



**BUREAU  
VERITAS**

# 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 G98/1 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 G98/1-1:2018

Requirements for the connection of Fully Type Tested Micro-generators (up to and including 16 A per phase) in parallel with public Low Voltage 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**

**Certificate number:** **U19-0112**

**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 C Type Test Verification Report**

Extract from test report according to the Engineering Recommendation G98/1-1

Nr. PVUK180906N022

**Type Approval and declaration of compliance with the requirements of Engineering Recommendation G98/1.**

|                                   |  |                                    |                                    |                                    |                                    |                                      |
|-----------------------------------|--|------------------------------------|------------------------------------|------------------------------------|------------------------------------|--------------------------------------|
| <b>Manufacturer / applicant:</b>  | Huawei Technologies Co., Ltd.<br>Administration Building, Headquarters of Huawei Technologies Co., Ltd., Bantian,<br>Longgang District, Shenzhen, 518129,<br>P.R.C |                                    |                                    |                                    |                                    |                                      |
| <b>Generating Unit technology</b> | SOLAR INVERTER   |                                    |                                    |                                    |                                    |                                      |
| <b>Rated values</b>               | SUN2000-3KTL-M0<br>SUN2000-3KTL-M1   | SUN2000-4KTL-M0<br>SUN2000-4KTL-M1 | SUN2000-5KTL-M0<br>SUN2000-5KTL-M1 | SUN2000-6KTL-M0<br>SUN2000-6KTL-M1 | SUN2000-8KTL-M0<br>SUN2000-8KTL-M1 | SUN2000-10KTL-M0<br>SUN2000-10KTL-M1 |
| <b>Nominal rated capacity</b>     | 3,0 kW   | 4,0 kW                             | 5,0 kW                             | 6,0 kW                             | 8,0 kW                             | 10,0 kW                              |
| <b>Maximum capacity</b>           | 3,3 kVA  | 4,4 kVA                            | 5,5 kVA                            | 6,6 kVA                            | 8,8 kVA                            | 11,0 kVA                             |
| <b>Rated voltage</b>              | 230V/400V  |                                    |                                    |                                    |                                    |                                      |
| <b>Firmware version</b>           | V100R001   |                                    |                                    |                                    |                                    |                                      |
| <b>Measurement period:</b>        | 2018-09-06 bis 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 G98/1-1. 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 G98/1-1.

**Appendix C Type Test Verification Report**

Extract from test report according to the Engineering Recommendation G98/1-1

Nr. PVUK180906N022

| Operating Range. |  |
|------------------|--|
| Connection:      | Always connected   |
| Limit:           | Always connected   |
| Test 1           | Voltage = 85% of nominal (195,5 V)<br>Frequency = 47,5 Hz<br>Power Factor = 1<br>Period of test 90 minutes |
| Connection:      | Always connected   |
| Limit:           | Always connected   |
| Test 2           | Voltage = 110% of nominal (253 V)<br>Frequency = 51,5 Hz<br>Power Factor = 1<br>Period of test 90 minutes  |
| Connection:      | Always connected   |
| Limit:           | Always connected   |
| Test 3           | Voltage = 110% of nominal (253 V)<br>Frequency = 52,0 Hz<br>Power Factor = 1<br>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 C Type Test Verification Report**

Extract from test report according to the Engineering Recommendation G98/1-1

Nr. PVUK180906N022

| 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  $\pm 3,45V$ . 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  $\pm 4V$  and for the relevant times as shown in the table above to ensure that the protection will not trip in error.

**Appendix C Type Test Verification Report**

Extract from test report according to the Engineering Recommendation G98/1-1

Nr. PVUK180906N022

| 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  $\pm 0,1$ Hz. 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  $\pm 0,2$ Hz 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<br>Test 22 | 66% of -5% Q<br>Test 12 | 100% of -5% P<br>Test 5 | 33% of +5% Q<br>Test 31 | 66% of +5% Q<br>Test 21 | 100% of +5% P<br>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 C Type Test Verification Report**

Extract from test report according to the Engineering Recommendation G98/1-1

Nr. PVUK180906N022

| <b>Protection. Re-connection timer.</b>   |                 |                       |                 |                 |
|---|-----------------|-----------------------|-----------------|-----------------|
| 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. |                 |                       |                 |                 |
| <b>Under Voltage (182V)</b>   |                 |                       |                 |                 |
| <b>Time delay setting</b>   |                 | <b>Measured delay</b> |                 |                 |
| 20s   |                 | 121s                  |                 |                 |
| <b>Over Voltage (266,2V)</b>  |                 |                       |                 |                 |
| <b>Time delay setting</b>   |                 | <b>Measured delay</b> |                 |                 |
| 20s   |                 | 125s                  |                 |                 |
| <b>Under Frequency (47,4Hz)</b>   |                 |                       |                 |                 |
| <b>Time delay setting</b>   |                 | <b>Measured delay</b> |                 |                 |
| 20s   |                 | 125s                  |                 |                 |
| <b>Over Frequency (52,1Hz)</b>  |                 |                       |                 |                 |
| <b>Time delay setting</b>   |                 | <b>Measured delay</b> |                 |                 |
| 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 182,0V             | At 47,4Hz       | At 52,1Hz       |
| <b>Confirmation that the Generating Unit does not re-connect.</b>   | No reconnection | No reconnection       | No reconnection | No reconnection |

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

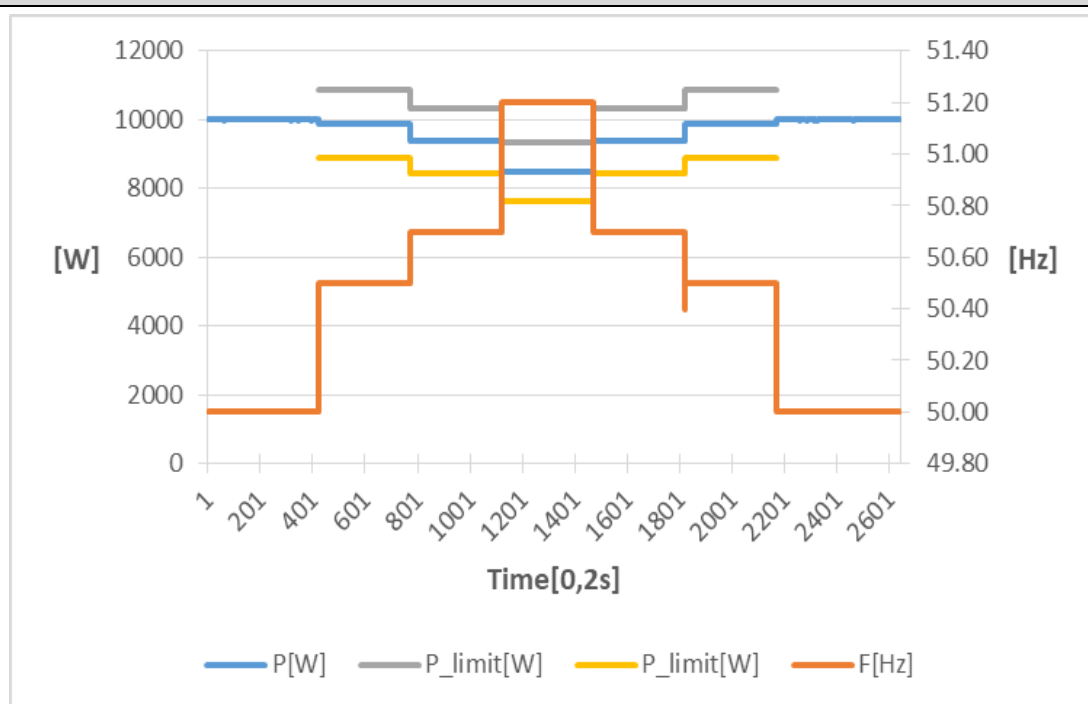
**Appendix C Type Test Verification Report**

Extract from test report according to the Engineering Recommendation G98/1-1

Nr. PVUK180906N022

| 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 |
| <b>1. Measurement a) to g): Active power output &gt; 80% Pn</b>                            |              |          |          |          |          |          |          |
| 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   |
| $\Delta$ PE60/PM [%]:  | N/A          | 0,06     | 0,06     | 0,07     | 0,06     | 0,04     | N/A      |
| Limit $\Delta$ P/P <sub>1min</sub> :   | + 10 % of PM |          |          |          |          |          |          |
| <b>2. Measurement a) to g): Active power output 40% and 60% after freezing &gt; 80% Pn</b> |              |          |          |          |          |          |          |
| 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    |
| $\Delta$ PE60/PM [%]:  | N/A          | 0,02     | 0,01     | 0,02     | 0,02     | 0,01     | N/A      |
| Limit $\Delta$ P/P <sub>1min</sub> :   | + 10 % of PM |          |          |          |          |          |          |

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

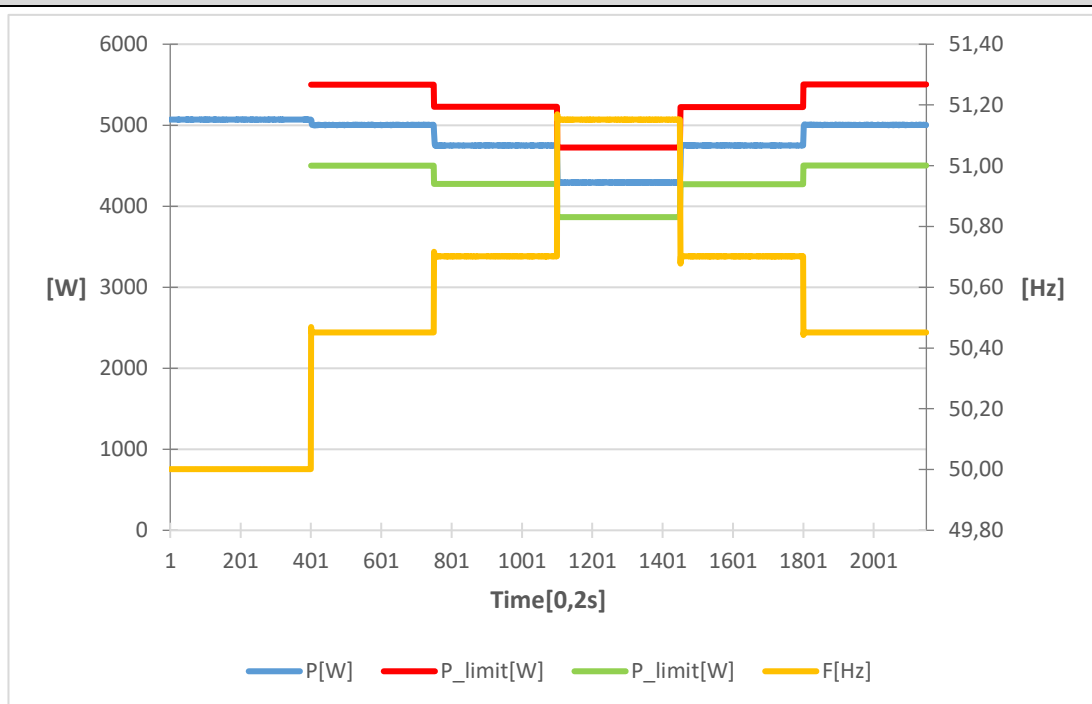


**Appendix C Type Test Verification Report**

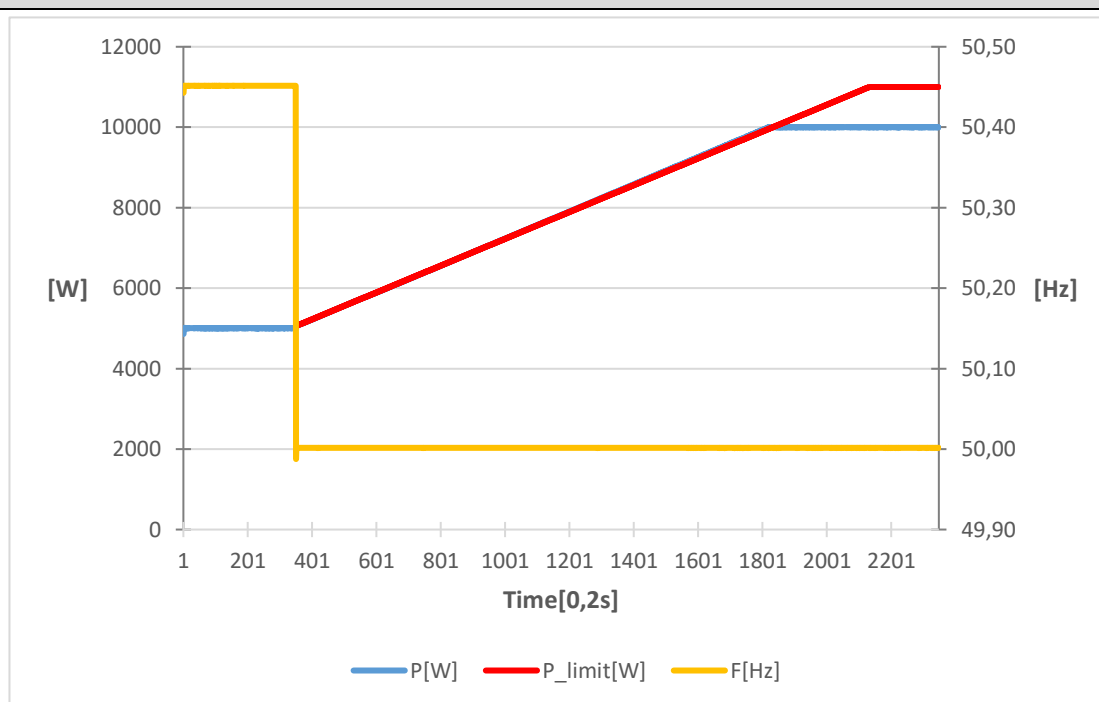
Extract from test report according to the Engineering Recommendation G98/1-1

