Certificate of compliance

Applicant:	**NingBo Deye Inverter Technology Co., Ltd.** **No. 26 South YongJiang Road, Daqi, Beilun, NingBo,** **China**
Product:	**Photovoltaic inverter**
Model:	**SUN-70K-G03,** **SUN-75K-G03,** **SUN-80K-G03,** **SUN-90K-G03,** **SUN-100K-G03,** **SUN-110K-G03,** **SUN-70K-G03P3-EU-BM4,** **SUN-75K-G03P3-EU-BM4,** **SUN-80K-G03P3-EU-BM4,** **SUN-90K-G03P3-EU-BM6,** **SUN-100K-G03P3-EU-BM6,** **SUN-110K-G03P3-EU-BM6**

Use in accordance with regulations:

Automatic disconnection device with three-phase mains surveillance in accordance with Engineering Recommendation G99/NI for photovoltaic systems with a three-phase parallel coupling via an inverter in the public mains supply. The automatic disconnection device is an integral part of the aforementioned inverter. This serves as a replacement for the disconnection device with isolating function, which can be accessed the distribution network provider at any time.

Applied rules and standards:

Engineering Recommendation G99/1-10:2024
Requirements for the connection of generation equipment in parallel with public distribution networks

At the time of issue of this certificate, the safety concept of an aforementioned representative product corresponds to the valid safety specifications for the specified use in accordance with regulations.

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Certificate number: **U26-0908**

Certification Program: **NSOP-0032-DEU-ZE-ES-V11**
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Certification body

Domenik Koll
Head of Energy Systems Germany

Accreditation

EUROPEAN RECOGNITION
DAkkS Deutsche Akkreditierungsstelle D-ZE-12024-01-00

Accredited certification body by Deutsche Akkreditierungsstelle GmbH (DAkkS) according to ISO/IEC 17065. The accreditation is valid only for the scope listed in the annex of the accreditation certificate D-ZE-12024-01-00. The Deutsche Akkreditierungsstelle GmbH (DAkkS) is signatory of the multilateral arrangements of EA, ILAC and IAF for mutual recognition.

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Appendix A2-3 Compliance Verification Report for Inverter Connected Power Generating Modules			
Extract from test report according to the Engineering Recommendation G99			
Type Approval and declaration of compliance with the requirements of Engineering Recommendation G99			
PGM Technology	Photovoltaic inverter		
Manufacturer	NingBo Deye Inverter Technology Co., Ltd.		
Address	No. 26 South YongJiang Road, Daqi, Beilun, NingBo, China		
Tel	+852 2884 4318	**Fax**	--
Email	zhaoxt@deye.com.cn	**Website**	--

PGM Model	**SUN-70K-G03**	**SUN-75K-G03**	**SUN-80K-G03**	**SUN-90K-G03**
Input (DC photovoltaic)				
MPP voltage range [V]	200-850	200-850	200-850	200-850
Max. input voltage [V]	1000	1000	1000	1000
Max. input current per MPPT [A]	40+40+40+40	40+40+40+40	40+40+40+40	40+40+40+40+40+40
Output (AC)				
Rated AC voltage [V]	3L/N/PE, 230/400V, 50Hz	3L/N/PE, 230/400V, 50Hz	3L/N/PE, 230/400V, 50Hz	3L/N/PE, 230/400V, 50Hz
Rated output current [A]	101,5	108,7	115,9	130,4
Max. output current [A]	111,6	119,6	127,5	143,5
Nom. converter output (P_{NINV}) [kW]	70,0	75,0	80,0	90,0
Max. apparent power [kVA]	77,0	82,5	88,0	99,0

PGM Model	**SUN-100K-G03**	**SUN-110K-G03**	**-**	**-**
Input (DC photovoltaic)				
MPP voltage range [V]	200-850	200-850	-	-
Max. input voltage [V]	1000	1000	-	-
Max. input current per MPPT [A]	40+40+40+40+40+40	40+40+40+40+40+40	-	-
Output (AC)				
Rated AC voltage [V]	3L/N/PE, 230/400V, 50Hz	3L/N/PE, 230/400V, 50Hz	-	-
Rated output current [A]	144,9	159,4	-	-
Max. output current [A]	159,4	175,4	-	-
Nom. converter output (P_{NINV}) [kW]	100,0	110,0	-	-
Max. apparent power [kVA]	110,0	121,0	-	-

PGM Model	**SUN-70K-G03P3-EU-BM4**	**SUN-75K-G03P3-EU-BM4**	**SUN-80K-G03P3-EU-BM4**	**SUN-90K-G03P3-EU-BM6**
Input (DC photovoltaic)				
MPP voltage range [V]	200-1000	200-1000	200-1000	200-1000
Max. input voltage [V]	1100	1100	1100	1100
Max. input current per MPPT [A]	40+40+40+40	40+40+40+40	40+40+40+40	40+40+40+40+40+40
Output (AC)				
Rated AC voltage [V]	3L/N/PE, 230/400V, 50Hz	3L/N/PE, 230/400V, 50Hz	3L/N/PE, 230/400V, 50Hz	3L/N/PE, 230/400V, 50Hz
Rated output current [A]	101,5	108,7	116,0	130,5
Max. output current [A]	111,6	119,6	127,6	143,5
Nom. converter output (P_{NINV}) [kW]	70,0	75,0	80,0	90,0
Max. apparent power [kVA]	77,0	82,5	88,0	99,0
PGM Model	**SUN-100K-G03P3-EU-BM6**	**SUN-110K-G03P3-EU-BM6**	**-**	**-**
Input (DC photovoltaic)				
MPP voltage range [V]	200-1000	200-1000	-	-
Max. input voltage [V]	1100	1100	-	-
Max. input current per MPPT [A]	40+40+40+40+40+40	40+40+40+40+40+40	-	-
Output (AC)				
Rated AC voltage [V]	3L/N/PE, 230/400V, 50Hz	3L/N/PE, 230/400V, 50Hz	-	-
Rated output current [A]	145,0	159,5	-	-
Max. output current [A]	159,5	175,4	-	-
Nom. converter output (P_{NINV}) [kW]	100,0	110,0	-	-
Max. apparent power [kVA]	110,0	121,0	-	-

Interface protection system and interface switch (Network and system protection "NS-protection")	
Type of protection	integrated NS-protection
Assigned to generation unit type	SUN-70K-G03, SUN-75K-G03, SUN-80K-G03, SUN-90K-G03, SUN-100K-G03, SUN-110K-G03, SUN-70K-G03P3-EU-BM4, SUN-75K-G03P3-EU-BM4, SUN-80K-G03P3-EU-BM4, SUN-90K-G03P3-EU-BM6, SUN-100K-G03P3-EU-BM6, SUN-110K-G03P3-EU-BM6
Integrated interface switch	Type of switching equipment 1: Relay (Model CHAR-112A200C) Type of switching equipment 2: Relay (Model CHAR-112A200C)
	Note: The output is switched off by the inverter bridge and two relay in series in each line and neutral.
Software	
Firmware version	5332-0344
Differences between Generating Units	
The models SUN-70K-G03, SUN-75K-G03, SUN-80K-G03, SUN-90K-G03, SUN-100K-G03, SUN-110K-G03, SUN-70K-G03P3-EU-BM4, SUN-75K-G03P3-EU-BM4, SUN-80K-G03P3-EU-BM4, SUN-90K-G03P3-EU-BM6, SUN-100K-G03P3-EU-BM6 and SUN-110K-G03P3-EU-BM6 are based on the same hardware platform, use the same control unit and software.	
The above stated Generating Units are tested according the requirements in the Engineering Recommendation G99/NI. Any modification that affects the stated tests must be named by the manufacturer/supplier of the product to ensure that the product meets all requirements of the Engineering Recommendation G99/NI.	

Operating Range.	
Test 1	Voltage = 85% of nominal (195,5 V) Frequency = 47,0 Hz Power Factor = 1 Period of test 20 seconds
Connection	Always connected
Limit	Always connected
Test 2	Voltage = 85% of nominal (195,5 V) Frequency = 47,0 Hz Power Factor = 1 Period of test 90 minutes
Connection:	Always connected
Limit	Always connected
Test 3	Voltage = 110% of nominal (253,0 V) Frequency = 51,5 Hz Power Factor = 1 Period of test 90 minutes
Connection:	Always connected
Limit	Always connected
Test 4	Voltage = 110% of nominal (253,0 V) Frequency = 52,0 Hz Power Factor = 1 Period of test 15 minutes
Connection:	Always connected
Limit:	Always connected
Test 5	Voltage = 100% of nominal (230,0 V) Frequency = 50,0 Hz Power Factor = 1 Period of test 90 minutes
Connection:	Always connected
Limit:	Always connected
Test 6 RoCof withstand	Confirm that the Power Generating Module is capable of staying connected to the Distribution Network and operate at rates of change of frequency up to 1 Hzs^{-1} as measured over a period of 500 ms. Note that this is not expected to be demonstrated on site.
Connection:	Always connected
Limit:	Always connected

Protection. Voltage tests.						
Phase 1						
Function	**Setting**		**Trip test**		**No trip test**	
	Voltage [V]	**Time delay [s]**	**Voltage [V]**	**Time delay [s]**	**Voltage / time**	**Confirm no trip**
U/V stage 1	184,0	2,5	184,2	2,538	188 V / 5,00 s	No trip
					180 V / 2,45 s	No trip
O/V stage 1	262,2	1,0	262,3	1,029	258,2 V / 5,00 s	No trip
O/V stage 2	273,7	0,5	273,6	0,509	269,7 V / 0,95 s	No trip
					277,7 V / 0,45 s	No trip
Note. For Voltage tests the Voltage required to trip is the setting ±3,45V. The time delay can be measured at a larger deviation than the minimum required to operate the protection. The No trip tests need to be carried out at the setting ±4V and for the relevant times as shown in the table above to ensure that the protection will not trip in error.						

