



**BUREAU
VERITAS**

Certificate of compliance

Applicant: AISWEI Technology Co., Ltd.
Room 905B, 757 Mengzi Road, Huangpu District, 200023 Shanghai
P.R. China

Product: Photovoltaic (PV) and battery inverter

Model:	ASW05kH-T2	ASW05kH-T2-O
	ASW06kH-T2	ASW06kH-T2-O
	ASW08kH-T2	ASW08kH-T2-O
	ASW10kH-T2	ASW10kH-T2-O
	ASW05kH-T3	ASW05kH-T3-O
	ASW06kH-T3	ASW06kH-T3-O
	ASW08kH-T3	ASW08kH-T3-O
	ASW10kH-T3	ASW10kH-T3-O

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, which can be accessed the distribution network provider at any time.

Applied rules and standards:

Engineering Recommendation G98/1-7:2022

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 (4.1 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: PVGB2306WDG0281-1

Certification program: NSOP-0032-DEU-ZE-V01

Certificate number: U23-0994

Date of issue: 2023-11-15

Certification body



Certification body Bureau Veritas Consumer Products Services Germany GmbH accredited according to DIN EN ISO/IEC 17065

Testing laboratory accredited according to DIN EN ISO/IEC 17025

A partial representation of the certificate requires the written approval of Bureau Veritas Consumer Products Services Germany GmbH

Appendix C Type Test Verification Report

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

Nr. PVGB2306WDG0281-1

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

PGM Technology	Photovoltaic and battery inverter		
Manufacturer	AISWEI Technology Co., Ltd.		
Address	Room 905B, 757 Mengzi Road, Huangpu District, 200023 Shanghai P.R.China		
Tel	--	Fax	--
Email	--	Website	--

	ASW05kH-T2	ASW06kH-T2	ASW08kH-T2	ASW10kH-T2
Max. input PV voltage [V]	1100			
Input PV voltage range [V]	150-950	150-950	200-950	200-950
Max. Input PV current [A]	2*20,0	2*20,0	2*20,0	2*20,0
Input Battery voltage range [V]	120-600			
Max. Battery current [A]	30,0	30,0	30,0	30,0
Output AC voltage [V][Grid]	3L/N/PE, 230V, 50Hz			
Nominal Output AC current [A] [Grid]	7,3	8,7	11,6	14,5
Max. Output AC current [A] [Grid]	8,0	9,6	12,8	16,0
Nominal Output power [kW] [Grid]	5,0	6,0	8,0	10,0
Max. Output power [kVA] [Grid]	5,0	6,0	8,0	10,0
Output AC voltage [V][EPS]	3L/N/PE, 230V, 50Hz			
Nominal Output AC current [A] [EPS]	7,3	8,7	11,6	14,5
Max. Output AC current [A] [EPS]	8,0	9,6	12,8	16,0
Nominal Output power [kW] [EPS]	5,0	6,0	8,0	10,0
Max. Output power [kVA] [EPS]	5,0	6,0	8,0	10,0

	ASW05kH-T3	ASW06kH-T3	ASW08kH-T3	ASW10kH-T3
Max. input PV voltage [V]	1100			
Input PV voltage range [V]	150-950	150-950	200-950	200-950
Max. Input PV current [A]	3*16,0	3*16,0	3*16,0	3*16,0
Input Battery voltage range [V]	120-600			
Max. Battery current [A]	30,0	30,0	30,0	30,0
Output AC voltage [V][Grid]	3L/N/PE, 230V, 50Hz			
Nominal Output AC current [A] [Grid]	7,3	8,7	11,6	14,5
Max. Output AC current [A] [Grid]	8,0	9,6	12,8	16,0
Nominal Output power [kW] [Grid]	5,0	6,0	8,0	10,0

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Max. Output power [kVA] [Grid]	5,0	6,0	8,0	10,0
Output AC voltage [V][EPS]	3L/N/PE, 230V, 50Hz			
Nominal Output AC current [A] [EPS]	7,3	8,7	11,6	14,5
Max. Output AC current [A] [EPS]	8,0	9,6	12,8	16,0
Nominal Output power [kW] [EPS]	5,0	6,0	8,0	10,0
Max. Output power [kVA] [EPS]	5,0	6,0	8,0	10,0
	ASW05kH-T2-O	ASW06kH-T2-O	ASW08kH-T2-O	ASW10kH-T2-O
Max. input PV voltage [V]	1100			
Input PV voltage range [V]	150-950	150-950	200-950	200-950
Max. Input PV current [A]	2*20,0	2*20,0	2*20,0	2*20,0
Input Battery voltage range [V]	120-600			
Max. Battery current [A]	30,0	30,0	30,0	30,0
Output AC voltage [V][Grid]	3L/N/PE, 230V, 50Hz			
Nominal Output AC current [A] [Grid]	7,3	8,7	11,6	14,5
Max. Output AC current [A] [Grid]	8,0	9,6	12,8	16,0
Nominal Output power [kW] [Grid]	5,0	6,0	8,0	10,0
Max. Output power [kVA] [Grid]	5,0	6,0	8,0	10,0
	ASW05kH-T3-O	ASW06kH-T3-O	ASW08kH-T3-O	ASW10kH-T3-O
Max. input PV voltage [V]	1100			
Input PV voltage range [V]	150-950	150-950	200-950	200-950
Max. Input PV current [A]	3*16,0	3*16,0	3*16,0	3*16,0
Input Battery voltage range [V]	120-600			
Max. Battery current [A]	30,0	30,0	30,0	30,0
Output AC voltage [V][Grid]	3L/N/PE, 230V, 50Hz			
Nominal Output AC current [A] [Grid]	7,3	8,7	11,6	14,5
Max. Output AC current [A] [Grid]	8,0	9,6	12,8	16,0
Nominal Output power [kW] [Grid]	5,0	6,0	8,0	10,0
Max. Output power [kVA] [Grid]	5,0	6,0	8,0	10,0
Firmware version	Master Software version: V610-05001-01; Slave Software version: V610-60015-00; Safety version: V610-11022-01.			

Appendix C Type Test Verification Report

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

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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 (each) line and neutral. This enables a safe disconnection of the power generation unit from the network in case of error.

Differences between Generating Units:

There are four series models. The differences between four series refer to below description and table.

The "ASWxxkH-T2" series is basic series and including model ASW05kH-T2, ASW06kH-T2, ASW08kH-T2 and ASW10kH-T2. They are identical in hardware and software, expected the output power derated by software.

The "ASWxxkH-T2-O" series is almost same with the "ASWxxkH-T2" series but without EPS output terminal. The "ASWxxkH-T2-O" series including model ASW05kH-T2-O, ASW06kH-T2-O, ASW08kH-T2-O and ASW10kH-T2-O. They are identical in hardware and software, expected the output power derated by software.

The "ASWxxkH-T3" series is almost same with the "ASWxxkH-T2" series but with 3 PV trackers and 6 pole DC switch. The "ASWxxkH-T3" series including model ASW05kH-T3, ASW06kH-T3, ASW08kH-T3 and ASW10kH-T3. They are identical in hardware and software, expected the output power derated by software.

The "ASWxxkH-T3-O" series is almost same with the "ASWxxkH-T3" series but without EPS output circuit. The "ASWxxkH-T3-O" series including model ASW05kH-T3-O, ASW06kH-T3-O, ASW08kH-T3-O and ASW10kH-T3-O. They are identical in hardware and software, expected the output power derated by software.

Series	ASWxxkH-T2	ASWxxkH-T2-O	ASWxxkH-T3	ASWxxkH-T3-O
PV tracker's number	2	2	3	3
EPS output terminal	With	Without	With	Without
DC switch's pole number	4	4	6	6

The above stated Generating Units are tested according the requirements in the Engineering Recommendation G98/1. 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.

Appendix C Type Test Verification Report

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

Nr. PVGB2306WDG0281-1

Operating Range.

Test 1	Voltage = 85% of nominal (195,5 V) Frequency = 47,0 Hz Power Factor = 1 Period of test 20 seconds
Connection:	Always connected
Limit:	Always connected
Test 2	Voltage = 85% of nominal (195,5 V) Frequency = 47,5 Hz Power Factor = 1 Period of test 90 minutes
Connection:	Always connected
Limit:	Always connected
Test 3	Voltage = 110% of nominal (253 V) Frequency = 51,5 Hz Power Factor = 1 Period of test 90 minutes
Connection:	Always connected
Limit:	Always connected
Test 4	Voltage = 110% of nominal (253 V) Frequency = 52,0 Hz Power Factor = 1 Period of test 15 minutes
Connection:	Always connected
Limit:	Always connected
Test 5	Voltage = 100% of nominal (230 V) Frequency = 50,0 Hz Power Factor = 1 Period of test 90 minutes
Connection:	Always connected
Limit:	Always connected
Test 6	Confirm that the Micro-Generating Plant is capable of staying connected to the Distribution Network and operate at rates of change of frequency up to 1 Hzs-1 as measured over a period of 500 ms.
Connection:	Always connected
Limit:	Always connected

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

Nr. PVGB2306WDG0281-1

Protection. Voltage tests.

ASW10kH-T2

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	184,0	2,5	183,7	2,568	188V / 5s	No trip
					180V / 2,45s	No trip
O/V stage 1	262,2	1,0	262,7	1,010	258,2V 5,0s	No trip
O/V stage 2	273,7	0,5	274,8	0,501	269,7V 0,95s	No trip
					277,7V 0,45s	No trip

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	184,0	2,5	183,7	2,564	188V / 5s	No trip
					180V / 2,45s	No trip
O/V stage 1	262,2	1,0	262,7	1,001	258,2V 5,0s	No trip
O/V stage 2	273,7	0,5	275,2	0,506	269,7V 0,95s	No trip
					277,7V 0,45s	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	184,0	2,5	182,7	2,570	188V / 5s	No trip
					180V / 2,45s	No trip
O/V stage 1	262,2	1,0	261,9	1,004	258,2V 5,0s	No trip
O/V stage 2	273,7	0,5	272,8	0,508	269,7V 0,95s	No trip
					277,7V	No trip

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0,45s

Note. For Voltage tests the Voltage required to trip is the setting $\pm 3,45$ V. 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 ± 4 V and for the relevant times as shown in the table above to ensure that the protection will not trip in error.

Protection. Frequency tests.

Function	Setting		Trip test		No trip test	
	Frequency [Hz]	Time delay [s]	Frequency [Hz]	Time delay [s]	Frequency / time	Confirm no trip
U/F stage 1	47,5	20	47,50	20,060	47,7Hz / 30s	No trip
U/F stage 2	47	0,5	47,00	0,549	47,2Hz / 19,5s	No trip
					46,8Hz / 0,45s	No trip
O/F stage 2	52	0,5	52,00	0,560	51,8Hz / 120s	No trip
					52,2Hz / 0,45s	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 protection 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.

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

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Protection. Loss of Mains.

Inverters tested according to BS EN 62116.

Balancing load on islanded network	33% of -5% Q Test 22	66% of -5% Q Test 12	100% of -5% P Test 5	33% of +5% Q Test 31	66% of +5% Q Test 21	100% of +5% P Test 10
Trip time. Ph1 fuse removed [ms]	130,5	277,5	426,1	129,0	199,4	424,8

Note. Trip time limit is 0,5s.

Protection. Re-connection timer.

Test should prove that the reconnection sequence starts in no less than 20 seconds for restoration of voltage and frequency to within the stage 1 settings of table 2.

