Certificate of compliance

Applicant:	**Huawei Technologies Co., Ltd.** Administration Building, Headquarters of Huawei Technologies Co., Ltd., Bantian, Longgang District, Shenzhen, 518129, **P.R.C**
Product:	**SOLAR INVERTER**
Model:	**SUN2000-3KTL-M0, SUN2000-4KTL-M0, SUN2000-5KTL-M0, SUN2000-6KTL-M0, SUN2000-8KTL-M0, SUN2000-10KTL-M0, SUN2000-3KTL-M1, SUN2000-4KTL-M1, SUN2000-5KTL-M1, SUN2000-6KTL-M1, SUN2000-8KTL-M1, SUN2000-10KTL-M1**

Use in accordance with regulations:

Automatic disconnection device with three-phase mains surveillance in accordance with Engineering Recommendation G99/1 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 that can access the distribution network provider at any time.

Applied rules and standards:

Engineering Recommendation G99/1-1:2018
Requirements for the connection of generation equipment in parallel with public distribution networks

DIN V VDE V 0126-1-1:2006-02 (Functional safety)
Automatic disconnection device between a generator and the public low-voltage grid

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.

Report number:	**PVUK180906N022-1**
Certificate number:	**U19-0114**
Date of issue:	**2019-02-20**

Certification body

Holger Schaffer
Certification body of Bureau Veritas Consumer Products Services Germany GmbH
Accredited according to DIN EN ISO/IEC 17065

Appendix A2-3 Compliance Verification Report for Inverter Connected Power Generating Modules

Extract from test report according to the Engineering Recommendation G99/1-1 **Nr. PVUK180906N022-1**

Type Approval and declaration of compliance with the requirements of Engineering Recommendation G99/1.						
Manufacturer / applicant:	Huawei Technologies Co., Ltd. Administration Building, Headquarters of Huawei Technologies Co., Ltd., Bantian, Longgang District, Shenzhen, 518129, P.R.C					
Generating Unit technology	SOLAR INVERTER					
Rated values	SUN2000-3KTL-M0 SUN2000-3KTL-M1	SUN2000-4KTL-M0 SUN2000-4KTL-M1	SUN2000-5KTL-M0 SUN2000-5KTL-M1	SUN2000-6KTL-M0 SUN2000-6KTL-M1	SUN2000-8KTL-M0 SUN2000-8KTL-M1	SUN2000-10KTL-M0 SUN2000-10KTL-M1
Nominal rated capacity	3,0 kW	4,0 kW	5,0 kW	6,0 kW	8,0 kW	10,0 kW
Maximum capacity	3,3 kVA	4,4 kVA	5,5 kVA	6,6 kVA	8,8 kVA	11,0 kVA
Rated voltage	230V/400V					
Firmware version	V100R001					
Measurement period:	2018-09-06 to 2018-12-16					
Description of the structure of the power generation unit: The power generation unit is equipped with a PV and line-side EMC filter. The power generation unit has no galvanic isolation between DC input and AC output. Output switch-off is performed with single-fault tolerance based on two series-connected relays in line and neutral. This enables a safe disconnection of the power generation unit from the network in case of error.						
The above stated Generating Units are tested according the requirements in the Engineering Recommendation G99/1-1. 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 G99/1-1.						

Appendix A2-3 Compliance Verification Report for Inverter Connected Power Generating Modules

Extract from test report according to the Engineering Recommendation G99/1-1 **Nr. PVUK180906N022-1**

Operating Range.	
Test 1	Voltage = 85% of nominal (195,5 V) Frequency = 47 Hz Power Factor = 1 Period of test 20 s
Connection:	Always connected
Limit:	Always connected
Test 1	Voltage = 85% of nominal (195,5 V) Frequency = 47.5 Hz Power Factor = 1 Period of test 90 minutes
Connection:	Always connected
Limit:	Always connected
Test 1	Voltage = 110% of nominal (253 V) Frequency = 51.5 Hz Power Factor = 1 Period of test 90 minutes
Connection:	Always connected
Limit:	Always connected
Test 1	Voltage = 110% of nominal (253 V) Frequency = 52.0 Hz Power Factor = 1 Period of test 15 minutes
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	184	2,5	182,9	2,572	188V / 3,5s	No trip
					180V / 2,48s	No trip
O/V stage 1	262,2	1,0	261,0	1,062	258,2V 2,0s	No trip
O/V stage 2	273,7	0,5	272,2	0,563	269,7V 0,98s	No trip
					277,7V 0,48s	No trip

