RIB Repower – Technical Overview

Implementation Guide for Conversion from LS700 to NEP BDM800 Retrofit
Prepared by Global RAIS | Spectrum Solar LLC

RIB REPOWER – TECHNICAL OVERVIEW

Summary

- Purpose: Retrofit legacy LS700-based RIB arrays with NEP BDM800 microinverters.
- Objectives: Improve reliability, enable 3-phase operation, restore full system output.
- Applies to both REFLECT and RAIS DUO legacy systems. Can be used to update older 5KW based systems.

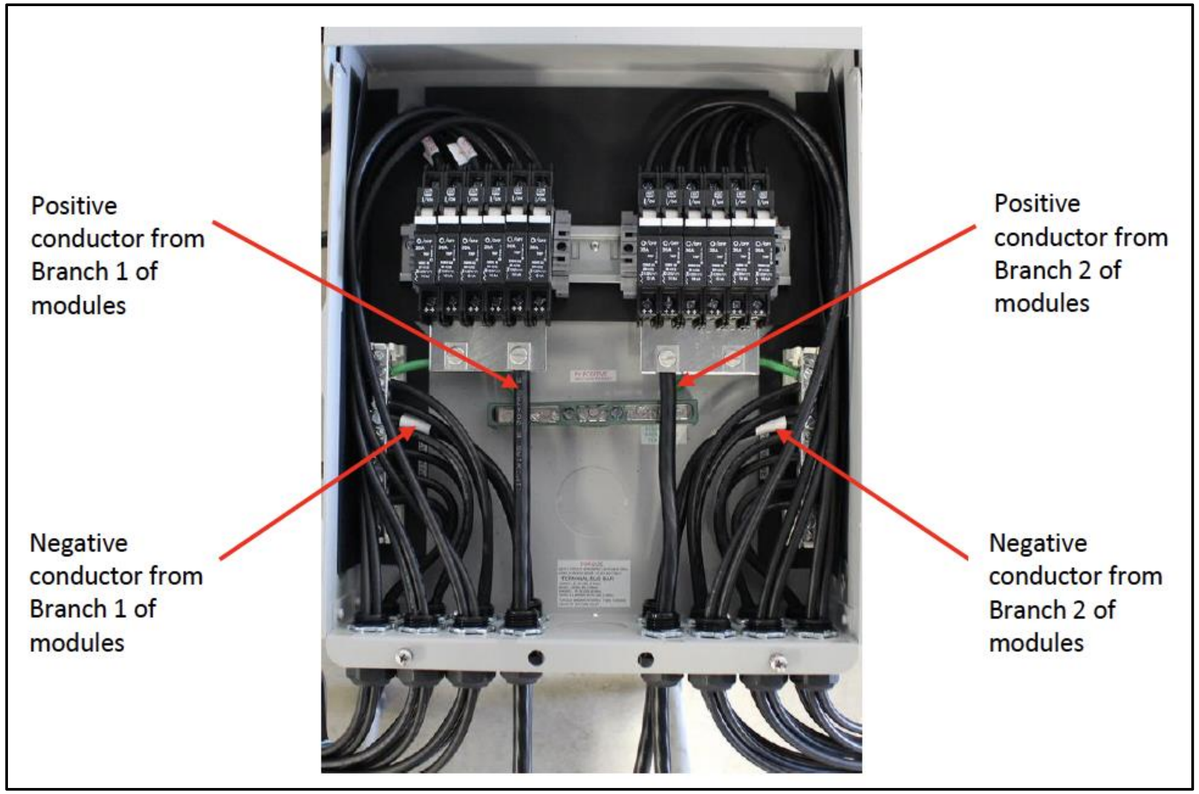
RIB REPOWER – TECHNICAL OVERVIEW

System Architecture Comparison

- Legacy: LS700 microinverters (TenK) with TK modules and DC-AC trunk cabling.
- Upgraded: NEP BDM800 240/208V and 277V microinverters, NEP Trunk connectors, NEP Gateway installed.
- Improvements: Simplified wiring, integrated monitoring, better thermal and electrical performance.

