Declaration for VDE-AR-N 4105_2018

Manufacturer's reference number	X1-3.0-T-D X1-3.0-T-N X1-3.3-T-D X1-3.3-T-N X1-3.6-T-D X1-3.6-T-N X1-4.2-T-D X1-4.2-T-N X1-4.6-T-D X1-4.6-T-N X1-5.0-T-D X1-5.0-T-N
Micro-generator technology	Photovoltaic Grid-tied inverter
Manufacturer name	SolaX Power Network Technology (Zhe jiang) Co. , Ltd.
Address	No.288 Shizhu Road,Tonglu Economic Development Zone, Dongxing District,Tonglu City, Zhejiang Province, China.

Tel	+86(0571)-56260011	Fax	+86(0571)-56075753
E-mail	info@solaxpower.com	Web site	www.solaxpower.com

Registered Capacity, use separate sheet if more than one connection option.	Connection Option	
	3.0	kW single phase system
	3.3	kW single phase system
	3.6	kW single phase system
	4.2	kW single phase system
	4.6	kW single phase system

Manufacturer Type Test declaration. - I certify that all products supplied by the company with the above **Type Tested** reference number will be manufactured and tested to ensure that they perform as stated in this document, prior to shipment to site and that no site modifications are required to ensure that the product meets all the requirements of VDE-AR-N 4105_2018.

Signed	Guo Huawei	On behalf of	SolaX Power Network Technology (Zhe jiang) Co. , Ltd.

Additional comments

2019/05/06

Clause	Test description	Verdict
5.1	Principles for determining the network connection point	P
5.2	Rating of the network equipment	P
5.3	Permissible voltage change	P
5.4	Network Disturbances	P
5.5.1	General	P
5.5.3	Plug-in production plants	P
5.6	Three-phase converter systems	NA
5.7.1	General	P
5.7.2	Static voltage maintenance / reactive power provision	P
5.7.2.1	General boundary conditions	P
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5.7.2.3	Reactive power supply below Pemax	P
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5.7.4.4	Voltage-dependent active power reduction	P
5.7.5	Short-circuit current contribution	P
6.1	General requirements	P
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6.5.2	Protection functions	P
6.5.3	Islanding detection	P
8.3	Connection conditions and synchronization	P

Protection function	Setting value	Trip delay	Tripping value	Break time
Voltage drop protection U<<	0.45Un	≤300ms	103.2V	260ms
Voltage drop protection U<	0.8Un	≤3s	183.4 V	20.8ms
Rise-in-voltage protection U>	1.1Un	≤100ms	253 V	90ms
Rise-in-voltage protection U>>	1.25Un	≤100ms	287.8 V	94ms
Frequency decrease protection f<	47.5Hz	≤100ms	47.51Hz	95ms
Frequency increase protection f>	51.5Hz	≤100ms	51,50Hz	94.8ms

a) cos φ (P)

