enclosure Components			
Circuit breaker, 2-pole, 480VAC, 6A	PHOENIX CONTACT GmbH & Co. KG	2907656	cULus, File No. E320373
Circuit breaker, 2-pole, 480VAC, 15A	PHOENIX CONTACT GmbH & Co. KG	2907662	cULus, File No. E320373
UPS, 120-230VAC	PHOENIX CONTACT GmbH & Co. KG	1067327	cURus, File No. E359066
UPS battery, 4Ah	PHOENIX CONTACT GmbH & Co. KG	1274117	cULus, File No. E199827
Power supply, 240VAC 1ph in, 24VDC out, 120W	PHOENIX CONTACT GmbH & Co. KG	1110466	UL, File No. E199827
Relay, DPDT, 6A, 250VAC, 24VDC coil	PHOENIX CONTACT GmbH & Co. KG	2903350	EAC, Approval ID: TR_TS_D_00573_c
Relay, SPST, 6A, 250VAC, 24VDC coil	PHOENIX CONTACT GmbH & Co. KG	2903370	EAC, Approval ID: TR_TS_D_00573_c
Surge Protective Device	PHOENIX CONTACT GmbH & Co. KG	2910361	cULus, File No. E330181
Thermoelectric cooler	Seifert Systems Inc.	3050303	cURus, File No. SA32278
Fire control panel	Kentec Electronics Ltd.	Sigma A-XT K1810-13	cULus, File No. S8485

OVERVIEW

POWERNODE NEXUS BASIC DIMENSIONS & WEIGHT

Overall Height:	92 ¾" (2,356 mm)
Overall Width:	70 ⅞" (1,800 mm)
Overall Depth:	52 ⅝" (1,336 mm)
Total Mass:	6,195 lbs (2,810 kg)

Note: The Battery Rack alone, without the Ancillary Rack, weighs 5,644 lb (2,560 kg).

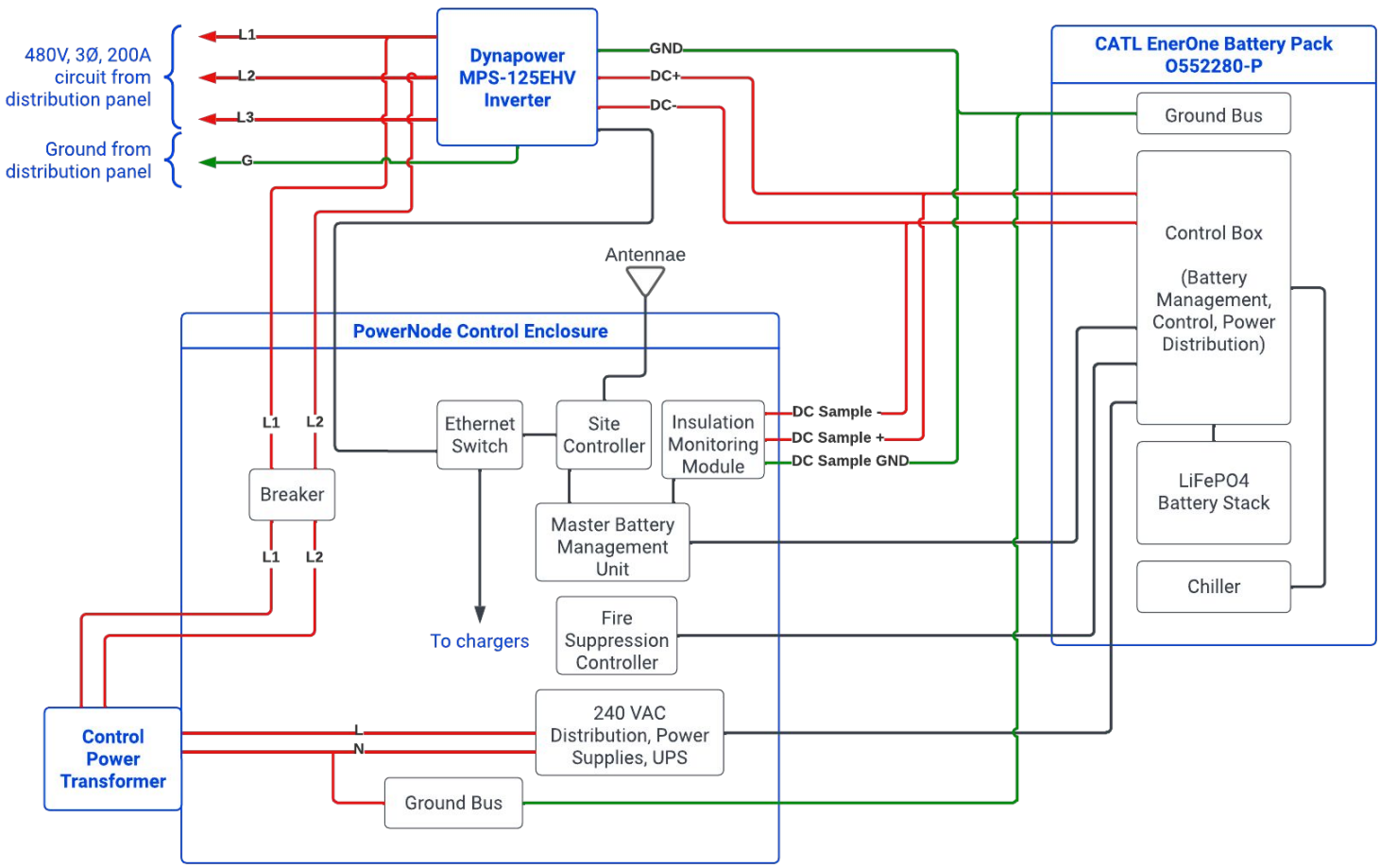


POWERNODE NEXUS ELECTRICAL REQUIREMENTS

Main Power Connection:	480V, 3-phase, 3-wire + ground (Delta or floating Wye)
Main Overcurrent Protection:	200A

OVERVIEW

POWERNODE NEXUS TOP-LEVEL ELECTRICAL SCHEMATIC



POWERNODE NEXUS CONTROL ENCLOSURE DIAGRAM

Refer to PowerNode Nexus Control Enclosure Wiring Diagram, Drawing No. 920-01597 for detailed electrical diagram of Control Enclosure.

SITE PREPARATION

POWERNODE NEXUS PAD PREPARATION (1/3)

The following diagrams show the size & positions of the Battery Rack anchors, concrete pad edges, PN Nexus equipment edges, and door swing area. Positions are given for the PN Nexus conduits, Ancillary Rack anchor locations, and Security Cage anchor locations (site-dependent).

For all other remaining details of PowerNode Nexus pad preparation that do not conflict with the following diagrams or the site-specific approved construction drawings, the details found in “CATL 280 Ah Liquid Cooling Rack User’s Manual (O852280-E/ O852280-P)” section 5.1 “Site and Environmental Requirements” and section 5.2 “Foundation Requirement” apply. Note that the battery rack model O552280 weighs less than model O852280.

Aside from the conduits, only the first Battery Rack M16 chemical anchor indicated in the following diagram should be installed in the pad prior to installation of PowerNode Nexus. The other eight Battery Rack M16 chemical anchors, the two 1/2” expansion anchors for the Ancillary Rack, the four 1/2” expansion anchors for the Security Cage (site-dependent), and the holes drilled in the concrete pad for each of them, will be aligned and installed after the Battery Rack is on-site, according to the “PowerNode Nexus Mechanical Installation Instructions” section of this document.