Protection. Voltage tests.						
Phase 2						
Function	**Setting**		**Trip test**		**No trip test**	
	Voltage [V]	**Time delay [s]**	**Voltage [V]**	**Time delay [s]**	**Voltage / time**	**Confirm no trip**
U/V stage 1	184,0	2,5	184,1	2,533	188 V / 5,00 s	No trip
					180 V / 2,45 s	No trip
O/V stage 1	262,2	1,0	262,2	1,015	258,2 V / 5,00 s	No trip
O/V stage 2	273,7	0,5	273,5	0,507	269,7 V / 0,95 s	No trip
					277,7 V / 0,45 s	No trip

Protection. Voltage tests.						
Phase 3						
Function	**Setting**		**Trip test**		**No trip test**	
	Voltage [V]	**Time delay [s]**	**Voltage [V]**	**Time delay [s]**	**Voltage / time**	**Confirm no trip**
U/V stage 1	184,0	2,5	184,2	2,527	188 V / 5,00 s	No trip
					180 V / 2,45 s	No trip
O/V stage 1	262,2	1,0	262,4	1,017	258,2 V / 5,00 s	No trip
O/V stage 2	273,7	0,5	273,7	0,509	269,7 V / 0,95 s	No trip
					277,7 V / 0,45 s	No trip
Note. For Voltage tests the Voltage required to trip is the setting ±3,45V. The time delay can be measured at a larger deviation than the minimum required to operate the protection. The No trip tests need to be carried out at the setting ±4V and for the relevant times as shown in the table above to ensure that the protection will not trip in error.						

Protection. Frequency tests.						
Function	**Setting**		**Trip test**		**No trip test**	
	Frequency [Hz]	**Time delay [s]**	**Frequency [Hz]**	**Time delay [s]**	**Frequency / time**	**Confirm no trip**
U/F stage 1	47,5	20,0	47,50	20,726	47,7 Hz / 30,00 s	No trip
U/F stage 2	47,0	0,5	47,00	0,527	47,2 Hz / 19,50 s	
					47,8Hz / 0,45s	No trip
O/F stage 1	52,0	0,5	52,00	0,530	51,8 Hz / 120,00 s	No trip
					52,2Hz / 0,98s	No trip
Note. For Frequency Trip tests the Frequency required to trip is the setting ±0,1Hz. In order to measure the time delay a larger deviation than the minimum required to operate the projection can be used. The "No-trip tests" need to be carried out at the setting ±0,2Hz and for the relevant times as shown in the table above to ensure that the protection will not trip in error.						

Protection. Loss of Mains.						
Inverters tested according to BS EN 62116.						
Balancing load on islanded network	33% of -5% Q Test 22	66% of -5% Q Test 12	100% of -5% P Test 5	33% of +5% Q Test 31	66% of +5% Q Test 21	100% of +5% P Test 10
Trip time. Ph1 fuse removed [s]	0,228	0,194	0,355	0,152	0,192	0,344
Note. Trip time limit is 0,5s.						

Protection. Re-connection timer.				
Test should prove that the reconnection sequence starts in no less than 20 seconds for restoration of voltage and frequency to within the stage 1 settings of table 10.1.				
Over Voltage				
Time delay setting	**Measured delay**			
20s	42,2s			
Under Voltage				
Time delay setting	**Measured delay**			
20s	45,2s			
Over Frequency				
Time delay setting	**Measured delay**			
20s	40,2s			
Under Frequency				
Time delay setting	**Measured delay**			
20s	44,2s			
	Checks on no reconnection when voltage or frequency is brought to just outside stage 1 limits of table 1.			
	At 257,0V	At 191,5V	At 47,9Hz	At 52,1Hz
Confirmation that the Generating Unit does not re-connect.	No reconnection	No reconnection	No reconnection	No reconnection

Protection. Frequency change, Stability test.				
	Start Frequency [Hz]	**Change**	**Test Duration**	**Confirm no trip**
Positive Vector Shift	49,5	+50 degrees		No trip
Negative Vector Shift	50,5	-50 degrees		No trip
Positive Frequency drift	49,0 to 51,0	+0,95Hz/sec	2,1s	No trip
Negative Frequency drift	51,0 to 49,0	-0,95Hz/sec	2,1s	No trip

Limited Frequency Sensitive Mode – Over Frequency							
1-min mean value [Hz]:	**a) 50,00**	**b) 50,25**	**c) 50,70**	**d) 51,15**	**e) 50,70**	**f) 50,25**	**g) 50,00**
1. Measurement a) to g): Active power output > 80% Pn							
Frequency [Hz]	50,00	50,45	50,70	51,15	50,70	50,45	50,00
$P_{expected}$ [kW]	110,00	108,90	103,40	93,50	103,40	108,90	110,00
$P_{measured}$ [kW]	110,06	108,97	103,43	93,58	103,45	108,96	110,06
2. Measurement a) to g): Active power output 40% and 60% Pn							
Frequency [Hz]	50,00	50,45	50,70	51,15	50,70	50,45	50,00
$P_{expected}$ [kW]	55,00	53,90	48,40	38,50	48,40	53,90	110,00
$P_{measured}$ [kW]	55,01	53,91	48,46	38,50	48,43	53,86	109,93

Output Power with falling Frequency						
Frequency setpoint [Hz]	50,00	49,50	49,00	48,00	47,60	47,10
Frequency [Hz]	50,00	49,50	49,00	48,00	47,60	47,10
Active power [kW]	110,1	110,2	110,1	110,0	110,0	110,0
ΔP/Pmax [%]		0,18	0,09	0,0	0,0	0,0

Note.

For a CHP the test point a) at 50,00Hz is taken as Registered capacity (P_{max}) due to limited discrete operating points of the CHP's thermal process.

No Power reduction take place for electronic inverter

Power Quality. Harmonics.						
Phase 1						
SSEG rating per phase (rpp)			**SUN-70K-G03P3-EU-BM4**			
	At 50% of rated ouput 35,0 kW		**100% of rated output 70,0 kW**			
Harmonic	**Measured Value (MV) in [A]**	**Measured Value (%) in [A]**	**Measured Value (MV) in [A]**	**Measured Value (%) in [A]**	**Limit in BS EN61000-3-12 in %**	
					1 phase	**3 phase**
2nd	0,106	0,098	0,098	0,090	8%	8%
3rd	0,012	0,011	0,032	0,029	21,6%	N/A
4th	0,057	0,053	0,045	0,041	4%	4%
5th	0,055	0,051	0,080	0,073	10,7%	10,7%
6th	0,013	0,012	0,010	0,009	2,67%	2,67%
7th	0,052	0,048	0,035	0,032	7,2%	7,2%
8th	0,045	0,041	0,074	0,068	2%	2%
9th	0,009	0,008	0,011	0,010	3,8%	N/A
10th	0,080	0,074	0,046	0,042	1,6%	1,6%
11th	0,023	0,022	0,139	0,128	3,1%	3,1%
12th	0,018	0,016	0,008	0,007	1,33%	1,33%
13th	0,088	0,081	0,063	0,058	2%	2%
14th	0,041	0,038	0,026	0,024	N/A	N/A
15th	0,013	0,012	0,004	0,004	N/A	N/A
16th	0,023	0,021	0,013	0,012	N/A	N/A
17th	0,045	0,042	0,035	0,032	N/A	N/A
18th	0,005	0,005	0,003	0,002	N/A	N/A
19th	0,036	0,033	0,028	0,026	N/A	N/A
20th	0,012	0,011	0,011	0,010	N/A	N/A
21th	0,005	0,005	0,007	0,006	N/A	N/A
22th	0,010	0,009	0,007	0,007	N/A	N/A
23th	0,010	0,009	0,030	0,027	N/A	N/A
24th	0,003	0,003	0,002	0,002	N/A	N/A
25th	0,023	0,021	0,026	0,024	N/A	N/A
26th	0,012	0,011	0,011	0,010	N/A	N/A
27th	0,006	0,006	0,004	0,004	N/A	N/A
28th	0,002	0,002	0,004	0,004	N/A	N/A
29th	0,019	0,017	0,027	0,025	N/A	N/A
30th	0,003	0,003	0,002	0,002	N/A	N/A
31th	0,019	0,017	0,033	0,030	N/A	N/A
32th	0,005	0,004	0,002	0,002	N/A	N/A
33th	0,003	0,003	0,002	0,002	N/A	N/A
34th	0,003	0,003	0,008	0,007	N/A	N/A
35th	0,003	0,002	0,032	0,029	N/A	N/A
36th	0,003	0,002	0,003	0,003	N/A	N/A
37th	0,012	0,011	0,036	0,033	N/A	N/A
38th	0,002	0,002	0,002	0,002	N/A	N/A
39th	0,016	0,014	0,007	0,006	N/A	N/A
40th	0,003	0,003	0,005	0,004	N/A	N/A
THD_{40}	-	0,419	-	0,242	23%	13%
PWHD	-	0,198	-	0,504	23%	22%

