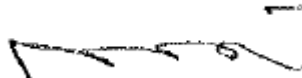


Test Verification of Conformity

Verification Number: 2401B1678SHA-V1

On the basis of the tests undertaken, the sample<s> of the below product have been found to comply with the requirements of the referenced specification<s>/standard<s> at the time the tests were carried out. This verification is part of the full test report<s> and should be read in conjunction with it <them>.

Applicant Name & Address:	Shenzhen Stepup-Tech Co., Ltd. Unit B, Floor6, Building 4, Block B, Xushengxiafa, Gonghe Road, Xixiang Street, Shenzhen, Guangdong, China 518105
Product Description:	Micro Inverter
Ratings & Principle Characteristics:	See Appendix (Specifications table)
Models/Type References:	See Appendix (Specifications table)
Brand Name:	ACreppower
Relevant Standards:	VDE-AR-N 4105:2018 conjunction with DIN VDE V 0124-100 :2020
Verification Issuing Office Name & Address:	Intertek Testing Services Shanghai Building No.86, 1198 Qinzhou Road (North), Shanghai 200233, China
Date of Tests:	2024-01-11 to 2024-01-18
Test Report Number(s):	2401B1678SHA-001
Additional information in Appendix.	



Signature

Name: Max Jin
Position: General Manager
Date: 2024-03-04

This Verification is for the exclusive use of Intertek's client and is provided pursuant to the agreement between Intertek and its Client. Intertek's responsibility and liability are limited to the terms and conditions of the agreement. Intertek assumes no liability to any party, other than to the Client in accordance with the agreement, for any loss, expense or damage occasioned by the use of this Verification. Only the Client is authorized to permit copying or distribution of this Verification. Any use of the Intertek name or one of its marks for the sale or advertisement of the tested material, product or service must first be approved in writing by Intertek. The observations and test/inspection results referenced in this Verification are relevant only to the sample tested/inspected. This Verification by itself does not imply that the material, product, or service is or has ever been under an Intertek certification program.

APPENDIX: Test Verification of Conformity

This is an Appendix to Test Verification of Conformity Number: 2401B1678SHA-V1

Manufacturer:

Shenzhen Stepup-Tech Co., Ltd.

Unit B, Floor6, Building 4, Block B, Xushengxiafa, Gonghe Road, Xixiang Street,
Shenzhen, Guandong, China 518105

Specifications table			
Model	SPD-600	SPD-700	SPD-800
Input:			
Vmax PV (Vdc)	60	60	60
Isc PV (absolute Max.) (A)	2*18A	2*18A	2*18A
Number MPP trackers	1	1	1
Number input strings	2	2	2
Max. PV input current(A)	2*12.5A	2*12.5A	2*12.5A
MPPT voltage range (Vdc)	30 to 48	30 to 48	30 to 48
Output			
Normal Voltage(V)	<input checked="" type="checkbox"/> 1/N/PE 230Vac <input type="checkbox"/> 3 φ /N/PE 230/400Vac		
Frequency (Hz)	<input checked="" type="checkbox"/> 50 Hz <input type="checkbox"/> 60Hz		
Current (Max. continuous) (A)	3.48	3.48	3.48
Power rating (W)	800	800	800
Power Rating (VA)	800	800	800
Power factor /rated	≥0.99	≥0.99	≥0.99
others			
Protective class	Class I		
Ingress protection (IP)	IP 67		
Temperature (°C)	-20°C to +50°C		
Inverter Isolation	<input type="checkbox"/> Non-isolated <input checked="" type="checkbox"/> High frequency isolated		
Overvoltage category	OVC III (AC Main), OVC II (PV)		
Weight (kg)	2.81		
Dimensions (WxHxD) (mm)	385 x 305 x 90		

This Verification is for the exclusive use of Intertek's client and is provided pursuant to the agreement between Intertek and its Client. Intertek's responsibility and liability are limited to the terms and conditions of the agreement. Intertek assumes no liability to any party, other than to the Client in accordance with the agreement, for any loss, expense or damage occasioned by the use of this Verification. Only the Client is authorized to permit copying or distribution of this Verification. Any use of the Intertek name or one of its marks for the sale or advertisement of the tested material, product or service must first be approved in writing by Intertek. The observations and test/inspection results referenced in this Verification are relevant only to the sample tested/inspected. This Verification by itself does not imply that the material, product, or service is or has ever been under an Intertek certification program.