Power step under applied cosφ(P)-curve setted through control panel	Measured cosφ	Active Power P_{1+} (W)	Apparent Power S_{1+} (VA)	Reactive Power Q_{1+} (Var)	Deviation of Q (Var)	Limit of Q [≤±4% P_{Emax} = Var]	Voltage V_{1+} (V)
Point 1: P = 10% P_{Emax};	0.988	457.6	463.1	71.0	71.0	±4%	230.5
Point 2: P = 20% P_{Emax};	0.997	920.5	923.4	73.3	73.3	±4%	230.6
Point 3: P = 30% P_{Emax} ;	0.998	1379.2	1381.6	80.4	80.4	±4%	230
Point 4: P = 40% P_{Emax} ;	0.998	1842.3	1844.4	88.7	88.7	±4%	230.2
Point 5: P = 50% P_{Emax} ;	0.998	2288.7	2293.1	-141	141.0	±4%	230.2
Point 6: P = 60% P_{Emax} ;	0.990	2765.9	2794.3	-396.8	3.6	±4%	230.4
Point 7: P = 70% P_{Emax} ;	0.981	3194.7	3256.8	-633.2	19.4	±4%	230.5
Point 8: P = 80% P_{Emax} ;	0.970	3704.3	3817.0	-920.9	1.4	±4%	230.7
Point 9: P = 90% P_{Emax} ;	0.962	4125.5	4289.3	-1173.9	9.9	±4%	230.9
Point 10: P = 100%P_{Emax} ;	0.956	4381.5	4583.5	-1345.7	100.3	±4%	231
Point 11: P = 90% P_{Emax} ;	0.960	4154.5	4326.8	-1208.7	16.7	±4%	231.5
Point 12: P = 80% P_{Emax} ;	0.970	3696.0	3811.6	-931.3	9	±4%	231.4
Point 13: P = 70% P_{Emax} ;	0.979	3233.9	3303.3	-673.4	19.6	±4%	231.2
Point 14: P = 60% P_{Emax} ;	0.988	2770.0	2803.9	-433.9	40.7	±4%	231

Point 15: P = 50% P_{Emax} ;	0.996	2303.5	2313.1	-160.9	160.9	±4%	230.9
Point 16: P = 40% P_{Emax} ;	0.995	1832.7	1842.8	-152.5	152.5	±4%	230.7
Point 17: P = 30% P_{Emax} ;	0.992	1376.7	1387.7	-143.9	143.9	±4%	230.5
Point 18: P = 20% P_{Emax};	0.995	912.8	917.5	92.1	92.1	±4%	230.7
Point 19: P = 10% P_{Emax};	0.981	453.8	462.8	-90.9	90.9	±4%	230.5

Reactive power transfer function – standard-cos φ-(p)-characteristic

Active power P/P_{Emax} [%]	10	20	30	40	50	60	70	80	90	100*
cos φ	0.985	0.996	0.995	0.997	0.997	0.989	0.980	0.970	0.961	0.956

"*":The maximum apparent power of the inverter is limited to S_{Emax}. If setting cos φ≠1, the maximum active power is reduced accordingly. The active power 100% P/P_{Emax} is therefore only achieved when cos φ = 1.

Response time measurement: Standard characteristic curve for cos φ (P)

Power step under applied cosφ(P)-curve setted through control panel	Voltage V_{1+} (Vac)	Measured cosφ	Active Power (W) P_{1+}	Apparent Power (VA) S_{1+}	Reactive Power (Var) Q_{1+}	Response time (s)
20% P_{Emax}, cosφ=1,0	231.3	0.997	917	920.5	68.6	
50% P_{Emax}, cosφ=1,0	231.3	0.999	2290	2292	-91.6	0.8
90% P_{Emax}, cosφ=0,96	231.3	0.965	4000	4143.4	-1080	1.6
90% P_{Emax}, cosφ=0,96	231.1	0.962	4140	4302	-1171	
50% P_{Emax}, cosφ=1,0	231.1	0.999	2300	2305	-120.4	3
20% P_{Emax}, cosφ=1,0	231.1	0.995	890	892.5	92.4	5

b) fixed cosφ

P_{Emax} with fixed cosφ	cosφ	Active Power P_{1+} (W)	Apparent Power S_{1+} (VA)	Reactive Power Q_{1+}(Var)	Deviation of Q (Var)	Limit of Q (≤±4% P_{Emax} = Var)
cosφ = 0,900 over-excited	0.893	4180	4681	2106	101	±4%
cosφ = 0,910 over-excited	0.903	4204.8	4655	1997	90	±4%
cosφ = 0,920 over-excited	0.914	4248	4649	1888	85	±4%

