TEST REPORT

AS_NZS 4777.2

Grid connection of energy systems via inverters

Part 2: Inverter requirements

Report reference number .....:	**PVAU200224N005-8-R1**
Date of issue .....:	2021-03-24
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Testing laboratory name.....:	**Bureau Veritas Shenzhen Co., Ltd. Dongguan Branch**
Address .....:	No. 96, Guantai Road (Houjie Section), Houjie Town, Dongguan City, Guangdong Province, 523942, People's Republic of China
Applicant's name.....:	**Shenzhen SOFAR SOLAR Co., Ltd.**
Address .....:	401, Building 4, AnTongDa Industrial Park, District 68, XingDong Community, XinAn Street, BaoAn District, Shenzhen, China.
Test specification	
Standard.....:	Short duration under voltage response test (LVRT capability) - Inverter Conformance Test Procedure For South Australia
Test report form number.....:	LVRT For South Australia VER.0
Master TRF originator .....:	Bureau Veritas Shenzhen Co., Ltd. Dongguan Branch
Matster TRF .....:	Dated 2020-08-13
Test item description .....:	**Hybrid inverter**
Trademark .....:	SOFAR SOLAR
Model / Type.....:	**HYD 5KTL-3PH, HYD 6KTL-3PH, HYD 8KTL-3PH, HYD 10KTL-3PH, HYD 15KTL-3PH, HYD 20KTL-3PH**

Ratings ..... :	**HYD 5KTL-3PH**	**HYD 6KTL-3PH**	**HYD 8KTL-3PH**
Full load MPP DC voltage range [V]	250-850V	320-850V	360-850V
DC voltage range [V]..... :	180-960		
DC input voltage [V] ..... :	1000V Max		
Input DC current [A] ..... :	Max 12,5A * 2		
Output AC voltage [V] ..... :	3/N/PE, 380/400Vac, 50/60Hz		
Output AC current [A]..... :	Max. 8,0	Max. 10,0	Max. 13,0
Output power [kVA]..... :	5,5	6,6	8,8
Intput DC voltage range [V]……: [Battery charging]……:	180-800V		
Intput DC current range [V]……: [Battery charging]……:	Max 25,0A		
Output DC current range [V]……: [Battery discharg]……:	Max 25,0A		
Charging and discharge power [kVA].:	Max.5,5	Max.6,6	Max.8,8
Output AC voltage [V]……...:	3/N/PE, 380/400Vac, 50/60Hz		
Output AC current [A]……...:	Max. 8,0	Max. 10,0	Max. 13,0
Output power [kVA]	Max.5,5	Max.6,6	Max.8,8
Ratings ..... :	**HYD 10KTL-3PH**	**HYD 15KTL-3PH**	**HYD 20KTL-3PH**
Full load MPP DC voltage range [V]	220-850V	350-850V	450-850V
DC voltage range [V]..... :	180-960V		
DC input voltage [V] ..... :	1000V Max		
Input DC current [A] ..... :	Max 25,0A * 2		
Output AC voltage [V] ..... :	3/N/PE, 380/400Vac, 50/60Hz		
Output AC current [A]..... :	Max. 16,0	Max. 24,0	Max. 32
Output power [kVA]..... :	Max.11,0	Max.16,5	Max. 22,0
Intput DC voltage range [V]……: [Battery charging]……:	180-800V		
Intput DC current range [V]……: [Battery charging]……:	Max 25,0A * 2		
Output DC current range [V]……: [Battery discharg]……:	Max 25,0A * 2		
Charging and discharge power [kVA].:	11,0	16,5	22,0
Output AC voltage [V]……...:	3/N/PE, 380/400Vac, 50/60Hz		
Output AC current [A]……...:	Max. 16,0	Max. 24,0	Max. 32
Output power [kVA]	Max. 11,0	Max.16,5	Max.22,0

Testing Location.....:	**Bureau Veritas Shenzhen Co., Ltd. Dongguan Branch**
Address .....:	No. 96, Guantai Road (Houjie Section), Houjie Town, Dongguan City, Guangdong Province, 523942, People's Republic of China
Tested by (name, function and signature) .....:	Lukes Lin 
Approved by (name, function and signature) .....:	James Huang 
Manufacturer's name .....:	**Shenzhen SOFAR SOLAR Co., Ltd.**
Factory address.....:	401, Building 4, AnTongDa Industrial Park, District 68, XingDong Community, XinAn Street, BaoAn District, Shenzhen, China.
Factory's name .....:	**Dongguan SOFAR SOLAR Co.,Ltd.**
Factory address .....:	1F - 6F, Building E, No. 1 JinQi Road, Bihu Industrial Park, Wulian Village, Fenggang Town, Dongguan City

Document History			
Date	**Internal reference**	**Modification / Change / Status**	**Revision**
2020-09-22	Lukes Lin	Initial report was written	0
2021-03-23	Lukes Lin	Update the test result of clause 2.2 and clause 2.3	R1
Supplementary information:			

Test items particulars	
Equipment mobility ..... :	Permanent connection
Operating condition ..... :	Continuous
Class of equipment..... :	Class I
Protection against ingress of water .. :	IP65 according to EN 60529
Mass of equipment [kg] ..... :	Approx. 33kg for HYD 5KTL-3PH, HYD 6KTL-3PH, HYD 8KTL-3PH, Approx. 37kg for HYD 10KTL-3PH, HYD 15KTL-3PH, HYD 20KTL-3PH
Test case verdicts	
Test case does not apply to the test object ..... :	N/A
Test item does meet the requirement ..... :	P(ass)
Test item does not meet the requirement ..... :	F(ail)
Testing	
Date of receipt of test item ..... :	2020-09-11
Date(s) of performance of test ..... :	2020-09-11 to 2020-09-14, 2021-03-22

General remarks:

The test result presented in this report relate only to the object(s) tested.

The report shall state compliance of the tested objects with the requirements of Short Duration Undervoltage Disturbance Ride-Through – Inverter Conformance Test Procedure for South Australia.

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”(see Annex #)" refers to additional information appended to the report.
"(see appended table)" refers to a table appended to the report.

Throughout this report a comma is used as the decimal separator.

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SOFAR SOLAR

Hybrid Inverter

Model No:	HYD 5KTL-3PH
Max.DC Voltage	1000V
MPPT Voltage Range	180~960V
Max. Input Current	12.5/12.5A
Max.PV Isc	15/15A
Battery Type	Li-Ion
Battery Voltage Range	180~800V
Battery Max. Charging Current	25A
Battery Max. Discharging Current	25A
Nominal Grid/Back-up Voltage	3/N/PE, 380/400V
Nominal Grid/Back-up Frequency	50/60Hz
Max. Current Output to Grid	8A
Max. Power Output to Grid	5500VA
Max. Current from Grid	15A
Max. Power from Grid	10000VA
Back-up Max. Output Current	8A
Back-up Max. Output Power	5500VA
Power Factor	1(adjustable+/-0.8)
Operating Temperature Range	-30~+60℃
Ingress Protection	IP65
Protective Class	ClassI
Inverter Topology	Non-isolated
Overvoltage Category	AC III,DC II

Manufacturer : Shenzhen SOFAR SOLAR Co.,Ltd.
Address : 401, Building 4, AnTongDa Industrial Park,
District 68, XingDong Community,XinAn Street,
BaoAn District, Shenzhen, China

SAA VDE0126-1-1,VDE-AR-N4105
G98,G99,EN50438,AS4777,UTE C15-712-1

SOFAR SOLAR

Hybrid Inverter

Model No:	HYD 6KTL-3PH
Max.DC Voltage	1000V
MPPT Voltage Range	180~960V
Max. Input Current	12.5/12.5A
Max.PV Isc	15/15A
Battery Type	Li-Ion
Battery Voltage Range	180~800V
Battery Max. Charging Current	25A
Battery Max. Discharging Current	25A
Nominal Grid/Back-up Voltage	3/N/PE, 380/400V
Nominal Grid/Back-up Frequency	50/60Hz
Max. Current Output to Grid	10A
Max. Power Output to Grid	6600VA
Max. Current from Grid	17A
Max. Power from Grid	12000VA
Back-up Max. Output Current	10A
Back-up Max. Output Power	6600VA
Power Factor	1(adjustable+/-0.8)
Operating Temperature Range	-30~+60℃
Ingress Protection	IP65
Protective Class	ClassI
Inverter Topology	Non-isolated
Overvoltage Category	AC III,DC II

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SOFAR SOLAR

Hybrid Inverter

Model No:	HYD 8KTL-3PH
Max.DC Voltage	1000V
MPPT Voltage Range	180~960V
Max. Input Current	12.5/12.5A
Max.PV Isc	15/15A
Battery Type	Li-Ion
Battery Voltage Range	180~800V
Battery Max. Charging Current	25A
Battery Max. Discharging Current	25A
Nominal Grid/Back-up Voltage	3/N/PE, 380/400V
Nominal Grid/Back-up Frequency	50/60Hz
Max. Current Output to Grid	13A
Max. Power Output to Grid	8800VA
Max. Current from Grid	24A
Max. Power from Grid	16000VA
Back-up Max. Output Current	13A
Back-up Max. Output Power	8800VA
Power Factor	1(adjustable+/-0.8)
Operating Temperature Range	-30~+60℃
Ingress Protection	IP65
Protective Class	ClassI
Inverter Topology	Non-isolated
Overvoltage Category	AC III,DC II

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SOFAR SOLAR

Hybrid Inverter

Model No:	HYD 10KTL-3PH
Max.DC Voltage	1000V
MPPT Voltage Range	180~960V
Max. Input Current	25/25A
Max.PV Isc	30/30A
Battery Type	Li-Ion
Battery Voltage Range	180~800V
Battery Max. Charging Current	25/25A
Battery Max. Discharging Current	25/25A
Nominal Grid/Back-up Voltage	3/N/PE, 380/400V
Nominal Grid/Back-up Frequency	50/60Hz
Max. Current Output to Grid	16A
Max. Power Output to Grid	11000VA
Max. Current from Grid	29A
Max. Power from Grid	20000VA
Back-up Max. Output Current	16A
Back-up Max. Output Power	11000VA
Power Factor	1(adjustable+/-0.8)
Operating Temperature Range	-30~+60℃
Ingress Protection	IP65
Protective Class	ClassI
Inverter Topology	Non-isolated
Overvoltage Category	AC III,DC II

Manufacturer : Shenzhen SOFAR SOLAR Co.,Ltd.
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SOFAR SOLAR

Hybrid Inverter

Model No: HYD 15KTL-3PH

Max.DC Voltage	1000V
MPPT Voltage Range	180~960V
Max. Input Current	25/25A
Max.PV Isc	30/30A
Battery Type	Li-Ion
Battery Voltage Range	180~800V
Battery Max. Charging Current	25/25A
Battery Max. Discharging Current	25/25A
Nominal Grid/Back-up Voltage	3/N/PE, 380/400V
Nominal Grid/Back-up Frequency	50/60Hz
Max. Current Output to Grid	24A
Max. Power Output to Grid	16500VA
Max. Current from Grid	44A
Max. Power from Grid	30000VA
Back-up Max. Output Current	24A
Back-up Max. Output Power	16500VA
Power Factor	1(adjustable+/-0.8)
Operating Temperature Range	-30~+60℃
Ingress Protection	IP65
Protective Class	ClassI
Inverter Topology	Non-isolated
Overvoltage Category	AC III,DC II

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SOFAR SOLAR

Hybrid Inverter

Model No: HYD 20KTL-3PH

Max.DC Voltage	1000V
MPPT Voltage Range	180~960V
Max. Input Current	25/25A
Max.PV Isc	30/30A
Battery Type	Li-Ion
Battery Voltage Range	180~800V
Battery Max. Charging Current	25/25A
Battery Max. Discharging Current	25/25A
Nominal Grid/Back-up Voltage	3/N/PE, 380/400V
Nominal Grid/Back-up Frequency	50/60Hz
Max. Current Output to Grid	32A
Max. Power Output to Grid	22000VA
Max. Current from Grid	58A
Max. Power from Grid	40000VA
Back-up Max. Output Current	32A
Back-up Max. Output Power	22000VA
Power Factor	1(adjustable+/-0.8)
Operating Temperature Range	-30~+60℃
Ingress Protection	IP65
Protective Class	ClassI
Inverter Topology	Non-isolated
Overvoltage Category	AC III,DC II

Manufacturer : Shenzhen SOFAR SOLAR Co.,Ltd.
Address : 401, Building 4, AnTongDa Industrial Park,
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General product information:

The Solar converter converts DC voltage into AC voltage.

