






中国认可  
国际互认  
检测  
TESTING  
CNAS L5313



<b>TEST REPORT</b> <b>CEI 0-21</b> <b>Reference technical rules for the connection of active and passive users to the LV networks of electrical distribution companies</b>	
<b>Report</b>	
Report Number .....	6072825.50
Date of issue.....	2020-07-23
Total number of pages .....	151 pages
<b>Testing Laboratory</b> .....	
DEKRA Testing and Certification (Suzhou) Co., Ltd.	
Address .....	No. 99, Hongye Road, Suzhou Industrial Park Suzhou, 215006, P.R. China
<b>Applicant's name</b> .....	
EAST Group Co., Ltd.	
Address .....	No.6 Northern Industry Road, Songshan Lake Sci. & Tech. Industrial Park, Dongguan City, Guangdong Province, China.
<b>Test specification:</b>	
Standard .....	CEI 0-21:2019-04
Test procedure.....	Type test
Non-standard test method.....	N/A
<b>Test Report Form No.</b> .....	
CEI 0-21_V2.0	
Test Report Form(s) Originator .....	DEKRA Testing and Certification (Suzhou) Co., Ltd.
Master TRF.....	Dated 2019-05
<b>Test item description</b> .....	
Grid-connected PV Inverter	
Trade Mark .....	
Manufacturer .....	EAST Group Co., Ltd. No.6 Northern Industry Road, Songshan Lake Sci. & Tech. Industrial Park, Dongguan City, Guangdong Province, China
Model/Type reference .....	EA20KTSI, EA25KTSI, EA30KTSI

Ratings .....	EA20KTSI: PV input: Max. 1100 Vdc , MPPT voltage range: 200-950 Vdc , max 22 A/22 A, Isc PV: 24 A/24 A Output: 230/400 Vac, 3/N/PE, 50 Hz, 20000 VA, max 29.0 A
	EA25KTSI: PV input: Max. 1100 Vdc , MPPT voltage range: 200-950 Vdc , max 33 A/22 A, Isc PV: 36 A/24 A Output: 230/400 Vac, 3/N/PE, 50 Hz, 25000 VA, max 36.3 A
	EA30KTSI: PV input: Max. 1100 Vdc , MPPT voltage range: 200-950 Vdc , max 33 A/33 A, Isc PV: 36 A/36 A Output: 230/400 Vac, 3/N/PE, 50 Hz, 30000 VA, max 43.5 A

<b>Responsible Testing Laboratory (as applicable), testing procedure and testing location(s):</b>		
<input checked="" type="checkbox"/>	<b>Testing Laboratory:</b>	DEKRA Testing and Certification (Suzhou) Co., Ltd.
<b>Testing location/ address.....:</b>		No. 99, Hongye Road, Suzhou Industrial Park Suzhou, 215006, P.R. China
<input type="checkbox"/>	<del><b>Associated CB Testing Laboratory:</b></del>	
<del><b>Testing location/ address.....:</b></del>		
<b>Tested by (name, function, signature).....:</b>		Hua Yu 
<b>Approved by (name, function, signature)..:</b>		Jason Guo 
<input type="checkbox"/>	<del><b>Testing procedure: CTF Stage 1:</b></del>	
<del><b>Testing location/ address.....:</b></del>		
<del><b>Tested by (name, function, signature).....:</b></del>		
<del><b>Approved by (name, function, signature)..:</b></del>		
<input type="checkbox"/>	<del><b>Testing procedure: CTF Stage 2:</b></del>	
<del><b>Testing location/ address.....:</b></del>		
<del><b>Tested by (name + signature) .....</b></del>		
<del><b>Witnessed by (name, function, signature) :</b></del>		
<del><b>Approved by (name, function, signature)..:</b></del>		
<input type="checkbox"/>	<del><b>Testing procedure: CTF Stage 3:</b></del>	
<input type="checkbox"/>	<del><b>Testing procedure: CTF Stage 4:</b></del>	
<del><b>Testing location/ address.....:</b></del>		
<del><b>Tested by (name, function, signature).....:</b></del>		
<del><b>Witnessed by (name, function, signature) :</b></del>		
<del><b>Approved by (name, function, signature)..:</b></del>		
<del><b>Supervised by (name, function, signature):</b></del>		


**Copy of marking plate**


The artwork below may be only a draft. The use of certification marks on a product must be authorized by the respective NCBs that own these marks.