RIB REPOWER – TECHNICAL OVERVIEW

DC Combiner Box and Old LS700 RIB Assemblies

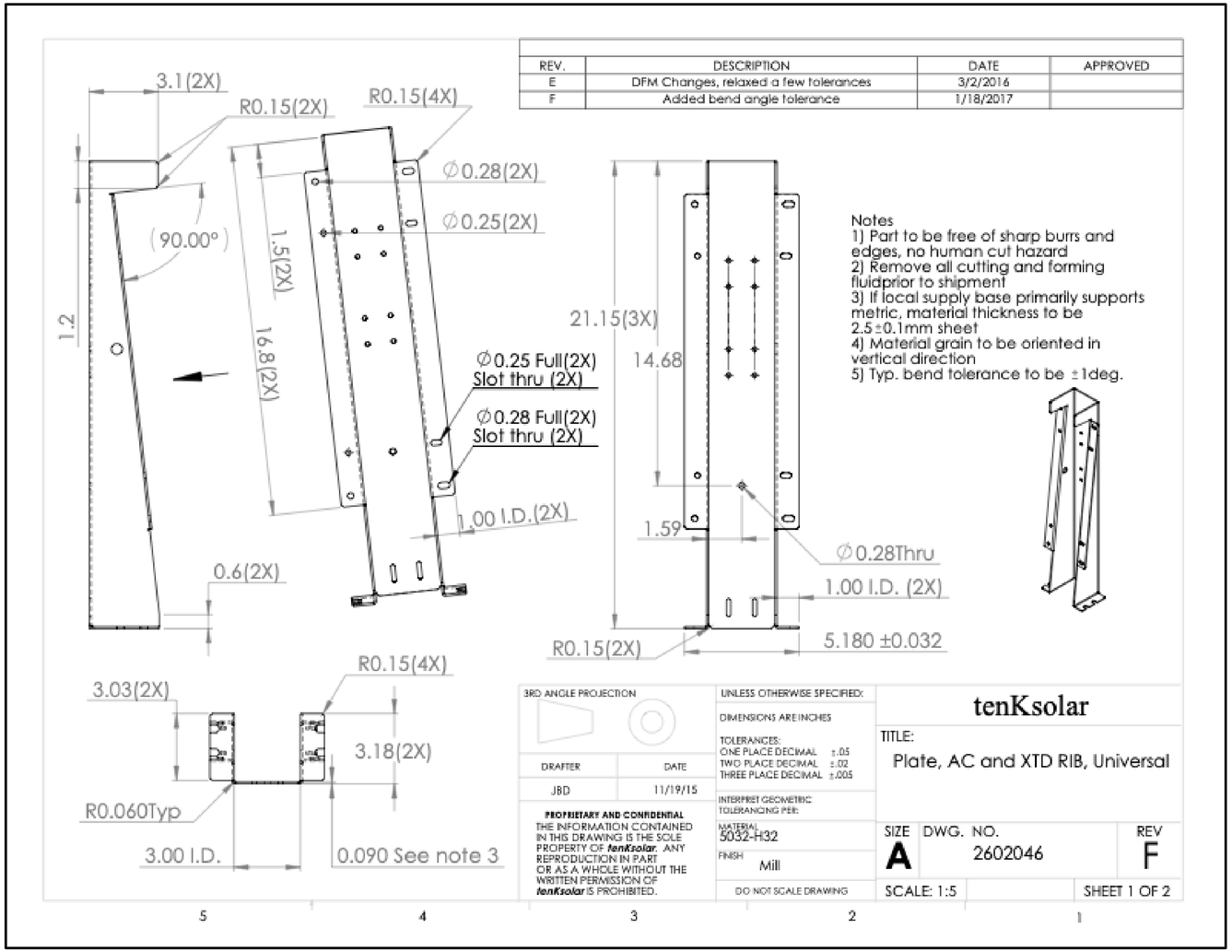




RIB REPOWER – TECHNICAL OVERVIEW

RIB Plate – Rev B and Rev F

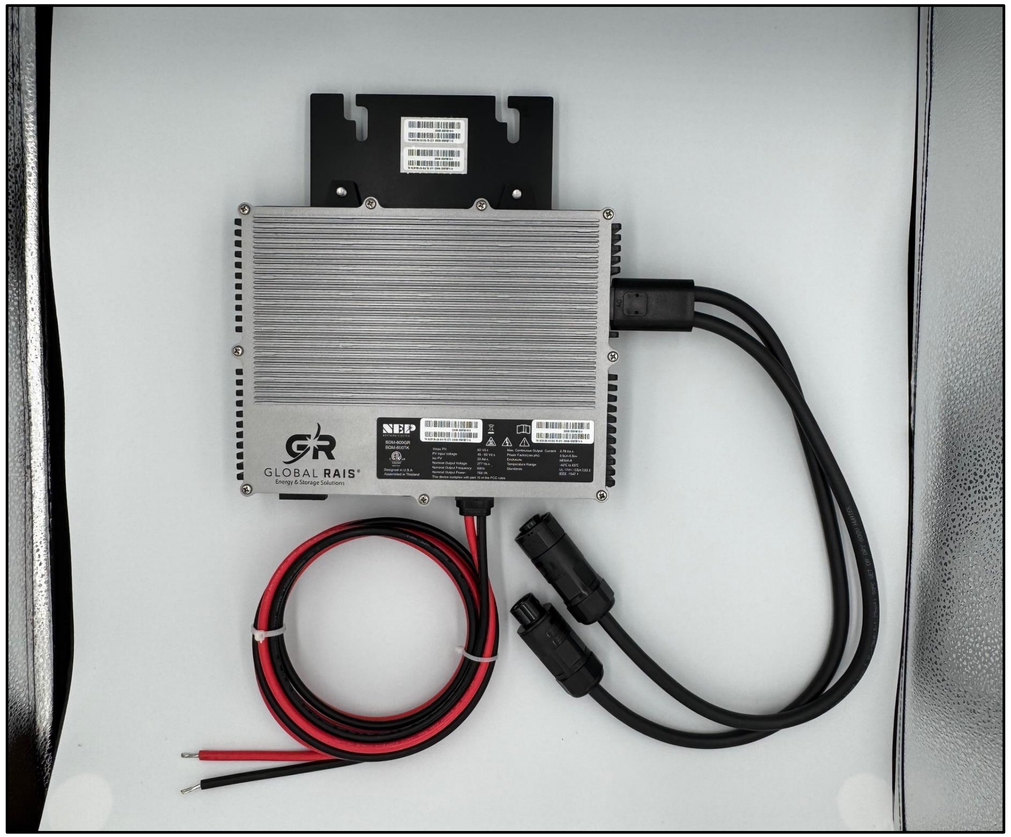




RIB REPOWER – TECHNICAL OVERVIEW

NEP BDM800 GR/TK 240/208V and 277V





RIB REPOWER – TECHNICAL OVERVIEW

Component Overview

- NEP BDM800 Specs: Dual-input, 800W rated, 97.5% efficiency, available in 240V/208V/277V versions.
- NEP Gateway: Supports 3-phase 208V and 480Y/277V; Used PLC communications and supports up to 256 inverters.
- T-Connector: Provides trunk connectivity and quick field replacement capability.
- All components meet UL 1741, IEEE 1547, NEC 2020 Sections 690.11 & 690.12