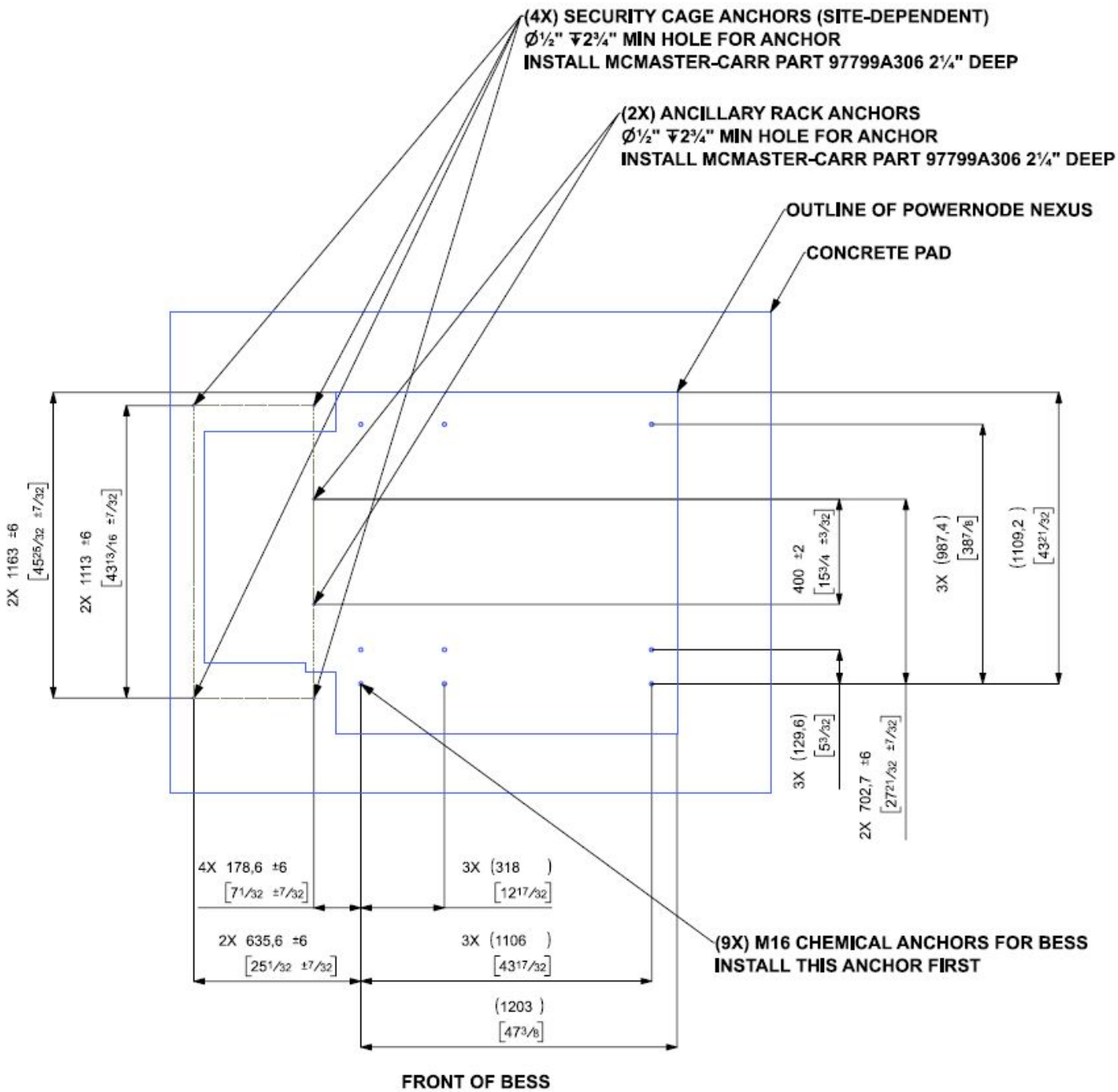
The Ancillary Rack mounts to the concrete pad with two 1/2" diameter, 4-1/2" long, 316 stainless steel stud anchors for concrete. The Security Cage (site-dependent) mounts to the concrete pad with four identical anchors. Minimum anchor pull-out strength should be 1,100 lb and shear strength should be 1,200 lb. McMaster-Carr part # 97799A306 (torqued to 60 Lb-Ft) is recommended. Note that anchor installation details in this document may be impacted if different hardware is used.

To avoid interference, the Battery Rack chemical anchors should not protrude more than 2.5” from the concrete pad.

SITE PREPARATION

POWERNODE NEXUS PAD PREPARATION (2/3)

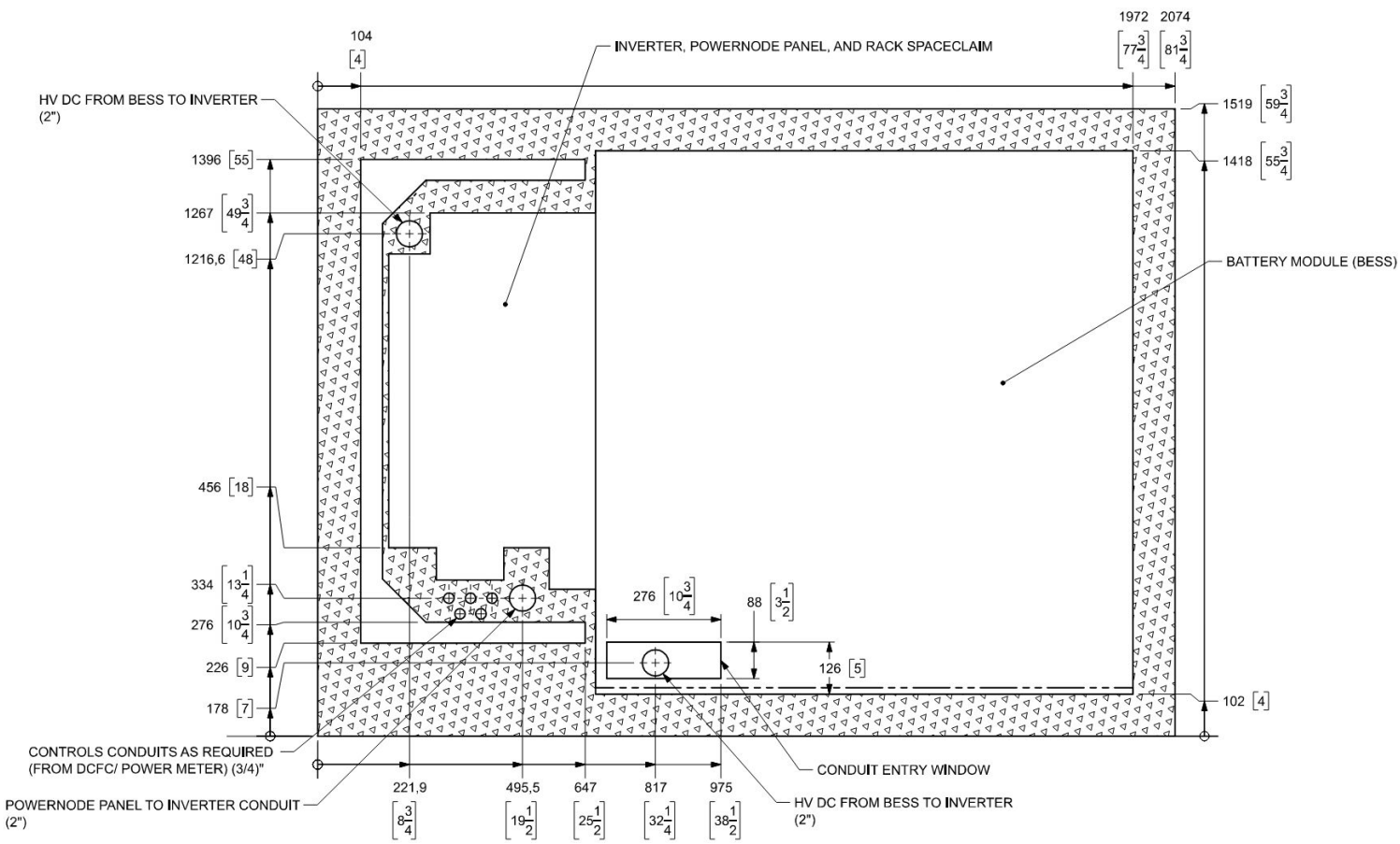
Refer to the diagram below for the anchor locating dimensions. The Security Cage anchor details should be ignored at sites that will not have a Security Cage.



