

Test Verification of Conformity

Verification Number: 221100804SHA-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:	Xiamen E-Star Energy Co., Ltd. Room 501-1, No. 43, Huli Avenue, Huli District, Xiamen, China
Product Description:	Solar inverter
Ratings & Principle Characteristics:	See Appendix (Specifications table)
Models/Type References:	See Appendix (Specifications table)
Brand Name:	DORF
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:	2022-11-06 to 2022-12-02
Test Report Number(s):	221100804SHA-001
Additional information in Appendix.	


Signature

Name: Max Jin

Position: General Manager

Date: 2022-12-08

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APPENDIX: Test Verification of Conformity

This is an Appendix to Test Verification of Conformity Number: 221100804SHA-V1

Manufacturer: Same as applicant

Specifications table		
Model	HT-350W	HT-300W
Input:		
Vmax PV (Vdc)	60	60
Isc PV (absolute Max.) (A)	20	15
Number MPP trackers	1	1
Number input strings	1	1
Max. PV input current(A)	16	13.7
MPPT voltage range (Vdc)	22 to 60	22 to 60
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)	1.52	1.3
Power rating (W)	350	300
Power Rating (VA)	350	300
Power factor /rated	≥0.99	≥0.99
others		
Protective class	Class I	
Ingress protection (IP)	IP 65	
Temperature (°C)	-40°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)	0.82	
Dimensions (WxHxD) (mm)	165 x 176 x 38	

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Annex E4: Verification of Conformity for power generation units

Verification of Conformity for power generation units	No.: 221100804SHA-V1		
Manufacturer	Xiamen E-Star Energy Co., Ltd. Room 501-1, No. 43, Huli Avenue, Huli District, Xiamen, China		
Type power generation unit	Solar inverter		
Model		HT-300W	HT-350W
Assessment values	Max. active power $P_{E_{max}}$	300 W	350 W
	Max. apparent power $S_{E_{max}}$	300 VA	350 VA
	Rated voltage	230Vac	230Vac
Rated values	Rated current (AC) I_r	1.3 A	1.52
	Initial short-circuit AC current	1.3 A	1.55
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	VVC300R3-55-100-433-c3 for HT-300W VVC350R3-55-100-433-c3 for HT-350W		

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

Extract from the test report on the certificate of units	221100804SHA-001					
Manufacturer:	Xiamen E-Star Energy Co., Ltd. Room 501-1, No. 43, Huli Avenue, Huli District, Xiamen, China					
Manufacturer indications:	System type	HT-350W				
	Max. active power $P_{E_{max}}$	350 W				
	Rated voltage	230Vac				
Measurement period	2022-11-14 to 2022-11-22					
Rapid voltage changes						N/A
Connection without provisions (regarding the primary energy carrier)						$k_i = 0.52$
Most adverse case when switching between generator levels						N/A
Connection at nominal conditions (of the primary energy carrier)						$k_i = 1.02$
Disconnection at rated power						$k_i = 1.01$
Worst value of all switching operations						$k_{i_{max}} = 1.02$
Flicker	Angle of network impedance Ψ_k :	32°	30°	50°	70°	85°
	Long-term flicker strength P_{lt} :	0.26	N/A	N/A	N/A	N/A
	Initial flicker factor c_ψ :	N/A	N/A	N/A	N/A	N/A

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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	0.08	0.25	0.47	0.38	0.28	0.20	0.21	0.17	0.23	0.34	--
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	0.01	0.08	0.06	0.07	0.09	0.09	0.08	0.09	0.10	0.10	--
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	--

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(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	--	--	--	--	--

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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"		221100804SHA-001	
Test report NS Protection			
Type of NS protection:	Integrated NS protection	Further manufacturer indications	
Software version:	VVC350R3-55-100-433-c3, VVC300R3-55-100-433-c3		
Manufacturer:	Xiamen E-Star Energy Co., Ltd.		
Measurement period:	2022-11-14 to 2022-11-22		
Inverter(s)			
Protective function	Set value	Tripping value	Tripping time NS protection
Rise-in-voltage protection U >>	1.25 * U _n	1.252 U _n	135 ms
Rise-in-voltage protection U >	1.10 * U _n	1.100 U _n	523 s
Voltage drop protection U <	0.8 * U _n	0.800 U _n	3010 ms
Voltage drop protection U <	0.45 * U _n	0.448 U _n	305 ms
Frequency decrease protection f <	47.5Hz	47.50 Hz	101 ms
Frequency increase protection f >	51.5Hz	51.50 Hz	60 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		HT-350W, HT-300W	
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: U _n =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: 2022-12-08

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