

CERTIFICATE OF COMPLIANCE

Certificate Number: XWDA, BVQYDA Certification Report Number: LIT15250623 Issue Date: April 2, 2025

COC No.:LIT15250623COC

Sangam Baligar Enphase Energy, Inc. 47281 Bayside Pkwy Fremont, CA 94538 sbaligar@enphaseenergy.com

Product Name: IQ Battery R4 Model No.: IQBATTERY-10C-1P-NA

This is to certify that representative samples of the above listed product have been investigated by Bureau Veritas in accordance with the Standard(s) indicated in Annex A of this certificate.

Please Note: This certificate does not represent authorization for the use of any Bureau Veritas Certification Marks.

If there are any questions regarding the details contained in this letter, please contact me or any Bureau Veritas CPS customer service representative.

Sincerely,

Reviewed by,

Aditya Iyer

Aditya Iyer Principle Engineer aditya.iyer@bureauveritas.com

Dishant Patel

Dishant Patel Reviewer dishant.patel@bureauveritas.com



ANNEX A: CERTIFICATION STANDARDS

ANSI/CAN/UL 9540:2023, 3rd Edition, June 28, 2023, Energy Storage Systems and Equipment

UL 1741, 3rd Edition, October 23, 2024, Inverters, Converters, Controllers and Interconnection System Equipment for Use with Distributed Energy Resources, including Supplement A and Supplement B

CSA C22.2 #107.1:16 (R2021), 4th Edition, Power Conversion Equipment

UL 62109-1, 1st Edition, November 28, 2023, Safety of Power Converters for Use in Photovoltaic Power Systems -Part 1: General Requirements

IEEE1547-2018: IEEE Standard for Interconnection and Interoperability of Distributed Energy Resources with Associated Electric Power Systems Interface

IEEE1547.1-2020: IEEE Standard Conformance Test Procedures for Equipment interconnecting Distributed Energy Resources with Associated Electric Power Systems Interface

California Rule 21 Interconnection

HECO Rule 14H, SRD V2.0, Interconnection Application

ANNEX B: UL1998 COMPLIANCE DETAILS

Type/Model No.	Version	Unique Identifier	Date of Evaluation
BMU	4.4.24	555ba49b	
IQ8BL	10.9.13	1281c134	March 10, 2025
IQ8BN	10.9.16	7d7725c0	
BMU	4.4.28	9e9f96d	
IQ8BL	10.9.45	d807875c	March 23, 2025
IQ8BN	10.9.46	1aafd2b8	



ANNEX C: TEST SUMMARY

Test Name	UL1741	UL62109-1	IEC62109-2	CSA C22.2 #107.1
Maximum-Voltage Measurements	45	-	-	6.2
Temperature	46	4.3	-	6.3
Dielectric Voltage-Withstand Test	47	7.5	-	6.5
Output ratings	48.2	4.7	-	6.2, 10.5.4
Input range	48.3	4.7	-	6.2
Harmonic distortion	48.4	-	-	10.5.2
Output overload test	50.2	4.4.4.7	-	6.6
Short-circuit test	50.3	4.4.4.5	-	6.6, 10.5.5, 14.4.6
Component short- and open-circuit	50.6	4.4.4.1	-	6.6
Capacitor Voltage Determination Test	60	7.3.9	-	6.19
Backfeed Current Test	-	4.4.4.6	-	-
Durability of Marking	-	5.1.2	-	-
Ingress Protection	-	6.3	-	-
Protection Against Energy Hazards	-	7.5	-	-
Stress Relief Test	53	13.6.2.1	-	6.17
Impact Test	-	13.7.3	-	6.12
Harmonic Distortion	48.4	-	-	10.5.2
Stand-alone Inverter AC output voltage and frequency	-	-	4.7.4	-
Stand-alone Inverter output voltage waveform	-	-	4.7.5	-