cosφ = 0,930 over-excited	0.924	4314	4669	1785	94	±4%
cosφ = 0,940 over-excited	0.934	4350	4655	1659	90	±4%
cosφ = 0,950 over-excited	0.945	4396	4652	1523	87	±4%
cosφ = 0,960 over-excited	0.955	4427	4634	1369	81	±4%
cosφ = 0,970 over-excited	0.966	4482	4639	1199	81	±4%
cosφ = 0,980 over-excited	0.977	4540	4648	993	78	±4%
cosφ = 0,990 over-excited	0.988	4556	4614	725	76	±4%
cosφ = 1	0.999	4595	4598	169	169	±4%
cosφ = 0,990 under-excited	0.990	4563	4607	-636	13	±4%
cosφ = 0,980 under-excited	0.981	4511	4599	-894	21	±4%
cosφ = 0,970 under-excited	0.971	4463	4597	-1099	19	±4%
cosφ = 0,960 under-excited	0.961	4409	4588	-1267	21	±4%
cosφ = 0,950 under-excited	0.951	4358	4581	-1412	24	±4%
cosφ = 0,940 under-excited	0.941	4308	4576	-1543	26	±4%
cosφ = 0,930 under-excited	0.932	4261	4573	-1661	30	±4%
cosφ = 0,920 under-excited	0.922	4212	4569	-1770	33	±4%
cosφ = 0,910 under-excited	0.912	4167	4569	-1875	32	±4%
cosφ = 0,900 under-excited	0.902	4121	4568	-1971	34	±4%

c) PT1 step response verification

	Time (s)	Active Power P_{1+} (W)	Apparent Power S_{1+} (VA)	Reactive Power Q_{1+} (Var)	Q_{1+}/P_{Emax}
50% Pn, Q=0 → $Q_{max. over-excited}$	0	2304	2309	150	0.0325
	0.2	2306	2311	153	0.0333
	0.4	2308	2318	206	0.0447
	0.6	2309	2328	299	0.0651
	0.8	2311	2345	398	0.0866

1	2311	2364	499	0.1084
1.2	2311	2387	595	0.1293
1.4	2312	2411	686	0.1492
1.6	2314	2440	775	0.1686
1.8	2314	2467	858	0.1864
2	2314	2496	936	0.2034
2.2	2314	2525	1011	0.2198
2.4	2313	2553	1082	0.2353
2.6	2311	2581	1149	0.2498
2.8	2311	2610	1213	0.2638
3	2310	2638	1274	0.2768
3.2	2309	2665	1331	0.2893
3.4	2308	2692	1385	0.3012
3.6	2307	2718	1437	0.3124
3.8	2306	2743	1485	0.3228
4	2305	2767	1531	0.3328
4.2	2305	2792	1576	0.3425
4.4	2305	2814	1615	0.3510
4.6	2304	2837	1655	0.3598
4.8	2303	2858	1692	0.3679
5	2303	2879	1727	0.3754
5.2	2303	2898	1759	0.3825
5.4	2302	2918	1792	0.3897
5.6	2302	2935	1821	0.3958
5.8	2302	2953	1850	0.4022
6	2301	2970	1877	0.4080

6.2	2301	2985	1901	0.4133
6.4	2301	3001	1926	0.4186
6.6	2300	3013	1947	0.4233
6.8	2301	3028	1968	0.4278
7	2301	3041	1989	0.4324
7.2	2299	3053	2008	0.4366
7.4	2298	3063	2026	0.4404
7.6	2296	3074	2044	0.4444
7.8	2295	3085	2061	0.4480
8	2295	3095	2075	0.4512
8.2	2296	3105	2090	0.4544
8.4	2295	3113	2103	0.4572
8.6	2296	3122	2116	0.4600
8.8	2295	3130	2129	0.4627
9	2294	3137	2140	0.4652
9.2	2294	3145	2151	0.4676
9.4	2295	3153	2162	0.4700
9.6	2292	3158	2172	0.4722
9.8	2292	3164	2181	0.4741
10	2292	3171	2191	0.4763
10.2	2291	3176	2199	0.4781
10.4	2291	3181	2207	0.4797
10.6	2291	3187	2215	0.4815
10.8	2290	3191	2221	0.4829
11	2289	3195	2228	0.4844
11.2	2290	3201	2236	0.4860