Power Quality. Harmonics.						
Phase 2						
SSEG rating per phase (rpp)			**SUN-70K-G03P3-EU-BM4**			
	At 50% of rated ouput 35,0 kW		**100% of rated output 70,0 kW**			
Harmonic	**Measured Value (MV) in [A]**	**Measured Value (%) in [A]**	**Measured Value (MV) in [A]**	**Measured Value (%) in [A]**	**Limit in BS EN61000-3-12 in %**	
					1 phase	**3 phase**
2nd	0,076	0,070	0,052	0,048	8%	8%
3rd	0,016	0,015	0,034	0,031	21,6%	N/A
4th	0,053	0,049	0,037	0,034	4%	4%
5th	0,066	0,061	0,087	0,080	10,7%	10,7%
6th	0,013	0,012	0,013	0,012	2,67%	2,67%
7th	0,047	0,043	0,029	0,026	7,2%	7,2%
8th	0,030	0,027	0,064	0,058	2%	2%
9th	0,013	0,012	0,009	0,008	3,8%	N/A
10th	0,071	0,065	0,045	0,041	1,6%	1,6%
11th	0,021	0,019	0,135	0,124	3,1%	3,1%
12th	0,020	0,018	0,006	0,006	1,33%	1,33%
13th	0,071	0,066	0,055	0,050	2%	2%
14th	0,055	0,050	0,034	0,031	N/A	N/A
15th	0,006	0,006	0,010	0,009	N/A	N/A
16th	0,026	0,023	0,013	0,012	N/A	N/A
17th	0,045	0,041	0,029	0,026	N/A	N/A
18th	0,004	0,004	0,004	0,004	N/A	N/A
19th	0,029	0,027	0,026	0,024	N/A	N/A
20th	0,017	0,016	0,010	0,009	N/A	N/A
21th	0,006	0,005	0,007	0,007	N/A	N/A
22th	0,016	0,014	0,009	0,008	N/A	N/A
23th	0,014	0,013	0,036	0,034	N/A	N/A
24th	0,005	0,005	0,005	0,004	N/A	N/A
25th	0,024	0,022	0,030	0,027	N/A	N/A
26th	0,011	0,010	0,008	0,007	N/A	N/A
27th	0,009	0,008	0,007	0,007	N/A	N/A
28th	0,004	0,003	0,002	0,002	N/A	N/A
29th	0,024	0,022	0,032	0,030	N/A	N/A
30th	0,005	0,005	0,006	0,005	N/A	N/A
31th	0,018	0,017	0,035	0,032	N/A	N/A
32th	0,003	0,003	0,002	0,002	N/A	N/A
33th	0,009	0,008	0,005	0,004	N/A	N/A
34th	0,003	0,002	0,003	0,003	N/A	N/A
35th	0,007	0,006	0,036	0,033	N/A	N/A
36th	0,005	0,005	0,005	0,004	N/A	N/A
37th	0,014	0,013	0,038	0,035	N/A	N/A
38th	0,005	0,005	0,005	0,004	N/A	N/A
39th	0,012	0,011	0,006	0,006	N/A	N/A
40th	0,004	0,004	0,005	0,004	N/A	N/A
THD_{40}	-	0,380	-	0,224	23%	13%
PWHD	-	0,196	-	0,505	23%	22%

Power Quality. Harmonics.						
Phase 3						
SSEG rating per phase (rpp)			SUN-70K-G03P3-EU-BM4			
	At 50% of rated ouput 35,0 kW		At 100% of rated output 70,0 kW			
Harmonic	Measured Value (MV) in [A]	Measured Value (%) in [A]	Measured Value (MV) in [A]	Measured Value (%) in [A]	Limit in BS EN61000-3-12 in %	
					1 phase	3 phase
2nd	0,110	0,101	0,091	0,084	8%	8%
3rd	0,013	0,012	0,033	0,030	21,6%	N/A
4th	0,051	0,047	0,039	0,036	4%	4%
5th	0,057	0,053	0,078	0,071	10,7%	10,7%
6th	0,017	0,016	0,017	0,016	2,67%	2,67%
7th	0,057	0,052	0,036	0,033	7,2%	7,2%
8th	0,051	0,047	0,077	0,071	2%	2%
9th	0,012	0,011	0,015	0,014	3,8%	N/A
10th	0,053	0,049	0,039	0,036	1,6%	1,6%
11th	0,025	0,023	0,126	0,116	3,1%	3,1%
12th	0,019	0,017	0,005	0,005	1,33%	1,33%
13th	0,070	0,065	0,058	0,054	2%	2%
14th	0,045	0,041	0,027	0,025	N/A	N/A
15th	0,011	0,010	0,004	0,004	N/A	N/A
16th	0,016	0,015	0,009	0,008	N/A	N/A
17th	0,046	0,042	0,035	0,032	N/A	N/A
18th	0,007	0,006	0,004	0,004	N/A	N/A
19th	0,035	0,032	0,021	0,019	N/A	N/A
20th	0,012	0,011	0,005	0,005	N/A	N/A
21th	0,006	0,006	0,006	0,005	N/A	N/A
22th	0,013	0,012	0,011	0,010	N/A	N/A
23th	0,015	0,014	0,035	0,032	N/A	N/A
24th	0,004	0,003	0,004	0,004	N/A	N/A
25th	0,018	0,016	0,025	0,023	N/A	N/A
26th	0,007	0,006	0,007	0,007	N/A	N/A
27th	0,004	0,004	0,003	0,003	N/A	N/A
28th	0,005	0,004	0,004	0,004	N/A	N/A
29th	0,024	0,022	0,031	0,028	N/A	N/A
30th	0,003	0,003	0,004	0,004	N/A	N/A
31th	0,014	0,013	0,034	0,031	N/A	N/A
32th	0,002	0,002	0,003	0,003	N/A	N/A
33th	0,003	0,003	0,005	0,005	N/A	N/A
34th	0,002	0,002	0,005	0,004	N/A	N/A
35th	0,004	0,004	0,032	0,029	N/A	N/A
36th	0,003	0,003	0,004	0,003	N/A	N/A
37th	0,012	0,011	0,037	0,034	N/A	N/A
38th	0,005	0,004	0,005	0,004	N/A	N/A
39th	0,009	0,008	0,006	0,006	N/A	N/A
40th	0,002	0,002	0,003	0,003	N/A	N/A
THD_{40}	-	0,399	-	0,231	23%	13%
PWHD	-	0,199	-	0,504	23%	22%

Power Quality. Harmonics.						
Phase 1						
Generating Unit rating per phase (rpp)			**SUN-75K-G03P3-EU-BM4**			
	At 50% of rated ouput 37,5 kW		**100% of rated output 75,0 kW**			
Harmonic	**Measured Value (MV) in [A]**	**Measured Value (MV) in [%]**	**Measured Value (MV) in [A]**	**Measured Value (MV) in [%]**	**Limit in BS EN61000-3-12 in %**	
					1 phase	**3 phase**
2nd	0,101	0,093	0,089	0,082	8%	8%
3rd	0,015	0,014	0,038	0,035	21,6%	N/A
4th	0,060	0,055	0,043	0,039	4%	4%
5th	0,058	0,053	0,082	0,075	10,7%	10,7%
6th	0,012	0,011	0,012	0,011	2,67%	2,67%
7th	0,055	0,051	0,032	0,029	7,2%	7,2%
8th	0,047	0,043	0,071	0,065	2%	2%
9th	0,008	0,008	0,012	0,011	3,8%	N/A
10th	0,076	0,070	0,046	0,043	1,6%	1,6%
11th	0,028	0,026	0,146	0,134	3,1%	3,1%
12th	0,018	0,016	0,006	0,005	1,33%	1,33%
13th	0,080	0,074	0,081	0,074	2%	2%
14th	0,045	0,041	0,020	0,018	N/A	N/A
15th	0,012	0,011	0,003	0,003	N/A	N/A
16th	0,024	0,022	0,008	0,007	N/A	N/A
17th	0,044	0,041	0,041	0,038	N/A	N/A
18th	0,005	0,005	0,003	0,003	N/A	N/A
19th	0,039	0,036	0,031	0,029	N/A	N/A
20th	0,013	0,012	0,009	0,008	N/A	N/A
21th	0,006	0,006	0,005	0,005	N/A	N/A
22th	0,011	0,010	0,005	0,005	N/A	N/A
23th	0,016	0,015	0,029	0,027	N/A	N/A
24th	0,003	0,003	0,002	0,002	N/A	N/A
25th	0,025	0,023	0,023	0,021	N/A	N/A
26th	0,011	0,010	0,011	0,010	N/A	N/A
27th	0,007	0,007	0,004	0,004	N/A	N/A
28th	0,002	0,002	0,006	0,005	N/A	N/A
29th	0,014	0,013	0,023	0,021	N/A	N/A
30th	0,003	0,003	0,002	0,002	N/A	N/A
31th	0,015	0,014	0,028	0,026	N/A	N/A
32th	0,006	0,005	0,003	0,003	N/A	N/A
33th	0,004	0,004	0,002	0,002	N/A	N/A
34th	0,003	0,003	0,009	0,008	N/A	N/A
35th	0,008	0,007	0,026	0,024	N/A	N/A
36th	0,003	0,003	0,003	0,003	N/A	N/A
37th	0,018	0,016	0,029	0,027	N/A	N/A
38th	0,003	0,003	0,002	0,002	N/A	N/A
39th	0,017	0,015	0,007	0,006	N/A	N/A
40th	0,003	0,002	0,005	0,004	N/A	N/A
THD_{40} [%]	-	0,389	-	0,229	23%	13%
PWHD [%]	-	0,197	-	0,500	23%	22%

Power Quality. Harmonics.						
Phase 2						
Generating Unit rating per phase (rpp)			SUN-75K-G03P3-EU-BM4			
	At 50% of rated ouput 37,5 kW		100% of rated output 75,0 kW			
Harmonic	Measured Value (MV) in [A]	Measured Value (MV) in [%]	Measured Value (MV) in [A]	Measured Value (MV) in [%]	Limit in BS EN61000-3-12 in %	
					1 phase	3 phase
2nd	0,077	0,071	0,041	0,038	8%	8%
3rd	0,015	0,014	0,041	0,038	21,6%	N/A
4th	0,052	0,048	0,037	0,034	4%	4%
5th	0,069	0,064	0,090	0,083	10,7%	10,7%
6th	0,014	0,013	0,014	0,013	2,67%	2,67%
7th	0,044	0,041	0,026	0,023	7,2%	7,2%
8th	0,034	0,031	0,058	0,053	2%	2%
9th	0,012	0,011	0,009	0,009	3,8%	N/A
10th	0,074	0,068	0,045	0,042	1,6%	1,6%
11th	0,024	0,022	0,136	0,125	3,1%	3,1%
12th	0,017	0,015	0,006	0,005	1,33%	1,33%
13th	0,070	0,065	0,074	0,068	2%	2%
14th	0,056	0,051	0,027	0,025	N/A	N/A
15th	0,007	0,006	0,008	0,008	N/A	N/A
16th	0,025	0,023	0,009	0,008	N/A	N/A
17th	0,047	0,043	0,036	0,033	N/A	N/A
18th	0,005	0,004	0,004	0,003	N/A	N/A
19th	0,030	0,028	0,031	0,028	N/A	N/A
20th	0,018	0,016	0,007	0,006	N/A	N/A
21th	0,007	0,006	0,006	0,005	N/A	N/A
22th	0,017	0,015	0,008	0,007	N/A	N/A
23th	0,017	0,016	0,033	0,031	N/A	N/A
24th	0,005	0,005	0,004	0,004	N/A	N/A
25th	0,024	0,022	0,027	0,025	N/A	N/A
26th	0,010	0,009	0,008	0,007	N/A	N/A
27th	0,009	0,008	0,007	0,006	N/A	N/A
28th	0,003	0,003	0,003	0,003	N/A	N/A
29th	0,020	0,018	0,026	0,024	N/A	N/A
30th	0,006	0,005	0,005	0,005	N/A	N/A
31th	0,016	0,015	0,030	0,028	N/A	N/A
32th	0,004	0,003	0,002	0,002	N/A	N/A
33th	0,008	0,008	0,004	0,004	N/A	N/A
34th	0,003	0,002	0,005	0,004	N/A	N/A
35th	0,012	0,011	0,030	0,028	N/A	N/A
36th	0,005	0,005	0,005	0,004	N/A	N/A
37th	0,018	0,016	0,031	0,028	N/A	N/A
38th	0,005	0,005	0,004	0,004	N/A	N/A
39th	0,012	0,011	0,005	0,005	N/A	N/A
40th	0,004	0,004	0,004	0,003	N/A	N/A
THD_{40} [%]	-	0,361	-	0,210	23%	13%
PWHD [%]	-	0,196	-	0,502	23%	22%