The DC input of Solar converter can be supplied from PV array and batteries.

The input and output are protected by Varistors to Earth. The unit is providing EMC filtering at the output toward mains. The unit does not provide galvanic separation from input to output (transformerless). The output is switched off redundant by the high power switching bridge and a two relays. This assures that the opening of the output circuit will also operate in case of one error.

Description of the electrical circuit: (Figure 1):

The internal control is redundant built. It consists of master DSP(U37) and slave DSP(U39).

The master DSP (U37) control the relays by switch signals, measures PV voltage, PV current,Bus voltage, grid voltage, frequency, AC current with injected DC and the array insulation resistance to ground, in addition it tests the array insulation resistance and the RMCU circuit before each start up.

The slave DSP (U39) is measures the grid voltage, grid frequency and residual current , also can switch off the relays independently, and communicate with master DSP (U39).

The current is measured by a current sensor. The AC current signal and the injectied DC current signal are sent to the Main DSP(U37). The Mian DSP(U37) tests and calibrates before each start upp all current sensors.

The unit provides two relays in series in all output conductors. When single-fault applied to one relay,alarm an error code in display panel, another redundant relay provides basic insulation maintained between the PV array and the mains. All the relays are tested before start up. Both DPSs can open the relays.

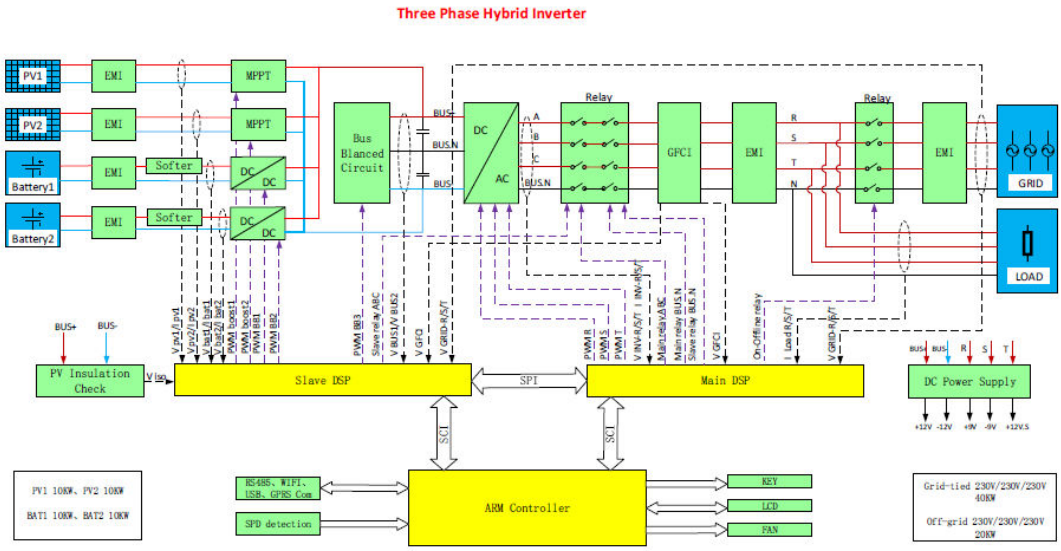


Figure 1 – Block diagram

Differences of the models in the series:

1. Model HYD 5KTL-3PH, HYD 6KTL-3PH, HYD 8KTL-3PH, HYD 10KTL-3PH, HYD 15KTL-3PH, HYD 20KTL-3PH are completely identical and output power derated by software, except for the following table.

Models	HYD 5KTL-3PH	HYD 6KTL-3PH	HYD 8KTL-3PH	HYD 10KTL-3PH	HYD 15KTL-3PH	HYD 20KTL-3PH
Inverter induction	0,876mH		1,12mH		1,5mH	
BOOST induction	0,915mH			1,8mH		
Cooling system	Without external fans			With external fans		

The product was tested on:

Hardware Version: V1.0

Software Version: V2.00

Test Results

1	General test and reporting requirments	
Clause	**Requirement – Test**	**Verdict**
1.1	General	**P**
1.2	Test condition	**P**
1.3	Inverter setup	**P**
1.4	Grid source	**P**
2	**Test procedure**	
2.1	General	**P**
2.2	Undervoltage (V<) disconnection test in response to event duration exceeding trip delay time	**P**
2.3	Undervoltage (V<) withstand test in response to event duration of less than trip delay time	**P**

2.2 Under voltage (V<) trip setting of disconnection test in response to event duration exceeding trip delay time	**P**

L1 phase

	Output Current level: 50+/-5% of rated current						
Test	**Voltage (V)**			**Time to disconnect (s) (Trip delay 1s)**			**Time to reconnection (s)**
Limit	**--**			**<=2s**			**>=60s**
Grid source voltage 230V down to 177,5 V (2,.5 V below 180 V)	177,5			2,0			--
Measured value	177,8	177,7	177,8	1,260	1,250	1,240	--
Return the voltage (177.5 V) to the grid test voltage (230V)	230			--			--
Measured value	230,3			--			65,0

L2 phase

	Output Current level: 50+/-5% of rated current						
Test	**Voltage (V)**			**Time to disconnect (s) (Trip delay 1s)**			**Time to reconnection (s)**
Limit	--			<=2s			>=60s
Grid source voltage 230V down to 177,5 V (2,.5 V below 180 V)	177,5			2,0			--
Measured value	177,6	177,6	177,7	1,250	1,260	1,230	--
Return the voltage (177.5 V) to the grid test voltage (230V)	230			--			--
Measured value	230,2			--			65,0

L3 phase

	Output Current level: 50+/-5% of rated current						
Test	**Voltage (V)**			**Time to disconnect (s) (Trip delay 1s)**			**Time to reconnection (s)**
Limit	--			<=2s			>=60s
Grid source voltage 230V down to 177,5 V (2,.5 V below 180 V)	177,5			2,0			--
Measured value	177,6	177,7	177,6	1,240	1,230	1,240	--
Return the voltage (177.5 V) to the grid test voltage (230V)	230			--			--
Measured value	230,3			--			65,0

2.2 Under voltage (V<) trip setting of disconnection test in response to event duration exceeding trip delay time	**P**

All phases

	Output Current level: 50+/-5% of rated current						
Test	**Voltage (V)**			**Time to disconnect (s) (Trip delay 1s)**			**Time to reconnection (s)**
Limit	--			<=2s			>=60s
Grid source voltage 230V down to 177,5 V (2,.5 V below 180 V)	177,5			2,0			--
Measured value	177,7	177,8	177,7	1,520	1,515	1,520	--
Return the voltage (177.5 V) to the grid test voltage (230V)	230			--			--
Measured value	230,1			--			65,0

2.2 Under voltage (V<) trip setting of disconnection test in response to event duration exceeding trip delay time	P

Test procedure:

The disconnection time for the protective function undervoltage (180 V) for a voltage step shall be confirmed. The procedure shall be as follows:

(a) Set the grid source equal to the grid test voltage. The energy source shall be varied until the a.c. output of the device under test equals 50 ± 5 % of its rated current output.

NOTE: For three-phase inverters or inverter combinations, the required inverter output is based on the per phase inverter current rating.

(b) The grid source voltage shall be stepped to 177.5 V (2.5 V below 180 V) with the step change completed within 2 ms and occurring at the zero crossing of the grid source voltage. The time interval between the start of the voltage step and the device under test disconnecting from the grid source shall be recorded.

(c) Adjust the grid source to return the voltage to the grid test voltage. The reconnection time (the time taken for the device under test to reconnect to the grid source) shall be recorded.

Note:

The Voltage required to trip is the setting 177.5V (180V minus 2.5V). The time delay can be measured at a larger deviation than the minimum required to operate the protection. It has to be in the range of *+/- 2,3V* of the grid test voltage.