RIB REPOWER – TECHNICAL OVERVIEW

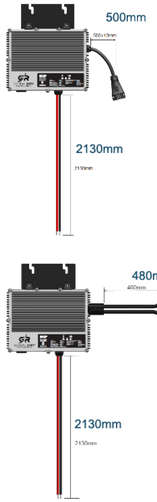
NORTHERN ELECTRIC

BDM-800GR MICROINVERTER

NEP Part Name
BDM-800GR-277
BDM-800GR-208/240

BDM-800TK MICROINVERTER

NEP Part Name
BDM-800TK-277
BDM-800TK-208/240



cable lengths
+-10mm
estimate

northernep.com

Features

- U.S. California Rule 21 Certified
- High performance, application specific design
- Continuous output up to 768Wac

recommended for dual max 600W solar panel

- High efficiency with 96.5% CEC
- Globally certified for UL1741, SAA, TUV, VDE-AR-N 4105, VDE 0126, TOR Erzeuger Typ A
- Integrated grounding for easy installation
- NEMA-6/IP-66/IP-67 enclosure rating
- Integrated monitoring and power line communication with BDG256 gateway
- Designed for Global RAIS® (TenK) solar panels

SAA 152167

Important product information

- NEP is committed to developing Clean, Affordable, Reliable and Efficient (CARE) products for our customers worldwide.
- NEP microinverters have an isolation transformer and basic isolation between the DC input and the AC output network.

2024-08-28

NORTHERN ELECTRIC

BDM-800GR BDM-800TK MICROINVERTER

INPUT(DC)	Max Recommended PV Power (Wp)	1200		
	Max DC Open Circuit Voltage (Vdc)	60		
	Max DC Input Current (Adc)	20		
	Isc PV (absolute maximum) (Adc)	30		
	Maximum Inverter Backfeed Current to the Array (Adc)	0		
OUTPUT (AC)	Max AC Output Power (Wp)	800		
	Nominal Power Grid Voltage (Vac)	240	208	277
	Allowable Power Grid Voltage (Vac)	configurable*		
	Allowable Power Grid Frequency (Hz)	60 / configurable*		
	THD	<3% (at rated power)		
	Power Factor (cos phi, fixed)	0.8un>0.8ov		
	Rated Output Current (Aac)	3.2	3.85	2.89
	Current (inrush)(Peak and Duration)	9.4A, 15us		
	Nominal Frequency (Hz)	60		
	Maximum Output Fault Current (Aac)	9.6A peak		
	Maximum Output Overcurrent Protection (Aac)	10		
	Maximum Number of Units Per Branch (20A) (All NEC adjustment factors have been considered)	5	4	5
SYSTEM EFFICIENCY	Weighted Averaged Efficiency (CEC)	96.50%		
PROTECTION FUNCTIONS	Night Time Rate Loss (Wp)	0.11		
	Over/Under Voltage Protection	Yes		
	Over/Under Frequency Protection	Yes		
	Anti-Islanding Protection	Yes		
	Over Current Protection	Yes		
	Reverse DC Polarity Protection	Yes		
	Overload Protection	Yes		
	Protection Degree	NEMA-6 / IP-66 / IP-67		
	Ambient Temperature	-40°F to +149°F (-40°C to +65°C)		
	Operating Temperature	-40°F to +185°F (-40°C to +85°C)		
	Display	LED LIGHT		
	Comunications	Power Line		
	Dimension (W-H-D)	8.8" x8.2" x1.38" (268x250x42 mm)		
	Weight	6.4 lbs. (2.9 kg)		
	Environment Category	Indoor and outdoor		
	Wet Location	Suitable		
	Pollution Degree	PD 3		
	Overvoltage Category	II(PV), III (AC MAINS)		
	Product Safety Compliance	UL 1741 CSA C22.2 No. 107.1		IEC/EN 62109-1 IEC/EN 62109-2
	Grid Code Compliance* (Refer to the label for the detailed grid code compliance)	IEEE 1547		VDE-AR-N 4105* VDE V 0126-1-1 AS 4777.2 & AS TOR Erzeuger Typ A

* Grid parameters are configurable through a BDG-256 or BDG-256P3 gateway
* All NEC required adjustment factors have been considered for AC outputs. AC current outputs will not exceed stated values for Rated Output AC Current

COMPLIANCE
*NEC 2020 Section 690.11 DC Arc-Fault Circuit Protection
*NEC 2020 Section 690.12 Rapid Shutdown of PV Systems on Buildings
*NEC 2020 Section 705.12 Point of Connection (AC Arc-Fault Protection)

NEP BDM800GR/TK Specifications

RIB REPOWER – TECHNICAL OVERVIEW

RIB Rebuild Process

1. Disassemble RIB and inspect components.

2. Clean and test bus bars, replace faulty wiring.

3. Mount NEP BDM800 microinverters and confirm torque specs. Stack mount plates and then bolt into the inverter mount bar.

4. Connect T-Connectors and validate continuity.

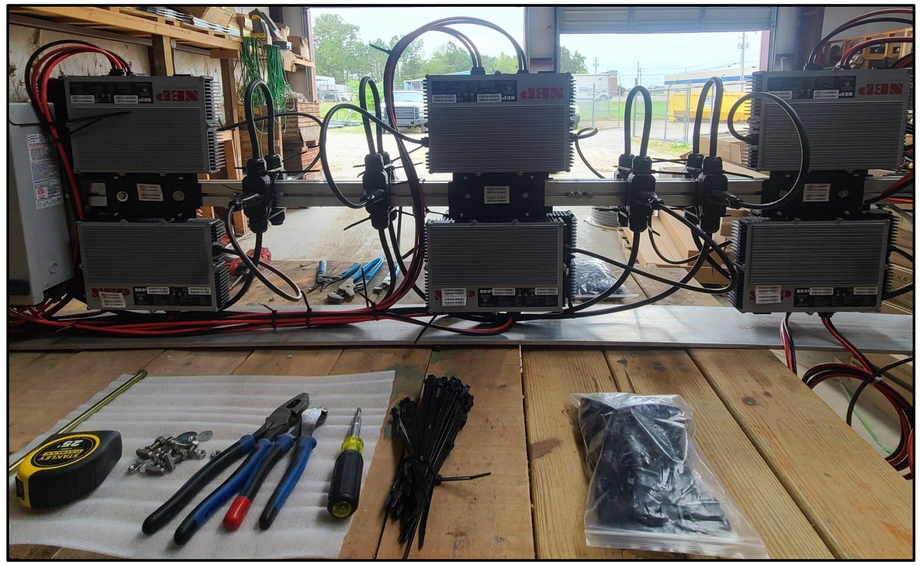
5. Record each inverter and gateway serial number.

