TESTING FOR THE VERIFICATION OF COMPLIANCE OF PV INVERTER WITH :

ENA ENGINEERING RECOMMENDATION G99

ISSUE 1- AMENDMENT 9 2022,

REQUIREMENTS FOR THE CONNECTION OF GENERATION EQUIPMENT IN PARALLEL WITH PUBLIC DISTRIBUTION NETWORKS ON OR AFTER 27 APRIL 2019

Test Report Number	:	GZES230400692002
Type	:	Bidirectional Battery Inverter
Tested Model	:	PCS630
Variant Models	:	PCS500, PCS250, PCS100

APPLICANT

Name	:	Shenzhen Atess Power Technology Co., Ltd
Address	:	2nd Floor, No.23 Zhulongtian Road, Shuitian Community, Shiyan Street, Baoan District, Shenzhen, Guangdong, China

TESTING LABORATORY

Name	:	SGS-CSTC Standards Technical Services Co., Ltd. Guangzhou Branch
Address	:	198 Kezhu Road, Science City, Economic & Technology Development Area, Guangzhou, Guangdong, China
Conducted (tested) by	:	Colin Chen (Project Engineer)
Approved by	:	Roger Hu (Technical Reviewer)
Date of issue	:	2023/09/08
Number of pages	:	60

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Test Report Historical Revision:

Test Report Version	Date	Resume
GZES230400692002	2023/09/08	First issuance

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1 SCOPE

SGS-CSTC Standards Technical Services Co., Ltd. Guangzhou Branch has been contract by Shenzhen ATESS Power Technology Co., Ltd, in order to perform the testing according the "ENA ENGINEERING RECOMMENDATION G99 ISSUE 1- AMENDMENT 9 3 October 2022, REQUIREMENTS FOR THE CONNECTION OF GENERATION EQUIPMENT IN PARALLEL WITH PUBLIC DISTRIBUTION NETWORKS ON OR AFTER 27 APRIL 2019".

Note: This standard details connection process, technical and compliance requirements for Type A, Type B, Type C and Type D Power Generating Modules. The tests offered at this test report evaluate the EUT compliance with the requirements of **Type A** defined as below:

Type A
A Power Generating Module with a Connection Point below 110 kV and a Registered Capacity of 0.8 kW or greater but less than 1 MW.

Type B
A Power Generating Module with a Connection Point below 110 kV and Registered Capacity of 1 MW or greater but less than 10 MW.

Type C
A Power Generating Module with a Connection Point below 110 kV and a Registered Capacity of 10 MW or greater but less than 50 MW.

Type D
A Power Generating Module with a Connection Point at or greater than 110 kV, and/or with a Registered Capacity of 50 MW or greater.

2 GENERAL INFORMATION

2.1 TESTING PERIOD AND CLIMATIC CONDITIONS

The necessary testing has been performed along between the 24th of May and 29th of June of 2023.
All the tests and checks have been performed at 25 ± 5ºC, 96 kPa ± 10 kPa and 50% RH ± 10% RH)

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SITE TEST

Name .....:	**Dongguan BALUN Testing Technology Co., Ltd.**
Address.....:	Room 104, 204, 205, Building 1, No. 6, Industrial South Road, Songshan Lake District, Dongguan, Guangdong, China

2.2 EQUIPMENT UNDER TESTING

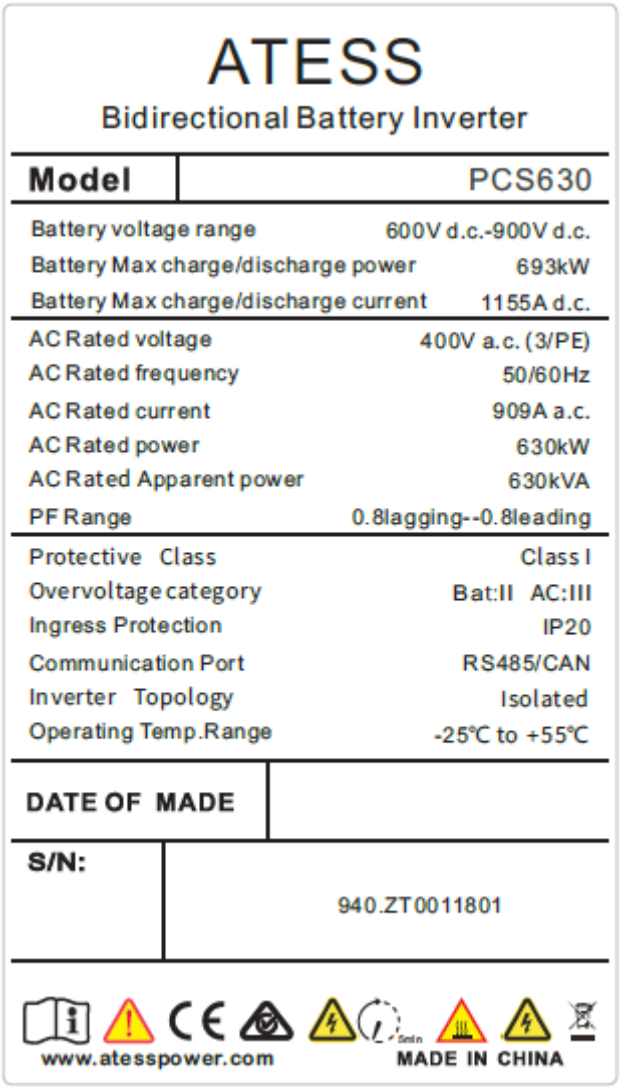
Apparatus type .....:	Bidirectional Battery Inverter
Installation .....:	Fixed (permanent connection)
Manufacturer .....:	Shenzhen Atess Power Technology Co., Ltd
Address .....:	2nd Floor, No.23 Zhulongtian Road, Shuitian Community, Shiyan Street, Baoan District, Shenzhen, Guangdong, China
Trade mark .....:	ATESS
Model / Type reference.....:	PCS630
Serial Number.....:	ZBD0A39003
Software Version .....:	DSP Software Version: PCS50_630_HV3_SV1.1.26_APP LCD Software Version: PCS50_630K_FLEXEMScreen_HV1.0_SV1.1.15
Rated Characteristics .....:	DC input: 500-820 V, Max. 1155 A AC output: 3/PE 400V, 50 Hz, 3× 909A, 630kW

Date of manufacturing: 2020

Test item particulars

Input.....:	DC
Output.....	3P/PE
Class of protection against electric shock ...:	Class I
Degree of protection against moisture.....:	IP20
Type of connection to the main supply .....:	TN
Cooling group .....:	Fans
Modular.....:	No
Internal Transformer .....:	Isolated

Copy of marking plate (representative):



Note:

1. The above markings are the minimum requirements required by the safety standard. For the final production samples, the additional markings which do not give rise to misunderstanding may be added.
2. Label is attached on the side surface of enclosure and visible after installation.
3. Labels of other models are as the same with **PCS630**'s except the parameters of rating.
4. As declared by the applicant, the importer (and manufacturer, if it is different)'s name, registered trade name or registered trade mark and the postal address will be marked on the products before being place on the market. The contact details shall be in a language easily understood by end-users and market surveillance authorities.

Equipment Under Testing:

- PCS630

The variants models are:

- PCS500;
- PCS250;
- PCS100;

The variants models have been included in this test report without tests because the following features don´t change regarding to the tested model:

- Same connection system and hardware topology
- Same control algorithm.
- Same Firmware Version.

Following table shows the full ratings of the all models referenced in this report, marked in **bold letters** the ones subjected to testing:

Model	**PCS100**	**PCS250**	**PCS500**	**PCS630**
DC Input				
Battery voltage range	500 V ~ 820 V		600 V ~ 900 V	
Battery Max. charge/discharge power	110 kW	275 kW	550 kW	693 kW
Battery Max. charge/discharge current	220 A	550 A	917 A	1155 A
AC Output				
Rated grid voltage	3/PE, 400 V_{ac}			
Rated grid frequency	50 Hz/60 Hz			
Rated power	100 kW	250 kW	500 kW	630 kW
Max. Apparent power	110 kVA	275 kVA	550 kVA	693 kVA
Rated current	144 A	361 A	722 A	909 A
Output power factor	0.8 lagging ~ 0.8 leading			
General Data				
Operating temperature range	-25 ºC ~ +55 ºC			
Protection degree	IP20			
Protective class	Class I			
Cooling method	Intelligent air cooling			
Topology	Isolated			

The results obtained apply only to the particular sample tested that is the subject of the present test report. The most unfavorable result values of the verifications and tests performed are contained herein.

Throughout this report a point ~~(comma)~~ is used as the decimal separator.

2.3 MANUFACTURER AND FACTORY INFORMATION

Manufacturer Name .....: Shenzhen Atess Power Technology Co., Ltd

Manufacturer Address.....: 2nd Floor, No.23 Zhulongtian Road, Shuitian Community, Shiyan Street, Baoan District, Shenzhen, Guangdong, China

Factory Name .....: Shenzhen Atess Power Technology Co., Ltd

Factory Address.....: 2nd Floor, No.23 Zhulongtian Road, Shuitian Community, Shiyan Street, Baoan District, Shenzhen, Guangdong, China

2.4 TEST EQUIPMENT LIST

From	No.	Equipment Name	Trademark / Model No.	Equipment No.	Calibration Period
Balun	1	Power analyzer	DEWETRON / DEWE2-PA7	BZ-DGD-L119	2022-11-03 to 2023-11-02
	2	Current clamp	YINHE / CSA102-P031T01-S	BZ-DGD-L198	2022-06-18 to 2023-06-17
	3	Current clamp	YINHE / CSA102-P031T01-S	BZ-DGD-L199	2022-06-18 to 2023-06-17
	4	Current clamp	YINHE / CSA102-P031T01-S	BZ-DGD-L200	2022-06-18 to 2023-06-17
	5	Current clamp	YINHE / CSA102-P031T01-S	BZ-DGD-L201	2022-06-18 to 2023-06-17
	6	Temperature and Humidity meter	CEM / DT-322	BZ-DGD-L270	2022-10-25 to 2023-10-24
SGS	7	True RMS Multimeter	Fluke / 15B	GZE012-43	2022-11-11 to 2023-11-10

2.5 MEASUREMENT UNCERTAINTY

Associated uncertainties through measurements showed in this this report are the maximum allowable uncertainties.

Magnitude	Uncertainty
Voltage measurement	±1.5 %
Current measurement	±2.0 %
Frequency measurement	±0.2 %
Time measurement	±0.2 %
Power measurement	±2.5 %
Phase Angle	±1 º
Temperature	±3 ºC
Note1: Measurements uncertainties showed in this table are maximum allowable uncertainties. The measurement uncertainties associated with other parameters measured during the tests are in the laboratory at disposal of the petitioner. Note2: Where the standard requires lower uncertainties that those in this table. Most restrictive uncertainty has been considered.	

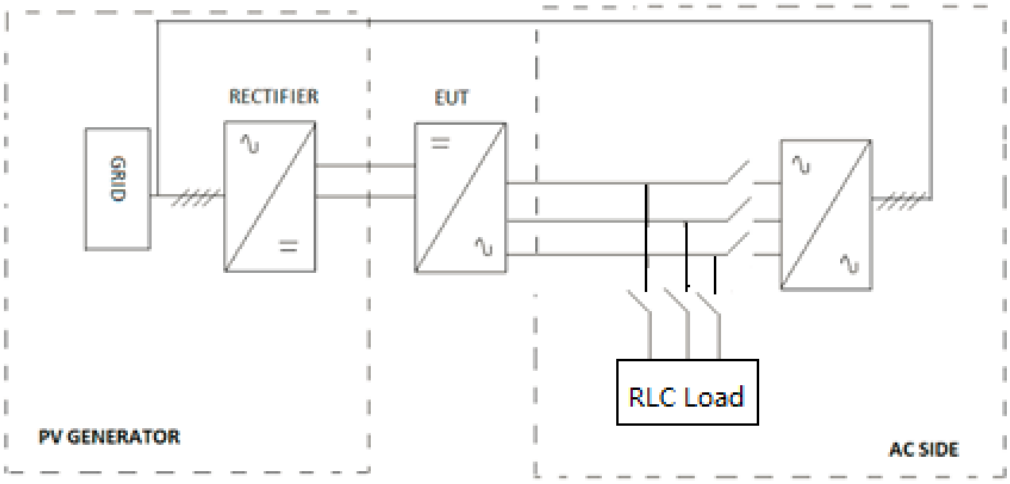
2.6 REFERENCE VALUES

The values presented in the following table have been used for calculation of referenced values (p.u.; %) thougth the report.

Reference Values for Model: PCS630	
Rated power, **Pn** in kW	630
Maximun apparent power, **S max** in kVA	693
Rated wind speed (only WT), **vn** in m/s	N/A
Rated current, **In** in A	909
Rated output voltage, (Line to Line) **Un** in Vac	400
Note: In this report p.u. values are calculated as follows: -For Active & Reactive Power p.u values are reference to **Sn** -For Currents p.u values, the reference is always **In** -For Voltages p.u values, the reference is always **Un**	

2.7 TEST SET UP OF THE DIFFERENT STANDARD

Below is the simplified construction of the test set up.



Different equipment has been used to take measures as it shows in chapter 2.3. Current and voltage clamps have been connected to the inverter input / output for all the tests.
All the tests described in the following pages have used this specified test setup.

The test bench used includes:

EQUIPMENT	MARK / MODEL	RATED CHARACTERISTICS	OWNER / ID. CODE
AC source	Wogo / WLPA-33-1000kVA	1000 kVA 5-400 Vrms 44.5-65.5 Hz	BZ-DGD-L001
DC source	Wogo / WDGC-1000kW	0 – 1500 Vdc (0.01 V step) 0 – 1333 A (0.01 A step)	BZ-DGD-L002
RLC load	Qunlin / ACLT3816H	563.3kW, 563.3kVAr	BZ-DGD-L003

2.8 Definitions

EUT	Equipment Under Testing	Hz	Hertz
A	Ampere	V	Volt
VAr	Volt-Ampere reactive	W	Watt
EMC	Electromagnetic Compatibility	p.u	Per unit
Un	Nominal Voltage	Pn	Nominal Active Power
In	Nominal Current	Qn	Nominal Reactive Power
Ia	Active Current	Sn	Nominal Apparent Power
Ir	Reactive Current	THD	Total Harmonic Distortion
I_h	Harmonic Current	TDD	Total Demand Distortion
PWHD	Partial Weighted Harmonic Distortion	PLT	Severity of Flicker Long-Term
		d(t)	Variation of Voltage
PST	Severity of Flicker Short-Term	OV	Over Voltage
d max	Maximum Absolute Value of Voltage Variation	OF	Over Frequency
UV	Under Voltage	UF	Under Frequency

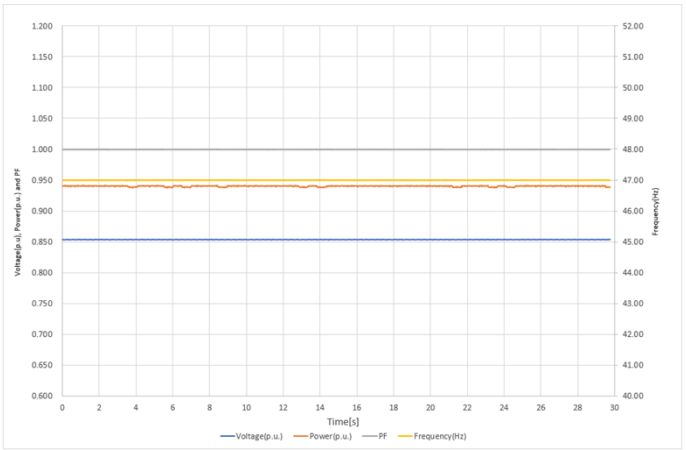
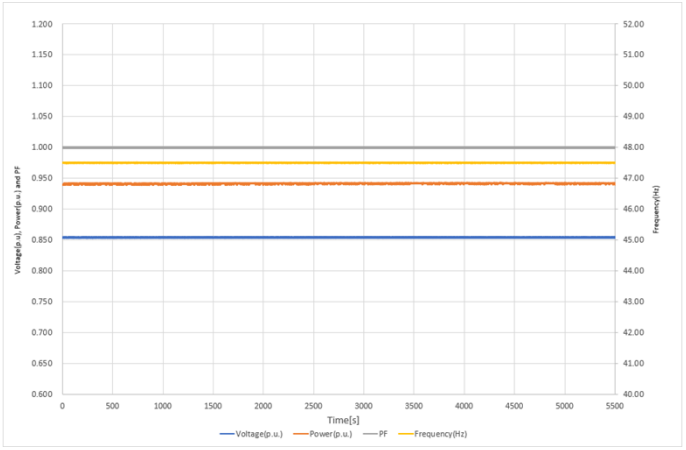
3 RESUME OF TEST RESULTS

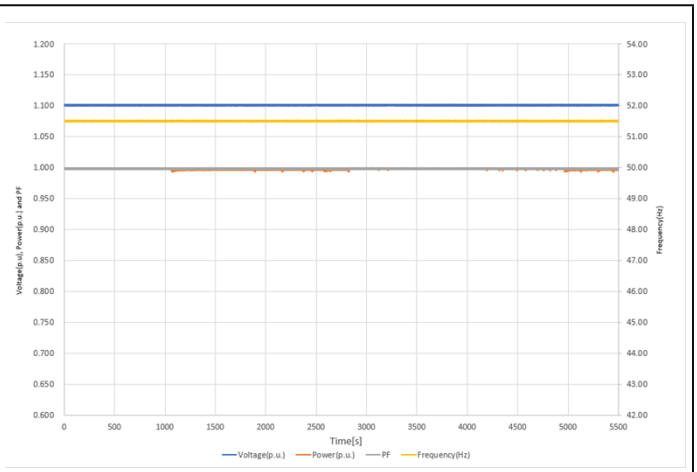
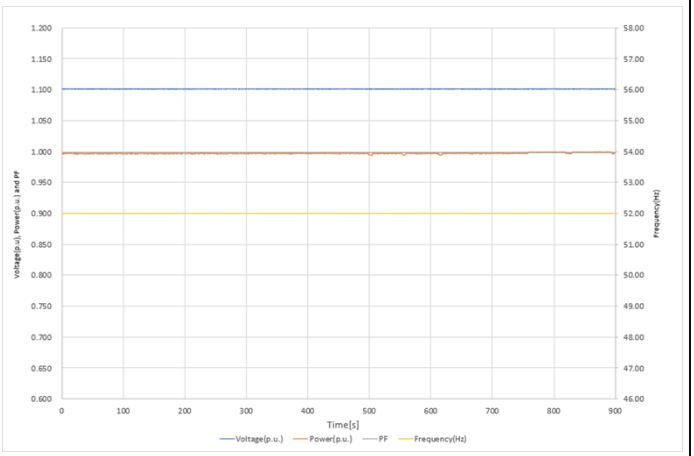
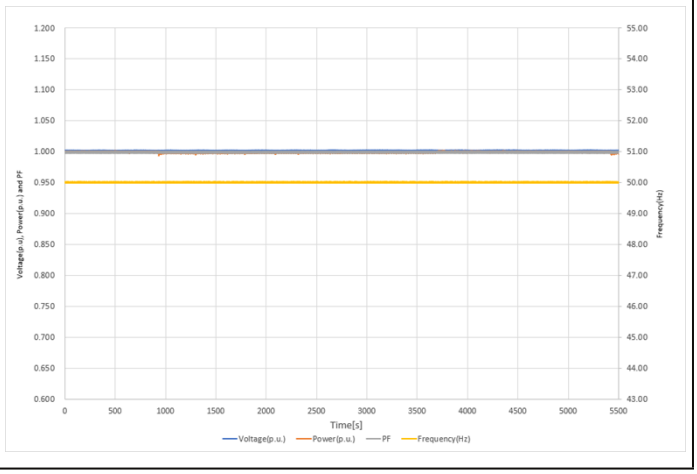
INTERPRETATION KEYS

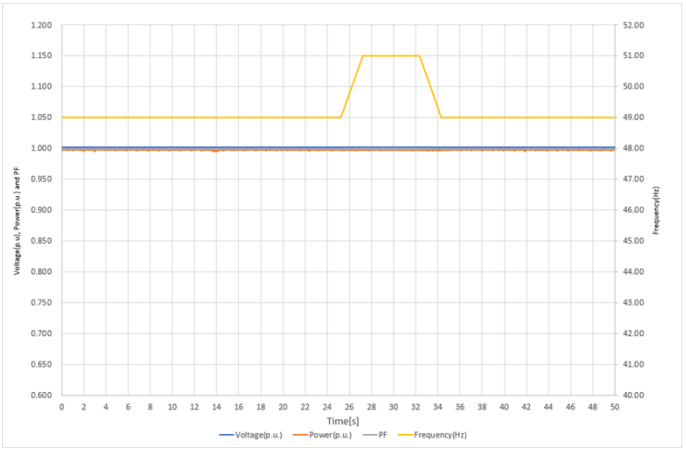
Test object does meet the requirement.....: **P** Pass
Test object does not meet the requirement.....: **F** Fails
Test case does not apply to the test object.....: **N/A** Not applicable
To make a reference to a table or an annex. .....: See additional sheet
To indicate that the test has not been realized .....: **N/R** Not realized

STANDAARD CLAUSE	STANDARD REQUIREMENTS G99 Issue 1 – Amendment 9 2022		RESULT
	TEST	REMARKS	
Annex A 2-3 (1)	Operating Range		P
A.7.1.5	Harmonics		P
A.7.1.4.3	Voltage fluctuations and Flicker		P
A.7.1.4.4	DC injection		N/A
A.7.1.4.2	Power Factor		P
A.7.1.2.3	Frequency tests		P
A.7.1.2.2	Voltage tests:		P
A.7.1.2.4	Loss of Mains test		P
A.7.1.2.6	Loss of Mains Protection, Vector Shift Stability test.		P
	Loss of Mains Protection, RoCoF Stability test		P
A.7.1.3	Limited Frequency Sensitive Mode – Over frequency test		P
Annex A 2-3 (10)	Re-connection timer.		P
A.7.1.5	Fault level contribution		P
A.7.1.7	Self-Monitoring solid state switching	No solid state switching devices	N/A
Para 15.2.1	Wiring functional tests		N/A
Annex A 2-3 (14)	Logic Interface (input port)		P
Annex A 2-3 (15)	Cyber security		P

4 TEST RESULTS

A2-3 Compliance Verification Report –Tests for Type A Inverter Connected Power Generating Modules – test record	
4.1 OPERATING RANGE: Tests should be carried with the **Power Generating Module** operating at **Registered Capacity** and connected to a suitable test supply or grid simulation set. The power supplied by the primary source shall be kept stable within ± 5 % of the apparent power value set for the entire duration of each test sequence. Frequency, voltage and **Active Power** measurements at the output terminals of the **Power Generating Module** shall be recorded every second. The tests will verify that the **Power Generating Module** can operate within the required ranges for the specified period of time. The **Interface Protection** shall be disabled during the tests. In case of a PV **Power Park Module** the PV primary source may be replaced by a DC source. In case of a full converter **Power Park Module** (eg wind) the primary source and the prime mover I**nverter**/rectifier may be replaced by a DC source.	
Test 1 Voltage = 85% of nominal (340V) Frequency = 47 Hz Power factor = 1 Period of test 20 s	
Test 2: Voltage = 85% of nominal (340V) Frequency = 47.5 Hz Power factor = 1 Period of test 90 minutes	

Test 3: Voltage = 110% of nominal (440 V) Frequency = 51.5 Hz Power factor = 1 Period of test 90 minutes	
Test 4: Voltage = 110% of nominal (440 V) Frequency = 52.0 Hz Power factor = 1 Period of test 15 minutes	
Test 5 Voltage = 100% of nominal (400 V) Frequency = 50.0 Hz, Power Factor = 1, Period of test = 90 minutes	

Test 6 RoCoF withstand Confirm that the **Power Generating Module** is capable of staying connected to the **Distribution Network** and operate at rates of change of frequency up to 1 Hzs-1 as measured over a period of 500 ms.	