Power Quality. Harmonics.						
Phase 3						
Generating Unit rating per phase (rpp)			**SUN-75K-G03P3-EU-BM4**			
	At 50% of rated ouput 37,5 kW		**100% of rated output 75,0 kW**			
Harmonic	**Measured Value (MV) in [A]**	**Measured Value (MV) in [%]**	**Measured Value (MV) in [A]**	**Measured Value (MV) in [%]**	**Limit in BS EN61000-3-12 in %**	
					1 phase	**3 phase**
2nd	0,105	0,097	0,086	0,079	8%	8%
3rd	0,017	0,016	0,038	0,035	21,6%	N/A
4th	0,055	0,050	0,034	0,032	4%	4%
5th	0,060	0,055	0,075	0,069	10,7%	10,7%
6th	0,013	0,012	0,022	0,020	2,67%	2,67%
7th	0,057	0,052	0,035	0,032	7,2%	7,2%
8th	0,053	0,048	0,072	0,066	2%	2%
9th	0,013	0,012	0,014	0,012	3,8%	N/A
10th	0,050	0,046	0,042	0,039	1,6%	1,6%
11th	0,026	0,024	0,134	0,123	3,1%	3,1%
12th	0,018	0,017	0,004	0,004	1,33%	1,33%
13th	0,066	0,060	0,075	0,069	2%	2%
14th	0,043	0,039	0,023	0,021	N/A	N/A
15th	0,012	0,011	0,004	0,003	N/A	N/A
16th	0,017	0,015	0,005	0,005	N/A	N/A
17th	0,045	0,041	0,041	0,038	N/A	N/A
18th	0,007	0,006	0,005	0,004	N/A	N/A
19th	0,037	0,034	0,025	0,023	N/A	N/A
20th	0,014	0,013	0,005	0,004	N/A	N/A
21th	0,008	0,007	0,005	0,005	N/A	N/A
22th	0,011	0,010	0,009	0,008	N/A	N/A
23th	0,020	0,018	0,033	0,031	N/A	N/A
24th	0,003	0,003	0,004	0,004	N/A	N/A
25th	0,017	0,016	0,022	0,020	N/A	N/A
26th	0,005	0,005	0,009	0,008	N/A	N/A
27th	0,003	0,003	0,003	0,002	N/A	N/A
28th	0,004	0,003	0,003	0,003	N/A	N/A
29th	0,020	0,019	0,026	0,024	N/A	N/A
30th	0,003	0,003	0,004	0,004	N/A	N/A
31th	0,013	0,012	0,030	0,027	N/A	N/A
32th	0,003	0,002	0,004	0,004	N/A	N/A
33th	0,004	0,004	0,004	0,004	N/A	N/A
34th	0,003	0,003	0,005	0,004	N/A	N/A
35th	0,006	0,006	0,027	0,025	N/A	N/A
36th	0,003	0,003	0,004	0,004	N/A	N/A
37th	0,015	0,014	0,030	0,028	N/A	N/A
38th	0,004	0,003	0,005	0,005	N/A	N/A
39th	0,010	0,009	0,005	0,005	N/A	N/A
40th	0,002	0,002	0,003	0,003	N/A	N/A
THD_{40} [%]	-	0,368	-	0,219	23%	13%
PWHD [%]	-	0,198	-	0,498	23%	22%

Power Quality. Harmonics.						
Phase 1						
Generating Unit rating per phase (rpp)			SUN-80K-G03P3-EU-BM4			
	At 50% of rated ouput 40,0 kW		100% of rated output 80,0 kW			
Harmonic	Measured Value (MV) in [A]	Measured Value (MV) in [%]	Measured Value (MV) in [A]	Measured Value (MV) in [%]	Limit in BS EN61000-3-12 in %	
					1 phase	3 phase
2nd	0,103	0,089	0,085	0,073	8%	8%
3rd	0,016	0,014	0,037	0,032	21,6%	N/A
4th	0,050	0,043	0,036	0,031	4%	4%
5th	0,061	0,053	0,085	0,073	10,7%	10,7%
6th	0,012	0,011	0,012	0,010	2,67%	2,67%
7th	0,054	0,047	0,026	0,023	7,2%	7,2%
8th	0,056	0,048	0,063	0,054	2%	2%
9th	0,008	0,007	0,008	0,007	3,8%	N/A
10th	0,069	0,060	0,052	0,045	1,6%	1,6%
11th	0,040	0,034	0,153	0,132	3,1%	3,1%
12th	0,020	0,017	0,007	0,006	1,33%	1,33%
13th	0,065	0,056	0,106	0,092	2%	2%
14th	0,046	0,039	0,015	0,013	N/A	N/A
15th	0,013	0,011	0,003	0,003	N/A	N/A
16th	0,023	0,019	0,005	0,004	N/A	N/A
17th	0,048	0,042	0,049	0,042	N/A	N/A
18th	0,005	0,004	0,003	0,002	N/A	N/A
19th	0,047	0,041	0,038	0,033	N/A	N/A
20th	0,014	0,012	0,009	0,008	N/A	N/A
21th	0,005	0,005	0,005	0,004	N/A	N/A
22th	0,011	0,009	0,005	0,005	N/A	N/A
23th	0,027	0,024	0,027	0,023	N/A	N/A
24th	0,003	0,003	0,002	0,002	N/A	N/A
25th	0,029	0,025	0,019	0,017	N/A	N/A
26th	0,010	0,009	0,011	0,010	N/A	N/A
27th	0,007	0,006	0,004	0,003	N/A	N/A
28th	0,003	0,002	0,008	0,007	N/A	N/A
29th	0,007	0,006	0,016	0,014	N/A	N/A
30th	0,003	0,003	0,002	0,002	N/A	N/A
31th	0,010	0,009	0,024	0,020	N/A	N/A
32th	0,005	0,005	0,003	0,003	N/A	N/A
33th	0,004	0,003	0,002	0,002	N/A	N/A
34th	0,005	0,004	0,009	0,008	N/A	N/A
35th	0,016	0,014	0,023	0,019	N/A	N/A
36th	0,003	0,003	0,003	0,003	N/A	N/A
37th	0,025	0,022	0,021	0,018	N/A	N/A
38th	0,003	0,003	0,003	0,002	N/A	N/A
39th	0,018	0,015	0,007	0,006	N/A	N/A
40th	0,002	0,002	0,004	0,004	N/A	N/A
THD_{40} [%]	-	0,366	-	0,222	23%	13%
PWHD [%]	-	0,191	-	0,504	23%	22%

Power Quality. Harmonics.						
Phase 2						
Generating Unit rating per phase (rpp)			SUN-80K-G03P3-EU-BM4			
	At 50% of rated ouput 40,0 kW		100% of rated output 80,0 kW			
Harmonic	Measured Value (MV) in [A]	Measured Value (MV) in [%]	Measured Value (MV) in [A]	Measured Value (MV) in [%]	Limit in BS EN61000-3-12 in %	
					1 phase	3 phase
2nd	0,072	0,062	0,027	0,023	8%	8%
3rd	0,017	0,015	0,041	0,036	21,6%	N/A
4th	0,049	0,043	0,030	0,026	4%	4%
5th	0,076	0,066	0,086	0,075	10,7%	10,7%
6th	0,017	0,015	0,017	0,014	2,67%	2,67%
7th	0,043	0,037	0,027	0,023	7,2%	7,2%
8th	0,038	0,033	0,053	0,046	2%	2%
9th	0,012	0,010	0,008	0,007	3,8%	N/A
10th	0,067	0,057	0,052	0,045	1,6%	1,6%
11th	0,033	0,029	0,145	0,125	3,1%	3,1%
12th	0,019	0,016	0,008	0,007	1,33%	1,33%
13th	0,058	0,050	0,099	0,085	2%	2%
14th	0,058	0,050	0,022	0,019	N/A	N/A
15th	0,007	0,006	0,008	0,007	N/A	N/A
16th	0,024	0,021	0,005	0,005	N/A	N/A
17th	0,048	0,042	0,045	0,039	N/A	N/A
18th	0,004	0,003	0,004	0,003	N/A	N/A
19th	0,039	0,033	0,038	0,032	N/A	N/A
20th	0,019	0,016	0,006	0,005	N/A	N/A
21th	0,007	0,006	0,005	0,004	N/A	N/A
22th	0,017	0,014	0,007	0,006	N/A	N/A
23th	0,028	0,024	0,029	0,025	N/A	N/A
24th	0,005	0,005	0,004	0,004	N/A	N/A
25th	0,026	0,022	0,024	0,021	N/A	N/A
26th	0,009	0,008	0,008	0,007	N/A	N/A
27th	0,009	0,008	0,006	0,005	N/A	N/A
28th	0,004	0,003	0,004	0,004	N/A	N/A
29th	0,011	0,010	0,018	0,016	N/A	N/A
30th	0,005	0,004	0,005	0,005	N/A	N/A
31th	0,012	0,011	0,027	0,023	N/A	N/A
32th	0,003	0,003	0,003	0,002	N/A	N/A
33th	0,008	0,007	0,004	0,003	N/A	N/A
34th	0,003	0,003	0,005	0,005	N/A	N/A
35th	0,020	0,017	0,027	0,023	N/A	N/A
36th	0,006	0,005	0,005	0,004	N/A	N/A
37th	0,025	0,022	0,022	0,019	N/A	N/A
38th	0,005	0,004	0,005	0,004	N/A	N/A
39th	0,011	0,010	0,004	0,004	N/A	N/A
40th	0,004	0,004	0,003	0,002	N/A	N/A
THD_{40} [%]	-	0,339	-	0,205	23%	13%
PWHD [%]	-	0,188	-	0,504	23%	22%