Nr. PVUK180906N022

**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 C Type Test Verification Report**

Extract from test report according to the Engineering Recommendation G98/1-1

Nr. PVUK180906N022

**Power Quality. Harmonics.**

**Phase 1**

| SSEG rating per phase (rpp)         |                            |                                | SUN2000-3KTL-M0            |                            | Limit in BS EN61000-3-2 in Amps | Higher limit for odd harmonics 21 and above |
|-------------------------------------|----------------------------|--------------------------------|----------------------------|----------------------------|---------------------------------|---|
| At 45-55% of rated output<br>0,6 kW |                            | 100% of rated output<br>1,0 kW |                            |                            |                                 |   |
| Harmonic                            | Measured Value (MV) in [A] | Measured Value (MV) in [%]     | Measured Value (MV) in [A] | Measured Value (MV) in [%] |                                 |   |
| 2nd                                 | 0,032                      | 0,669                          | 0,008                      | 0,189                      | 1,080                           |   |
| 3rd                                 | 0,030                      | 0,627                          | 0,012                      | 0,278                      | 2,300                           |   |
| 4th                                 | 0,022                      | 0,460                          | 0,006                      | 0,140                      | 0,430                           |   |
| 5th                                 | 0,015                      | 0,314                          | 0,009                      | 0,207                      | 1,140                           |   |
| 6th                                 | 0,012                      | 0,251                          | 0,005                      | 0,117                      | 0,300                           |   |
| 7th                                 | 0,013                      | 0,272                          | 0,007                      | 0,157                      | 0,770                           |   |
| 8th                                 | 0,011                      | 0,230                          | 0,004                      | 0,102                      | 0,230                           |   |
| 9th                                 | 0,013                      | 0,272                          | 0,009                      | 0,196                      | 0,400                           |   |
| 10th                                | 0,012                      | 0,251                          | 0,005                      | 0,117                      | 0,184                           |   |
| 11th                                | 0,011                      | 0,230                          | 0,007                      | 0,152                      | 0,330                           |   |
| 12th                                | 0,012                      | 0,251                          | 0,005                      | 0,113                      | 0,153                           |   |
| 13th                                | 0,012                      | 0,251                          | 0,006                      | 0,141                      | 0,210                           |   |
| 14th                                | 0,010                      | 0,209                          | 0,005                      | 0,115                      | 0,131                           |   |
| 15th                                | 0,012                      | 0,251                          | 0,007                      | 0,153                      | 0,150                           |   |
| 16th                                | 0,009                      | 0,188                          | 0,004                      | 0,098                      | 0,115                           |   |
| 17th                                | 0,009                      | 0,188                          | 0,007                      | 0,160                      | 0,132                           |   |
| 18th                                | 0,008                      | 0,167                          | 0,005                      | 0,122                      | 0,102                           |   |
| 19th                                | 0,008                      | 0,167                          | 0,006                      | 0,139                      | 0,118                           |   |
| 20th                                | 0,007                      | 0,146                          | 0,005                      | 0,111                      | 0,092                           |   |
| 21th                                | 0,008                      | 0,167                          | 0,006                      | 0,131                      | 0,107                           | 0,160                                       |
| 22th                                | 0,006                      | 0,125                          | 0,005                      | 0,113                      | 0,084                           |   |
| 23th                                | 0,006                      | 0,125                          | 0,007                      | 0,170                      | 0,098                           | 0,147                                       |
| 24th                                | 0,006                      | 0,125                          | 0,006                      | 0,144                      | 0,077                           |   |
| 25th                                | 0,006                      | 0,125                          | 0,007                      | 0,167                      | 0,090                           | 0,135                                       |
| 26th                                | 0,004                      | 0,084                          | 0,006                      | 0,136                      | 0,071                           |   |
| 27th                                | 0,005                      | 0,105                          | 0,006                      | 0,135                      | 0,083                           | 0,124                                       |
| 28th                                | 0,003                      | 0,063                          | 0,006                      | 0,131                      | 0,066                           |   |
| 29th                                | 0,005                      | 0,105                          | 0,006                      | 0,141                      | 0,078                           | 0,117                                       |
| 30th                                | 0,004                      | 0,084                          | 0,006                      | 0,132                      | 0,061                           |   |
| 31th                                | 0,004                      | 0,084                          | 0,005                      | 0,126                      | 0,073                           | 0,109                                       |
| 32th                                | 0,003                      | 0,063                          | 0,007                      | 0,152                      | 0,058                           |   |
| 33th                                | 0,013                      | 0,272                          | 0,007                      | 0,150                      | 0,068                           | 0,102                                       |
| 34th                                | 0,003                      | 0,063                          | 0,004                      | 0,092                      | 0,054                           |   |
| 35th                                | 0,012                      | 0,251                          | 0,005                      | 0,111                      | 0,064                           | 0,096                                       |
| 36th                                | 0,004                      | 0,084                          | 0,005                      | 0,106                      | 0,051                           |   |
| 37th                                | 0,017                      | 0,355                          | 0,005                      | 0,104                      | 0,061                           | 0,091                                       |
| 38th                                | 0,004                      | 0,084                          | 0,004                      | 0,095                      | 0,048                           |   |
| 39th                                | 0,016                      | 0,335                          | 0,004                      | 0,097                      | 0,058                           | 0,087                                       |
| 40th                                | 0,004                      | 0,084                          | 0,004                      | 0,086                      | 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 C Type Test Verification Report**

Extract from test report according to the Engineering Recommendation G98/1-1

Nr. PVUK180906N022

| Power Quality. Harmonics.   |                                     |                            |                                |                            |                                 |   |
|-----------------------------|-------------------------------------|----------------------------|--------------------------------|----------------------------|---------------------------------|---|
| Phase 2                     |                                     |                            |                                |                            |                                 |   |
| SSEG rating per phase (rpp) |                                     |                            | SUN2000-3KTL-M0                |                            |                                 |   |
|                             | At 45-55% of rated output<br>0,6 kW |                            | 100% of rated output<br>1,0 kW |                            |                                 |   |
| Harmonic                    | Measured Value (MV) in [A]          | Measured Value (MV) in [%] | Measured Value (MV) in [A]     | Measured Value (MV) in [%] | Limit in BS EN61000-3-2 in Amps | Higher limit for odd harmonics 21 and above |
| 2nd                         | 0,041                               | 0,857                      | 0,009                          | 0,204                      | 1,080                           |   |
| 3rd                         | 0,034                               | 0,711                      | 0,025                          | 0,576                      | 2,300                           |   |
| 4th                         | 0,019                               | 0,397                      | 0,007                          | 0,156                      | 0,430                           |   |
| 5th                         | 0,013                               | 0,272                      | 0,009                          | 0,210                      | 1,140                           |   |
| 6th                         | 0,011                               | 0,230                      | 0,005                          | 0,125                      | 0,300                           |   |
| 7th                         | 0,010                               | 0,209                      | 0,008                          | 0,177                      | 0,770                           |   |
| 8th                         | 0,010                               | 0,209                      | 0,005                          | 0,123                      | 0,230                           |   |
| 9th                         | 0,013                               | 0,272                      | 0,007                          | 0,165                      | 0,400                           |   |
| 10th                        | 0,010                               | 0,209                      | 0,006                          | 0,135                      | 0,184                           |   |
| 11th                        | 0,010                               | 0,209                      | 0,007                          | 0,153                      | 0,330                           |   |
| 12th                        | 0,010                               | 0,209                      | 0,005                          | 0,110                      | 0,153                           |   |
| 13th                        | 0,012                               | 0,251                      | 0,006                          | 0,145                      | 0,210                           |   |
| 14th                        | 0,011                               | 0,230                      | 0,005                          | 0,119                      | 0,131                           |   |
| 15th                        | 0,017                               | 0,355                      | 0,007                          | 0,161                      | 0,150                           |   |
| 16th                        | 0,009                               | 0,188                      | 0,005                          | 0,121                      | 0,115                           |   |
| 17th                        | 0,009                               | 0,188                      | 0,007                          | 0,165                      | 0,132                           |   |
| 18th                        | 0,009                               | 0,188                      | 0,006                          | 0,129                      | 0,102                           |   |
| 19th                        | 0,008                               | 0,167                      | 0,006                          | 0,144                      | 0,118                           |   |
| 20th                        | 0,008                               | 0,167                      | 0,005                          | 0,115                      | 0,092                           |   |
| 21th                        | 0,010                               | 0,209                      | 0,008                          | 0,171                      | 0,107                           | 0,160                                       |
| 22th                        | 0,006                               | 0,125                      | 0,005                          | 0,113                      | 0,084                           |   |
| 23th                        | 0,006                               | 0,125                      | 0,007                          | 0,161                      | 0,098                           | 0,147                                       |
| 24th                        | 0,005                               | 0,105                      | 0,007                          | 0,159                      | 0,077                           |   |
| 25th                        | 0,005                               | 0,105                      | 0,008                          | 0,174                      | 0,090                           | 0,135                                       |
| 26th                        | 0,004                               | 0,084                      | 0,006                          | 0,145                      | 0,071                           |   |
| 27th                        | 0,005                               | 0,105                      | 0,009                          | 0,195                      | 0,083                           | 0,124                                       |
| 28th                        | 0,003                               | 0,063                      | 0,005                          | 0,124                      | 0,066                           |   |
| 29th                        | 0,004                               | 0,084                      | 0,006                          | 0,142                      | 0,078                           | 0,117                                       |
| 30th                        | 0,004                               | 0,084                      | 0,006                          | 0,139                      | 0,061                           |   |
| 31th                        | 0,004                               | 0,084                      | 0,006                          | 0,129                      | 0,073                           | 0,109                                       |
| 32th                        | 0,003                               | 0,063                      | 0,006                          | 0,144                      | 0,058                           |   |
| 33th                        | 0,015                               | 0,314                      | 0,007                          | 0,148                      | 0,068                           | 0,102                                       |
| 34th                        | 0,003                               | 0,063                      | 0,005                          | 0,105                      | 0,054                           |   |
| 35th                        | 0,012                               | 0,251                      | 0,005                          | 0,111                      | 0,064                           | 0,096                                       |
| 36th                        | 0,004                               | 0,084                      | 0,006                          | 0,126                      | 0,051                           |   |
| 37th                        | 0,018                               | 0,376                      | 0,005                          | 0,104                      | 0,061                           | 0,091                                       |
| 38th                        | 0,004                               | 0,084                      | 0,004                          | 0,101                      | 0,048                           |   |
| 39th                        | 0,020                               | 0,418                      | 0,007                          | 0,168                      | 0,058                           | 0,087                                       |
| 40th                        | 0,004                               | 0,084                      | 0,004                          | 0,089                      | 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 C Type Test Verification Report**