SITE PREPARATION

POWERNODE NEXUS PAD PREPARATION (3/3)

Refer to the diagram below for the PN Nexus concrete pad dimensions and conduit locating dimensions.



SITE PREPARATION

POWERNODE NEXUS LOCATION AND CLEARANCES (1/3)

⚠️ **WARNING!** *PowerNode Nexus must be installed in accordance with requirements in this document and in accordance with local electrical, building, fire, and other codes or utility requirements as applicable to the installation and equipment, by qualified service personnel in accordance with the installation instructions and appropriate practices.*

A minimum clearance of 3 ft (914 mm) in all directions is required from PowerNode Nexus to lot lines, public ways, buildings, stored combustible materials, hazardous materials, high-piled stock, and other exposure hazards not associated with electrical grid infrastructure. The minimum clearance between two PowerNode Nexus units side-to-side can be reduced to 4 inches, but only if they are oriented such that no inverter is between the two Battery Racks. The inverter should have 3 ft (914 mm) minimum clearance to any object including other Battery Racks for airflow and service.

Areas within 10 ft in all directions from PowerNode Nexus must have combustible vegetation cleared. Single specimens of trees, shrubbery, or cultivated ground cover may be permitted provided that they do not provide a means of readily transmitting fire.

PowerNode Nexus shall not be installed in a “Hazardous (classified) location” defined by NFPA 70. The PowerNode Nexus environment must be free from corrosive agents, flammable or explosive gases, and conductive gases, and must be away from heat sources and flame.

PowerNode Nexus must be located in an environment matching the allowable conditions specified in the PowerNode Nexus Specifications document. Indoor installations carry different code compliance requirements than outdoor installations.

There must be sufficient room around PowerNode Nexus for a forklift or telehandler to approach to install and remove inverter(s) and battery module(s). To accommodate most equipment, it is preferred to allow 16 ft of clearance (space on which motorized lifting equipment can travel) *beyond* the marked door swing clearance shown in the diagram on the page 16; alternative arrangements are possible but reduce ease of maintenance.

- *Preferred clearance:* 16 ft beyond door swing clearance (maximum dimension) on bottom and left sides
- *Alternative clearance:* 16 ft beyond door swing clearance on bottom side only
- *Minimum clearance:* 3 ft beyond door swing clearance on bottom side only

Required working space around this equipment per NFPA 70 shall also be provided.

SITE PREPARATION

POWERNODE NEXUS LOCATION AND CLEARANCES (2/3)

⚠️ **WARNING!** *Vehicle guard posts are required where PowerNode Nexus is subject to impact by motor vehicles.*

When guard posts (both fixed and removable) are installed, they shall be designed to meet requirements of the authority having jurisdiction (AHJ) according to all relevant standards, including NFPA 855.

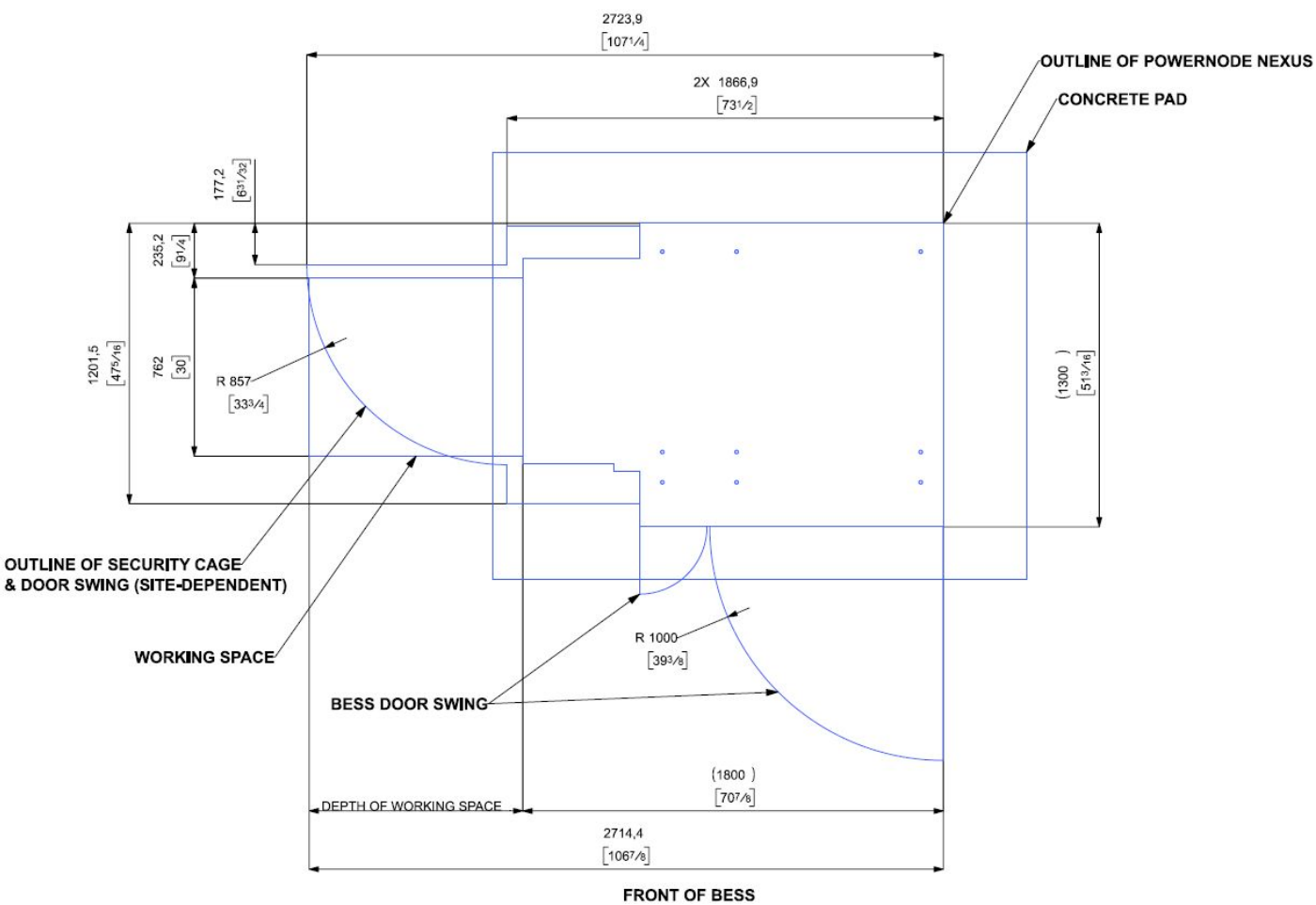
Posts shall be located outside of the door swing areas shown on the next page. The guard posts must also not interfere with code required working space of equipment.

SITE PREPARATION

POWERNODE NEXUS LOCATION AND CLEARANCES (3/3)

The diagram below shows the dimensions of PN Nexus, the Security Cage (site-dependent), the Battery Rack/Security Cage door swing area, and the working space required for the Control Enclosure, with units in mm / [in]. The depth of the working space must be determined for each particular site plan according to electrical code, but in no case shall the depth of the working space be less than 3 feet. Only the Control Enclosure is likely to require examination, adjustment, servicing, or maintenance while energized.

The Security Cage details should be ignored at sites that will not have a Security Cage.