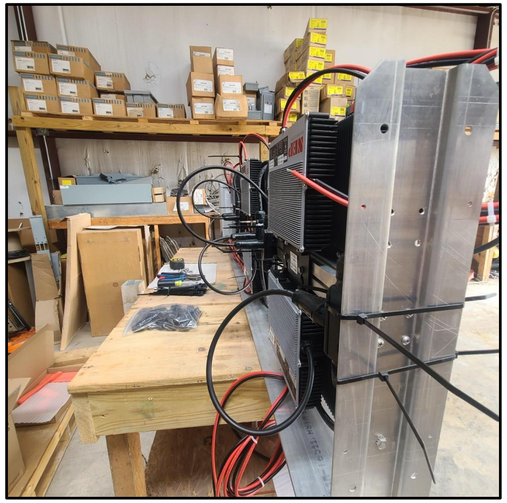
6. Perform insulation and phase verification before commissioning.

RIB REPOWER – TECHNICAL OVERVIEW



RIB Repower Build Process



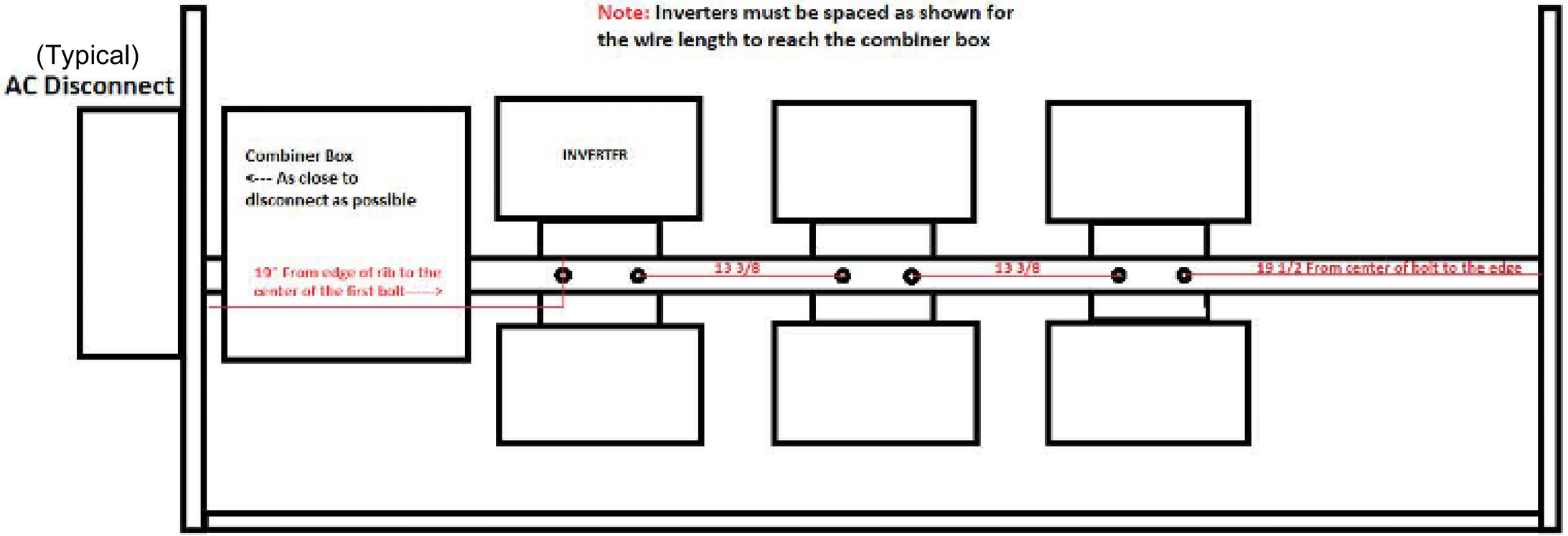




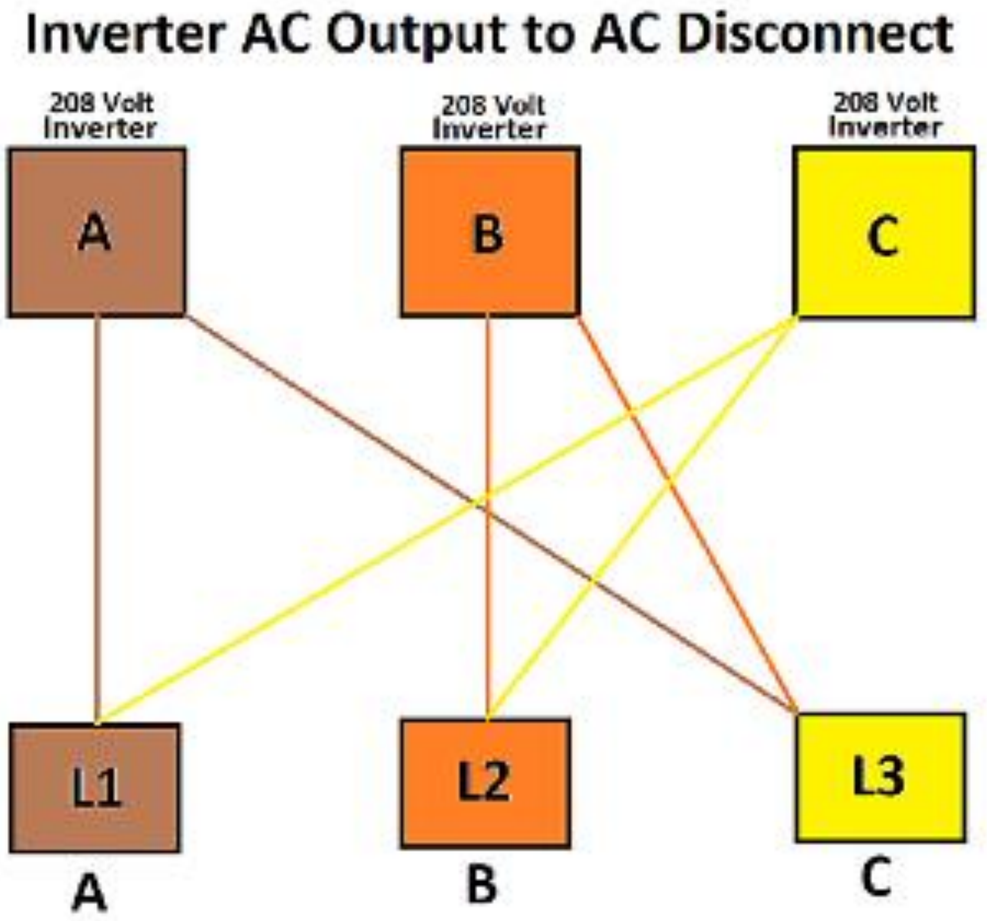


RIB REPOWER – TECHNICAL OVERVIEW