Diagram of under-voltage protection: L1 phase

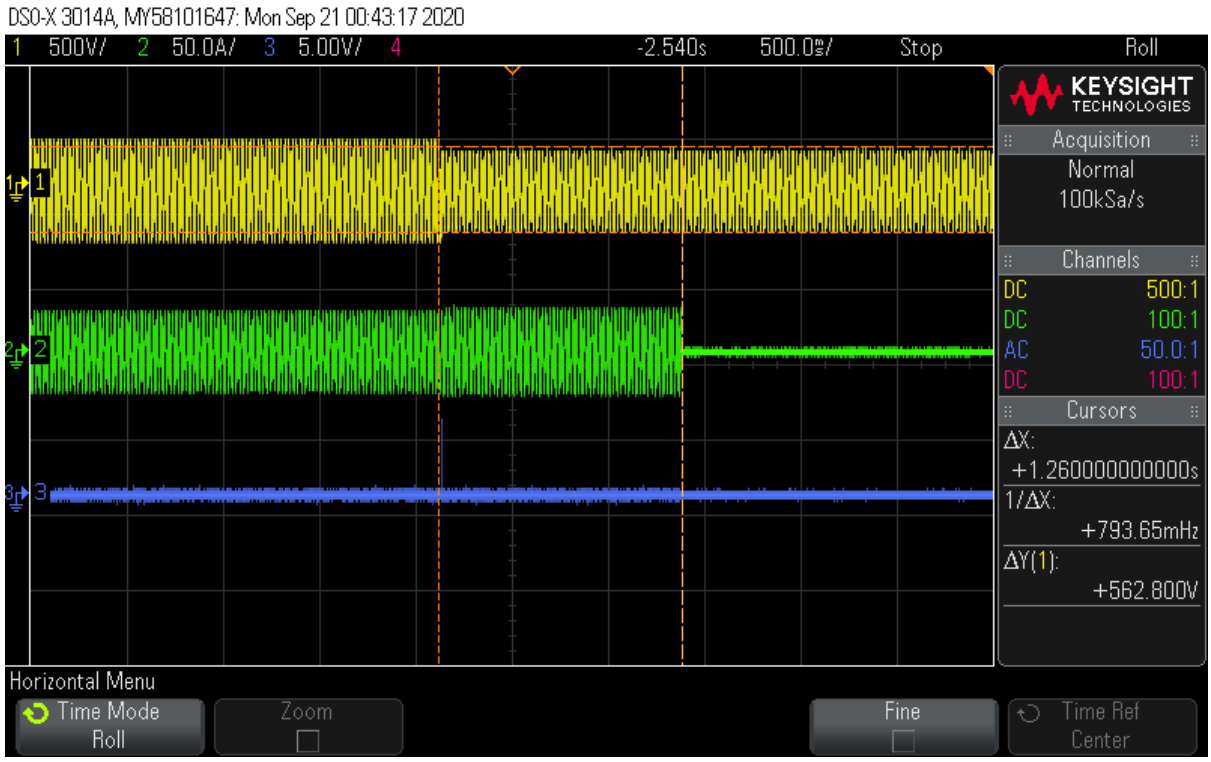


Diagram of under-voltage protection: L2 phase

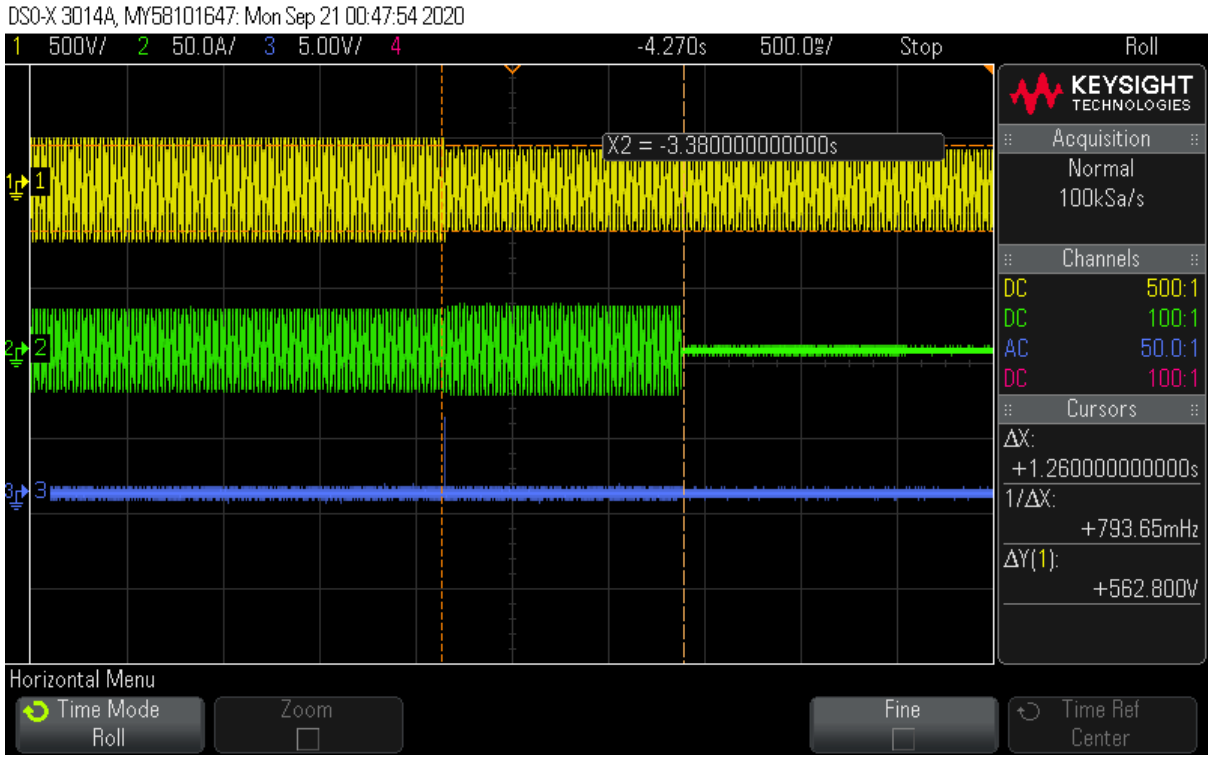


Diagram of under-voltage protection: L3 phase

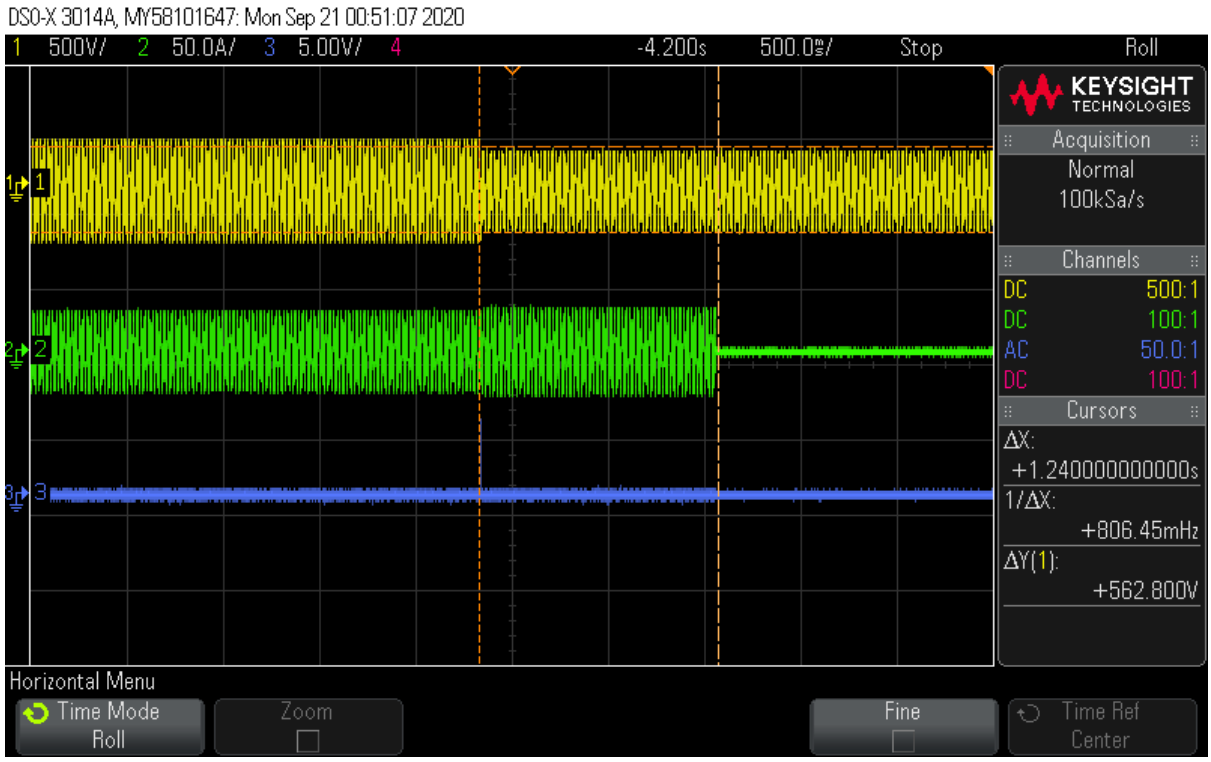


Diagram of under-voltage protection: All phase

2.3 Undervoltage (V<) withstand test in response to event duration of less than trip delay time

Test procedure

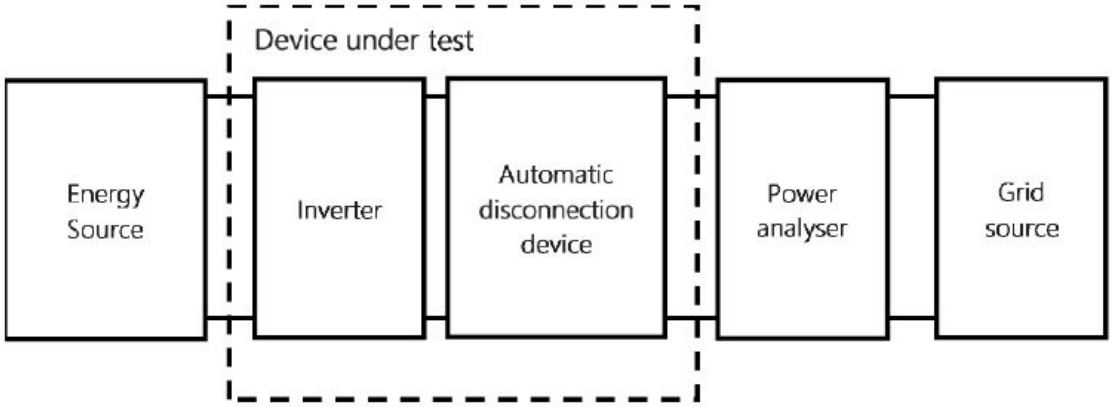


Figure 1 – Test circuit of voltage limits

The trip delay requirement for the protective function undervoltage 1 (V <) of 180 V for a voltage step shall be confirmed. The procedure shall be as follows:

(d) Set the grid source equal to the grid test voltage. Vary the energy source until the a.c. output of the device under test equals 50 ± 5 % of its rated current output.
NOTE: For three-phase inverters or inverter combinations, the required inverter output is based on the per phase inverter current rating.

(e) Record the stabilised active power output.

(f) Step the grid source voltage down to 50 V with the step change completed within 2 ms and occurring at the zero crossing of the grid source voltage, remain at 50 V for 220 ms. Increase the grid source voltage to the grid test voltage with the step change completed within 2 ms and occurring at the zero crossing of the grid source voltage. Record the time interval between each voltage step passing through 180 V (i.e. the duration for which voltage lies below 180 V).

NOTE: For three phase systems, the test shall be conducted at the zero-crossing for each phase individually, and additionally for all three phases stepped together at the zero-crossing for one of the phases.

(g) After 1 second, record the active power output, and confirm it is equal to that recorded at Step (e) ± 4 %.
NOTE: There is no defined behaviour of the inverter during the simulated fault. Monitor and recording at this stage is to better understand the anticipated inverter response.

List of tests	Residual amplitude of phase-to-neutral voltage V	Tolerance	Duration [ms]	Form (*)
Type for single phase inverter				
test 1 one-phase symmetrical fault	50V	± 0,01Un	220	
Type for three phase inverter				
test 1 a) one-phase: L1 symmetrical fault	50V	± 0,01Un	220	
test 1 b) one-phase: L1 symmetrical fault	50V	± 0,01Un	220	
test 1 c) one-phase: L1 symmetrical fault	50V	± 0,01Un	220	

test 2 a) one-phase: L2 symmetrical fault	50V	± 0,01Un	220	
test 2 b) one-phase: L2 symmetrical fault	50V	± 0,01Un	220	
test 2 c) one-phase: L2 symmetrical fault	50V	± 0,01Un	220	
test 3 a) one-phase: L3 symmetrical fault	50V	± 0,01Un	220	
test 3 b) one-phase: L3 symmetrical fault	50V	± 0,01Un	220	
test 3 c) one-phase: L3 symmetrical fault	50V	± 0,01Un	220	
test 4 a) all-phase: L1, L2, L3 symmetrical fault	50V	± 0,01Un	220	
test 4 b) all-phase: L1, L2, L3 symmetrical fault	50V	± 0,01Un	220	
test 4 c) all-phase: L1, L2, L3 symmetrical fault	50V	± 0,01Un	220	

Criteria for acceptance

.

a. The device under test shall remain connected for the duration of test step (f).

b. At Step (g) the device under test shall have recovered its active power output to that recorded at Step (e) ± 4 % within 1 second.