Over Voltage				
Time delay setting [s]		Measured delay [s]		
60		60,2		
Under Voltage				
Time delay setting [s]		Measured delay [s]		
60		60,2		
Over Frequency				
Time delay setting [s]		Measured delay [s]		
60		60,0		
Under Frequency				
Time delay setting [s]		Measured delay [s]		
60		60,0		
	Checks on no reconnection when voltage or frequency is brought to just outside stage 1 limits of table 1.			
	At 266,2V	At 180,0V	At 47,4Hz	At 52,1Hz
Confirmation that the Generating Unit does not re-connect.	No reconnection	No reconnection	No reconnection	No reconnection

Appendix C Type Test Verification Report

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

Nr. PVGB2306WDG0281-1

Protection. Frequency change, Stability test.

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

Limited Frequency Sensitive Mode – Over Frequency

1-min mean value [Hz]:	a) 50,00	b) 50,45	c) 50,70	d) 51,15	e) 50,70	f) 50,45	g) 50,00
1. Measurement a) to g): Active power output > 80% P _n							
Frequency [Hz]:	50,00	50,45	50,70	51,15	50,70	50,45	50,00
P _{expected} [kW]:	N/A	9,90	9,40	8,50	9,40	9,90	N/A
P _{measured} [kW]:	10,03	10,03	9,46	8,55	9,46	10,03	10,03
2. Measurement a) to g): Active power output 40% and 60% after freezing > 80% P _n							
Frequency [Hz]:	50,00	50,45	50,70	51,15	50,70	50,45	50,00
P _{expected} [kW]:	N/A	4,90	4,40	3,50	4,40	4,90	N/A
P _{measured} [kW]:	4,99	4,96	4,46	3,55	4,46	4,96	10,01

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	49,50	47,50
Active power [W]:	9,99	10,00	10,01
ΔP/P _{max} [%]:			0,10

Note.

No Power reduction takes place for electronic inverter.

Appendix C Type Test Verification Report

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

Nr. PVGB2306WDG0281-1

Power Quality. Harmonics.

ASW05kH-T2

Phase 1

SSEG rating per phase (rpp)			1,67kW			
	At 45-55% of rated outputs 2,5kW		100% of rated output 5,0kW			
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	0,022	0,310	0,041	0,566	1,080	
3rd	0,017	0,236	0,017	0,238	2,300	
4th	0,116	1,604	0,141	1,944	0,430	
5th	0,116	1,608	0,133	1,831	1,140	
6th	0,009	0,126	0,014	0,188	0,300	
7th	0,029	0,404	0,056	0,769	0,770	
8th	0,057	0,791	0,021	0,288	0,230	
9th	0,007	0,100	0,010	0,138	0,400	
10th	0,058	0,805	0,025	0,346	0,184	
11th	0,065	0,890	0,129	1,786	0,330	
12th	0,008	0,114	0,009	0,119	0,153	
13th	0,029	0,405	0,069	0,952	0,210	
14th	0,023	0,313	0,055	0,764	0,131	
15th	0,009	0,123	0,011	0,149	0,150	
16th	0,043	0,600	0,050	0,687	0,115	
17th	0,034	0,470	0,058	0,804	0,132	
18th	0,007	0,095	0,004	0,060	0,102	
19th	0,035	0,483	0,092	1,269	0,118	
20th	0,006	0,087	0,018	0,242	0,092	
21th	0,005	0,064	0,007	0,101	0,107	0,160
22th	0,015	0,204	0,025	0,347	0,084	
23th	0,031	0,427	0,038	0,519	0,098	0,147
24th	0,005	0,069	0,005	0,067	0,077	
25th	0,041	0,562	0,037	0,511	0,090	0,135
26th	0,028	0,386	0,031	0,422	0,071	
27th	0,007	0,098	0,006	0,087	0,083	0,124
28th	0,005	0,064	0,045	0,619	0,066	
29th	0,015	0,206	0,028	0,383	0,078	0,117
30th	0,006	0,083	0,006	0,081	0,061	
31th	0,064	0,888	0,023	0,312	0,073	0,109
32th	0,014	0,193	0,018	0,244	0,058	
33th	0,006	0,083	0,006	0,080	0,068	0,102
34th	0,029	0,404	0,011	0,147	0,054	
35th	0,031	0,425	0,010	0,145	0,064	0,096
36th	0,005	0,067	0,004	0,056	0,051	
37th	0,030	0,417	0,027	0,370	0,061	0,091
38th	0,018	0,250	0,017	0,240	0,048	
39th	0,005	0,066	0,006	0,077	0,058	0,087
40th	0,004	0,051	0,033	0,452	0,046	

Note

The normal current is 7,264A 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

Nr. PVGB2306WDG0281-1

Power Quality. Harmonics.

ASW05kH-T2

Phase 2

SSEG rating per phase (rpp)			1,67 kW			
	At 45-55% of rated outputs 2,5kW		100% of rated output 5,0kW			
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	0,063	0,865	0,087	1,201	1,080	
3rd	0,024	0,331	0,038	0,522	2,300	
4th	0,125	1,728	0,150	2,073	0,430	
5th	0,118	1,629	0,136	1,871	1,140	
6th	0,006	0,080	0,006	0,088	0,300	
7th	0,027	0,379	0,054	0,751	0,770	
8th	0,059	0,813	0,020	0,272	0,230	
9th	0,014	0,186	0,009	0,127	0,400	
10th	0,061	0,847	0,030	0,413	0,184	
11th	0,066	0,909	0,115	1,580	0,330	
12th	0,010	0,134	0,005	0,076	0,153	
13th	0,027	0,371	0,075	1,035	0,210	
14th	0,022	0,308	0,055	0,755	0,131	
15th	0,013	0,175	0,009	0,129	0,150	
16th	0,046	0,632	0,052	0,721	0,115	
17th	0,035	0,483	0,059	0,809	0,132	
18th	0,006	0,087	0,004	0,057	0,102	
19th	0,043	0,600	0,096	1,323	0,118	
20th	0,007	0,099	0,016	0,218	0,092	
21th	0,010	0,145	0,005	0,075	0,107	0,160
22th	0,017	0,238	0,027	0,377	0,084	
23th	0,027	0,376	0,033	0,455	0,098	0,147
24th	0,004	0,052	0,005	0,062	0,077	
25th	0,041	0,563	0,040	0,558	0,090	0,135
26th	0,022	0,304	0,029	0,400	0,071	
27th	0,007	0,093	0,005	0,072	0,083	0,124
28th	0,006	0,079	0,049	0,673	0,066	
29th	0,019	0,258	0,029	0,406	0,078	0,117
30th	0,007	0,094	0,004	0,057	0,061	
31th	0,067	0,925	0,024	0,331	0,073	0,109
32th	0,014	0,191	0,016	0,227	0,058	
33th	0,004	0,056	0,005	0,065	0,068	0,102
34th	0,028	0,385	0,014	0,189	0,054	
35th	0,032	0,435	0,007	0,101	0,064	0,096
36th	0,006	0,085	0,004	0,061	0,051	
37th	0,029	0,407	0,029	0,400	0,061	0,091
38th	0,014	0,200	0,019	0,263	0,048	
39th	0,007	0,091	0,009	0,120	0,058	0,087
40th	0,003	0,048	0,038	0,519	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

Nr. PVGB2306WDG0281-1

Power Quality. Harmonics.

ASW05kH-T2

Phase 3

SSEG rating per phase (rpp)			1,67 kW			
	At 45-55% of rated outputs 2,5kW		100% of rated output 5,0kW			
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	0,084	1,159	0,109	1,500	1,080	
3rd	0,032	0,448	0,037	0,504	2,300	
4th	0,127	1,749	0,146	2,014	0,430	
5th	0,117	1,618	0,134	1,843	1,140	
6th	0,010	0,136	0,009	0,128	0,300	
7th	0,028	0,387	0,056	0,772	0,770	
8th	0,048	0,664	0,010	0,140	0,230	
9th	0,010	0,133	0,007	0,090	0,400	
10th	0,065	0,891	0,032	0,447	0,184	
11th	0,056	0,774	0,125	1,732	0,330	
12th	0,005	0,072	0,006	0,083	0,153	
13th	0,029	0,398	0,072	1,000	0,210	
14th	0,025	0,351	0,053	0,731	0,131	
15th	0,005	0,066	0,008	0,112	0,150	
16th	0,051	0,710	0,048	0,656	0,115	
17th	0,019	0,260	0,067	0,921	0,132	
18th	0,007	0,101	0,003	0,045	0,102	
19th	0,038	0,527	0,092	1,276	0,118	
20th	0,007	0,090	0,019	0,260	0,092	
21th	0,006	0,080	0,004	0,061	0,107	0,160
22th	0,016	0,222	0,023	0,320	0,084	
23th	0,022	0,299	0,041	0,561	0,098	0,147
24th	0,006	0,078	0,004	0,060	0,077	
25th	0,043	0,591	0,037	0,512	0,090	0,135
26th	0,022	0,298	0,031	0,428	0,071	
27th	0,007	0,092	0,005	0,064	0,083	0,124
28th	0,005	0,063	0,047	0,649	0,066	
29th	0,016	0,225	0,034	0,472	0,078	0,117
30th	0,006	0,086	0,003	0,048	0,061	
31th	0,069	0,956	0,024	0,333	0,073	0,109
32th	0,010	0,141	0,018	0,251	0,058	
33th	0,005	0,062	0,004	0,052	0,068	0,102
34th	0,028	0,392	0,010	0,136	0,054	
35th	0,026	0,357	0,005	0,076	0,064	0,096
36th	0,005	0,071	0,004	0,054	0,051	
37th	0,029	0,404	0,026	0,356	0,061	0,091
38th	0,014	0,191	0,018	0,254	0,048	
39th	0,006	0,080	0,005	0,067	0,058	0,087
40th	0,003	0,044	0,036	0,491	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

Nr. PVGB2306WDG0281-1

Power Quality. Harmonics.

ASW05kH-T3

Phase 1

SSEG rating per phase (rpp)			1,67kW			
	At 45-55% of rated outputs 2,5kW		100% of rated output 5,0kW			
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	0,044	0,610	0,033	0,454	1,080	
3rd	0,033	0,449	0,003	0,046	2,300	
4th	0,110	1,524	0,028	0,383	0,430	
5th	0,122	1,686	0,110	1,515	1,140	
6th	0,006	0,082	0,007	0,095	0,300	
7th	0,051	0,706	0,040	0,557	0,770	
8th	0,055	0,764	0,011	0,155	0,230	
9th	0,005	0,073	0,010	0,143	0,400	
10th	0,042	0,580	0,008	0,113	0,184	
11th	0,136	1,871	0,074	1,019	0,330	
12th	0,003	0,046	0,004	0,051	0,153	
13th	0,038	0,525	0,086	1,189	0,210	
14th	0,013	0,181	0,007	0,101	0,131	
15th	0,004	0,052	0,006	0,088	0,150	
16th	0,008	0,116	0,009	0,126	0,115	
17th	0,024	0,330	0,012	0,165	0,132	
18th	0,004	0,053	0,002	0,027	0,102	
19th	0,040	0,547	0,029	0,401	0,118	
20th	0,019	0,268	0,005	0,067	0,092	
21th	0,005	0,063	0,002	0,033	0,107	0,160
22th	0,034	0,466	0,011	0,149	0,084	
23th	0,018	0,253	0,009	0,120	0,098	0,147
24th	0,005	0,064	0,001	0,020	0,077	
25th	0,031	0,433	0,027	0,370	0,090	0,135
26th	0,027	0,376	0,004	0,053	0,071	
27th	0,006	0,088	0,003	0,041	0,083	0,124
28th	0,031	0,421	0,011	0,153	0,066	
29th	0,020	0,271	0,006	0,082	0,078	0,117
30th	0,007	0,094	0,001	0,019	0,061	
31th	0,030	0,415	0,019	0,264	0,073	0,109
32th	0,023	0,319	0,005	0,064	0,058	
33th	0,006	0,084	0,003	0,037	0,068	0,102
34th	0,023	0,323	0,010	0,144	0,054	
35th	0,018	0,249	0,015	0,202	0,064	0,096
36th	0,006	0,077	0,002	0,026	0,051	
37th	0,011	0,153	0,029	0,398	0,061	0,091
38th	0,011	0,147	0,006	0,082	0,048	
39th	0,004	0,060	0,003	0,048	0,058	0,087
40th	0,010	0,139	0,008	0,115	0,046	

Note The normal current is 7,264A 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

Nr. PVGB2306WDG0281-1

Power Quality. Harmonics.