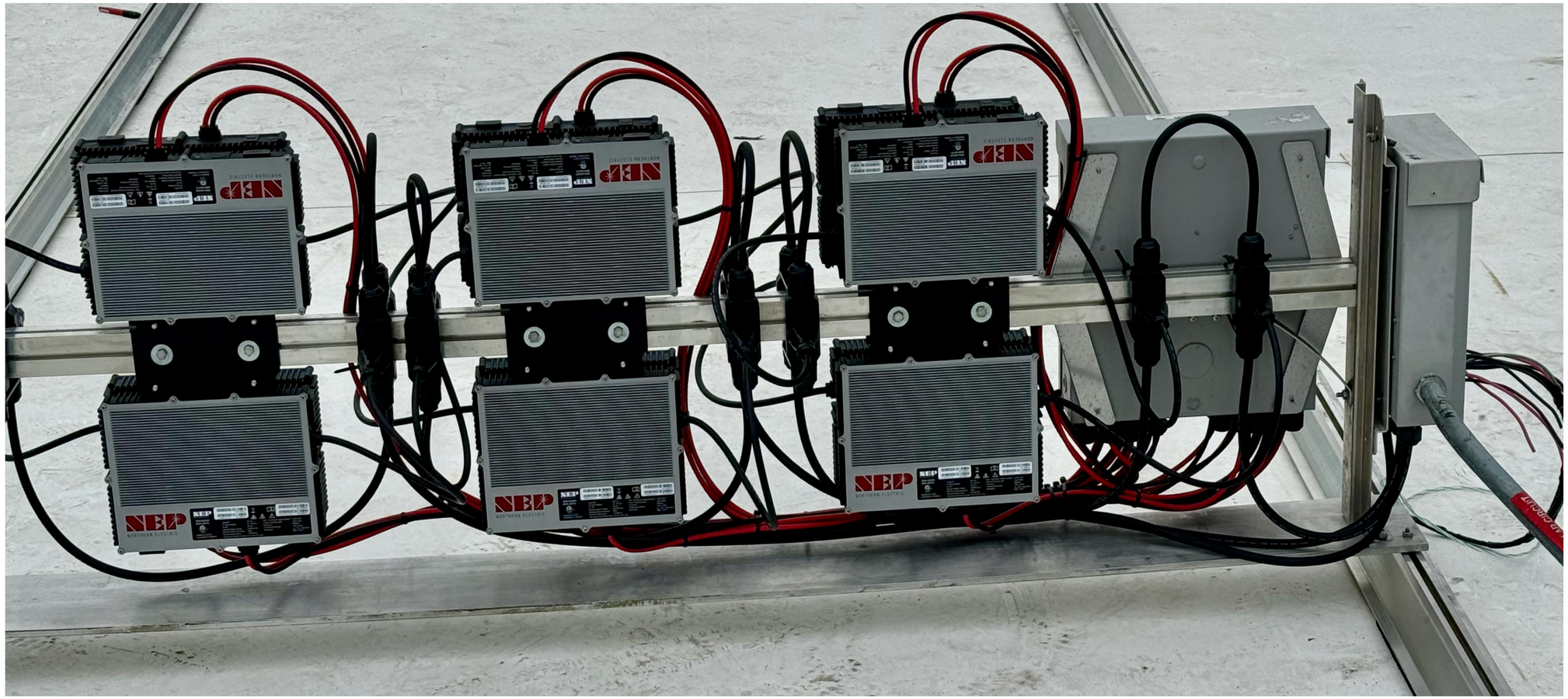
RIB Microinverter Layout



RIB REPOWER – TECHNICAL OVERVIEW



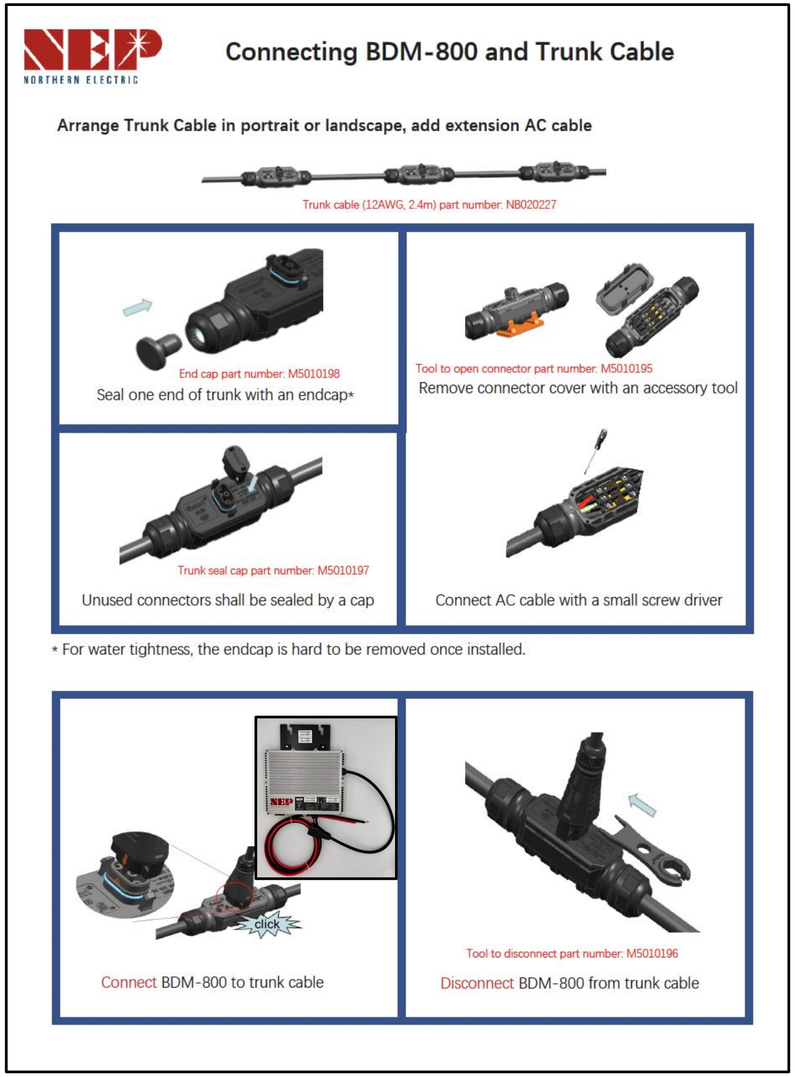
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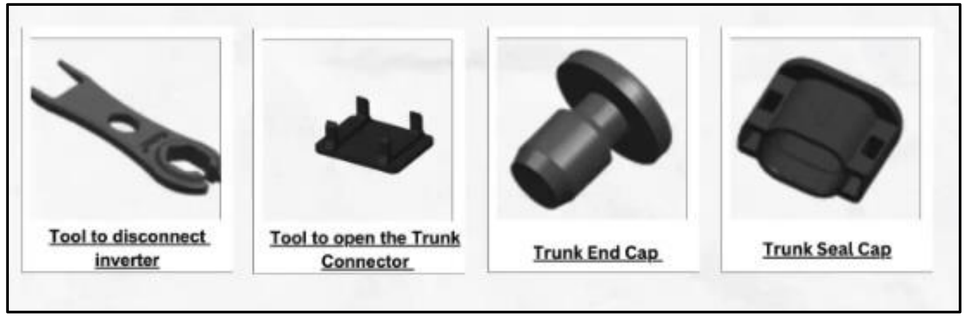
Finished NEP BDM800 3Phase Build