SITE PREPARATION

POWERNODE NEXUS MECHANICAL INSTALLATION INSTRUCTIONS (1/6)

⚠ **WARNING!** *Always follow the precautions in the "General Precautions" section of this manual.*

⚠ **WARNING!** *Follow safe lifting practices according to regulations and these instructions.*

⚠ **WARNING!** *Lifting operator must be trained to use lifting equipment.*

⚠ **WARNING!** *During the hoisting process, handle the Battery Rack and Ancillary Rack with care.*

⚠ **WARNING!** *Do not stand under lifting equipment or the equipment being lifted.*

⚠ **WARNING!** *Clear and block off the area before using lifting equipment.*

⚠ **WARNING!** *Use lifting equipment rated for the intended loads.*

⚠ **WARNING!** *When lifting the Battery Rack or Ancillary Rack, at least two people must support both sides of the Battery Rack/Ancillary Rack.*

⚠ **WARNING!** *At minimum wear hard hats, reflective vests, and steel-toed shoes when performing any lifting steps in this section, as well as any other personal protective equipment required at the site. The operator of the lifting machinery must also wear high-grip gloves and safety goggles.*

⚠ **WARNING!** *The tilt angle should be less than 5° while hoisting the Battery Rack.*

⚠ **WARNING!** *Do not hit anybody while lowering equipment.*

⚠ **WARNING!** *Do not perform installation under weather such as rain, snow, or dusty/sandy wind.*

⚠ **WARNING!** *Place PN Nexus and its components on level ground to ensure that it is stable without shaking or tilting.*

⚠ **WARNING!** *PN Nexus installation should consider the load capacity of its installation ground and floor (according to the requirements of architectural drawings).*

⚠ **WARNING!** *Handle Battery Rack and Ancillary Rack with care. Do not impact, pull, drag, or step on Battery Rack/Ancillary Rack. Do not subject Battery Rack/Ancillary Rack to any strong force. To help prevent damage, leave Battery Rack/Ancillary Rack in their shipping packaging until they are ready to be installed.*

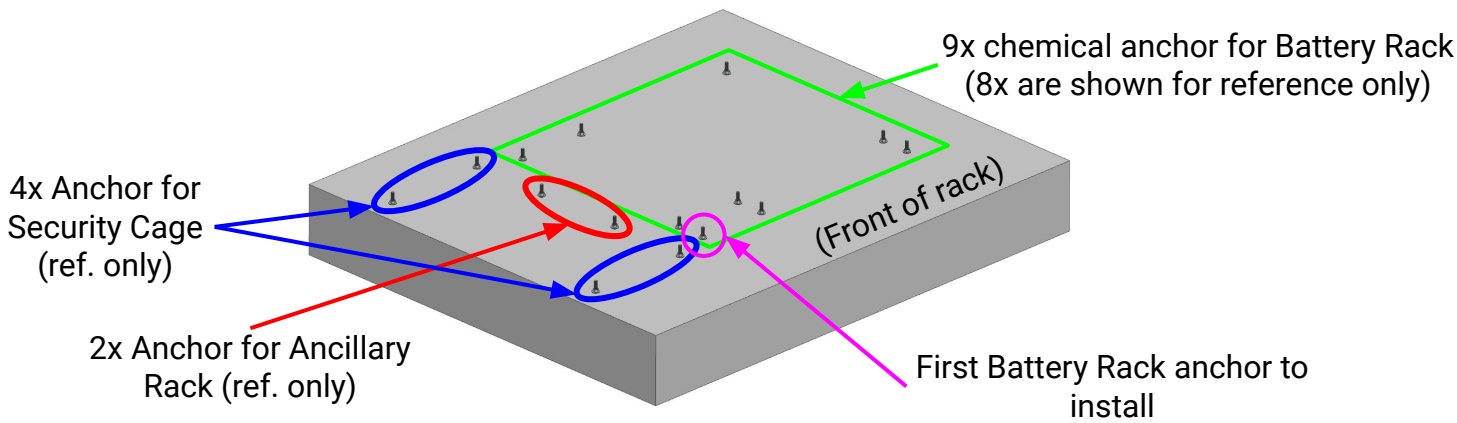
Note: Perform these installation steps only when instructed to do so by the PowerNode Nexus Commission, Operation, & Decommission Manual.

SITE PREPARATION

POWERNODE NEXUS MECHANICAL INSTALLATION INSTRUCTIONS (2/6)

1. Prepare a concrete pad with conduit for PN Nexus according to the “PowerNode Nexus Pad Preparation” section of this Site Design Guide and the site-specific approved construction drawings/SLD. Ensure that the requirements of the “PowerNode Nexus Location and Clearances” section of this Site Design Guide are met.

   To ensure proper anchor alignment later, it is recommended to drill only the first Battery Rack hole (front-left) & install the first Battery Rack chemical anchor indicated below. Refer to the site-specific approved construction drawings for details on chemical anchor installation. Do not drill holes or install the other 8 chemical anchors or the expansion anchors for the Ancillary Rack/Security Cage yet.

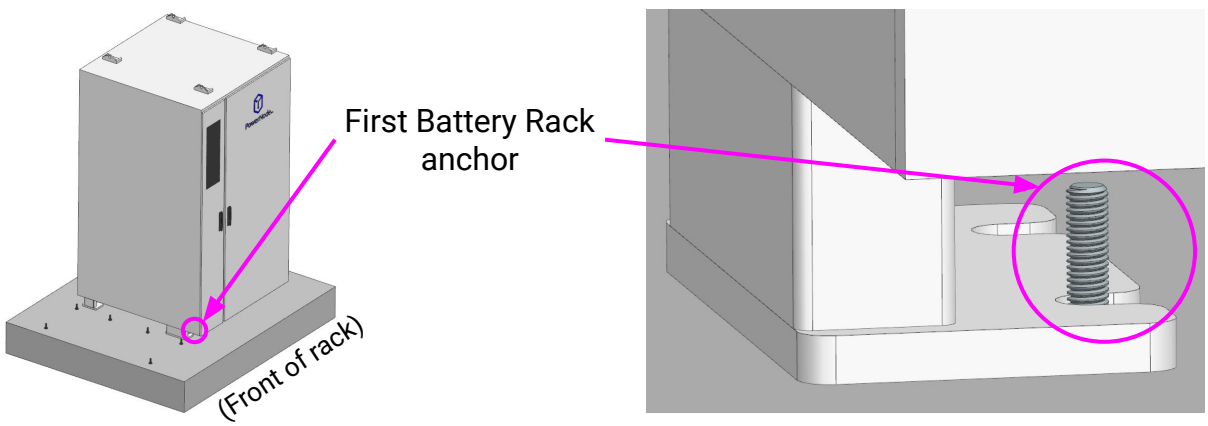


2. Site-dependent: when required by the site plans, prepare guard posts as required by site-specific construction drawings, while meeting the minimum requirements from the “PowerNode Nexus Location and Clearances” section of this document.

SITE PREPARATION

POWERNODE NEXUS MECHANICAL INSTALLATION INSTRUCTIONS (3/6)

3. To install anchors:
   a. Perform mechanical installation of the Battery Rack as per the CATL 280 Ah Liquid Cooling Rack User's Manual section 5.3 "Preparation for installation" and section 5.4 "Installation Procedure," such that the Battery Rack front-left mounting slot engages the only chemical anchor installed so far. Do not damage the protruding anchor or conduits in the concrete pad. Ensure the Battery Rack is oriented correctly relative to the concrete pad. Use the remaining 8 Battery Rack foot slots to precisely mark the locations on the concrete pad for the remaining 8 Battery Rack chemical anchors to be installed. Then lift the Battery Rack off the concrete pad and place it down nearby in a designated secure location.



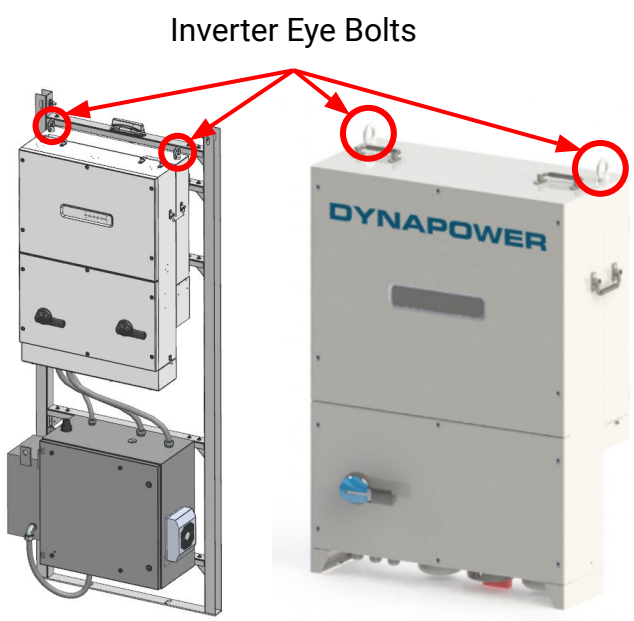
   b. Precisely mark on the concrete pad the locations for the 2 concrete anchors for the Ancillary Rack according to the "PowerNode Nexus Pad Preparation" section of this Site Design Guide and the site-specific approved construction drawings. If the site will have a Security Cage, also mark locations for the 4 concrete anchors for the Security Cage. Drill holes for those anchors and install anchors according to the "PowerNode Nexus Pad Preparation" specifications.
   c. Drill holes for the 8 remaining Battery Rack chemical anchors in the locations marked earlier, and install the chemical anchors. Refer to the site-specific approved construction drawings for details on chemical anchor holes and anchor installation.