Extract from test report according to the Engineering Recommendation G98/1-1

Nr. PVUK180906N022

**Power Quality. Harmonics.**

**Phase 3**

| SSEG rating per phase (rpp)         |                            |                            | SUN2000-3KTL-M0                |                            | Limit in BS EN61000-3-2 in Amps | Higher limit for odd harmonics 21 and above |
|-------------------------------------|----------------------------|----------------------------|--------------------------------|----------------------------|---------------------------------|---|
| At 45-55% of rated output<br>0,6 kW |                            |                            | 100% of rated output<br>1,0 kW |                            |                                 |   |
| Harmonic                            | Measured Value (MV) in [A] | Measured Value (MV) in [%] | Measured Value (MV) in [A]     | Measured Value (MV) in [%] |                                 |   |
| 2nd                                 | 0,031                      | 0,648                      | 0,006                          | 0,144                      | 1,080                           |   |
| 3rd                                 | 0,038                      | 0,795                      | 0,014                          | 0,319                      | 2,300                           |   |
| 4th                                 | 0,022                      | 0,460                      | 0,007                          | 0,160                      | 0,430                           |   |
| 5th                                 | 0,018                      | 0,376                      | 0,006                          | 0,128                      | 1,140                           |   |
| 6th                                 | 0,013                      | 0,272                      | 0,005                          | 0,116                      | 0,300                           |   |
| 7th                                 | 0,013                      | 0,272                      | 0,006                          | 0,141                      | 0,770                           |   |
| 8th                                 | 0,011                      | 0,230                      | 0,006                          | 0,128                      | 0,230                           |   |
| 9th                                 | 0,013                      | 0,272                      | 0,008                          | 0,173                      | 0,400                           |   |
| 10th                                | 0,010                      | 0,209                      | 0,006                          | 0,130                      | 0,184                           |   |
| 11th                                | 0,011                      | 0,230                      | 0,005                          | 0,120                      | 0,330                           |   |
| 12th                                | 0,012                      | 0,251                      | 0,005                          | 0,114                      | 0,153                           |   |
| 13th                                | 0,011                      | 0,230                      | 0,006                          | 0,141                      | 0,210                           |   |
| 14th                                | 0,011                      | 0,230                      | 0,005                          | 0,114                      | 0,131                           |   |
| 15th                                | 0,013                      | 0,272                      | 0,009                          | 0,217                      | 0,150                           |   |
| 16th                                | 0,010                      | 0,209                      | 0,005                          | 0,122                      | 0,115                           |   |
| 17th                                | 0,010                      | 0,209                      | 0,007                          | 0,156                      | 0,132                           |   |
| 18th                                | 0,009                      | 0,188                      | 0,006                          | 0,135                      | 0,102                           |   |
| 19th                                | 0,009                      | 0,188                      | 0,005                          | 0,124                      | 0,118                           |   |
| 20th                                | 0,008                      | 0,167                      | 0,006                          | 0,135                      | 0,092                           |   |
| 21th                                | 0,007                      | 0,146                      | 0,007                          | 0,160                      | 0,107                           | 0,160                                       |
| 22th                                | 0,006                      | 0,125                      | 0,006                          | 0,149                      | 0,084                           |   |
| 23th                                | 0,007                      | 0,146                      | 0,006                          | 0,148                      | 0,098                           | 0,147                                       |
| 24th                                | 0,005                      | 0,105                      | 0,007                          | 0,156                      | 0,077                           |   |
| 25th                                | 0,005                      | 0,105                      | 0,007                          | 0,156                      | 0,090                           | 0,135                                       |
| 26th                                | 0,005                      | 0,105                      | 0,007                          | 0,163                      | 0,071                           |   |
| 27th                                | 0,005                      | 0,105                      | 0,010                          | 0,218                      | 0,083                           | 0,124                                       |
| 28th                                | 0,004                      | 0,084                      | 0,006                          | 0,142                      | 0,066                           |   |
| 29th                                | 0,006                      | 0,125                      | 0,005                          | 0,126                      | 0,078                           | 0,117                                       |
| 30th                                | 0,004                      | 0,084                      | 0,005                          | 0,122                      | 0,061                           |   |
| 31th                                | 0,004                      | 0,084                      | 0,005                          | 0,114                      | 0,073                           | 0,109                                       |
| 32th                                | 0,004                      | 0,084                      | 0,005                          | 0,118                      | 0,058                           |   |
| 33th                                | 0,010                      | 0,209                      | 0,013                          | 0,289                      | 0,068                           | 0,102                                       |
| 34th                                | 0,003                      | 0,063                      | 0,005                          | 0,108                      | 0,054                           |   |
| 35th                                | 0,012                      | 0,251                      | 0,005                          | 0,123                      | 0,064                           | 0,096                                       |
| 36th                                | 0,004                      | 0,084                      | 0,006                          | 0,137                      | 0,051                           |   |
| 37th                                | 0,018                      | 0,376                      | 0,005                          | 0,113                      | 0,061                           | 0,091                                       |
| 38th                                | 0,004                      | 0,084                      | 0,005                          | 0,107                      | 0,048                           |   |
| 39th                                | 0,015                      | 0,314                      | 0,007                          | 0,159                      | 0,058                           | 0,087                                       |
| 40th                                | 0,004                      | 0,084                      | 0,005                          | 0,107                      | 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 C Type Test Verification Report**

Extract from test report according to the Engineering Recommendation G98/1-1

Nr. PVUK180906N022

| Power Quality. Harmonics.   |                                     |                            |                                |                            |                                 |   |
|-----------------------------|-------------------------------------|----------------------------|--------------------------------|----------------------------|---------------------------------|---|
| Phase 1                     |                                     |                            |                                |                            |                                 |   |
| SSEG rating per phase (rpp) |                                     |                            | SUN2000-4KTL-M0                |                            |                                 |   |
|                             | At 45-55% of rated output<br>0,7 kW |                            | 100% of rated output<br>1,3 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                         | 0,028                               | 0,439                      | 0,038                          | 0,645                      | 1,080                           |   |
| 3rd                         | 0,024                               | 0,376                      | 0,017                          | 0,290                      | 2,300                           |   |
| 4th                         | 0,024                               | 0,376                      | 0,016                          | 0,268                      | 0,430                           |   |
| 5th                         | 0,014                               | 0,220                      | 0,026                          | 0,447                      | 1,140                           |   |
| 6th                         | 0,013                               | 0,204                      | 0,005                          | 0,084                      | 0,300                           |   |
| 7th                         | 0,012                               | 0,188                      | 0,033                          | 0,564                      | 0,770                           |   |
| 8th                         | 0,011                               | 0,173                      | 0,012                          | 0,203                      | 0,230                           |   |
| 9th                         | 0,009                               | 0,141                      | 0,007                          | 0,124                      | 0,400                           |   |
| 10th                        | 0,011                               | 0,173                      | 0,017                          | 0,292                      | 0,184                           |   |
| 11th                        | 0,010                               | 0,157                      | 0,014                          | 0,247                      | 0,330                           |   |
| 12th                        | 0,013                               | 0,204                      | 0,007                          | 0,124                      | 0,153                           |   |
| 13th                        | 0,010                               | 0,157                      | 0,023                          | 0,388                      | 0,210                           |   |
| 14th                        | 0,011                               | 0,173                      | 0,004                          | 0,076                      | 0,131                           |   |
| 15th                        | 0,008                               | 0,125                      | 0,007                          | 0,122                      | 0,150                           |   |
| 16th                        | 0,010                               | 0,157                      | 0,007                          | 0,120                      | 0,115                           |   |
| 17th                        | 0,008                               | 0,125                      | 0,069                          | 1,169                      | 0,132                           |   |
| 18th                        | 0,009                               | 0,141                      | 0,007                          | 0,118                      | 0,102                           |   |
| 19th                        | 0,007                               | 0,110                      | 0,045                          | 0,761                      | 0,118                           |   |
| 20th                        | 0,007                               | 0,110                      | 0,006                          | 0,103                      | 0,092                           |   |
| 21th                        | 0,007                               | 0,110                      | 0,006                          | 0,107                      | 0,107                           | 0,160                                       |
| 22th                        | 0,008                               | 0,125                      | 0,007                          | 0,111                      | 0,084                           |   |
| 23th                        | 0,005                               | 0,078                      | 0,009                          | 0,158                      | 0,098                           | 0,147                                       |
| 24th                        | 0,006                               | 0,094                      | 0,007                          | 0,120                      | 0,077                           |   |
| 25th                        | 0,005                               | 0,078                      | 0,015                          | 0,247                      | 0,090                           | 0,135                                       |
| 26th                        | 0,005                               | 0,078                      | 0,011                          | 0,188                      | 0,071                           |   |
| 27th                        | 0,005                               | 0,078                      | 0,007                          | 0,127                      | 0,083                           | 0,124                                       |
| 28th                        | 0,005                               | 0,078                      | 0,011                          | 0,183                      | 0,066                           |   |
| 29th                        | 0,005                               | 0,078                      | 0,012                          | 0,210                      | 0,078                           | 0,117                                       |
| 30th                        | 0,004                               | 0,063                      | 0,009                          | 0,146                      | 0,061                           |   |
| 31th                        | 0,004                               | 0,063                      | 0,010                          | 0,163                      | 0,073                           | 0,109                                       |
| 32th                        | 0,003                               | 0,047                      | 0,020                          | 0,333                      | 0,058                           |   |
| 33th                        | 0,011                               | 0,173                      | 0,008                          | 0,134                      | 0,068                           | 0,102                                       |
| 34th                        | 0,003                               | 0,047                      | 0,014                          | 0,234                      | 0,054                           |   |
| 35th                        | 0,013                               | 0,204                      | 0,009                          | 0,156                      | 0,064                           | 0,096                                       |
| 36th                        | 0,004                               | 0,063                      | 0,007                          | 0,121                      | 0,051                           |   |
| 37th                        | 0,019                               | 0,298                      | 0,012                          | 0,196                      | 0,061                           | 0,091                                       |
| 38th                        | 0,004                               | 0,063                      | 0,012                          | 0,208                      | 0,048                           |   |
| 39th                        | 0,013                               | 0,204                      | 0,011                          | 0,187                      | 0,058                           | 0,087                                       |
| 40th                        | 0,004                               | 0,063                      | 0,012                          | 0,198                      | 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 C Type Test Verification Report**

Extract from test report according to the Engineering Recommendation G98/1-1

Nr. PVUK180906N022

**Power Quality. Harmonics.**

**Phase 2**

| SSEG rating per phase (rpp)         |                            |                                | SUN2000-4KTL-M0            |                            | Limit in BS EN61000-3-2 in Amps | Higher limit for odd harmonics 21 and above |
|-------------------------------------|----------------------------|--------------------------------|----------------------------|----------------------------|---------------------------------|---|
| At 45-55% of rated output<br>0,7 kW |                            | 100% of rated output<br>1,3 kW |                            |                            |                                 |   |
| Harmonic                            | Measured Value (MV) in [A] | Measured Value (MV) in [%]     | Measured Value (MV) in [A] | Measured Value (MV) in [%] |                                 |   |
| 2nd                                 | 0,040                      | 0,627                          | 0,023                      | 0,391                      | 1,080                           |   |
| 3rd                                 | 0,028                      | 0,439                          | 0,010                      | 0,162                      | 2,300                           |   |
| 4th                                 | 0,022                      | 0,345                          | 0,016                      | 0,268                      | 0,430                           |   |
| 5th                                 | 0,010                      | 0,157                          | 0,027                      | 0,458                      | 1,140                           |   |
| 6th                                 | 0,010                      | 0,157                          | 0,005                      | 0,090                      | 0,300                           |   |
| 7th                                 | 0,008                      | 0,125                          | 0,029                      | 0,496                      | 0,770                           |   |
| 8th                                 | 0,010                      | 0,157                          | 0,016                      | 0,266                      | 0,230                           |   |
| 9th                                 | 0,008                      | 0,125                          | 0,016                      | 0,274                      | 0,400                           |   |
| 10th                                | 0,010                      | 0,157                          | 0,018                      | 0,302                      | 0,184                           |   |
| 11th                                | 0,007                      | 0,110                          | 0,014                      | 0,232                      | 0,330                           |   |
| 12th                                | 0,011                      | 0,173                          | 0,008                      | 0,131                      | 0,153                           |   |
| 13th                                | 0,009                      | 0,141                          | 0,022                      | 0,372                      | 0,210                           |   |
| 14th                                | 0,011                      | 0,173                          | 0,007                      | 0,121                      | 0,131                           |   |
| 15th                                | 0,014                      | 0,220                          | 0,006                      | 0,095                      | 0,150                           |   |
| 16th                                | 0,011                      | 0,173                          | 0,007                      | 0,111                      | 0,115                           |   |
| 17th                                | 0,007                      | 0,110                          | 0,069                      | 1,176                      | 0,132                           |   |
| 18th                                | 0,009                      | 0,141                          | 0,006                      | 0,106                      | 0,102                           |   |
| 19th                                | 0,006                      | 0,094                          | 0,045                      | 0,764                      | 0,118                           |   |
| 20th                                | 0,008                      | 0,125                          | 0,007                      | 0,124                      | 0,092                           |   |
| 21th                                | 0,007                      | 0,110                          | 0,008                      | 0,130                      | 0,107                           | 0,160                                       |
| 22th                                | 0,007                      | 0,110                          | 0,007                      | 0,114                      | 0,084                           |   |
| 23th                                | 0,006                      | 0,094                          | 0,010                      | 0,166                      | 0,098                           | 0,147                                       |
| 24th                                | 0,006                      | 0,094                          | 0,008                      | 0,138                      | 0,077                           |   |
| 25th                                | 0,005                      | 0,078                          | 0,014                      | 0,245                      | 0,090                           | 0,135                                       |
| 26th                                | 0,004                      | 0,063                          | 0,012                      | 0,198                      | 0,071                           |   |
| 27th                                | 0,007                      | 0,110                          | 0,008                      | 0,136                      | 0,083                           | 0,124                                       |
| 28th                                | 0,005                      | 0,078                          | 0,013                      | 0,220                      | 0,066                           |   |
| 29th                                | 0,005                      | 0,078                          | 0,009                      | 0,152                      | 0,078                           | 0,117                                       |
| 30th                                | 0,004                      | 0,063                          | 0,007                      | 0,123                      | 0,061                           |   |
| 31th                                | 0,004                      | 0,063                          | 0,008                      | 0,134                      | 0,073                           | 0,109                                       |
| 32th                                | 0,003                      | 0,047                          | 0,010                      | 0,172                      | 0,058                           |   |
| 33th                                | 0,013                      | 0,204                          | 0,009                      | 0,147                      | 0,068                           | 0,102                                       |
| 34th                                | 0,004                      | 0,063                          | 0,010                      | 0,174                      | 0,054                           |   |
| 35th                                | 0,013                      | 0,204                          | 0,007                      | 0,122                      | 0,064                           | 0,096                                       |
| 36th                                | 0,004                      | 0,063                          | 0,008                      | 0,143                      | 0,051                           |   |
| 37th                                | 0,018                      | 0,282                          | 0,012                      | 0,206                      | 0,061                           | 0,091                                       |
| 38th                                | 0,004                      | 0,063                          | 0,014                      | 0,236                      | 0,048                           |   |
| 39th                                | 0,015                      | 0,235                          | 0,008                      | 0,141                      | 0,058                           | 0,087                                       |
| 40th                                | 0,004                      | 0,063                          | 0,013                      | 0,216                      | 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.