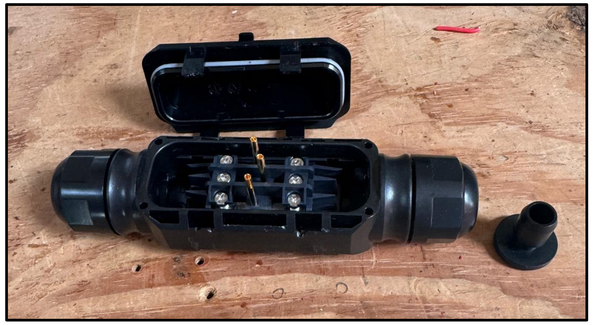
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NEP Trunk Connector (T-connector)











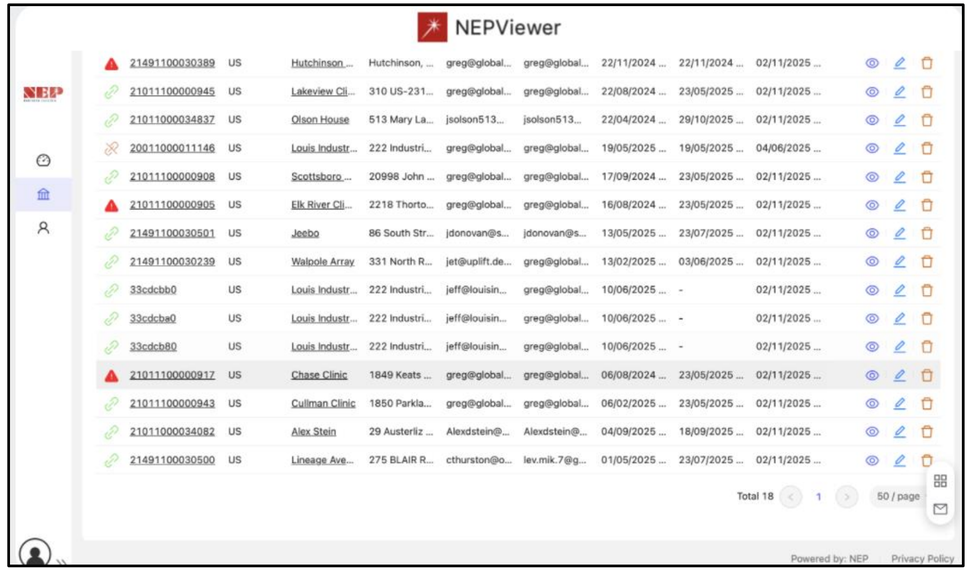


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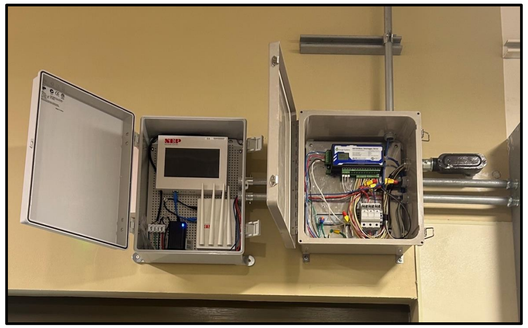