Test Name	UL1741	IEEE 1547.1	CSA C22.2 #107.1
Operational Temperature	SB4.3.5.3	5.3	-
Protection From Electromagnetic Interference (EMI) Test	SB4.3.5.8.1	5.8.1	-
Surge Withstand Performance Test	SB4.3.5.8.2	5.8.2	-
Overvoltage Trip	SB4.3.5.4.2	5.4.2	-
Undervoltage Trip	SB4.3.5.4.3	5.4.3	-
Overfrequency Trip	SB4.3.5.5.1	5.5.1	-
Underfrequency Trip	SB4.3.5.5.2	5.5.2	-
Low Voltage Ride-Through	SA9, SB4.3.5.4.4	5.4.4	-
High Voltage Ride-Through	SA9, SB4.3.5.4.7	5.4.7	-
Low Frequency Ride-Through	SA10, SB4.3.5.5.3	5.5.3	-
High Frequency Ride-Through	SA10, SB4.3.5.5.4	5.5.4	-
Rate Of Change Of Frequency	-	5.5.5	-
Anti-Islanding Protection - With Grid Support Functions Enabled	SA8, SB4.3.5.10.2	5.10.2	14.4.3
Test For Voltage Disturbances Within Continuous Operating Region	-	5.4.5	-
Test For Voltage Phase-Angle Change Ride- Though (Variation 1)	SB4.3.5.5.6	5.5.6	-
Enter Service	SA17	5.6	-
Normal Ramp Rate Test	SA11.2	-	-
Soft-Start Ramp Rates	SA11.4	-	-
Limitation Of DC Injection For Inverters	-	5.9	10.5.3

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Test Name	UL1741	IEEE 1547.1	CSA C22.2 #107.1			
Open Phase	-	5.11	-			
Current Distortion	-	5.12	14.3.3			
Limit Active Power	SA18	5.13	-			
Constant Power Factor	SA12, SB4.3.5.14.3	5.14.3	-			
Voltage-Reactive Power (Volt-Var) Mode Fixed Vref	SA13, SB4.3.5.14.4	5.14.4	-			
Voltage-Reactive Power (Volt-Var) Mode (Vref Test)	SB4.3.5.14.5	5.14.5	-			
Active Power-Reactive Power Mode (Watt-Var)	SB4.3.5.14.7	5.14.7	-			
Constant Reactive Power (Var) Mode	SB4.3.5.14.8	5.14.8	-			
Voltage-Active Power (Volt-Watt) Mode	SA15, SB4.3.5.14.9	5.14.9	-			
Test For Frequency-Droop (Frequency-Power Or Frequency-Watt) Capability—Above Nominal Frequency	SA14, SB4.3.5.15.2	5.15.2	-			
Test For Frequency-Droop (Frequency-Power Or Frequency-Watt) Capability—Below Nominal Frequency	SA14, SB4.3.5.15.3	5.15.3	-			
Prioritization Of DER Responses	SB4.3.5.16	5.16	-			
Load Rejection Overvoltage (LROV)	SB4.3.5.17.2	5.17.2	-			
Persistence Of DER Parameter Settings	-	5.19	-			
Nameplate Data Test	-	6.4	-			
Monitoring Information Test	SB4.3.6.6	6.6	-			
Management Information Test	SB4.3.6.7	6.7	-			
Note: For Volt/Var Mode – Priority Tested in Reactive Power						

Test Name	UL9540A	UL9540	UL1973	UL50E
Normal Operations Test	-	30	-	-
Dielectric Voltage-Withstand Test	-	32	-	-
Equipment Grounding and Bonding	-	34	-	-
Insulation Resistance Test	-	35	-	-
Electromagnetic Immunity Tests	-	36	-	-
Wall Mount Fixture/Test	-	40.1	-	-
Enclosure Impact	-	40.2	-	-
Enclosure Steady Force	-	40.3	-	
Outdoor Installations Subject to Moisture Exposure	-	41.2	-	8.3
Unit Level Testing	9	26.2	-	-
Overcharge Test	-	-	15	-
High-Rate Charge	-	-	16	-
Short Circuit Test	-	-	17	
Overload Under Discharge	-	-	18	-
Overdischarge Protection Test	-	-	19	-
Imbalanced Charging Test	-	-	21	-

END



PCS Certificate of Compliance

April 14, 2025

Sangam Baligar Enphase Energy, Inc. 47281 Bayside Pkwy, Fremont, CA 94538 sbaligar@enphaseenergy.com

Subject: PCS Export-only testing for the Enphase Battery Energy storage system with IQ Battery 10C

Dear Mr. Baligar

This test report represents the results of our evaluation/testing of the PV + Battery Energy Storage System to the requirements contained in following standards:

UL3141 Issue 2 Outline of Investigation for Power Control Systems (PCS) Dated Oct 9th, 2024 UL1741 3rd Ed CRD for Power Control Systems (PCS), Dated April 8, 2023 UL1741 2nd Ed CRD for Power Control Systems (PCS), Dated March 8, 2019

Compliance includes management, control, and limitation of power exchange between Energy Storage Systems and Area EPS/AC utility systems.