BUREAU  
VERITAS

Annex to the G98/1 certificate of compliance No. U19-0112

Appendix C Type Test Verification Report

Extract from test report according to the Engineering Recommendation G98/1-1

Nr. PVUK180906N022

| Power Quality. Harmonics.   |                                     |                            |                                |                            |                                 |   |
|-----------------------------|-------------------------------------|----------------------------|--------------------------------|----------------------------|---------------------------------|---|
| Phase 3                     |                                     |                            |                                |                            |                                 |   |
| SSEG rating per phase (rpp) |                                     |                            | SUN2000-4KTL-M0                |                            |                                 |   |
|                             | At 45-55% of rated output<br>0,7 kW |                            | 100% of rated output<br>1,3 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                         | 0,029                               | 0,455                      | 0,031                          | 0,525                      | 1,080                           |   |
| 3rd                         | 0,036                               | 0,565                      | 0,012                          | 0,213                      | 2,300                           |   |
| 4th                         | 0,024                               | 0,376                      | 0,014                          | 0,234                      | 0,430                           |   |
| 5th                         | 0,014                               | 0,220                      | 0,035                          | 0,598                      | 1,140                           |   |
| 6th                         | 0,013                               | 0,204                      | 0,006                          | 0,095                      | 0,300                           |   |
| 7th                         | 0,010                               | 0,157                      | 0,033                          | 0,554                      | 0,770                           |   |
| 8th                         | 0,010                               | 0,157                      | 0,013                          | 0,220                      | 0,230                           |   |
| 9th                         | 0,011                               | 0,173                      | 0,007                          | 0,122                      | 0,400                           |   |
| 10th                        | 0,010                               | 0,157                      | 0,018                          | 0,301                      | 0,184                           |   |
| 11th                        | 0,010                               | 0,157                      | 0,011                          | 0,181                      | 0,330                           |   |
| 12th                        | 0,013                               | 0,204                      | 0,005                          | 0,093                      | 0,153                           |   |
| 13th                        | 0,009                               | 0,141                      | 0,025                          | 0,433                      | 0,210                           |   |
| 14th                        | 0,010                               | 0,157                      | 0,006                          | 0,106                      | 0,131                           |   |
| 15th                        | 0,009                               | 0,141                      | 0,008                          | 0,141                      | 0,150                           |   |
| 16th                        | 0,010                               | 0,157                      | 0,006                          | 0,108                      | 0,115                           |   |
| 17th                        | 0,007                               | 0,110                      | 0,070                          | 1,198                      | 0,132                           |   |
| 18th                        | 0,010                               | 0,157                      | 0,006                          | 0,105                      | 0,102                           |   |
| 19th                        | 0,007                               | 0,110                      | 0,046                          | 0,786                      | 0,118                           |   |
| 20th                        | 0,007                               | 0,110                      | 0,007                          | 0,123                      | 0,092                           |   |
| 21th                        | 0,005                               | 0,078                      | 0,006                          | 0,094                      | 0,107                           | 0,160                                       |
| 22th                        | 0,007                               | 0,110                      | 0,007                          | 0,119                      | 0,084                           |   |
| 23th                        | 0,005                               | 0,078                      | 0,011                          | 0,179                      | 0,098                           | 0,147                                       |
| 24th                        | 0,006                               | 0,094                      | 0,007                          | 0,118                      | 0,077                           |   |
| 25th                        | 0,004                               | 0,063                      | 0,014                          | 0,231                      | 0,090                           | 0,135                                       |
| 26th                        | 0,005                               | 0,078                      | 0,009                          | 0,159                      | 0,071                           |   |
| 27th                        | 0,004                               | 0,063                      | 0,008                          | 0,128                      | 0,083                           | 0,124                                       |
| 28th                        | 0,004                               | 0,063                      | 0,010                          | 0,171                      | 0,066                           |   |
| 29th                        | 0,005                               | 0,078                      | 0,010                          | 0,176                      | 0,078                           | 0,117                                       |
| 30th                        | 0,005                               | 0,078                      | 0,007                          | 0,122                      | 0,061                           |   |
| 31th                        | 0,004                               | 0,063                      | 0,007                          | 0,119                      | 0,073                           | 0,109                                       |
| 32th                        | 0,004                               | 0,063                      | 0,014                          | 0,239                      | 0,058                           |   |
| 33th                        | 0,009                               | 0,141                      | 0,006                          | 0,099                      | 0,068                           | 0,102                                       |
| 34th                        | 0,003                               | 0,047                      | 0,013                          | 0,216                      | 0,054                           |   |
| 35th                        | 0,013                               | 0,204                      | 0,008                          | 0,141                      | 0,064                           | 0,096                                       |
| 36th                        | 0,004                               | 0,063                      | 0,007                          | 0,116                      | 0,051                           |   |
| 37th                        | 0,018                               | 0,282                      | 0,010                          | 0,174                      | 0,061                           | 0,091                                       |
| 38th                        | 0,004                               | 0,063                      | 0,011                          | 0,195                      | 0,048                           |   |
| 39th                        | 0,012                               | 0,188                      | 0,009                          | 0,154                      | 0,058                           | 0,087                                       |
| 40th                        | 0,004                               | 0,063                      | 0,009                          | 0,149                      | 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 C Type Test Verification Report**

Extract from test report according to the Engineering Recommendation G98/1-1

Nr. PVUK180906N022

**Power Quality. Harmonics.**

**Phase 1**

| SSEG rating per phase (rpp)         |                            |                                | SUN2000-5KTL-M0            |                            | Limit in BS EN61000-3-2 in Amps | Higher limit for odd harmonics 21 and above |
|-------------------------------------|----------------------------|--------------------------------|----------------------------|----------------------------|---------------------------------|---|
| At 45-55% of rated output<br>0,8 kW |                            | 100% of rated output<br>1,6 kW |                            |                            |                                 |   |
| Harmonic                            | Measured Value (MV) in [A] | Measured Value (MV) in [%]     | Measured Value (MV) in [A] | Measured Value (MV) in [%] |                                 |   |
| 2nd                                 | 0,015                      | 0,188                          | 0,015                      | 0,203                      | 1,080                           |   |
| 3rd                                 | 0,008                      | 0,100                          | 0,017                      | 0,233                      | 2,300                           |   |
| 4th                                 | 0,010                      | 0,125                          | 0,007                      | 0,097                      | 0,430                           |   |
| 5th                                 | 0,007                      | 0,088                          | 0,041                      | 0,552                      | 1,140                           |   |
| 6th                                 | 0,009                      | 0,113                          | 0,007                      | 0,102                      | 0,300                           |   |
| 7th                                 | 0,009                      | 0,113                          | 0,031                      | 0,420                      | 0,770                           |   |
| 8th                                 | 0,007                      | 0,088                          | 0,005                      | 0,069                      | 0,230                           |   |
| 9th                                 | 0,007                      | 0,088                          | 0,008                      | 0,111                      | 0,400                           |   |
| 10th                                | 0,010                      | 0,125                          | 0,006                      | 0,076                      | 0,184                           |   |
| 11th                                | 0,008                      | 0,100                          | 0,032                      | 0,432                      | 0,330                           |   |
| 12th                                | 0,012                      | 0,151                          | 0,006                      | 0,084                      | 0,153                           |   |
| 13th                                | 0,006                      | 0,075                          | 0,013                      | 0,173                      | 0,210                           |   |
| 14th                                | 0,010                      | 0,125                          | 0,007                      | 0,094                      | 0,131                           |   |
| 15th                                | 0,006                      | 0,075                          | 0,009                      | 0,122                      | 0,150                           |   |
| 16th                                | 0,011                      | 0,138                          | 0,006                      | 0,086                      | 0,115                           |   |
| 17th                                | 0,008                      | 0,100                          | 0,032                      | 0,443                      | 0,132                           |   |
| 18th                                | 0,009                      | 0,113                          | 0,006                      | 0,079                      | 0,102                           |   |
| 19th                                | 0,005                      | 0,063                          | 0,048                      | 0,655                      | 0,118                           |   |
| 20th                                | 0,007                      | 0,088                          | 0,008                      | 0,112                      | 0,092                           |   |
| 21th                                | 0,005                      | 0,063                          | 0,011                      | 0,144                      | 0,107                           | 0,160                                       |
| 22th                                | 0,008                      | 0,100                          | 0,006                      | 0,085                      | 0,084                           |   |
| 23th                                | 0,004                      | 0,050                          | 0,012                      | 0,165                      | 0,098                           | 0,147                                       |
| 24th                                | 0,006                      | 0,075                          | 0,007                      | 0,092                      | 0,077                           |   |
| 25th                                | 0,004                      | 0,050                          | 0,012                      | 0,160                      | 0,090                           | 0,135                                       |
| 26th                                | 0,004                      | 0,050                          | 0,009                      | 0,118                      | 0,071                           |   |
| 27th                                | 0,004                      | 0,050                          | 0,009                      | 0,119                      | 0,083                           | 0,124                                       |
| 28th                                | 0,005                      | 0,063                          | 0,008                      | 0,103                      | 0,066                           |   |
| 29th                                | 0,004                      | 0,050                          | 0,010                      | 0,130                      | 0,078                           | 0,117                                       |
| 30th                                | 0,005                      | 0,063                          | 0,010                      | 0,142                      | 0,061                           |   |
| 31th                                | 0,005                      | 0,063                          | 0,009                      | 0,120                      | 0,073                           | 0,109                                       |
| 32th                                | 0,003                      | 0,038                          | 0,010                      | 0,132                      | 0,058                           |   |
| 33th                                | 0,013                      | 0,163                          | 0,009                      | 0,125                      | 0,068                           | 0,102                                       |
| 34th                                | 0,003                      | 0,038                          | 0,008                      | 0,108                      | 0,054                           |   |
| 35th                                | 0,017                      | 0,213                          | 0,009                      | 0,121                      | 0,064                           | 0,096                                       |
| 36th                                | 0,004                      | 0,050                          | 0,009                      | 0,128                      | 0,051                           |   |
| 37th                                | 0,015                      | 0,188                          | 0,007                      | 0,102                      | 0,061                           | 0,091                                       |
| 38th                                | 0,003                      | 0,038                          | 0,010                      | 0,141                      | 0,048                           |   |
| 39th                                | 0,017                      | 0,213                          | 0,009                      | 0,127                      | 0,058                           | 0,087                                       |
| 40th                                | 0,003                      | 0,038                          | 0,008                      | 0,103                      | 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 C Type Test Verification Report**