4.2 POWER QUALITY – HARMONICS:

For **Power Generating Module**s of **Registered Capacity** of less than 75 A per phase (ie 50 kW) the test requirements are specified in Annex A.7.1.5. These tests should be carried out as specified in BS EN 61000-3-12, and measurements for the 2nd – 13th harmonics should be provided. The results need to comply with the limits of Table 2 of BS EN 61000-3-12 for single phase equipment and Table 3 of BS EN 610000-3-12 for three phase equipment. For three phase **Power Generating Module**s, measurements for all phases should be provided.

For **Power Generating Module**s of **Registered Capacity** of greater than 75 A per phase (ie 50 kW) the installation shall be designed in accordance with EREC G5.

The rating of the **Power Generating Module** (per phase) should be provided below, and the Total Harmonic Distortion (THD) and Partial Weighted Harmonic Distortion (PWHD) should be provided at the bottom of this section.

Power Generating Module tested to BS EN 61000-3-12

Power Generating Module rating per phase (rpp)	630/3	kVA	Harmonic % = Measured Value (A) x 23/rating per phase (kVA)

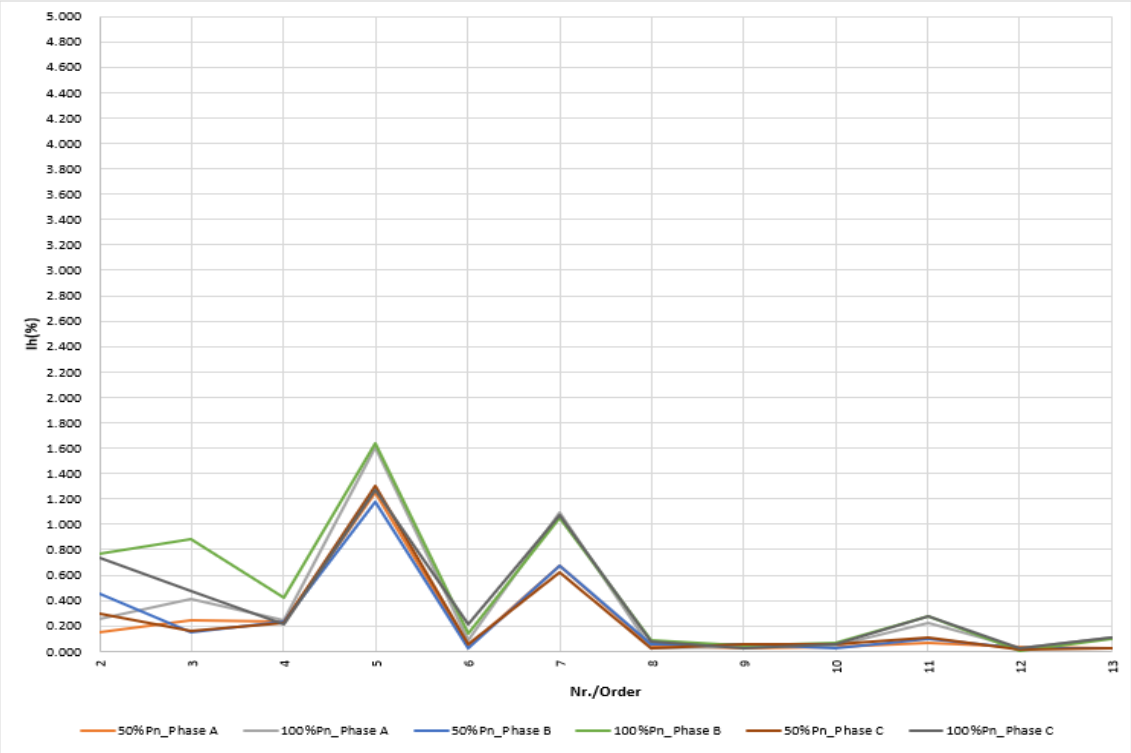
Harmonic	At 45-55% of Registered Capacity						Limit in BS EN 61000-3-12	
	Measured value (MV) in Amps			Measured value (MV) in %			1 phase	3 phase
	L1	L2	L3	L1	L2	L3		
2	1.404	4.135	2.707	0.154	0.453	0.296	8%	8%
3	2.202	1.358	1.427	0.241	0.149	0.156	21.6%	Not stated
4	2.102	2.140	2.032	0.230	0.234	0.223	4%	4%
5	11.431	10.777	11.862	1.252	1.180	1.299	10.7%	10.7%
6	0.353	0.258	0.459	0.039	0.028	0.050	2.67%	2.67%
7	6.137	6.181	5.664	0.672	0.677	0.620	7.2%	7.2%
8	0.445	0.539	0.183	0.049	0.059	0.020	2%	2%
9	0.195	0.548	0.495	0.021	0.060	0.054	3.8%	Not stated
10	0.332	0.251	0.524	0.036	0.027	0.057	1.6%	1.6%
11	0.610	0.846	0.949	0.067	0.093	0.104	3.1%	3.1%
12	0.276	0.189	0.155	0.030	0.021	0.017	1.33%	1.33%
13	0.209	0.266	0.209	0.023	0.029	0.023	2%	2%
THD	--	--	--	1.489	1.493	1.523	23%	13%
PWHD	--	--	--	1.018	1.254	1.121	23%	22%

Harmonic	At 100% of Registered Capacity						Limit in BS EN 61000-3-12	
	Measured value (MV) in Amps			Measured value (MV) in %			1 phase	3 phase
2	2.371	7.008	6.756	0.260	0.768	0.740	8%	8%
3	3.722	8.071	4.368	0.408	0.884	0.478	21.6%	Not stated
4	2.210	3.832	1.930	0.242	0.420	0.211	4%	4%
5	14.627	14.914	11.644	1.602	1.633	1.275	10.7%	10.7%

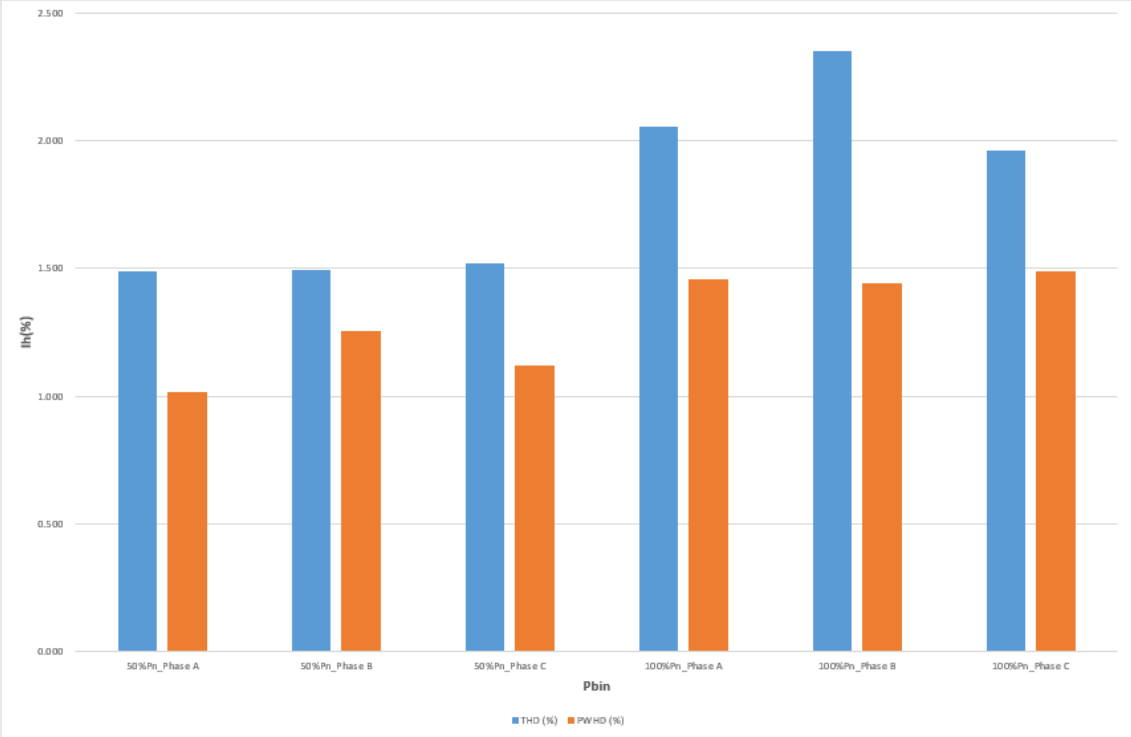
6	0.755	1.292	1.899	0.083	0.142	0.208	2.67%	2.67%
7	9.967	9.572	9.755	1.092	1.048	1.068	7.2%	7.2%
8	0.198	0.753	0.668	0.022	0.082	0.073	2%	2%
9	0.280	0.363	0.183	0.031	0.040	0.020	3.8%	Not stated
10	0.380	0.585	0.522	0.042	0.064	0.057	1.6%	1.6%
11	2.061	2.480	2.526	0.226	0.272	0.277	3.1%	3.1%
12	0.187	0.065	0.184	0.020	0.007	0.020	1.33%	1.33%
13	1.021	0.923	1.030	0.112	0.101	0.113	2%	2%
THD	--	--	--	2.056	2.351	1.959	23%	13%
PWHD	--	--	--	1.459	1.442	1.491	23%	22%

The test results are shown in the following figure:

Current Harmonics



THD& PWHD



4.3 POWER QUALITY – VOLTAGE FLUCTUATIONS AND FLICKER:

For **Power Generating Module**s of **Registered Capacity** of less than 75 A per phase (ie 50 kW) these tests should be undertaken in accordance with Annex A.7.1.4.3. Results should be normalised to a standard source impedance, or if this results in figures above the limits set in BS EN 61000-3-11 to a suitable Maximum Impedance.
For **Power Generating Module**s of **Registered Capacity** of greater than 75 A per phase (ie 50 kW) the installation shall be designed in accordance with EREC P28.
The standard test impedance is 0.4 Ω for a single phase **Power Generating Module** (and for a two phase unit in a three phase system) and 0.24 Ω for a three phase **Power Generating Module** (and for a two phase unit in a split phase system). Please ensure that both test and standard impedance are completed on this form. If the test impedance (or the measured impedance) is different to the standard impedance, it must be normalised to the standard impedance as follows (where the **Power Factor** of the generation output is 0.98 or above):
d max normalised value = (Standard impedance / Measured impedance) x Measured value.
Where the **Power Factor** of the output is under 0.98 then the X to R ratio of the test impedance should be close to that of the standard impedance.
The stopping test should be a trip from full load operation.
The duration of these tests needs to comply with the particular requirements set out in the testing notes for the technology under test.
The test date and location must be declared.

Test start date	2023.06.06	Test end date	2023.06.06
Test location	Room 104, 204, 205, Building 1, No. 6, Industrial South Road, Songshan Lake District, Dongguan, Guangdong, China		

	Starting			Stopping			Running	
	d max	dc	d(t)	d max	dc	d(t)	P st	P lt 2 hours
Measured Values at test impedance	--	--	--	--	--	--	--	--
Normalised to standard impedance	L1: 0.170 L2: 0.160 L3: 0.171	L1: 0.010 L2: 0.008 L3: 0.013	0.00	L1: 0.161 L2: 0.166 L3: 0.172	L1: 0.012 L2: 0.012 L3: 0.011	0.00	L1: 0.140 L2: 0.140 L3: 0.144	L1: 0.134 L2: 0.135 L3: 0.141
Normalised to required maximum impedance	--	--	--	--	--	--	--	--
Limits set under BS EN 61000-3-11	4%	3.3%	3.3%	4%	3.3%	3.3%	1.0	0.65

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

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

4.4 POWER QUALITY – DC INJECTION:

The tests should be carried out on a single **Generating Unit**. Tests are to be carried out at three defined power levels ±5%. At 230 V a 50 kW three phase **Inverter** has a current output of 217 A so DC limit is 543 mA. These tests should be undertaken in accordance with Annex A.7.1.4.4.

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

% DC injection = Recorded DC value in Amps / Base current

where the base current is the **Registered Capacity** (W) / Vphase. The % DC injection should not be greater than 0.25%.

Test power level	10%	55%	100%
Recorded value in Amps	L1: L2: L3: L123:	L1: L2: L3: L123:	L1: L2: L3: L123:
as % of rated AC current	L1: L2: L3: L123:	L1: L2: L3: L123:	L1: L2: L3: L123:
Limit	0.25%	0.25%	0.25%
Note:The inverter has an isolation transformer, so this test item is not applicable			

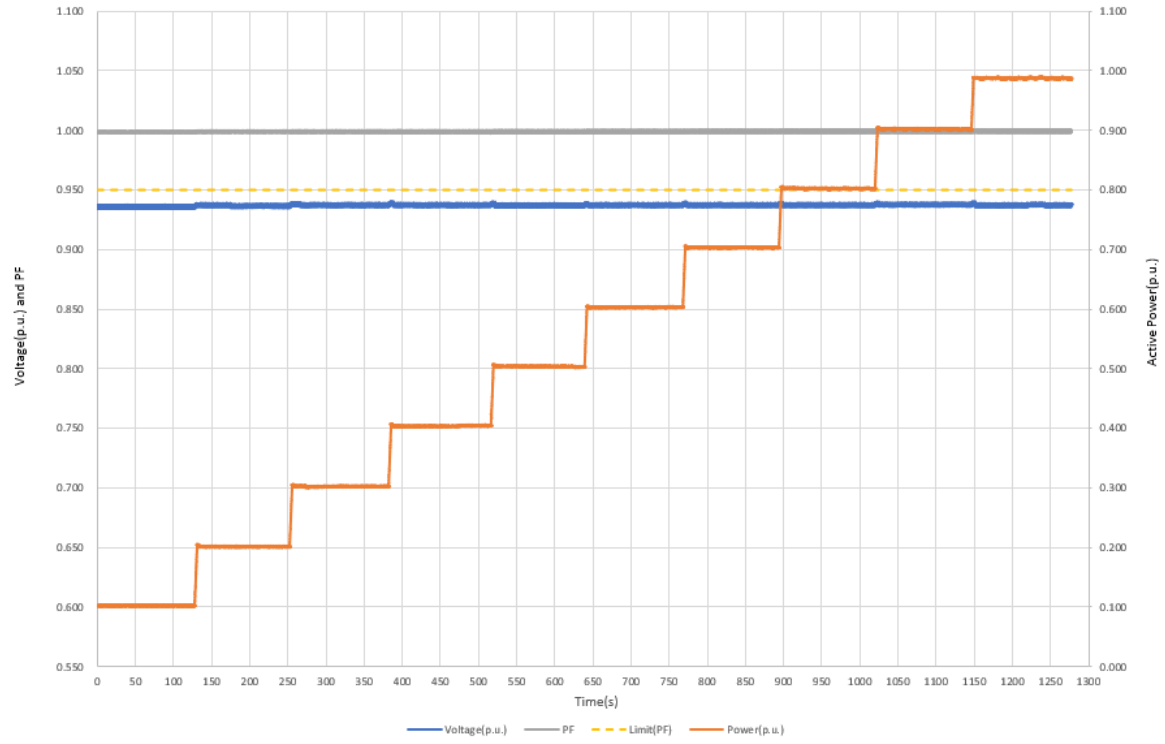
4.5 POWER FACTOR:

The tests should be carried out on a single **Power Generating Module**. Tests are to be carried out at three voltage levels and at **Registered Capacity** and the measured **Power Factor** must be greater than 0.95 to pass. Voltage to be maintained within ±1.5% of the stated level during the test. These tests should be undertaken in accordance with Annex A.7.1.4.2.

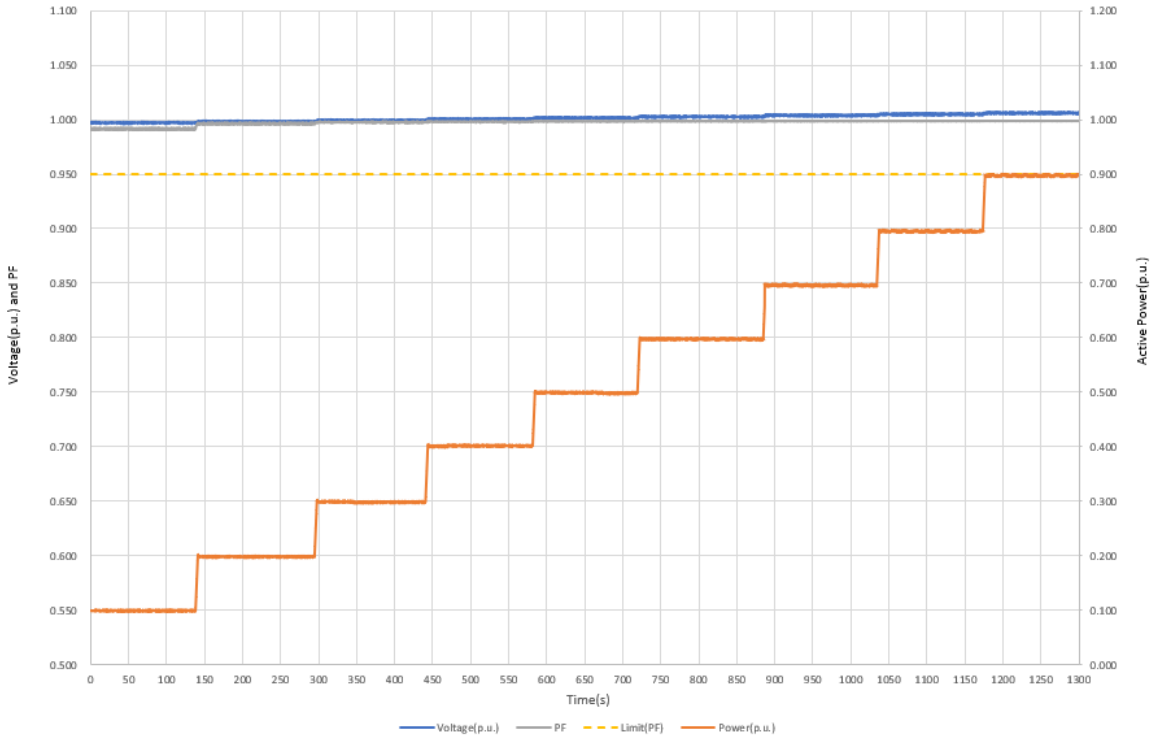
Note that the value of voltage stated in brackets assumes a **LV** connection. This should be adjusted for **HV** as required.