11.4	2290	3203	2240	0.4869
11.6	2290	3207	2246	0.4882
11.8	2290	3211	2251	0.4894
12	2291	3216	2257	0.4906
12.2	2291	3220	2263	0.4919
12.4	2291	3222	2266	0.4926
12.6	2291	3225	2270	0.4935
12.8	2291	3229	2275	0.4946
13	2290	3230	2278	0.4952
13.2	2290	3233	2282	0.4960
13.4	2290	3235	2285	0.4967
13.6	2289	3237	2288	0.4975
13.8	2289	3239	2291	0.4980
14	2290	3242	2296	0.4990
14.2	2289	3243	2297	0.4993
14.4	2290	3246	2301	0.5001
14.6	2290	3248	2304	0.5009
14.8	2289	3248	2305	0.5010
15	2288	3250	2308	0.5016
15.2	2289	3253	2311	0.5023
15.4	2289	3253	2312	0.5025
15.6	2289	3254	2313	0.5027
15.8	2290	3256	2315	0.5033
16	2289	3258	2318	0.5039
16.2	2289	3258	2318	0.5040
16.4	2289	3260	2321	0.5046

16.6	2290	3261	2322	0.5048
16.8	2290	3262	2322	0.5049
17	2290	3263	2324	0.5052
17.2	2291	3264	2325	0.5054
17.4	2291	3265	2326	0.5057
17.6	2290	3265	2328	0.5060
17.8	2290	3266	2329	0.5063
18	2289	3266	2329	0.5063
18.2	2289	3266	2330	0.5066
18.4	2288	3266	2331	0.5067
18.6	2289	3267	2331	0.5068
18.8	2290	3270	2334	0.5074
19	2290	3270	2335	0.5076
19.2	2290	3270	2334	0.5074
19.4	2291	3272	2336	0.5077
19.6	2291	3272	2336	0.5077
19.8	2292	3273	2336	0.5079
20	2291	3273	2338	0.5082
20.2	2290	3271	2336	0.5078
20.4	2291	3273	2338	0.5082
20.6	2291	3274	2338	0.5083
20.8	2291	3274	2339	0.5085
21	2290	3274	2340	0.5087
21.2	2292	3275	2340	0.5086
21.4	2291	3275	2339	0.5085
21.6	2292	3275	2340	0.5087

21.8	2291	3276	2342	0.5091
22	2290	3274	2341	0.5089
22.2	2288	3274	2342	0.5091
22.4	2288	3273	2341	0.5090
22.6	2288	3273	2341	0.5090
22.8	2289	3275	2342	0.5092
23	2289	3276	2343	0.5094
23.2	2289	3276	2343	0.5094
23.4	2290	3276	2343	0.5093
23.6	2290	3277	2344	0.5095
23.8	2288	3275	2343	0.5094
24	2288	3275	2343	0.5093
24.2	2287	3274	2343	0.5093
24.4	2286	3274	2343	0.5094
24.6	2287	3275	2344	0.5096
24.8	2285	3274	2344	0.5095
25	2284	3273	2344	0.5096
25.2	2282	3272	2345	0.5097
25.4	2281	3272	2346	0.5100
25.6	2282	3272	2345	0.5098
25.8	2282	3272	2345	0.5098
26	2283	3273	2346	0.5099
26.2	2284	3274	2345	0.5098
26.4	2284	3274	2345	0.5098
26.6	2284	3273	2344	0.5097
26.8	2284	3273	2344	0.5096