Extract from test report according to the Engineering Recommendation G98/1-1

Nr. PVUK180906N022

**Power Quality. Harmonics.**

**Phase 2**

| SSEG rating per phase (rpp)         |                            |                            | SUN2000-5KTL-M0                |                            | Limit in BS EN61000-3-2 in Amps | Higher limit for odd harmonics 21 and above |
|-------------------------------------|----------------------------|----------------------------|--------------------------------|----------------------------|---------------------------------|---|
| At 45-55% of rated output<br>0,8 kW |                            |                            | 100% of rated output<br>1,6 kW |                            |                                 |   |
| Harmonic                            | Measured Value (MV) in [A] | Measured Value (MV) in [%] | Measured Value (MV) in [A]     | Measured Value (MV) in [%] |                                 |   |
| 2nd                                 | 0,022                      | 0,276                      | 0,010                          | 0,140                      | 1,080                           |   |
| 3rd                                 | 0,008                      | 0,100                      | 0,025                          | 0,345                      | 2,300                           |   |
| 4th                                 | 0,010                      | 0,125                      | 0,007                          | 0,101                      | 0,430                           |   |
| 5th                                 | 0,007                      | 0,088                      | 0,036                          | 0,492                      | 1,140                           |   |
| 6th                                 | 0,008                      | 0,100                      | 0,007                          | 0,093                      | 0,300                           |   |
| 7th                                 | 0,006                      | 0,075                      | 0,030                          | 0,413                      | 0,770                           |   |
| 8th                                 | 0,007                      | 0,088                      | 0,006                          | 0,078                      | 0,230                           |   |
| 9th                                 | 0,005                      | 0,063                      | 0,007                          | 0,091                      | 0,400                           |   |
| 10th                                | 0,009                      | 0,113                      | 0,006                          | 0,081                      | 0,184                           |   |
| 11th                                | 0,005                      | 0,063                      | 0,030                          | 0,405                      | 0,330                           |   |
| 12th                                | 0,010                      | 0,125                      | 0,006                          | 0,087                      | 0,153                           |   |
| 13th                                | 0,007                      | 0,088                      | 0,014                          | 0,194                      | 0,210                           |   |
| 14th                                | 0,009                      | 0,113                      | 0,007                          | 0,089                      | 0,131                           |   |
| 15th                                | 0,009                      | 0,113                      | 0,009                          | 0,118                      | 0,150                           |   |
| 16th                                | 0,010                      | 0,125                      | 0,007                          | 0,097                      | 0,115                           |   |
| 17th                                | 0,005                      | 0,063                      | 0,029                          | 0,392                      | 0,132                           |   |
| 18th                                | 0,009                      | 0,113                      | 0,009                          | 0,123                      | 0,102                           |   |
| 19th                                | 0,006                      | 0,075                      | 0,045                          | 0,607                      | 0,118                           |   |
| 20th                                | 0,007                      | 0,088                      | 0,010                          | 0,134                      | 0,092                           |   |
| 21th                                | 0,010                      | 0,125                      | 0,008                          | 0,103                      | 0,107                           | 0,160                                       |
| 22th                                | 0,007                      | 0,088                      | 0,007                          | 0,098                      | 0,084                           |   |
| 23th                                | 0,004                      | 0,050                      | 0,011                          | 0,143                      | 0,098                           | 0,147                                       |
| 24th                                | 0,006                      | 0,075                      | 0,007                          | 0,092                      | 0,077                           |   |
| 25th                                | 0,004                      | 0,050                      | 0,012                          | 0,164                      | 0,090                           | 0,135                                       |
| 26th                                | 0,004                      | 0,050                      | 0,007                          | 0,102                      | 0,071                           |   |
| 27th                                | 0,005                      | 0,063                      | 0,008                          | 0,109                      | 0,083                           | 0,124                                       |
| 28th                                | 0,005                      | 0,063                      | 0,008                          | 0,102                      | 0,066                           |   |
| 29th                                | 0,004                      | 0,050                      | 0,007                          | 0,100                      | 0,078                           | 0,117                                       |
| 30th                                | 0,004                      | 0,050                      | 0,011                          | 0,148                      | 0,061                           |   |
| 31th                                | 0,006                      | 0,075                      | 0,007                          | 0,096                      | 0,073                           | 0,109                                       |
| 32th                                | 0,003                      | 0,038                      | 0,010                          | 0,130                      | 0,058                           |   |
| 33th                                | 0,013                      | 0,163                      | 0,009                          | 0,117                      | 0,068                           | 0,102                                       |
| 34th                                | 0,004                      | 0,050                      | 0,009                          | 0,118                      | 0,054                           |   |
| 35th                                | 0,017                      | 0,213                      | 0,008                          | 0,112                      | 0,064                           | 0,096                                       |
| 36th                                | 0,004                      | 0,050                      | 0,009                          | 0,118                      | 0,051                           |   |
| 37th                                | 0,015                      | 0,188                      | 0,010                          | 0,134                      | 0,061                           | 0,091                                       |
| 38th                                | 0,004                      | 0,050                      | 0,010                          | 0,133                      | 0,048                           |   |
| 39th                                | 0,022                      | 0,276                      | 0,008                          | 0,112                      | 0,058                           | 0,087                                       |
| 40th                                | 0,004                      | 0,050                      | 0,010                          | 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 C Type Test Verification Report**

Extract from test report according to the Engineering Recommendation G98/1-1

Nr. PVUK180906N022

**Power Quality. Harmonics.**

**Phase 3**

| SSEG rating per phase (rpp)         |                            |                                | SUN2000-5KTL-M0            |                            | Limit in BS EN61000-3-2 in Amps | Higher limit for odd harmonics 21 and above |
|-------------------------------------|----------------------------|--------------------------------|----------------------------|----------------------------|---------------------------------|---|
| At 45-55% of rated output<br>0,8 kW |                            | 100% of rated output<br>1,6 kW |                            |                            |                                 |   |
| Harmonic                            | Measured Value (MV) in [A] | Measured Value (MV) in [%]     | Measured Value (MV) in [A] | Measured Value (MV) in [%] |                                 |   |
| 2nd                                 | 0,014                      | 0,176                          | 0,015                      | 0,200                      | 1,080                           |   |
| 3rd                                 | 0,024                      | 0,301                          | 0,009                      | 0,126                      | 2,300                           |   |
| 4th                                 | 0,008                      | 0,100                          | 0,007                      | 0,095                      | 0,430                           |   |
| 5th                                 | 0,007                      | 0,088                          | 0,048                      | 0,654                      | 1,140                           |   |
| 6th                                 | 0,009                      | 0,113                          | 0,005                      | 0,070                      | 0,300                           |   |
| 7th                                 | 0,007                      | 0,088                          | 0,035                      | 0,482                      | 0,770                           |   |
| 8th                                 | 0,007                      | 0,088                          | 0,006                      | 0,079                      | 0,230                           |   |
| 9th                                 | 0,008                      | 0,100                          | 0,006                      | 0,079                      | 0,400                           |   |
| 10th                                | 0,009                      | 0,113                          | 0,005                      | 0,069                      | 0,184                           |   |
| 11th                                | 0,008                      | 0,100                          | 0,029                      | 0,398                      | 0,330                           |   |
| 12th                                | 0,012                      | 0,151                          | 0,005                      | 0,075                      | 0,153                           |   |
| 13th                                | 0,008                      | 0,100                          | 0,010                      | 0,137                      | 0,210                           |   |
| 14th                                | 0,008                      | 0,100                          | 0,006                      | 0,083                      | 0,131                           |   |
| 15th                                | 0,008                      | 0,100                          | 0,007                      | 0,103                      | 0,150                           |   |
| 16th                                | 0,009                      | 0,113                          | 0,007                      | 0,096                      | 0,115                           |   |
| 17th                                | 0,007                      | 0,088                          | 0,023                      | 0,310                      | 0,132                           |   |
| 18th                                | 0,010                      | 0,125                          | 0,008                      | 0,109                      | 0,102                           |   |
| 19th                                | 0,006                      | 0,075                          | 0,044                      | 0,601                      | 0,118                           |   |
| 20th                                | 0,007                      | 0,088                          | 0,007                      | 0,097                      | 0,092                           |   |
| 21th                                | 0,005                      | 0,063                          | 0,008                      | 0,116                      | 0,107                           | 0,160                                       |
| 22th                                | 0,007                      | 0,088                          | 0,006                      | 0,088                      | 0,084                           |   |
| 23th                                | 0,004                      | 0,050                          | 0,011                      | 0,146                      | 0,098                           | 0,147                                       |
| 24th                                | 0,006                      | 0,075                          | 0,007                      | 0,091                      | 0,077                           |   |
| 25th                                | 0,004                      | 0,050                          | 0,009                      | 0,128                      | 0,090                           | 0,135                                       |
| 26th                                | 0,004                      | 0,050                          | 0,007                      | 0,100                      | 0,071                           |   |
| 27th                                | 0,004                      | 0,050                          | 0,010                      | 0,141                      | 0,083                           | 0,124                                       |
| 28th                                | 0,004                      | 0,050                          | 0,008                      | 0,108                      | 0,066                           |   |
| 29th                                | 0,005                      | 0,063                          | 0,010                      | 0,138                      | 0,078                           | 0,117                                       |
| 30th                                | 0,005                      | 0,063                          | 0,008                      | 0,106                      | 0,061                           |   |
| 31th                                | 0,005                      | 0,063                          | 0,008                      | 0,112                      | 0,073                           | 0,109                                       |
| 32th                                | 0,003                      | 0,038                          | 0,010                      | 0,130                      | 0,058                           |   |
| 33th                                | 0,010                      | 0,125                          | 0,010                      | 0,139                      | 0,068                           | 0,102                                       |
| 34th                                | 0,003                      | 0,038                          | 0,008                      | 0,103                      | 0,054                           |   |
| 35th                                | 0,018                      | 0,226                          | 0,008                      | 0,116                      | 0,064                           | 0,096                                       |
| 36th                                | 0,004                      | 0,050                          | 0,009                      | 0,121                      | 0,051                           |   |
| 37th                                | 0,015                      | 0,188                          | 0,010                      | 0,139                      | 0,061                           | 0,091                                       |
| 38th                                | 0,003                      | 0,038                          | 0,008                      | 0,114                      | 0,048                           |   |
| 39th                                | 0,016                      | 0,201                          | 0,011                      | 0,144                      | 0,058                           | 0,087                                       |
| 40th                                | 0,004                      | 0,050                          | 0,009                      | 0,118                      | 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 C Type Test Verification Report**

Extract from test report according to the Engineering Recommendation G98/1-1

Nr. PVUK180906N022

**Power Quality. Harmonics.**

**Phase 1**

| SSEG rating per phase (rpp) |                                     |                            | SUN2000-6KTL-M0                |                            | Limit in BS EN61000-3-2 in Amps | Higher limit for odd harmonics 21 and above |
|-----------------------------|-------------------------------------|----------------------------|--------------------------------|----------------------------|---------------------------------|---|
| Harmonic                    | At 45-55% of rated output<br>1,0 kW |                            | 100% of rated output<br>2,0 kW |                            |                                 |   |
|                             | Measured Value (MV) in [A]          | Measured Value (MV) in [%] | Measured Value (MV) in [A]     | Measured Value (MV) in [%] |                                 |   |
| 2nd                         | 0,008                               | 0,189                      | 0,012                          | 0,136                      | 1,080                           |   |
| 3rd                         | 0,012                               | 0,278                      | 0,018                          | 0,211                      | 2,300                           |   |
| 4th                         | 0,006                               | 0,140                      | 0,007                          | 0,081                      | 0,430                           |   |
| 5th                         | 0,009                               | 0,207                      | 0,037                          | 0,424                      | 1,140                           |   |
| 6th                         | 0,005                               | 0,117                      | 0,008                          | 0,090                      | 0,300                           |   |
| 7th                         | 0,007                               | 0,157                      | 0,030                          | 0,342                      | 0,770                           |   |
| 8th                         | 0,004                               | 0,102                      | 0,006                          | 0,068                      | 0,230                           |   |
| 9th                         | 0,009                               | 0,196                      | 0,011                          | 0,128                      | 0,400                           |   |
| 10th                        | 0,005                               | 0,117                      | 0,006                          | 0,073                      | 0,184                           |   |
| 11th                        | 0,007                               | 0,152                      | 0,005                          | 0,062                      | 0,330                           |   |
| 12th                        | 0,005                               | 0,113                      | 0,007                          | 0,085                      | 0,153                           |   |
| 13th                        | 0,006                               | 0,141                      | 0,024                          | 0,278                      | 0,210                           |   |
| 14th                        | 0,005                               | 0,115                      | 0,007                          | 0,082                      | 0,131                           |   |
| 15th                        | 0,007                               | 0,153                      | 0,006                          | 0,072                      | 0,150                           |   |
| 16th                        | 0,004                               | 0,098                      | 0,006                          | 0,069                      | 0,115                           |   |
| 17th                        | 0,007                               | 0,160                      | 0,052                          | 0,592                      | 0,132                           |   |
| 18th                        | 0,005                               | 0,122                      | 0,009                          | 0,098                      | 0,102                           |   |
| 19th                        | 0,006                               | 0,139                      | 0,055                          | 0,632                      | 0,118                           |   |
| 20th                        | 0,005                               | 0,111                      | 0,009                          | 0,106                      | 0,092                           |   |
| 21th                        | 0,006                               | 0,131                      | 0,006                          | 0,071                      | 0,107                           | 0,160                                       |
| 22th                        | 0,005                               | 0,113                      | 0,006                          | 0,070                      | 0,084                           |   |
| 23th                        | 0,007                               | 0,170                      | 0,008                          | 0,088                      | 0,098                           | 0,147                                       |
| 24th                        | 0,006                               | 0,144                      | 0,010                          | 0,110                      | 0,077                           |   |
| 25th                        | 0,007                               | 0,167                      | 0,020                          | 0,226                      | 0,090                           | 0,135                                       |
| 26th                        | 0,006                               | 0,136                      | 0,009                          | 0,098                      | 0,071                           |   |
| 27th                        | 0,006                               | 0,135                      | 0,006                          | 0,072                      | 0,083                           | 0,124                                       |
| 28th                        | 0,006                               | 0,131                      | 0,007                          | 0,078                      | 0,066                           |   |
| 29th                        | 0,006                               | 0,141                      | 0,008                          | 0,097                      | 0,078                           | 0,117                                       |
| 30th                        | 0,006                               | 0,132                      | 0,010                          | 0,118                      | 0,061                           |   |
| 31th                        | 0,005                               | 0,126                      | 0,008                          | 0,097                      | 0,073                           | 0,109                                       |
| 32th                        | 0,007                               | 0,152                      | 0,010                          | 0,109                      | 0,058                           |   |
| 33th                        | 0,007                               | 0,150                      | 0,010                          | 0,109                      | 0,068                           | 0,102                                       |
| 34th                        | 0,004                               | 0,092                      | 0,008                          | 0,088                      | 0,054                           |   |
| 35th                        | 0,005                               | 0,111                      | 0,007                          | 0,085                      | 0,064                           | 0,096                                       |
| 36th                        | 0,005                               | 0,106                      | 0,009                          | 0,098                      | 0,051                           |   |
| 37th                        | 0,005                               | 0,104                      | 0,017                          | 0,189                      | 0,061                           | 0,091                                       |
| 38th                        | 0,004                               | 0,095                      | 0,008                          | 0,095                      | 0,048                           |   |
| 39th                        | 0,004                               | 0,097                      | 0,007                          | 0,085                      | 0,058                           | 0,087                                       |
| 40th                        | 0,004                               | 0,086                      | 0,007                          | 0,075                      | 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 C Type Test Verification Report**