ASW05kH-T3

Phase 2

SSEG rating per phase (rpp)			1,67kW			
	At 45-55% of rated outputs 2,5kW		100% of rated output 5,0kW			
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	0,057	0,782	0,030	0,420	1,080	
3rd	0,023	0,317	0,009	0,119	2,300	
4th	0,119	1,640	0,032	0,441	0,430	
5th	0,121	1,668	0,107	1,476	1,140	
6th	0,009	0,119	0,003	0,042	0,300	
7th	0,048	0,666	0,040	0,556	0,770	
8th	0,063	0,864	0,007	0,101	0,230	
9th	0,012	0,160	0,006	0,090	0,400	
10th	0,042	0,578	0,010	0,145	0,184	
11th	0,134	1,842	0,085	1,176	0,330	
12th	0,006	0,076	0,002	0,024	0,153	
13th	0,036	0,495	0,082	1,138	0,210	
14th	0,015	0,205	0,004	0,052	0,131	
15th	0,004	0,054	0,005	0,064	0,150	
16th	0,010	0,138	0,008	0,117	0,115	
17th	0,026	0,355	0,017	0,240	0,132	
18th	0,004	0,049	0,001	0,020	0,102	
19th	0,040	0,549	0,028	0,385	0,118	
20th	0,018	0,250	0,003	0,043	0,092	
21th	0,005	0,071	0,002	0,034	0,107	0,160
22th	0,033	0,453	0,010	0,145	0,084	
23th	0,013	0,184	0,012	0,167	0,098	0,147
24th	0,005	0,064	0,001	0,019	0,077	
25th	0,028	0,393	0,027	0,379	0,090	0,135
26th	0,030	0,408	0,004	0,056	0,071	
27th	0,006	0,082	0,003	0,041	0,083	0,124
28th	0,030	0,415	0,011	0,148	0,066	
29th	0,023	0,311	0,009	0,125	0,078	0,117
30th	0,005	0,075	0,001	0,018	0,061	
31th	0,031	0,421	0,019	0,266	0,073	0,109
32th	0,026	0,365	0,005	0,071	0,058	
33th	0,006	0,080	0,003	0,043	0,068	0,102
34th	0,023	0,321	0,010	0,134	0,054	
35th	0,018	0,251	0,013	0,177	0,064	0,096
36th	0,005	0,070	0,001	0,017	0,051	
37th	0,011	0,152	0,026	0,363	0,061	0,091
38th	0,013	0,175	0,005	0,076	0,048	
39th	0,005	0,064	0,001	0,018	0,058	0,087
40th	0,010	0,143	0,007	0,101	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

Nr. PVGB2306WDG0281-1

Power Quality. Harmonics.

ASW05kH-T3

Phase 3

SSEG rating per phase (rpp)						
	At 45-55% of rated outputs 2,5kW		100% of rated output 5,0kW			
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	0,085	0,084	0,032	0,444	1,080	
3rd	0,041	0,032	0,011	0,149	2,300	
4th	0,122	0,127	0,030	0,415	0,430	
5th	0,119	0,117	0,108	1,485	1,140	
6th	0,014	0,010	0,005	0,069	0,300	
7th	0,049	0,028	0,040	0,546	0,770	
8th	0,060	0,048	0,005	0,073	0,230	
9th	0,009	0,010	0,003	0,047	0,400	
10th	0,043	0,065	0,011	0,146	0,184	
11th	0,130	0,056	0,079	1,097	0,330	
12th	0,005	0,005	0,003	0,043	0,153	
13th	0,039	0,029	0,081	1,114	0,210	
14th	0,017	0,025	0,005	0,070	0,131	
15th	0,004	0,005	0,002	0,034	0,150	
16th	0,009	0,051	0,009	0,128	0,115	
17th	0,023	0,019	0,018	0,246	0,132	
18th	0,004	0,007	0,002	0,024	0,102	
19th	0,039	0,038	0,027	0,378	0,118	
20th	0,019	0,007	0,004	0,062	0,092	
21th	0,005	0,006	0,002	0,024	0,107	0,160
22th	0,033	0,016	0,010	0,141	0,084	
23th	0,017	0,022	0,013	0,174	0,098	0,147
24th	0,005	0,006	0,001	0,020	0,077	
25th	0,029	0,043	0,026	0,357	0,090	0,135
26th	0,028	0,022	0,004	0,056	0,071	
27th	0,007	0,007	0,003	0,037	0,083	0,124
28th	0,030	0,005	0,011	0,152	0,066	
29th	0,016	0,016	0,007	0,095	0,078	0,117
30th	0,006	0,006	0,001	0,020	0,061	
31th	0,032	0,069	0,020	0,281	0,073	0,109
32th	0,024	0,010	0,004	0,052	0,058	
33th	0,006	0,005	0,003	0,045	0,068	0,102
34th	0,023	0,028	0,010	0,137	0,054	
35th	0,018	0,026	0,012	0,166	0,064	0,096
36th	0,005	0,005	0,001	0,018	0,051	
37th	0,010	0,029	0,028	0,389	0,061	0,091
38th	0,012	0,014	0,004	0,058	0,048	
39th	0,005	0,006	0,003	0,040	0,058	0,087
40th	0,009	0,003	0,007	0,101	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

Nr. PVGB2306WDG0281-1

Power Quality. Harmonics.

ASW06kH-T2

Phase 1

SSEG rating per phase (rpp)			2,00kW			
	At 45-55% of rated outputs 3,0kW		100% of rated output 6,0kW			
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	0,043	0,492	0,058	0,665	1,080	
3rd	0,014	0,159	0,025	0,288	2,300	
4th	0,018	0,210	0,023	0,266	0,430	
5th	0,110	1,260	0,124	1,421	1,140	
6th	0,011	0,123	0,011	0,128	0,300	
7th	0,027	0,305	0,038	0,440	0,770	
8th	0,009	0,101	0,012	0,138	0,230	
9th	0,010	0,111	0,013	0,155	0,400	
10th	0,007	0,083	0,005	0,054	0,184	
11th	0,016	0,180	0,102	1,172	0,330	
12th	0,002	0,025	0,006	0,070	0,153	
13th	0,024	0,277	0,095	1,091	0,210	
14th	0,008	0,093	0,009	0,108	0,131	
15th	0,005	0,060	0,009	0,107	0,150	
16th	0,010	0,113	0,007	0,083	0,115	
17th	0,019	0,214	0,025	0,292	0,132	
18th	0,005	0,057	0,003	0,039	0,102	
19th	0,020	0,232	0,025	0,291	0,118	
20th	0,005	0,060	0,007	0,078	0,092	
21th	0,008	0,092	0,005	0,057	0,107	0,160
22th	0,008	0,093	0,010	0,111	0,084	
23th	0,027	0,308	0,013	0,149	0,098	0,147
24th	0,004	0,047	0,002	0,025	0,077	
25th	0,051	0,582	0,025	0,290	0,090	0,135
26th	0,005	0,058	0,004	0,051	0,071	
27th	0,004	0,043	0,003	0,032	0,083	0,124
28th	0,011	0,125	0,010	0,115	0,066	
29th	0,019	0,224	0,010	0,111	0,078	0,117
30th	0,002	0,018	0,001	0,017	0,061	
31th	0,042	0,488	0,027	0,309	0,073	0,109
32th	0,006	0,063	0,003	0,038	0,058	
33th	0,002	0,021	0,002	0,024	0,068	0,102
34th	0,010	0,112	0,008	0,094	0,054	
35th	0,017	0,200	0,010	0,111	0,064	0,096
36th	0,003	0,030	0,002	0,018	0,051	
37th	0,035	0,399	0,018	0,209	0,061	0,091
38th	0,005	0,056	0,003	0,034	0,048	
39th	0,004	0,051	0,002	0,022	0,058	0,087
40th	0,008	0,097	0,006	0,065	0,046	

Note The normal current is 8,696A. 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

Nr. PVGB2306WDG0281-1

Power Quality. Harmonics.

ASW06kH-T2

Phase 2

SSEG rating per phase (rpp)			2,00kW			
	At 45-55% of rated outputs 3,0kW		100% of rated output 6,0kW			
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	0,038	0,440	0,039	0,448	1,080	
3rd	0,030	0,344	0,045	0,518	2,300	
4th	0,025	0,287	0,030	0,346	0,430	
5th	0,111	1,276	0,126	1,445	1,140	
6th	0,003	0,030	0,003	0,036	0,300	
7th	0,024	0,279	0,038	0,435	0,770	
8th	0,004	0,043	0,009	0,105	0,230	
9th	0,016	0,186	0,013	0,155	0,400	
10th	0,006	0,066	0,008	0,097	0,184	
11th	0,007	0,076	0,090	1,034	0,330	
12th	0,003	0,033	0,003	0,029	0,153	
13th	0,029	0,330	0,102	1,172	0,210	
14th	0,007	0,085	0,006	0,067	0,131	
15th	0,008	0,088	0,011	0,127	0,150	
16th	0,014	0,156	0,007	0,084	0,115	
17th	0,008	0,091	0,016	0,187	0,132	
18th	0,004	0,043	0,002	0,021	0,102	
19th	0,026	0,300	0,030	0,341	0,118	
20th	0,005	0,053	0,004	0,041	0,092	
21th	0,012	0,141	0,007	0,079	0,107	0,160
22th	0,006	0,073	0,009	0,104	0,084	
23th	0,022	0,254	0,010	0,119	0,098	0,147
24th	0,003	0,032	0,002	0,019	0,077	
25th	0,056	0,642	0,028	0,322	0,090	0,135
26th	0,003	0,030	0,003	0,031	0,071	
27th	0,007	0,086	0,003	0,035	0,083	0,124
28th	0,011	0,130	0,010	0,115	0,066	
29th	0,019	0,217	0,009	0,101	0,078	0,117
30th	0,002	0,020	0,002	0,019	0,061	
31th	0,042	0,488	0,028	0,323	0,073	0,109
32th	0,004	0,047	0,003	0,039	0,058	
33th	0,003	0,030	0,002	0,025	0,068	0,102
34th	0,009	0,104	0,009	0,105	0,054	
35th	0,024	0,273	0,008	0,097	0,064	0,096
36th	0,002	0,025	0,002	0,019	0,051	
37th	0,035	0,405	0,018	0,207	0,061	0,091
38th	0,005	0,053	0,004	0,050	0,048	
39th	0,006	0,070	0,002	0,028	0,058	0,087
40th	0,008	0,096	0,006	0,072	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

Nr. PVGB2306WDG0281-1

Power Quality. Harmonics.