	27	2283	3273	2345	0.5097
	27.2	2282	3273	2346	0.5099
	27.4	2282	3272	2345	0.5097
	27.6	2282	3273	2347	0.5101
	27.8	2282	3272	2345	0.5098
	28	2283	3272	2345	0.5097
	28.2	2283	3273	2346	0.5100
	28.4	2282	3273	2346	0.5100
	28.6	2281	3271	2345	0.5099
	28.8	2279	3271	2346	0.5101
	29	2279	3271	2346	0.5100
	29.2	2279	3271	2346	0.5100
	29.4	2280	3272	2347	0.5103
	29.6	2278	3271	2347	0.5102
	29.8	2278	3271	2347	0.5103
	30	2277	3269	2346	0.5100
50% Pn, Q=0 → $Q_{max. under-excited}$	0	2301	2306	150	0.0326
	0.2	2301	2306	160	0.0348
	0.4	2302	2313	226	0.0491
	0.6	2302	2324	-318	-0.0692
	0.8	2301	2339	-418	-0.0909
	1	2304	2361	-516	-0.1122
	1.2	2303	2382	-608	-0.1322
	1.4	2305	2409	-700	-0.1521
	1.6	2306	2436	-785	-0.1706
	1.8	2307	2464	-865	-0.1881

2	2309	2494	-942	-0.2049
2.2	2311	2525	-1016	-0.2208
2.4	2311	2552	-1083	-0.2355
2.6	2313	2583	-1150	-0.2500
2.8	2314	2613	-1213	-0.2637
3	2315	2641	-1272	-0.2764
3.2	2315	2669	-1328	-0.2886
3.4	2315	2696	-1381	-0.3002
3.6	2318	2724	-1431	-0.3110
3.8	2319	2750	-1479	-0.3215
4	2320	2775	-1522	-0.3309
4.2	2321	2799	-1565	-0.3403
4.4	2321	2822	-1605	-0.3490
4.6	2321	2843	-1642	-0.3570
4.8	2321	2865	-1680	-0.3652
5	2322	2887	-1714	-0.3727
5.2	2322	2906	-1747	-0.3797
5.4	2322	2924	-1777	-0.3862
5.6	2323	2943	-1807	-0.3927
5.8	2323	2960	-1833	-0.3986
6	2324	2976	-1860	-0.4043
6.2	2325	2993	-1885	-0.4097
6.4	2325	3007	-1906	-0.4143
6.6	2326	3022	-1930	-0.4195
6.8	2325	3035	-1951	-0.4241
7	2326	3048	-1969	-0.4281

7.2	2326	3060	-1989	-0.4324
7.4	2326	3072	-2007	-0.4363
7.6	2326	3083	-2023	-0.4398
7.8	2325	3093	-2040	-0.4435
8	2325	3103	-2054	-0.4466
8.2	2325	3111	-2067	-0.4494
8.4	2324	3120	-2082	-0.4526
8.6	2324	3130	-2096	-0.4555
8.8	2324	3136	-2106	-0.4578
9	2324	3145	-2119	-0.4605
9.2	2325	3152	-2129	-0.4628
9.4	2326	3160	-2139	-0.4650
9.6	2325	3166	-2149	-0.4672
9.8	2324	3171	-2158	-0.4692
10	2323	3176	-2166	-0.4708
10.2	2324	3182	-2174	-0.4725
10.4	2323	3187	-2182	-0.4743
10.6	2323	3191	-2188	-0.4757
10.8	2323	3197	-2197	-0.4776
11	2323	3201	-2202	-0.4787
11.2	2321	3204	-2208	-0.4800
11.4	2321	3208	-2215	-0.4815
11.6	2320	3212	-2221	-0.4828
11.8	2320	3215	-2226	-0.4838
12	2320	3219	-2232	-0.4851
12.2	2319	3220	-2235	-0.4858

