



SMA New Energy Technology (Jiangsu) Co., Ltd

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Manufacture's Declaration

Confirmation of Compliance with the Requirements of VFR 2014/UTE C 15-712-1

SMA New Energy Technology (Jiangsu) Co., Ltd hereby confirms that the inverter types listed below table meet the requirement of the French code of practice UTE C 15-712-1.

Brand	zeversolar		
Type reference	Evershine TLC6000	Evershine TLC5000	Evershine TLC4000
Nominal AC Power	6000W	5000W	4000W
Maximum AC Power	6000W	5500W	4400W

The inverters meet the requirements of VFR 2014/UTE C 15-712-1, along with the specifications in the data sheet and the CE declaration, by the following points:

- The certificate of the compliance with VDE 0126-1-1/A1:2012 has been issued by an accredited institute. The certificate can be downloaded from the website <http://www.zeversolar.com/>.
- The inverters meet the requirements of the French code of practice UTE C 15-712-1.
- The automatic disconnection devices integrated within the inverters with three-phase mains surveillance meet the requirements of DIN VDE 0126-1-1 / A1: 2012 with the deviation of VFR 2014 (mentioned in "Protections des installations de production raccordées au réseau public de distribution, ERDF-NOI-RES_13E, Version 5, 30/06/2013").
- The grid protection parameters can't be changed by user, an installer or by any person other than SMA (password protected).

Suzhou, 31.07.2017

SMA New Energy Technology (Jiangsu) Co., Ltd.

Sandy Gong, Safety Manager

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Test Results

Power quality

Harmonic current emissions as per EN 61000-3-2							
Harmonic	Test Value in Amps Phase 1	% of fund Phase 1	Test Value in Amps Phase 2	% of fund Phase 2	Test Value in Amps Phase 3	% of fund Phase 3	Limit value in Amps
2	0.020	0.234	0.020	0.235	0.032	0.374	1.080
3	0.007	0.078	0.028	0.321	0.010	0.119	2.300
4	0.007	0.078	0.012	0.140	0.012	0.134	0.430
5	0.072	0.834	0.065	0.747	0.071	0.814	1.140
6	0.001	0.015	0.006	0.073	0.006	0.068	0.300
7	0.032	0.370	0.028	0.320	0.023	0.270	0.770
8	0.018	0.207	0.022	0.258	0.024	0.274	0.230
9	0.003	0.034	0.007	0.087	0.005	0.054	0.400
10	0.018	0.203	0.022	0.256	0.021	0.243	0.184
11	0.024	0.277	0.027	0.318	0.026	0.298	0.330
12	0.002	0.028	0.003	0.036	0.006	0.067	0.153
13	0.021	0.245	0.020	0.229	0.021	0.244	0.210
14	0.008	0.087	0.005	0.053	0.004	0.048	0.131
15	0.001	0.014	0.003	0.034	0.002	0.018	0.150
16	0.001	0.009	0.003	0.036	0.002	0.023	0.115
17	0.016	0.182	0.015	0.179	0.016	0.184	0.132
18	0.003	0.037	0.002	0.020	0.003	0.040	0.102
19	0.014	0.167	0.015	0.169	0.012	0.138	0.118
20	0.003	0.035	0.002	0.022	0.004	0.051	0.092
21	0.000	0.004	0.004	0.044	0.003	0.040	0.107
22	0.003	0.030	0.008	0.091	0.005	0.060	0.084
23	0.010	0.121	0.015	0.170	0.012	0.136	0.098
24	0.002	0.023	0.003	0.036	0.005	0.061	0.077
25	0.012	0.144	0.011	0.126	0.011	0.121	0.090
26	0.003	0.029	0.003	0.040	0.002	0.020	0.071
27	0.001	0.006	0.003	0.040	0.001	0.013	0.083
28	0.002	0.022	0.001	0.011	0.001	0.011	0.066
29	0.011	0.125	0.012	0.136	0.010	0.119	0.078
30	0.002	0.020	0.001	0.014	0.002	0.024	0.061
31	0.010	0.110	0.010	0.116	0.009	0.107	0.073
32	0.002	0.023	0.002	0.019	0.001	0.006	0.058

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33	0.003	0.031	0.002	0.027	0.003	0.030	0.068
34	0.003	0.031	0.003	0.040	0.001	0.007	0.054
35	0.010	0.111	0.010	0.110	0.006	0.065	0.064
36	0.002	0.026	0.002	0.027	0.005	0.059	0.051
37	0.011	0.129	0.012	0.134	0.012	0.137	0.061
38	0.002	0.018	0.005	0.058	0.003	0.039	0.048
39	0.006	0.066	0.003	0.038	0.001	0.011	0.058
40	0.002	0.029	0.001	0.016	0.001	0.015	0.046
THD	-	1.14%	-	1.16%	-	1.17%	-

Voltage fluctuations and flicker as per EN 61000-3-3								
	Starting			Stopping			Running	
	dmax	dc	d(t)	dmax	dc	d(t)	Pst	Plt 2 hours
Measured Values	-0.45%	-0.71%	-0.28%	0.67%	0.66%	0.37%	0.18	0.07
Limits set under EN 61000-3-3	4%	3.3%	3.3% 500ms	4%	3.3%	3.3% 500ms	1.0	0.65
Test start date	08/01/2014			Test end date			08/01/2014	
Test location	Audix Technology (Wujiang) Co., Ltd. EMC Dept							

Power factor *			
Test Voltage level	210 V	230 V	253 V
Measured value at 100%Pn	0.998	0.999	0.999
Limit	>0.95	>0.95	>0.95

* Measured at three voltage levels and at full output. The voltage maintained within $\pm 1.5\%$ of the stated level during the test.