Rating label:

**EAST**


PV Inverter	
Model	EA20KTSI
Max.Input Voltage	1100Vd.c.
MPPT Voltage Range	200~950Vd.c.
Max.Input Current	22A/22A
Isc PV	24A/24A
Rated Output Voltage	3/N/PE~230V/400Va.c.
Rated Output Frequency	50/60Hz
Max.Output Current	29.0A
Rated Output Power	20kW
Power Factor Range	0.8 cap.~0.8 ind.
Enclosure	IP65
Overvoltage Category	III(AC), II (DC)
Ambient Temperature	-25°C~60°C


 EA20KTSI 201904100001 Protection Class I



**EAST**


PV Inverter	
Model	EA25KTSI
Max.Input Voltage	1100Vd.c.
MPPT Voltage Range	200~950Vd.c.
Max.Input Current	33A/22A
Isc PV	36A/24A
Rated Output Voltage	3/N/PE~230V/400Va.c.
Rated Output Frequency	50/60Hz
Max.Output Current	36.3A
Rated Output Power	25kW
Power Factor Range	0.8 cap.~0.8 ind.
Enclosure	IP65
Overvoltage Category	III(AC), II (DC)
Ambient Temperature	-25°C~60°C


 EA25KTSI 201904100001 Protection Class I



**EAST**

PV Inverter	
Model	EA30KTSI
Max.Input Voltage	1100Vd.c.
MPPT Voltage Range	200~950Vd.c.
Max.Input Current	33A/33A
Isc PV	36A/36A
Rated Output Voltage	3/N/PE~230V/400Va.c.
Rated Output Frequency	50/60Hz
Max.Output Current	43.5A
Rated Output Power	30kW
Power Factor Range	0.8 cap.~0.8 ind.
Enclosure	IP65
Overvoltage Category	III(AC), II (DC)
Ambient Temperature	-25°C~60°C

 EA30KTSI 201904100001 Protection Class I



Remark:

According to customer's requirement, these models were evaluated under the grid frequency of 50 Hz.

<b>Test item particulars:</b>			
Equipment mobility .....	movable <u>fixed</u>	hand-held transportable	stationary for building-in
Connection to the mains .....	pluggable equipment <u>permanent connection</u>		direct plug-in for building-in
Environmental category .....	outdoor	indoor unconditional	<u>indoor</u> <u>conditional</u>
Over voltage category Mains .....	OVC I	OVC II	<u>OVC III</u> OVC IV
Over voltage category PV .....	OVC I	<u>OVC II</u>	OVC III OVC IV
Mains supply tolerance (%) .....	-90 / +115 %		
Tested for power systems .....	TN		
IT testing, phase-phase voltage (V).....	N/A		
Class of equipment .....	<u>Class I</u> Not classified	Class II	Class III
Mass of equipment (kg).....	43		
Pollution degree.....	Outside PD3; Inside PD2		
IP protection class.....	IP65		
<b>Possible test case verdicts:</b>			
- test case does not apply to the test object.....	N/A		
- test object does meet the requirement .....	P (Pass)		
- test object does not meet the requirement .....	F (Fail)		
- this clause is information reference for installation.:	Info.		
<b>Testing:</b>			
Date of receipt of test item .....	2020-03-12(samples provided by applicant)		
Date (s) of performance of tests.....	2020-03-16 to 2020-07-15		
<b>General remarks:</b>			
The test results presented in this report relate only to the object tested. This report shall not be reproduced, except in full, without the written approval of the Issuing testing laboratory. The measurement result is considered in conformance with the requirement if it is within the prescribed limit, It is not necessary to account the uncertainty associated with the measurement result. This report is only for reference and is not used for legal proof function in China market. The information provided by the customer in this report may affect the validity of the results, the test lab is not responsible for it.  "(see Enclosure #)" refers to additional information appended to the report. "(see appended table)" refers to a table appended to the report. Throughout this report a <input type="checkbox"/> comma / <input checked="" type="checkbox"/> point is used as the decimal separator.			
<b>Name and address of factory (ies):</b>			
EAST Group Co., Ltd No.6 Northern Industry Road, Songshan Lake Sci. & Tech. Industrial Park, Dongguan City, Guangdong Province, China			