ASW06kH-T2

Phase 3

SSEG rating per phase (rpp)			2,00kW			
	At 45-55% of rated outputs 3,0kW		100% of rated output 6,0kW			
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	0,080	0,919	0,096	1,098	1,080	
3rd	0,035	0,401	0,037	0,421	2,300	
4th	0,026	0,296	0,027	0,312	0,430	
5th	0,110	1,270	0,124	1,427	1,140	
6th	0,010	0,111	0,009	0,101	0,300	
7th	0,026	0,294	0,039	0,452	0,770	
8th	0,007	0,077	0,004	0,041	0,230	
9th	0,007	0,079	0,004	0,049	0,400	
10th	0,005	0,062	0,008	0,096	0,184	
11th	0,011	0,129	0,099	1,135	0,330	
12th	0,003	0,030	0,005	0,054	0,153	
13th	0,027	0,308	0,105	1,203	0,210	
14th	0,007	0,085	0,004	0,046	0,131	
15th	0,004	0,045	0,006	0,064	0,150	
16th	0,012	0,142	0,009	0,104	0,115	
17th	0,011	0,124	0,021	0,241	0,132	
18th	0,004	0,050	0,003	0,030	0,102	
19th	0,022	0,251	0,030	0,346	0,118	
20th	0,002	0,028	0,004	0,049	0,092	
21th	0,004	0,044	0,004	0,051	0,107	0,160
22th	0,009	0,106	0,010	0,111	0,084	
23th	0,012	0,139	0,008	0,094	0,098	0,147
24th	0,003	0,040	0,002	0,020	0,077	
25th	0,055	0,634	0,027	0,312	0,090	0,135
26th	0,004	0,040	0,004	0,044	0,071	
27th	0,006	0,064	0,003	0,035	0,083	0,124
28th	0,010	0,116	0,010	0,110	0,066	
29th	0,018	0,203	0,008	0,088	0,078	0,117
30th	0,002	0,021	0,002	0,018	0,061	
31th	0,044	0,504	0,028	0,324	0,073	0,109
32th	0,004	0,050	0,003	0,040	0,058	
33th	0,003	0,034	0,002	0,024	0,068	0,102
34th	0,010	0,113	0,009	0,100	0,054	
35th	0,018	0,204	0,010	0,116	0,064	0,096
36th	0,002	0,025	0,002	0,020	0,051	
37th	0,036	0,419	0,017	0,200	0,061	0,091
38th	0,004	0,051	0,004	0,042	0,048	
39th	0,004	0,049	0,002	0,020	0,058	0,087
40th	0,007	0,082	0,006	0,074	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

Nr. PVGB2306WDG0281-1

Power Quality. Harmonics.

ASW06kH-T3

Phase 1

SSEG rating per phase (rpp)			2,00kW			
	At 45-55% of rated outputs 3,0kW		100% of rated output 6,0kW			
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	0,051	0,583	0,038	0,436	1,080	
3rd	0,033	0,376	0,007	0,078	2,300	
4th	0,116	1,336	0,027	0,313	0,430	
5th	0,125	1,433	0,113	1,300	1,140	
6th	0,007	0,085	0,006	0,070	0,300	
7th	0,055	0,627	0,040	0,465	0,770	
8th	0,053	0,611	0,012	0,136	0,230	
9th	0,006	0,065	0,010	0,118	0,400	
10th	0,044	0,500	0,008	0,087	0,184	
11th	0,177	2,032	0,096	1,099	0,330	
12th	0,004	0,049	0,004	0,043	0,153	
13th	0,045	0,516	0,119	1,370	0,210	
14th	0,016	0,184	0,007	0,086	0,131	
15th	0,004	0,045	0,008	0,093	0,150	
16th	0,007	0,084	0,009	0,103	0,115	
17th	0,019	0,217	0,017	0,198	0,132	
18th	0,005	0,053	0,002	0,027	0,102	
19th	0,031	0,356	0,037	0,423	0,118	
20th	0,015	0,171	0,006	0,065	0,092	
21th	0,005	0,057	0,004	0,048	0,107	0,160
22th	0,030	0,343	0,010	0,115	0,084	
23th	0,025	0,288	0,010	0,120	0,098	0,147
24th	0,006	0,066	0,002	0,023	0,077	
25th	0,034	0,387	0,034	0,390	0,090	0,135
26th	0,027	0,307	0,004	0,049	0,071	
27th	0,006	0,066	0,002	0,026	0,083	0,124
28th	0,032	0,365	0,010	0,114	0,066	
29th	0,023	0,264	0,010	0,113	0,078	0,117
30th	0,008	0,094	0,002	0,017	0,061	
31th	0,029	0,336	0,031	0,357	0,073	0,109
32th	0,028	0,318	0,004	0,051	0,058	
33th	0,007	0,085	0,002	0,020	0,068	0,102
34th	0,022	0,250	0,009	0,107	0,054	
35th	0,018	0,211	0,011	0,127	0,064	0,096
36th	0,006	0,068	0,001	0,016	0,051	
37th	0,010	0,120	0,021	0,240	0,061	0,091
38th	0,010	0,114	0,005	0,058	0,048	
39th	0,005	0,052	0,001	0,017	0,058	0,087
40th	0,011	0,121	0,008	0,088	0,046	

Note The normal current is 8,696A 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

Nr. PVGB2306WDG0281-1

Power Quality. Harmonics.

ASW06kH-T3

Phase 2

SSEG rating per phase (rpp)			2,00kW			
	At 45-55% of rated outputs 3,0kW		100% of rated output 6,0kW			
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	0,060	0,695	0,041	0,473	1,080	
3rd	0,024	0,277	0,010	0,120	2,300	
4th	0,127	1,463	0,032	0,366	0,430	
5th	0,123	1,420	0,110	1,270	1,140	
6th	0,009	0,104	0,002	0,027	0,300	
7th	0,051	0,589	0,039	0,452	0,770	
8th	0,064	0,737	0,007	0,082	0,230	
9th	0,017	0,196	0,005	0,061	0,400	
10th	0,042	0,478	0,010	0,111	0,184	
11th	0,176	2,020	0,108	1,239	0,330	
12th	0,004	0,046	0,002	0,021	0,153	
13th	0,042	0,486	0,115	1,318	0,210	
14th	0,015	0,175	0,004	0,050	0,131	
15th	0,004	0,047	0,005	0,054	0,150	
16th	0,008	0,091	0,008	0,095	0,115	
17th	0,020	0,229	0,024	0,277	0,132	
18th	0,004	0,048	0,002	0,018	0,102	
19th	0,032	0,373	0,035	0,402	0,118	
20th	0,016	0,190	0,003	0,034	0,092	
21th	0,005	0,058	0,003	0,032	0,107	0,160
22th	0,029	0,333	0,009	0,105	0,084	
23th	0,024	0,277	0,013	0,149	0,098	0,147
24th	0,005	0,062	0,001	0,017	0,077	
25th	0,030	0,347	0,033	0,380	0,090	0,135
26th	0,027	0,314	0,003	0,033	0,071	
27th	0,006	0,071	0,003	0,034	0,083	0,124
28th	0,031	0,355	0,009	0,109	0,066	
29th	0,025	0,290	0,011	0,127	0,078	0,117
30th	0,006	0,073	0,001	0,017	0,061	
31th	0,030	0,341	0,031	0,357	0,073	0,109
32th	0,031	0,358	0,004	0,043	0,058	
33th	0,006	0,071	0,002	0,029	0,068	0,102
34th	0,023	0,260	0,009	0,106	0,054	
35th	0,017	0,194	0,013	0,145	0,064	0,096
36th	0,006	0,064	0,001	0,014	0,051	
37th	0,010	0,111	0,020	0,235	0,061	0,091
38th	0,012	0,143	0,005	0,059	0,048	
39th	0,005	0,058	0,002	0,022	0,058	0,087
40th	0,010	0,120	0,007	0,078	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

Nr. PVGB2306WDG0281-1

Power Quality. Harmonics.

ASW06kH-T3

Phase 3

SSEG rating per phase (rpp)			2,00kW			
	At 45-55% of rated outputs 3,0kW		100% of rated output 6,0kW			
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	0,094	1,085	0,038	0,436	1,080	
3rd	0,041	0,466	0,013	0,153	2,300	
4th	0,129	1,481	0,030	0,344	0,430	
5th	0,121	1,392	0,111	1,273	1,140	
6th	0,015	0,177	0,006	0,071	0,300	
7th	0,053	0,604	0,039	0,450	0,770	
8th	0,060	0,692	0,005	0,063	0,230	
9th	0,014	0,163	0,004	0,046	0,400	
10th	0,042	0,480	0,011	0,121	0,184	
11th	0,165	1,893	0,102	1,173	0,330	
12th	0,004	0,044	0,003	0,040	0,153	
13th	0,046	0,524	0,112	1,291	0,210	
14th	0,016	0,186	0,004	0,047	0,131	
15th	0,004	0,049	0,003	0,039	0,150	
16th	0,008	0,089	0,010	0,111	0,115	
17th	0,017	0,196	0,024	0,273	0,132	
18th	0,004	0,051	0,002	0,027	0,102	
19th	0,032	0,373	0,034	0,393	0,118	
20th	0,019	0,215	0,004	0,047	0,092	
21th	0,005	0,056	0,002	0,020	0,107	0,160
22th	0,028	0,322	0,009	0,108	0,084	
23th	0,023	0,261	0,015	0,177	0,098	0,147
24th	0,005	0,063	0,002	0,018	0,077	
25th	0,031	0,353	0,033	0,375	0,090	0,135
26th	0,026	0,304	0,004	0,043	0,071	
27th	0,006	0,066	0,002	0,018	0,083	0,124
28th	0,033	0,376	0,009	0,108	0,066	
29th	0,019	0,217	0,012	0,144	0,078	0,117
30th	0,007	0,081	0,001	0,015	0,061	
31th	0,031	0,353	0,030	0,348	0,073	0,109
32th	0,025	0,289	0,004	0,046	0,058	
33th	0,008	0,089	0,002	0,025	0,068	0,102
34th	0,024	0,275	0,009	0,102	0,054	
35th	0,016	0,179	0,012	0,136	0,064	0,096
36th	0,006	0,065	0,001	0,016	0,051	
37th	0,009	0,104	0,022	0,248	0,061	0,091
38th	0,012	0,144	0,005	0,052	0,048	
39th	0,005	0,054	0,002	0,026	0,058	0,087
40th	0,011	0,126	0,007	0,080	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

Nr. PVGB2306WDG0281-1

Power Quality. Harmonics.

ASW08kH-T2

Phase 1

SSEG rating per phase (rpp)			2,67kW			
	At 45-55% of rated outputs 4,0kW		100% of rated output 8,0kW			
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	0,047	0,405	0,065	0,559	1,080	
3rd	0,019	0,163	0,030	0,258	2,300	
4th	0,021	0,179	0,024	0,210	0,430	
5th	0,115	0,992	0,132	1,140	1,140	
6th	0,012	0,099	0,011	0,093	0,300	
7th	0,032	0,278	0,039	0,336	0,770	
8th	0,011	0,092	0,010	0,089	0,230	
9th	0,014	0,123	0,012	0,103	0,400	
10th	0,006	0,051	0,003	0,026	0,184	
11th	0,050	0,430	0,128	1,103	0,330	
12th	0,004	0,037	0,006	0,053	0,153	
13th	0,031	0,267	0,131	1,126	0,210	
14th	0,007	0,062	0,008	0,069	0,131	
15th	0,005	0,041	0,008	0,072	0,150	
16th	0,010	0,083	0,006	0,049	0,115	
17th	0,015	0,127	0,042	0,363	0,132	
18th	0,002	0,017	0,004	0,036	0,102	
19th	0,018	0,153	0,054	0,462	0,118	
20th	0,005	0,043	0,008	0,065	0,092	
21th	0,004	0,033	0,006	0,053	0,107	0,160
22th	0,010	0,085	0,007	0,061	0,084	
23th	0,007	0,058	0,016	0,140	0,098	0,147
24th	0,003	0,029	0,003	0,027	0,077	
25th	0,007	0,064	0,021	0,180	0,090	0,135
26th	0,004	0,034	0,005	0,044	0,071	
27th	0,005	0,040	0,004	0,032	0,083	0,124
28th	0,009	0,075	0,009	0,081	0,066	
29th	0,010	0,082	0,010	0,088	0,078	0,117
30th	0,004	0,033	0,003	0,024	0,061	
31th	0,032	0,277	0,024	0,209	0,073	0,109
32th	0,004	0,038	0,005	0,040	0,058	
33th	0,003	0,024	0,002	0,020	0,068	0,102
34th	0,008	0,073	0,008	0,071	0,054	
35th	0,019	0,166	0,009	0,078	0,064	0,096
36th	0,003	0,022	0,002	0,017	0,051	
37th	0,033	0,288	0,026	0,225	0,061	0,091
38th	0,005	0,044	0,004	0,035	0,048	
39th	0,003	0,025	0,002	0,021	0,058	0,087
40th	0,007	0,061	0,006	0,056	0,046	

Note The normal current is 11,594A 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

Nr. PVGB2306WDG0281-1

Power Quality. Harmonics.