Appendix A2-3 Compliance Verification Report for Inverter Connected Power Generating Modules

Extract from test report according to the Engineering Recommendation G99/1-1 **Nr. PVUK180906N022-1**

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	184	2,5	184,9	2,552	188V / 3,5s	No trip
					180V / 2,48s	No trip
O/V stage 1	262,2	1,0	263,2	1,077	258,2V 2,0s	No trip
O/V stage 2	273,7	0,5	275,0	0,583	269,7V 0,98s	No trip
					277,7V 0,48s	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	184	2,5	184,8	2,556	188V / 3,5s	No trip
					180V / 2,48s	No trip
O/V stage 1	262,2	1,0	262,1	1,074	258,2V 2,0s	No trip
O/V stage 2	273,7	0,5	274,1	0,558	269,7V 0,98s	No trip
					277,7V 0,48s	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.

Appendix A2-3 Compliance Verification Report for Inverter Connected Power Generating Modules

Extract from test report according to the Engineering Recommendation G99/1-1 **Nr. PVUK180906N022-1**

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	47,5	20,065	47,7Hz / 25s	No trip
U/F stage 2	47	0,5	47,0	0,567	47,2Hz / 19,98s	No trip
					46,8Hz / 0,48s	No trip
O/F stage 2	52	0,5	52,0	0,560	51,8Hz / 89,98s	No trip
					52,2Hz / 0,48s	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]	0,169	0,173	0,291	0,255	0,248	0,270
Trip time. Ph2 fuse removed [s]	0,169	0,173	0,291	0,255	0,248	0,270
Trip time. Ph3 fuse removed [s]	0,169	0,173	0,291	0,255	0,248	0,270
Note. Trip time limit is 0,5s. For technologies which have a substantial shut down time this can be added to the 0,5s in establishing that the trip occurred in less than 0,5s maximum. Shut down time could therefore be up to 1,0s for these technologies.						

Appendix A2-3 Compliance Verification Report for Inverter Connected Power Generating Modules	
Extract from test report according to the Engineering Recommendation G99/1-1	**Nr. PVUK180906N022-1**

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 10.5.7.1.	
Under Voltage (196,1V)	
Time delay setting	**Measured delay**
20s	121s
Over Voltage (266,2V)	
Time delay setting	**Measured delay**
20s	125s
Under Frequency (47,4Hz)	
Time delay setting	**Measured delay**
20s	125s
Over Frequency (52,1Hz)	
Time delay setting	**Measured delay**
20s	125s

	Checks on no reconnection when voltage or frequency is brought to just outside stage 1 limits of table 1.			
	At 266,2V	At 196,1V	At 47,4Hz	At 52,1Hz
Confirmation that the Generating Unit does not re-connect.	No reconnection	No reconnection	No reconnection	No reconnection