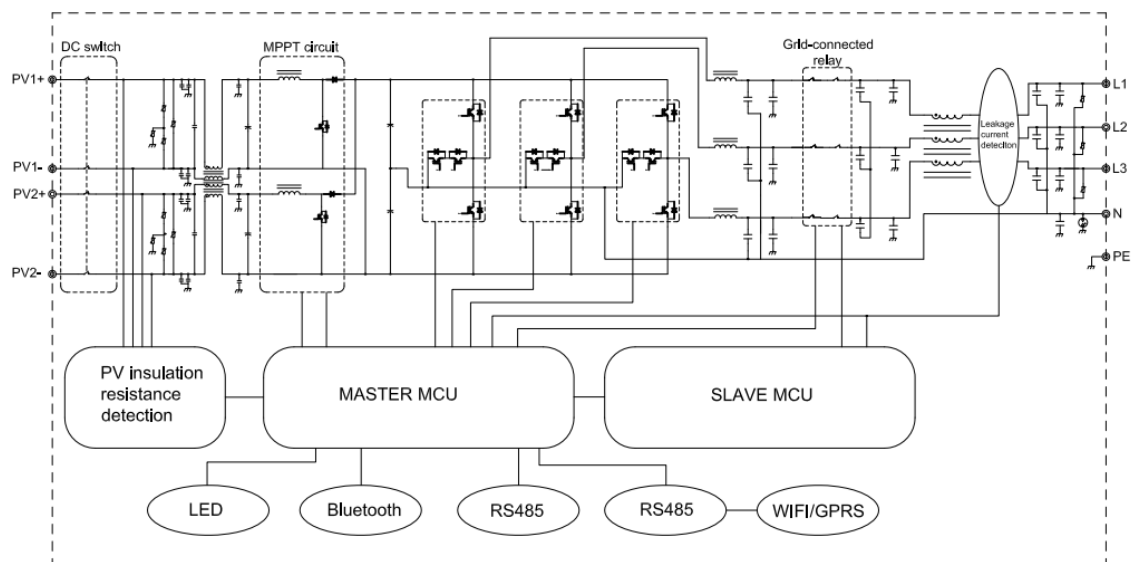
### General product information:

The products are grid-connected photovoltaic inverter converts DC voltage into AC voltage, the unit is providing EMC filtering at the input and output towards mains.

The output was switched off redundant by the high power switching bridge and relay in series. This designation assures that the disconnection of the output circuit from the grid will also operate in case of one error.

The internal control is redundant built. It consists of two Microcontrollers (master DSP U1, slave DSP U22). The master DSP can control the relays; detect the PV voltage, PV current and BUS voltage, measures grid voltage, frequency, AC current with injected DC, insulation resistance to ground and residual current. The slave CPU (U22) were also detected grid voltage, injected DC current and residual current. Both microcontrollers communicate with each other. Any abnormal of those electrical parameter will trigger the disconnection of the inverter from the grid.

### Block Diagram



### Model difference:

1. The models EA20KTSI/ EA25KTSI are similar with EA30KTSI in hardware and just power derating according to setting variations parameter in software.
2. The models EA20KTSI, EA25KTSI are identical with EA30KTSI in topological schematic circuit diagram of hardware except for the boost inductor (EA25KTSI and EA30KTSI with 889  $\mu\text{H}$ \*2 pcs, EA20KTSI with 650  $\mu\text{H}$ \*2 pcs); bus capacitor quantity (EA25KTSI and EA30KTSI with 8 bus capacitors, EA20KTSI with 6 bus capacitors); Boost diode and IGBT; current sampling resistor (EA25KTSI and EA30KTSI with 13 k $\Omega$ , EA20KTSI with 8.2 k $\Omega$ ); AC relay type of output side (EA25KTSI and EA30KTSI with type HF176F/12-H3F; EA20KTSI with type HF165FD-G/12-HY1STF); Internal fan (Only model EA30KTSI designed with internal fan); the type designation and the input/output electrical rating.

### The product was tested on:

Hardware version: 00

Software version: HornetV019

Unless otherwise specified, all the tests were performed on model EA30KTSI and also applicable for all other models stated in this report. According to the user manual and testing, the product was evaluated for maximum ambient temperature of 60°C and will derating the output power above 45°C.