Graph of LVRT testing

List of tests	Output Current level: 50+/-5% of rated current			
	Residual amplitude of phase-to-phase voltage (V)	Duration limit of Voltage dips [ms]	Measured duration [ms]	Measured recover time（ms）
L1 phase				
Test 1 a) – one-phase symmetrical fault	50	220	222	33
Test 1 b) – one-phase symmetrical fault	50	220	220	33
Test 1 c) – one-phase symmetrical fault	50	220	222	33
Test voltage	Voltage 230V +/- 1%			
Before test - Active power output (kW)	10,283	10,283	10,377	
After test - Active power output(kW) after 1s	10,311	10,331	10,371	
Limit(%)	+/- 4 %	+/- 4 %	+/- 4 %	
L2 phase				
Test 2 a) – one-phase symmetrical fault	50	220	222	35
Test 2 b) – one-phase symmetrical fault	50	220	222	35
Test 2 c) one-phase symmetrical fault	50	220	223	36
Test voltage	Voltage 230V +/- 1%			
Before test - Active power output (kW)	10,377	10,377	10,377	
After test - Active power output(kW) after 1s	10,375	10,376	10,369	
Limit(%)	+/- 4 %	+/- 4 %	+/- 4 %	
L3 phase				
Test 3 a) – one-phase symmetrical fault	50	220	223	31
Test 3 b) – one-phase symmetrical fault	50	220	222	31
Test 3 c) one-phase symmetrical fault	50	220	221	30
Test voltage	Voltage 230V +/- 1%			
Before test - Active power output (kW)	10,283	10,377	10,283	
After test - Active power output(kW) after 1s	10,271	10,375	10,280	
Limit(%)	+/- 4 %	+/- 4 %	+/- 4 %	

Graph of LVRT testing

All (L1,L2,L3) phase				
Test 4 a) – All-phase symmetrical fault (P = 0,5)	50	220	229	31
Test 4 a) – All-phase symmetrical fault	50	220	227	30
Test 4 a) – All-phase symmetrical fault	50	220	227	43

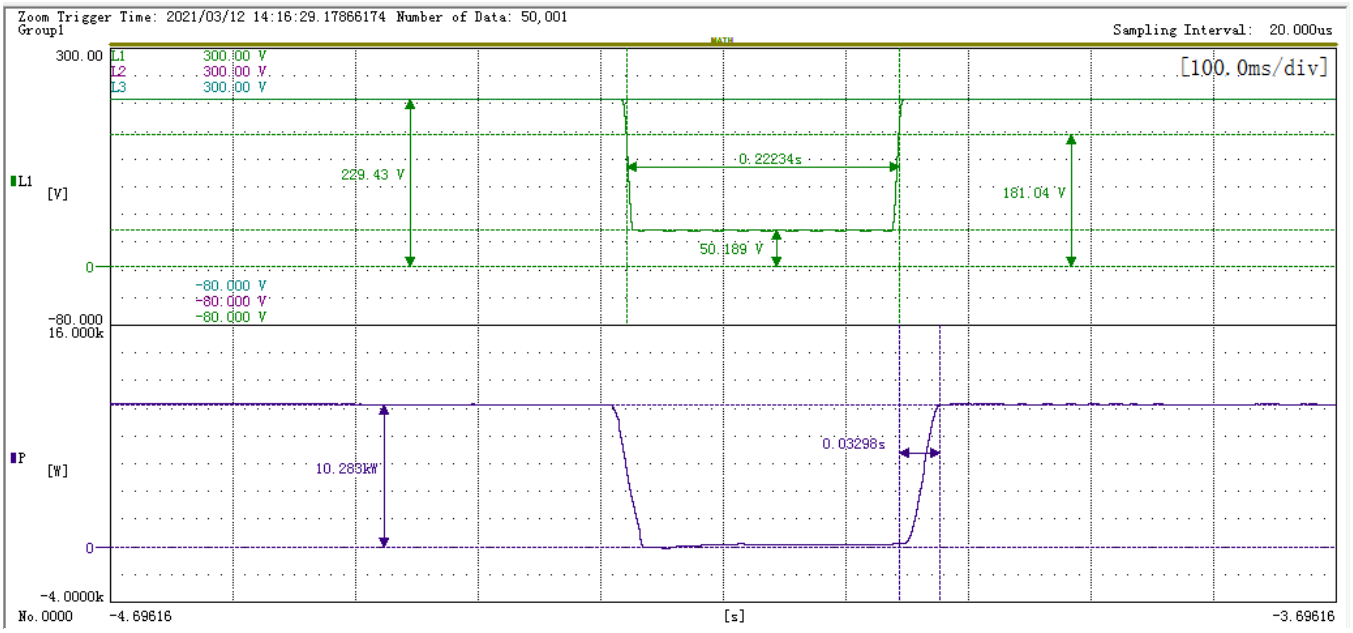
Test voltage	Voltage 230V +/- 1%		
Before test - Active power output (kW)	10,472	10,377	10,472
After test - Active power output(kW) after 1s	10,468	10,309	10,311
Limit(%)	+/- 4 %	+/- 4 %	+/- 4 %

Test conditions:
Voltage simulator fall and rise time: < 2ms

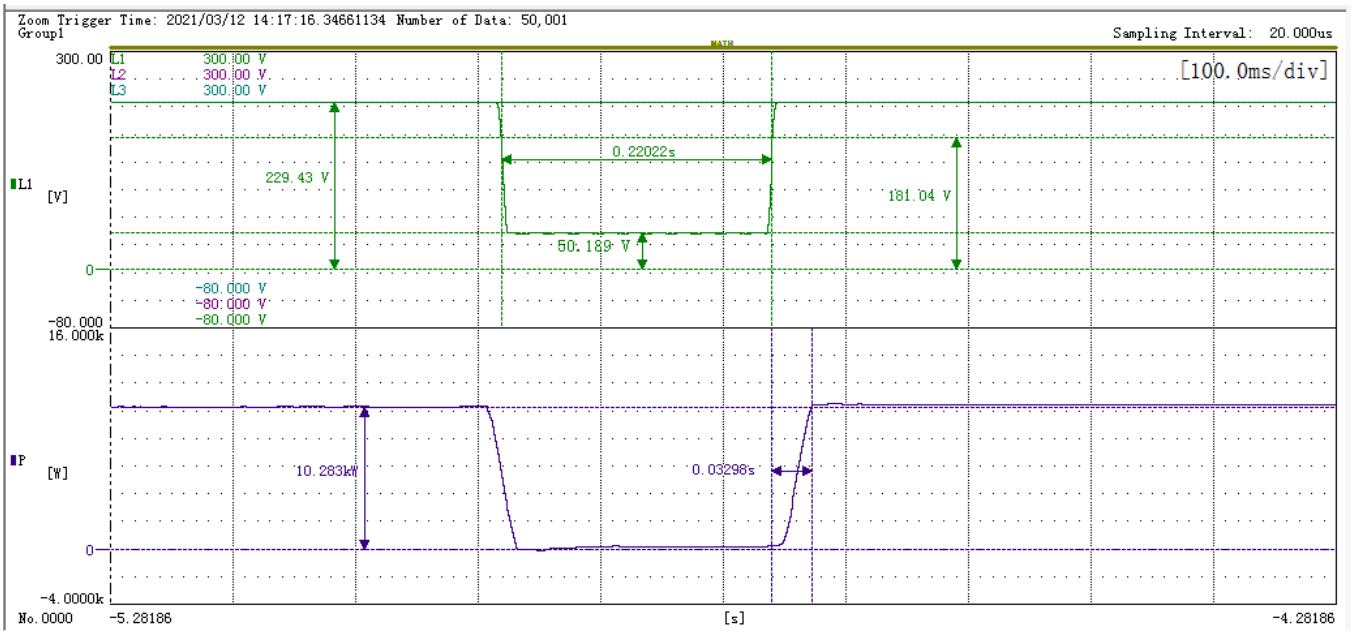
The test conditions are performed as 50% ± 5% of In conditions. The inverter feeds maximal active and reactive power during the complete test.

Note:

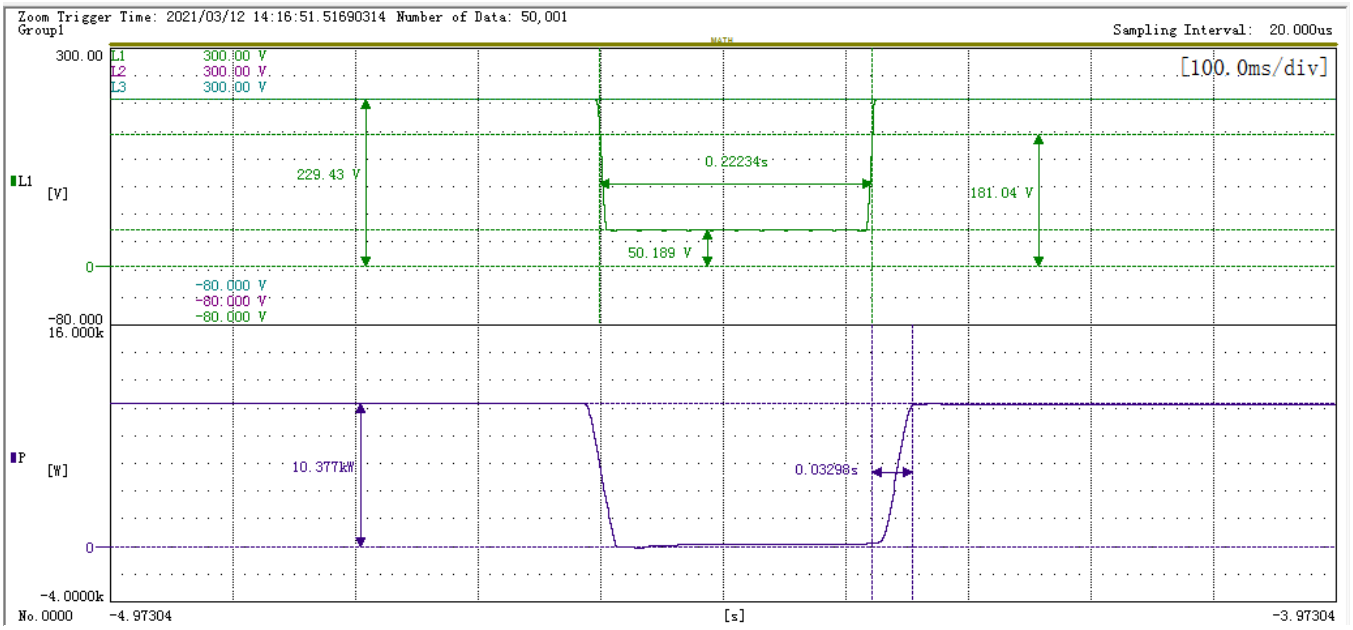
Test 1 a) – one-phase symmetrical fault



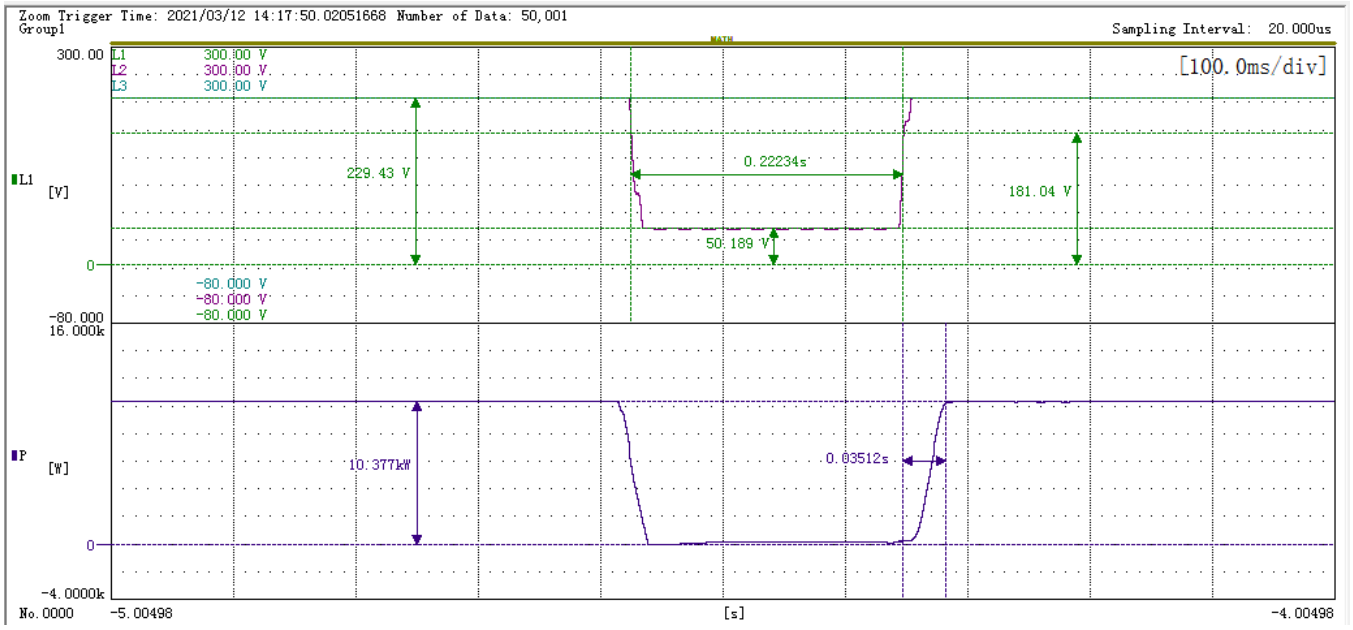
Test 1 b) – one-phase symmetrical fault



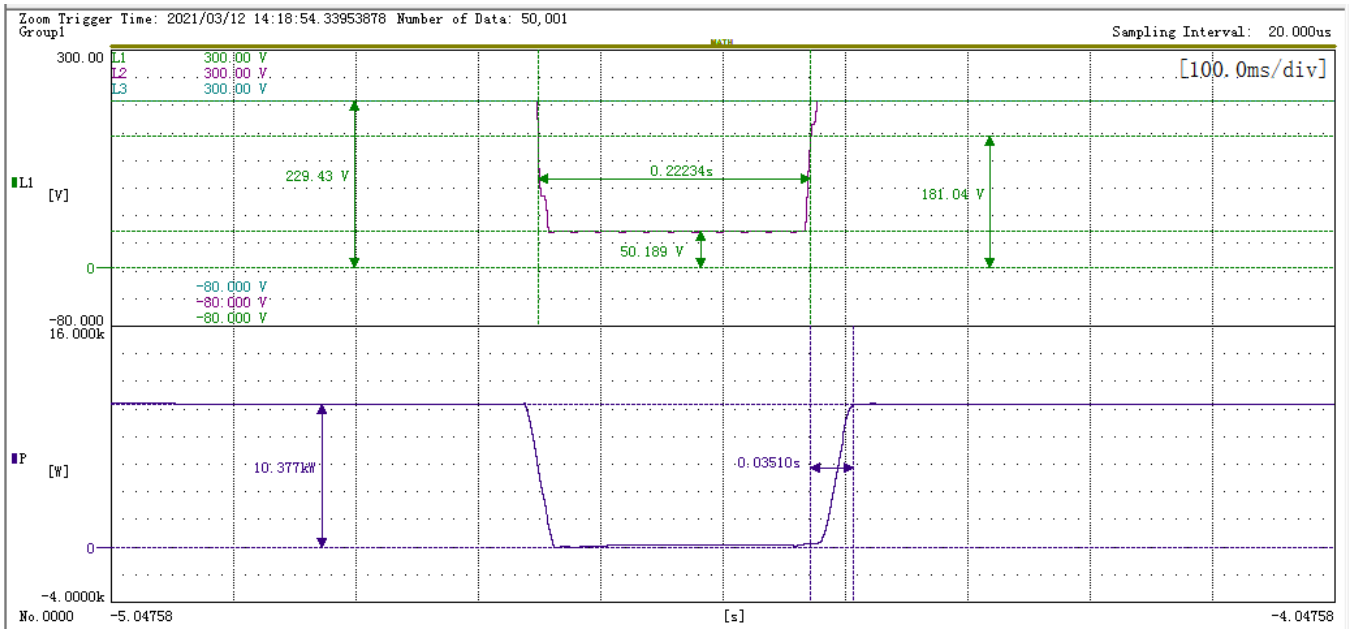
Test 1 c) – one-phase symmetrical fault



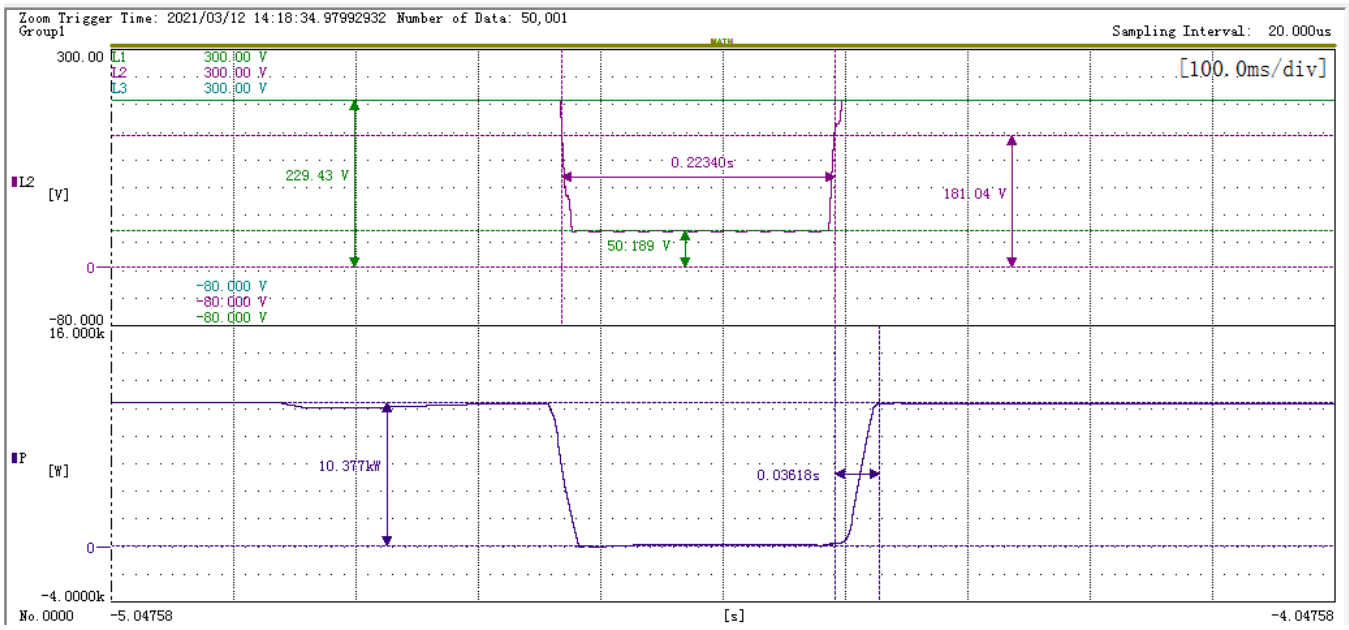
Test 2 a) – one-phase symmetrical fault



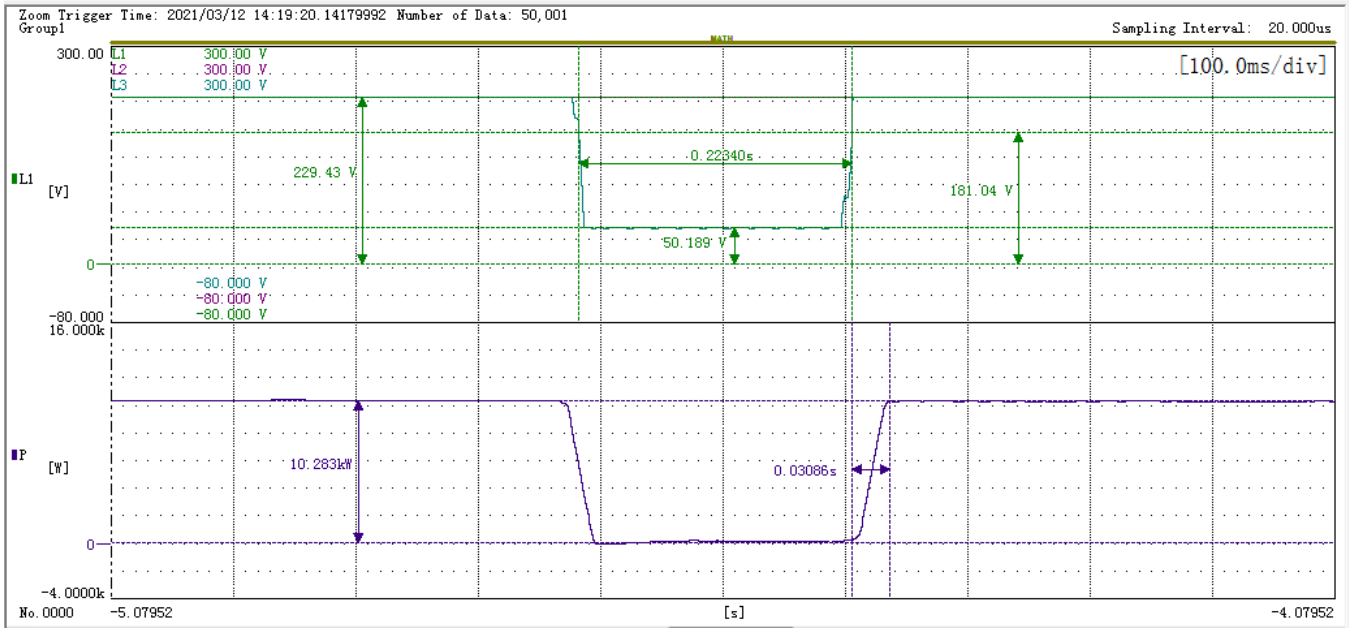
Test 2 b) – one-phase symmetrical fault