Extract from test report according to the Engineering Recommendation G98/1-1

Nr. PVUK180906N022

| Power Quality. Harmonics.   |                                     |                            |                                |                            |                                 |   |
|-----------------------------|-------------------------------------|----------------------------|--------------------------------|----------------------------|---------------------------------|---|
| Phase 2                     |                                     |                            |                                |                            |                                 |   |
| SSEG rating per phase (rpp) |                                     |                            | SUN2000-6KTL-M0                |                            |                                 |   |
|                             | At 45-55% of rated output<br>1,0 kW |                            | 100% of rated output<br>2,0 kW |                            |                                 |   |
| Harmonic                    | Measured Value (MV) in [A]          | Measured Value (MV) in [%] | Measured Value (MV) in [A]     | Measured Value (MV) in [%] | Limit in BS EN61000-3-2 in Amps | Higher limit for odd harmonics 21 and above |
| 2nd                         | 0,009                               | 0,204                      | 0,010                          | 0,110                      | 1,080                           |   |
| 3rd                         | 0,025                               | 0,576                      | 0,024                          | 0,273                      | 2,300                           |   |
| 4th                         | 0,007                               | 0,156                      | 0,008                          | 0,090                      | 0,430                           |   |
| 5th                         | 0,009                               | 0,210                      | 0,035                          | 0,400                      | 1,140                           |   |
| 6th                         | 0,005                               | 0,125                      | 0,007                          | 0,081                      | 0,300                           |   |
| 7th                         | 0,008                               | 0,177                      | 0,033                          | 0,378                      | 0,770                           |   |
| 8th                         | 0,005                               | 0,123                      | 0,008                          | 0,090                      | 0,230                           |   |
| 9th                         | 0,007                               | 0,165                      | 0,006                          | 0,066                      | 0,400                           |   |
| 10th                        | 0,006                               | 0,135                      | 0,006                          | 0,070                      | 0,184                           |   |
| 11th                        | 0,007                               | 0,153                      | 0,009                          | 0,100                      | 0,330                           |   |
| 12th                        | 0,005                               | 0,110                      | 0,007                          | 0,082                      | 0,153                           |   |
| 13th                        | 0,006                               | 0,145                      | 0,021                          | 0,240                      | 0,210                           |   |
| 14th                        | 0,005                               | 0,119                      | 0,007                          | 0,080                      | 0,131                           |   |
| 15th                        | 0,007                               | 0,161                      | 0,009                          | 0,098                      | 0,150                           |   |
| 16th                        | 0,005                               | 0,121                      | 0,006                          | 0,073                      | 0,115                           |   |
| 17th                        | 0,007                               | 0,165                      | 0,049                          | 0,562                      | 0,132                           |   |
| 18th                        | 0,006                               | 0,129                      | 0,009                          | 0,105                      | 0,102                           |   |
| 19th                        | 0,006                               | 0,144                      | 0,055                          | 0,629                      | 0,118                           |   |
| 20th                        | 0,005                               | 0,115                      | 0,008                          | 0,095                      | 0,092                           |   |
| 21th                        | 0,008                               | 0,171                      | 0,007                          | 0,082                      | 0,107                           | 0,160                                       |
| 22th                        | 0,005                               | 0,113                      | 0,008                          | 0,094                      | 0,084                           |   |
| 23th                        | 0,007                               | 0,161                      | 0,010                          | 0,117                      | 0,098                           | 0,147                                       |
| 24th                        | 0,007                               | 0,159                      | 0,010                          | 0,114                      | 0,077                           |   |
| 25th                        | 0,008                               | 0,174                      | 0,015                          | 0,170                      | 0,090                           | 0,135                                       |
| 26th                        | 0,006                               | 0,145                      | 0,010                          | 0,109                      | 0,071                           |   |
| 27th                        | 0,009                               | 0,195                      | 0,011                          | 0,129                      | 0,083                           | 0,124                                       |
| 28th                        | 0,005                               | 0,124                      | 0,009                          | 0,101                      | 0,066                           |   |
| 29th                        | 0,006                               | 0,142                      | 0,014                          | 0,163                      | 0,078                           | 0,117                                       |
| 30th                        | 0,006                               | 0,139                      | 0,011                          | 0,124                      | 0,061                           |   |
| 31th                        | 0,006                               | 0,129                      | 0,012                          | 0,138                      | 0,073                           | 0,109                                       |
| 32th                        | 0,006                               | 0,144                      | 0,011                          | 0,128                      | 0,058                           |   |
| 33th                        | 0,007                               | 0,148                      | 0,009                          | 0,098                      | 0,068                           | 0,102                                       |
| 34th                        | 0,005                               | 0,105                      | 0,010                          | 0,112                      | 0,054                           |   |
| 35th                        | 0,005                               | 0,111                      | 0,009                          | 0,104                      | 0,064                           | 0,096                                       |
| 36th                        | 0,006                               | 0,126                      | 0,011                          | 0,123                      | 0,051                           |   |
| 37th                        | 0,005                               | 0,104                      | 0,010                          | 0,110                      | 0,061                           | 0,091                                       |
| 38th                        | 0,004                               | 0,101                      | 0,009                          | 0,104                      | 0,048                           |   |
| 39th                        | 0,007                               | 0,168                      | 0,015                          | 0,170                      | 0,058                           | 0,087                                       |
| 40th                        | 0,004                               | 0,089                      | 0,009                          | 0,097                      | 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 C Type Test Verification Report**

Extract from test report according to the Engineering Recommendation G98/1-1

Nr. PVUK180906N022

**Power Quality. Harmonics.**

**Phase 3**

| SSEG rating per phase (rpp) |                                     |                            | SUN2000-6KTL-M0                |                            | Limit in BS EN61000-3-2 in Amps | Higher limit for odd harmonics 21 and above |
|-----------------------------|-------------------------------------|----------------------------|--------------------------------|----------------------------|---------------------------------|---|
| Harmonic                    | At 45-55% of rated output<br>1,0 kW |                            | 100% of rated output<br>2,0 kW |                            |                                 |   |
|                             | Measured Value (MV) in [A]          | Measured Value (MV) in [%] | Measured Value (MV) in [A]     | Measured Value (MV) in [%] |                                 |   |
| 2nd                         | 0,006                               | 0,144                      | 0,009                          | 0,105                      | 1,080                           |   |
| 3rd                         | 0,014                               | 0,319                      | 0,013                          | 0,154                      | 2,300                           |   |
| 4th                         | 0,007                               | 0,160                      | 0,007                          | 0,079                      | 0,430                           |   |
| 5th                         | 0,006                               | 0,128                      | 0,048                          | 0,553                      | 1,140                           |   |
| 6th                         | 0,005                               | 0,116                      | 0,007                          | 0,080                      | 0,300                           |   |
| 7th                         | 0,006                               | 0,141                      | 0,034                          | 0,390                      | 0,770                           |   |
| 8th                         | 0,006                               | 0,128                      | 0,007                          | 0,079                      | 0,230                           |   |
| 9th                         | 0,008                               | 0,173                      | 0,005                          | 0,060                      | 0,400                           |   |
| 10th                        | 0,006                               | 0,130                      | 0,007                          | 0,081                      | 0,184                           |   |
| 11th                        | 0,005                               | 0,120                      | 0,007                          | 0,086                      | 0,330                           |   |
| 12th                        | 0,005                               | 0,114                      | 0,006                          | 0,071                      | 0,153                           |   |
| 13th                        | 0,006                               | 0,141                      | 0,027                          | 0,313                      | 0,210                           |   |
| 14th                        | 0,005                               | 0,114                      | 0,007                          | 0,084                      | 0,131                           |   |
| 15th                        | 0,009                               | 0,217                      | 0,008                          | 0,091                      | 0,150                           |   |
| 16th                        | 0,005                               | 0,122                      | 0,007                          | 0,081                      | 0,115                           |   |
| 17th                        | 0,007                               | 0,156                      | 0,049                          | 0,567                      | 0,132                           |   |
| 18th                        | 0,006                               | 0,135                      | 0,007                          | 0,077                      | 0,102                           |   |
| 19th                        | 0,005                               | 0,124                      | 0,055                          | 0,630                      | 0,118                           |   |
| 20th                        | 0,006                               | 0,135                      | 0,009                          | 0,099                      | 0,092                           |   |
| 21th                        | 0,007                               | 0,160                      | 0,006                          | 0,064                      | 0,107                           | 0,160                                       |
| 22th                        | 0,006                               | 0,149                      | 0,008                          | 0,089                      | 0,084                           |   |
| 23th                        | 0,006                               | 0,148                      | 0,008                          | 0,095                      | 0,098                           | 0,147                                       |
| 24th                        | 0,007                               | 0,156                      | 0,008                          | 0,089                      | 0,077                           |   |
| 25th                        | 0,007                               | 0,156                      | 0,016                          | 0,186                      | 0,090                           | 0,135                                       |
| 26th                        | 0,007                               | 0,163                      | 0,008                          | 0,093                      | 0,071                           |   |
| 27th                        | 0,010                               | 0,218                      | 0,007                          | 0,086                      | 0,083                           | 0,124                                       |
| 28th                        | 0,006                               | 0,142                      | 0,008                          | 0,095                      | 0,066                           |   |
| 29th                        | 0,005                               | 0,126                      | 0,017                          | 0,191                      | 0,078                           | 0,117                                       |
| 30th                        | 0,005                               | 0,122                      | 0,010                          | 0,112                      | 0,061                           |   |
| 31th                        | 0,005                               | 0,114                      | 0,012                          | 0,133                      | 0,073                           | 0,109                                       |
| 32th                        | 0,005                               | 0,118                      | 0,008                          | 0,093                      | 0,058                           |   |
| 33th                        | 0,013                               | 0,289                      | 0,008                          | 0,092                      | 0,068                           | 0,102                                       |
| 34th                        | 0,005                               | 0,108                      | 0,009                          | 0,107                      | 0,054                           |   |
| 35th                        | 0,005                               | 0,123                      | 0,009                          | 0,100                      | 0,064                           | 0,096                                       |
| 36th                        | 0,006                               | 0,137                      | 0,008                          | 0,097                      | 0,051                           |   |
| 37th                        | 0,005                               | 0,113                      | 0,015                          | 0,174                      | 0,061                           | 0,091                                       |
| 38th                        | 0,005                               | 0,107                      | 0,007                          | 0,086                      | 0,048                           |   |
| 39th                        | 0,007                               | 0,159                      | 0,008                          | 0,090                      | 0,058                           | 0,087                                       |
| 40th                        | 0,005                               | 0,107                      | 0,007                          | 0,086                      | 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 C Type Test Verification Report**

