Certificate of Compliance

Certificate: 70184750 **Master Contract:** 259077

Project: 80069266 **Date Issued:** 2021-02-07

Issued to: Altenergy Power System Inc.
No.1 Yatai Road
Jiaxing, Zhejiang, 314050
CHINA

Attention: Kevin Lu

The products listed below are eligible to bear the CSA Mark shown with adjacent indicators 'C' and 'US' for Canada and US or with adjacent indicator 'US' for US only or without either indicator for Canada only

Issued by: *Rohana Yang*
Rohana Yang

PRODUCTS

CLASS - C531109 - POWER SUPPLIES - Distributed Generation Power Systems Equipment
CLASS - C531189 - POWER SUPPLIES - Distributed Generation-Power Systems Equipment - Certified to U.S. Standards

Grid Support Utility Interactive Microinverter, Model QS1200 and QS1, Rack mounted.
Utility Interactive Microinverter, Model QS1A, Rack mounted.

For details related to rating, size, configuration, etc., reference should be made to the CSA Certification Record, Certificate of Compliance Annex A, or the Descriptive Report.

APPLICABLE REQUIREMENTS

CSA-C22.2 No. 107.1-16 - Power conversion equipment

*UL1741 - Inverters, Converters, Controllers and Interconnection System Equipment for Use With Distributed Energy Resources (Second Edition, Revision dated February 15, 2018)

UL1741 CRD - Grid Support Utility Interactive Interoperability Optional Functions: Prevent Enter Service and Limit Active Power (CA Rule 21, Phase 3, functions 2 and 3) (Dated October 22, 2019)

*Note: Conformity to UL 1741 (Second Edition, Revision dated February 15, 2018) includes compliance with applicable requirements of IEEE 1547-2003 (R2008), IEEE 1547.1-2005(R2011), California Rule 21 and Supplement SA8-SA18.

*Note: This product is PV Rapid Shut Down Equipment and conforms with NEC-2014, NEC-2017 and NEC-2020 Article 690.12 and CEC-2018 Sec 64-218 Rapid Shutdown of PV Systems, for AC and DC conductors, when installed according manufacturer's instructions.

March 18, 2020

Kevin Lu
Altenergy Power System Inc.
No. 1 Yatai Road, Jiaxing
ZheJiang, China, 314050

Subject: Evidence of inverter support for IEEE 2030.5/Rule 21 CSIP Phase 2 and Phase 3 Function 1 and 8 Functionality

Dear Kevin Lu,

This letter confirms that CSA Group witnessed the Appendix C testing listed in Resolution E-5000 from the California Public Utilities Commission Draft dated July 11, 2019 (as modified by Resolution E5036) under the CSA project 80037979. The Resolution requires the verification of five test cased for inverters that do not directly implement IEEE 2030.5 client functionality. During the tests, the inverter is to be connected to a SunSpec Certified IEEE 2030.5/CSIP gateway. The five tests are listed below and specified in the SunSpec IEEE 2030.5/CSIP test procedures:

- Inverter Status (BASIC-028)
- Inverter Meter Reading (BASIC-029)
- Basic Inverter Control – Volt/Var (BASIC-006)
- Basic Inverter Control – Fixed Power Factor (BASIC-008)
- Basic Inverter Control – Volt-Watt (BASIC-011)

The tests were performed on the Grid Support Utility Interactive Microinverter on 3/14/2020 with the ECU (https://sunspec.org/wp-content/uploads/2020/01/SunSpec-APSystems-certificate-CS-000012.pdf) model number ECU-R to connected to Grid Support Utility Interactive Microinverter Inverter model number QS1/QS1200 bearing the serial number 801002160022 which is used to represent the inverter models below:

APsystems Model Numbers

- QS1/QS1200

The inverter under test was subjected to testing conditions as follows:

- The inverter was operating during test harness verification procedure
- The ECU was given stimuli in the form of IEEE 2030.5 commands (Inverter Status, Inverter Meter Reading, Volt/VAR, Fixed Power Factor, and Volt/Watt) sent from an IEEE 2030.5 server that were subsequently translated to signals understood by the inverter.
- The inverter parameters were verified: a) to change during the test cases for Volt-VAR, Fixed Power Factor, and Volt-Watt and b) report monitored data during the test cases for Inverter Status and Inverter Meter Reading. Based on this procedure, the requirements from Appendix C of the resolution were verified.

Very truly yours,

Tested By,

Test Engineer Name: Xueji Dong
Test Engineer Title: Certifier
SunSpec ATL name: CSA Group

February 5, 2021

Kevin Lu
Altenergy Power System Inc.
No. 1 Yatai Road, Jiaxing
ZheJiang, China, 314050

Subject: Evidence of inverter support for IEEE 2030.5/Rule 21 CSIP Phase 2 and Phase 3 Function 1 and 8 Functionality

Dear Kevin Lu,

This letter confirms that CSA Group witnessed the Appendix C testing listed in Resolution E-5000 from the California Public Utilities Commission Draft dated July 11, 2019 (as modified by Resolution E5036) under the CSA project 80069265. The Resolution requires the verification of five test cased for inverters that do not directly implement IEEE 2030.5 client functionality. During the tests, the inverter is to be connected to a SunSpec Certified IEEE 2030.5/CSIP gateway. The five tests are listed below and specified in the SunSpec IEEE 2030.5/CSIP test procedures:

- Inverter Status (BASIC-028)
- Inverter Meter Reading (BASIC-029)
- Basic Inverter Control – Volt/Var (BASIC-006)
- Basic Inverter Control – Fixed Power Factor (BASIC-008)
- Basic Inverter Control – Volt-Watt (BASIC-011)

The tests were performed on the Grid Support Utility Interactive Microinverter on 2/5/2021 with the ECU (https://sunspec.org/wp-content/uploads/2020/01/SunSpec-APSystems-certificate-CS-000012.pdf) model number ECU-R to connected to Grid Support Utility Interactive Microinverter Inverter model number QS1 bearing the serial number 801000062880 which is used to represent the inverter models below:

APsystems Model Numbers

- QS1

The inverter under test was subjected to testing conditions as follows:

- The inverter was operating during test harness verification procedure
- The ECU was given stimuli in the form of IEEE 2030.5 commands (Inverter Status, Inverter Meter Reading, Volt/VAR, Fixed Power Factor, and Volt/Watt) sent from an IEEE 2030.5 server that were subsequently translated to signals understood by the inverter.
- The inverter parameters were verified: a) to change during the test cases for Volt-VAR, Fixed Power Factor, and Volt-Watt and b) report monitored data during the test cases for Inverter Status and Inverter Meter Reading. Based on this procedure, the requirements from Appendix C of the resolution were verified.

Very truly yours,

Tested By,

Test Engineer Name: Xueji Dong
Test Engineer Title: Certifier
SunSpec ATL name: CSA Group

Letter of Attestation

Document: 70203119 **Master Contract:** 259077

Project: 70203119 **Date Issued:** November 12, 2018

Issued to: Altenergy Power System Inc.
No.1 Yatai Road,
Jiaxing, Zhejiang, 314050
China
Attention: Guofeng Jiang

CSA Group, Certification and Testing hereby confirms that it has completed an evaluation of:
Utility Interactive Microinverter (at 240Vac output)

Model: QS1 and QS1200

CSA Group, Certification and Testing hereby attests that the products identified above and described in test report 70203119 dated November 12, 2018
complies with the following standards/tests, to the extent applicable:

The testing of the subject inverters were completed according to the following sections of the test protocol entitled "Performance Test Protocol for Evaluating Inverters Used in Grid-Connected Photovoltaic Systems" prepared by "Sandia National Laboratories, Endecon Engineering, BEW Engineering, and Institute for Sustainable Technology", dated October 14, 2004 as modified by the "Guidelines for the use of the Performance Test Protocol for Evaluating Inverters Used in Grid-Connected Photovoltaic Systems" prepared by KEMA-Xenergy, and BEW Engineering, dated March 1, 2005 with deviations according to the requirements of the California Energy Commission New Solar Homes Partnership Guidebook Sixth Edition (CEC-300-2016-008-CMF), Appendix III section C – "Inverters".

- ***Maximum Continuous Power***
- ***Conversion Efficiency***
- ***Tare Losses***

Notes:

1. Units verified against CSA report 70203119, dated November 12, 2018.
2. Refer to TIS report and Testdata for test results and setup details.

Allen Yao
Issued by: ----------
Name of CSA Staff

Document: 70203119 **Master Contract:** 259077

Project: 70203119 **Date:** November 12, 2018

THIS LETTER OF ATTESTATION DOES NOT AUTHORIZE THE USE OF THE CSA MARK ON THE SUBJECT PRODUCTS.
QUOTATIONS FROM THE TEST REPORT OR THE USE OF THE NAME OF THE CANADIAN STANDARDS ASSOCIATION AND CSA GROUP OR ITS REGISTERED TRADEMARK, IN ANY WAY, IS NOT PERMITTED WITHOUT PRIOR WRITTEN CONSENT OF THE CANADIAN STANDARDS ASSOCIATION OPERATING AS CSA GROUP, CERTIFICATION AND TESTING DIVISION.

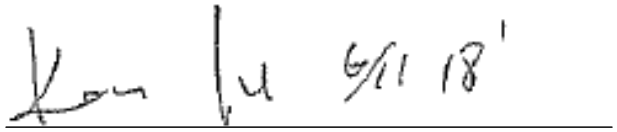
Technical Compliance Statement
FCC and ISED VERIFICATION

For the following information **Ref. File No.: C1W1805018**

Product	:	Microinverter
Model Number	:	QS1200; QS1
Brand Name	:	APsystems
Applicant	:	Altenergy Power System Inc.
Rules and Standards	:	47 CFR FCC Part 15 Subpart B and ICES-003 Issue 6: 2016 (Class B Limit)

We hereby certify that the above product has been tested by us and complied with the FCC and ISED official limits. The product might be marketed in US in accordance with the standard 47 CFR FCC Part 2 and Part 15 Subpart B class B equipment regulations under FCC Rules. The test was performed according to the procedures mentioned in ANSI C63.4-2014.
The test data and results are issued on the test report no. **ACWE-F1806001.**

Jun.11, 2018



Ken Lu/ Assistant General Manager
AUDIX Technology (Wujiang) Co., Ltd. EMC Dept.

The statement is based on a single evaluation of one sample of the above-mentioned products. It does not imply an assessment of the whole production and does not permit the use of the test lab logo.