ASW08kH-T2

Phase 2

SSEG rating per phase (rpp)			2,67kW			
	At 45-55% of rated outputs 4,0kW		100% of rated output 8,0kW			
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	0,352	0,036	0,308	1,080	
3rd	0,039	0,336	0,049	0,422	2,300	
4th	0,029	0,251	0,031	0,267	0,430	
5th	0,117	1,005	0,135	1,162	1,140	
6th	0,002	0,021	0,003	0,022	0,300	
7th	0,031	0,270	0,038	0,331	0,770	
8th	0,007	0,064	0,009	0,080	0,230	
9th	0,016	0,142	0,009	0,079	0,400	
10th	0,006	0,051	0,006	0,052	0,184	
11th	0,037	0,319	0,119	1,026	0,330	
12th	0,002	0,018	0,003	0,022	0,153	
13th	0,037	0,323	0,137	1,179	0,210	
14th	0,004	0,031	0,005	0,046	0,131	
15th	0,008	0,067	0,009	0,081	0,150	
16th	0,009	0,080	0,007	0,064	0,115	
17th	0,009	0,077	0,033	0,284	0,132	
18th	0,002	0,018	0,002	0,020	0,102	
19th	0,020	0,172	0,057	0,496	0,118	
20th	0,005	0,044	0,005	0,046	0,092	
21th	0,005	0,043	0,008	0,065	0,107	0,160
22th	0,012	0,103	0,007	0,060	0,084	
23th	0,004	0,031	0,010	0,084	0,098	0,147
24th	0,003	0,024	0,002	0,017	0,077	
25th	0,008	0,070	0,024	0,208	0,090	0,135
26th	0,004	0,038	0,003	0,026	0,071	
27th	0,008	0,065	0,005	0,044	0,083	0,124
28th	0,008	0,070	0,009	0,078	0,066	
29th	0,015	0,126	0,009	0,081	0,078	0,117
30th	0,003	0,022	0,002	0,016	0,061	
31th	0,036	0,313	0,027	0,233	0,073	0,109
32th	0,004	0,034	0,004	0,031	0,058	
33th	0,007	0,064	0,003	0,027	0,068	0,102
34th	0,008	0,066	0,008	0,067	0,054	
35th	0,022	0,190	0,011	0,096	0,064	0,096
36th	0,002	0,014	0,002	0,015	0,051	
37th	0,035	0,298	0,028	0,241	0,061	0,091
38th	0,004	0,036	0,003	0,027	0,048	
39th	0,005	0,042	0,002	0,020	0,058	0,087
40th	0,008	0,066	0,007	0,058	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

Nr. PVGB2306WDG0281-1

Power Quality. Harmonics.

ASW08kH-T2

Phase 3

SSEG rating per phase (rpp)			2,67kW			
	At 45-55% of rated outputs 4,0kW		100% of rated output 8,0kW			
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	0,086	0,742	0,099	0,852	1,080	
3rd	0,037	0,316	0,037	0,318	2,300	
4th	0,029	0,246	0,027	0,236	0,430	
5th	0,115	0,994	0,133	1,148	1,140	
6th	0,010	0,090	0,010	0,084	0,300	
7th	0,033	0,286	0,039	0,338	0,770	
8th	0,004	0,033	0,003	0,022	0,230	
9th	0,004	0,034	0,004	0,034	0,400	
10th	0,008	0,073	0,006	0,053	0,184	
11th	0,049	0,424	0,125	1,078	0,330	
12th	0,004	0,033	0,005	0,042	0,153	
13th	0,038	0,328	0,139	1,198	0,210	
14th	0,006	0,054	0,003	0,026	0,131	
15th	0,005	0,044	0,005	0,046	0,150	
16th	0,008	0,072	0,008	0,073	0,115	
17th	0,012	0,108	0,037	0,323	0,132	
18th	0,002	0,019	0,004	0,031	0,102	
19th	0,020	0,175	0,058	0,502	0,118	
20th	0,005	0,044	0,003	0,025	0,092	
21th	0,002	0,019	0,005	0,042	0,107	0,160
22th	0,011	0,098	0,008	0,072	0,084	
23th	0,007	0,063	0,011	0,091	0,098	0,147
24th	0,003	0,027	0,003	0,022	0,077	
25th	0,005	0,044	0,024	0,205	0,090	0,135
26th	0,002	0,021	0,003	0,023	0,071	
27th	0,003	0,026	0,004	0,036	0,083	0,124
28th	0,010	0,086	0,009	0,081	0,066	
29th	0,005	0,044	0,005	0,045	0,078	0,117
30th	0,003	0,024	0,002	0,015	0,061	
31th	0,035	0,301	0,027	0,229	0,073	0,109
32th	0,002	0,018	0,003	0,024	0,058	
33th	0,004	0,032	0,003	0,030	0,068	0,102
34th	0,007	0,063	0,008	0,067	0,054	
35th	0,014	0,124	0,007	0,060	0,064	0,096
36th	0,002	0,014	0,002	0,013	0,051	
37th	0,036	0,311	0,028	0,238	0,061	0,091
38th	0,004	0,033	0,003	0,024	0,048	
39th	0,004	0,037	0,003	0,023	0,058	0,087
40th	0,007	0,060	0,006	0,055	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

Nr. PVGB2306WDG0281-1

Power Quality. Harmonics.

ASW08kH-T3

Phase 1

SSEG rating per phase (rpp)			2,67kW			
	At 45-55% of rated outputs 4,0kW		100% of rated output 8,0kW			
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	0,100	0,864	0,051	0,444	1,080	
3rd	0,040	0,349	0,013	0,116	2,300	
4th	0,133	1,150	0,029	0,249	0,430	
5th	0,126	1,083	0,121	1,044	1,140	
6th	0,012	0,102	0,003	0,025	0,300	
7th	0,057	0,493	0,042	0,359	0,770	
8th	0,059	0,506	0,008	0,071	0,230	
9th	0,016	0,136	0,008	0,068	0,400	
10th	0,036	0,308	0,007	0,063	0,184	
11th	0,202	1,741	0,120	1,036	0,330	
12th	0,006	0,053	0,002	0,021	0,153	
13th	0,083	0,716	0,159	1,376	0,210	
14th	0,015	0,128	0,007	0,059	0,131	
15th	0,010	0,083	0,009	0,077	0,150	
16th	0,019	0,161	0,008	0,069	0,115	
17th	0,020	0,170	0,031	0,265	0,132	
18th	0,005	0,044	0,002	0,019	0,102	
19th	0,023	0,201	0,062	0,536	0,118	
20th	0,022	0,191	0,006	0,048	0,092	
21th	0,005	0,047	0,006	0,052	0,107	0,160
22th	0,025	0,213	0,010	0,089	0,084	
23th	0,024	0,210	0,010	0,088	0,098	0,147
24th	0,005	0,046	0,002	0,017	0,077	
25th	0,021	0,179	0,032	0,276	0,090	0,135
26th	0,020	0,172	0,004	0,036	0,071	
27th	0,006	0,053	0,004	0,032	0,083	0,124
28th	0,027	0,229	0,011	0,092	0,066	
29th	0,015	0,127	0,010	0,084	0,078	0,117
30th	0,006	0,055	0,002	0,018	0,061	
31th	0,030	0,260	0,038	0,325	0,073	0,109
32th	0,022	0,187	0,005	0,039	0,058	
33th	0,006	0,051	0,002	0,020	0,068	0,102
34th	0,019	0,167	0,010	0,084	0,054	
35th	0,016	0,138	0,014	0,121	0,064	0,096
36th	0,006	0,049	0,002	0,017	0,051	
37th	0,013	0,109	0,034	0,294	0,061	0,091
38th	0,012	0,106	0,005	0,045	0,048	
39th	0,005	0,043	0,002	0,017	0,058	0,087
40th	0,011	0,093	0,007	0,064	0,046	

Note The normal current is 11,594A 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

Nr. PVGB2306WDG0281-1

Power Quality. Harmonics.

ASW08kH-T3

Phase 2

SSEG rating per phase (rpp)			2,67 kW			
	At 45-55% of rated outputs 4,0kW		100% of rated output 8,0kW			
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	0,050	0,433	0,051	0,442	1,080	
3rd	0,031	0,265	0,015	0,130	2,300	
4th	0,124	1,072	0,032	0,275	0,430	
5th	0,130	1,123	0,118	1,019	1,140	
6th	0,006	0,049	0,002	0,017	0,300	
7th	0,059	0,511	0,041	0,352	0,770	
8th	0,052	0,444	0,007	0,061	0,230	
9th	0,006	0,048	0,005	0,044	0,400	
10th	0,040	0,343	0,008	0,073	0,184	
11th	0,216	1,860	0,130	1,121	0,330	
12th	0,005	0,044	0,002	0,015	0,153	
13th	0,081	0,701	0,155	1,336	0,210	
14th	0,016	0,134	0,005	0,041	0,131	
15th	0,005	0,045	0,006	0,051	0,150	
16th	0,019	0,167	0,008	0,071	0,115	
17th	0,019	0,162	0,038	0,327	0,132	
18th	0,005	0,040	0,002	0,014	0,102	
19th	0,023	0,198	0,059	0,512	0,118	
20th	0,023	0,198	0,004	0,031	0,092	
21th	0,006	0,051	0,004	0,033	0,107	0,160
22th	0,026	0,225	0,010	0,085	0,084	
23th	0,024	0,205	0,014	0,120	0,098	0,147
24th	0,005	0,047	0,002	0,013	0,077	
25th	0,022	0,194	0,030	0,258	0,090	0,135
26th	0,021	0,183	0,003	0,025	0,071	
27th	0,006	0,052	0,003	0,029	0,083	0,124
28th	0,026	0,228	0,010	0,085	0,066	
29th	0,018	0,154	0,010	0,083	0,078	0,117
30th	0,006	0,056	0,002	0,014	0,061	
31th	0,031	0,266	0,037	0,316	0,073	0,109
32th	0,022	0,187	0,003	0,030	0,058	
33th	0,005	0,047	0,003	0,024	0,068	0,102
34th	0,019	0,161	0,009	0,081	0,054	
35th	0,017	0,147	0,013	0,109	0,064	0,096
36th	0,006	0,048	0,001	0,013	0,051	
37th	0,014	0,121	0,034	0,291	0,061	0,091
38th	0,011	0,098	0,004	0,037	0,048	
39th	0,004	0,039	0,004	0,031	0,058	0,087
40th	0,010	0,089	0,007	0,060	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

Nr. PVGB2306WDG0281-1

Power Quality. Harmonics.