Power Quality. Harmonics.						
Phase 3						
Generating Unit rating per phase (rpp)			SUN-80K-G03P3-EU-BM4			
	At 50% of rated ouput 40,0 kW		100% of rated output 80,0 kW			
Harmonic	Measured Value (MV) in [A]	Measured Value (MV) in [%]	Measured Value (MV) in [A]	Measured Value (MV) in [%]	Limit in BS EN61000-3-12 in %	
					1 phase	3 phase
2nd	0,103	0,089	0,080	0,069	8%	8%
3rd	0,019	0,017	0,038	0,033	21,6%	N/A
4th	0,049	0,043	0,028	0,024	4%	4%
5th	0,063	0,054	0,078	0,067	10,7%	10,7%
6th	0,017	0,015	0,020	0,017	2,67%	2,67%
7th	0,057	0,049	0,033	0,029	7,2%	7,2%
8th	0,059	0,051	0,064	0,055	2%	2%
9th	0,012	0,010	0,013	0,011	3,8%	N/A
10th	0,042	0,036	0,050	0,043	1,6%	1,6%
11th	0,036	0,031	0,146	0,126	3,1%	3,1%
12th	0,018	0,016	0,005	0,004	1,33%	1,33%
13th	0,050	0,043	0,099	0,085	2%	2%
14th	0,047	0,040	0,019	0,016	N/A	N/A
15th	0,012	0,010	0,003	0,003	N/A	N/A
16th	0,015	0,013	0,003	0,003	N/A	N/A
17th	0,048	0,042	0,049	0,042	N/A	N/A
18th	0,006	0,005	0,005	0,004	N/A	N/A
19th	0,041	0,036	0,032	0,027	N/A	N/A
20th	0,014	0,012	0,005	0,004	N/A	N/A
21th	0,007	0,006	0,005	0,004	N/A	N/A
22th	0,010	0,009	0,010	0,009	N/A	N/A
23th	0,031	0,027	0,030	0,026	N/A	N/A
24th	0,003	0,003	0,004	0,004	N/A	N/A
25th	0,021	0,018	0,019	0,016	N/A	N/A
26th	0,005	0,005	0,010	0,008	N/A	N/A
27th	0,003	0,002	0,002	0,002	N/A	N/A
28th	0,002	0,002	0,004	0,004	N/A	N/A
29th	0,012	0,010	0,020	0,017	N/A	N/A
30th	0,003	0,003	0,004	0,003	N/A	N/A
31th	0,010	0,009	0,026	0,023	N/A	N/A
32th	0,003	0,002	0,005	0,005	N/A	N/A
33th	0,004	0,004	0,003	0,003	N/A	N/A
34th	0,004	0,004	0,005	0,005	N/A	N/A
35th	0,015	0,013	0,023	0,020	N/A	N/A
36th	0,003	0,002	0,005	0,004	N/A	N/A
37th	0,023	0,020	0,022	0,019	N/A	N/A
38th	0,004	0,003	0,006	0,005	N/A	N/A
39th	0,009	0,008	0,005	0,004	N/A	N/A
40th	0,003	0,003	0,003	0,003	N/A	N/A
THD_{40} [%]	-	0,345	-	0,214	23%	13%
PWHD [%]	-	0,191	-	0,503	23%	22%

Power Quality. Harmonics.						
Phase 1						
Generating Unit rating per phase (rpp)			**SUN-90K-G03P3-EU-BM6**			
	At 50% of rated ouput 45,0 kW		**100% of rated output 90,0 kW**			
Harmonic	**Measured Value (MV) in [A]**	**Measured Value (MV) in [%]**	**Measured Value (MV) in [A]**	**Measured Value (MV) in [%]**	**Limit in BS EN61000-3-12 in %**	
					1 phase	**3 phase**
2nd	0,102	0,078	0,073	0,056	8%	8%
3rd	0,020	0,015	0,049	0,037	21,6%	N/A
4th	0,052	0,040	0,038	0,029	4%	4%
5th	0,065	0,050	0,093	0,071	10,7%	10,7%
6th	0,010	0,008	0,016	0,012	2,67%	2,67%
7th	0,055	0,042	0,021	0,016	7,2%	7,2%
8th	0,067	0,052	0,051	0,039	2%	2%
9th	0,008	0,006	0,011	0,008	3,8%	N/A
10th	0,057	0,044	0,066	0,051	1,6%	1,6%
11th	0,060	0,046	0,184	0,141	3,1%	3,1%
12th	0,019	0,014	0,008	0,006	1,33%	1,33%
13th	0,054	0,041	0,155	0,119	2%	2%
14th	0,045	0,035	0,009	0,007	N/A	N/A
15th	0,010	0,008	0,005	0,004	N/A	N/A
16th	0,020	0,015	0,005	0,004	N/A	N/A
17th	0,049	0,037	0,064	0,049	N/A	N/A
18th	0,004	0,003	0,004	0,003	N/A	N/A
19th	0,053	0,041	0,054	0,041	N/A	N/A
20th	0,017	0,013	0,008	0,006	N/A	N/A
21th	0,005	0,003	0,006	0,004	N/A	N/A
22th	0,012	0,009	0,007	0,006	N/A	N/A
23th	0,037	0,029	0,027	0,021	N/A	N/A
24th	0,003	0,002	0,002	0,002	N/A	N/A
25th	0,034	0,026	0,020	0,015	N/A	N/A
26th	0,011	0,008	0,008	0,006	N/A	N/A
27th	0,005	0,004	0,004	0,003	N/A	N/A
28th	0,004	0,003	0,009	0,007	N/A	N/A
29th	0,006	0,004	0,008	0,006	N/A	N/A
30th	0,002	0,002	0,003	0,002	N/A	N/A
31th	0,009	0,007	0,017	0,013	N/A	N/A
32th	0,002	0,002	0,002	0,001	N/A	N/A
33th	0,003	0,002	0,002	0,001	N/A	N/A
34th	0,007	0,005	0,009	0,007	N/A	N/A
35th	0,020	0,015	0,021	0,016	N/A	N/A
36th	0,003	0,003	0,004	0,003	N/A	N/A
37th	0,027	0,020	0,011	0,009	N/A	N/A
38th	0,002	0,002	0,003	0,002	N/A	N/A
39th	0,016	0,012	0,007	0,005	N/A	N/A
40th	0,004	0,003	0,005	0,004	N/A	N/A
THD_{40} [%]	-	0,335	-	0,234	23%	13%
PWHD [%]	-	0,187	-	0,503	23%	22%

Power Quality. Harmonics.						
Phase 2						
Generating Unit rating per phase (rpp)			SUN-90K-G03P3-EU-BM6			
	At 50% of rated ouput 45,0 kW		100% of rated output 90,0 kW			
Harmonic	Measured Value (MV) in [A]	Measured Value (MV) in [%]	Measured Value (MV) in [A]	Measured Value (MV) in [%]	Limit in BS EN61000-3-12 in %	
					1 phase	3 phase
2nd	0,073	0,056	0,025	0,019	8%	8%
3rd	0,016	0,012	0,050	0,038	21,6%	N/A
4th	0,048	0,036	0,034	0,026	4%	4%
5th	0,079	0,061	0,082	0,063	10,7%	10,7%
6th	0,016	0,012	0,027	0,021	2,67%	2,67%
7th	0,045	0,035	0,032	0,025	7,2%	7,2%
8th	0,052	0,040	0,050	0,038	2%	2%
9th	0,011	0,009	0,006	0,005	3,8%	N/A
10th	0,061	0,047	0,069	0,053	1,6%	1,6%
11th	0,058	0,045	0,182	0,140	3,1%	3,1%
12th	0,013	0,010	0,011	0,008	1,33%	1,33%
13th	0,053	0,041	0,141	0,108	2%	2%
14th	0,053	0,041	0,018	0,014	N/A	N/A
15th	0,009	0,007	0,012	0,009	N/A	N/A
16th	0,021	0,016	0,011	0,009	N/A	N/A
17th	0,048	0,037	0,064	0,049	N/A	N/A
18th	0,004	0,003	0,006	0,005	N/A	N/A
19th	0,049	0,037	0,050	0,038	N/A	N/A
20th	0,020	0,015	0,002	0,002	N/A	N/A
21th	0,007	0,006	0,008	0,006	N/A	N/A
22th	0,017	0,013	0,007	0,006	N/A	N/A
23th	0,040	0,030	0,031	0,024	N/A	N/A
24th	0,005	0,004	0,007	0,005	N/A	N/A
25th	0,030	0,023	0,022	0,017	N/A	N/A
26th	0,011	0,008	0,003	0,002	N/A	N/A
27th	0,009	0,007	0,007	0,005	N/A	N/A
28th	0,006	0,005	0,008	0,006	N/A	N/A
29th	0,008	0,006	0,012	0,009	N/A	N/A
30th	0,005	0,004	0,008	0,006	N/A	N/A
31th	0,012	0,009	0,023	0,018	N/A	N/A
32th	0,002	0,002	0,007	0,005	N/A	N/A
33th	0,008	0,006	0,007	0,006	N/A	N/A
34th	0,005	0,004	0,007	0,005	N/A	N/A
35th	0,023	0,017	0,022	0,017	N/A	N/A
36th	0,005	0,004	0,007	0,006	N/A	N/A
37th	0,030	0,023	0,017	0,013	N/A	N/A
38th	0,005	0,004	0,010	0,007	N/A	N/A
39th	0,012	0,009	0,007	0,006	N/A	N/A
40th	0,004	0,003	0,006	0,005	N/A	N/A
THD_{40} [%]	-	0,318	-	0,223	23%	13%
PWHD [%]	-	0,185	-	0,504	23%	22%