NEP Gateways and Portfolio Viewer

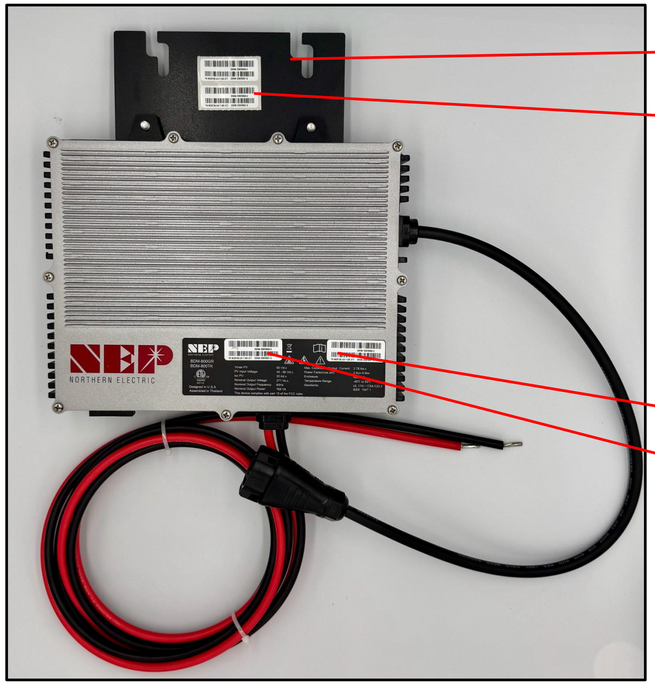


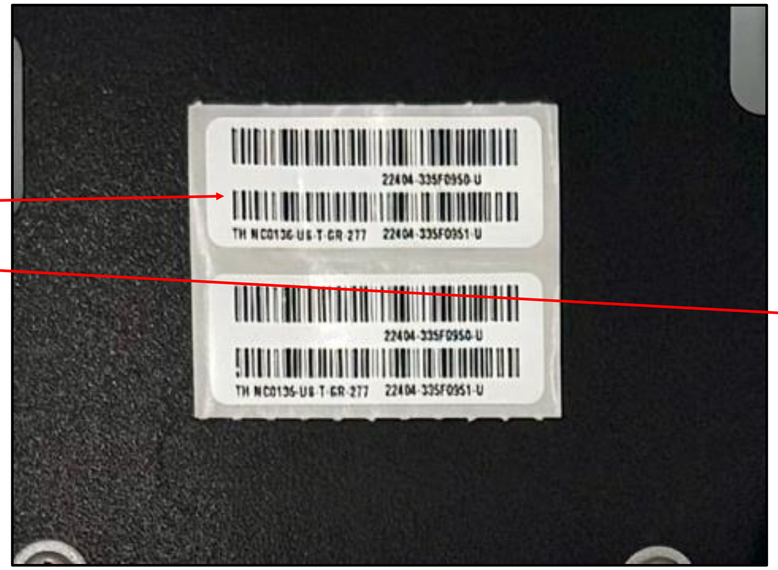




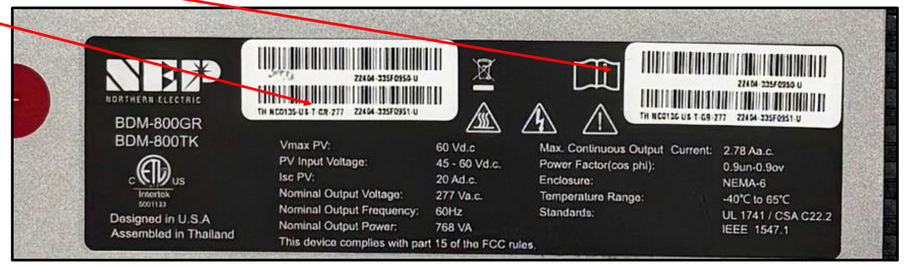
RIB REPOWER – TECHNICAL OVERVIEW

Microinverter Serial Numbers

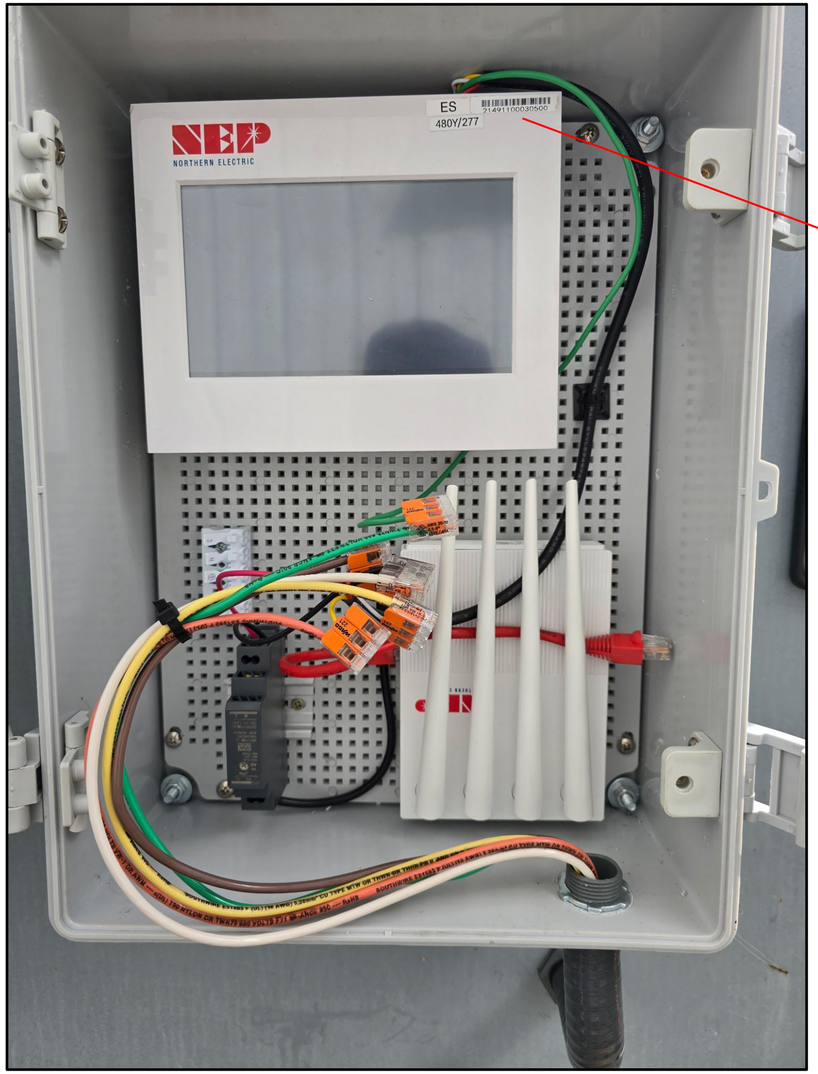








RIB REPOWER – TECHNICAL OVERVIEW



3PH 480Y/277V Gateway



Gateway Serial No.

RIB REPOWER – TECHNICAL OVERVIEW

Testing & Commissioning

1. Verify all microinverters registered in NEP Viewer.

2. Confirm communication between gateway and all devices.

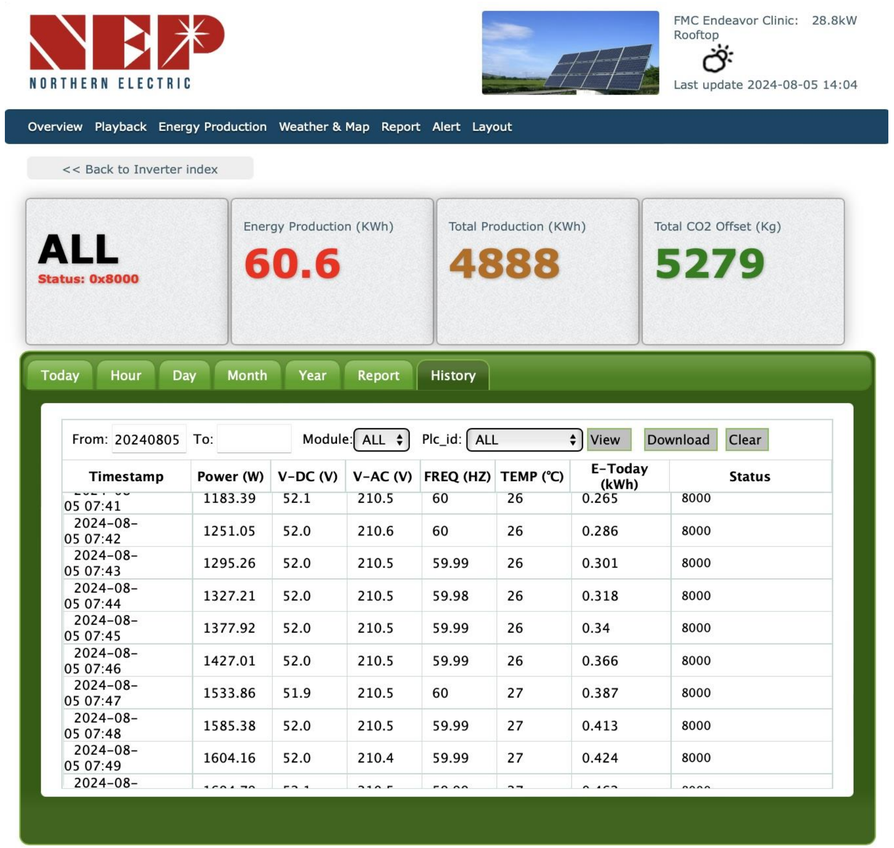
3. Measure voltage and current per RIB leg; verify phase balance.