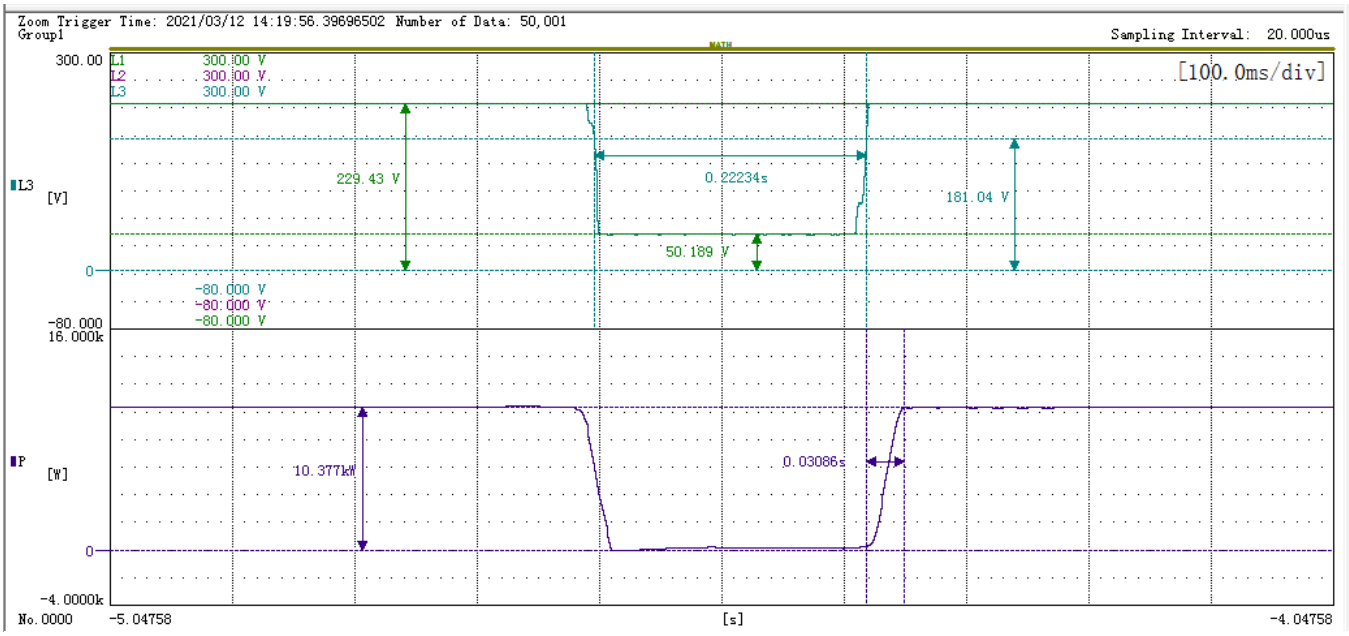
Test 2 c) – one-phase symmetrical fault



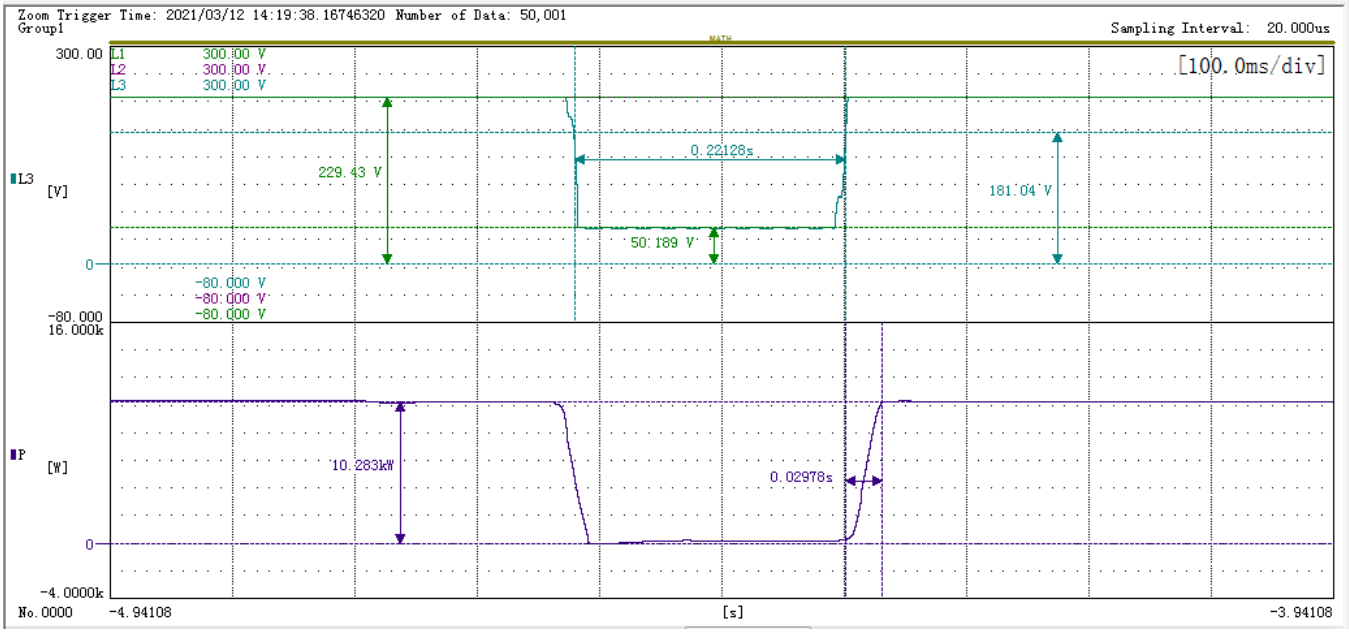
Test 3 a) – one-phase symmetrical fault



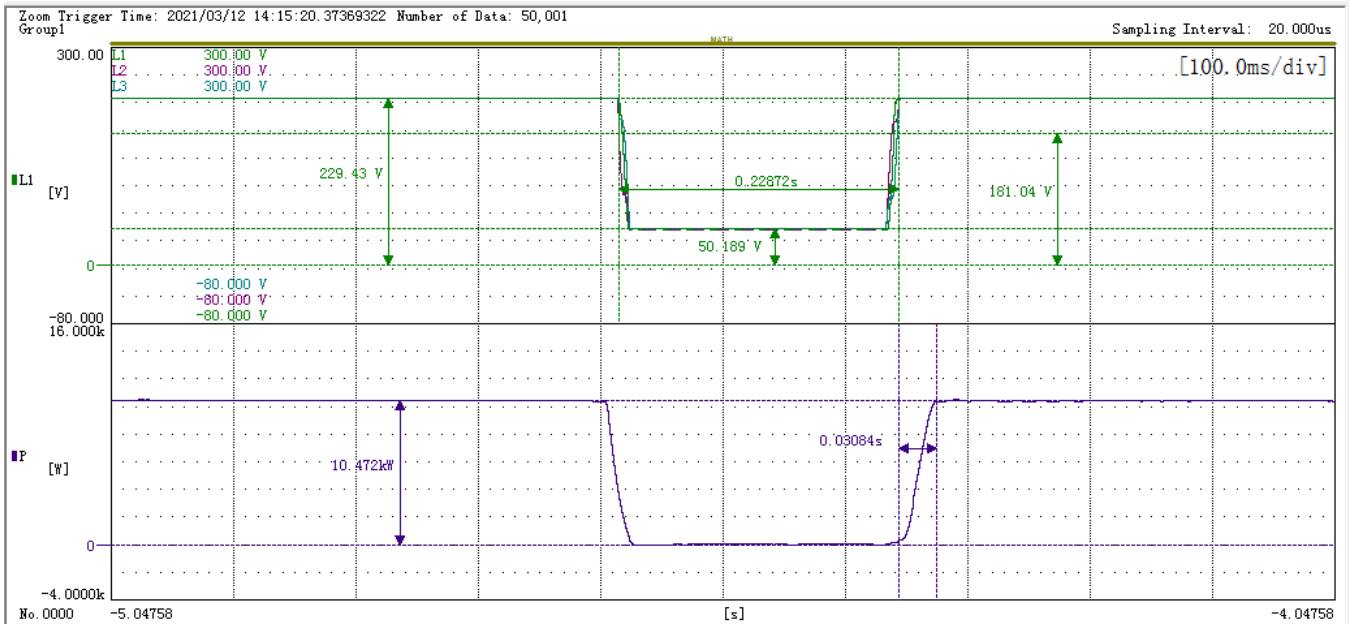
Test 3 b) – one-phase symmetrical fault



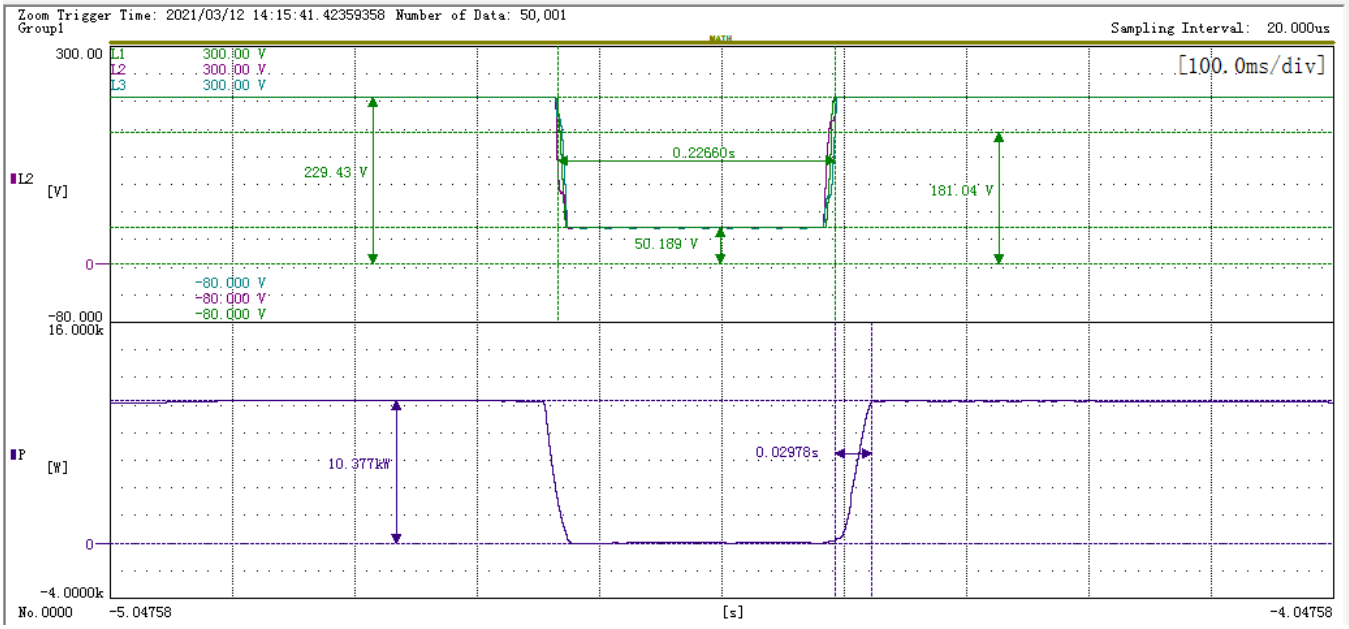
Test 3 c) – one-phase symmetrical fault



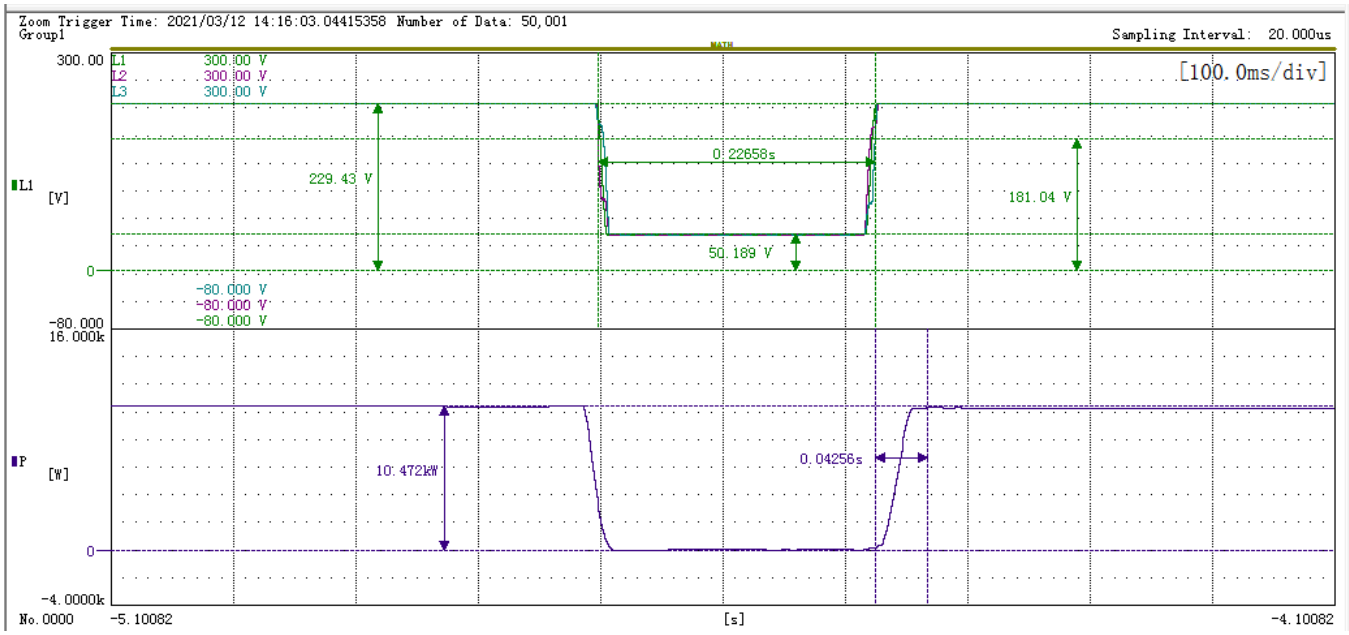
Test 4 a) – all-phase symmetrical fault