CEI 0-21			
Clause	Requirement - Test	Result - Remark	Verdict

CEI 0-21:2019-04 Annex A: Characteristics and tests for the Interface Protection System (SPI)		
Clause	Test	Result
A.3.1-3.4	Adjustable ranges of the interface protection system (SPI)	N/A
A.4.3	Functional tests on the interface protection system (SPI)	N/A
A.4.4	Self -test	N/A
A.4.5	Single fault tolerance	N/A
A.4.6	EMC compatibility tests	N/A
A.4.7	Climatic compatibility tests	N/A
A.4.8	Insulation tests	N/A
A.4.9	Tests for the overload capacity of measuring circuits	N/A
A.4.10	Compliance of equipment	N/A
A.4.11	Automatic mechanism to prevent current imbalance during production	N/A

CEI 0-21			
Clause	Requirement - Test	Result - Remark	Verdict

A.4.3	Functional tests on the interface protection system (SPI)	N/A
Clause	Test	Result
A.3.1-3.4	Checking the adjustable values and the description in the user manual	N/A
A.4.3.1	Test procedure for maximum voltage and frequency functions	N/A
A.4.3.2	Test procedure for minimum voltage and frequency functions	N/A
A.4.3.3	Additional requirements for functional tests	N/A
A.4.3.3.1	Insensitivity to harmonics of the frequency relay	N/A
A.4.3.3.2	Remote trip signal	N/A
A.4.3.3.3	Communication signal	N/A



CEI 0-21			
Clause	Requirement - Test	Result - Remark	Verdict

CEI 0-21:2019-04 Annex B: Tests on generators connected to the network through static converters		
Clause	Test	Result
B.1 (a)	Harmonic current	P
B.1 (c)	Voltage fluctuation and flicker	P
B.1.1	Conditions of connection, reconnection and gradual power supply	P
B.1.2	Reactive power exchange	P
B.1.3	Limitation of active power	P
B.1.4	Output of DC component in the output current	P
B.1.5	Checking insensitivity to voltage dips (LVRT capability)	P
B.1.6	Checking the insensitivity to automatic reclosing during phase accordance	P

CEI 0-21			
Clause	Requirement - Test	Result - Remark	Verdict

B.1 (a)	Harmonic current					P
<b>Normal ambient (EN 61000-3-12)</b>						
<b>Output power 33%Pn</b>						
<b>Model: EA30KTSI</b>						
Power (W)			3081.42			
Voltage (V)			230.55			
Current (A)			13.39			
Frequency (Hz)			50.0			
Harmonics	Current Magnitude (A)	% of Fundamental	Phase	Harmonic Current Limits (A) [%]		
				1 phase	3 phase	
2nd	0.023	0.169	Phase A	8	8	
3rd	0.014	0.107	Phase A	21.6	N/A	
4th	0.041	0.304	Phase A	4	4	
5th	0.049	0.367	Phase A	10.7	10.7	
6th	0.033	0.248	Phase A	2.67	2.67	
7th	0.162	1.218	Phase A	7.2	7.2	
8th	0.006	0.045	Phase A	2	2	
9th	0.035	0.261	Phase A	3.8	N/A	
10th	0.012	0.086	Phase A	1.6	1.6	
11th	0.054	0.404	Phase A	3.1	3.1	
12th	0.018	0.138	Phase A	1.33	1.33	
13th	0.042	0.317	Phase A	2	2	
14th	0.031	0.231	Phase A	N/A	N/A	
15th	0.016	0.122	Phase A	N/A	N/A	
16th	0.014	0.103	Phase A	N/A	N/A	
17th	0.177	1.325	Phase A	N/A	N/A	
18th	0.023	0.172	Phase A	N/A	N/A	
19th	0.182	1.368	Phase A	N/A	N/A	
20th	0.032	0.240	Phase A	N/A	N/A	
21th	0.023	0.172	Phase A	N/A	N/A	
22th	0.029	0.219	Phase A	N/A	N/A	
23th	0.029	0.219	Phase A	N/A	N/A	
24th	0.053	0.401	Phase A	N/A	N/A	
25th	0.044	0.332	Phase A	N/A	N/A	
26th	0.049	0.365	Phase A	N/A	N/A	
27th	0.043	0.324	Phase A	N/A	N/A	
28th	0.034	0.254	Phase A	N/A	N/A	
29th	0.077	0.580	Phase A	N/A	N/A	
30th	0.033	0.251	Phase A	N/A	N/A	
31th	0.140	1.050	Phase A	N/A	N/A	
32th	0.018	0.137	Phase A	N/A	N/A	
33th	0.026	0.194	Phase A	N/A	N/A	
34th	0.019	0.141	Phase A	N/A	N/A	
35th	0.113	0.844	Phase A	N/A	N/A	
36th	0.011	0.080	Phase A	N/A	N/A	
37th	0.074	0.557	Phase A	N/A	N/A	
38th	0.008	0.061	Phase A	N/A	N/A	
39th	0.017	0.128	Phase A	N/A	N/A	
40th	0.021	0.159	Phase A	N/A	N/A	
THD <sub>40</sub>	-	3.05	Phase A	23	13	