Voltage	0.94 p.u (376 V)	1.0 p.u (400 V)	1.1 p.u (440 V)
Measured value	0.999	0.999	0.97
Power Factor Limit	>0.95	>0.95	>0.95

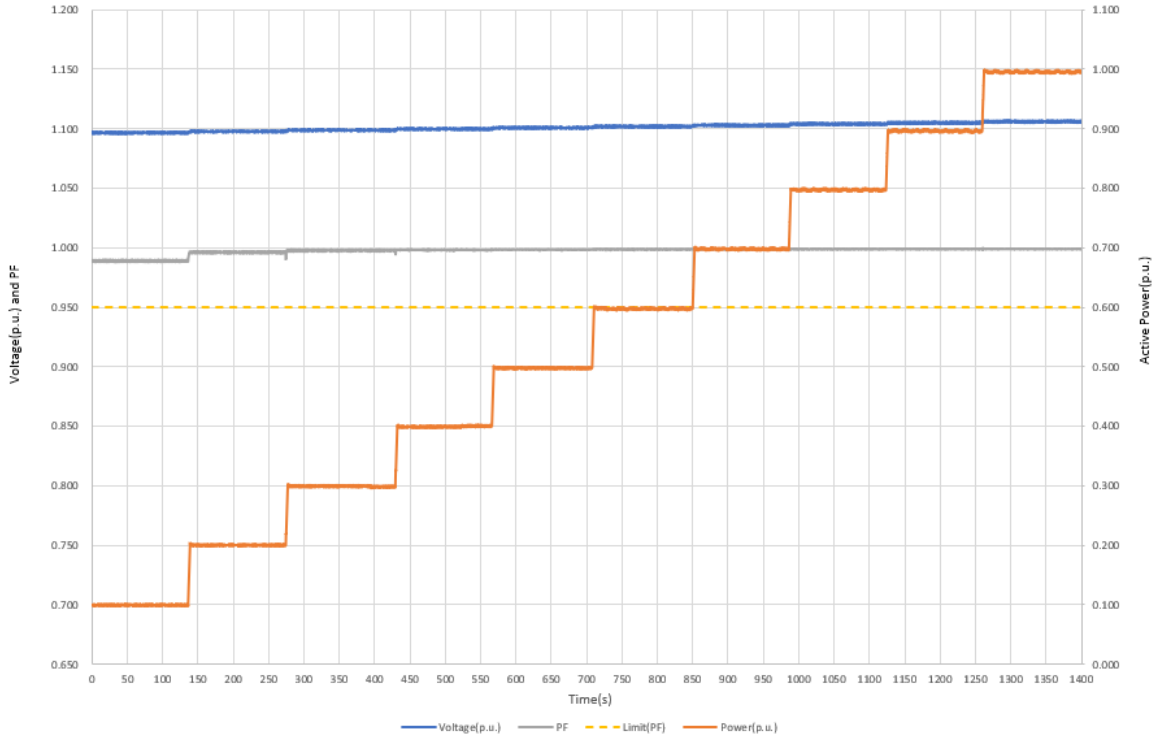
Power Factor and 0.94 p.u



Power Factor and 1.0 p.u



Power Factor and 1.0 p.u



4.6 PROTECTION – FREQUENCY TESTS:

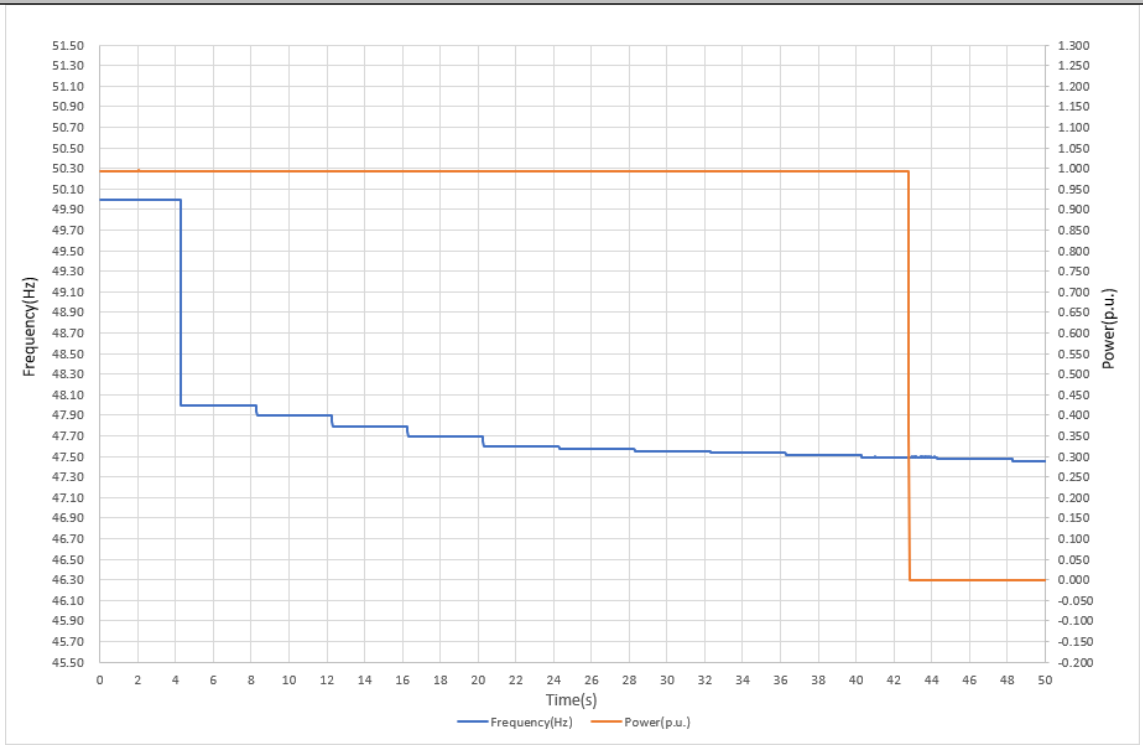
These tests should be carried out in accordance with the Annex A.7.1.2.3. For trip tests, frequency and time delay should be stated. For “no trip tests”, “no trip” can be stated.

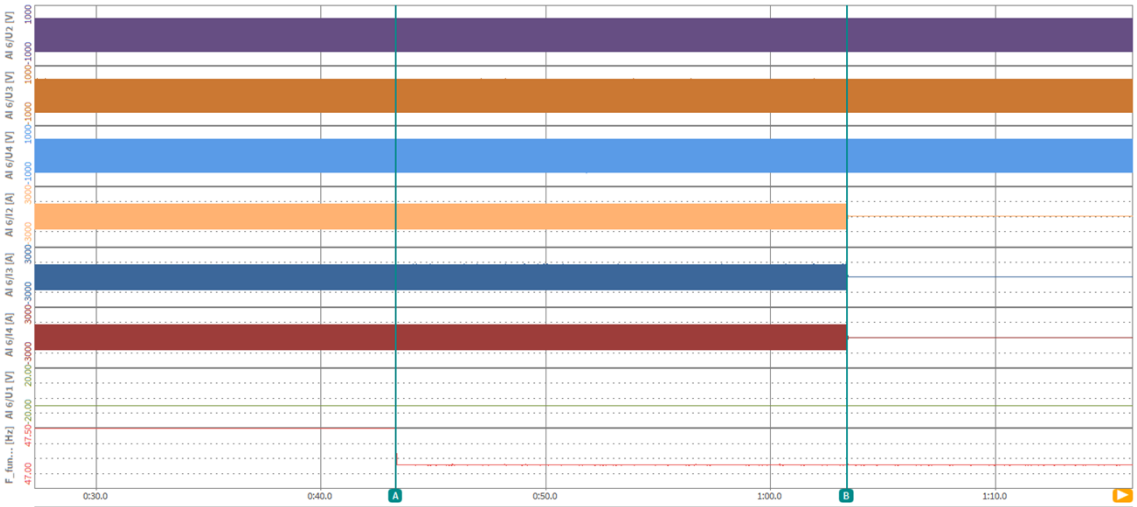
Function	Setting		Trip test		“No trip tests”	
	Frequency	Time delay	Frequency	Time delay	Frequency /time	Confirm no trip
U/F stage 1	47.5 Hz	20 s	47.49Hz	20.05s	47.7 Hz 30 s	No trip
U/F stage 2	47 Hz	0.5 s	46.99Hz	0.569s	47.2 Hz 19.5 s	No trip
					46.8 Hz 0.45 s	No trip
O/F	52 Hz	0.5 s	52.00Hz	0.522s	51.8 Hz 120.0 s	No trip
					52.2 Hz 0.45 s	No trip

Note. For frequency trip tests the frequency required to trip is the setting ± 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 ± 0.2 Hz and for the relevant times as shown in the table above to ensure that the protection will not trip in error.

The test results are shown in the following figure：

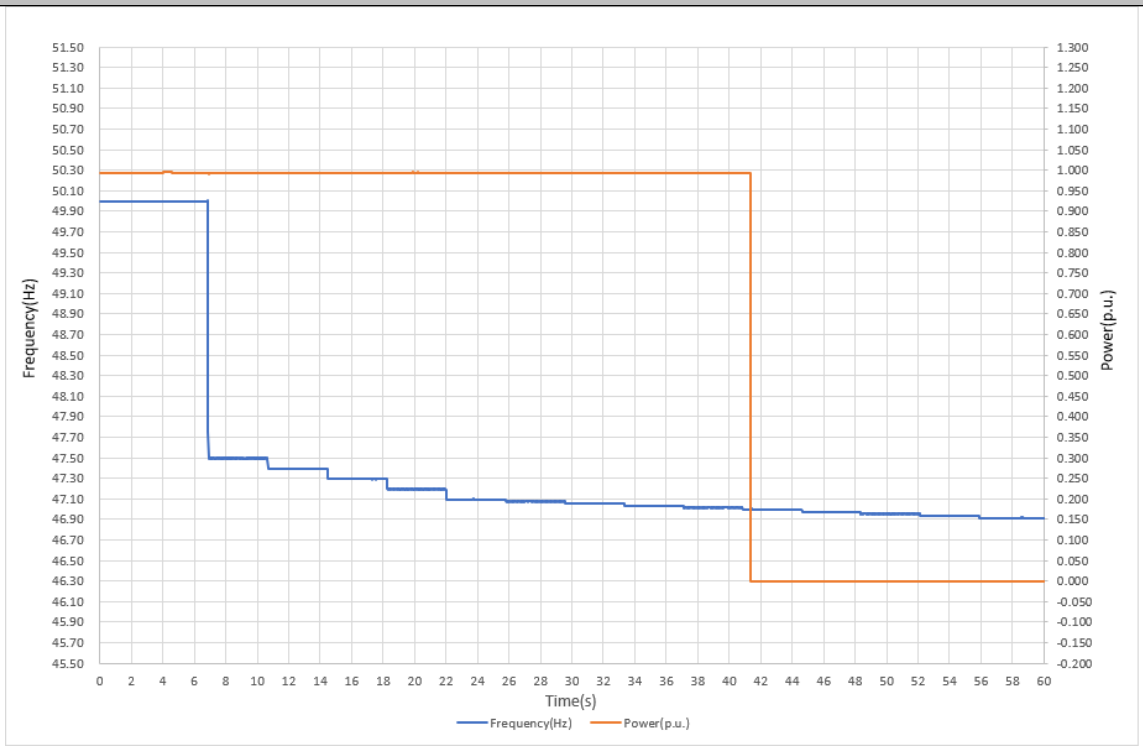
U/F stage 1

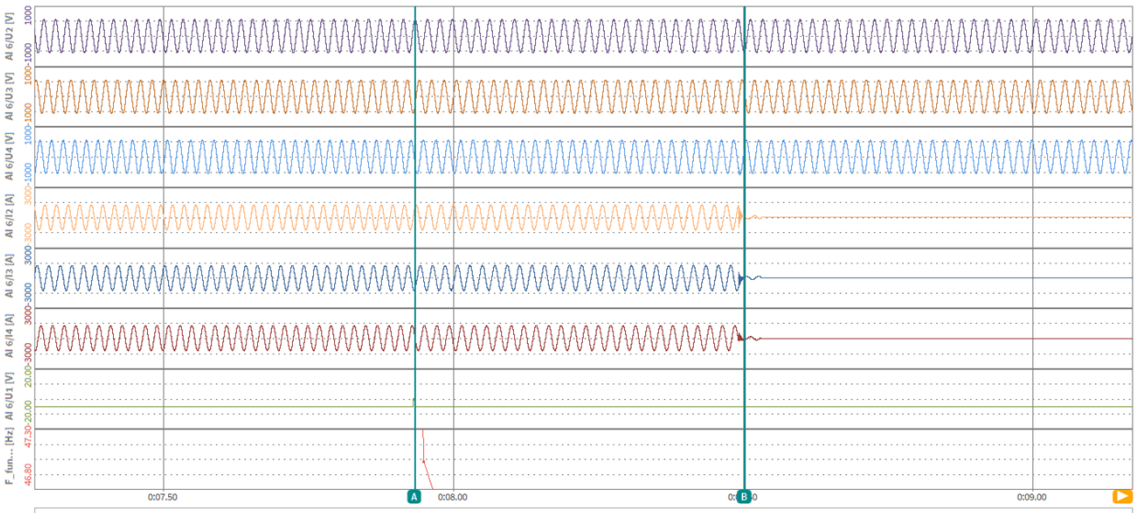




时间 [s]	A 0:43.34233	B 1:03.39243	间隔 0:20.05010
AI 6/U2 [V]	546.4852	117.3618	-429.1234
AI 6/U3 [V]	-388.7444	397.8606	786.6049
AI 6/U4 [V]	-157.8639	-515.1658	-357.3020
AI 6/I2 [A]	942.5970	414.7191	-527.8778
AI 6/I3 [A]	-1232.202	-114.6838	1117.518
AI 6/I4 [A]	297.4869	-293.1308	-590.6177
AI 6/U1 [V]	-6.086588	-5.300999	0.785589
F_fund@AC [Hz]	50.00278	47.19267	-2.810112

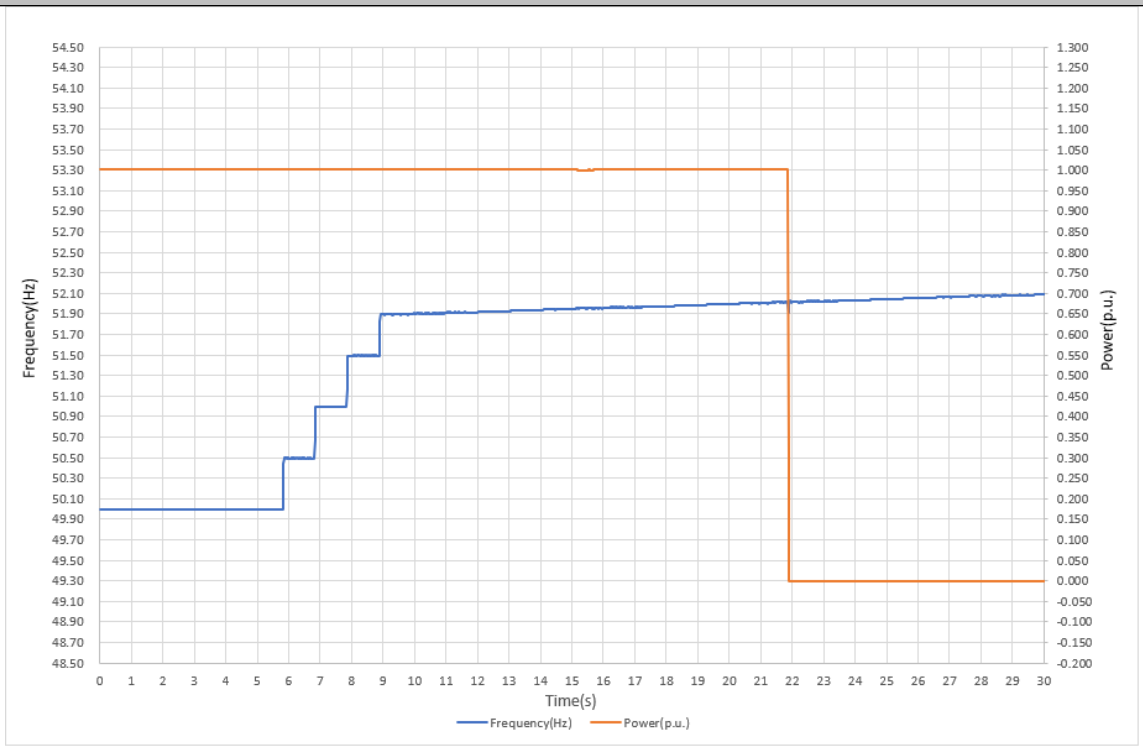
U/F stage 2

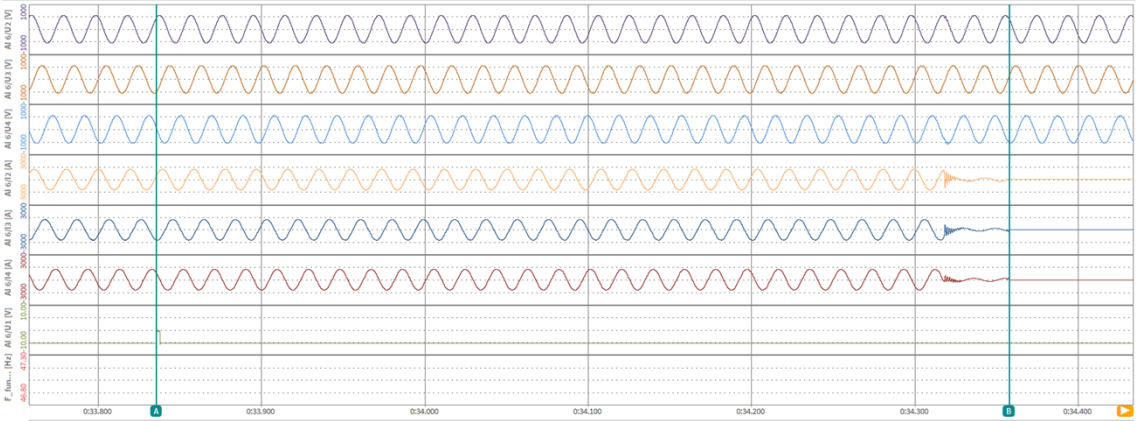




	A	B	间隔
时间 [s]	7.9335734	8.5025938	0.5690204
AI 6/U2 [V]	514.4055	-560.0019	-1074.407
AI 6/U3 [V]	-458.9358	286.4258	745.3616
AI 6/U4 [V]	-55.61900	273.7563	329.3753
AI 6/I2 [A]	746.2330	68.24685	-677.9862
AI 6/I3 [A]	-1271.984	48.04161	1320.026
AI 6/I4 [A]	535.2761	-110.2518	-645.5279
AI 6/U1 [V]	-0.325918	-5.341292	-5.015374
F_fund@AC [Hz]	50.00266	46.68517	-3.317490

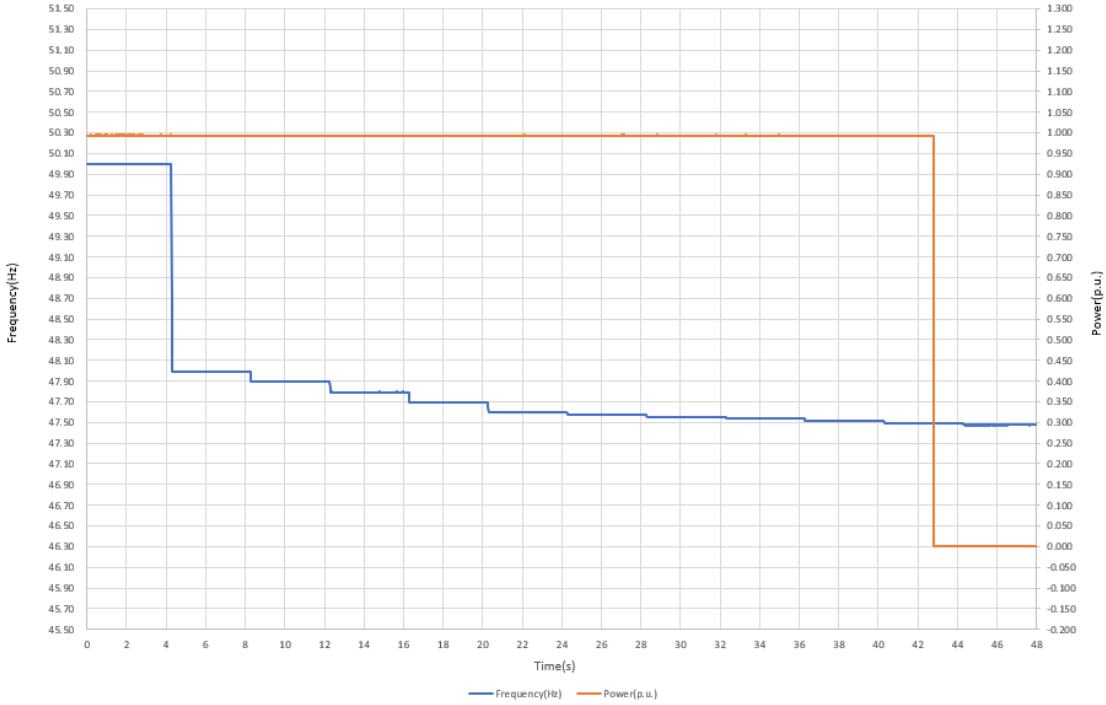
O/F stage 1

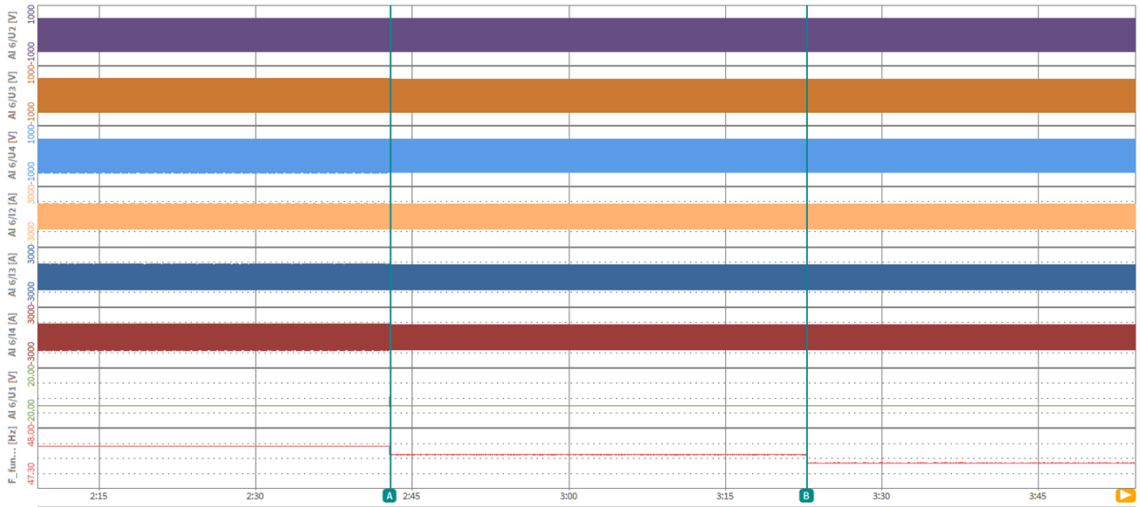




	A	B	间隔
时间 [s]	0:33.8359785	0:34.3574847	0.5215063
AI 6/U2 [V]	457.6831	414.8171	-42.86599
AI 6/U3 [V]	-517.1345	121.4950	638.6295
AI 6/U4 [V]	59.32546	-536.3639	-595.6893
AI 6/I2 [A]	421.5284	0.609883	-420.9185
AI 6/I3 [A]	-1252.804	-143.1129	1109.691
AI 6/I4 [A]	833.7118	143.4375	-690.2743
AI 6/U1 [V]	-4.942656	-5.341292	-0.398636
F_fund@AC [Hz]	50.99311	52.19210	1.198990