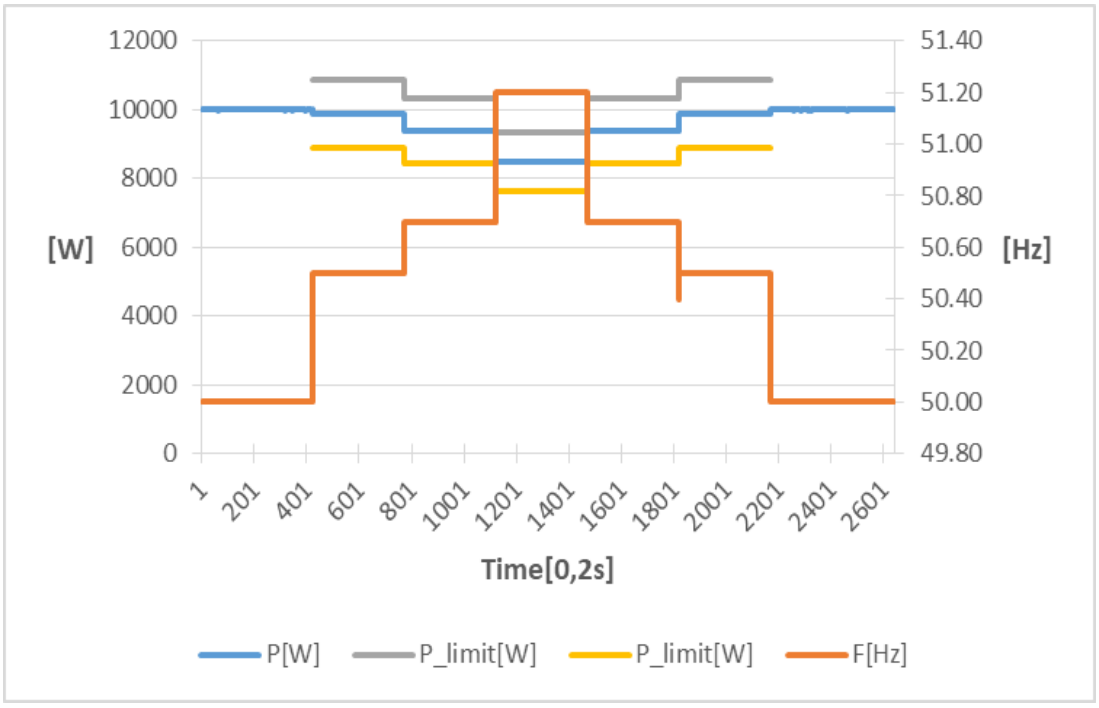
Protection. Frequency change, Stability test.				
	Start Frequency [Hz]	**Change**	**Test Duration**	**Confirm no trip**
Positive Vector Shift	49,5	+50 degrees		No trip
Negative Vector Shift	50,5	-50 degrees		No trip
Positive Frequency drift	49,0	+0,95Hz/sec	2,1s	No trip
Negative Frequency drift	51,0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

Appendix A2-3 Compliance Verification Report for Inverter Connected Power Generating Modules

Extract from test report according to the Engineering Recommendation G99/1-1 **Nr. PVUK180906N022-1**

Limited Frequency Sensitive Mode – Over Frequency							
1-min mean value [Hz]:	**a) 50,00**	**b) 50,45**	**c) 50,70**	**d) 51,15**	**e) 50,70**	**f) 50,45**	**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
PM [kW]:	N/A	9,880	9,390	8,480	9,390	9,880	N/A
PE60 [kW]:	10,000	9,884	9,384	8,483	9,384	9,884	10,000
ΔPE60/PM [%]:	N/A	0,06	0,06	0,07	0,06	0,04	N/A
Limit $\Delta P/P_{1min}$:	+ 10 % of PM						
2. Measurement a) to g): Active power output 40% and 60% after freezing > 80% Pn							
Frequency [Hz]:	50,00	50,45	50,70	51,15	50,70	50,45	50,00
PM [kW]:	N/A	5,001	4,751	4,295	4,748	5,003	N/A
PE60 [kW]:	5,070	5,003	4,750	4,293	4,750	5,003	5,558
ΔPE60/PM [%]:	N/A	0,02	0,01	0,02	0,02	0,01	N/A
Limit $\Delta P/P_{1min}$:	+ 10 % of PM						