Annex E4: Verification of Conformity for power generation units

Verification of Conformity for power generation units	No.: 2401B1678SHA-V1			
Manufacturer	Shenzhen Stepup-Tech Co., Ltd. Unit B, Floor6, Building 4, Block B, Xushengxiafa, Gonghe Road, Xixiang Street, Shenzhen, Guandong, China 518105			
Type power generation unit	Micro Inverter			
Model	SPD-600	SPD-700	SPD-800	
Assessment values	Max. active power $P_{E_{max}}$	800 W	800 W	800W
	Max. apparent power $S_{E_{max}}$	800 VA	800 VA	800 VA
	Rated voltage	230Vac	230Vac	230Vac
Rated values	Rated current (AC) I_r	3.48A	3.48A	3.48A
	Initial short-circuit AC current	3.48A	3.48A	3.48A
Network connection rules	VDE-AR-N 4105 "Power generation systems connected to the low-voltage network" Technical minimum requirements for connection and parallel operation of power generation systems connected to the low voltage network			
Firmware version	Software version number V1.1 and Hardware version number v10 for SPD-600, SPD-700 and SPD-800			

This Verification is for the exclusive use of Intertek's client and is provided pursuant to the agreement between Intertek and its Client. Intertek's responsibility and liability are limited to the terms and conditions of the agreement. Intertek assumes no liability to any party, other than to the Client in accordance with the agreement, for any loss, expense or damage occasioned by the use of this Verification. Only the Client is authorized to permit copying or distribution of this Verification. Any use of the Intertek name or one of its marks for the sale or advertisement of the tested material, product or service must first be approved in writing by Intertek. The observations and test/inspection results referenced in this Verification are relevant only to the sample tested/inspected. This Verification by itself does not imply that the material, product, or service is or has ever been under an Intertek certification program.

Annex E.5 Test report “Network interactions” for power generation units

Extract from the test report on the certificate of units	2401B1678SHA-001					
Manufacturer:	Shenzhen Stepup-Tech Co., Ltd. Unit B, Floor6, Building 4, Block B, Xushengxiafa, Gonghe Road, Xixiang Street, Shenzhen, Guangdong, China 518105					
Manufacturer indications:	System type	SPD-800				
	Max. active power $P_{E_{max}}$	800 W				
	Rated voltage	230Vac				
Measurement period	2024-01-11 to 2024-01-18					
Rapid voltage changes	N/A					
Connection without provisions (regarding the primary energy carrier)	$k_i = 0.104$					
Most adverse case when switching between generator levels	N/A					
Connection at nominal conditions (of the primary energy carrier)	$k_i = 0.02$					
Disconnection at rated power	$k_i = 1.01$					
Worst value of all switching operations	$k_{imax} = 1.02$					
Flicker	Angle of network impedance Ψ_k :	32°	30°	50°	70°	85°
	Long-term flicker strength P_{It} :	0.101	N/A	N/A	N/A	N/A
	Initial flicker factor c_ψ :	N/A	N/A	N/A	N/A	N/A

This Verification is for the exclusive use of Intertek's client and is provided pursuant to the agreement between Intertek and its Client. Intertek's responsibility and liability are limited to the terms and conditions of the agreement. Intertek assumes no liability to any party, other than to the Client in accordance with the agreement, for any loss, expense or damage occasioned by the use of this Verification. Only the Client is authorized to permit copying or distribution of this Verification. Any use of the Intertek name or one of its marks for the sale or advertisement of the tested material, product or service must first be approved in writing by Intertek. The observations and test/inspection results referenced in this Verification are relevant only to the sample tested/inspected. This Verification by itself does not imply that the material, product, or service is or has ever been under an Intertek certification program.

