TEST REPORT **SunSpec Common Smart Inverter Profile (CSIP) Conformance Test**	
Report Reference No. ..... :	SHES240901891101
Tested by (name + signature) ..... :	Sunny Lin
Approved by (name + signature) ..... :	Roger Hu
Date of issue ..... :	2024-09-25
Testing Laboratory Name..... :	SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd.
Address ..... :	No.588 West JinDu Road, SongJiang District, ShangHai, CHINA
Testing location / procedure ..... :	NRTL ☒ WMT ☐ TMP ☐
Testing location / address ..... :	Same as above
Applicant's name ..... :	SPITZER ENERGY COMPANY
Address ..... :	4295 East Jurupa Street, Suite 103A, Ontario, 91761, California, United States of America
Test specification:	
Standard ..... :	California Public Utilities Commission Resolution E-5000 & E-5036
Reference test procedure/standard . :	Common Smart Inverter Profile V2.1 SunSpec Common Smart Inverter Profile (CSIP) Conformance Test Procedures V1.2
Non-standard test method ..... :	N/A
Test item description ..... :	ESS Inverter
Trademark ..... :	Spitzer
Inverter Model/Type reference ..... :	SPZ 15KW-LV
Variant Models..... :	SPZ 7.5KW-LV, SPZ 9KW-LV, SPZ 12KW-LV-A, SPZ 12KW-LV-B, SPZ 15KW-LV-B
Firmware version..... :	051001
Rating(s) ..... :	Refer to the page 5 to page 7 of this report
Gateway Model/Type reference ..... :	Refer to page 4 of the report for details
Manufacturer ..... :	As same as Applicant's name
Address ..... :	As same as Applicant's Address
Sample Series# ..... :	2324-20060081PH

Testing

Date of receipt of test item .....: 2024-07-08

Date(s) of performance of test .....: 2024-07-08 to 2024-07-10

General remarks

Remarks: This report is based on the original report SHES240701489101 issued on July 16, 2024, which changes the applicant, model, nameplate.

Throughout this report a ☐ comma / ☒ point is used as the decimal separator.

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1. GENERAL INFORMATION

1.1 Testing Period and Climatic Conditions

The necessary testing has been performed between 8th July 2024 and 10th July 2024.
All the tests and checks have been performed at climatic conditions:

Temperature	25 ± 10 ºC
Relative Humidity	50 ± 20 %
Pressure	90 ± 10 kPa

1.2 Equipment Under Testing

- Part 1: Gateway Information

Product Type	CA Rule 21/CSIP DER Client
Product Name	Stick Logger(WiFi)
Product Model	LSW-5 Series
Product Object ID	1.3.6.1.4.1.58214.01
Software Operation Environment Type	Physical device
Software Name	LSW5BLE_MW17_CSIP5406_1.11
Software Version	1.11
Software Checksum	16b8d9d19a489cfd35277816eae40232
Operating System	FreeRTOS
Operating System Version	V10.2.0
SunSpec Certificate Number	CS-000046

- Part 2: Inverter Information

  Equipment under testing:

  - **SPZ 15KW-LV**

  Variant models:

  - SPZ 7.5KW-LV
  - SPZ 9KW-LV
  - SPZ 12KW-LV-A
  - SPZ 12KW-LV-B
  - SPZ 15KW-LV-B

The parameter of each model as following:

Model:	SPZ 7.5KW-LV	SPZ 9KW-LV
INPUT RATINGS:		
Maximum input voltage	600V dc	
Range of input operating voltage	70 V dc to 540 V dc	
Range of input operating voltage with full power	200 V dc to 480 V dc	
Maximum input current (dc)	30/22 Adc	
Number of input	2	
OUTPUT RATINGS (Grid terminal, Bi-directional):		
Output power factor rating	default >0.99 (-0.8~+0.8 adjustable)	
Operating voltage range (ac) (L1-L2/L1-N)	0.88Un~1.1Un	
Number of phases	Single phase/Split phase	
Nominal output voltage (ac)	Split phase:120/240Vac; 2/3 phase: 208Vac	
Normal output frequency	60 Hz	
Maximum continuous output current (ac) per line	22.9Arms	27.5Arms
Rated output current (ac) per line	20.9Arms	25Arms
Maximum output apparent power (ac)	5.5 kVA	6.6 kVA
Maximum continuous output power (ac)	5.0 kW	6.0 kW
Maximum output fault current (ac) and duration	494 A_{peak}/18.6ms, 14.09 A_{rms}/cycle	
Trip limit and trip time accuracy - Voltage:	±1% Un	
Utility interconnection voltage and frequency trip limits and trip times	see Note 1 and 2	
Trip limit and trip time accuracy - Frequency:	±0.01 Hz	
Trip limit and trip time accuracy - Time	±1%setting, but not less than 50ms	
Normal operation temperature range	-25ºC to 60ºC (>45 ºC derating)	
Enclosure Rating Type	Type 3R	
Weigh (kg)	40kg	
Dimension (mm)	420*800*240	
OUTPUT RATINGS (BACKUP output terminal):		
Number of phases	Single phase/Split phase	
Nominal output voltage (ac)	Split phase:120/240Vac; 2/3 phase: 208Vac	
Normal output frequency	60 Hz	
Maximum continuous output power (ac)	5.5 kVA	6.6 kVA
Rated output power (ac)	5.0 kW	6.0 kW
Battery terminal, Bi-directional:		
Battery Type	Lithium-ion/Lead-acid	
Range of DC operating voltage (Vdc)	40-64V dc	
Nominal voltage (Vdc)	48V dc	
Max. charging/ discharging current (Adc)	210/130 Arms	210/130 Arms
Max. charging/ discharging power (W)	10000W/5000W	10000W/6000W