Graph of Measurement 1.: Active power output > 80% Pn

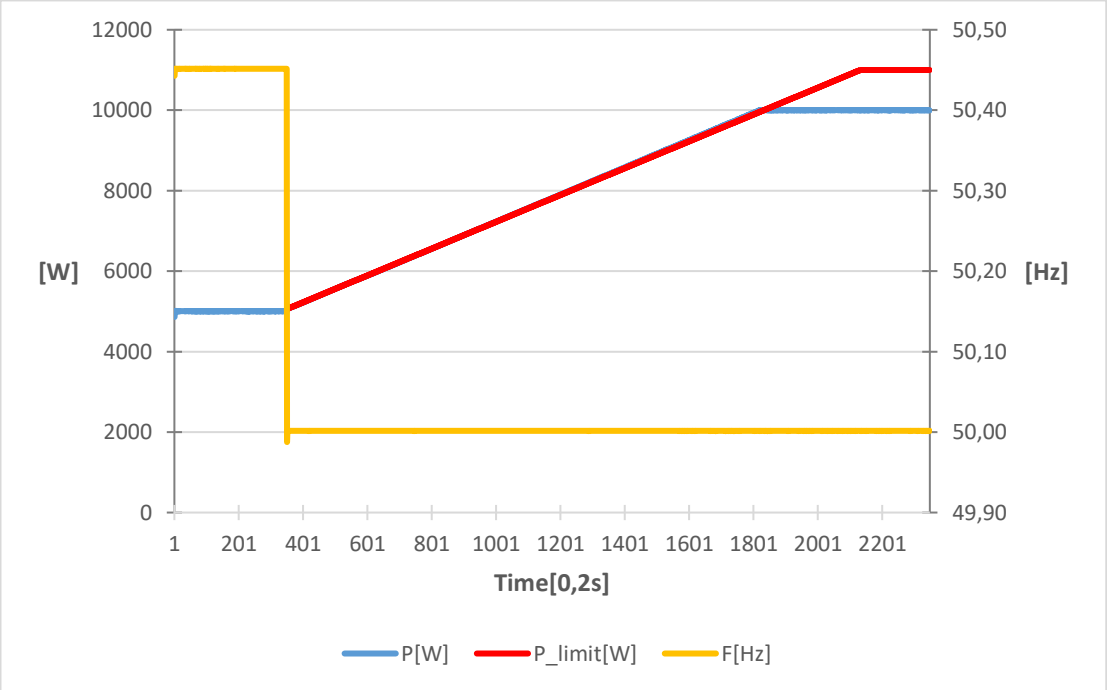


Appendix A2-3 Compliance Verification Report for Inverter Connected Power Generating Modules

Extract from test report according to the Engineering Recommendation G99/1-1 **Nr. PVUK180906N022-1**

Graph of Measurement 2.:Active power output 40% and 60% after freezing > 80% Pn

Graph of power gradient:



Output Power with falling Frequency			
5-min mean value (each)	**a) 50 ± 0,01 Hz**	**b) - 0,4 to - 0,5 Hz**	**c) - 2,4 to - 2,5 Hz**
Frequency [Hz]:	50,00	49,55	47,55
Active power [W]:	9995	9995	9996
ΔP/PM [%] per 1 Hz:			0

Appendix A2-3 Compliance Verification Report for Inverter Connected Power Generating Modules

Extract from test report according to the Engineering Recommendation G99/1-1 **Nr. PVUK180906N022-1**

Power Quality. Harmonics.

Phase 3						
SSEG rating per phase (rpp)			SUN2000-10KTL-M0			
	At 45-55% of rated output 1,6 kW		100% of rated output 3,3 kW			
Harmonic	Measured Value (MV) in [A]	Measured Value (MV) in [%]	Measured Value (MV) in [A]	Measured Value (MV) in [%]	Limit in BS EN61000-3-2 in Amps	Higher limit for odd harmonics 21 and above
2nd	0,015	0,200	0,025	0,173	1,080	
3rd	0,009	0,126	0,036	0,246	2,300	
4th	0,007	0,095	0,015	0,102	0,430	
5th	0,048	0,654	0,016	0,110	1,140	
6th	0,005	0,070	0,008	0,053	0,300	
7th	0,035	0,482	0,012	0,080	0,770	
8th	0,006	0,079	0,009	0,063	0,230	
9th	0,006	0,079	0,008	0,055	0,400	
10th	0,005	0,069	0,008	0,055	0,184	
11th	0,029	0,398	0,011	0,076	0,330	
12th	0,005	0,075	0,007	0,050	0,153	
13th	0,010	0,137	0,012	0,081	0,210	
14th	0,006	0,083	0,008	0,057	0,131	
15th	0,007	0,103	0,009	0,059	0,150	
16th	0,007	0,096	0,007	0,051	0,115	
17th	0,023	0,310	0,008	0,053	0,132	
18th	0,008	0,109	0,008	0,054	0,102	
19th	0,044	0,601	0,009	0,061	0,118	
20th	0,007	0,097	0,007	0,046	0,092	
21th	0,008	0,116	0,009	0,061	0,107	0,160
22th	0,006	0,088	0,007	0,050	0,084	
23th	0,011	0,146	0,009	0,065	0,098	0,147
24th	0,007	0,091	0,007	0,050	0,077	
25th	0,009	0,128	0,009	0,065	0,090	0,135
26th	0,007	0,100	0,007	0,048	0,071	
27th	0,010	0,141	0,008	0,059	0,083	0,124
28th	0,008	0,108	0,010	0,070	0,066	
29th	0,010	0,138	0,009	0,062	0,078	0,117
30th	0,008	0,106	0,011	0,077	0,061	
31th	0,008	0,112	0,010	0,071	0,073	0,109
32th	0,010	0,130	0,017	0,119	0,058	
33th	0,010	0,139	0,013	0,088	0,068	0,102
34th	0,008	0,103	0,015	0,105	0,054	
35th	0,008	0,116	0,036	0,248	0,064	0,096
36th	0,009	0,121	0,016	0,110	0,051	
37th	0,010	0,139	0,037	0,255	0,061	0,091
38th	0,008	0,114	0,026	0,180	0,048	
39th	0,011	0,144	0,016	0,110	0,058	0,087
40th	0,009	0,118	0,019	0,135	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.