E.5 Test report “Network interactions” for power generation units

(5.2.4)	TABLE: Harmonics											P
Harmonics												
P/P _n [%]	0	10	20	30	40	50	60	70	80	90	100	Limit
Order No.	I/In [%]											
2	0.00	0.07	0.23	0.45	0.37	0.27	0.21	0.20	0.18	0.22	0.33	--
3	0.01	0.08	0.09	0.09	0.08	0.09	0.17	0.11	0.19	0.20	0.21	--
4	0.00	0.10	0.09	0.03	0.03	0.05	0.14	0.17	0.15	0.16	0.15	--
5	0.01	0.43	0.68	0.84	0.83	0.89	0.90	0.89	0.92	0.99	1.06	--
6	0.00	0.02	0.11	0.08	0.09	0.09	0.11	0.14	0.17	0.20	0.21	--
7	0.00	0.09	0.10	0.24	0.27	0.26	0.28	0.27	0.31	0.38	0.46	--
8	0.00	0.02	0.05	0.03	0.05	0.07	0.07	0.09	0.08	0.07	0.04	--
9	0.00	0.00	0.07	0.05	0.06	0.08	0.08	0.08	0.09	0.10	0.11	--
10	0.00	0.04	0.04	0.05	0.04	0.02	0.09	0.10	0.04	0.04	0.10	--
11	0.00	0.02	0.05	0.06	0.12	0.13	0.14	0.12	0.14	0.15	0.17	--
12	0.00	0.01	0.02	0.02	0.03	0.04	0.03	0.02	0.02	0.02	0.02	--
13	0.00	0.01	0.02	0.01	0.04	0.05	0.06	0.06	0.08	0.10	0.11	--
14	0.00	0.04	0.10	0.12	0.09	0.04	0.06	0.09	0.06	0.06	0.07	--
15	0.00	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	--
16	0.00	0.03	0.07	0.07	0.06	0.04	0.02	0.04	0.04	0.04	0.05	--
17	0.00	0.01	0.05	0.02	0.06	0.08	0.06	0.03	0.03	0.05	0.05	--
18	0.00	0.01	0.02	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.01	--
19	0.00	0.01	0.03	0.02	0.04	0.05	0.04	0.02	0.01	0.02	0.02	--
20	0.00	0.01	0.02	0.02	0.03	0.04	0.05	0.04	0.02	0.02	0.04	--
21	0.00	0.01	0.02	0.01	0.01	0.02	0.03	0.02	0.02	0.02	0.02	--
22	0.00	0.02	0.04	0.03	0.03	0.07	0.12	0.13	0.08	0.05	0.02	--
23	0.00	0.01	0.05	0.02	0.03	0.06	0.08	0.06	0.04	0.05	0.04	--
24	0.00	0.01	0.03	0.02	0.02	0.03	0.02	0.02	0.01	0.01	0.01	--
25	0.00	0.01	0.05	0.01	0.02	0.04	0.04	0.03	0.05	0.06	0.05	--
26	0.00	0.03	0.22	0.24	0.20	0.18	0.16	0.11	0.04	0.04	0.13	--
27	0.00	0.01	0.02	0.02	0.03	0.04	0.04	0.02	0.01	0.02	0.02	--
28	0.01	0.04	0.16	0.16	0.16	0.15	0.15	0.09	0.04	0.03	0.09	--
29	0.00	0.01	0.09	0.06	0.03	0.10	0.13	0.11	0.07	0.08	0.08	--
30	0.01	0.01	0.06	0.05	0.05	0.06	0.04	0.03	0.02	0.03	0.05	--
31	0.00	0.01	0.09	0.07	0.04	0.08	0.12	0.08	0.08	0.08	0.05	--
32	0.00	0.05	0.34	0.25	0.20	0.09	0.08	0.16	0.20	0.24	0.33	--
33	0.00	0.01	0.02	0.02	0.02	0.01	0.03	0.04	0.04	0.04	0.03	--
34	0.00	0.08	0.32	0.27	0.22	0.15	0.08	0.06	0.09	0.14	0.21	--
35	0.00	0.02	0.06	0.05	0.03	0.01	0.02	0.04	0.04	0.03	0.01	--
36	0.01	0.01	0.02	0.02	0.01	0.01	0.02	0.02	0.02	0.02	0.02	--
37	0.00	0.03	0.05	0.03	0.02	0.02	0.03	0.03	0.03	0.02	0.01	--
38	0.00	0.18	0.10	0.11	0.10	0.14	0.17	0.18	0.18	0.19	0.20	--
39	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.01	0.01	0.01	--
40	0.00	0.08	0.05	0.04	0.04	0.05	0.06	0.07	0.08	0.08	0.09	--

This Verification is for the exclusive use of Intertek's client and is provided pursuant to the agreement between Intertek and its Client. Intertek's responsibility and liability are limited to the terms and conditions of the agreement. Intertek assumes no liability to any party, other than to the Client in accordance with the agreement, for any loss, expense or damage occasioned by the use of this Verification. Only the Client is authorized to permit copying or distribution of this Verification. Any use of the Intertek name or one of its marks for the sale or advertisement of the tested material, product or service must first be approved in writing by Intertek. The observations and test/inspection results referenced in this Verification are relevant only to the sample tested/inspected. This Verification by itself does not imply that the material, product, or service is or has ever been under an Intertek certification program.