Power Quality. Harmonics.						
Phase 3						
Generating Unit rating per phase (rpp)			**SUN-90K-G03P3-EU-BM6**			
	At 50% of rated ouput 45,0 kW		**100% of rated output 90,0 kW**			
Harmonic	**Measured Value (MV) in [A]**	**Measured Value (MV) in [%]**	**Measured Value (MV) in [A]**	**Measured Value (MV) in [%]**	**Limit in BS EN61000-3-12 in %**	
					1 phase	**3 phase**
2nd	0,108	0,083	0,067	0,051	8%	8%
3rd	0,025	0,019	0,046	0,036	21,6%	N/A
4th	0,053	0,040	0,030	0,023	4%	4%
5th	0,069	0,053	0,080	0,061	10,7%	10,7%
6th	0,014	0,011	0,023	0,018	2,67%	2,67%
7th	0,051	0,039	0,039	0,030	7,2%	7,2%
8th	0,070	0,054	0,049	0,038	2%	2%
9th	0,014	0,011	0,012	0,009	3,8%	N/A
10th	0,037	0,028	0,062	0,047	1,6%	1,6%
11th	0,049	0,038	0,187	0,144	3,1%	3,1%
12th	0,018	0,013	0,006	0,005	1,33%	1,33%
13th	0,041	0,032	0,146	0,112	2%	2%
14th	0,039	0,030	0,012	0,009	N/A	N/A
15th	0,009	0,007	0,003	0,003	N/A	N/A
16th	0,013	0,010	0,008	0,006	N/A	N/A
17th	0,052	0,040	0,067	0,051	N/A	N/A
18th	0,006	0,004	0,005	0,004	N/A	N/A
19th	0,048	0,037	0,046	0,035	N/A	N/A
20th	0,015	0,011	0,006	0,004	N/A	N/A
21th	0,007	0,006	0,008	0,006	N/A	N/A
22th	0,016	0,012	0,013	0,010	N/A	N/A
23th	0,043	0,033	0,033	0,025	N/A	N/A
24th	0,004	0,003	0,007	0,005	N/A	N/A
25th	0,028	0,022	0,014	0,011	N/A	N/A
26th	0,005	0,004	0,008	0,006	N/A	N/A
27th	0,004	0,003	0,003	0,003	N/A	N/A
28th	0,003	0,003	0,002	0,002	N/A	N/A
29th	0,010	0,008	0,011	0,009	N/A	N/A
30th	0,004	0,003	0,006	0,004	N/A	N/A
31th	0,010	0,007	0,023	0,018	N/A	N/A
32th	0,003	0,002	0,007	0,005	N/A	N/A
33th	0,003	0,002	0,002	0,001	N/A	N/A
34th	0,004	0,003	0,004	0,003	N/A	N/A
35th	0,019	0,015	0,019	0,014	N/A	N/A
36th	0,003	0,002	0,006	0,005	N/A	N/A
37th	0,026	0,020	0,013	0,010	N/A	N/A
38th	0,005	0,004	0,009	0,007	N/A	N/A
39th	0,007	0,005	0,003	0,003	N/A	N/A
40th	0,002	0,002	0,002	0,001	N/A	N/A
THD_{40} [%]	-	0,326	-	0,229	23%	13%
PWHD [%]	-	0,188	-	0,501	23%	22%

Power Quality. Harmonics.						
Phase 1						
Generating Unit rating per phase (rpp)			**SUN-100K-G03P3-EU-BM6**			
	At 50% of rated ouput 50,0 kW		**100% of rated output 100,0 kW**			
Harmonic	**Measured Value (MV) in [A]**	**Measured Value (MV) in [%]**	**Measured Value (MV) in [A]**	**Measured Value (MV) in [%]**	**Limit in BS EN61000-3-12 in %**	
					1 phase	**3 phase**
2nd	0,107	0,074	0,070	0,048	8%	8%
3rd	0,020	0,014	0,059	0,041	21,6%	N/A
4th	0,056	0,039	0,055	0,038	4%	4%
5th	0,068	0,047	0,104	0,072	10,7%	10,7%
6th	0,010	0,007	0,026	0,018	2,67%	2,67%
7th	0,051	0,035	0,019	0,013	7,2%	7,2%
8th	0,071	0,049	0,046	0,032	2%	2%
9th	0,008	0,006	0,023	0,016	3,8%	N/A
10th	0,053	0,036	0,077	0,053	1,6%	1,6%
11th	0,072	0,050	0,239	0,165	3,1%	3,1%
12th	0,018	0,013	0,009	0,006	1,33%	1,33%
13th	0,038	0,026	0,188	0,129	2%	2%
14th	0,043	0,030	0,006	0,004	N/A	N/A
15th	0,010	0,007	0,005	0,004	N/A	N/A
16th	0,020	0,014	0,012	0,009	N/A	N/A
17th	0,045	0,031	0,085	0,059	N/A	N/A
18th	0,004	0,003	0,006	0,004	N/A	N/A
19th	0,052	0,036	0,063	0,043	N/A	N/A
20th	0,018	0,013	0,006	0,004	N/A	N/A
21th	0,005	0,004	0,007	0,005	N/A	N/A
22th	0,013	0,009	0,004	0,003	N/A	N/A
23th	0,038	0,026	0,036	0,025	N/A	N/A
24th	0,002	0,002	0,004	0,003	N/A	N/A
25th	0,036	0,025	0,021	0,015	N/A	N/A
26th	0,012	0,008	0,006	0,004	N/A	N/A
27th	0,005	0,003	0,005	0,003	N/A	N/A
28th	0,005	0,003	0,010	0,007	N/A	N/A
29th	0,010	0,007	0,007	0,005	N/A	N/A
30th	0,002	0,002	0,003	0,002	N/A	N/A
31th	0,011	0,007	0,013	0,009	N/A	N/A
32th	0,002	0,002	0,003	0,002	N/A	N/A
33th	0,003	0,002	0,002	0,001	N/A	N/A
34th	0,006	0,004	0,010	0,007	N/A	N/A
35th	0,018	0,012	0,020	0,014	N/A	N/A
36th	0,003	0,002	0,004	0,002	N/A	N/A
37th	0,024	0,017	0,011	0,007	N/A	N/A
38th	0,003	0,002	0,005	0,003	N/A	N/A
39th	0,016	0,011	0,005	0,003	N/A	N/A
40th	0,006	0,004	0,007	0,005	N/A	N/A
THD_{40} [%]	-	0,305	-	0,256	23%	13%
PWHD [%]	-	0,183	-	0,502	23%	22%

Power Quality. Harmonics.						
Phase 2						
Generating Unit rating per phase (rpp)			**SUN-100K-G03P3-EU-BM6**			
	At 50% of rated ouput 50,0 kW		**100% of rated output 100,0 kW**			
Harmonic	**Measured Value (MV) in [A]**	**Measured Value (MV) in [%]**	**Measured Value (MV) in [A]**	**Measured Value (MV) in [%]**	**Limit in BS EN61000-3-12 in %**	
					1 phase	**3 phase**
2nd	0,067	0,046	0,029	0,020	8%	8%
3rd	0,022	0,015	0,059	0,041	21,6%	N/A
4th	0,052	0,036	0,051	0,035	4%	4%
5th	0,082	0,057	0,076	0,052	10,7%	10,7%
6th	0,014	0,010	0,039	0,027	2,67%	2,67%
7th	0,043	0,029	0,041	0,028	7,2%	7,2%
8th	0,056	0,039	0,051	0,035	2%	2%
9th	0,010	0,007	0,013	0,009	3,8%	N/A
10th	0,052	0,036	0,084	0,058	1,6%	1,6%
11th	0,070	0,048	0,248	0,171	3,1%	3,1%
12th	0,012	0,008	0,014	0,010	1,33%	1,33%
13th	0,038	0,026	0,170	0,118	2%	2%
14th	0,051	0,035	0,013	0,009	N/A	N/A
15th	0,008	0,006	0,015	0,010	N/A	N/A
16th	0,020	0,014	0,021	0,014	N/A	N/A
17th	0,044	0,030	0,085	0,059	N/A	N/A
18th	0,004	0,003	0,009	0,006	N/A	N/A
19th	0,048	0,033	0,056	0,039	N/A	N/A
20th	0,020	0,014	0,005	0,004	N/A	N/A
21th	0,008	0,005	0,011	0,008	N/A	N/A
22th	0,017	0,012	0,009	0,006	N/A	N/A
23th	0,042	0,029	0,042	0,029	N/A	N/A
24th	0,005	0,004	0,009	0,006	N/A	N/A
25th	0,033	0,022	0,020	0,014	N/A	N/A
26th	0,012	0,008	0,003	0,002	N/A	N/A
27th	0,009	0,006	0,010	0,007	N/A	N/A
28th	0,007	0,005	0,011	0,008	N/A	N/A
29th	0,014	0,010	0,012	0,008	N/A	N/A
30th	0,005	0,003	0,009	0,006	N/A	N/A
31th	0,013	0,009	0,022	0,015	N/A	N/A
32th	0,004	0,002	0,010	0,007	N/A	N/A
33th	0,008	0,005	0,010	0,007	N/A	N/A
34th	0,005	0,004	0,009	0,006	N/A	N/A
35th	0,021	0,014	0,019	0,013	N/A	N/A
36th	0,005	0,004	0,008	0,005	N/A	N/A
37th	0,028	0,019	0,012	0,008	N/A	N/A
38th	0,007	0,005	0,012	0,009	N/A	N/A
39th	0,013	0,009	0,007	0,005	N/A	N/A
40th	0,007	0,005	0,008	0,006	N/A	N/A
THD_{40} [%]	-	0,283	-	0,251	23%	13%
PWHD [%]	-	0,180	-	0,504	23%	22%