Appendix A2-3 Compliance Verification Report for Inverter Connected Power Generating Modules

Extract from test report according to the Engineering Recommendation G99/1-1 **Nr. PVUK180906N022-1**

Power Quality. Power factor.				
SUN2000-3KTL				
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%	0,9955	0,9962	0,9951	
50%	0,9991	0,9992	0,9991	
75%	0,9996	0,9996	0,9996	
100%	0,9998	0,9998	0,9998	
Limit	>0,95	>0,95	>0,95	
SUN2000-10KTL				
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%	0,9996	0,9996	0,9995	
50%	0,9999	0,9993	0,9999	
75%	0,9999	0,9997	0,9999	
100%	0,9999	0,9998	0,9999	
Limit	**>0,95**	**>0,95**	**>0,95**	

Power Quality. Voltage fluctuation and Flicker.								
SUN2000-3KTL-M0	**Starting**			**Stopping**			**Running**	
	dmax	**dc**	**d(t)**	**dmax**	**dc**	**d(t)**	**Pst**	**Plt 2 hours**
Measured values at test impedance Phase 1	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,07	0,07
Measured values at test impedance Phase 2	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,07	0,07
Measured values at test impedance Phase 3	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,07	0,07
Limits set under BS EN 61000-3-11	4%	3,3%	3,3% 500ms	4%	3,3%	3,3% 500ms	1,0	0,65
SUN2000-4KTL-M0	**Starting**			**Stopping**			**Running**	
	dmax	**dc**	**d(t)**	**dmax**	**dc**	**d(t)**	**Pst**	**Plt 2 hours**
Measured values at test impedance Phase 1	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,08	0,07
Measured values at test impedance Phase 2	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,07	0,07
Measured values at test impedance Phase 3	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,07	0,07
Limits set under BS EN 61000-3-11	4%	3,3%	3,3% 500ms	4%	3,3%	3,3% 500ms	1,0	0,65

Appendix A2-3 Compliance Verification Report for Inverter Connected Power Generating Modules

Extract from test report according to the Engineering Recommendation G99/1-1 **Nr. PVUK180906N022-1**

SUN2000-5KTL-M0	Starting			Stopping			Running	
	dmax	dc	d(t)	dmax	dc	d(t)	Pst	Plt 2 hours
Measured values at test impedance Phase 1	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,7	0,7
Measured values at test impedance Phase 2	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,7	0,7
Measured values at test impedance Phase 3	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,7	0,7
Limits set under BS EN 61000-3-11	4%	3,3%	3,3% 500ms	4%	3,3%	3,3% 500ms	1,0	0,65

SUN2000-6KTL-M0	Starting			Stopping			Running	
	dmax	dc	d(t)	dmax	dc	d(t)	Pst	Plt 2 hours
Measured values at test impedance Phase 1	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,7	0,7
Measured values at test impedance Phase 2	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,7	0,7
Measured values at test impedance Phase 3	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,7	0,7
Limits set under BS EN 61000-3-11	4%	3,3%	3,3% 500ms	4%	3,3%	3,3% 500ms	1,0	0,65

SUN2000-8KTL-M0	Starting			Stopping			Running	
	dmax	dc	d(t)	dmax	dc	d(t)	Pst	Plt 2 hours
Measured values at test impedance Phase 1	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,7	0,7
Measured values at test impedance Phase 2	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,7	0,7
Measured values at test impedance Phase 3	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,7	0,7
Limits set under BS EN 61000-3-11	4%	3,3%	3,3% 500ms	4%	3,3%	3,3% 500ms	1,0	0,65