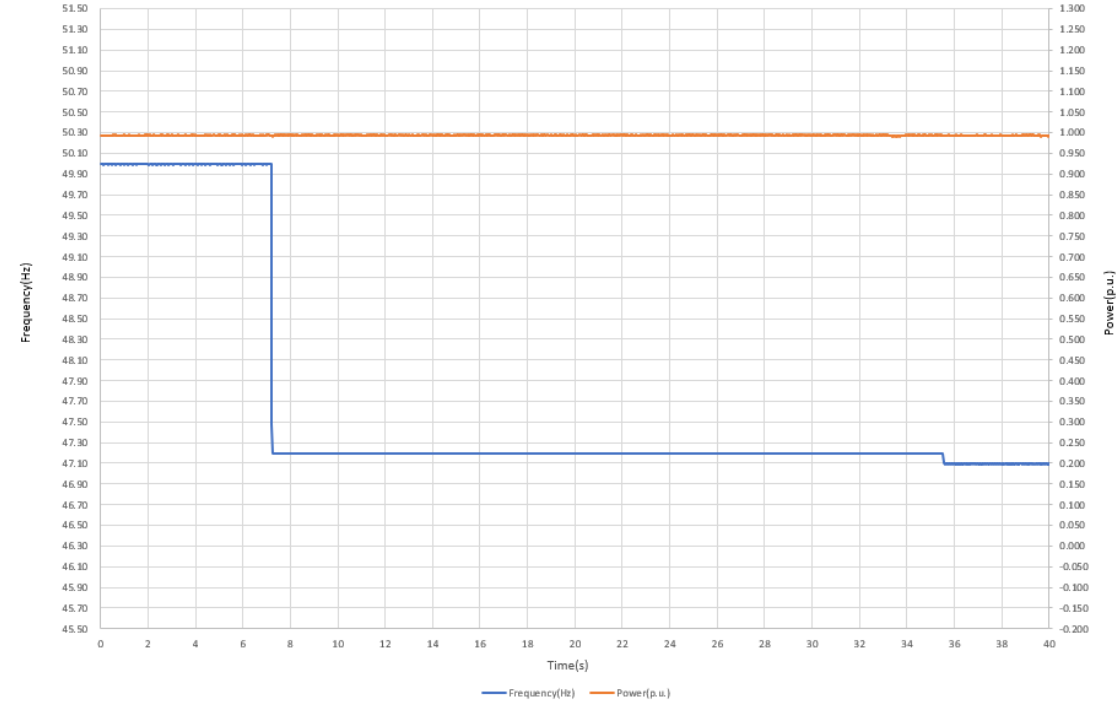
No trip tests - 47.7 Hz / 30 s

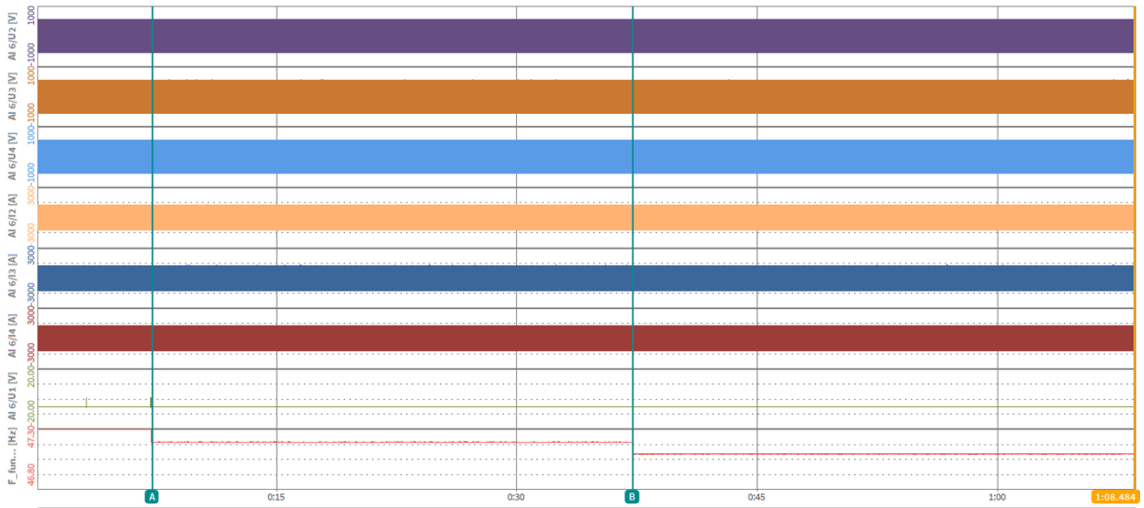




	A	B	间隔
时间 [s]	2:42.8998	3:22.8366	0:39.9368
AI 6/U2 [V]	-557.6120	-136.1146	421.4974
AI 6/U3 [V]	178.9060	540.4892	361.5833
AI 6/U4 [V]	378.8614	-404.2750	-783.1364
AI 6/I2 [A]	-1194.509	344.3237	1538.832
AI 6/I3 [A]	994.2869	880.1225	-114.1644
AI 6/I4 [A]	203.8456	-1218.340	-1422.186
AI 6/U1 [V]	-5.326987	-5.347252	-0.020266
F_fund@AC [Hz]	47.70972	47.69434	-0.015381

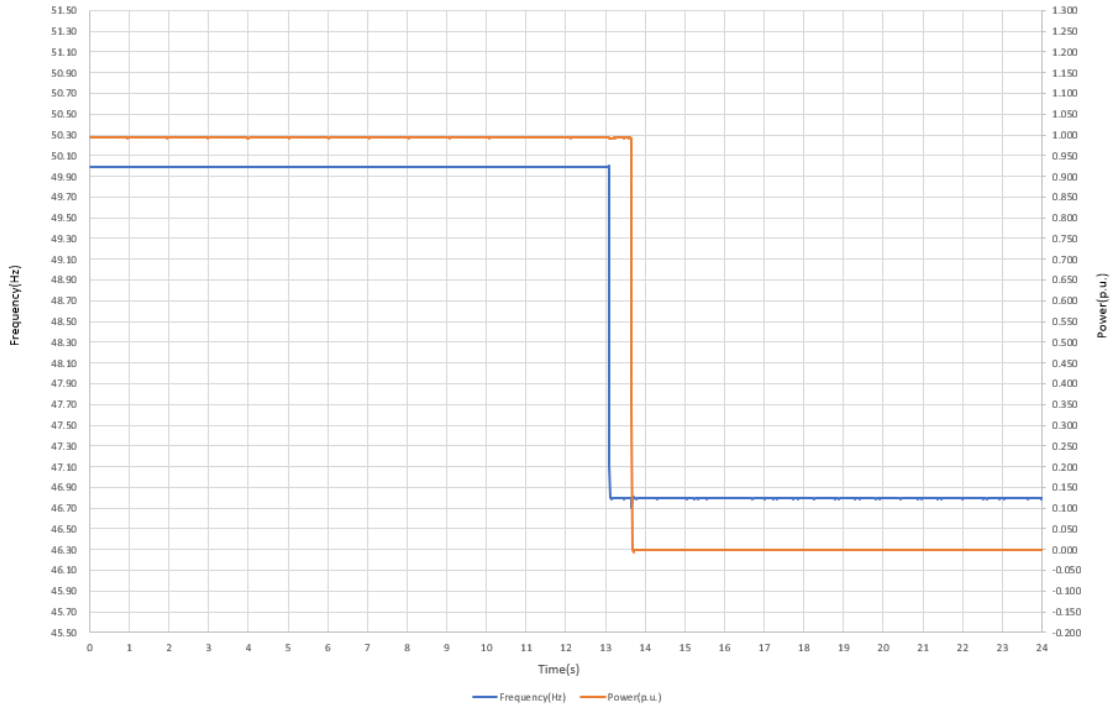
No trip tests – 47.2 Hz / 19.5 s

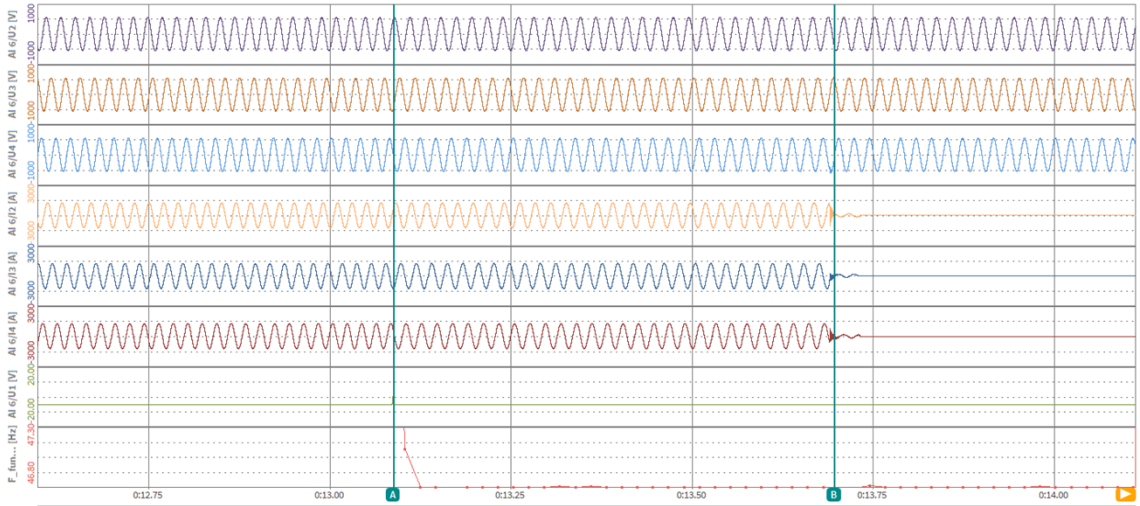




时间 [s]	A 7.28514	B 0:37.23435	间隔 0:29.94921
AI 6/U2 [V]	-16.70528	-225.2388	-208.5335
AI 6/U3 [V]	496.1844	-337.9493	-834.1337
AI 6/U4 [V]	-479.3892	563.2222	1042.611
AI 6/I2 [A]	642.1371	-1044.665	-1686.802
AI 6/I3 [A]	612.6073	-136.4062	-749.0135
AI 6/I4 [A]	-1248.233	1183.558	2431.791
AI 6/U1 [V]	-5.326748	-5.304575	0.022173
F_fund@AC [Hz]	47.19218	47.19340	1.221e-3

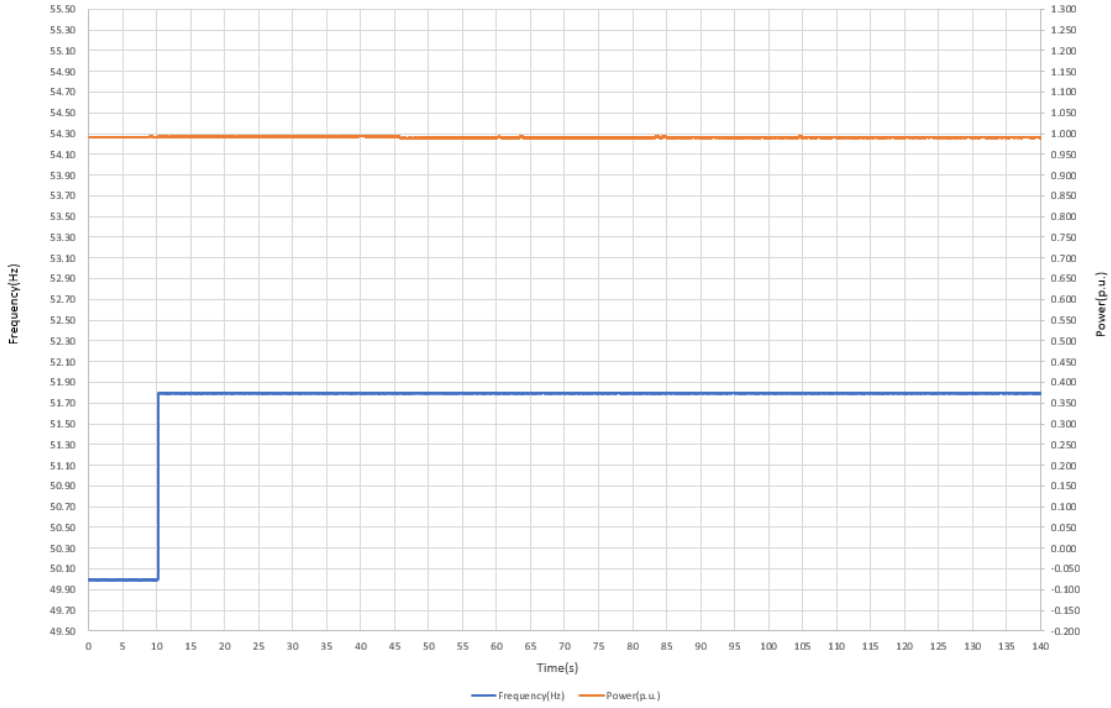
No trip tests – 46.8 Hz / 0.45 s

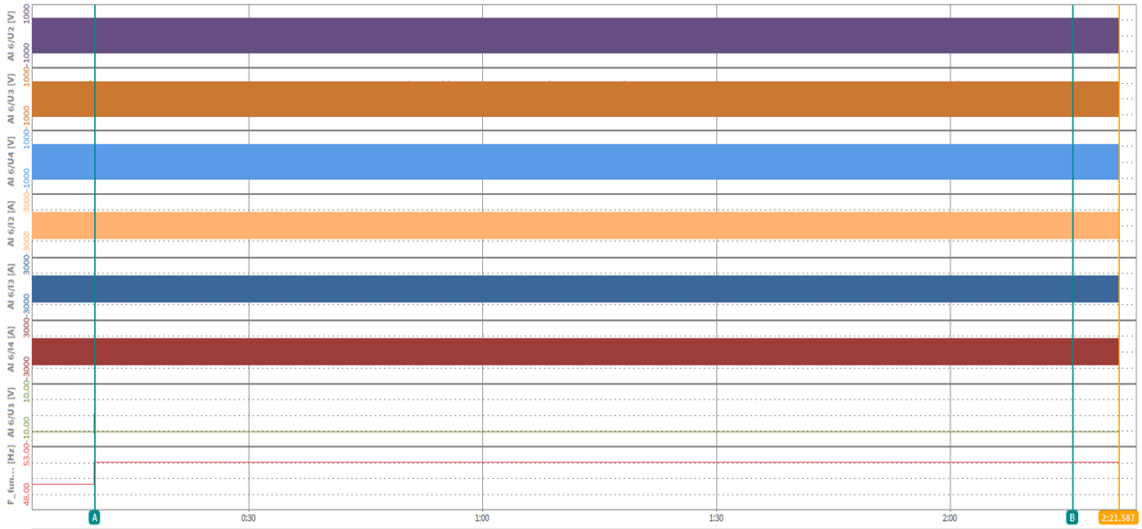




	A	B	间隔
时间 [s]	0:13.087913	0:13.696433	0.608520
AI 6/U2 [V]	460.6803	-386.6890	-847.3692
AI 6/U3 [V]	-512.6050	550.7651	1063.370
AI 6/U4 [V]	51.79620	-163.8999	-215.6961
AI 6/I2 [A]	502.3165	216.3763	-285.9402
AI 6/I3 [A]	-1279.592	-150.3036	1129.289
AI 6/I4 [A]	783.5223	-61.69307	-845.2154
AI 6/U1 [V]	-0.321627	-5.326271	-5.004645
F_fund@AC [Hz]	50.00532	46.79416	-3.211163

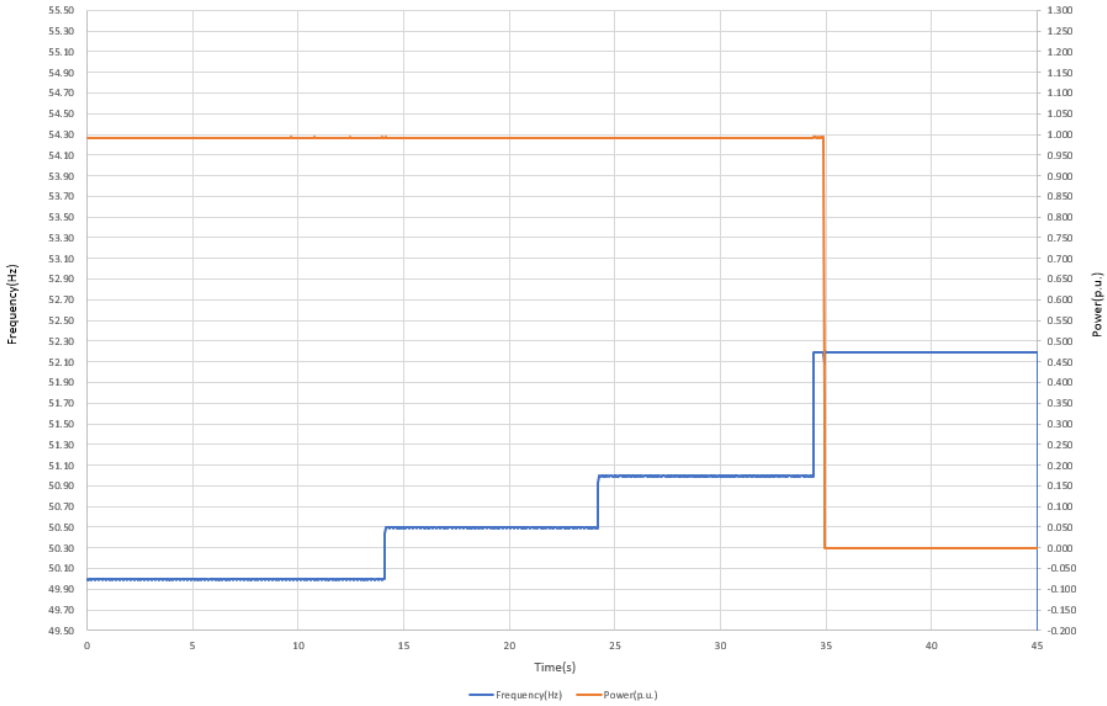
No trip tests - 51.8 Hz / 120 s

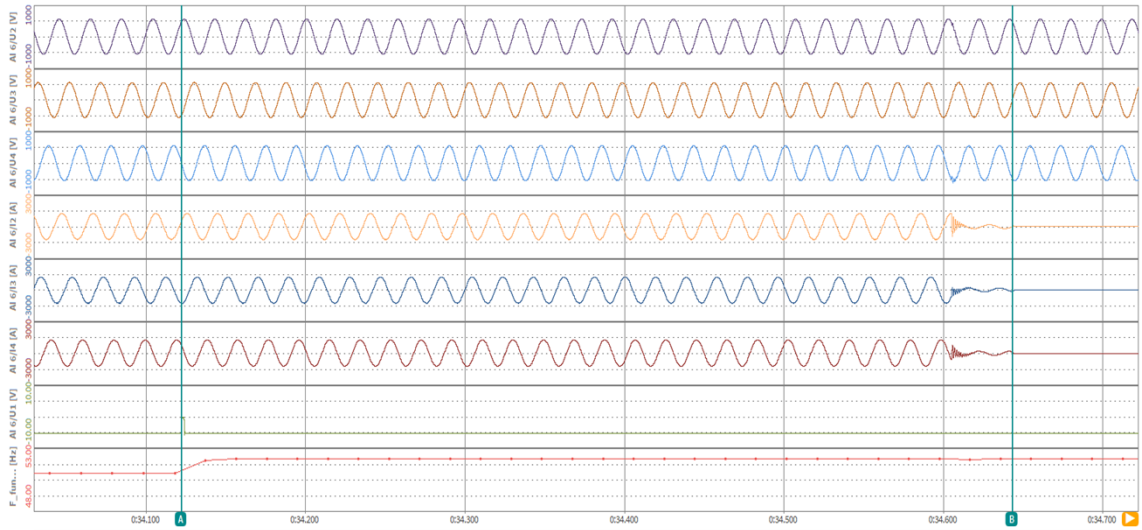




时间 [s]	A 0:10.32223	B 2:15.63864	间隔 2:05.31641
AI 6/U2 [V]	-561.6529	396.1594	957.8124
AI 6/U3 [V]	223.6533	151.8042	-71.84911
AI 6/U4 [V]	338.1803	-548.0035	-886.1838
AI 6/I2 [A]	-1152.533	1237.552	2390.084
AI 6/I3 [A]	1038.034	-347.5258	-1385.560
AI 6/I4 [A]	114.4506	-891.0298	-1005.480
AI 6/U1 [V]	-5.328894	-5.340338	-0.011444
F_fund@AC [Hz]	51.79471	51.79184	-2.869e-3

No trip tests – 52.2 Hz / 0.45 s





	A	B	间隔
时间 [s]	0:34.1222134	0:34.6428918	0.5206784
AI 6/U2 [V]	477.0627	494.2968	17.23409
AI 6/U3 [V]	-504.0076	-18.70585	485.3018
AI 6/U4 [V]	26.80898	-475.6677	-502.4767
AI 6/I2 [A]	507.9742	-3.610126	-511.5843
AI 6/I3 [A]	-1289.003	-162.6870	1126.316
AI 6/I4 [A]	785.3057	165.3053	-620.0004
AI 6/U1 [V]	0.368595	-5.331517	-5.700112
F_fund@AC [Hz]	50.99111	52.19044	1.199329

4.7 PROTECTION – VOLTAGE TESTS:

These tests should be carried out in accordance with Annex A.7.1.2.2. For trip tests, voltage and time delay should be stated. For “no trip tests”, “no trip” can be stated.