ASW08kH-T3

Phase 3

SSEG rating per phase (rpp)			2,67kW			
	At 45-55% of rated outputs 4,0kW		100% of rated output 8,0kW			
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	0,062	0,539	0,049	0,420	1,080	
3rd	0,027	0,230	0,019	0,165	2,300	
4th	0,132	1,142	0,031	0,265	0,430	
5th	0,130	1,120	0,119	1,028	1,140	
6th	0,008	0,070	0,003	0,027	0,300	
7th	0,056	0,481	0,040	0,347	0,770	
8th	0,063	0,545	0,005	0,044	0,230	
9th	0,018	0,154	0,005	0,045	0,400	
10th	0,037	0,316	0,008	0,073	0,184	
11th	0,216	1,866	0,126	1,089	0,330	
12th	0,005	0,041	0,002	0,021	0,153	
13th	0,077	0,664	0,153	1,316	0,210	
14th	0,018	0,152	0,005	0,043	0,131	
15th	0,008	0,066	0,005	0,043	0,150	
16th	0,018	0,159	0,009	0,076	0,115	
17th	0,021	0,181	0,037	0,316	0,132	
18th	0,005	0,040	0,002	0,020	0,102	
19th	0,024	0,207	0,059	0,506	0,118	
20th	0,022	0,185	0,004	0,033	0,092	
21th	0,005	0,044	0,003	0,023	0,107	0,160
22th	0,025	0,212	0,010	0,090	0,084	
23th	0,023	0,195	0,016	0,137	0,098	0,147
24th	0,005	0,046	0,002	0,016	0,077	
25th	0,021	0,183	0,030	0,261	0,090	0,135
26th	0,023	0,199	0,003	0,028	0,071	
27th	0,006	0,051	0,002	0,017	0,083	0,124
28th	0,025	0,218	0,010	0,089	0,066	
29th	0,017	0,144	0,013	0,115	0,078	0,117
30th	0,006	0,050	0,002	0,013	0,061	
31th	0,029	0,247	0,036	0,312	0,073	0,109
32th	0,024	0,206	0,003	0,029	0,058	
33th	0,006	0,050	0,002	0,014	0,068	0,102
34th	0,018	0,157	0,009	0,080	0,054	
35th	0,019	0,160	0,016	0,140	0,064	0,096
36th	0,005	0,047	0,001	0,011	0,051	
37th	0,012	0,106	0,034	0,290	0,061	0,091
38th	0,013	0,110	0,004	0,038	0,048	
39th	0,005	0,040	0,002	0,013	0,058	0,087
40th	0,011	0,091	0,007	0,059	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

Nr. PVGB2306WDG0281-1

Power Quality. Harmonics.

ASW10kH-T2

Phase 1

SSEG rating per phase (rpp)			3,33kW			
	At 45-55% of rated outputs 5,0kW		100% of rated output 10,0kW			
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	0,053	0,364	0,035	0,243	1,080	
3rd	0,023	0,155	0,033	0,230	2,300	
4th	0,023	0,162	0,143	0,984	0,430	
5th	0,119	0,821	0,149	1,027	1,140	
6th	0,010	0,068	0,010	0,067	0,300	
7th	0,036	0,250	0,040	0,279	0,770	
8th	0,011	0,078	0,087	0,603	0,230	
9th	0,013	0,087	0,012	0,081	0,400	
10th	0,006	0,039	0,063	0,436	0,184	
11th	0,079	0,548	0,196	1,350	0,330	
12th	0,005	0,035	0,004	0,028	0,153	
13th	0,063	0,434	0,121	0,837	0,210	
14th	0,008	0,057	0,040	0,275	0,131	
15th	0,008	0,053	0,009	0,065	0,150	
16th	0,009	0,061	0,026	0,182	0,115	
17th	0,018	0,121	0,038	0,259	0,132	
18th	0,002	0,016	0,008	0,058	0,102	
19th	0,020	0,141	0,076	0,527	0,118	
20th	0,005	0,037	0,009	0,065	0,092	
21th	0,003	0,022	0,003	0,024	0,107	0,160
22th	0,011	0,074	0,021	0,147	0,084	
23th	0,012	0,084	0,015	0,101	0,098	0,147
24th	0,002	0,011	0,005	0,035	0,077	
25th	0,025	0,170	0,037	0,256	0,090	0,135
26th	0,004	0,025	0,024	0,165	0,071	
27th	0,003	0,019	0,006	0,041	0,083	0,124
28th	0,010	0,070	0,017	0,118	0,066	
29th	0,007	0,049	0,022	0,152	0,078	0,117
30th	0,002	0,014	0,003	0,019	0,061	
31th	0,016	0,110	0,036	0,249	0,073	0,109
32th	0,003	0,023	0,015	0,102	0,058	
33th	0,003	0,018	0,005	0,036	0,068	0,102
34th	0,008	0,057	0,024	0,168	0,054	
35th	0,005	0,036	0,017	0,115	0,064	0,096
36th	0,003	0,018	0,005	0,034	0,051	
37th	0,020	0,138	0,016	0,114	0,061	0,091
38th	0,004	0,027	0,008	0,055	0,048	
39th	0,001	0,009	0,003	0,024	0,058	0,087
40th	0,007	0,046	0,009	0,060	0,046	

Note The normal current is 11,594A 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

Nr. PVGB2306WDG0281-1

Power Quality. Harmonics.

ASW10kH-T2

Phase 2

SSEG rating per phase (rpp)			3,33kW			
	At 45-55% of rated outputs 5,0kW		100% of rated output 10,0kW			
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	0,040	0,279	0,082	0,563	1,080	
3rd	0,042	0,290	0,047	0,325	2,300	
4th	0,030	0,204	0,150	1,038	0,430	
5th	0,121	0,836	0,151	1,045	1,140	
6th	0,003	0,021	0,004	0,028	0,300	
7th	0,036	0,245	0,040	0,275	0,770	
8th	0,008	0,058	0,094	0,649	0,230	
9th	0,013	0,091	0,010	0,067	0,400	
10th	0,009	0,059	0,060	0,411	0,184	
11th	0,066	0,457	0,187	1,292	0,330	
12th	0,002	0,014	0,004	0,024	0,153	
13th	0,069	0,479	0,130	0,899	0,210	
14th	0,004	0,030	0,030	0,205	0,131	
15th	0,010	0,071	0,012	0,080	0,150	
16th	0,008	0,054	0,025	0,170	0,115	
17th	0,011	0,076	0,036	0,248	0,132	
18th	0,002	0,011	0,007	0,045	0,102	
19th	0,025	0,170	0,080	0,549	0,118	
20th	0,004	0,026	0,008	0,054	0,092	
21th	0,004	0,027	0,003	0,023	0,107	0,160
22th	0,011	0,074	0,027	0,183	0,084	
23th	0,009	0,059	0,014	0,100	0,098	0,147
24th	0,002	0,012	0,005	0,033	0,077	
25th	0,026	0,179	0,038	0,259	0,090	0,135
26th	0,004	0,026	0,027	0,185	0,071	
27th	0,003	0,022	0,007	0,052	0,083	0,124
28th	0,011	0,075	0,016	0,109	0,066	
29th	0,004	0,029	0,016	0,113	0,078	0,117
30th	0,002	0,013	0,003	0,019	0,061	
31th	0,015	0,106	0,038	0,265	0,073	0,109
32th	0,004	0,030	0,011	0,079	0,058	
33th	0,005	0,032	0,007	0,045	0,068	0,102
34th	0,008	0,059	0,022	0,153	0,054	
35th	0,011	0,079	0,017	0,119	0,064	0,096
36th	0,002	0,012	0,004	0,028	0,051	
37th	0,023	0,156	0,021	0,148	0,061	0,091
38th	0,005	0,031	0,005	0,037	0,048	
39th	0,005	0,034	0,004	0,025	0,058	0,087
40th	0,006	0,043	0,010	0,070	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

Nr. PVGB2306WDG0281-1

Power Quality. Harmonics.

ASW10kH-T2

Phase 3

SSEG rating per phase (rpp)			3,33kW			
	At 45-55% of rated outputs 5,0kW		100% of rated output 10,0kW			
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	0,092	0,635	0,111	0,765	1,080	
3rd	0,037	0,257	0,035	0,243	2,300	
4th	0,028	0,196	0,144	0,996	0,430	
5th	0,120	0,825	0,149	1,029	1,140	
6th	0,008	0,054	0,009	0,061	0,300	
7th	0,037	0,254	0,040	0,279	0,770	
8th	0,004	0,025	0,088	0,606	0,230	
9th	0,003	0,023	0,005	0,036	0,400	
10th	0,009	0,063	0,060	0,415	0,184	
11th	0,076	0,527	0,193	1,334	0,330	
12th	0,004	0,030	0,006	0,039	0,153	
13th	0,071	0,492	0,126	0,868	0,210	
14th	0,005	0,036	0,039	0,269	0,131	
15th	0,005	0,037	0,006	0,039	0,150	
16th	0,009	0,064	0,026	0,181	0,115	
17th	0,014	0,095	0,036	0,246	0,132	
18th	0,002	0,012	0,004	0,025	0,102	
19th	0,023	0,159	0,085	0,589	0,118	
20th	0,005	0,035	0,011	0,078	0,092	
21th	0,003	0,022	0,004	0,031	0,107	0,160
22th	0,010	0,072	0,026	0,177	0,084	
23th	0,011	0,073	0,005	0,037	0,098	0,147
24th	0,002	0,013	0,004	0,029	0,077	
25th	0,026	0,182	0,036	0,251	0,090	0,135
26th	0,004	0,029	0,021	0,146	0,071	
27th	0,002	0,013	0,004	0,029	0,083	0,124
28th	0,011	0,073	0,015	0,101	0,066	
29th	0,009	0,059	0,022	0,155	0,078	0,117
30th	0,002	0,016	0,003	0,021	0,061	
31th	0,015	0,102	0,037	0,254	0,073	0,109
32th	0,003	0,024	0,016	0,113	0,058	
33th	0,002	0,016	0,004	0,026	0,068	0,102
34th	0,009	0,062	0,023	0,158	0,054	
35th	0,010	0,072	0,015	0,103	0,064	0,096
36th	0,002	0,013	0,003	0,018	0,051	
37th	0,021	0,143	0,021	0,142	0,061	0,091
38th	0,003	0,022	0,007	0,046	0,048	
39th	0,001	0,010	0,004	0,026	0,058	0,087
40th	0,006	0,044	0,011	0,079	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

Nr. PVGB2306WDG0281-1

Power Quality. Harmonics.

ASW10kH-T3

Phase 1

SSEG rating per phase (rpp)			3,33kW			
	At 45-55% of rated outputs 5,0kW		100% of rated output 10,0kW			
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	0,105	0,723	0,070	0,485	1,080	
3rd	0,038	0,264	0,018	0,123	2,300	
4th	0,130	0,898	0,029	0,201	0,430	
5th	0,129	0,887	0,134	0,928	1,140	
6th	0,013	0,091	0,003	0,020	0,300	
7th	0,064	0,440	0,037	0,258	0,770	
8th	0,019	0,129	0,007	0,050	0,230	
9th	0,014	0,096	0,008	0,054	0,400	
10th	0,030	0,209	0,006	0,039	0,184	
11th	0,143	0,987	0,137	0,947	0,330	
12th	0,007	0,047	0,003	0,017	0,153	
13th	0,182	1,253	0,178	1,227	0,210	
14th	0,035	0,242	0,007	0,049	0,131	
15th	0,012	0,083	0,009	0,063	0,150	
16th	0,035	0,240	0,008	0,055	0,115	
17th	0,101	0,696	0,044	0,304	0,132	
18th	0,004	0,030	0,002	0,015	0,102	
19th	0,047	0,327	0,085	0,589	0,118	
20th	0,018	0,122	0,006	0,039	0,092	
21th	0,006	0,041	0,007	0,048	0,107	0,160
22th	0,021	0,144	0,009	0,064	0,084	
23th	0,027	0,186	0,013	0,087	0,098	0,147
24th	0,004	0,030	0,002	0,015	0,077	
25th	0,028	0,192	0,040	0,274	0,090	0,135
26th	0,023	0,158	0,004	0,029	0,071	
27th	0,004	0,029	0,005	0,035	0,083	0,124
28th	0,024	0,169	0,010	0,072	0,066	
29th	0,028	0,194	0,008	0,055	0,078	0,117
30th	0,004	0,027	0,002	0,014	0,061	
31th	0,021	0,145	0,034	0,233	0,073	0,109
32th	0,014	0,096	0,004	0,030	0,058	
33th	0,004	0,030	0,004	0,026	0,068	0,102
34th	0,023	0,160	0,010	0,070	0,054	
35th	0,020	0,136	0,013	0,088	0,064	0,096
36th	0,004	0,028	0,002	0,016	0,051	
37th	0,025	0,171	0,038	0,260	0,061	0,091
38th	0,018	0,124	0,005	0,035	0,048	
39th	0,005	0,035	0,003	0,020	0,058	0,087
40th	0,015	0,103	0,008	0,058	0,046	

Note The normal current is 14, 493A.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

Nr. PVGB2306WDG0281-1

Power Quality. Harmonics.