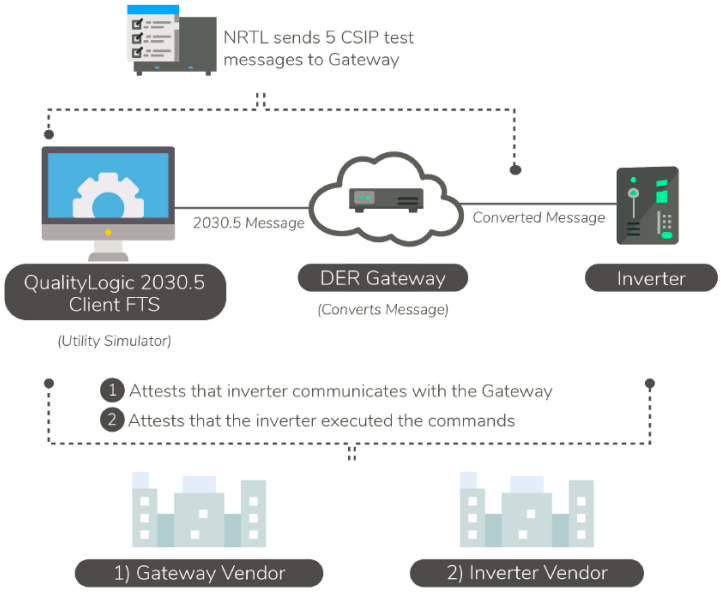
Model:	SPZ 12KW-LV-A	SPZ 12KW-LV-B
INPUT RATINGS:		
Maximum input voltage	600V dc	
Range of input operating voltage	70 V dc to 540 V dc	
Range of input operating voltage with full power	200 V dc to 480 V dc	
Maximum input current (dc)	30/22/22 Adc	
Number of input	3	
OUTPUT RATINGS (Grid terminal, Bi-directional):		
Output power factor rating	default >0.99 (-0.8~+0.8 adjustable)	
Operating voltage range (ac) (L1-L2/L1-N)	0.88Un~1.1Un	
Number of phases	Single phase/Split phase	
Nominal output voltage (ac)	Split phase:120/240Vac; 2/3 phase: 208Vac	
Normal output frequency	60 Hz	
Maximum continuous output current (ac) per line	34.8Arms	36.7Arms
Rated output current (ac) per line	31.7Arms	33.4Arms
Maximum output apparent power (ac)	8.36 kVA	8.8 kVA
Maximum continuous output power (ac)	7.6 kW	8.0 kW
Maximum output fault current (ac) and duration	494 A_{peak}/18.6ms, 14.09 A_{rms}/cycle	
Trip limit and trip time accuracy - Voltage:	±1% Un	
Utility interconnection voltage and frequency trip limits and trip times	see Note 1 and 2	
Trip limit and trip time accuracy - Frequency:	±0.01 Hz	
Trip limit and trip time accuracy - Time	±1%setting, but not less than 50ms	
Normal operation temperature range	-25ºC to 60ºC (>45 ºC derating)	
Enclosure Rating Type	Type 3R	
Weigh (kg)	40kg	
Dimension (mm)	420*800*240	
OUTPUT RATINGS (BACKUP output terminal):		
Number of phases	Single phase/Split phase	
Nominal output voltage (ac)	Split phase:120/240Vac; 2/3 phase: 208Vac	
Normal output frequency	60 Hz	
Maximum continuous output power (ac)	8.36 kVA	8.8 kVA
Rated output power (ac)	7.6 kW	8.0 kW
Battery terminal, Bi-directional:		
Battery Type	Lithium-ion/Lead-acid	
Range of DC operating voltage (Vdc)	40-64V dc	
Nominal voltage (Vdc)	48V dc	
Max. charging/ discharging current (Adc)	210/180 Arms	210/180 Arms
Max. charging/ discharging power (W)	10000W/7600W	10000W/8000W