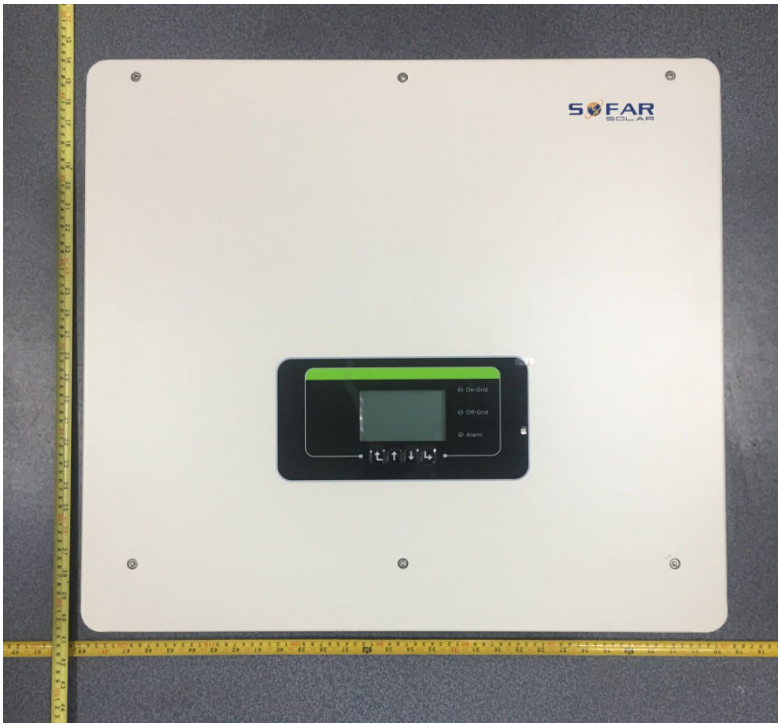
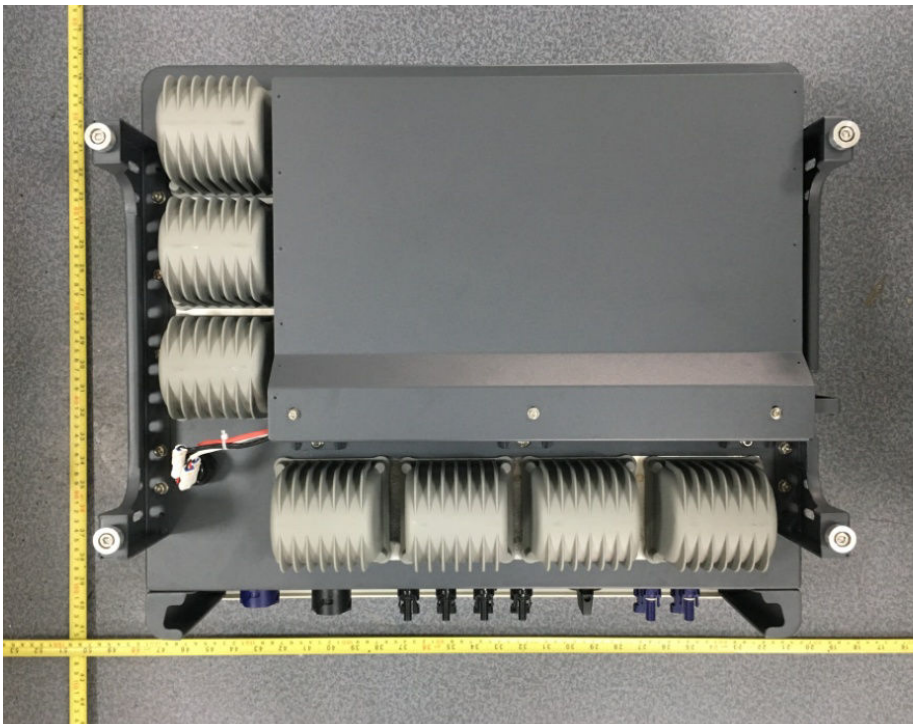
Test 4 b) – all-phase symmetrical fault



Test 4 c) – all-phase symmetrical fault



Annex No. 1
Pictures of the unit

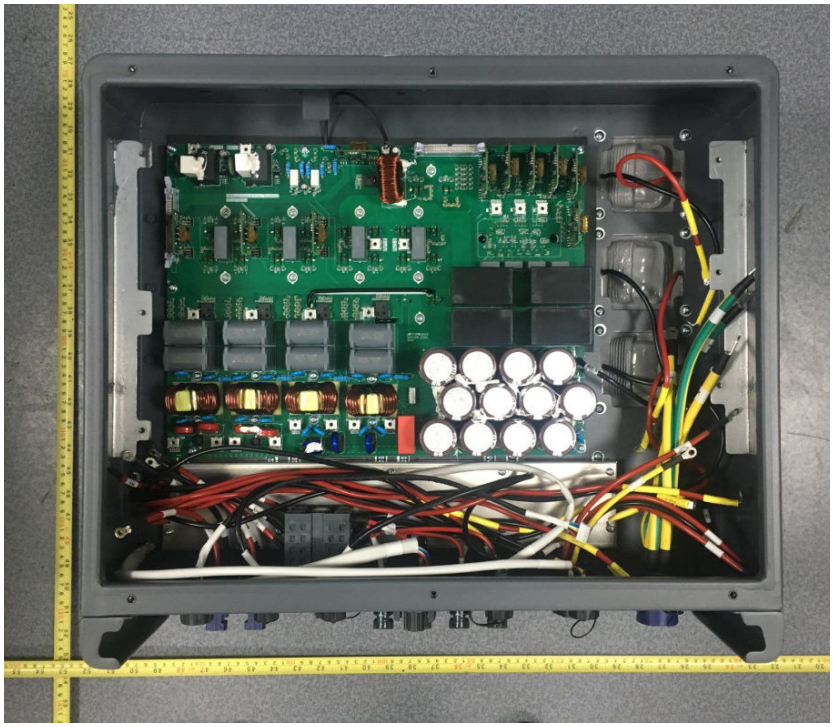
Front enclosure-view

Rear enclosure-view


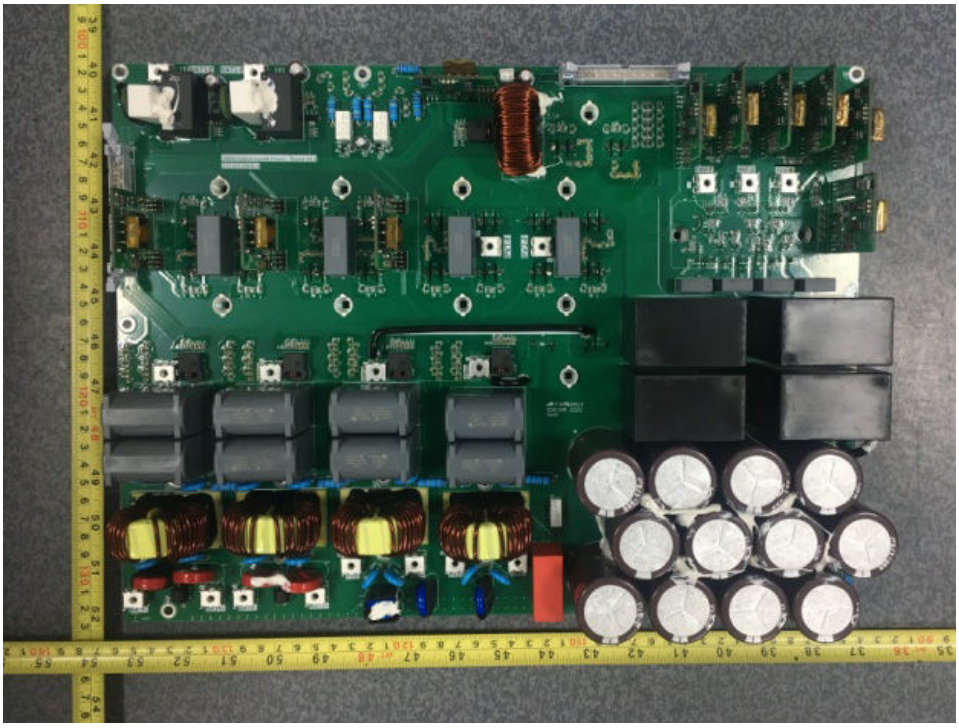
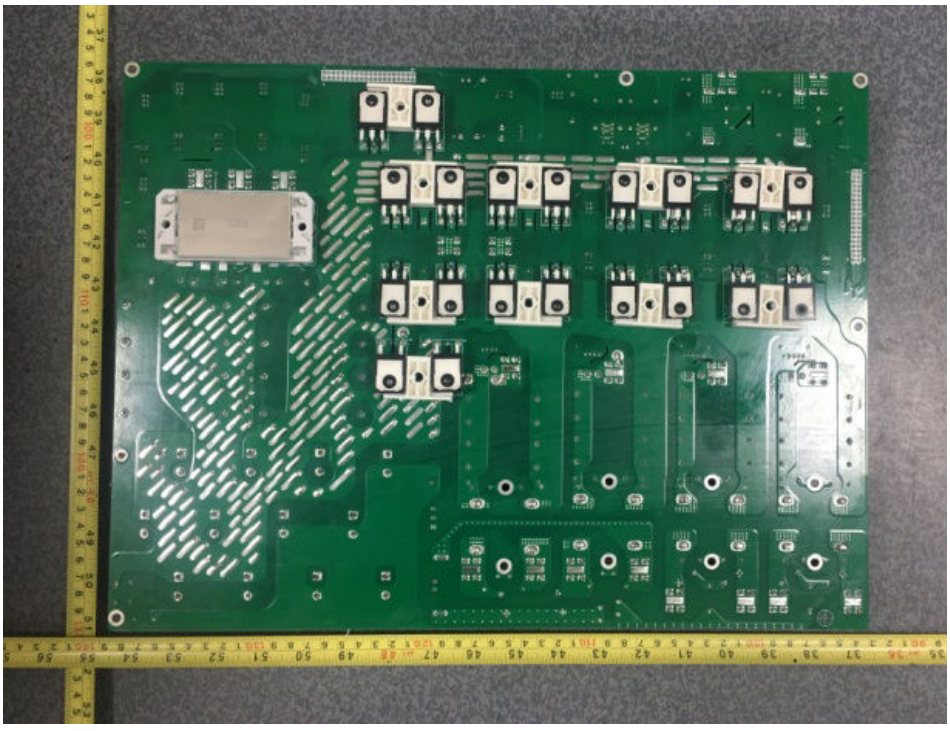
Bottom enclosure-view