12.4	2317	3223	-2239	-0.4868
12.6	2318	3227	-2245	-0.4880
12.8	2317	3229	-2249	-0.4890
13	2317	3230	-2250	-0.4892
13.2	2319	3234	-2254	-0.4899
13.4	2319	3238	-2259	-0.4911
13.6	2318	3239	-2262	-0.4917
13.8	2319	3241	-2265	-0.4924
14	2319	3244	-2268	-0.4930
14.2	2318	3245	-2271	-0.4936
14.4	2317	3246	-2273	-0.4941
14.6	2317	3248	-2275	-0.4947
14.8	2317	3249	-2277	-0.4950
15	2318	3251	-2280	-0.4957
15.2	2317	3252	-2281	-0.4959
15.4	2317	3252	-2283	-0.4962
15.6	2318	3255	-2285	-0.4967
15.8	2317	3256	-2288	-0.4974
16	2316	3257	-2290	-0.4978
16.2	2317	3258	-2291	-0.4981
16.4	2317	3259	-2293	-0.4984
16.6	2316	3259	-2293	-0.4985
16.8	2317	3262	-2296	-0.4991
17	2316	3263	-2298	-0.4995
17.2	2316	3263	-2299	-0.4998
17.4	2317	3264	-2299	-0.4998

17.6	2317	3265	-2300	-0.4999
17.8	2317	3266	-2302	-0.5003
18	2317	3266	-2302	-0.5005
18.2	2318	3267	-2303	-0.5007
18.4	2317	3268	-2305	-0.5010
18.6	2317	3268	-2304	-0.5010
18.8	2318	3270	-2306	-0.5014
19	2317	3269	-2306	-0.5013
19.2	2315	3268	-2306	-0.5013
19.4	2315	3269	-2308	-0.5017
19.6	2314	3269	-2310	-0.5021
19.8	2317	3270	-2309	-0.5018
20	2315	3269	-2309	-0.5019
20.2	2317	3271	-2309	-0.5020
20.4	2318	3273	-2311	-0.5023
20.6	2318	3273	-2310	-0.5022
20.8	2318	3274	-2313	-0.5027
21	2316	3272	-2311	-0.5025
21.2	2317	3273	-2313	-0.5028
21.4	2317	3273	-2312	-0.5026
21.6	2317	3273	-2312	-0.5026
21.8	2317	3274	-2313	-0.5028
22	2316	3275	-2315	-0.5033
22.2	2317	3273	-2312	-0.5025
22.4	2318	3275	-2314	-0.5030
22.6	2316	3274	-2314	-0.5031

22.8	2316	3275	-2316	-0.5034
23	2315	3274	-2315	-0.5032
23.2	2316	3275	-2315	-0.5033
23.4	2315	3275	-2316	-0.5034
23.6	2315	3274	-2315	-0.5032
23.8	2315	3275	-2317	-0.5037
24	2315	3273	-2314	-0.5031
24.2	2315	3275	-2315	-0.5033
24.4	2315	3276	-2317	-0.5038
24.6	2316	3275	-2316	-0.5035
24.8	2316	3276	-2317	-0.5037
25	2317	3276	-2316	-0.5036
25.2	2317	3276	-2317	-0.5037
25.4	2317	3276	-2316	-0.5035
25.6	2317	3277	-2318	-0.5039
25.8	2316	3276	-2318	-0.5039
26	2316	3277	-2318	-0.5040
26.2	2315	3276	-2318	-0.5039
26.4	2314	3275	-2318	-0.5040
26.6	2312	3274	-2318	-0.5038
26.8	2311	3274	-2318	-0.5040
27	2313	3275	-2318	-0.5040
27.2	2312	3274	-2319	-0.5041
27.4	2312	3275	-2320	-0.5042
27.6	2312	3275	-2319	-0.5040
27.8	2312	3275	-2319	-0.5042