Extract from test report according to the Engineering Recommendation G98/1-1

Nr. PVUK180906N022

**Power Quality. Harmonics.**

**Phase 1**

| SSEG rating per phase (rpp)         |                            |                            | SUN2000-8KTL-M0                |                            | Limit in BS EN61000-3-2 in Amps | Higher limit for odd harmonics 21 and above |
|-------------------------------------|----------------------------|----------------------------|--------------------------------|----------------------------|---------------------------------|---|
| At 45-55% of rated output<br>1,3 kW |                            |                            | 100% of rated output<br>2,6 kW |                            |                                 |   |
| Harmonic                            | Measured Value (MV) in [A] | Measured Value (MV) in [%] | Measured Value (MV) in [A]     | Measured Value (MV) in [%] |                                 |   |
| 2nd                                 | 0,038                      | 0,645                      | 0,017                          | 0,145                      | 1,080                           |   |
| 3rd                                 | 0,017                      | 0,290                      | 0,023                          | 0,198                      | 2,300                           |   |
| 4th                                 | 0,016                      | 0,268                      | 0,009                          | 0,077                      | 0,430                           |   |
| 5th                                 | 0,026                      | 0,447                      | 0,058                          | 0,502                      | 1,140                           |   |
| 6th                                 | 0,005                      | 0,084                      | 0,006                          | 0,048                      | 0,300                           |   |
| 7th                                 | 0,033                      | 0,564                      | 0,031                          | 0,264                      | 0,770                           |   |
| 8th                                 | 0,012                      | 0,203                      | 0,006                          | 0,052                      | 0,230                           |   |
| 9th                                 | 0,007                      | 0,124                      | 0,016                          | 0,134                      | 0,400                           |   |
| 10th                                | 0,017                      | 0,292                      | 0,007                          | 0,063                      | 0,184                           |   |
| 11th                                | 0,014                      | 0,247                      | 0,007                          | 0,060                      | 0,330                           |   |
| 12th                                | 0,007                      | 0,124                      | 0,006                          | 0,050                      | 0,153                           |   |
| 13th                                | 0,023                      | 0,388                      | 0,030                          | 0,261                      | 0,210                           |   |
| 14th                                | 0,004                      | 0,076                      | 0,006                          | 0,056                      | 0,131                           |   |
| 15th                                | 0,007                      | 0,122                      | 0,005                          | 0,046                      | 0,150                           |   |
| 16th                                | 0,007                      | 0,120                      | 0,007                          | 0,060                      | 0,115                           |   |
| 17th                                | 0,069                      | 1,169                      | 0,026                          | 0,219                      | 0,132                           |   |
| 18th                                | 0,007                      | 0,118                      | 0,009                          | 0,073                      | 0,102                           |   |
| 19th                                | 0,045                      | 0,761                      | 0,034                          | 0,293                      | 0,118                           |   |
| 20th                                | 0,006                      | 0,103                      | 0,010                          | 0,083                      | 0,092                           |   |
| 21th                                | 0,006                      | 0,107                      | 0,008                          | 0,069                      | 0,107                           | 0,160                                       |
| 22th                                | 0,007                      | 0,111                      | 0,008                          | 0,067                      | 0,084                           |   |
| 23th                                | 0,009                      | 0,158                      | 0,009                          | 0,077                      | 0,098                           | 0,147                                       |
| 24th                                | 0,007                      | 0,120                      | 0,011                          | 0,096                      | 0,077                           |   |
| 25th                                | 0,015                      | 0,247                      | 0,015                          | 0,131                      | 0,090                           | 0,135                                       |
| 26th                                | 0,011                      | 0,188                      | 0,010                          | 0,085                      | 0,071                           |   |
| 27th                                | 0,007                      | 0,127                      | 0,009                          | 0,075                      | 0,083                           | 0,124                                       |
| 28th                                | 0,011                      | 0,183                      | 0,010                          | 0,083                      | 0,066                           |   |
| 29th                                | 0,012                      | 0,210                      | 0,009                          | 0,073                      | 0,078                           | 0,117                                       |
| 30th                                | 0,009                      | 0,146                      | 0,014                          | 0,124                      | 0,061                           |   |
| 31th                                | 0,010                      | 0,163                      | 0,016                          | 0,138                      | 0,073                           | 0,109                                       |
| 32th                                | 0,020                      | 0,333                      | 0,014                          | 0,120                      | 0,058                           |   |
| 33th                                | 0,008                      | 0,134                      | 0,011                          | 0,091                      | 0,068                           | 0,102                                       |
| 34th                                | 0,014                      | 0,234                      | 0,011                          | 0,097                      | 0,054                           |   |
| 35th                                | 0,009                      | 0,156                      | 0,012                          | 0,099                      | 0,064                           | 0,096                                       |
| 36th                                | 0,007                      | 0,121                      | 0,014                          | 0,120                      | 0,051                           |   |
| 37th                                | 0,012                      | 0,196                      | 0,010                          | 0,084                      | 0,061                           | 0,091                                       |
| 38th                                | 0,012                      | 0,208                      | 0,014                          | 0,118                      | 0,048                           |   |
| 39th                                | 0,011                      | 0,187                      | 0,014                          | 0,121                      | 0,058                           | 0,087                                       |
| 40th                                | 0,012                      | 0,198                      | 0,010                          | 0,090                      | 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 C Type Test Verification Report**

Extract from test report according to the Engineering Recommendation G98/1-1

Nr. PVUK180906N022

**Power Quality. Harmonics.**

**Phase 2**

| SSEG rating per phase (rpp) |                                     |                            | SUN2000-8KTL-M0                |                            | Limit in BS EN61000-3-2 in Amps | Higher limit for odd harmonics 21 and above |
|-----------------------------|-------------------------------------|----------------------------|--------------------------------|----------------------------|---------------------------------|---|
| Harmonic                    | At 45-55% of rated output<br>1,3 kW |                            | 100% of rated output<br>2,6 kW |                            |                                 |   |
|                             | Measured Value (MV) in [A]          | Measured Value (MV) in [%] | Measured Value (MV) in [A]     | Measured Value (MV) in [%] |                                 |   |
| 2nd                         | 0,023                               | 0,391                      | 0,015                          | 0,129                      | 1,080                           |   |
| 3rd                         | 0,010                               | 0,162                      | 0,027                          | 0,232                      | 2,300                           |   |
| 4th                         | 0,016                               | 0,268                      | 0,010                          | 0,082                      | 0,430                           |   |
| 5th                         | 0,027                               | 0,458                      | 0,053                          | 0,459                      | 1,140                           |   |
| 6th                         | 0,005                               | 0,090                      | 0,007                          | 0,059                      | 0,300                           |   |
| 7th                         | 0,029                               | 0,496                      | 0,033                          | 0,283                      | 0,770                           |   |
| 8th                         | 0,016                               | 0,266                      | 0,006                          | 0,055                      | 0,230                           |   |
| 9th                         | 0,016                               | 0,274                      | 0,007                          | 0,060                      | 0,400                           |   |
| 10th                        | 0,018                               | 0,302                      | 0,007                          | 0,058                      | 0,184                           |   |
| 11th                        | 0,014                               | 0,232                      | 0,006                          | 0,049                      | 0,330                           |   |
| 12th                        | 0,008                               | 0,131                      | 0,006                          | 0,051                      | 0,153                           |   |
| 13th                        | 0,022                               | 0,372                      | 0,029                          | 0,252                      | 0,210                           |   |
| 14th                        | 0,007                               | 0,121                      | 0,008                          | 0,066                      | 0,131                           |   |
| 15th                        | 0,006                               | 0,095                      | 0,009                          | 0,075                      | 0,150                           |   |
| 16th                        | 0,007                               | 0,111                      | 0,007                          | 0,064                      | 0,115                           |   |
| 17th                        | 0,069                               | 1,176                      | 0,020                          | 0,175                      | 0,132                           |   |
| 18th                        | 0,006                               | 0,106                      | 0,007                          | 0,061                      | 0,102                           |   |
| 19th                        | 0,045                               | 0,764                      | 0,036                          | 0,308                      | 0,118                           |   |
| 20th                        | 0,007                               | 0,124                      | 0,009                          | 0,075                      | 0,092                           |   |
| 21th                        | 0,008                               | 0,130                      | 0,011                          | 0,094                      | 0,107                           | 0,160                                       |
| 22th                        | 0,007                               | 0,114                      | 0,008                          | 0,065                      | 0,084                           |   |
| 23th                        | 0,010                               | 0,166                      | 0,009                          | 0,075                      | 0,098                           | 0,147                                       |
| 24th                        | 0,008                               | 0,138                      | 0,009                          | 0,074                      | 0,077                           |   |
| 25th                        | 0,014                               | 0,245                      | 0,017                          | 0,148                      | 0,090                           | 0,135                                       |
| 26th                        | 0,012                               | 0,198                      | 0,009                          | 0,076                      | 0,071                           |   |
| 27th                        | 0,008                               | 0,136                      | 0,008                          | 0,072                      | 0,083                           | 0,124                                       |
| 28th                        | 0,013                               | 0,220                      | 0,011                          | 0,093                      | 0,066                           |   |
| 29th                        | 0,009                               | 0,152                      | 0,012                          | 0,106                      | 0,078                           | 0,117                                       |
| 30th                        | 0,007                               | 0,123                      | 0,013                          | 0,108                      | 0,061                           |   |
| 31th                        | 0,008                               | 0,134                      | 0,016                          | 0,138                      | 0,073                           | 0,109                                       |
| 32th                        | 0,010                               | 0,172                      | 0,015                          | 0,128                      | 0,058                           |   |
| 33th                        | 0,009                               | 0,147                      | 0,012                          | 0,104                      | 0,068                           | 0,102                                       |
| 34th                        | 0,010                               | 0,174                      | 0,011                          | 0,098                      | 0,054                           |   |
| 35th                        | 0,007                               | 0,122                      | 0,017                          | 0,146                      | 0,064                           | 0,096                                       |
| 36th                        | 0,008                               | 0,143                      | 0,015                          | 0,125                      | 0,051                           |   |
| 37th                        | 0,012                               | 0,206                      | 0,012                          | 0,100                      | 0,061                           | 0,091                                       |
| 38th                        | 0,014                               | 0,236                      | 0,015                          | 0,132                      | 0,048                           |   |
| 39th                        | 0,008                               | 0,141                      | 0,014                          | 0,122                      | 0,058                           | 0,087                                       |
| 40th                        | 0,013                               | 0,216                      | 0,011                          | 0,092                      | 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 C Type Test Verification Report**

Extract from test report according to the Engineering Recommendation G98/1-1

Nr. PVUK180906N022

| Power Quality. Harmonics.   |                                     |                            |                                |                            |                                 |   |
|-----------------------------|-------------------------------------|----------------------------|--------------------------------|----------------------------|---------------------------------|---|
| Phase 3                     |                                     |                            |                                |                            |                                 |   |
| SSEG rating per phase (rpp) |                                     |                            | SUN2000-8KTL-M0                |                            |                                 |   |
|                             | At 45-55% of rated output<br>1,3 kW |                            | 100% of rated output<br>2,6 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                         | 0,031                               | 0,525                      | 0,007                          | 0,065                      | 1,080                           |   |
| 3rd                         | 0,012                               | 0,213                      | 0,018                          | 0,159                      | 2,300                           |   |
| 4th                         | 0,014                               | 0,234                      | 0,008                          | 0,066                      | 0,430                           |   |
| 5th                         | 0,035                               | 0,598                      | 0,074                          | 0,636                      | 1,140                           |   |
| 6th                         | 0,006                               | 0,095                      | 0,007                          | 0,063                      | 0,300                           |   |
| 7th                         | 0,033                               | 0,554                      | 0,035                          | 0,300                      | 0,770                           |   |
| 8th                         | 0,013                               | 0,220                      | 0,006                          | 0,048                      | 0,230                           |   |
| 9th                         | 0,007                               | 0,122                      | 0,007                          | 0,058                      | 0,400                           |   |
| 10th                        | 0,018                               | 0,301                      | 0,006                          | 0,055                      | 0,184                           |   |
| 11th                        | 0,011                               | 0,181                      | 0,007                          | 0,063                      | 0,330                           |   |
| 12th                        | 0,005                               | 0,093                      | 0,006                          | 0,053                      | 0,153                           |   |
| 13th                        | 0,025                               | 0,433                      | 0,032                          | 0,276                      | 0,210                           |   |
| 14th                        | 0,006                               | 0,106                      | 0,006                          | 0,054                      | 0,131                           |   |
| 15th                        | 0,008                               | 0,141                      | 0,008                          | 0,071                      | 0,150                           |   |
| 16th                        | 0,006                               | 0,108                      | 0,008                          | 0,069                      | 0,115                           |   |
| 17th                        | 0,070                               | 1,198                      | 0,025                          | 0,218                      | 0,132                           |   |
| 18th                        | 0,006                               | 0,105                      | 0,007                          | 0,061                      | 0,102                           |   |
| 19th                        | 0,046                               | 0,786                      | 0,034                          | 0,296                      | 0,118                           |   |
| 20th                        | 0,007                               | 0,123                      | 0,008                          | 0,070                      | 0,092                           |   |
| 21th                        | 0,006                               | 0,094                      | 0,007                          | 0,060                      | 0,107                           | 0,160                                       |
| 22th                        | 0,007                               | 0,119                      | 0,008                          | 0,072                      | 0,084                           |   |
| 23th                        | 0,011                               | 0,179                      | 0,008                          | 0,067                      | 0,098                           | 0,147                                       |
| 24th                        | 0,007                               | 0,118                      | 0,007                          | 0,064                      | 0,077                           |   |
| 25th                        | 0,014                               | 0,231                      | 0,017                          | 0,145                      | 0,090                           | 0,135                                       |
| 26th                        | 0,009                               | 0,159                      | 0,010                          | 0,084                      | 0,071                           |   |
| 27th                        | 0,008                               | 0,128                      | 0,010                          | 0,083                      | 0,083                           | 0,124                                       |
| 28th                        | 0,010                               | 0,171                      | 0,010                          | 0,086                      | 0,066                           |   |
| 29th                        | 0,010                               | 0,176                      | 0,014                          | 0,123                      | 0,078                           | 0,117                                       |
| 30th                        | 0,007                               | 0,122                      | 0,012                          | 0,103                      | 0,061                           |   |
| 31th                        | 0,007                               | 0,119                      | 0,014                          | 0,117                      | 0,073                           | 0,109                                       |
| 32th                        | 0,014                               | 0,239                      | 0,011                          | 0,098                      | 0,058                           |   |
| 33th                        | 0,006                               | 0,099                      | 0,011                          | 0,099                      | 0,068                           | 0,102                                       |
| 34th                        | 0,013                               | 0,216                      | 0,013                          | 0,116                      | 0,054                           |   |
| 35th                        | 0,008                               | 0,141                      | 0,015                          | 0,134                      | 0,064                           | 0,096                                       |
| 36th                        | 0,007                               | 0,116                      | 0,013                          | 0,116                      | 0,051                           |   |
| 37th                        | 0,010                               | 0,174                      | 0,010                          | 0,083                      | 0,061                           | 0,091                                       |
| 38th                        | 0,011                               | 0,195                      | 0,015                          | 0,131                      | 0,048                           |   |
| 39th                        | 0,009                               | 0,154                      | 0,013                          | 0,115                      | 0,058                           | 0,087                                       |
| 40th                        | 0,009                               | 0,149                      | 0,010                          | 0,084                      | 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 C Type Test Verification Report**