ASW10kH-T3

Phase 2

SSEG rating per phase (rpp)			3,33kW			
	At 45-55% of rated outputs 5,0kW		100% of rated output 10,0kW			
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	0,054	0,370	0,052	0,362	1,080	
3rd	0,030	0,207	0,018	0,122	2,300	
4th	0,124	0,853	0,032	0,220	0,430	
5th	0,132	0,910	0,131	0,906	1,140	
6th	0,007	0,049	0,002	0,014	0,300	
7th	0,066	0,459	0,037	0,253	0,770	
8th	0,021	0,147	0,007	0,047	0,230	
9th	0,006	0,041	0,004	0,027	0,400	
10th	0,026	0,180	0,007	0,049	0,184	
11th	0,160	1,101	0,147	1,014	0,330	
12th	0,005	0,035	0,002	0,012	0,153	
13th	0,179	1,235	0,172	1,190	0,210	
14th	0,032	0,222	0,005	0,035	0,131	
15th	0,007	0,051	0,004	0,031	0,150	
16th	0,037	0,255	0,008	0,055	0,115	
17th	0,110	0,756	0,052	0,357	0,132	
18th	0,005	0,035	0,002	0,012	0,102	
19th	0,045	0,309	0,082	0,568	0,118	
20th	0,018	0,127	0,004	0,027	0,092	
21th	0,004	0,031	0,005	0,031	0,107	0,160
22th	0,021	0,142	0,009	0,061	0,084	
23th	0,028	0,191	0,017	0,118	0,098	0,147
24th	0,004	0,028	0,002	0,011	0,077	
25th	0,025	0,169	0,038	0,259	0,090	0,135
26th	0,023	0,160	0,003	0,020	0,071	
27th	0,004	0,029	0,003	0,019	0,083	0,124
28th	0,025	0,173	0,010	0,069	0,066	
29th	0,029	0,203	0,008	0,055	0,078	0,117
30th	0,004	0,028	0,002	0,012	0,061	
31th	0,020	0,136	0,033	0,225	0,073	0,109
32th	0,013	0,088	0,003	0,020	0,058	
33th	0,004	0,025	0,003	0,022	0,068	0,102
34th	0,022	0,154	0,010	0,067	0,054	
35th	0,021	0,142	0,010	0,069	0,064	0,096
36th	0,005	0,037	0,002	0,012	0,051	
37th	0,025	0,170	0,037	0,254	0,061	0,091
38th	0,021	0,147	0,004	0,030	0,048	
39th	0,004	0,027	0,004	0,026	0,058	0,087
40th	0,015	0,102	0,008	0,055	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

Nr. PVGB2306WDG0281-1

Power Quality. Harmonics.

ASW10kH-T3

Phase 3

SSEG rating per phase (rpp)			3,33kW			
	At 45-55% of rated outputs 5,0kW		100% of rated output 10,0kW			
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	0,065	0,451	0,064	0,440	1,080	
3rd	0,024	0,168	0,023	0,162	2,300	
4th	0,131	0,906	0,032	0,218	0,430	
5th	0,131	0,902	0,133	0,915	1,140	
6th	0,008	0,053	0,003	0,020	0,300	
7th	0,065	0,445	0,036	0,250	0,770	
8th	0,024	0,168	0,005	0,038	0,230	
9th	0,016	0,112	0,005	0,031	0,400	
10th	0,027	0,189	0,007	0,051	0,184	
11th	0,161	1,113	0,144	0,991	0,330	
12th	0,006	0,044	0,002	0,017	0,153	
13th	0,173	1,192	0,171	1,181	0,210	
14th	0,038	0,262	0,004	0,029	0,131	
15th	0,013	0,087	0,004	0,031	0,150	
16th	0,036	0,251	0,009	0,061	0,115	
17th	0,110	0,762	0,051	0,349	0,132	
18th	0,004	0,027	0,002	0,015	0,102	
19th	0,045	0,308	0,082	0,563	0,118	
20th	0,018	0,127	0,004	0,025	0,092	
21th	0,006	0,041	0,004	0,030	0,107	0,160
22th	0,022	0,151	0,009	0,063	0,084	
23th	0,027	0,187	0,018	0,124	0,098	0,147
24th	0,004	0,027	0,002	0,015	0,077	
25th	0,028	0,190	0,038	0,262	0,090	0,135
26th	0,023	0,159	0,003	0,020	0,071	
27th	0,005	0,033	0,003	0,022	0,083	0,124
28th	0,026	0,176	0,010	0,070	0,066	
29th	0,028	0,194	0,012	0,081	0,078	0,117
30th	0,004	0,029	0,002	0,012	0,061	
31th	0,021	0,145	0,032	0,224	0,073	0,109
32th	0,013	0,090	0,003	0,020	0,058	
33th	0,005	0,032	0,002	0,013	0,068	0,102
34th	0,022	0,155	0,010	0,068	0,054	
35th	0,017	0,120	0,015	0,101	0,064	0,096
36th	0,004	0,031	0,001	0,010	0,051	
37th	0,025	0,170	0,036	0,250	0,061	0,091
38th	0,022	0,149	0,004	0,025	0,048	
39th	0,005	0,032	0,002	0,012	0,058	0,087
40th	0,016	0,108	0,008	0,054	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

Nr. PVGB2306WDG0281-1

Power Quality. Power factor.

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%	0,997	0,995	0,992	
50%	0,999	0,999	0,998	
75%	1,000	0,999	0,999	
100%	1,000	1,000	0,999	
Limit	>0,95	>0,95	>0,95	

Power Quality. Voltage fluctuation and Flicker.

ASW10kH-T2

		Starting			Stopping			Running	
		d _{max} [%]	dc [%]	d _(t) [%]	d _{max} [%]	dc [%]	d _(t) [%]	Pst	Plt 2 hours
Measured values at test impedance	L1	0,481	0,168	0,000	0,224	0,087	0,000	0,115	0,120
Normalised to standard impedance	L1	0,481	0,168	0,000	0,224	0,087	0,000	0,115	0,120
Normalised to maximum impedance	L1	0,481	0,168	0,000	0,224	0,087	0,000	0,115	0,120
Measured values at test impedance	L2	0,276	0,140	0,000	0,385	0,086	0,000	0,115	0,117
Normalised to standard impedance	L2	0,276	0,140	0,000	0,385	0,086	0,000	0,115	0,117
Normalised to maximum impedance	L2	0,276	0,140	0,000	0,385	0,086	0,000	0,115	0,117
Measured values at test impedance	L3	0,457	0,132	0,000	0,315	0,092	0,000	0,115	0,122
Normalised to standard impedance	L3	0,457	0,132	0,000	0,315	0,092	0,000	0,115	0,122
Normalised to maximum impedance	L3	0,457	0,132	0,000	0,315	0,092	0,000	0,115	0,122
Limits set under BS EN 61000-3-11		4,0	3,3	3,3 500ms	4,0	3,3	3,3 500ms	1,0	0,65
Test impedance		R	0,240	Ω	XI		0,150	Ω	
		Z	0,283	Ω					
Standard impedance		R	0,240	Ω	XI		0,150	Ω	
		Z	0,283	Ω					
Maximum impedance		R	0,240	Ω	XI		0,150	Ω	

Appendix C Type Test Verification Report

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

Nr. PVGB2306WDG0281-1

		Zmax	0,283		Ω				
ASW10kH-T3									
		Starting			Stopping			Running	
		d _{max} [%]	dc [%]	d _(t) [%]	d _{max} [%]	dc [%]	d _(t) [%]	Pst	Plt 2 hours
Measured values at test impedance	L1	0,482	0,168	0,000	0,225	0,082	0,000	0,115	0,120
Normalised to standard impedance	L1	0,482	0,168	0,000	0,225	0,082	0,000	0,115	0,120
Normalised to maximum impedance	L1	0,482	0,168	0,000	0,225	0,082	0,000	0,115	0,120
Measured values at test impedance	L2	0,276	0,141	0,000	0,385	0,086	0,000	0,117	0,119
Normalised to standard impedance	L2	0,276	0,141	0,000	0,385	0,086	0,000	0,117	0,119
Normalised to maximum impedance	L2	0,276	0,141	0,000	0,385	0,086	0,000	0,117	0,119
Measured values at test impedance	L3	0,457	0,131	0,000	0,316	0,092	0,000	0,135	0,122
Normalised to standard impedance	L3	0,457	0,131	0,000	0,316	0,092	0,000	0,135	0,122
Normalised to maximum impedance	L3	0,457	0,131	0,000	0,316	0,092	0,000	0,135	0,122
Limits set under BS EN 61000-3-11		4%	3,3%	3,3% 500ms	4%	3,3%	3,3% 500ms	1,0	0,65
Test impedance		R	0,240		Ω		XI	0,150	Ω
		Z	0,283		Ω				
Standard impedance		R	0,240		Ω		XI	0,150	Ω
		Z	0,283		Ω				
Maximum impedance		R	0,240		Ω		XI	0,150	Ω
		Zmax	0,283		Ω				

Power Quality. DC injection.

ASW05kH-T2

Phase 1

Test level power [%]	20	50	75	100
Recorded value [mA]	9,270	8,230	10,500	16,975
Recorded value [%]	0,13	0,11	0,14	0,23
Limit [%]	0,25	0,25	0,25	0,25



Annex to the G98/1 certificate of compliance No. U23-0994

Appendix C Type Test Verification Report

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

Nr. PVGB2306WDG0281-1

Phase 2

Test level power [%]	20	50	75	100
Recorded value [mA]	6,710	15,450	13,400	16,978
Recorded value [%]	0,09	0,21	0,18	0,23
Limit [%]	0,25	0,25	0,25	0,25

Phase 3

Test level power [%]	20	50	75	100
Recorded value [mA]	5,940	11,550	12,000	13,982
Recorded value [%]	0,08	0,16	0,17	0,19
Limit [%]	0,25	0,25	0,25	0,25

Note. DC-injection is tested at each phase of the inverter and a limit of 0,25% per phase was used as pass criteria.

Sum of all Phases

Tests are carried out at three defined power levels $\pm 5\%$. At 230 V a 5 kW three phase Inverter has a current output of 21,739 A so DC limit is 54,348 mA. These tests is undertaken in accordance with Annex A.1.3.4

The % DC injection ("as % of rated AC current" below) is calculated as follows:

% DC injection = Recorded DC value in Amps / Base current where the base current is the Registered Capacity (W) / V phase.

The % DC injection should not be greater than 0,25%.

Sum of all Phases

Test level power [%]	20	50	75	100
Recorded value [mA]	21,920	35,230	35,900	47,935
Recorded value [%]	0,10	0,16	0,17	0,22
Limit [%]	0,25	0,25	0,25	0,25

Appendix C Type Test Verification Report

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

Nr. PVGB2306WDG0281-1

Power Quality. DC injection.