SITE PREPARATION

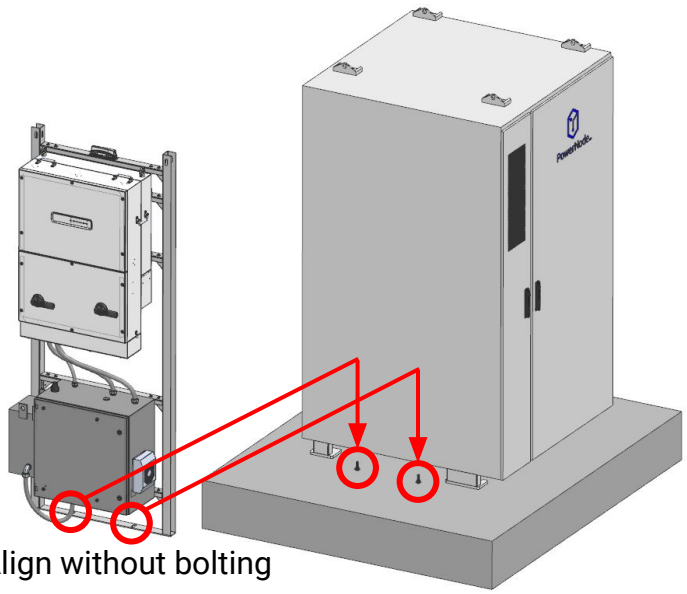
POWERNODE NEXUS MECHANICAL INSTALLATION INSTRUCTIONS (4/6)

4. Perform mechanical installation of the Battery Rack as per the CATL 280 Ah Liquid Cooling Rack User's Manual section 5.4 "Installation Procedure." Do not damage the protruding anchors or conduits in the concrete pad. Install 9x nuts & washers for the Battery Rack M16 chemical anchors and torque to 110-150 Lb-Ft (defer to chemical anchor manufacturer spec if different). Repaint lifting lugs if needed after lifting with a crane.

5. Stabilize the Ancillary Rack until it is secured in place. Lift the Ancillary Rack, without the Roof Weldment, by the inverter eye bolts. Use lifting machinery rated for at least 660 lbs weight.



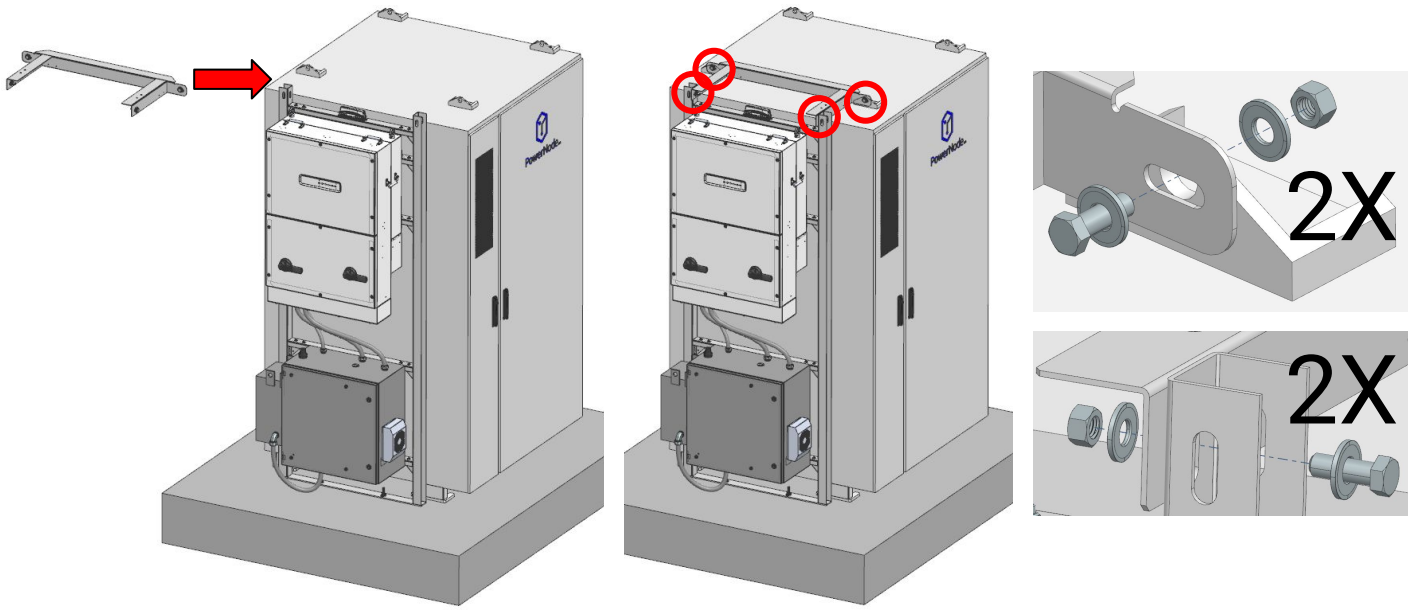
6. Lower the Ancillary Rack into position beside the Battery Rack such that the two anchors in the concrete pad protrude through the Rack's bottom slots, but do not install the associated nuts yet. Take care not to damage the anchors. Continue supporting the Ancillary Rack with the lifting machinery and stabilizing it by hand until instructed otherwise.



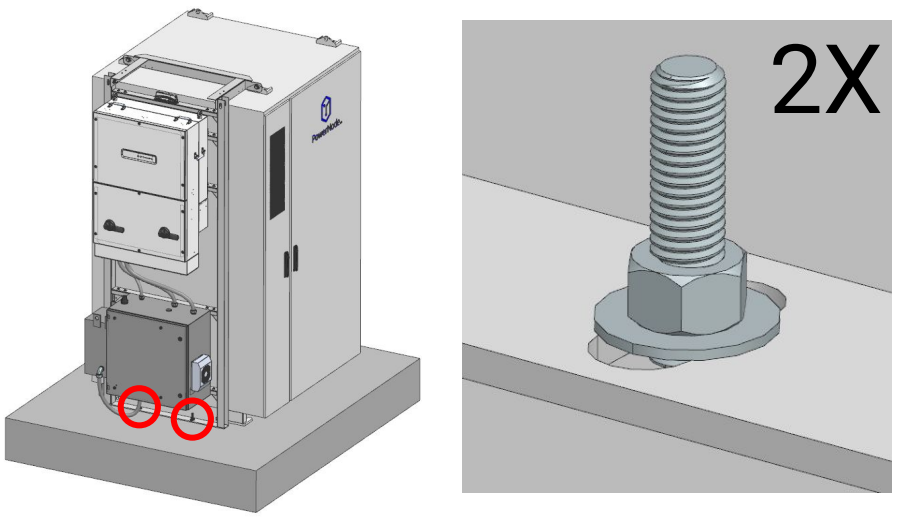
SITE PREPARATION

POWERNODE NEXUS MECHANICAL INSTALLATION INSTRUCTIONS (5/6)

7. Place the Ancillary Roof Weldment as shown, and loosely thread the four bolted connections that attach it to the Ancillary Frame and to the Battery Rack. Do not tighten the bolts with any preload yet; allow the bolts to slip. Use two 1/2” oversized washers for each 1/2”-13 screw and nut (all 316 stainless steel).