Power Quality. Harmonics.						
Phase 3						
Generating Unit rating per phase (rpp)			SUN-100K-G03P3-EU-BM6			
	At 50% of rated ouput 50,0 kW		100% of rated output 100,0 kW			
Harmonic	Measured Value (MV) in [A]	Measured Value (MV) in [%]	Measured Value (MV) in [A]	Measured Value (MV) in [%]	Limit in BS EN61000-3-12 in %	
					1 phase	3 phase
2nd	0,102	0,071	0,066	0,046	8%	8%
3rd	0,022	0,015	0,052	0,036	21,6%	N/A
4th	0,055	0,038	0,045	0,031	4%	4%
5th	0,068	0,047	0,089	0,061	10,7%	10,7%
6th	0,015	0,011	0,030	0,021	2,67%	2,67%
7th	0,050	0,034	0,047	0,032	7,2%	7,2%
8th	0,074	0,051	0,042	0,029	2%	2%
9th	0,014	0,010	0,015	0,011	3,8%	N/A
10th	0,032	0,022	0,071	0,049	1,6%	1,6%
11th	0,058	0,040	0,249	0,172	3,1%	3,1%
12th	0,017	0,012	0,009	0,006	1,33%	1,33%
13th	0,026	0,018	0,175	0,121	2%	2%
14th	0,035	0,024	0,009	0,006	N/A	N/A
15th	0,009	0,006	0,007	0,005	N/A	N/A
16th	0,012	0,008	0,015	0,011	N/A	N/A
17th	0,050	0,034	0,090	0,062	N/A	N/A
18th	0,005	0,003	0,005	0,003	N/A	N/A
19th	0,047	0,033	0,052	0,036	N/A	N/A
20th	0,014	0,010	0,006	0,004	N/A	N/A
21th	0,007	0,005	0,010	0,007	N/A	N/A
22th	0,016	0,011	0,008	0,005	N/A	N/A
23th	0,044	0,031	0,042	0,029	N/A	N/A
24th	0,004	0,003	0,007	0,005	N/A	N/A
25th	0,030	0,021	0,012	0,008	N/A	N/A
26th	0,007	0,005	0,006	0,004	N/A	N/A
27th	0,005	0,003	0,005	0,003	N/A	N/A
28th	0,004	0,003	0,004	0,003	N/A	N/A
29th	0,015	0,010	0,013	0,009	N/A	N/A
30th	0,004	0,003	0,007	0,005	N/A	N/A
31th	0,009	0,006	0,021	0,014	N/A	N/A
32th	0,002	0,001	0,008	0,006	N/A	N/A
33th	0,002	0,002	0,003	0,002	N/A	N/A
34th	0,003	0,002	0,003	0,002	N/A	N/A
35th	0,018	0,012	0,014	0,010	N/A	N/A
36th	0,002	0,002	0,006	0,004	N/A	N/A
37th	0,024	0,017	0,005	0,003	N/A	N/A
38th	0,006	0,004	0,011	0,008	N/A	N/A
39th	0,007	0,005	0,005	0,003	N/A	N/A
40th	0,004	0,003	0,002	0,002	N/A	N/A
THD_{40} [%]	-	0,288	-	0,253	23%	13%
PWHD [%]	-	0,182	-	0,501	23%	22%

Power Quality. Harmonics.						
Phase 1						
Generating Unit rating per phase (rpp)			**SUN-110K-G03P3-EU-BM6**			
	At 50% of rated ouput 55,0 kW		**100% of rated output 110,0 kW**			
Harmonic	**Measured Value (MV) in [A]**	**Measured Value (MV) in [%]**	**Measured Value (MV) in [A]**	**Measured Value (MV) in [%]**	**Limit in BS EN61000-3-12 in %**	
					1 phase	**3 phase**
2nd	0,101	0,063	0,042	0,027	8%	8%
3rd	0,021	0,013	0,053	0,033	21,6%	N/A
4th	0,052	0,032	0,090	0,056	4%	4%
5th	0,071	0,045	0,120	0,075	10,7%	10,7%
6th	0,011	0,007	0,044	0,028	2,67%	2,67%
7th	0,045	0,028	0,024	0,015	7,2%	7,2%
8th	0,074	0,047	0,057	0,036	2%	2%
9th	0,008	0,005	0,023	0,014	3,8%	N/A
10th	0,049	0,031	0,082	0,051	1,6%	1,6%
11th	0,089	0,056	0,296	0,186	3,1%	3,1%
12th	0,018	0,011	0,013	0,008	1,33%	1,33%
13th	0,029	0,018	0,205	0,129	2%	2%
14th	0,039	0,025	0,010	0,006	N/A	N/A
15th	0,011	0,007	0,006	0,004	N/A	N/A
16th	0,017	0,011	0,020	0,012	N/A	N/A
17th	0,041	0,026	0,092	0,058	N/A	N/A
18th	0,004	0,002	0,010	0,006	N/A	N/A
19th	0,048	0,030	0,071	0,044	N/A	N/A
20th	0,020	0,012	0,005	0,003	N/A	N/A
21th	0,005	0,003	0,005	0,003	N/A	N/A
22th	0,012	0,007	0,004	0,003	N/A	N/A
23th	0,036	0,022	0,042	0,026	N/A	N/A
24th	0,003	0,002	0,004	0,003	N/A	N/A
25th	0,034	0,022	0,026	0,016	N/A	N/A
26th	0,014	0,009	0,006	0,004	N/A	N/A
27th	0,004	0,002	0,003	0,002	N/A	N/A
28th	0,005	0,003	0,007	0,005	N/A	N/A
29th	0,014	0,009	0,010	0,006	N/A	N/A
30th	0,002	0,002	0,003	0,002	N/A	N/A
31th	0,016	0,010	0,020	0,012	N/A	N/A
32th	0,005	0,003	0,003	0,002	N/A	N/A
33th	0,003	0,002	0,003	0,002	N/A	N/A
34th	0,005	0,003	0,007	0,004	N/A	N/A
35th	0,019	0,012	0,023	0,015	N/A	N/A
36th	0,003	0,002	0,004	0,002	N/A	N/A
37th	0,025	0,016	0,008	0,005	N/A	N/A
38th	0,006	0,004	0,003	0,002	N/A	N/A
39th	0,014	0,009	0,004	0,003	N/A	N/A
40th	0,008	0,005	0,005	0,003	N/A	N/A
THD_{40} [%]	-	0,275	-	0,271	23%	13%
PWHD [%]	-	0,189	-	0,502	23%	22%

Power Quality. Harmonics.						
Phase 2						
Generating Unit rating per phase (rpp)			**SUN-110K-G03P3-EU-BM6**			
	At 50% of rated ouput 55,0 kW		**100% of rated output 110,0 kW**			
Harmonic	**Measured Value (MV) in [A]**	**Measured Value (MV) in [%]**	**Measured Value (MV) in [A]**	**Measured Value (MV) in [%]**	**Limit in BS EN61000-3-12 in %**	
					1 phase	**3 phase**
2nd	0,060	0,038	0,039	0,024	8%	8%
3rd	0,027	0,017	0,075	0,047	21,6%	N/A
4th	0,051	0,032	0,085	0,054	4%	4%
5th	0,086	0,054	0,071	0,045	10,7%	10,7%
6th	0,015	0,010	0,056	0,035	2,67%	2,67%
7th	0,037	0,023	0,046	0,029	7,2%	7,2%
8th	0,056	0,035	0,060	0,038	2%	2%
9th	0,010	0,006	0,018	0,012	3,8%	N/A
10th	0,045	0,028	0,093	0,059	1,6%	1,6%
11th	0,084	0,053	0,308	0,193	3,1%	3,1%
12th	0,013	0,008	0,014	0,009	1,33%	1,33%
13th	0,025	0,016	0,191	0,120	2%	2%
14th	0,048	0,030	0,005	0,003	N/A	N/A
15th	0,008	0,005	0,012	0,008	N/A	N/A
16th	0,018	0,011	0,028	0,018	N/A	N/A
17th	0,039	0,024	0,091	0,057	N/A	N/A
18th	0,004	0,003	0,010	0,006	N/A	N/A
19th	0,045	0,028	0,065	0,041	N/A	N/A
20th	0,021	0,013	0,008	0,005	N/A	N/A
21th	0,007	0,004	0,012	0,007	N/A	N/A
22th	0,016	0,010	0,009	0,006	N/A	N/A
23th	0,041	0,026	0,045	0,028	N/A	N/A
24th	0,006	0,004	0,009	0,005	N/A	N/A
25th	0,032	0,020	0,025	0,016	N/A	N/A
26th	0,013	0,008	0,004	0,003	N/A	N/A
27th	0,009	0,006	0,009	0,006	N/A	N/A
28th	0,008	0,005	0,010	0,006	N/A	N/A
29th	0,019	0,012	0,016	0,010	N/A	N/A
30th	0,005	0,003	0,008	0,005	N/A	N/A
31th	0,017	0,011	0,027	0,017	N/A	N/A
32th	0,006	0,004	0,008	0,005	N/A	N/A
33th	0,008	0,005	0,010	0,006	N/A	N/A
34th	0,006	0,003	0,008	0,005	N/A	N/A
35th	0,022	0,014	0,022	0,014	N/A	N/A
36th	0,004	0,003	0,008	0,005	N/A	N/A
37th	0,029	0,018	0,014	0,009	N/A	N/A
38th	0,010	0,006	0,010	0,006	N/A	N/A
39th	0,011	0,007	0,008	0,005	N/A	N/A
40th	0,009	0,006	0,008	0,005	N/A	N/A
THD_{40} [%]	-	0,256	-	0,272	23%	13%
PWHD [%]	-	0,188	-	0,502	23%	22%