(5.2.4)	TABLE: Harmonic current limit test (EN 61000-3-2)						P
Model							
Harmonic	L1		--		--		Limits -A
	Magnitude (A)	% of I	Magnitude (A)	% of I	Magnitude (A)	% of I	
02	0.00	--	--	--	--	--	1.08
03	0.00	--	--	--	--	--	2.30
04	0.00	--	--	--	--	--	0.43
05	0.02	--	--	--	--	--	1.14
06	0.00	--	--	--	--	--	0.30
07	0.01	--	--	--	--	--	0.77
08	0.00	--	--	--	--	--	0.23
09	0.00	--	--	--	--	--	0.40
10	0.00	--	--	--	--	--	0.18
11	0.00	--	--	--	--	--	0.33
12	0.00	--	--	--	--	--	0.15
13	0.00	--	--	--	--	--	0.21
14	0.00	--	--	--	--	--	0.13
15	0.00	--	--	--	--	--	0.15
16	0.00	--	--	--	--	--	0.12
17	0.00	--	--	--	--	--	0.13
18	0.00	--	--	--	--	--	0.10
19	0.00	--	--	--	--	--	0.12
20	0.00	--	--	--	--	--	0.09
21	0.00	--	--	--	--	--	0.11
22	0.00	--	--	--	--	--	0.08
23	0.00	--	--	--	--	--	0.10
24	0.00	--	--	--	--	--	0.08
25	0.00	--	--	--	--	--	0.09
26	0.00	--	--	--	--	--	0.07
27	0.00	--	--	--	--	--	0.08
28	0.00	--	--	--	--	--	0.07
29	0.00	--	--	--	--	--	0.08
30	0.00	--	--	--	--	--	0.06
31	0.00	--	--	--	--	--	0.07
32	0.00	--	--	--	--	--	0.06
33	0.00	--	--	--	--	--	0.07
34	0.00	--	--	--	--	--	0.05
35	0.00	--	--	--	--	--	0.06
36	0.00	--	--	--	--	--	0.05
37	0.00	--	--	--	--	--	0.06
38	0.00	--	--	--	--	--	0.05
39	0.00	--	--	--	--	--	0.06
40	0.00	--	--	--	--	--	0.05
THD	--	1.37	--	--	--	--	--

This Verification is for the exclusive use of Intertek's client and is provided pursuant to the agreement between Intertek and its Client. Intertek's responsibility and liability are limited to the terms and conditions of the agreement. Intertek assumes no liability to any party, other than to the Client in accordance with the agreement, for any loss, expense or damage occasioned by the use of this Verification. Only the Client is authorized to permit copying or distribution of this Verification. Any use of the Intertek name or one of its marks for the sale or advertisement of the tested material, product or service must first be approved in writing by Intertek. The observations and test/inspection results referenced in this Verification are relevant only to the sample tested/inspected. This Verification by itself does not imply that the material, product, or service is or has ever been under an Intertek certification program.

Annex E.7 Requirements to the Test Report on the NS protection

Extract from the test report for the NS protection "Determination of electric properties"		2401B1678SHA-001	
Test report NS Protection			
Type of NS protection:	Integrated NS protection	Further manufacturer indications	
Software version:	V1.1		
Manufacturer:	Shenzhen Stepup Tech Co., Ltd.		
Measurement period:	2024-01-11 to 2024-01-18		
		Inverter(s)	
Protective function	Set value	Tripping value	Tripping value NS protection
Rise-in-voltage protection U >>	$1.25 * U_n$	1.243 Un	139 ms
Rise-in-voltage protection U >	$1.10 * U_n$	1.100 Un	500 s
Voltage drop protection U <	$0.8 * U_n$	0.791 Un	3027 ms
Voltage drop protection U <	$0.45 * U_n$	0.448 Un	315 ms
Frequency decrease protection f <	47.5Hz	47.50 Hz	122 ms
Frequency increase protection f >	51.5Hz	51.50 Hz	110 ms
<p>^a The tripping time includes the period from the limit value violation U/f until the tripping signal to the interface switch. When planning the power generation system, the response time of the interface switch shall be added to the maximum time value obtained as indicated above. The disconnection time (sum of tripping time of the NS protection plus response time of the interface switch) shall not exceed 200 ms * Longest disconnection of the rise-in-voltage protection as a moving 10-minute-average.</p>			
<input checked="" type="checkbox"/> For integrated NS protection			
Assigned to power generation unit of type		SPD-600, SPD-700 , SPD-800	
Type integrated interface switch		(Hongfa) HF115F	
Response time of interface switch for integrated NS protection		20ms	
Verification of the entire functional chain "integrated NS protection – interface switch" has resulted in successful disconnection.			
NOTE1: Un=230V			

Remark:

The sample<s> covered in this VOC are incomplete in functional features or limited in performance capabilities and are intended for use and evaluation in other products. See test report for detail information.


Signature

Name: Max Jin

Position: General Manager

Date: 2024-03-04

This Verification is for the exclusive use of Intertek's client and is provided pursuant to the agreement between Intertek and its Client. Intertek's responsibility and liability are limited to the terms and conditions of the agreement. Intertek assumes no liability to any party, other than to the Client in accordance with the agreement, for any loss, expense or damage occasioned by the use of this Verification. Only the Client is authorized to permit copying or distribution of this Verification. Any use of the Intertek name or one of its marks for the sale or advertisement of the tested material, product or service must first be approved in writing by Intertek. The observations and test/inspection results referenced in this Verification are relevant only to the sample tested/inspected. This Verification by itself does not imply that the material, product, or service is or has ever been under an Intertek certification program.