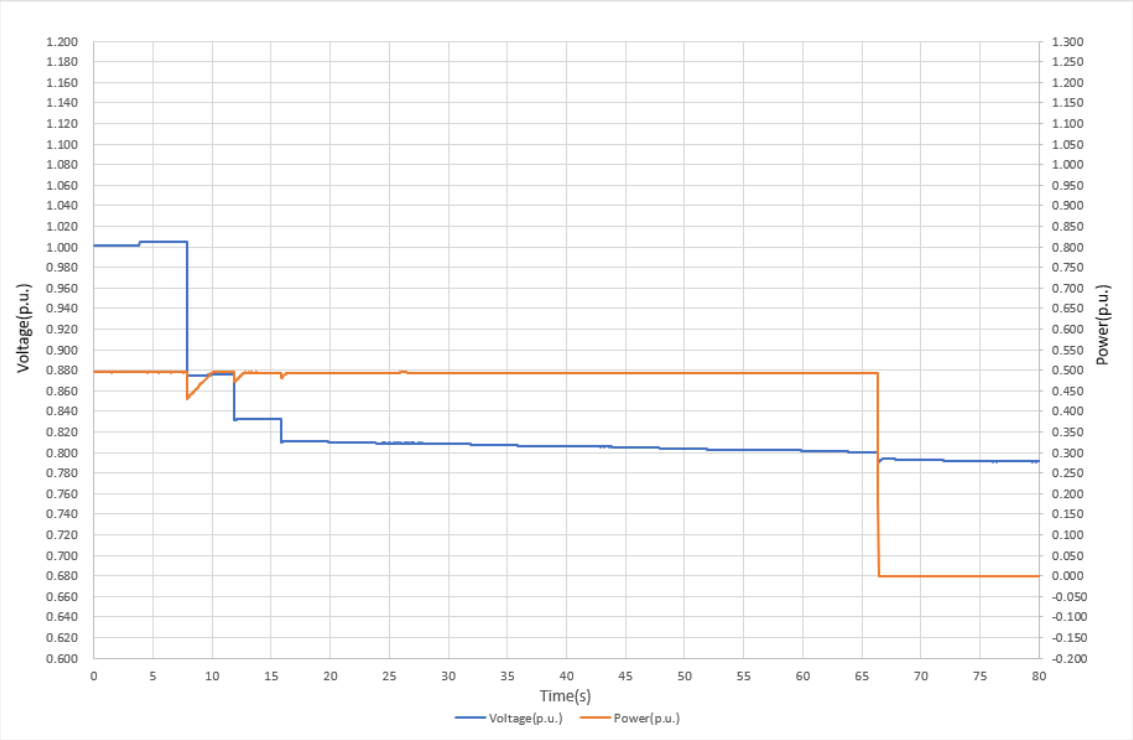
Note that the value of voltage stated below assumes a **LV** connection This should be adjusted for **HV** taking account of the VT ratio as required.

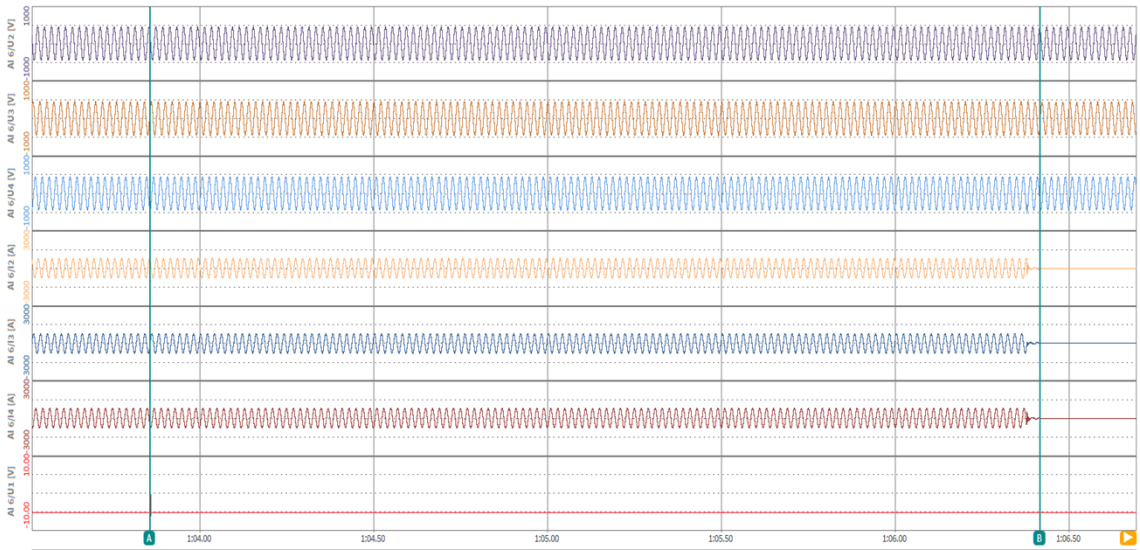
Function	Settin		Trip test		“No trip tests”	
	Voltage	Time delay	Voltage	Time delay	Voltage /time	Confirm no trip
U/V	0.8 p.u (320 V)	2.5 s	318.9 V	2.558s	327 V / 5.0 s	No trip
					313 V / 2.45 s	No trip
O/V stage 1	1.14p.u (456 V)	1.0 s	454.9 V	1.046s	448.8 V / 5.0 s	No trip
O/V stage 2	1.19 p.u (476 V)	0.5 s	473.9 V	0.527s	468.6 V / 0.95 s	No trip
					482 V / 0.45 s	No trip

Note for Voltage tests the Voltage required to trip is the setting ±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.

The test results are shown in the following figure：

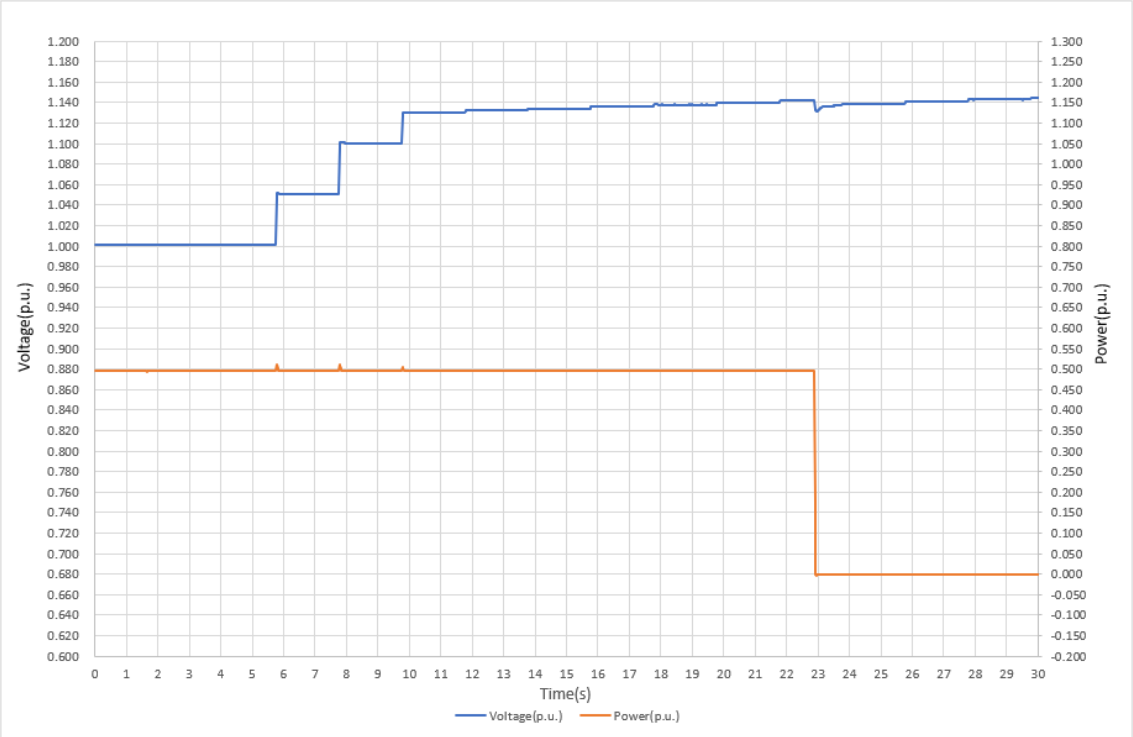
U/V

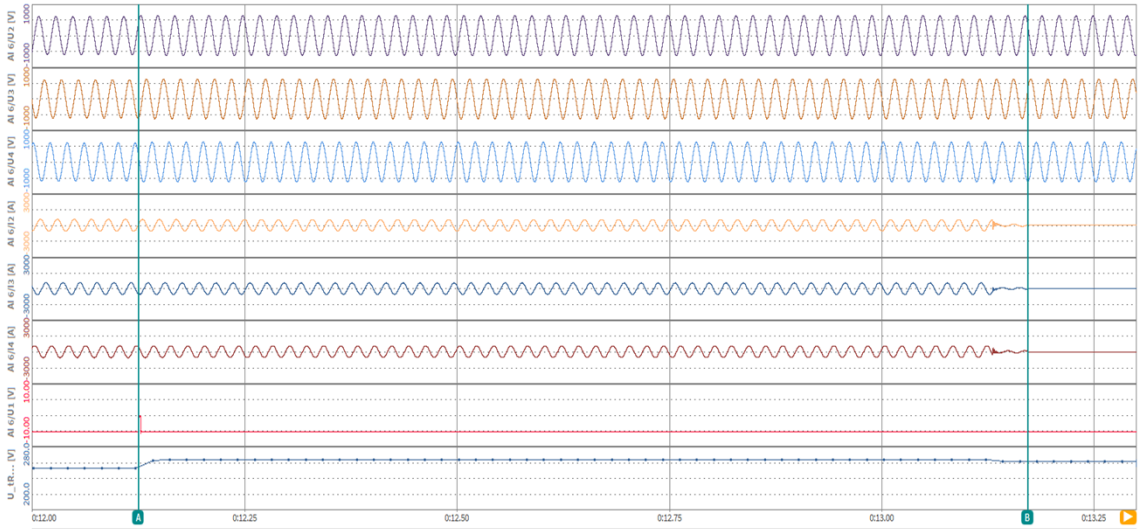




时间 [s]	A 1:03.857292	B 1:06.415700	间隔 2.558407
AI 6/U2 [V]	428.1509	426.9905	-1.160383
AI 6/U3 [V]	-80.23239	-317.7436	-237.5112
AI 6/U4 [V]	-347.9974	-109.3440	238.6534
AI 6/I2 [A]	772.5902	-55.33146	-827.9217
AI 6/I3 [A]	-541.7404	-18.55585	523.1846
AI 6/I4 [A]	-232.5152	73.74419	306.2594
AI 6/U1 [V]	-5.319596	-5.310774	8.821e-3

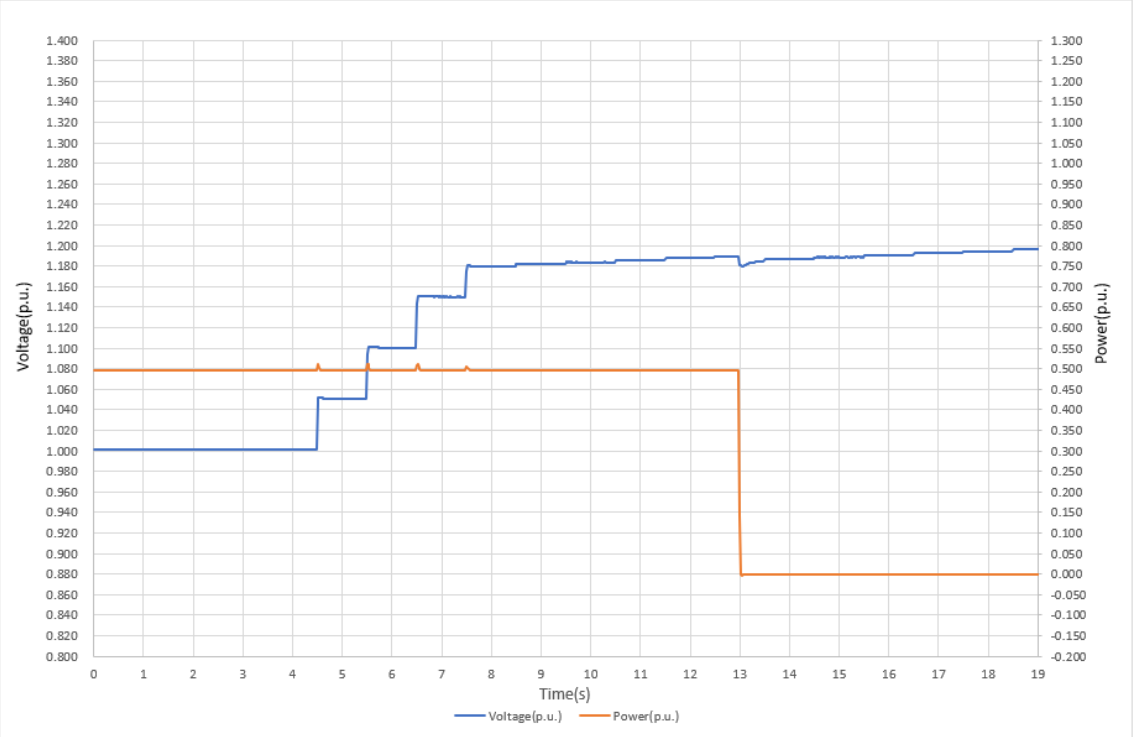
O/V stage 1

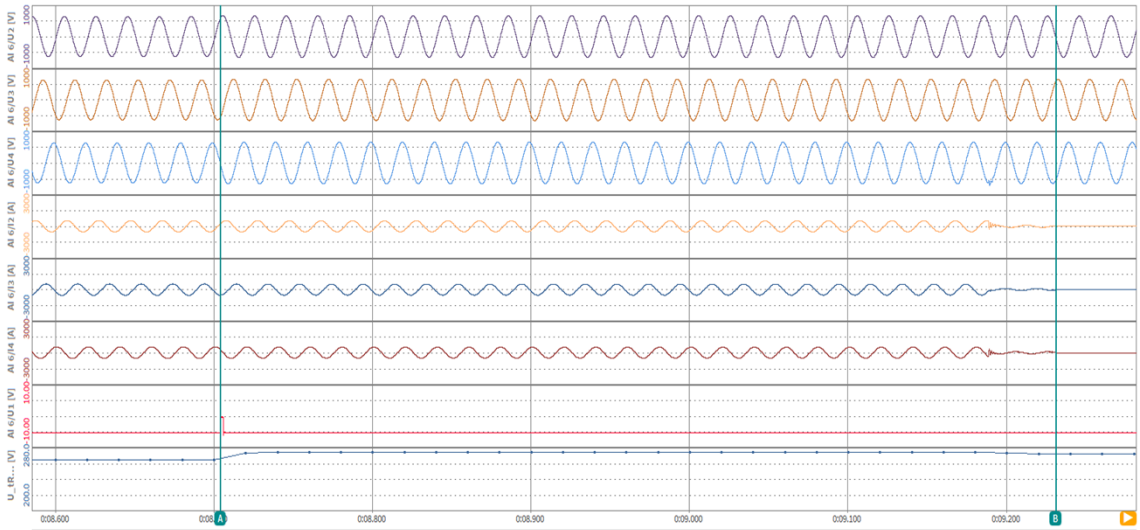




	A	B	间隔
时间 [s]	0:12.1253068	0:13.1716214	1.0463146
AI 6/U2 [V]	328.4002	389.7884	61.38826
AI 6/U3 [V]	-617.9726	237.0362	855.0089
AI 6/U4 [V]	289.4645	-626.8437	-916.3082
AI 6/I2 [A]	4.645118	-0.517837	-5.162955
AI 6/I3 [A]	-525.5435	-49.32377	476.2197
AI 6/I4 [A]	521.5182	49.95121	-471.5669
AI 6/U1 [V]	-5.350113	-5.329848	0.020266
U_tRMS@AC [V]	253.0951	261.1269	8.031815

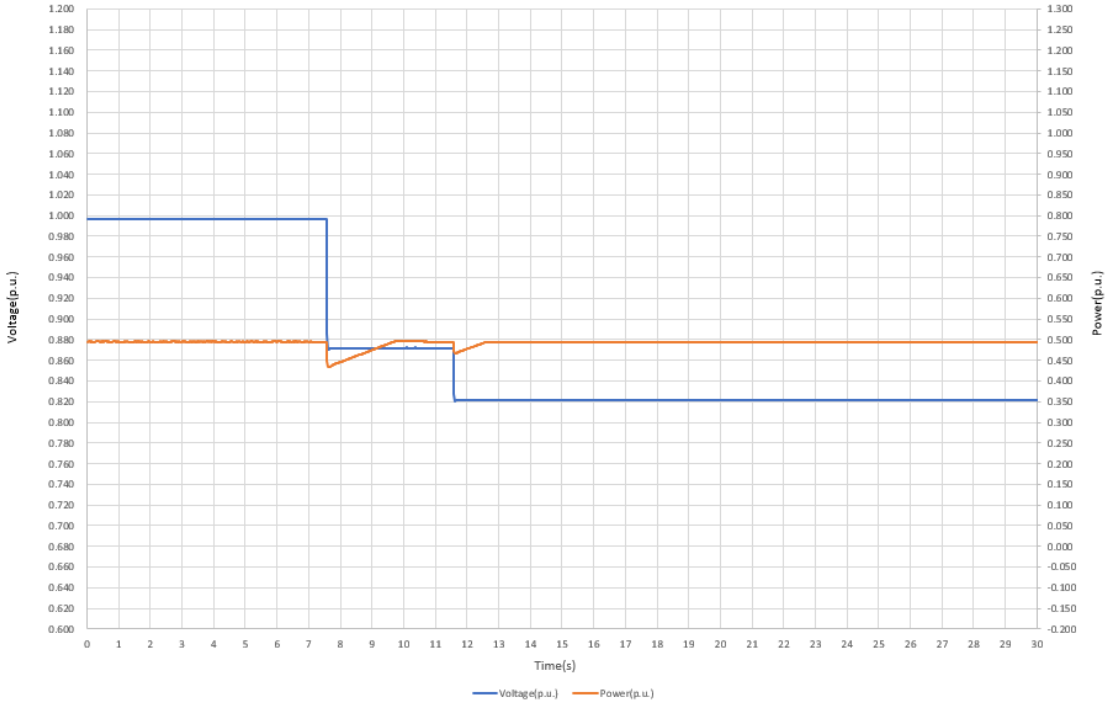
O/V stage 2

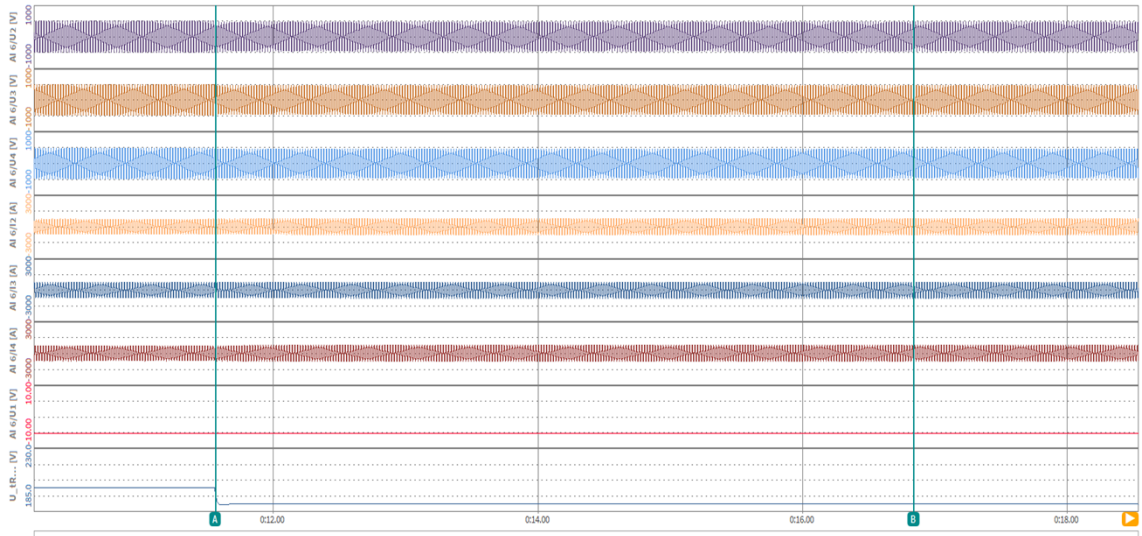




	A	B	间隔
时间 [s]	8.7042418	9.2311284	0.5268866
AI 6/U2 [V]	560.6902	-23.18859	-583.8788
AI 6/U3 [V]	-561.8222	588.5764	1150.399
AI 6/U4 [V]	0.983715	-565.3110	-566.2947
AI 6/I2 [A]	231.0403	-0.854007	-231.8943
AI 6/I3 [A]	-560.8115	-5.653831	555.1577
AI 6/I4 [A]	330.4948	6.826052	-323.6687
AI 6/U1 [V]	-3.488302	-5.335570	-1.847267
U_tRMS@AC [V]	264.4641	272.6539	8.189758