CEI 0-21					
Clause	Requirement - Test			Result - Remark	Verdict
PWHD	-	13.13	Phase A	23	22
Note: The tests were performed on model EA30KTSI and EA20KTSI are also applicable for all other models stated in this report.					

CEI 0-21			
Clause	Requirement - Test	Result - Remark	Verdict

Normal ambient (EN 61000-3-12) Output power 33%Pn Model: EA30KTSI					
Power (W)			3070.88		
Voltage (V)			230.34		
Current (A)			13.35		
Frequency (Hz)			50.0		
Harmonics	Current Magnitude (A)	% of Fundamental	Phase	Harmonic Current Limits (A) [%]	
				1 phase	3 phase
2nd	0.083	0.622	Phase B	8	8
3rd	0.022	0.166	Phase B	21.6	N/A
4th	0.081	0.610	Phase B	4	4
5th	0.050	0.376	Phase B	10.7	10.7
6th	0.064	0.482	Phase B	2.67	2.67
7th	0.190	1.424	Phase B	7.2	7.2
8th	0.014	0.106	Phase B	2	2
9th	0.046	0.348	Phase B	3.8	N/A
10th	0.024	0.179	Phase B	1.6	1.6
11th	0.053	0.398	Phase B	3.1	3.1
12th	0.032	0.240	Phase B	1.33	1.33
13th	0.033	0.250	Phase B	2	2
14th	0.031	0.230	Phase B	N/A	N/A
15th	0.012	0.089	Phase B	N/A	N/A
16th	0.022	0.167	Phase B	N/A	N/A
17th	0.168	1.262	Phase B	N/A	N/A
18th	0.020	0.149	Phase B	N/A	N/A
19th	0.165	1.240	Phase B	N/A	N/A
20th	0.037	0.277	Phase B	N/A	N/A
21th	0.019	0.143	Phase B	N/A	N/A
22th	0.029	0.214	Phase B	N/A	N/A
23th	0.046	0.348	Phase B	N/A	N/A
24th	0.048	0.363	Phase B	N/A	N/A
25th	0.041	0.309	Phase B	N/A	N/A
26th	0.063	0.476	Phase B	N/A	N/A
27th	0.038	0.286	Phase B	N/A	N/A
28th	0.040	0.302	Phase B	N/A	N/A
29th	0.085	0.638	Phase B	N/A	N/A
30th	0.035	0.263	Phase B	N/A	N/A
31th	0.113	0.849	Phase B	N/A	N/A
32th	0.020	0.153	Phase B	N/A	N/A
33th	0.025	0.188	Phase B	N/A	N/A
34th	0.025	0.191	Phase B	N/A	N/A
35th	0.098	0.738	Phase B	N/A	N/A
36th	0.021	0.161	Phase B	N/A	N/A
37th	0.068	0.514	Phase B	N/A	N/A
38th	0.013	0.099	Phase B	N/A	N/A
39th	0.015	0.109	Phase B	N/A	N/A
40th	0.022	0.166	Phase B	N/A	N/A
THD <sub>40</sub>	-	3.15	Phase B	23	13
PWHD	-	12.29	Phase B	23	22