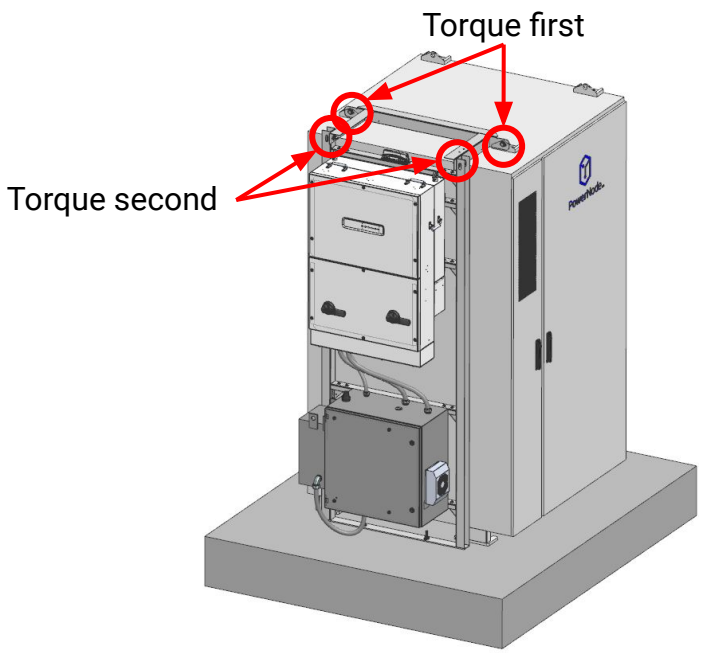
8. Fasten the Ancillary Rack to the concrete pad with the two 316 stainless steel 1/2” concrete anchors with nuts and oversized (1.25” O.D.) washers. Torque to 60 Lb-Ft.
Note: torque stainless steel hardware slowly to avoid galling. Anti-seize on threads may help ensure risk of galling is minimized, as long as torque values are adjusted according to anti-seize manufacturer’s recommendations.



SITE PREPARATION

POWERNODE NEXUS MECHANICAL INSTALLATION INSTRUCTIONS (6/6)

9. Torque the four bolts on the Ancillary Roof Weldment to 25 Lb-Ft. First torque the two bolts that attach the Roof Weldment to the Battery Rack, and then torque the two bolts that attach the Roof Weldment to the Ancillary Frame.
Note: torque stainless steel hardware slowly to avoid galling. Anti-seize on threads may help ensure risk of galling is minimized, as long as torque values are adjusted according to anti-seize manufacturer's recommendations.



10. Once the Ancillary Rack is secured, the Ancillary Rack no longer needs to be stabilized by hand, and the lifting machinery can be removed.

SITE PREPARATION

SITE LEVEL POWER METER

A site-level power meter kit containing particular component models is required to monitor the total energy exchange of the battery system. The kit must be supplied directly from Electric Era in order for parts to arrive with the firmware updates required to function properly. The kit to be ordered is:

Kit Part Number: 107-01367

The kit consists of one power meter housed in a standalone NEMA 4X-rated enclosure (Accuenergy Acupanel 9104X-IIR-mV-P3V3) which requires phase voltage connections, three Rogowski CTs (Accuenergy RCT16-1000) for current sensing, and one web module (Accuenergy AXM-WEB2). The power meter should be installed at the PowerNode Panel with appropriate mounting and conduit to meet local requirements. The meter connects to PowerNode Nexus via Ethernet cable.

POWERNODE NEXUS ISOLATION TRANSFORMER

The inverter in PowerNode Nexus must be supplied with 480V 3-phase 3-wire via a Delta or floating (ungrounded) Wye, typically derived by a dedicated isolation transformer. The PowerNode side must be Delta. Recommended specifications: 150 kVA, 10kV BIL, 1.2kV class, 5% impedance minimum, K factor 1, with electrostatic shield.

CLOUD CONNECTIVITY

In order to ensure proper internet connectivity of the unit, PowerNode Nexus+'s 5G antenna must be able to obtain a clear signal from a local cell tower. The simplest way to ensure this is to test for LTE/5G cell reception from any carrier at the site prior to installation.

ELECTRICAL CONNECTION

ELECTRICAL CONNECTION PRECAUTIONS

Once the unit is placed on the pad and bolted into place using the provided mounting points, PowerNode Nexus can be electrically integrated and connected to site power and Ethernet.

⚠ **WARNING!** *Always follow the precautions in the "General Precautions" section of this manual.*

⚠ **WARNING!** *All instructions in this document must be performed by qualified personnel authorized by Electric Era.*

⚠ **DANGER!** *Before performing any steps in this document's "Electrical Connection" chapter, first de-energize and lock out/tag out (LOTO) the system as per the "System and Source Shutdown" section of the PowerNode Nexus Commission, Operation, & Decommission Manual, and close and lock the Battery Rack right-side door.*

⚠ **DANGER!** *Stored energy is present in the inverter. After shutting down PN Nexus according to the "System and Source Shutdown" section of the PowerNode Nexus Commission, Operation, and Decommission Manual, do not remove the inverter front panel until 5 minutes have passed, and test exposed conductors for voltage to ensure internal capacitors have discharged.*

⚠ **WARNING!** *Perform the instructions in this document's "Electrical Connection" chapter only when instructed to do so by the PowerNode Nexus Commission, Operation, & Decommission Manual. Be sure to follow any warnings in that manual as they apply to these instructions.*

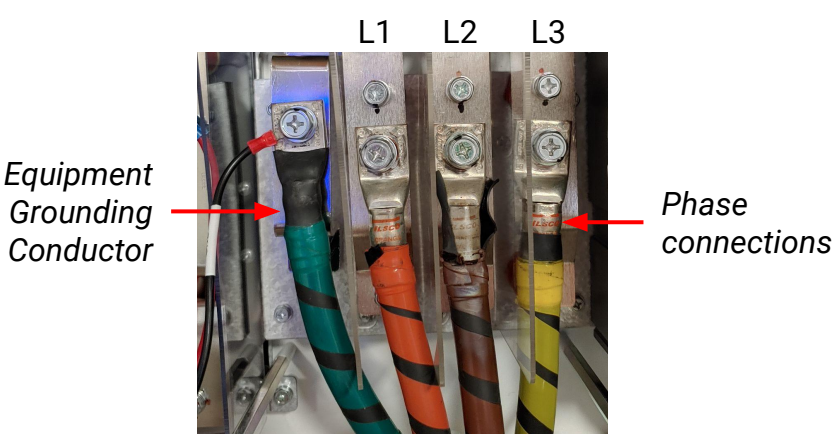
⚠ **WARNING!** *For all electrical connections: ensure the connection is correct, is reliable (will not be loosened), has good contact, and creates no short circuit.*

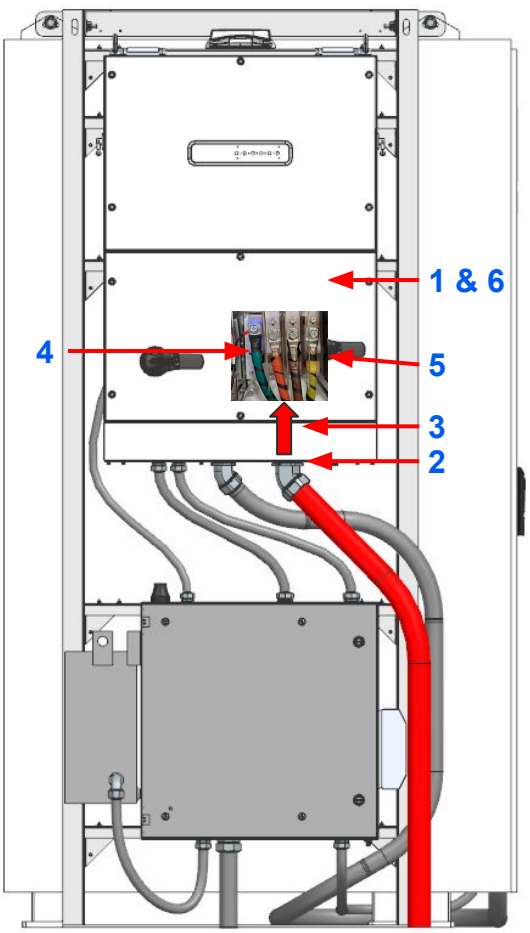
⚠ **WARNING!** *Do not allow precipitation such as rain, snow, or dusty/sandy wind to enter PN Nexus through open doors or removed covers. Do not let any unmated connectors get wet or dirty.*