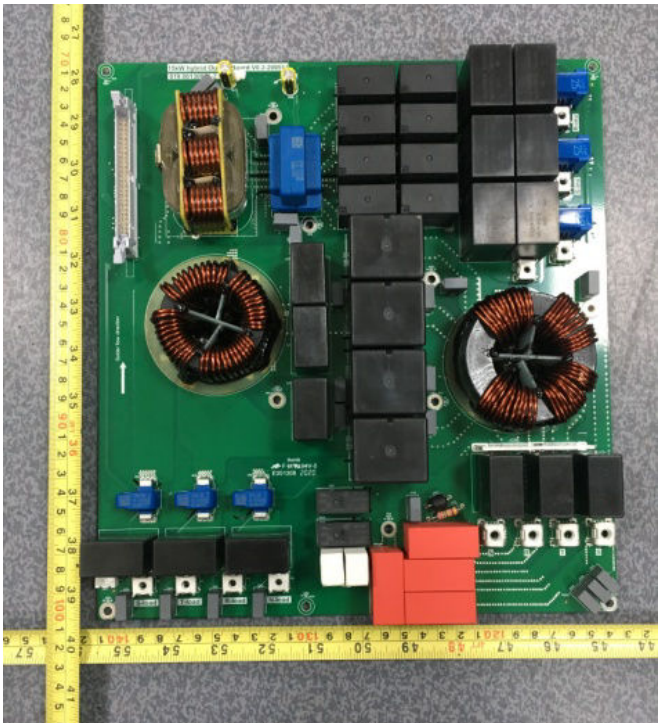
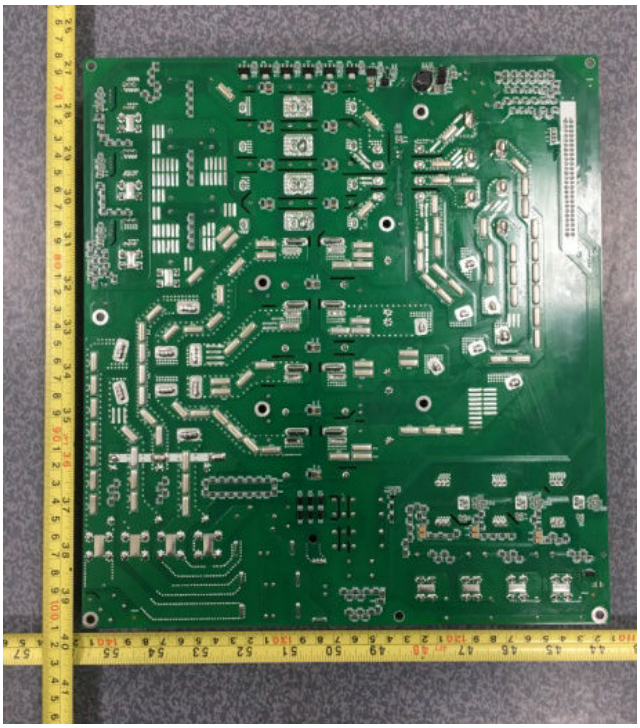
Right side view

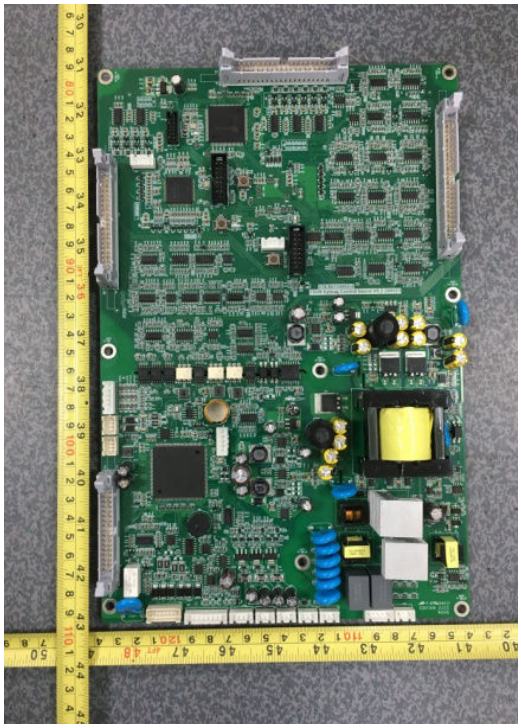
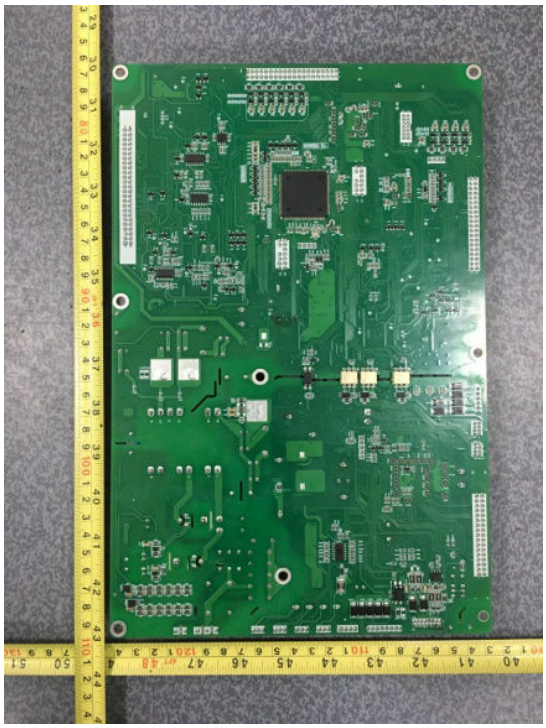
Internal view 1

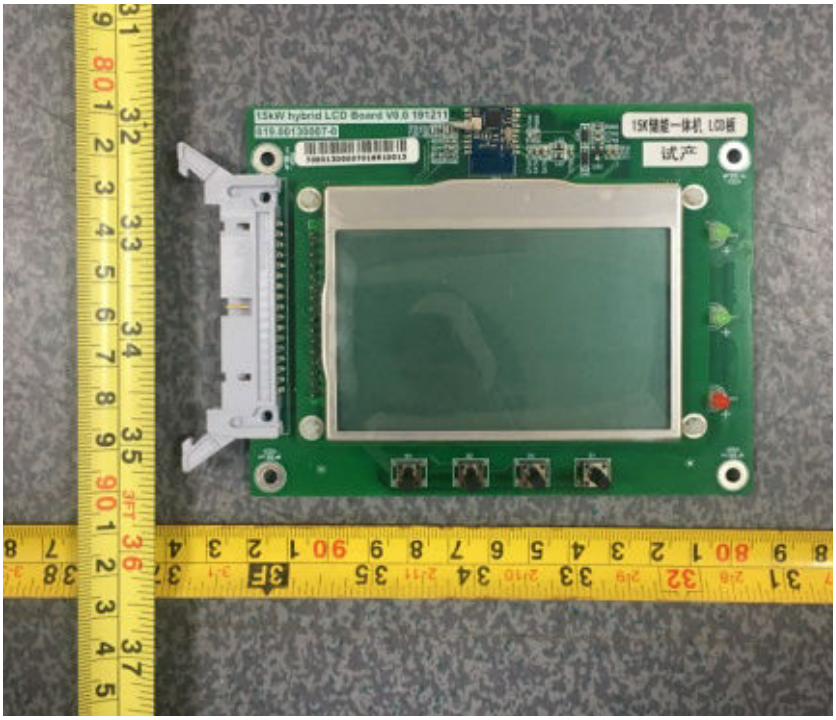
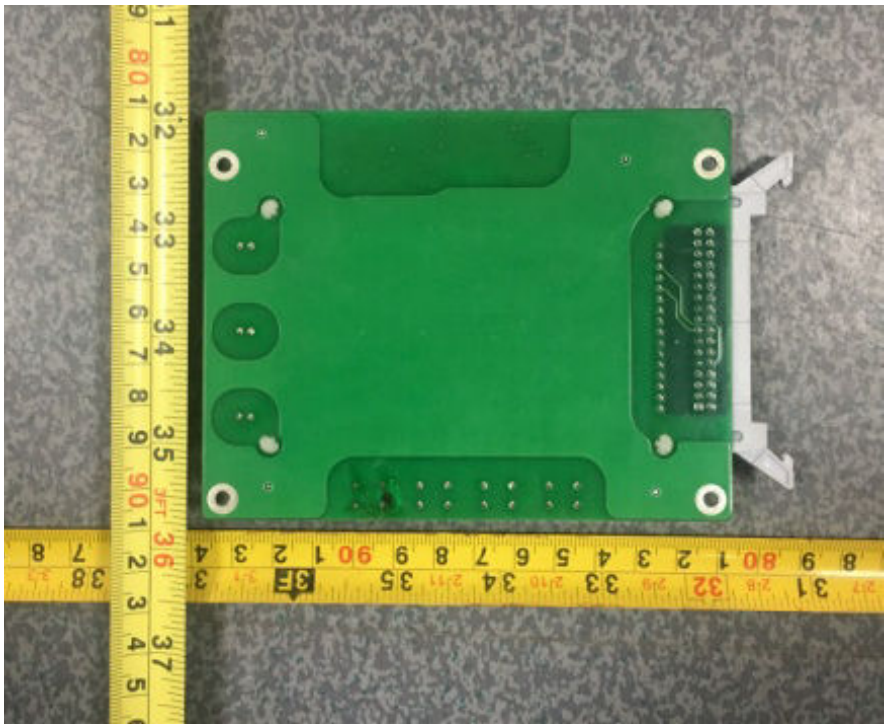
Internal view 2



Power board component side view

Power board solder side view


Output board component side view

Output board solder side view


Control board component side view

Control board solder side view


LCD board component side view

LCD board solder side view


Annex No. 2
Test Equipment list

Date(s) of performance test: 2020-09-11 to 2020-09-14

Equipment	Internal No.	Manufacturer	Type	Serial No.	Next calibration date
Power Analyser	A4080002DG	YOKOGAWA	WT3000	91M210852	Jun. 16, 2021
AC Source	A7040019DG	Chroma	61512	61512000439	Monitored by Power Analyser
	A7040020DG	Chroma	61512	61512000438	
DC Simulation Power Supply	A7040015DG	Chroma	62150H-1000S	62150EF00488	
	A7040016DG	Chroma	62150H-1000S	62150EF00490	
	A7040017DG	Chroma	620028	620028EF00120	
RLC Load	A7150027DG	Qunling	ACLT-3803H	93VOO2869	
Eight Channel Digital Phosphor Oscilloscope	A4089017DG	YOKOGAWA	DL850	91N726247	Sep. 24, 2020
Oscilloscope probe	A4089008DG	Tektronix	TPP1000	C008230	Aug. 10, 2021
	A4089010DG	Tektronix	TPP1000	C008228	Aug. 10, 2021
	A4089011DG	Tektronix	TPP1000	C008229	Aug. 10, 2021
Current transducer	A1060007DG	YOKOGAWA	CT200	1130700012	Sep. 02, 2021
	A1060008DG	YOKOGAWA	CT200	1130700017	Sep. 02, 2021
	A1060012DG	YOKOGAWA	CT200	1130700018	Sep. 02, 2021
Oscilloscope	//	KEYSIGHT	DSX3014T	MY57231269	Jan. 13, 2021
Oscilloscope current probe	//	CYBERTEK	CP1000A	C181000922	Jan. 13, 2021
	//	CYBERTEK	CP1000A	C181000925	Jan. 13, 2021
	//	CYBERTEK	CP1000A	C181000929	Jan. 13, 2021
	//	CYBERTEK	CP1000A	C181000931	Jan. 13, 2021
Oscilloscope probe	//	SANHUA	SI-9110	152627	Jan. 13, 2021
	//	SIALENT	DS5034X	SDS5XEAC3R0011	Jan. 13, 2021
	//	AGILENT	N2863B	YF0139	Jan. 13, 2021

End of Test Report