ASW05kH-T3

Phase 1

Test level power [%]	20	50	75	100
Recorded value [mA]	9,830	13,910	14,686	15,200
Recorded value [%]	0,14	0,19	0,20	0,21
Limit [%]	0,25	0,25	0,25	0,25

Phase 2

Test level power [%]	20	50	75	100
Recorded value [mA]	4,930	16,710	16,416	17,100
Recorded value [%]	0,07	0,23	0,23	0,24
Limit [%]	0,25	0,25	0,25	0,25

Phase 3

Test level power [%]	20	50	75	100
Recorded value [mA]	4,650	11,146	12,929	15,200
Recorded value [%]	0,06	0,15	0,18	0,21
Limit [%]	0,25	0,25	0,25	0,25

Note. DC-injection is tested at each phase of the inverter and a limit of 0,25% per phase was used as pass criteria.

Sum of all Phases

Tests are carried out at three defined power levels $\pm 5\%$. At 230 V a 5 kW three phase Inverter has a current output of 21,739 A so DC limit is 54,348 mA. These tests is undertaken in accordance with Annex A.1.3.4

The % DC injection ("as % of rated AC current" below) is calculated as follows:

% DC injection = Recorded DC value in Amps / Base current where the base current is the Registered Capacity (W) / V phase.
The % DC injection should not be greater than 0,25%.

Sum of all Phases

Test level power [%]	20	50	75	100
Recorded value [mA]	19,410	41,766	44,031	47,500
Recorded value [%]	0,09	0,19	0,20	0,22
Limit [%]	0,25	0,25	0,25	0,25

Appendix C Type Test Verification Report

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

Nr. PVGB2306WDG0281-1

Power Quality. DC injection.

ASW10kH-T2

Phase 1

Test level power [%]	20	50	75	100
Recorded value [mA]	28,990	28,924	28,965	28,999
Recorded value [%]	0,20	0,20	0,20	0,20
Limit [%]	0,25	0,25	0,25	0,25

Phase 2

Test level power [%]	20	50	75	100
Recorded value [mA]	18,000	17,996	30,947	30,978
Recorded value [%]	0,12	0,12	0,21	0,21
Limit [%]	0,25	0,25	0,25	0,25

Phase 3

Test level power [%]	20	50	75	100
Recorded value [mA]	32,985	31,981	32,913	32,977
Recorded value [%]	0,23	0,22	0,23	0,23
Limit [%]	0,25	0,25	0,25	0,25

Note. DC-injection is tested at each phase of the inverter and a limit of 0,25% per phase was used as pass criteria.

Sum of all Phases

Tests are carried out at three defined power levels $\pm 5\%$. At 230 V a 10 kW three phase Inverter has a current output of 43,478 A so DC limit is 108,696 mA. These tests is undertaken in accordance with Annex A.1.3.4

The % DC injection ("as % of rated AC current" below) is calculated as follows:

% DC injection = Recorded DC value in Amps / Base current where the base current is the Registered Capacity (W) / V phase.
The % DC injection should not be greater than 0,25%.

Sum of all Phases

Test level power [%]	20	50	75	100
Recorded value [mA]	79,975	78,901	92,825	92,954
Recorded value [%]	0,18	0,18	0,21	0,21
Limit [%]	0,25	0,25	0,25	0,25

Appendix C Type Test Verification Report

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

Nr. PVGB2306WDG0281-1

Power Quality. DC injection.

ASW10kH-T3

Phase 1

Test level power [%]	20	50	75	100
Recorded value [mA]	28,973	28,998	28,990	28,998
Recorded value [%]	0,20	0,20	0,20	0,20
Limit [%]	0,25	0,25	0,25	0,25

Phase 2

Test level power [%]	20	50	75	100
Recorded value [mA]	30,927	30,949	30,937	30,982
Recorded value [%]	0,21	0,21	0,21	0,21
Limit [%]	0,25	0,25	0,25	0,25

Phase 3

Test level power [%]	20	50	75	100
Recorded value [mA]	32,99	30,956	30,974	31,989
Recorded value [%]	0,23	0,21	0,21	0,22
Limit [%]	0,25	0,25	0,25	0,25

Note. DC-injection is tested at each phase of the inverter and a limit of 0,25% per phase was used as pass criteria.

Sum of all Phases

Tests are carried out at three defined power levels $\pm 5\%$. At 230 V a 10 kW three phase Inverter has a current output of 54,348 A so DC limit is 54,348 mA. These tests is undertaken in accordance with Annex A.1.3.4

The % DC injection ("as % of rated AC current" below) is calculated as follows:

% DC injection = Recorded DC value in Amps / Base current where the base current is the Registered Capacity (W) / V phase.
The % DC injection should not be greater than 0,25%.

Sum of all Phases

Test level power [%]	20	50	75	100
Recorded value [mA]	92,890	90,903	90,901	91,969
Recorded value [%]	0,21	0,21	0,21	0,21
Limit [%]	0,25	0,25	0,25	0,25

Appendix C Type Test Verification Report

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

Nr. PVGB2306WDG0281-1

Fault level Contribution.

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	20 ms	5,7	14,4
Initial Value of aperiodic current	A	N/A	100 ms	3,7	19,5
Initial symmetrical short-circuit current*	I_k	N/A	250 ms	-3,9	-20,2
Decaying (aperiodic) component of short circuit current*	i_{DC}	N/A	500 ms	5,3	-0,1
Reactance/Resistance Ratio of source*	X/R	N/A	Time to Trip [s]	0,348	

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	20 ms	1,8	-3,2
Initial Value of aperiodic current	A	N/A	100 ms	4,7	-2,5
Initial symmetrical short-circuit current*	I_k	N/A	250 ms	-4,6	1,6
Decaying (aperiodic) component of short circuit current*	i_{DC}	N/A	500 ms	-0,8	0,1
Reactance/Resistance Ratio of source*	X/R	N/A	Time to Trip [s]	0,345	

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	20 ms	8,2	11,7
Initial Value of aperiodic current	A	N/A	100 ms	9,1	14,1
Initial symmetrical short-circuit current*	I_k	N/A	250 ms	-8,6	-14,2
Decaying (aperiodic) component of short circuit current*	i_{DC}	N/A	500 ms	4,8	-0,1
Reactance/Resistance Ratio of source*	X/R	N/A	Time to Trip [s]	0,354	

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.

Appendix C Type Test Verification Report

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

Nr. PVGB2306WDG0281-1

Self Monitoring – Solid state switching.

N/A

It has been verified that in the event of the solid state switching device failing to disconnect the Generating Unit, the voltage on the output side of the switching device is reduced to a value below 50 volts within 0,5 seconds.

N/A

Note. Unit do not provide solid state switching relays. In case the semiconductor bridge is switched off, then the voltage on the output drops to 0. In this case the relays on the output will also open (Functional safety of the internal automatic disconnection device according to VDE 0126-1-1).

Cyber security

P

Confirm that the Manufacturer or Installer of the Micro-generator has provided a statement describing how the Micro-generator has been designed to comply with cyber security requirements, as detailed in 9.7.

Yes

Note. Different levels of access, all are password protected, only certain parameters can be changed on maintenance level. Manufacturer information provided.

Logic Interface (input port) Required by paragraph 9.4.4

P

Confirm that an input port is provided and can be used to reduce the Active Power output to zero

Yes

Note. Manufacturer information provided.

Provide high level description of logic interface, e.g. details in 9.4.4 such as AC or DC signal

Yes

Logical interfaces are implemented by external devices (model: Ai-Logger 1000). COM1 or 2 or 3 of the external device is connected to COM0 of the power generation module (Figure 4).

Pins 1 and 10 of the DI port of the external device are connected to the switch or contactor.

When the switch is closed, the generating module can work normally.

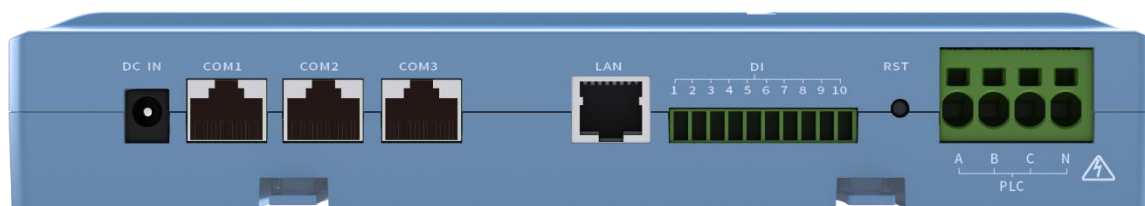
When the switch is opened, the logical port has a DC voltage of 5V, and the power module reduces the active power to zero within 5 seconds.



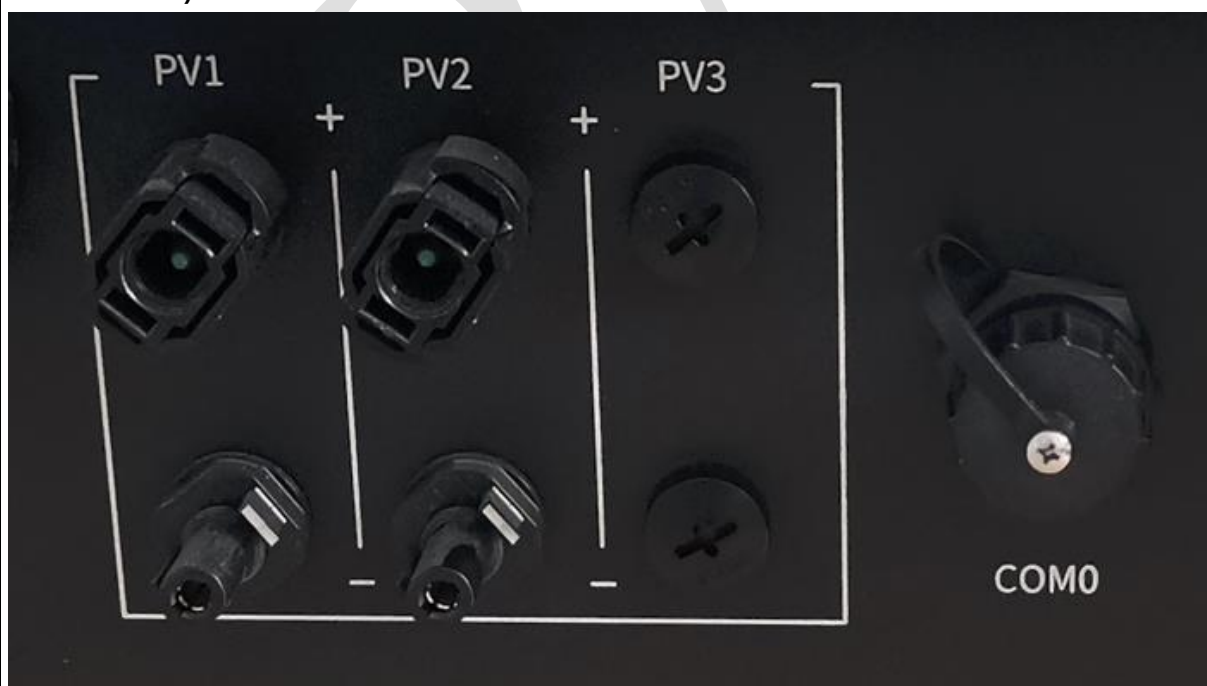
Appendix C Type Test Verification Report

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

Nr. PVGB2306WDG0281-1



(For ASW05kH-T3, ASW06kH-T3, ASW08kH-T3, ASW10kH-T3 and ASW05kH-T3-O, ASW06kH-T3-O, ASW08kH-T3-O, ASW10kH-T3-O)



(For ASW05kH-T2, ASW06kH-T2, ASW08kH-T2, ASW10kH-T2 and ASW05kH-T2-O, ASW06kH-T2-O, ASW08kH-T2-O, ASW10kH-T2-O)