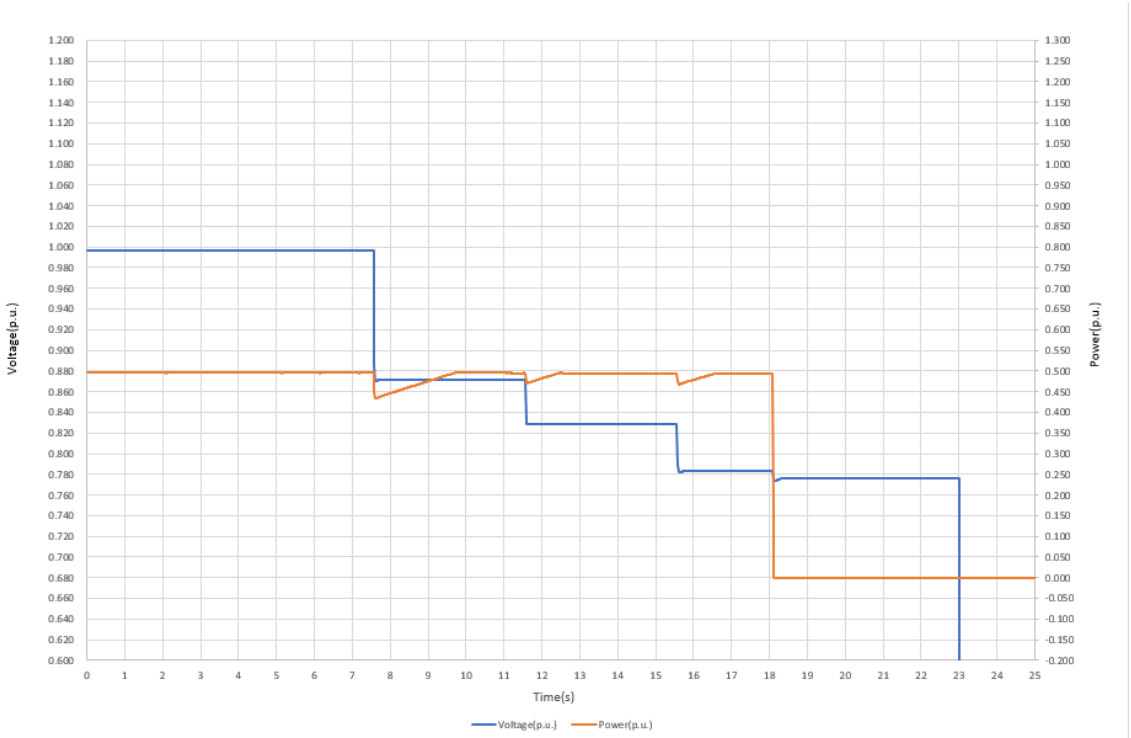
No trip tests –327 V / 5.0 s

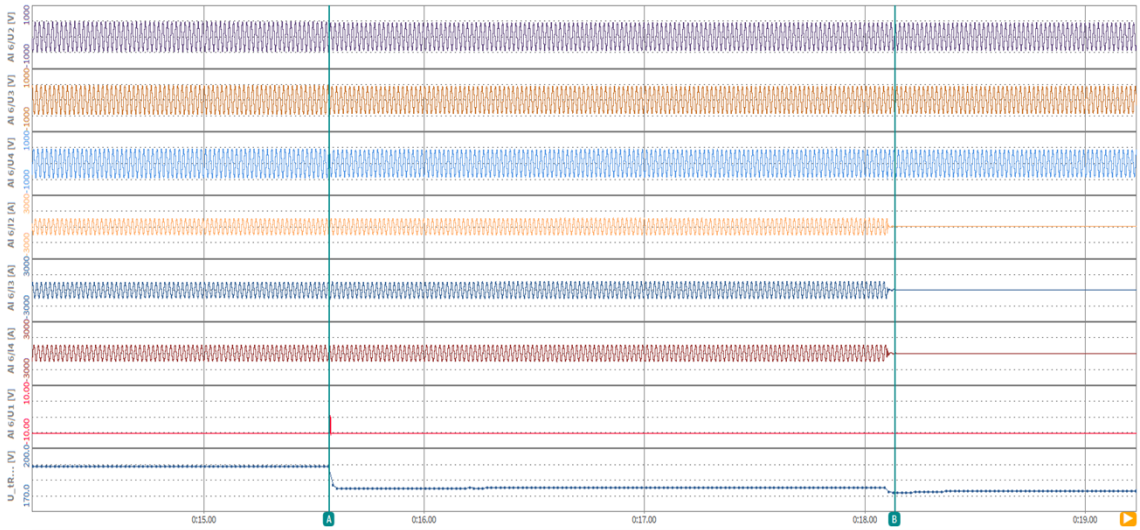




时间 [s]	A 0:11.56747	B 0:16.84025	间隔 5.27278
AI 6/U2 [V]	288.5192	-449.9765	-738.4956
AI 6/U3 [V]	-491.1137	325.3608	816.4745
AI 6/U4 [V]	202.5147	124.7714	-77.74330
AI 6/I2 [A]	45.25019	-555.2333	-600.4835
AI 6/I3 [A]	-658.5643	735.3917	1393.956
AI 6/I4 [A]	616.1644	-181.4495	-797.6139
AI 6/U1 [V]	-5.329371	-5.349160	-0.019789
U_tRMS@AC [V]	201.3805	189.7833	-11.59720

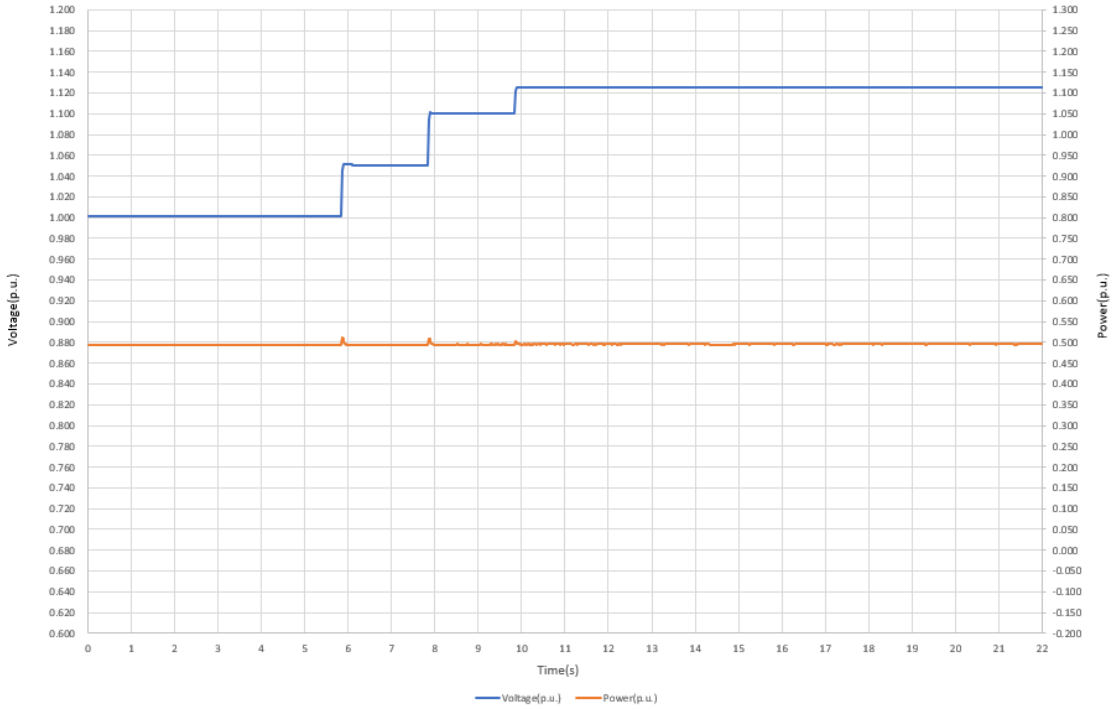
No trip tests –313 V / 2.45 s

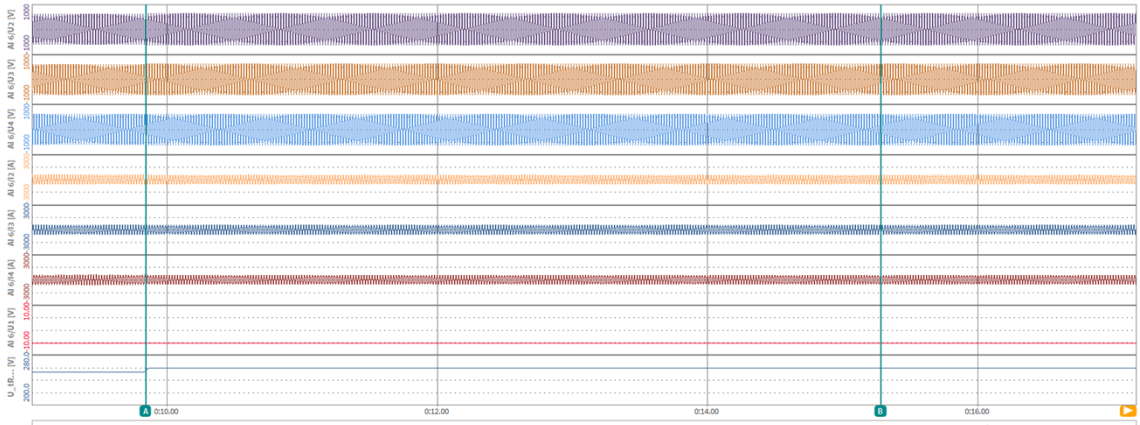




时间 [s]	A 0:15.570526	B 0:18.135344	间隔 2.564819
AI 6/U2 [V]	-266.6097	313.4468	580.0565
AI 6/U3 [V]	-203.2166	-422.0569	-218.8404
AI 6/U4 [V]	469.8661	108.5236	-361.3425
AI 6/I2 [A]	-678.9987	-72.08156	606.9172
AI 6/I3 [A]	18.78765	22.61069	3.823042
AI 6/I4 [A]	661.8943	49.88564	-612.0086
AI 6/U1 [V]	-5.320072	-5.336285	-0.016212
U_tRMS@AC [V]	191.4452	178.7744	-12.67072

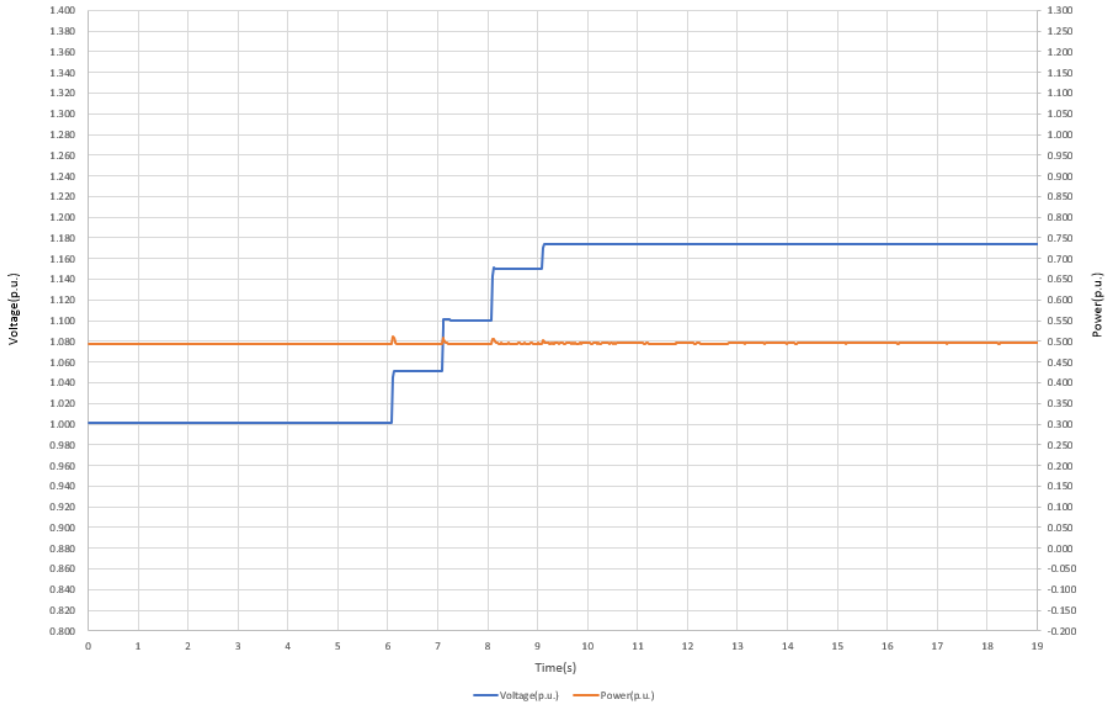
No trip tests – 448.8 V / 5.0 s

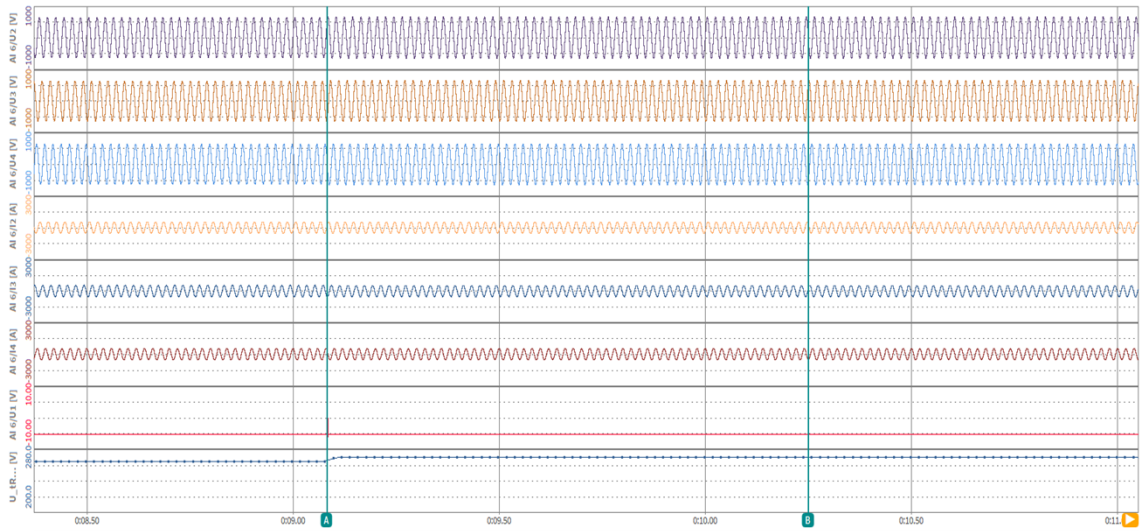




	A	B	间隔
时间 [s]	9.8448823	0:15.2827498	5.4378675
AI 6/U2 [V]	421.0179	-73.80724	-494.8252
AI 6/U3 [V]	-604.2638	-508.3204	95.94346
AI 6/U4 [V]	183.1141	582.0938	398.9797
AI 6/I2 [A]	73.04264	-355.3813	-428.4239
AI 6/I3 [A]	-548.9109	-208.9081	340.0028
AI 6/I4 [A]	476.9124	563.9102	86.99775
AI 6/U1 [V]	-5.331278	-5.326987	4.292e-3
U_tRMS@AC [V]	253.0860	258.7712	5.685150

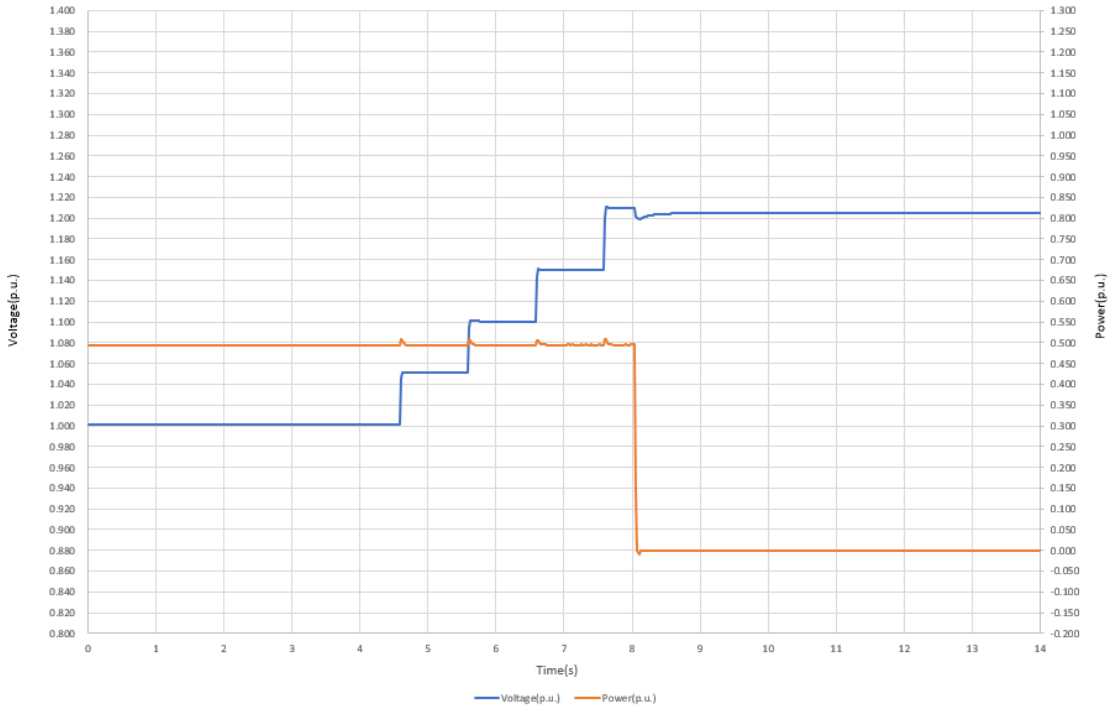
No trip tests – 468.6 V / 0.95 s

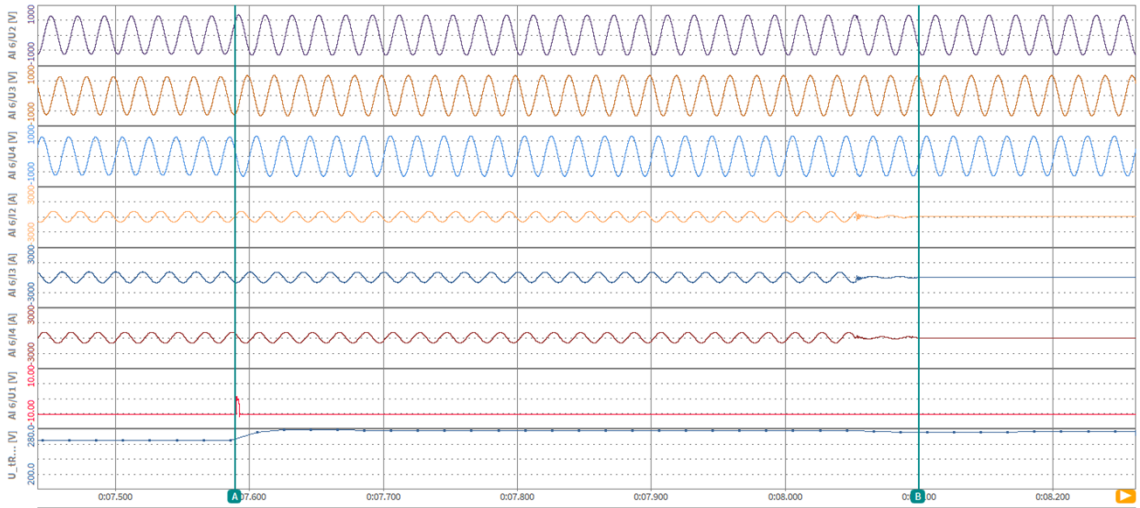




	A	B	间隔
时间 [s]	9.082844	0:10.250792	1.167949
AI 6/U2 [V]	326.1714	113.7960	-212.3754
AI 6/U3 [V]	-646.8020	504.9677	1151.770
AI 6/U4 [V]	320.5123	-618.6934	-939.2057
AI 6/I2 [A]	-19.87385	389.4420	409.3158
AI 6/I3 [A]	-488.3204	121.7869	610.1072
AI 6/I4 [A]	506.0198	-513.6000	-1019.620
AI 6/U1 [V]	-5.329609	-5.315781	0.013828
U_tRMS@AC [V]	264.4890	269.9681	5.479034

No trip tests – 482 V / 0.45 s





时间 [s]	A 7.5894279	B 8.0994235	间隔 0.5099956
AI 6/U2 [V]	437.4118	-443.1508	-880.5626
AI 6/U3 [V]	-632.7551	661.8526	1294.608
AI 6/U4 [V]	195.2016	-218.4894	-413.6911
AI 6/I2 [A]	64.86131	0.241526	-64.61978
AI 6/I3 [A]	-521.4748	0.275640	521.7505
AI 6/I4 [A]	458.1834	0.480541	-457.7029
AI 6/U1 [V]	-5.331278	-5.331040	2.384e-4
U_tRMS@AC [V]	264.5020	276.0912	11.58917

4.8 PROTECTION – LOSS OF MAINS TEST:

These tests should be carried out in accordance with BS EN 62116. Annex A.7.1.2.4.

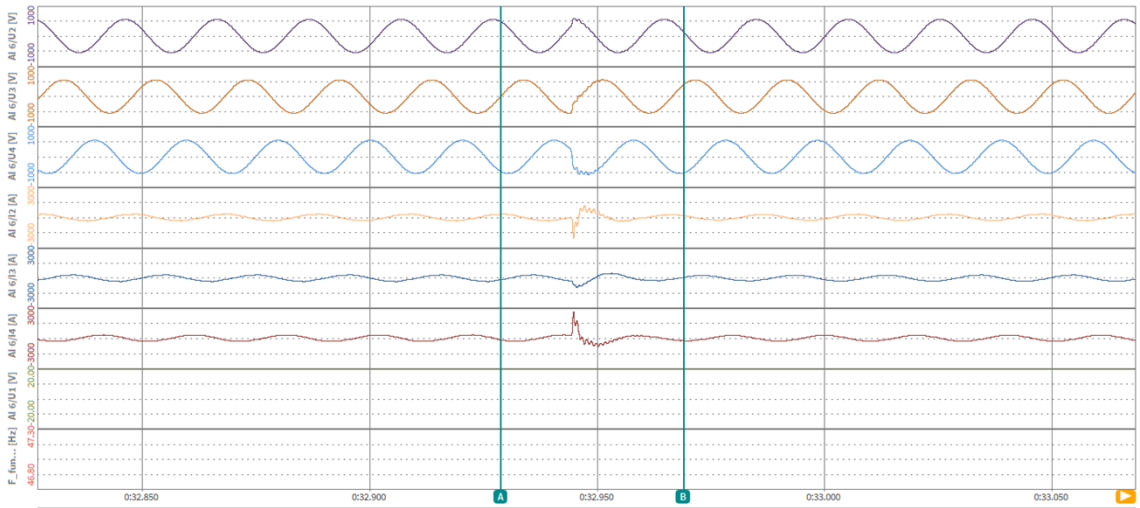
The following sub set of tests should be recorded in the following table.

Test Power and imbalance	33% -5% Q Test 22	66% -5% Q Test 12	100% -5% P Test 5	33% +5% Q Test 31	66% +5% Q Test 21	100% +5% P Test 10
Trip time. Limit is 0.5s	387ms	308ms	241ms	312ms	212ms	226ms

Protection –Loss of Mains Protection, Vector Shift Stability test: This test should be carried out in accordance with Annex A.7.1.2.6.