Model:	SPZ 15KW-LV	SPZ 15KW-LV-B
INPUT RATINGS:		
Maximum input voltage	600V dc	
Range of input operating voltage	70 V dc to 540 V dc	
Range of input operating voltage with full power	200 V dc to 480 V dc	
Maximum input current (dc)	30/22/22 Adc	
Number of input	3	
OUTPUT RATINGS (Grid terminal, Bi-directional):		
Output power factor rating	default >0.99 (-0.8~+0.8 adjustable)	
Operating voltage range (ac) (L1-L2/L1-N)	0.88Un~1.1Un	
Number of phases	Single phase/Split phase	
Nominal output voltage (ac)	Split phase:120/240Vac; 2/3 phase: 208Vac	
Normal output frequency	60 Hz	
Maximum continuous output current (ac) per line	45.8Arms	47.5Arms
Rated output current (ac) per line	41.7Arms	41.7Arms
Maximum output apparent power (ac)	11 kVA	11.4 kVA
Maximum continuous output power (ac)	10 kW	10 kW
Maximum output fault current (ac) and duration	494 A_{peak}/18.6ms, 14.09 A_{rms}/cycle	
Trip limit and trip time accuracy - Voltage:	±1% Un	
Utility interconnection voltage and frequency trip limits and trip times	see Note 1 and 2	
Trip limit and trip time accuracy - Frequency:	±0.01 Hz	
Trip limit and trip time accuracy - Time	±1%setting, but not less than 50ms	
Normal operation temperature range	-25ºC to 60ºC (>45 ºC derating)	
Enclosure Rating Type	Type 3R	
Weigh (kg)	40kg	
Dimension (mm)	420*800*240	
OUTPUT RATINGS (BACKUP output terminal):		
Number of phases	Single phase/Split phase	
Nominal output voltage (ac)	Split phase:120/240Vac; 2/3 phase: 208Vac	
Normal output frequency	60 Hz	
Maximum continuous output power (ac)	11 kVA	11.4 kVA
Rated output power (ac)	10 kW	10 kW
Battery terminal, Bi-directional:		
Battery Type	Lithium-ion/Lead-acid	
Range of DC operating voltage (Vdc)	40-64V dc	
Nominal voltage (Vdc)	48V dc	
Max. charging/ discharging current (Adc)	210/210Arms	210/210Arms
Max. charging/ discharging power (W)	10000W/10000W	10000W/10000W

1.3 Test Equipment List

SGS	IEEE 2030.5 (SEP 2.0) Test System	QualityLogic / FTS Function	Software Version: 4.2	--

1.4 Test Set up & Test Conditions



Note:

As the gateway used by customer is certified by SunSpec, the compatibility testing is as part of IEEE2030.5 conformance testing of the gateway. According to the Resolution E-5000 & E-5036, for inverters that do not directly implement IEEE 2030.5 client functionality, the following five test cases according to SunSpec CSIP test procedures on the gateway while it is connected to the inverter.

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

The test was conducted using the QualityLogic IEEE 2030.5 Test Harness which implements the test cases that are described in the CSIP Test Procedures document.

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

- ✓ The inverter was operating during test harness verification procedure.
- ✓ The gateway was given orders as IEEE 2030.5 commands (Inverter Status, Inverter Meter Reading, Volt/VAR, Fixed Power Factor, and Volt/Watt) sent from an IEEE 2030.5 Client FTS 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.

1.5 Test Results

Interpretation Keys

Test object does meet the requirement	**P** Pass
Test object does not meet the requirement	**F** Fails
Test case does not apply to the test object	**N/A** Not applicable
To make a reference to a table or an annex.	See additional sheet
To indicate that the test has not been realized	**N/R** Not realized

Test Name	Test Description	Result
BASIC-006	Basic Inverter Control (Volt/Var) [C, A, S]	Pass
BASIC-008	Basic Inverter Control (Fixed Power Factor) [C, A, S]	Pass
BASIC-011	Basic Inverter Control (Volt-Watt) [C, A, S]	Pass
BASIC-028	Inverter Status [C, A, S]	Pass
BASIC-029	Inverter Meter Reading [C, A, S]	Pass

-- END of REPORT --