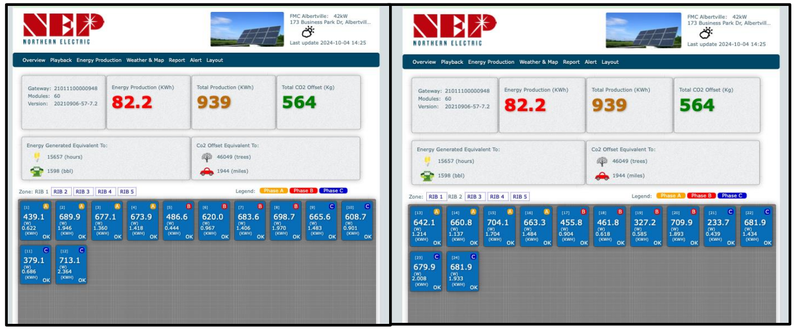
4. Conduct performance validation test for 30 minutes under load.

5. Record all serial numbers and upload to project QA log.

RIB REPOWER – TECHNICAL OVERVIEW

NEP Viewer Data Access







RIB REPOWER – TECHNICAL OVERVIEW

Site Example – Albertville, Alabama FKC Dialysis Clinic

- System size: 60kW DC | 3-Phase 208V output.
- Rebuilt RIBs: 5 RIB assemblies with new 208V/240V NEP BDM800 microinverters.
- 3PH Gateway Installed.
- Commissioned and online under NEP Viewer monitoring platform.

RIB REPOWER – TECHNICAL OVERVIEW

Albertville Dialysis Clinic – 60kW DC