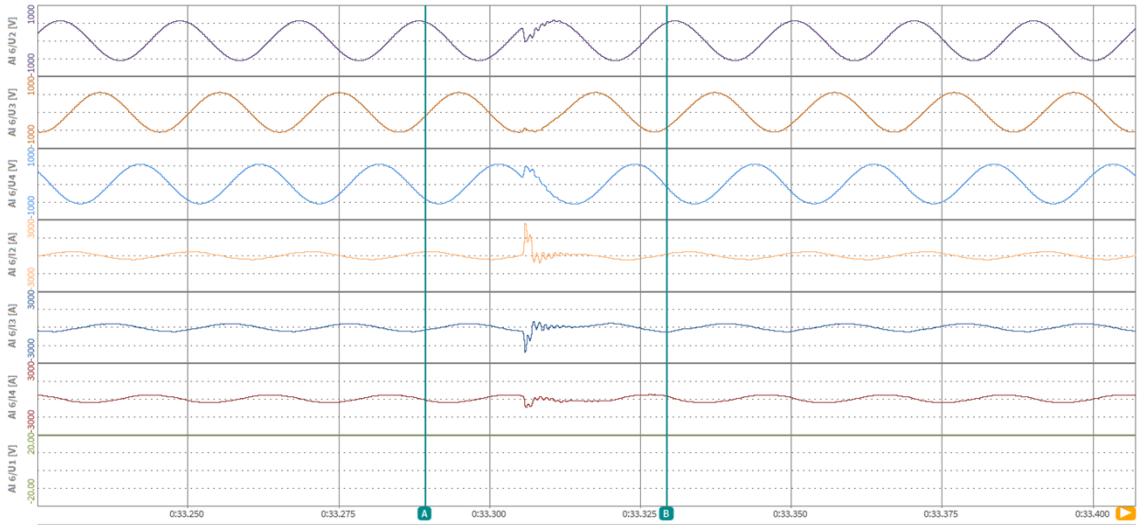
	Start Frequency	Change	Confirm no trip
Positive Vector Shift	49.5 Hz	+50 degrees	No trip
Negative Vector Shift	50.5 Hz	- 50 degrees	No trip

Positive Vector Shift:



Time [s]	A 0:32.9288921	B 0:32.9689682	Delta 0.0400761
AI 6/U2 [V]	494.7548	162.0276	-332.7272
AI 6/U3 [V]	-10.96487	383.6684	394.6333
AI 6/U4 [V]	-483.8450	-545.6543	-61.80931
AI 6/I2 [A]	318.2368	181.0746	-137.1622
AI 6/I3 [A]	-161.9482	29.75470	191.7029
AI 6/I4 [A]	-172.7685	-225.7547	-52.98615
AI 6/U1 [V]	747.9949	749.7714	1.776457
F_fund@AC [Hz]	49.49307	57.75592	8.262852

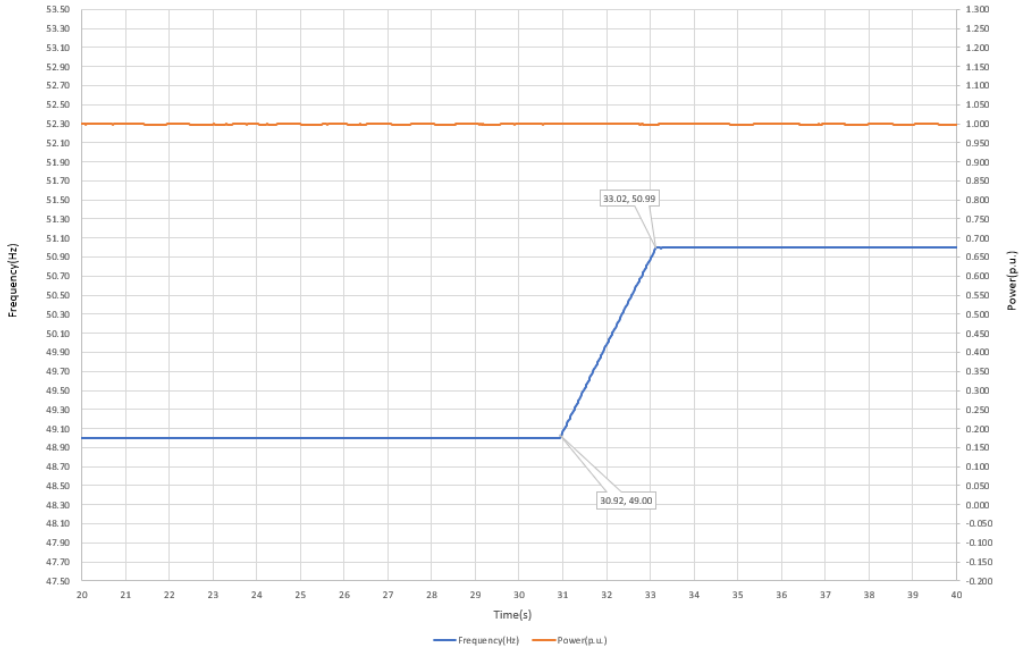
Negative Vector Shift:



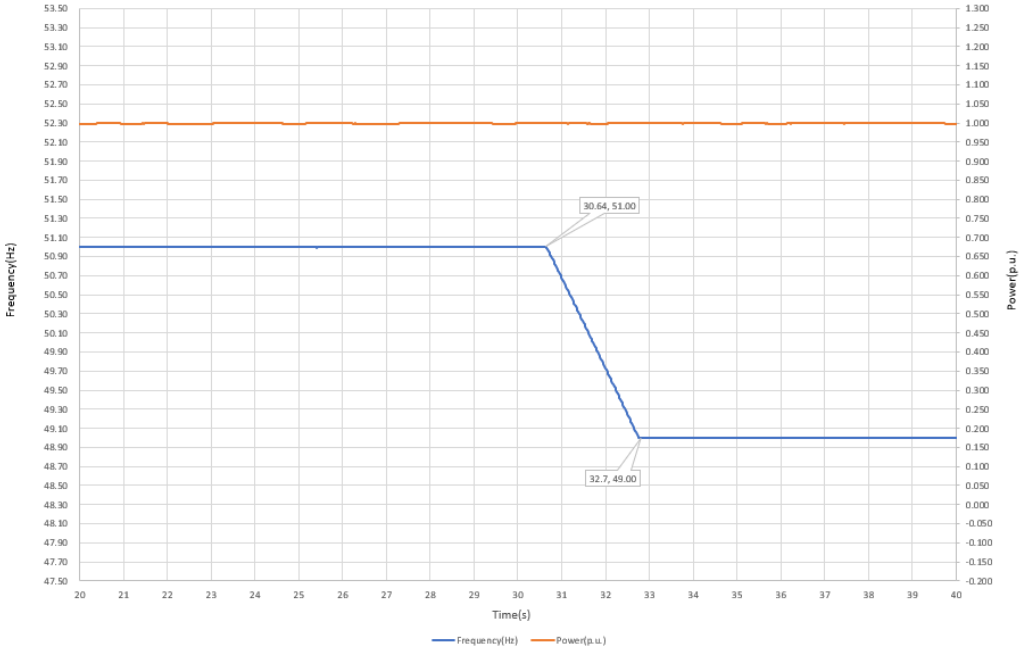
Time [s]	A 0:33.2893441	B 0:33.3294143	Delta 0.0400702
AI 6/U2 [V]	535.7490	518.1079	-17.64107
AI 6/U3 [V]	-110.8618	-419.4093	-308.5475
AI 6/U4 [V]	-424.9635	-98.82975	326.1337
AI 6/I2 [A]	306.5543	143.1780	-163.3763
AI 6/I3 [A]	-233.9673	-387.6853	-153.7180
AI 6/I4 [A]	-88.21335	230.8098	319.0232
AI 6/U1 [V]	747.7208	747.2897	-0.431061

Protection –Loss of Mains Protection, RoCoF Stability test: This test should be carried out in accordance with Annex A.7.1.2.6.			
Ramp range	Test frequency ramp:	Test Duration	Confirm no trip
49.0 Hz to 51.0 Hz	+0.95 Hzs^{-1}	2.10 s	No trip
51.0 Hz to 49.0 Hz	-0.95 Hzs^{-1}	2.06 s	No trip

+0.95 Hz/s:



-0.95 Hz/s:



4.9 LIMITED FREQUENCY SENSITIVE MODE – OVER FREQUENCY TEST:

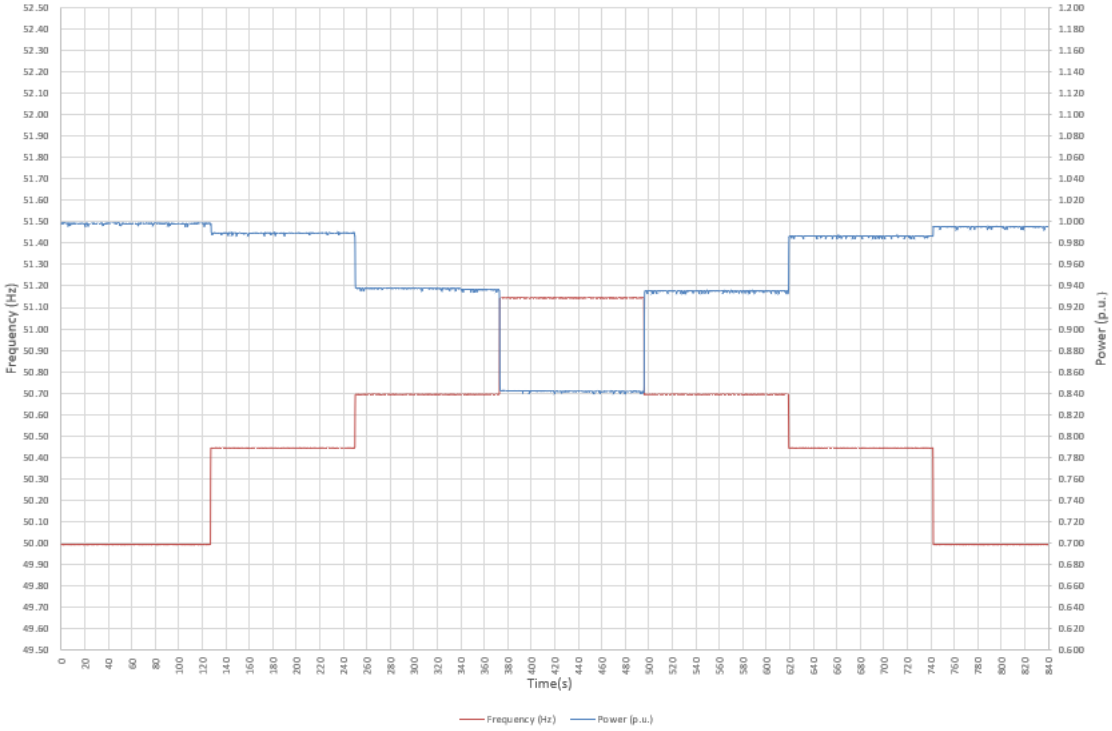
The test should be carried out using the specific threshold frequency of 50.4 Hz and **Droop** of 10%.

This test should be carried out in accordance with Annex A.7.1.3.

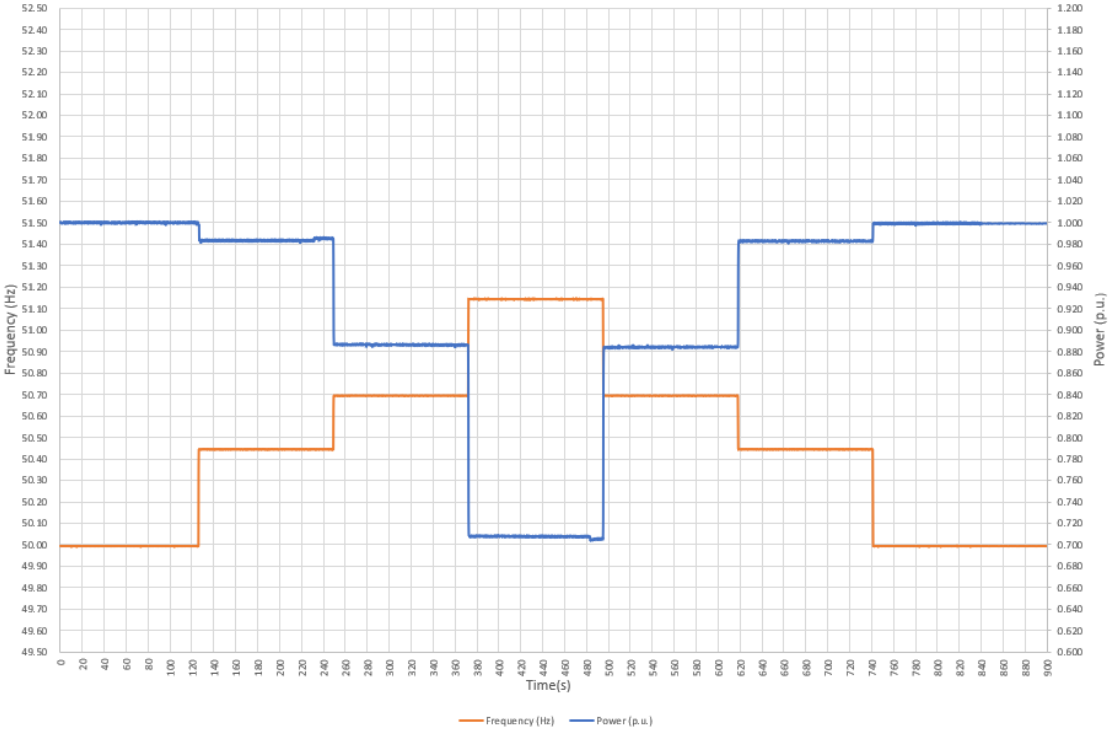
Active Power response to rising frequency/time plots are attached if frequency injection tests are undertaken in accordance with Annex A.7.2.4.	Y

Alternatively, simulation results should be noted below:

Test sequence at Registered Capacity >80%	Measured Active Power Output (kW)	Frequency (Hz)	Primary Power Source	Active Power Gradient Droop(%)
Step a) 50.00Hz ±0.01Hz	628.9	50.00	DC Souce	N/A
Step b) 50.45Hz ±0.05Hz	623.3	50.45		11.2
Step c) 50.70Hz ±0.10Hz	590.2	50.70		9.8
Step d) 51.15Hz ±0.05Hz	530.1	51.15		9.6
Step e) 50.70Hz ±0.10Hz	589.0	50.70		9.5
Step f) 50.45Hz ±0.05Hz	621.4	50.45		8.4
Step g) 50.00Hz ±0.01Hz	626.8	50.00		N/A
Test sequence at Registered Capacity 40% - 60%	Measured Active Power Output	Frequency	Primary Power Source	Active Power Gradient Droop(%)
Step a) 50.00Hz ±0.01Hz	315.0	50.00	DC Souce	N/A
Step b) 50.45Hz ±0.05Hz	309.8	50.45		8.6
Step c) 50.70Hz ±0.10Hz	279.2	50.70		10.4
Step d) 51.15Hz ±0.05Hz	222.9	51.15		10.2
Step e) 50.70Hz ±0.10Hz	278.5	50.70		10.4
Step f) 50.45Hz ±0.05Hz	309.6	50.45		8.6
Step g) 50.00Hz ±0.01Hz	314.8	50.00		N/A



Test sequence at Registered Capacity =100%



Test sequence at Registered Capacity =50%

4.10 PROTECTION – RE-CONNECTION TIMER.

Test should prove that the reconnection sequence starts after a minimum delay of 20 s for restoration of voltage and frequency to within the stage 1 settings of Table 10.1. Both the time delay setting and the measured delay should be provided in this form; both should be greater than 20 s to pass. Confirmation should be provided that the **Power Generating Module** does not reconnect at the voltage and frequency settings below; a statement of "no reconnection" can be made.

Time delay setting	Measured delay	Checks on no reconnection when voltage or frequency is brought to just outside stage 1 limits of Table 10.1.			
60s	UV: 110s OV: 110s UF: 110s OF: 110s	At 1.16pu (462V)	At 0.78pu (312V)	At 47.4 Hz	At 52.1 Hz
Confirmation that the Power Generating Module does not re-connect.		Not connection	Not connection	Not connection	Not connection

4.11 FAULT LEVEL CONTRIBUTION:

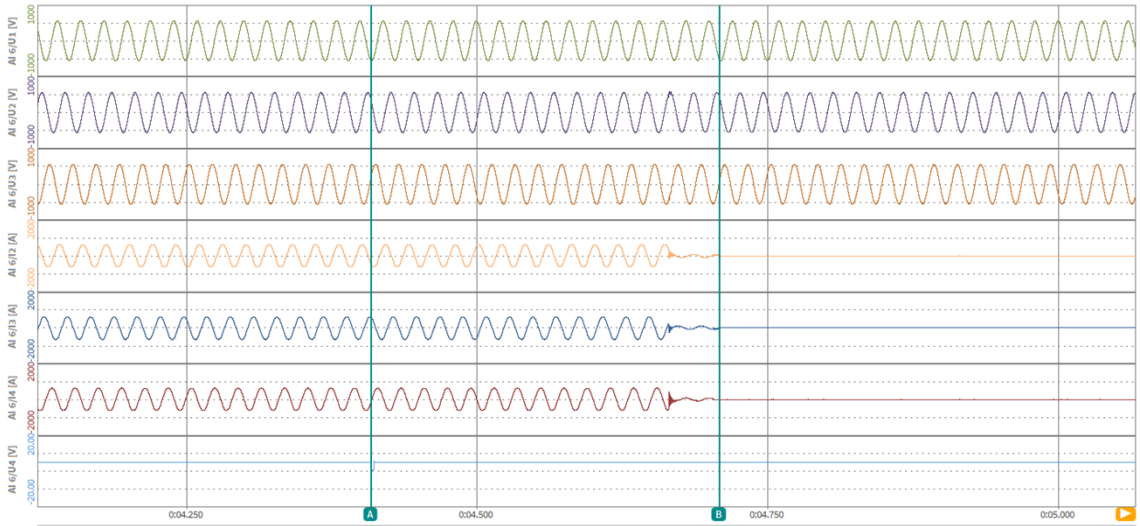
These tests shall be carried out in accordance with EREC G99 Annex A.7.1.5. Please complete each entry, even if the contribution to the fault level is zero.

For **Inverter** output (**L1-N**)		
Time after fault	Volts	Amps
20ms	1.8	136.9
100ms	1.2	80.7
250ms	0.2	20.6
500ms	0.1	8.4
Time to trip	0.521s	In seconds
For **Inverter** output (**L1-L2**)		
Time after fault	Volts	Amps
20ms	2.6	123.3
100ms	1.1	85.6
250ms	0.4	28.1
500ms	0.2	6.4
Time to trip	0.011s	In seconds

4.12 SELF-MONITORING SOLID STATE SWITCHING: No specified test requirements. Refer to Annex A.7.1.6.	
It has been verified that in the event of the solid state switching device failing to disconnect the **Power Park Module**, the voltage on the output side of the switching device is reduced to a value below 50 volts within 0.5 s.	N/A

4.13 WIRING FUNCTIONAL TESTS: If required by para 15.2.1.	
Confirm that the relevant test schedule is attached (tests to be undertaken at time of commissioning)	N/A

4.14 LOGIC INTERFACE (INPUT PORT).	
Confirm that an input port is provided and can be used to shut down the module.	Yes
Provide high level description of logic interface, e.g. details in 11.1.3.1 such as AC or DC signal (the additional comments box below can be used)	Yes
Additional comments. Power Generating Modules connected to the DNO's Distribution Netw ork shall be equipped with a logic interface (input port) in order to cease Active Power output within 5 s following an instruction being received at the input port.	



	A	B	Delta
Time [s]	4.4089077	4.7082895	0.2993819
AI 6/U1 [V]	-553.9056	-504.1587	49.74688
AI 6/U2 [V]	371.5260	459.4477	87.92179
AI 6/U3 [V]	187.3820	50.03820	-137.3438
AI 6/I2 [A]	-461.2289	0.157520	461.3865
AI 6/I3 [A]	594.4085	-2.292762	-596.7013
AI 6/I4 [A]	-131.8523	0.543390	132.3957
AI 6/U4 [V]	5.219221	5.210638	-8.583e-3

AI 6/U1, AI 6/U2, AI 6/U3: AC Voltage

AI 6/I1, AI 6/I2, AI 6/I3: Output Current

AI 6/U4: Signal of logic interface.