ELECTRICAL CONNECTION

CONNECT 480V AC 3-PHASE POWER TO INVERTER

1. Remove inverter front panel and interior safety shield.
2. Cut appropriate knockout on the right side of the bottom plate of the inverter cable entry shroud and install conduit from stub-up in pad to this knockout.
3. Route 480V 3 phase and ground wires into inverter.
4. Connect 480V ground wire lug to inverter ground terminal. Torque to 15.5 Lb-Ft.
5. Connect service conductor lugs to inverter terminals as shown below in phase order: L1/left, L2/middle, L3/right. Check phase rotation: inverter requires clockwise (positive) rotation. Torque to 15.5 Lb-Ft.
6. Reattach inverter interior safety shield and front panel. Torque front panel to 3.6 Lb-Ft.

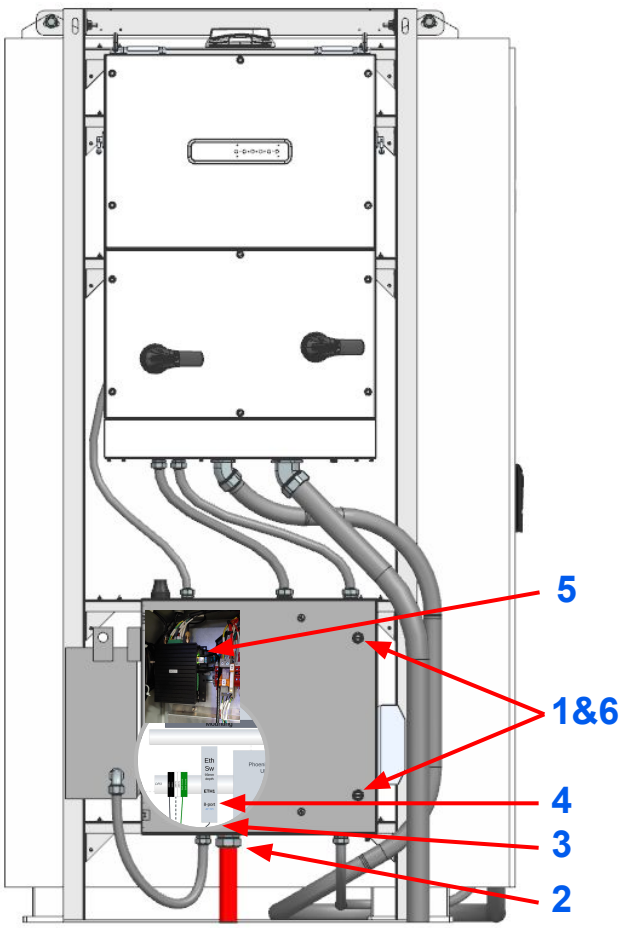




ELECTRICAL CONNECTION

CONNECT ETHERNET CABLES FROM SITE POWER METER, DISPENSERS, & SITE

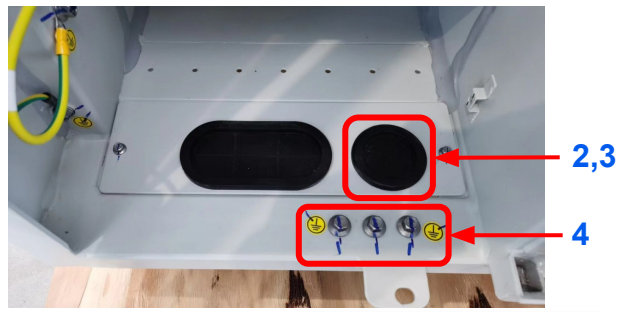
1. Open Control Enclosure door.
2. Cut appropriate knockout in bottom of Control Enclosure and install conduit from stub-up in pad to this knockout. Locate knockout near the Ethernet switch (shown in diagram below).
3. Route Ethernet cables into Control Enclosure. Cables should be CAT6, shielded, pre-terminated, and rated for the installation condition (wet locations when in conduit).
4. Connect cables from site power meter and dispensers to any open ports on Ethernet switch.
5. Close & lock the Control Enclosure door.

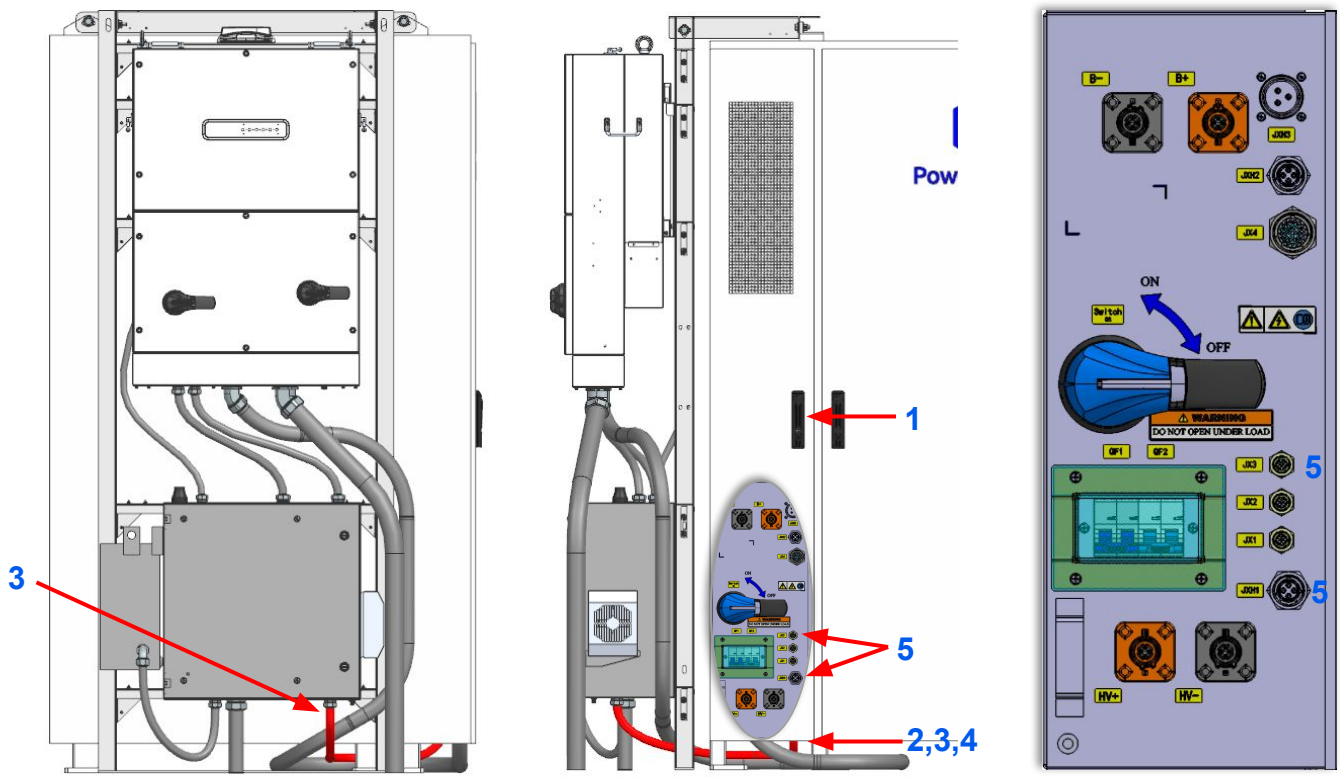


ELECTRICAL CONNECTION

CONNECT AUXILIARY PWR & COMMS CABLES FROM CONTROL ENCLOSURE TO BATTERY RACK

1. Open left-hand door on Battery Rack.
2. Precut and install rubber cable grommet for the Battery Rack right cable entry hole.
3. Route the Control Enclosure's bottom rightmost flexible conduit with cables behind & around Battery Rack corner foot as shown, & up through Battery Rack right cable entry hole. Secure the conduit.
4. Fasten ground cable from this conduit to grounding bar at bottom of Battery Rack bay using one of the M8 flanged bolts. Torque to 10 Nm.
5. Connect JXH1 & JX3 connectors (both twist-lock) to Battery Rack control box in labeled locations.