Under/Over frequency protection

Function	Limit		Actual setting		Trip test	
	Frequency[Hz]	Time[s]	Frequency[Hz]	Time[s]	Frequency[Hz]	Time[s]
U/F Stage 1	47.5	0.2	47.5	0.16	47.52	0.152
O/F Stage 1	50.6	0.2	50.6	0.16	50.60	0.146

Under/Over voltage protection

Function	Limit		Actual setting		Trip test	
	Voltage [V]	Time [s]	Voltage [V]	Time [s]	Voltage [V]	Time [s]
U/V Stage 1_phase 1	184.0	0.2	184.0	0.12	184.1	0.134
U/V Stage 1_phase 2	184.0	0.2	184.0	0.12	185.3	0.132

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U/V Stage 1_phase 3	184.0	0.2	184.0	0.12	184.8	0.125
O/V Stage 1*_phase 1	253.0	600	253.0	600	257.6	555
O/V Stage 1*_phase 2	253.0	600	253.0	600	257.6	568
O/V Stage 1*_phase 3	253.0	600	253.0	600	257.6	565
O/V Stage 2_phase 1	264.5	0.2	264.5	0.12	264.6	0.130
O/V Stage 2_phase 2	264.5	0.2	264.5	0.12	265.8	0.128
O/V Stage 2_phase 3	264.5	0.2	264.5	0.12	264.7	0.121

*Over voltage - stage 1: 10 min mean value corresponding to EN 50160. The voltage is set to 100%Un and held for 600s. After that, the voltage is set to 112%Un. It must be switched off within 600s.

Loss of mains test

Method used	Reactive power disturbed		
	25%Pn	50%Pn	100%Pn
Limit according to VDE 0126-1-1	5s	5s	5s
Trip time (L:+5%)	1.120s	1.104s	1.088s
Trip time (L:+4%)	1.130s	1.318s	1.158s
Trip time (L:+3%)	1.172s	1.320s	1.190s
Trip time (L:+2%)	1.092s	1.150s	1.184s
Trip time (L:+1%)	1.136s	1.106s	1.184s
Trip time (L:+0%)	1.336s	1.278s	1.246s
Trip time (L:-1%)	1.124s	1.386s	1.102s
Trip time (L:-2%)	1.086s	1.136s	1.104s
Trip time (L:-3%)	1.168s	1.312s	1.086s
Trip time (L:-4%)	1.164s	1.278s	1.426s
Trip time (L:-5%)	1.110s	1.338s	1.334s

Reconnection time measurement

Reconnection time	Under/over Voltage	Under / over Frequency	Loss of Mains
Limit	60s	60s	60s
Actual setting	60s	60s	60s
Recorded value	68s	67s	67s

DC current monitoring

A direct current feed to the low voltage grid due to a defective generator operation must lead to a disconnection within 0.2 s. (according to VDE 0126-1-1)

Function	Limit		Trip test	
	DC current [A]	Time [ms]	DC current [A]	Time [ms]

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Positive DC current	1.0	200	0.98	170.5
Negative DC current	1.0	200	0.99	163.5

Residual current monitoring

Test for correct triggering in event of steadily rising residual current				
PV connection	Limit		Trip test	
	Fault current [mA]	Time [ms]	Test Current [mA]	Time [ms]
PV+	300	300	92	165.5
PV-	300	300	96	177.0

Test for correct triggering in event of sudden rising residual current				
PV connection	Limit		Trip test	
	Fault current [mA]	Time [ms]	Test Current [mA]	Time [ms]
PV+	30	300	30.6	187.5
PV+	60	150	59.5	86.6
PV+	150	40	150.2	20.0
PV-	30	300	30.5	169.0
PV-	60	150	60.5	93.5
PV-	150	40	150.2	21.0

Array insulation resistance detection

The value of the total resistance, including the intentional resistance for array functional grounding, the expected insulation resistance of the array to ground, and the resistance of any other networks connected to ground (for example measurement networks) must not be lower than $R = (V_{MAX PV}/30 \text{ mA})$ ohms. (according to EN 62109-2)

PV connector	Test resistance value	Activation(Yes/No)	Display
PV+	40k Ω	Yes	Isolation Fault
PV-	40k Ω	Yes	Isolation Fault

Additional comments

Evershine TLC4000, Evershine TLC5000 are similar to Evershine TLC6000 in circuit and construction except for the output rating of current and power. The test result can refer to Evershine TLC6000.

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