



## Certificate EN 50438/2007

### European Standard

Manufacturer	<b>SMA Solar Technology AG</b>
Address	Sonnenallee 1, 34266 Niestetal (Germany)

Type Tested reference number	ZE_EN50438_2007_STPxx000TL-20_en_10
Generating Unit technology	Three Phase inverter
Test house details	<b>SMA Solar Technology AG</b>
Test period	From 2014-03-12 until 2014-05-26

Type reference	Max. apparent AC power (VA)	Rated AC power (W)	From FW Pack
STP 12000TL-20	12000	12000	2.52.00.R
STP 10000TL-20	10000	10000	2.52.00.R
STP 9000TL-10	9000	9000	2.52.00.R
STP 8000TL-10	8000	8000	2.52.00.R
STP 7000TL-20	7000	7000	2.52.00.R
STP 6000TL-20	6000	6000	2.52.00.R
STP 5000TL-20	5000	5000	2.52.00.R

The results of the EN 50438/2007 are summarized in this certificate. SMA declares that all units shipped to Poland, with at least the aforementioned FW version, are within the specifications and parameters set by the EN 50438/2007 European Standard. Note that all tests were carried out in the biggest inverter of the family under test. The results for the other inverters of the family are equivalent.

ZE\_EN50438\_2007\_STPxx000TL-20\_en\_10



## Test Results

### Power quality

Harmonics as per EN 61000-3-2						
Order	Frequency [Hz]	Thresholds [A]	P/Pn [%]		Max. MV / Limit [%]	
			50	100		
			MV [A]	MV [A]		
2	100	1,08	0,046108169	0,09051423	8,38%	✓
3	150	2,3	0,041442897	0,03798102	1,80%	✓
4	200	0,43	0,071754098	0,0392688	16,69%	✓
5	250	1,14	0,06021403	0,066622555	5,84%	✓
6	300	0,3	0,034406269	0,013428411	11,47%	✓
7	350	0,77	0,056021987	0,046825212	7,28%	✓
8	400	0,23	0,018470968	0,010577502	8,03%	✓
9	450	0,4	0,015047379	0,013231441	3,76%	✓
10	500	0,184	0,01274682	0,00938692	6,93%	✓
11	550	0,33	0,055520242	0,048373404	16,82%	✓
12	600	0,153	0,010511745	0,006489014	6,86%	✓
13	650	0,21	0,035540879	0,063886499	30,42%	✓
14	700	0,131	0,008476714	0,005425784	6,45%	✓
15	750	0,15	0,011417241	0,00815369	7,61%	✓
16	800	0,115	0,007382018	0,004590711	6,42%	✓
17	850	0,132	0,036206633	0,016684797	27,36%	✓
18	900	0,102	0,005522732	0,005341593	5,40%	✓
19	950	0,118	0,022867403	0,061920496	52,29%	✓
20	1000	0,092	0,004844671	0,003994787	5,27%	✓
21	1050	0,107	0,006845115	0,00657839	6,39%	✓
22	1100	0,084	0,004477082	0,00341029	5,35%	✓
23	1150	0,098	0,021180159	0,009169812	21,65%	✓
24	1200	0,077	0,003533526	0,003698063	4,82%	✓
25	1250	0,09	0,018298799	0,047752552	53,06%	✓
26	1300	0,071	0,003997459	0,003455569	5,65%	✓
27	1350	0,083	0,009941411	0,009593764	11,93%	✓
28	1400	0,066	0,00305844	0,003258756	4,96%	✓
29	1450	0,078	0,013498674	0,027891387	35,95%	✓
30	1500	0,061	0,002547838	0,003560723	5,81%	✓
31	1550	0,073	0,006929051	0,014733531	20,30%	✓
32	1600	0,058	0,001990269	0,002567724	4,47%	✓
33	1650	0,068	0,008082627	0,010028082	14,71%	✓
34	1700	0,054	0,001843172	0,002057369	3,80%	✓
35	1750	0,064	0,010482397	0,011449325	17,81%	✓
36	1800	0,051	0,001640271	0,001781244	3,49%	✓
37	1850	0,061	0,007244468	0,016511771	27,15%	✓
38	1900	0,048	0,001542685	0,001604858	3,31%	✓
39	1950	0,058	0,002320548	0,001915682	4,02%	✓
40	2000	0,046	0,001586823	0,001400641	3,45%	✓

MV - Measured Value

ZE\_EN50438\_2007\_STPxx000TL-20\_en\_10



## Test Results

### Power quality

Voltage fluctuations and flicker as per EN 61000-3-3				
	Starting	Stopping	Running	
	dmax	dmax	Pst	Plt (2hours)
Limit	4,0%	4,0%	1	0,65
MV	2,1%	2,6%	0,11	0,11
Verification	✓	✓	✓	✓

Power factor			
	Voltage [V]		
	218,2	230	253
Limit	0,95	0,95	0,95
MV	1,00	1,00	1,00
Verification	✓	✓	✓

MV - Measured value

### Protection - Grid monitoring and reconnection time

Trip Tests	EN 50438:2007		Setting		Measures Values		Verification
	Magnitude	Time	Magnitude	Time	Magnitude	Time	
Undervoltage	195,5 V	1500 ms	195,5 V	1500 ms	195,9 V	1493 ms	✓
Overvoltage	264,5 V	200 ms	264,5 V	200 ms	265 V	193 ms	✓
Underfrequency	47 Hz	500 ms	47 Hz	500 ms	47,08 Hz	481 ms	✓
Overfrequency	51Hz	500 ms	51Hz	500 ms	51,02 Hz	483 ms	✓

Tolerances on trip values:  
 - Voltage: ±1% Vnom      - Frequency: ± 0,5% fnom      - Clearance time: ± 10%

Fault level contribution		
Time after fault	Voltage (V)	Current (A)
< 50 ms	229,9	15,91
100 ms	11,51	0,04
250 ms	11,56	0,04
500 ms	11,64	0,04

Reconnection time			
Limit	Setting	MV	Verification
20 s	20 s	26,7 s	✓