	28	2312	3275	-2319	-0.5041
	28.2	2311	3273	-2318	-0.5039
	28.4	2310	3272	-2318	-0.5039
	28.6	2309	3273	-2319	-0.5042
	28.8	2308	3272	-2319	-0.5042
	29	2306	3271	-2320	-0.5043
	29.2	2307	3272	-2320	-0.5044
	29.4	2307	3271	-2319	-0.5042
	29.6	2308	3272	-2319	-0.5042
	29.8	2308	3273	-2320	-0.5044
	30	2305	3270	-2319	-0.5042

Power Quality – Voltage fluctuations and Flicker:

For Power Generating Modules of Registered Capacity of less than 75 A per phase (ie 50 kW) these tests should be undertaken in accordance with Annex A.7.1.4.3. Results should be normalised to a standard source impedance, or if this results in figures above the limits set in BS EN 61000-3-11 to a suitable Maximum Impedance.

For Power Generating Modules of Registered Capacity of greater than 75 A per phase (ie 50 kW) the installation must be designed in accordance with EREC P28.

Model：X1-5.0-T-D

	Starting			Stopping			Running	
	d max	d c	d(t)	d max	d c	d(t)	Pst	Plt 2 hours
Measured Values at test impedance	0.21%	0.10%	0%	0.25%	0.12%	0%	0.12	0.16
Normalised to standard impedance	0.21%	0.10%	0%	0.25%	0.12%	0%	0.12	0.16
Normalised to required maximum impedance	NA	NA	NA	NA	NA	NA	NA	NA

Limits set under BS EN 61000-3-11	4%	3.3%	3.3%	4%	3.3%	3.3%	1.0	0.65

Test Impedance	R		Ω	Xl		Ω
Standard Impedance	R	0.24 * 0.4 ^	Ω	Xl	0.15 * 0.25 ^	Ω
Maximum Impedance	R		Ω	Xl		Ω

* Applies to three phase and split single phase Power Generating Modules.

^ Applies to single phase Power Generating Module and Power Generating Modules using two phases on a three phase system

For voltage change and flicker measurements the following formula is to be used to convert the measured values to the normalised values where the Power Factor of the generation output is 0.98 or above.

Normalised value = Measured value x reference source resistance/measured source resistance at test point

Single phase units reference source resistance is 0.4 Ω

Two phase units in a three phase system reference source resistance is 0.4 Ω

Two phase units in a split phase system reference source resistance is 0.24 Ω

Three phase units reference source resistance is 0.24 Ω

Where the Power Factor of the output is under 0.98 then the Xl to R ratio of the test impedance should be close to that of the Standard Impedance.

The stopping test should be a trip from full load operation.

The duration of these tests need to comply with the particular requirements set out in the testing notes for the technology under test. Dates and location of the test need to be noted below

Test start date	2019-04-12	Test end date	2019-04-12
Test location	No.99, Hongye Road, Suzhou Industrial Park, Suzhou, Jiangsu,P.R. China		

Power Quality – Harmonics: These tests should be carried out as specified in BS EN 61000-3-2. The chosen test should be undertaken with a fixed source of energy at two power levels a) between 45 and 55% and b) at 100% of Registered Capacity. The test requirements are specified in Annex A1 A.1.3.1 (Inverter connected) or Annex A2 A.2.3.1 (Synchronous).				
Micro-generator tested to BS EN 61000-3-2				
Micro-generator rating per phase (rpp)		3.0	kW	
Harmonic	At 45-55% of Registered Capacity	100% of Registered Capacity		
	Measured Value MV in Amps	Measured Value MV in Amps	Limit in BS EN 61000-3-2 in Amps	Higher limit for odd harmonics 21 and above
2	0.02	0.16	1.080	
3	0.07	0.08	2.300	
4	0.01	0.02	0.430	
5	0.09	0.13	1.140	
6	0.01	0.04	0.300	
7	0.08	0.14	0.770	
8	0.02	0.02	0.230	
9	0.09	0.19	0.400	
10	0.01	0.01	0.184	
11	0.05	0.08	0.330	
12	0.01	0.02	0.153	
13	0.03	0.06	0.210	
14	0.01	0.01	0.131	
15	0.02	0.03	0.150	
16	0.01	0.01	0.115	
17	0.01	0.03	0.132	
18	0.01	0.01	0.102	