Extract from test report according to the Engineering Recommendation G98/1-1

Nr. PVUK180906N022

**Power Quality. Harmonics.**

**Phase 1**

| SSEG rating per phase (rpp)         |                            |                            | SUN2000-10KTL-M0               |                            | Limit in BS EN61000-3-2 in Amps | Higher limit for odd harmonics 21 and above |
|-------------------------------------|----------------------------|----------------------------|--------------------------------|----------------------------|---------------------------------|---|
| At 45-55% of rated output<br>1,6 kW |                            |                            | 100% of rated output<br>3,3 kW |                            |                                 |   |
| Harmonic                            | Measured Value (MV) in [A] | Measured Value (MV) in [%] | Measured Value (MV) in [A]     | Measured Value (MV) in [%] |                                 |   |
| 2nd                                 | 0,015                      | 0,203                      | 0,030                          | 0,207                      | 1,080                           |   |
| 3rd                                 | 0,017                      | 0,233                      | 0,043                          | 0,299                      | 2,300                           |   |
| 4th                                 | 0,007                      | 0,097                      | 0,010                          | 0,070                      | 0,430                           |   |
| 5th                                 | 0,041                      | 0,552                      | 0,017                          | 0,117                      | 1,140                           |   |
| 6th                                 | 0,007                      | 0,102                      | 0,008                          | 0,054                      | 0,300                           |   |
| 7th                                 | 0,031                      | 0,420                      | 0,011                          | 0,074                      | 0,770                           |   |
| 8th                                 | 0,005                      | 0,069                      | 0,007                          | 0,048                      | 0,230                           |   |
| 9th                                 | 0,008                      | 0,111                      | 0,010                          | 0,069                      | 0,400                           |   |
| 10th                                | 0,006                      | 0,076                      | 0,007                          | 0,050                      | 0,184                           |   |
| 11th                                | 0,032                      | 0,432                      | 0,010                          | 0,071                      | 0,330                           |   |
| 12th                                | 0,006                      | 0,084                      | 0,007                          | 0,047                      | 0,153                           |   |
| 13th                                | 0,013                      | 0,173                      | 0,009                          | 0,064                      | 0,210                           |   |
| 14th                                | 0,007                      | 0,094                      | 0,006                          | 0,044                      | 0,131                           |   |
| 15th                                | 0,009                      | 0,122                      | 0,006                          | 0,044                      | 0,150                           |   |
| 16th                                | 0,006                      | 0,086                      | 0,008                          | 0,057                      | 0,115                           |   |
| 17th                                | 0,032                      | 0,443                      | 0,009                          | 0,062                      | 0,132                           |   |
| 18th                                | 0,006                      | 0,079                      | 0,007                          | 0,048                      | 0,102                           |   |
| 19th                                | 0,048                      | 0,655                      | 0,008                          | 0,055                      | 0,118                           |   |
| 20th                                | 0,008                      | 0,112                      | 0,006                          | 0,043                      | 0,092                           |   |
| 21th                                | 0,011                      | 0,144                      | 0,006                          | 0,043                      | 0,107                           | 0,160                                       |
| 22th                                | 0,006                      | 0,085                      | 0,007                          | 0,047                      | 0,084                           |   |
| 23th                                | 0,012                      | 0,165                      | 0,009                          | 0,063                      | 0,098                           | 0,147                                       |
| 24th                                | 0,007                      | 0,092                      | 0,008                          | 0,053                      | 0,077                           |   |
| 25th                                | 0,012                      | 0,160                      | 0,008                          | 0,059                      | 0,090                           | 0,135                                       |
| 26th                                | 0,009                      | 0,118                      | 0,006                          | 0,043                      | 0,071                           |   |
| 27th                                | 0,009                      | 0,119                      | 0,009                          | 0,061                      | 0,083                           | 0,124                                       |
| 28th                                | 0,008                      | 0,103                      | 0,008                          | 0,056                      | 0,066                           |   |
| 29th                                | 0,010                      | 0,130                      | 0,008                          | 0,055                      | 0,078                           | 0,117                                       |
| 30th                                | 0,010                      | 0,142                      | 0,009                          | 0,064                      | 0,061                           |   |
| 31th                                | 0,009                      | 0,120                      | 0,009                          | 0,060                      | 0,073                           | 0,109                                       |
| 32th                                | 0,010                      | 0,132                      | 0,009                          | 0,062                      | 0,058                           |   |
| 33th                                | 0,009                      | 0,125                      | 0,013                          | 0,089                      | 0,068                           | 0,102                                       |
| 34th                                | 0,008                      | 0,108                      | 0,013                          | 0,090                      | 0,054                           |   |
| 35th                                | 0,009                      | 0,121                      | 0,048                          | 0,330                      | 0,064                           | 0,096                                       |
| 36th                                | 0,009                      | 0,128                      | 0,017                          | 0,121                      | 0,051                           |   |
| 37th                                | 0,007                      | 0,102                      | 0,026                          | 0,178                      | 0,061                           | 0,091                                       |
| 38th                                | 0,010                      | 0,141                      | 0,011                          | 0,075                      | 0,048                           |   |
| 39th                                | 0,009                      | 0,127                      | 0,025                          | 0,171                      | 0,058                           | 0,087                                       |
| 40th                                | 0,008                      | 0,103                      | 0,016                          | 0,108                      | 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 C Type Test Verification Report**

Extract from test report according to the Engineering Recommendation G98/1-1

Nr. PVUK180906N022

**Power Quality. Harmonics.**

**Phase 2**

| SSEG rating per phase (rpp) |                                     |                            | SUN2000-10KTL-M0               |                            | Limit in BS EN61000-3-2 in Amps | Higher limit for odd harmonics 21 and above |
|-----------------------------|-------------------------------------|----------------------------|--------------------------------|----------------------------|---------------------------------|---|
| Harmonic                    | At 45-55% of rated output<br>1,6 kW |                            | 100% of rated output<br>3,3 kW |                            |                                 |   |
|                             | Measured Value (MV) in [A]          | Measured Value (MV) in [%] | Measured Value (MV) in [A]     | Measured Value (MV) in [%] |                                 |   |
| 2nd                         | 0,010                               | 0,140                      | 0,016                          | 0,113                      | 1,080                           |   |
| 3rd                         | 0,025                               | 0,345                      | 0,016                          | 0,110                      | 2,300                           |   |
| 4th                         | 0,007                               | 0,101                      | 0,012                          | 0,084                      | 0,430                           |   |
| 5th                         | 0,036                               | 0,492                      | 0,018                          | 0,124                      | 1,140                           |   |
| 6th                         | 0,007                               | 0,093                      | 0,009                          | 0,060                      | 0,300                           |   |
| 7th                         | 0,030                               | 0,413                      | 0,009                          | 0,063                      | 0,770                           |   |
| 8th                         | 0,006                               | 0,078                      | 0,009                          | 0,062                      | 0,230                           |   |
| 9th                         | 0,007                               | 0,091                      | 0,014                          | 0,096                      | 0,400                           |   |
| 10th                        | 0,006                               | 0,081                      | 0,008                          | 0,057                      | 0,184                           |   |
| 11th                        | 0,030                               | 0,405                      | 0,010                          | 0,069                      | 0,330                           |   |
| 12th                        | 0,006                               | 0,087                      | 0,007                          | 0,049                      | 0,153                           |   |
| 13th                        | 0,014                               | 0,194                      | 0,012                          | 0,085                      | 0,210                           |   |
| 14th                        | 0,007                               | 0,089                      | 0,008                          | 0,058                      | 0,131                           |   |
| 15th                        | 0,009                               | 0,118                      | 0,007                          | 0,047                      | 0,150                           |   |
| 16th                        | 0,007                               | 0,097                      | 0,008                          | 0,058                      | 0,115                           |   |
| 17th                        | 0,029                               | 0,392                      | 0,009                          | 0,060                      | 0,132                           |   |
| 18th                        | 0,009                               | 0,123                      | 0,007                          | 0,048                      | 0,102                           |   |
| 19th                        | 0,045                               | 0,607                      | 0,009                          | 0,063                      | 0,118                           |   |
| 20th                        | 0,010                               | 0,134                      | 0,007                          | 0,045                      | 0,092                           |   |
| 21th                        | 0,008                               | 0,103                      | 0,007                          | 0,045                      | 0,107                           | 0,160                                       |
| 22th                        | 0,007                               | 0,098                      | 0,007                          | 0,049                      | 0,084                           |   |
| 23th                        | 0,011                               | 0,143                      | 0,009                          | 0,059                      | 0,098                           | 0,147                                       |
| 24th                        | 0,007                               | 0,092                      | 0,008                          | 0,052                      | 0,077                           |   |
| 25th                        | 0,012                               | 0,164                      | 0,009                          | 0,064                      | 0,090                           | 0,135                                       |
| 26th                        | 0,007                               | 0,102                      | 0,007                          | 0,050                      | 0,071                           |   |
| 27th                        | 0,008                               | 0,109                      | 0,010                          | 0,069                      | 0,083                           | 0,124                                       |
| 28th                        | 0,008                               | 0,102                      | 0,010                          | 0,071                      | 0,066                           |   |
| 29th                        | 0,007                               | 0,100                      | 0,008                          | 0,057                      | 0,078                           | 0,117                                       |
| 30th                        | 0,011                               | 0,148                      | 0,011                          | 0,074                      | 0,061                           |   |
| 31th                        | 0,007                               | 0,096                      | 0,010                          | 0,070                      | 0,073                           | 0,109                                       |
| 32th                        | 0,010                               | 0,130                      | 0,018                          | 0,126                      | 0,058                           |   |
| 33th                        | 0,009                               | 0,117                      | 0,014                          | 0,096                      | 0,068                           | 0,102                                       |
| 34th                        | 0,009                               | 0,118                      | 0,018                          | 0,121                      | 0,054                           |   |
| 35th                        | 0,008                               | 0,112                      | 0,048                          | 0,331                      | 0,064                           | 0,096                                       |
| 36th                        | 0,009                               | 0,118                      | 0,020                          | 0,141                      | 0,051                           |   |
| 37th                        | 0,010                               | 0,134                      | 0,042                          | 0,290                      | 0,061                           | 0,091                                       |
| 38th                        | 0,010                               | 0,133                      | 0,025                          | 0,174                      | 0,048                           |   |
| 39th                        | 0,008                               | 0,112                      | 0,015                          | 0,102                      | 0,058                           | 0,087                                       |
| 40th                        | 0,010                               | 0,135                      | 0,025                          | 0,172                      | 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 C Type Test Verification Report**

Extract from test report according to the Engineering Recommendation G98/1-1

Nr. PVUK180906N022

**Power Quality. Harmonics.**

**Phase 3**

| SSEG rating per phase (rpp) |                                     |                            | SUN2000-10KTL-M0               |                            | Limit in BS EN61000-3-2 in Amps | Higher limit for odd harmonics 21 and above |
|-----------------------------|-------------------------------------|----------------------------|--------------------------------|----------------------------|---------------------------------|---|
| Harmonic                    | At 45-55% of rated output<br>1,6 kW |                            | 100% of rated output<br>3,3 kW |                            |                                 |   |
|                             | Measured Value (MV) in [A]          | Measured Value (MV) in [%] | Measured Value (MV) in [A]     | Measured Value (MV) in [%] |                                 |   |
| 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 C Type Test Verification Report**

Extract from test report according to the Engineering Recommendation G98/1-1

Nr. PVUK180906N022

| 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 $\pm 1,5\%$ 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 $\pm 1,5\%$ 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%<br>500ms | 4%       | 3,3%  | 3,3%<br>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%<br>500ms | 4%       | 3,3%  | 3,3%<br>500ms | 1,0     | 0,65        |



BUREAU  
VERITAS

Annex to the G98/1 certificate of compliance No. U19-0112

Appendix C Type Test Verification Report

Extract from test report according to the Engineering Recommendation G98/1-1

Nr. PVUK180906N022

| 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%<br>500ms | 4%       | 3,3%  | 3,3%<br>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%<br>500ms | 4%       | 3,3%  | 3,3%<br>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%<br>500ms | 4%       | 3,3%  | 3,3%<br>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%<br>500ms | 4%       | 3,3%  | 3,3%<br>500ms | 1,0     | 0,65        |

**Appendix C Type Test Verification Report**

Extract from test report according to the Engineering Recommendation G98/1-1

Nr. PVUK180906N022

| 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 C Type Test Verification Report**

Extract from test report according to the Engineering Recommendation G98/1-1

Nr. PVUK180906N022

| 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.

|   |            |
|---|------------|
| <b>Self Monitoring – Solid state switching.</b>   | <b>N/A</b> |
| 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.                            |            |

|   |
|---|
| <b>Additional comments</b>  |
| 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) |