



LETTER REPORT

Sparq

Scope of Works

PV Micro-inverter Q2000-4301 EN50549-1 Tests

Report No. US22ZK53.001

Issue Date 2022-12-22

Revised Date N/A

Page 2

TUV Rheinland of North America, Inc.

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12/22/2022

Report No. US22ZK53.001

Project No. 234194715

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Email: span@sparqsys.com

Subject: PV Micro-inverter Q2000-4301 EN50549-1 Tests

Dear Mr. Shangzhi Pan:

This letter report is to present the results of tests standard for the above equipment in accordance with the following standard:

EN 50549-1:2019 Requirements for generating plants to be connected in parallel with distribution networks - Part 1: Connection to a LV distribution network - Generating plants up to and including Type B

The following tests have been performed and passed.

Clause	Test Description	Model	Pass/Fail
4.4.2	Operating frequency range	Q2000-4301	Pass
4.4.3	Min. requirement for active power delivery at underfrequency	Q2000-4301	Pass
4.4.4	Continuous operating voltage range	Q2000-4301	Pass
4.5.2	Rate of change of frequency (ROCOF) immunity	Q2000-4301	Pass
4.5.3	Under-voltage ride through (UVRT)	Q2000-4301	Pass
4.5.4	Over-voltage ride through (OVRT)	Q2000-4301	Pass
4.6.1	Power response to overfrequency	Q2000-4301	Pass
4.6.2	Power response to underfrequency	Q2000-4301	Pass
4.7.2.2	Voltage support by reactive power - Capacities	Q2000-4301	Pass
4.7.2.3.2	Setpoint control modes	Q2000-4301	Pass
4.7.2.3.3	Voltage related control mode	Q2000-4301	Pass
4.7.2.3.4	Power related control mode	Q2000-4301	Pass
4.7.3	Voltage related active power reduction	Q2000-4301	Pass

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Clause	Test Description	Model	Pass/Fail
4.8	EMC and power quality_DC injection	Q2000-4301	Pass
4.9.3	Voltage and frequency protection	Q2000-4301	Pass
4.9.4	Means to detect island situation	Q2000-4301	Pass
4.10	Connection and starting to generate electrical power	Q2000-4301	Pass
4.11	Ceasing and reduction of active power on set point	Q2000-4301	Pass
4.12	Remote information exchange	Q2000-4301	Note #1
4.13	Single fault tolerance of interface protection system and interface switch	Q2000-4301	Note #2

Notes

1. Refer to TUV report US22937Y.001.
2. Due to product being one PCB assembly and most components are typical SMD, it's impossible to perform single fault on relative components as required. The conclusion is the engineering rationale based on circuit analysis.

If there are any questions regarding the results contained in this report, or any of the other services offered by TUV Rheinland of North America, Inc., please do not hesitate to contact the undersigned.

Please note, this letter report does not represent authorization for the use of any TUV Rheinland certification marks.

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