Power Quality. Harmonics.						
Phase 3						
Generating Unit rating per phase (rpp)			**SUN-110K-G03P3-EU-BM6**			
	At 50% of rated ouput 55,0 kW		**100% of rated output 110,0 kW**			
Harmonic	**Measured Value (MV) in [A]**	**Measured Value (MV) in [%]**	**Measured Value (MV) in [A]**	**Measured Value (MV) in [%]**	**Limit in BS EN61000-3-12 in %**	
					1 phase	**3 phase**
2nd	0,097	0,061	0,052	0,033	8%	8%
3rd	0,021	0,013	0,061	0,038	21,6%	N/A
4th	0,049	0,030	0,058	0,036	4%	4%
5th	0,066	0,041	0,107	0,067	10,7%	10,7%
6th	0,020	0,013	0,055	0,035	2,67%	2,67%
7th	0,048	0,030	0,056	0,035	7,2%	7,2%
8th	0,076	0,048	0,036	0,022	2%	2%
9th	0,013	0,008	0,013	0,008	3,8%	N/A
10th	0,029	0,018	0,079	0,050	1,6%	1,6%
11th	0,075	0,047	0,307	0,193	3,1%	3,1%
12th	0,015	0,009	0,009	0,006	1,33%	1,33%
13th	0,016	0,010	0,195	0,123	2%	2%
14th	0,034	0,022	0,012	0,007	N/A	N/A
15th	0,008	0,005	0,008	0,005	N/A	N/A
16th	0,009	0,006	0,021	0,013	N/A	N/A
17th	0,045	0,028	0,101	0,063	N/A	N/A
18th	0,004	0,003	0,006	0,004	N/A	N/A
19th	0,043	0,027	0,061	0,038	N/A	N/A
20th	0,015	0,009	0,007	0,004	N/A	N/A
21th	0,007	0,005	0,012	0,008	N/A	N/A
22th	0,015	0,009	0,007	0,004	N/A	N/A
23th	0,044	0,027	0,047	0,030	N/A	N/A
24th	0,004	0,003	0,006	0,004	N/A	N/A
25th	0,029	0,018	0,019	0,012	N/A	N/A
26th	0,009	0,006	0,004	0,002	N/A	N/A
27th	0,006	0,004	0,007	0,005	N/A	N/A
28th	0,006	0,004	0,004	0,003	N/A	N/A
29th	0,019	0,012	0,017	0,011	N/A	N/A
30th	0,004	0,002	0,007	0,004	N/A	N/A
31th	0,013	0,008	0,025	0,016	N/A	N/A
32th	0,003	0,002	0,007	0,004	N/A	N/A
33th	0,003	0,002	0,004	0,003	N/A	N/A
34th	0,002	0,001	0,002	0,001	N/A	N/A
35th	0,019	0,012	0,017	0,011	N/A	N/A
36th	0,003	0,002	0,005	0,003	N/A	N/A
37th	0,025	0,016	0,009	0,006	N/A	N/A
38th	0,007	0,005	0,010	0,006	N/A	N/A
39th	0,007	0,005	0,007	0,004	N/A	N/A
40th	0,007	0,004	0,004	0,002	N/A	N/A
THD_{40} [%]	-	0,259	-	0,273	23%	13%
PWHD [%]	-	0,190	-	0,500	23%	22%

Power Quality. Power factor.				
Output power	216,2V	230V	253V	Measured at three voltage levels and at full output. Voltage to be maintained within ±1,5% of the stated level during the test.
20%	0,9994	0,9992	0,9987	
50%	0,9994	0,9994	0,9994	
75%	0,9994	0,9993	0,9994	
100%	0,9993	0,9993	0,9993	
Limit leading	>0,95	>0,95	>0,95	

Power Quality. Voltage fluctuation and Flicker.								
	Starting			**Stopping**			**Running**	
	dmax	**dc**	**d(t)**	**dmax**	**dc**	**d(t)**	**Pst**	**Plt 2 hours**
Measured values at test impedance	0,531	0,017	0,00	0,525	0,016	0,00	0,076	0,074
Measured values at standard impedance	0,531	0,017	0,00	0,525	0,016	0,00	0,076	0,074
Values for maximum impedance	0,531	0,017	0,00	0,525	0,016	0,00	0,076	0,074
Limits set under BS EN 61000-3-11	4%	3,3%	3,3% 500ms	4%	3,3%	3,3% 500ms	1,0	0,65

Test impedance	Z	0,28	Ω	Xl	0,15	Ω
	R	0,24	Ω			
Standard impedance	Z	0,28	Ω	Xl	0,15	Ω
	R	0,24	Ω			
Maximum impedance	Z_{max}	0,28	Ω	Xl	0,15	Ω
	Z	0,28	Ω			

Power Quality. DC injection.			
SUN-110K-G03P3-EU-BM6			
Phase 1			
Test level power [%]	10	55	100
Recorded value [mA]	0,030	0,092	0,108
Recorded value [%]	0,02	0,06	0,07
Limit [%]	0,25	0,25	0,25
Phase 2			
Test level power [%]	10	55	100
Recorded value [mA]	0,034	0,102	0,073
Recorded value [%]	0,02	0,06	0,05
Limit [%]	0,25	0,25	0,25
Phase 3			
Test level power [%]	10	55	100
Recorded value [mA]	0,052	0,168	0,169
Recorded value [%]	0,03	0,11	0,11
Limit [%]	0,25	0,25	0,25
Note. Informative measurement of DC-injection of each phase of the inverter and a limit of 0,25% per phase of the rated current per phase as pass criteria.			
Sum of all Phases Tests are carried out at three defined power levels ±5%. At 230 V a 110,0 kW three phase Inverter has a current output of 478,26 A so DC limit is 1,20 A. These tests is undertaken in accordance with Annex A.7.1.4.4. The % DC injection ("as % of rated AC current" below) is calculated as follows: % DC injection = Recorded DC value in Amps / Base current where the base current is the Registered Capacity (W) / V phase. The % DC injection should not be greater than 0,25%.			
Sum of all Phases			
Test level power [%]	10	55	100
Recorded value [mA]	0,116	0,362	0,350
Recorded value [%]	0,02	0,08	0,07
Limit [%]	0,25	0,25	0,25

Power Quality. DC injection.			
SUN-70K-G03P3-EU-BM4			
Phase 1			
Test level power [%]	10	55	100
Recorded value [mA]	0,020	0,045	0,112
Recorded value [%]	0,02	0,04	0,11
Limit [%]	0,25	0,25	0,25
Phase 2			
Test level power [%]	10	55	100
Recorded value [mA]	0,020	0,059	0,096
Recorded value [%]	0,02	0,06	0,09
Limit [%]	0,25	0,25	0,25
Phase 3			
Test level power [%]	10	55	100
Recorded value [mA]	0,035	0,124	0,127
Recorded value [%]	0,03	0,12	0,13
Limit [%]	0,25	0,25	0,25
Note. Informative measurement of DC-injection of each phase of the inverter and a limit of 0,25% per phase of the rated current per phase as pass criteria.			
Sum of all Phases Tests are carried out at three defined power levels ±5%. At 230 V a 70,0 kW three phase Inverter has a current output of 304,35 A so DC limit is 0,76 A. These tests is undertaken in accordance with Annex A.7.1.4.4. The % DC injection ("as % of rated AC current" below) is calculated as follows: % DC injection = Recorded DC value in Amps / Base current where the base current is the Registered Capacity (W) / V phase. The % DC injection should not be greater than 0,25%.			
Sum of all Phases			
Test level power [%]	10	55	100
Recorded value [mA]	0,075	0,228	0,335
Recorded value [%]	0,02	0,07	0,11
Limit [%]	0,25	0,25	0,25

Fault level Contribution.					
For a directly coupled SSEG			**For a Inverter SSEG**		
Parameter	**Symbol**	**Value**	**Time after fault**	**Volts [V]**	**Amps [A]**
Peak Short Circuit current	I_p	N/A	20ms	68,10V	0,67A
Initial Value of aperiodic current	A	N/A	100ms	58,89V	0,48A
Initial symmetrical short-circuit current*	I_k	N/A	250ms	62,24V	0,64A
Decaying (aperiodic) component of short circuit current*	i_{DC}	N/A	500ms	18,80V	0,16A
Reactance/Resistance Ratio of source*	X/R	N/A	**Time to Trip [s]**	0,035s	In seconds
For rotating machines and linear piston machines the test should produce a 0s – 2s plot of the short circuit current as seen at the Generating Unit terminals. * Values for these parameters should be provided where the short circuit duration is sufficiently long to enable interpolation of the plot.					

Self Monitoring – Solid state switching.	**N/A**
It has been verified that in the event of the solid state switching device failing to disconnect the Power Park Module, the voltage on the output side of the switching device is reduced to a value below 50 volts within 0,5 seconds.	N/A
Note. Unit do not provide solid state switching relays. In case the semiconductor bridge is switched off, then the voltage on the output drops to 0. In this case the relays on the output will also open (Functional safety of the internal automatic disconnection device according to VDE 0126-1-1 / VDE 0124-100).	

Wiring functional tests if required by para. 15.2.1	**N/A**
Confirm that the relevant test schedule is attached (tests to be undertaken at time of commissioning).	N/A
Note: The inverter was tested in a test laboratory. The correct wiring functional test in the filed has to be done by the responsible person for the installation of the plant.	

Logic Interface (input port) Required by paragraph 11.1.3.1	**P**
Confirm that an input port is provided and can be used to reduce the Active Power output to zero	Yes
Note. Manufacturer information provided.	
Provide high level description of logic interface, e.g. details in 11.1.3.1 such as AC or DC signal	Yes
The inverter has a DRM logical port,A 15K resistor needs to be connected to PIN 5 of the DRM port.The connection between PIN 1 and PIN 6 can be controlled by a switch,When the switch is closed, the inverter will reduce the active power to 0 within 5 seconds.	