19	0.01	0.03	0.118	
20	0.01	0.01	0.092	
21	0.01	0.02	0.107	0.160
22	0.01	0.01	0.084	
23	0.01	0.01	0.098	0.147
24	0.01	0.01	0.077	
25	0.01	0.01	0.090	0.135
26	0.01	0.01	0.071	
27	0.01	0.01	0.083	0.124
28	0.01	0.01	0.066	
29	0.01	0.01	0.078	0.117
30	0.01	0.01	0.061	
31	0.01	0.01	0.073	0.109
32	0.01	0.01	0.058	
33	0.01	0.01	0.068	0.102
34	0.01	0.01	0.054	
35	0.01	0.01	0.064	0.096
36	0.01	0.01	0.051	
37	0.01	0.01	0.061	0.091
38	0.01	0.01	0.048	
39	0.01	0.01	0.058	0.087
40	0.01	0.01	0.046	
Note the higher limits for odd harmonics 21 and above are only allowable under certain conditions, if these higher limits are utilised please state the exemption used as detailed in part 6.2.3.4 of BS EN 61000-3-2 in the box below. •				

Power Quality – Harmonics: These tests should be carried out as specified in BS EN 61000-3-2. The chosen test should be undertaken with a fixed source of energy at two power levels a) between 45 and 55% and b) at 100% of Registered Capacity. The test requirements are specified in Annex A1 A.1.3.1 (Inverter connected) or Annex A2 A.2.3.1 (Synchronous).				
Micro-generator tested to BS EN 61000-3-2				
Micro-generator rating per phase (rpp)		4.6	kW	
Harmonic	At 45-55% of Registered Capacity	100% of Registered Capacity		
	Measured Value MV in Amps	Measured Value MV in Amps	Limit in BS EN 61000-3-2 in Amps	Higher limit for odd harmonics 21 and above
2	0.040	0.086	1.080	
3	0.084	0.109	2.300	
4	0.014	0.038	0.430	
5	0.109	0.160	1.140	
6	0.020	0.037	0.300	
7	0.124	0.189	0.770	
8	0.021	0.050	0.230	
9	0.178	0.284	0.400	
10	0.022	0.023	0.184	
11	0.114	0.218	0.330	
12	0.016	0.023	0.153	
13	0.081	0.122	0.210	
14	0.016	0.020	0.131	
15	0.067	0.073	0.150	
16	0.013	0.013	0.115	
17	0.049	0.082	0.132	
18	0.021	0.020	0.102	
19	0.031	0.059	0.118	

20	0.008	0.016	0.092	
21	0.034	0.033	0.107	0.160
22	0.014	0.016	0.084	
23	0.036	0.024	0.098	0.147
24	0.012	0.013	0.077	
25	0.030	0.045	0.090	0.135
26	0.011	0.014	0.071	
27	0.028	0.034	0.083	0.124
28	0.007	0.016	0.066	
29	0.017	0.027	0.078	0.117
30	0.009	0.013	0.061	
31	0.009	0.036	0.073	0.109
32	0.008	0.012	0.058	
33	0.015	0.026	0.068	0.102
34	0.010	0.012	0.054	
35	0.008	0.026	0.064	0.096
36	0.007	0.010	0.051	
37	0.017	0.024	0.061	0.091
38	0.008	0.009	0.048	
39	0.013	0.028	0.058	0.087
40	0.007	0.012	0.046	
Note the higher limits for odd harmonics 21 and above are only allowable under certain conditions, if these higher limits are utilised please state the exemption used as detailed in part 6.2.3.4 of BS EN 61000-3-2 in the box below.				