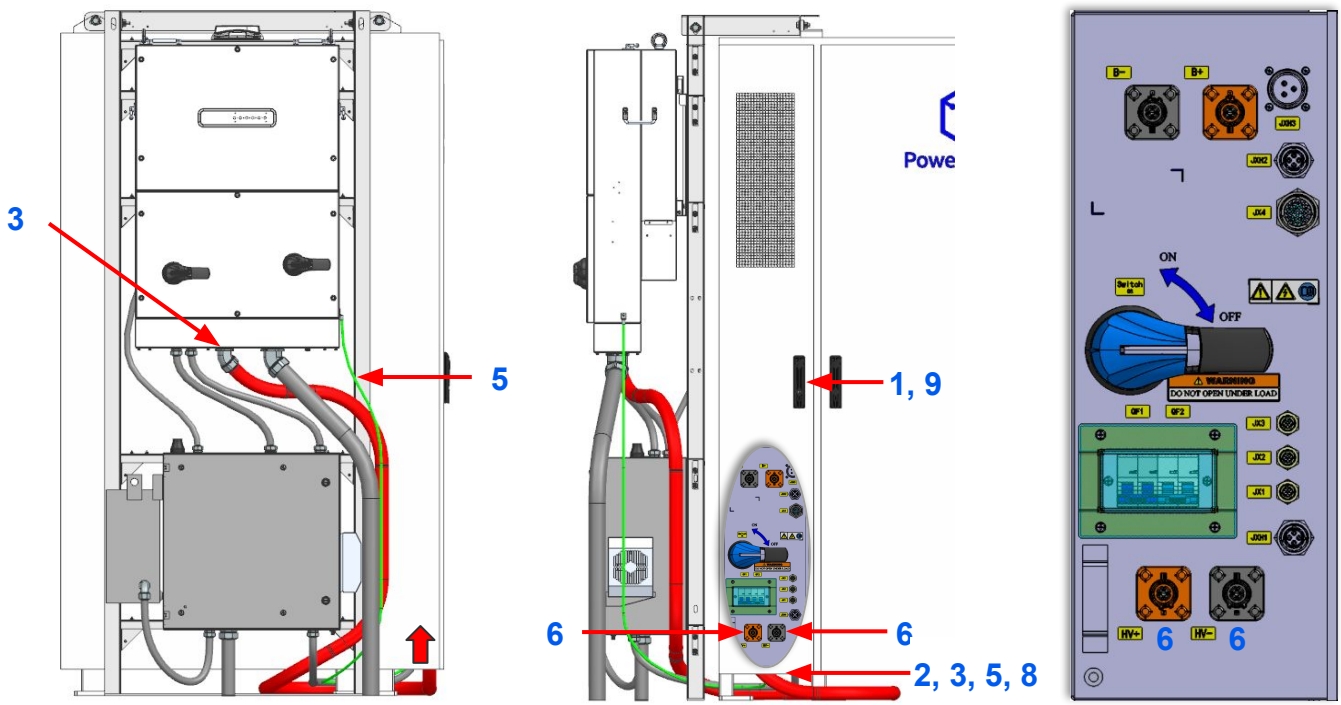
ELECTRICAL CONNECTION

CONNECT HIGH-VOLTAGE DC POWER CABLES FROM INVERTER TO BATTERY RACK (1/2)

1. Open left-hand door on Battery Rack.
2. Precut and install rubber cable grommet for the Battery Rack left bay's left cable entry slot.
3. Route the cut ends of the two provided high-voltage power cables down through the grommet, into the conduit running to the inverter, and to the HV DC bus bars in the inverter with small ring terminals included, as shown on next page.
4. Strip ends of two high-voltage power cables, and ground cable, and install provided compression lugs using appropriate crimp tooling. Fasten lugs to HV DC bus bars in inverter with small ring terminals included, as shown on next page, and torque to 31 Lb-Ft.
5. Route the ground cable from the side of the inverter up through the rubber cable grommet into the Battery Rack left bay, and fasten cable to grounding bar at bottom of Battery Rack bay using one of the M8 flanged bolts. Torque to 7 Lb-Ft.
6. Connect HV+ and HV- connector from the two high-voltage power cables to Battery Rack control box in labeled locations. Refer to CATL 280 Ah Liquid Cooling Rack User's Manual section 5.6.2.3 "DC Power Cable Connection" for details of making the connections.

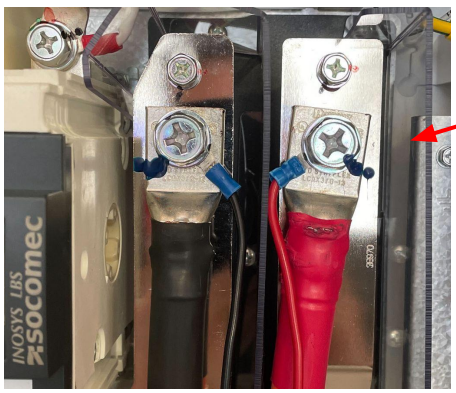
WARNING! *Ensure that positive and negative poles are not reversed and connector is locked.*

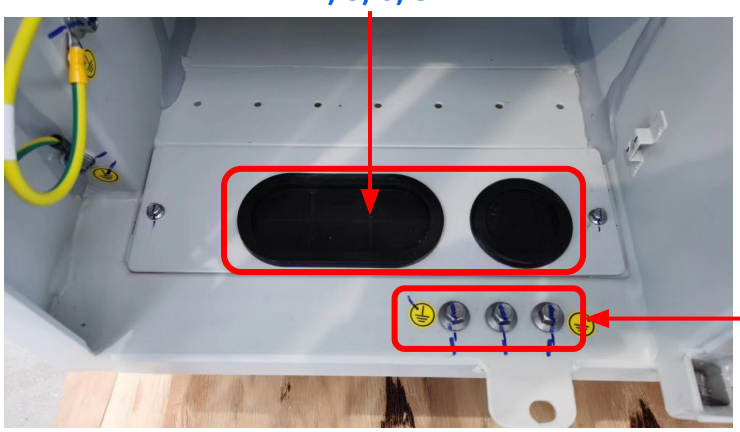
7. Reattach inverter interior safety shield and front panel. Torque front panel to 3.6 Lb-Ft.
8. Fill both Battery Rack cable entry ports with sealing compound to prevent moisture ingress.
9. Close and lock left-hand door on Battery Rack if access to bay is no longer needed.



ELECTRICAL CONNECTION

CONNECT HIGH-VOLTAGE DC POWER CABLES FROM INVERTER TO BATTERY RACK (2/2)





DOCUMENT INFO

REFERENCED DOCUMENTS

DOCUMENT NAME
PowerNode Nexus Commission, Operation, & Decommission Manual
PowerNode Nexus Maintenance Guide
PowerNode Nexus Specifications
CATL 280 Ah Liquid Cooling Rack User's Manual
Safety Data Sheet (for CATL Model Name O552280-P)
Product Specification: Outdoor Liquid Cooling Rack
PowerNode Nexus Control Enclosure Wiring Diagram, Drawing No. 920-01597
PowerNode Nexus Security Cage Manual

DOCUMENT INFO

CHANGELOG

Version ID	Date Released	Summary of Changes
V2.1.0	2/5/2024	Full document release for PN Nexus V2.1.
V2.1.1	3/6/2024	Corrected power meter P/N & SLD.
V2.1.2	8/5/2024	Removed references to FC200K dispenser; removed SLD; updated electrical installation for in-ground HV conduit.