4.15 CYBER SECURITY	
Confirm that the **Power Generating Module** has been designed to comply with cyber security requirements, as detailed in 9.1.7.	Yes
Additional comments.	
The DNO logic interface will take the form of a simple binary output that can be operated by the switch. When the switch is turned off the Power Generating Module can operate normally. When the switch is turned on the Power Generating Module will reduce its Active Power to zero within 5 s. The signal from the Power Generating Module that is being switched is DC (maximum value 3.3Vdc)	

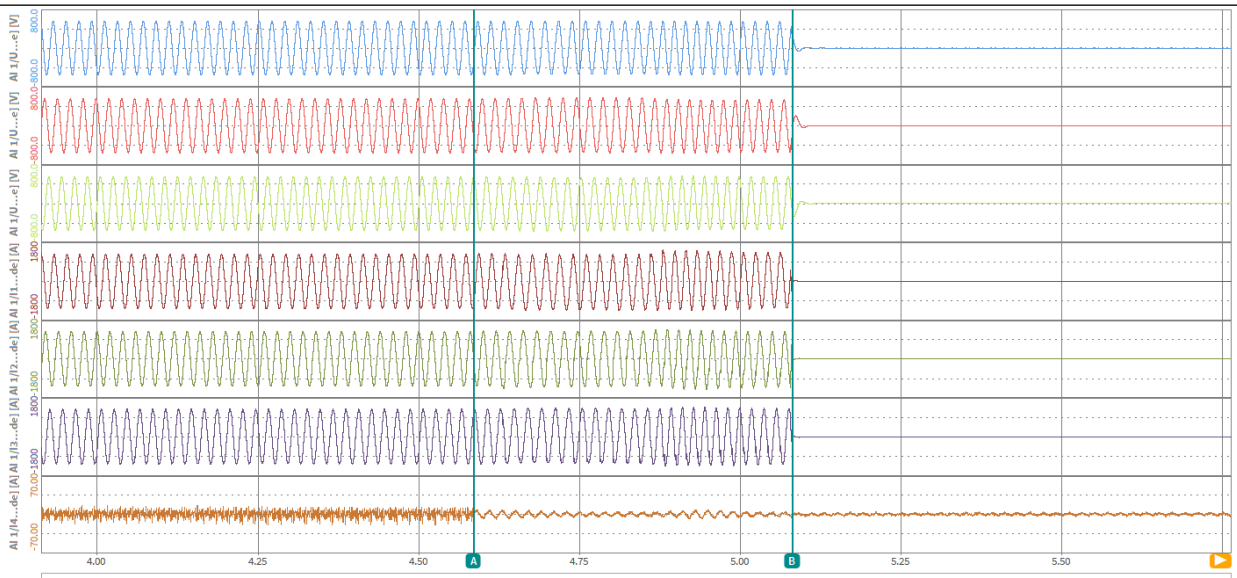
Protection. Loss of Mains test.-BS EN 62116

List of tested condition and run on time									
No.	PEUT[1] (% of EUT rating)	Reactive load (% of QL in 6.1.d)1)	PAC[2] (% of nominal)	QAC[3] (% of nominal)	Run on time (ms)	PEUT (kW)	Actual Qf	VDC	Remarks[4]
1[6]	100	100	0	0	496	500	1.00	700	Test A at BL
2	66	66	0	0	477	420	1.00	660	Test B at BL
3	33	33	0	0	483	210	1.00	620	Test C at BL
4[6]	100	100	-5	-5	402	500	1.02	700	Test A at IB
5[6]	100	100	-5	0	241	500	1.05	700	Test A at IB
6[6]	100	100	-5	5	223	500	1.07	700	Test A at IB
7[6]	100	100	0	-5	240	500	0.96	700	Test A at IB
8[6]	100	100	0	5	228	500	1.02	700	Test A at IB
9[6]	100	100	5	-5	495	500	0.93	700	Test A at IB
10[6]	100	100	5	0	226	500	0.95	700	Test A at IB
11[6]	100	100	5	5	224	500	0.97	700	Test A at IB
12	66	66	0	-5	308	420	0.97	660	Test B at IB
13	66	66	0	-4	406	420	0.97	660	Test B at IB
14	66	66	0	-3	260	420	0.98	660	Test B at IB
15	66	66	0	-2	236	420	0.98	660	Test B at IB
16	66	66	0	-1	407	420	0.99	660	Test B at IB
17	66	66	0	1	220	420	1.00	660	Test B at IB
18	66	66	0	2	227	420	1.00	660	Test B at IB
19	66	66	0	3	230	420	1.01	660	Test B at IB
20	66	66	0	4	226	420	1.01	660	Test B at IB
21	66	66	0	5	212	420	1.01	660	Test B at IB
22	33	33	0	-5	387	210	0.97	620	Test C at IB
23	33	33	0	-4	394	210	0.97	620	Test C at IB
24	33	33	0	-3	339	210	0.98	620	Test C at IB
25	33	33	0	-2	415	210	0.99	620	Test C at IB
26	33	33	0	-1	326	210	0.99	620	Test C at IB
27	33	33	0	1	326	210	1.01	620	Test C at IB
28	33	33	0	2	334	210	1.01	620	Test C at IB
29	33	33	0	3	334	210	1.01	620	Test C at IB
30	33	33	0	4	318	210	1.02	620	Test C at IB
31	33	33	0	5	312	210	1.02	620	Test C at IB
32*	100	100	-10	10	--	--	--	--	Test A at IB
33*	100	100	-10	5	--	--	--	--	Test A at IB
34*	100	100	-10	0	--	--	--	--	Test A at IB
35*	100	100	-10	-5	--	--	--	--	Test A at IB
36*	100	100	-10	-10	--	--	--	--	Test A at IB
37*	100	100	-5	10	--	--	--	--	Test A at IB
38*	100	100	-5	-10	--	--	--	--	Test A at IB

39*	100	100	10	10	--	--	--	--	Test A at IB
40*	100	100	10	5	--	--	--	--	Test A at IB
41*	100	100	10	0	--	--	--	--	Test A at IB
42*	100	100	10	-5	--	--	--	--	Test A at IB
43*	100	100	10	-10	--	--	--	--	Test A at IB
44*	100	100	0	10	--	--	--	--	Test A at IB
45*	100	100	0	-10	--	--	--	--	Test A at IB
46*	100	100	5	10	--	--	--	--	Test A at IB
47*	100	100	5	-10	--	--	--	--	Test A at IB

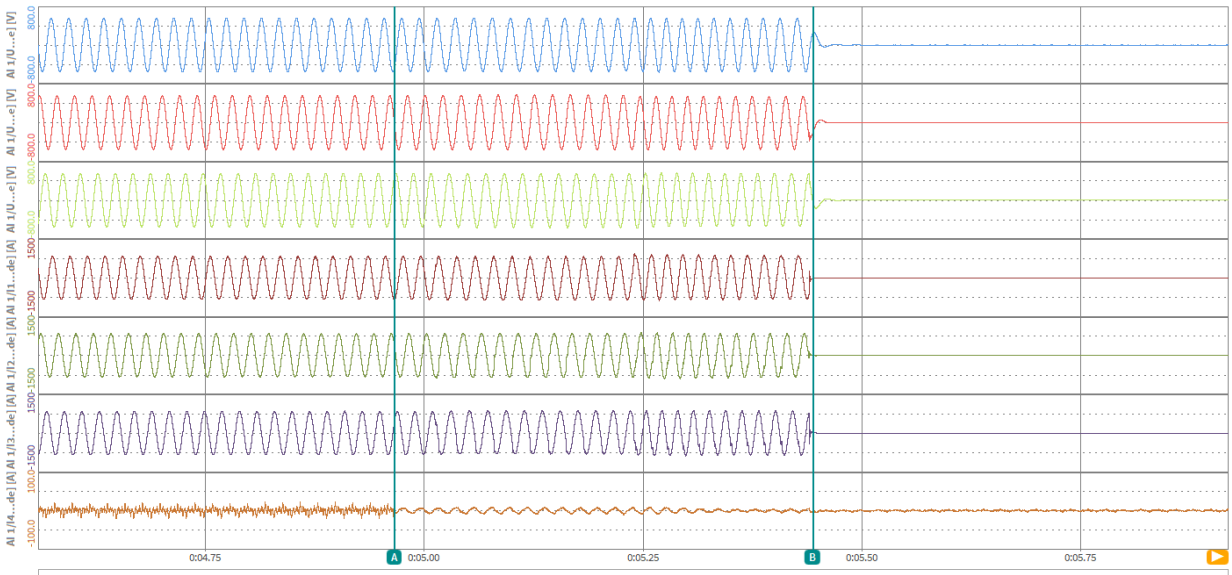
Remark:

1) PEUT: EUT output power
2) PAC: Real power flow at S1 in Figure 1. Positive means power from EUT to utility. Nominal is the 0% test condition value.
3) QAC: Reactive power flow at S1 in Figure 1. Positive means power from EUT to utility. Nominal is the 0% test condition value.
4) BL: Balance condition, IB: Imbalance condition.
5) *Note: test condition A (100%): If any of the recorded run-on times are longer than the one recorded for the rated balance condition, i.e. test procedure 6.1 f), then the non-shaded parameter combinations (no.32~47) also require testing.
6) The test power for test condition A is 500kVA



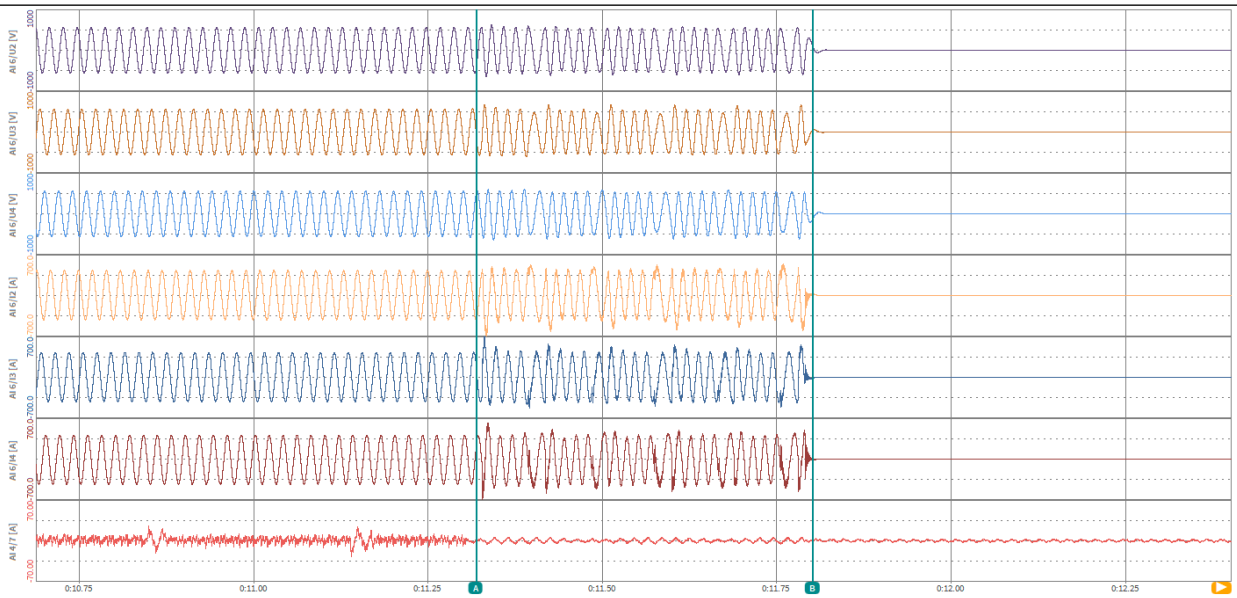
	A	B	间隔
时间 [s]	4.5860457	5.0817593	0.4957136
AI 1/U1@[RemoteNode] [V]	-224.1743	236.4199	460.5942
AI 1/U2@[RemoteNode] [V]	-336.4279	-8.348942	328.0790
AI 1/U3@[RemoteNode] [V]	560.7882	-228.0071	-788.7953
AI 1/I1@[RemoteNode] [A]	-1031.385	2.671044	1034.056
AI 1/I2@[RemoteNode] [A]	-133.5284	-67.89737	65.63103
AI 1/I3@[RemoteNode] [A]	1163.042	65.87623	-1097.166
AI 1/I4@[RemoteNode] [A]	-15.34581	-4.688502	10.65731

P_{EUT} 100%, P_{AC} 0%, Q_{AC} 0%, = 496ms



	A	B	间隔
时间 [s]	4.9668476	5.4441796	0.4773320
AI 1/U1@[RemoteNode] [V]	-507.8991	227.8330	735.7321
AI 1/U2@[RemoteNode] [V]	49.26849	-243.0728	-292.3412
AI 1/U3@[RemoteNode] [V]	458.8383	15.33842	-443.4998
AI 1/I1@[RemoteNode] [A]	-845.0950	-36.08108	809.0139
AI 1/I2@[RemoteNode] [A]	458.0725	6.111861	-451.9606
AI 1/I3@[RemoteNode] [A]	387.9905	28.75209	-359.2384
AI 1/I4@[RemoteNode] [A]	-9.979010	-3.452301	6.526709

P_{EUT} 66%, P_{AC} 0%, Q_{AC} 0%, = 477ms



时间 [s]	A 0:11.3191999	B 0:11.8019133	Δ 0.4827134
AI 6/U2 [V]	-553.9837	122.4587	676.4424
AI 6/U3 [V]	164.2890	34.45864	-129.8304
AI 6/U4 [V]	389.8525	-156.9121	-546.7646
AI 6/I2 [A]	-401.3796	18.50768	419.8873
AI 6/I3 [A]	328.0748	-21.54106	-349.6158
AI 6/I4 [A]	72.79549	5.245543	-67.54995
AI 4/7 [A]	1.080036	0.185967	-0.894070

P_{EUT} 33%, P_{AC} 0%, Q_{AC} 0%, = 483ms

Note:

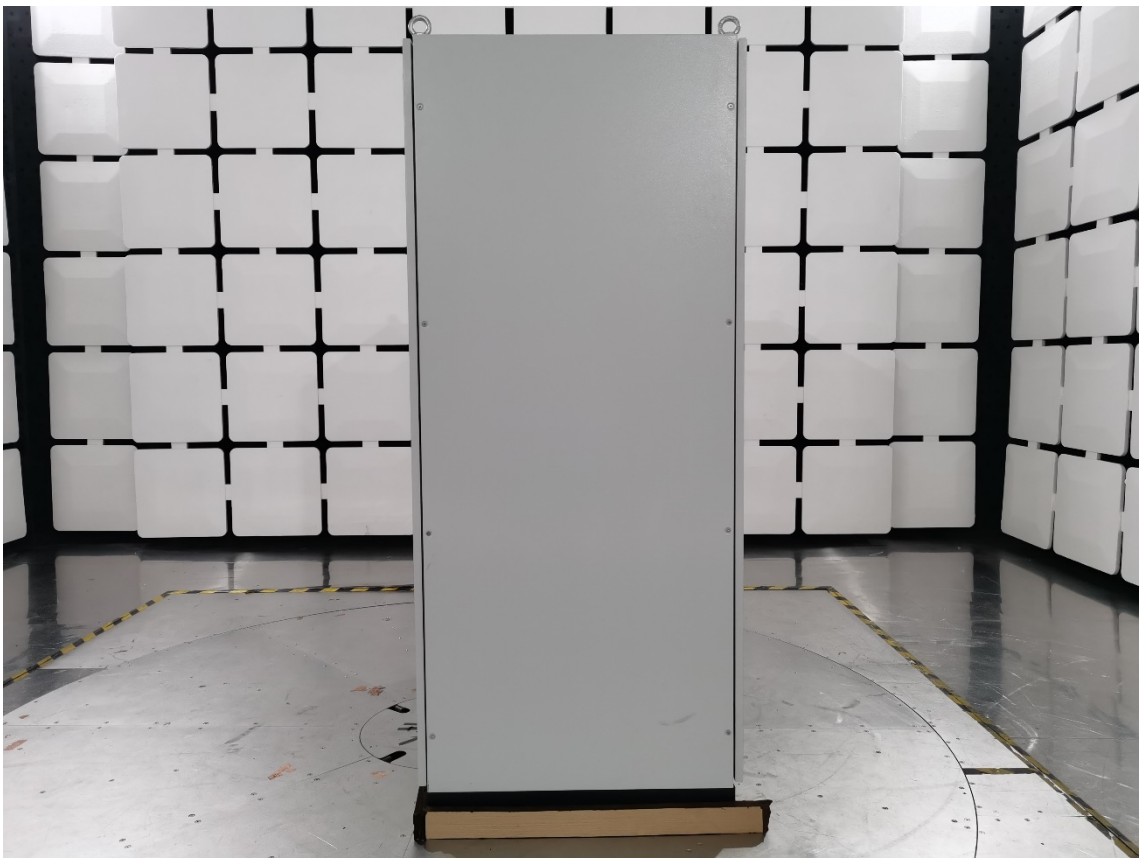
5 PICTURES

Front

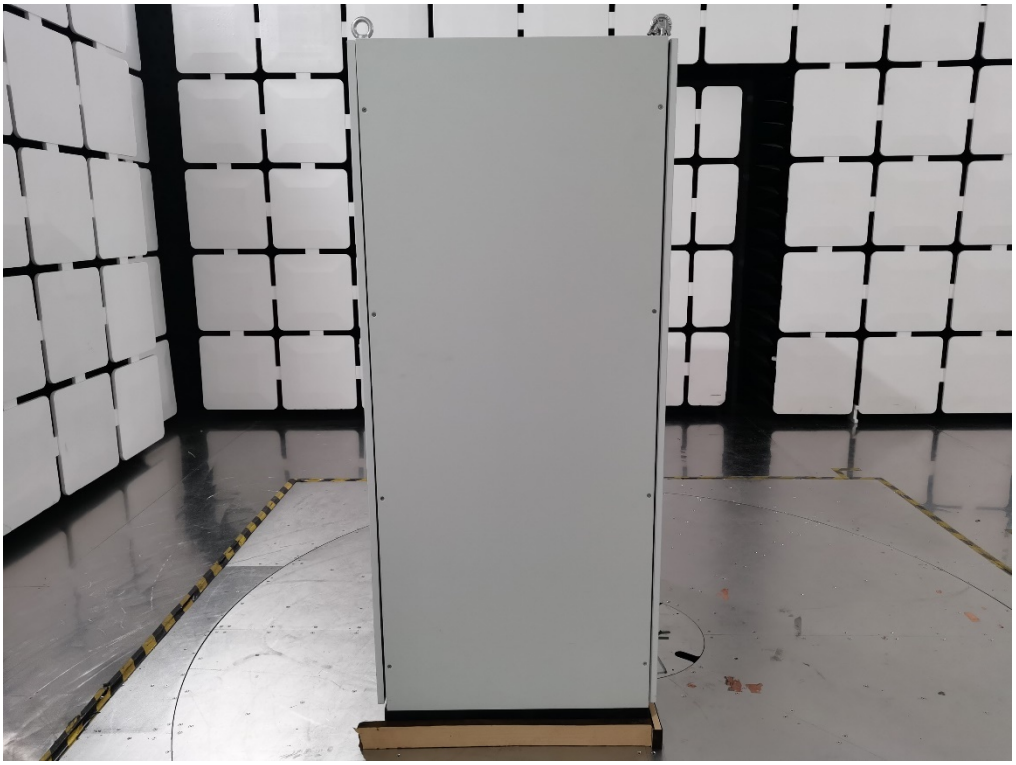

Front view

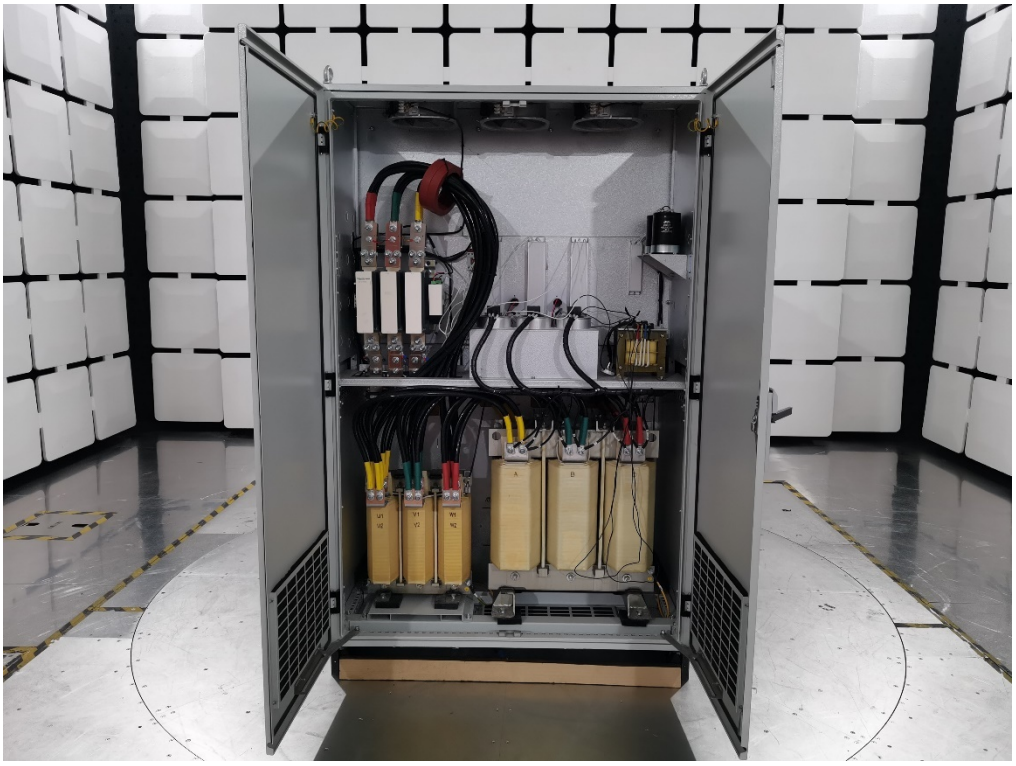
Back view


Left view



Right view



General view


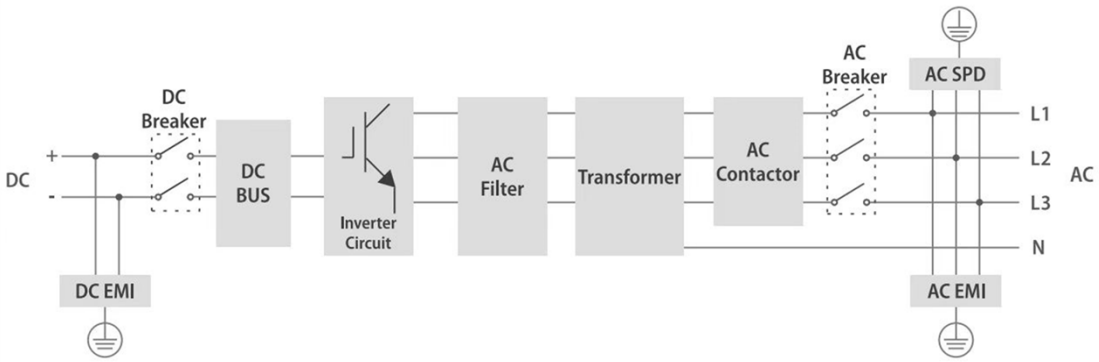
Serial Number

Software Version

DSP Software Version	PCS50_630_HV3_SV1.1.26_APP
LCD Software Version	PCS50-630K_FLEXEMScreen_HV1.0_SV1.1.15

6 ELECTRICAL SCHEMES

Equipment under testing



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