The PCS evaluation was conducted on a representative 4th Generation Enphase Energy System and the certification applies to the following configurations which were part of the tested system in the PCS modes defined below.

PCS Modes ¹	PV Model ²	ESS Model ²	Max PV Ratings	Max ESS Ratings	Max PV+ESS Rating	Additional Devices needed for PCS functionality	Measured Average/ Maximum OLRT	Settling Time ³
ESS Export- only Mode	UL Listed Line-to- Line PV	IQ Battery 10C	80A/ 19.20kVA	118A/ 28.32kVA	198A/ 47.52kVA	IQ Combiner 6C/ CTs /Meter Collar	1s / 1.05s	1.25s

1 Tested with PCS eSW 1.4.0

2 Please see System configuration table further for exact variations of SKU model numbers.

3 Considered only test cases in which ESS is importing power from Grid. Refer below mode definition.

NEM ESS Export Only Mode (charge from PV only):

This is a PCS mode where the Storage system was evaluated for its ability not to import power from the grid for ESS Charging and to only allow the ESS to export power to grid. ESS Import from grid and power consumed by the energy storage were monitored. The test verified that when PV power or system load levels were subjected to step changes and the ESS did not import from the grid.

Project #Y0623 Report #LIT14250623



System Component	Product SKUs	Equipment required in PCS mode?
Component		Export-only
Enphase PV ¹	IQ8H-240-72-2-US, IQ8-60-2-US, IQ8PLUS-72-2-US, IQ8M-72-2-US, IQ8A-72-2-US, IQ8-60-M-US, IQ8PLUS-72-M-US, IQ8M-72-M-US, IQ8A-72-M-US, IQ8H-240-72-M-US, IQ8MC-72-M-US, IQ8AC-72-M-US, IQ8HC-72-M-US, IQ8X-80-M-US	Optional
Enphase Battery	Enphase IQ Battery 10C (Encharge battery 4th generation): IQBATTERY-10C-1P-NA, IQBATTERY-10CS-1P-NA, B05-C01-US00-1-3-RMA rated at 240Vac	Required
Enphase IQ Combiner 6C	X-IQ-AM1-240-6C	Required
CTs	For consumption monitoring: At least 2 units of CT-200- SPLIT or CT-200-CLAMP or Meter Collar PV and battery monitoring CTs are integrated into the IQ Combiner 6C	Required ²
Meter Collar	For Monitoring consumption: At least 1 unit of MC-200- 011-V01	Required ²

The table below describes the System configuration and SKUs associated with tested PCS mode(s)

¹Enphase Battery Export-only Mode was tested with IQ8. However, this mode works independently of PV SKUs and the Battery can be paired with other PV SKUs ²Either Meter Collar (OR) Consumption CTs placed at the Point of Common Coupling (PCC) is required for operation in this mode. Both are

²Either Meter Collar (OR) Consumption CTs placed at the Point of Common Coupling (PCC) is required for operation in this mode. Both are not required

This PCS supports:

- Up to 3 circuit inputs, one PV aggregate breaker input and two ESS, each with up to 4 daisy-chained IQ Battery 10C units.
 - Each ESS circuits' charge/discharge current with IQ Battery 10C can be limited from 64 Amps to 8 Amps continuous.
 - 1. PV inverter breakers on the combiner box must be properly sized.
 - a. The maximum breaker size for each PV inverter branch in the combiner PV Bus is 20A.
 - b. The maximum breaker size for PV aggregate breaker circuit in the combiner is 100A.

2. Battery inverter breakers on the combiner box must be properly sized.

- a. The maximum breaker size for a single IQ Battery 10C-based branch in a combiner box is 40A.
- b. The maximum breaker size for each battery branch in the combiner is 80A per circuit.
- 3. Please refer to the equipment installation instructions for system configuration details.

If there are any questions regarding the results contained in this report, please contact me or any Bureau Veritas CPS customer service representative.

If there are any questions regarding the results contained in this report, please contact me or any Bureau Veritas CPS customer service representative.

Sincerely,

Dishant Patel

Dishant Patel Principal Engineer dishant.patel@bureauveritas.com

Reviewed by, Radhe. Partel

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