CEI 0-21			
Clause	Requirement - Test	Result - Remark	Verdict

Normal ambient (EN 61000-3-12) Output power 33%Pn Model: EA30KTSI					
Power (W)			3072.42		
Voltage (V)			230.42		
Current (A)			13.36		
Frequency (Hz)			50.0		
Harmonics	Current Magnitude (A)	% of Fundamental	Phase	Harmonic Current Limits (A) [%]	
				1 phase	3 phase
2nd	0.462	0.062	Phase C	8	8
3rd	0.212	0.028	Phase C	21.6	N/A
4th	0.315	0.042	Phase C	4	4
5th	0.425	0.057	Phase C	10.7	10.7
6th	0.237	0.032	Phase C	2.67	2.67
7th	1.279	0.171	Phase C	7.2	7.2
8th	0.119	0.016	Phase C	2	2
9th	0.107	0.014	Phase C	3.8	N/A
10th	0.133	0.018	Phase C	1.6	1.6
11th	0.239	0.032	Phase C	3.1	3.1
12th	0.109	0.015	Phase C	1.33	1.33
13th	0.279	0.037	Phase C	2	2
14th	0.060	0.008	Phase C	N/A	N/A
15th	0.104	0.014	Phase C	N/A	N/A
16th	0.132	0.018	Phase C	N/A	N/A
17th	1.233	0.165	Phase C	N/A	N/A
18th	0.109	0.015	Phase C	N/A	N/A
19th	1.111	0.148	Phase C	N/A	N/A
20th	0.192	0.026	Phase C	N/A	N/A
21th	0.158	0.021	Phase C	N/A	N/A
22th	0.154	0.021	Phase C	N/A	N/A
23th	0.241	0.032	Phase C	N/A	N/A
24th	0.296	0.040	Phase C	N/A	N/A
25th	0.330	0.044	Phase C	N/A	N/A
26th	0.294	0.039	Phase C	N/A	N/A
27th	0.218	0.029	Phase C	N/A	N/A
28th	0.192	0.026	Phase C	N/A	N/A
29th	0.607	0.081	Phase C	N/A	N/A
30th	0.260	0.035	Phase C	N/A	N/A
31th	1.013	0.135	Phase C	N/A	N/A
32th	0.187	0.025	Phase C	N/A	N/A
33th	0.121	0.016	Phase C	N/A	N/A
34th	0.124	0.017	Phase C	N/A	N/A
35th	0.873	0.117	Phase C	N/A	N/A
36th	0.115	0.015	Phase C	N/A	N/A
37th	0.595	0.079	Phase C	N/A	N/A
38th	0.087	0.012	Phase C	N/A	N/A
39th	0.136	0.018	Phase C	N/A	N/A
40th	0.170	0.023	Phase C	N/A	N/A
THD <sub>40</sub>	-	2.91	Phase C	23	13
PWHD	-	12.29	Phase C	23	22