SUN2000-10KTL-M0	Starting			Stopping			Running	
	dmax	dc	d(t)	dmax	dc	d(t)	Pst	Plt 2 hours
Measured values at test impedance Phase 1	0,29%	0,23%	0,00%	0,29%	0,23%	0,00%	0,8	0,8
Measured values at test impedance Phase 2	0,29%	0,31%	0,00%	0,29%	0,31%	0,00%	0,8	0,8
Measured values at test impedance Phase 3	0,34%	0,32%	0,00%	0,34%	0,32%	0,00%	0,8	0,8
Limits set under BS EN 61000-3-11	4%	3,3%	3,3% 500ms	4%	3,3%	3,3% 500ms	1,0	0,65

Appendix A2-3 Compliance Verification Report for Inverter Connected Power Generating Modules	
Extract from test report according to the Engineering Recommendation G99/1-1	Nr. PVUK180906N022-1

Power Quality. DC injection.				
SUN2000-10KTL-M0				
Test level power [%]	20	50	75	100
Recorded value [mA] Phase 1	4,5	4,2	4,2	4,0
Recorded value [%]Phase 1	0,08	0,08	0,08	0,08
Recorded value [mA] Phase 2	4,2	4,1	4,3	4,1
Recorded value [%]Phase 2	0,08	0,08	0,08	0,08
Recorded value [mA] Phase 3	1,2	1,2	0,7	0,8
Recorded value [%]Phase 3	0,02	0,02	0,01	0,02
Limit [%]	0,25	0,25	0,25	0,25
SUN2000-3KTL-M0				
Test level power [%]	20	50	75	100
Recorded value [mA] Phase 1	3,4	3,7	3,8	5,8
Recorded value [%]Phase 1	0,02	0,02	0,02	0,03
Recorded value [mA] Phase 2	3,9	3,1	3,5	5,3
Recorded value [%]Phase 2	0,02	0,02	0,02	0,03
Recorded value [mA] Phase 3	1,4	1,7	3,1	4,7
Recorded value [%]Phase 3	0,01	0,01	0,02	0,03
Limit [%]	0,25	0,25	0,25	0,25

Fault level Contribution.					
SUN2000-10KTL-M0 Phase 1					
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	54	12,9
Initial Value of aperiodic current	A	N/A	100ms	39	7,7
Initial symmetrical short-circuit current*	I_k	N/A	250ms	N/A	N/A
Decaying (aperiodic) component of short circuit current*	i_{DC}	N/A	500ms	N/A	N/A
Reactance/Resistance Ratio of source*	X/R	N/A	**Time to Trip [s]**	0,074	

Appendix A2-3 Compliance Verification Report for Inverter Connected Power Generating Modules

Extract from test report according to the Engineering Recommendation G99/1-1 **Nr. PVUK180906N022-1**

SUN2000-10KTL-M0 Phase 2					
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	49	13,1
Initial Value of aperiodic current	A	N/A	100ms	38	8,2
Initial symmetrical short-circuit current*	I_k	N/A	250ms	N/A	N/A
Decaying (aperiodic) component of short circuit current*	i_{DC}	N/A	500ms	N/A	N/A
Reactance/Resistance Ratio of source*	X/R	N/A	**Time to Trip [s]**	0,074	

SUN2000-10KTL-M0 Phase 3					
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	37	13,3
Initial Value of aperiodic current	A	N/A	100ms	35	7,7
Initial symmetrical short-circuit current*	I_k	N/A	250ms	N/A	N/A
Decaying (aperiodic) component of short circuit current*	i_{DC}	N/A	500ms	N/A	N/A
Reactance/Resistance Ratio of source*	X/R	N/A	**Time to Trip [s]**	0,074	

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 Generating Unit, the voltage on the output side of the switching device is reduced to a value below 50 volts within 0,5 seconds.	

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.

Additional comments
The models SUN2000-3KTL-M1, SUN2000-4KTL-M1, SUN2000-5KTL-M1, SUN2000-6KTL-M1, SUN2000-8KTL-M1 and SUN2000-10KTL-M1 are almost identical in hardware with SUN2000-3KTL-M0, SUN2000-4KTL-M0, SUN2000-5KTL-M0, SUN2000-6KTL-M0, SUN2000-8KTL-M0, and SUN2000-10KTL-M0 except the PLC communication circuit. (J6 port and a Hi3911V200 chip)