CEI 0-21			
Clause	Requirement - Test	Result - Remark	Verdict

Normal ambient (EN 61000-3-12) Output power 66% Pn Model: EA30KTSI					
Power (W)			6505.91		
Voltage (V)			230.56		
Current (A)			28.27		
Frequency (Hz)			50.0		
Harmonics	Current Magnitude (A)	% of Fundamental	Phase	Harmonic Current Limits (A) [%]	
				1 phase	3 phase
2nd	0.133	0.474	Phase A	8	8
3rd	0.060	0.213	Phase A	21.6	N/A
4th	0.092	0.328	Phase A	4	4
5th	0.117	0.418	Phase A	10.7	10.7
6th	0.068	0.244	Phase A	2.67	2.67
7th	0.353	1.257	Phase A	7.2	7.2
8th	0.035	0.125	Phase A	2	2
9th	0.023	0.083	Phase A	3.8	N/A
10th	0.037	0.133	Phase A	1.6	1.6
11th	0.060	0.215	Phase A	3.1	3.1
12th	0.026	0.094	Phase A	1.33	1.33
13th	0.074	0.265	Phase A	2	2
14th	0.016	0.058	Phase A	N/A	N/A
15th	0.028	0.102	Phase A	N/A	N/A
16th	0.037	0.131	Phase A	N/A	N/A
17th	0.351	1.250	Phase A	N/A	N/A
18th	0.029	0.103	Phase A	N/A	N/A
19th	0.318	1.133	Phase A	N/A	N/A
20th	0.050	0.177	Phase A	N/A	N/A
21th	0.042	0.151	Phase A	N/A	N/A
22th	0.046	0.164	Phase A	N/A	N/A
23th	0.066	0.234	Phase A	N/A	N/A
24th	0.084	0.299	Phase A	N/A	N/A
25th	0.094	0.334	Phase A	N/A	N/A
26th	0.079	0.283	Phase A	N/A	N/A
27th	0.080	0.286	Phase A	N/A	N/A
28th	0.051	0.183	Phase A	N/A	N/A
29th	0.173	0.615	Phase A	N/A	N/A
30th	0.071	0.251	Phase A	N/A	N/A
31th	0.284	1.011	Phase A	N/A	N/A
32th	0.055	0.195	Phase A	N/A	N/A
33th	0.042	0.149	Phase A	N/A	N/A
34th	0.032	0.112	Phase A	N/A	N/A
35th	0.248	0.885	Phase A	N/A	N/A
36th	0.036	0.129	Phase A	N/A	N/A
37th	0.166	0.593	Phase A	N/A	N/A
38th	0.026	0.091	Phase A	N/A	N/A
39th	0.038	0.134	Phase A	N/A	N/A
40th	0.049	0.173	Phase A	N/A	N/A
THD <sub>40</sub>	-	1.54	Phase A	23	13
PWHD	-	12.43	Phase A	23	22

CEI 0-21			
Clause	Requirement - Test	Result - Remark	Verdict

Normal ambient (EN 61000-3-12)					
Output power 66% Pn					
Model: EA30KTSI					
Power (W)			6486.03		
Voltage (V)			230.40		
Current (A)			28.21		
Frequency (Hz)			50.0		
Harmonics	Current Magnitude (A)	% of Fundamental	Phase	Harmonic Current Limits (A) [%]	
				1 phase	3 phase
2nd	0.006	0.638	Phase B	8	8
3rd	0.002	0.164	Phase B	21.6	N/A
4th	0.006	0.636	Phase B	4	4
5th	0.004	0.362	Phase B	10.7	10.7
6th	0.005	0.480	Phase B	2.67	2.67
7th	0.014	1.445	Phase B	7.2	7.2
8th	0.001	0.119	Phase B	2	2
9th	0.003	0.305	Phase B	3.8	N/A
10th	0.002	0.171	Phase B	1.6	1.6
11th	0.004	0.393	Phase B	3.1	3.1
12th	0.002	0.239	Phase B	1.33	1.33
13th	0.002	0.245	Phase B	2	2
14th	0.002	0.238	Phase B	N/A	N/A
15th	0.001	0.091	Phase B	N/A	N/A
16th	0.002	0.169	Phase B	N/A	N/A
17th	0.012	1.244	Phase B	N/A	N/A
18th	0.001	0.129	Phase B	N/A	N/A
19th	0.013	1.260	Phase B	N/A	N/A
20th	0.003	0.276	Phase B	N/A	N/A
21th	0.001	0.134	Phase B	N/A	N/A
22th	0.002	0.206	Phase B	N/A	N/A
23th	0.003	0.334	Phase B	N/A	N/A
24th	0.004	0.358	Phase B	N/A	N/A
25th	0.003	0.335	Phase B	N/A	N/A
26th	0.004	0.424	Phase B	N/A	N/A
27th	0.002	0.240	Phase B	N/A	N/A
28th	0.003	0.291	Phase B	N/A	N/A
29th	0.007	0.656	Phase B	N/A	N/A
30th	0.003	0.285	Phase B	N/A	N/A
31th	0.009	0.855	Phase B	N/A	N/A
32th	0.002	0.157	Phase B	N/A	N/A
33th	0.002	0.184	Phase B	N/A	N/A
34th	0.002	0.184	Phase B	N/A	N/A
35th	0.007	0.745	Phase B	N/A	N/A
36th	0.002	0.158	Phase B	N/A	N/A
37th	0.005	0.512	Phase B	N/A	N/A
38th	0.001	0.095	Phase B	N/A	N/A
39th	0.001	0.116	Phase B	N/A	N/A
40th	0.002	0.167	Phase B	N/A	N/A
THD <sub>40</sub>	-	1.49	Phase B	23	13
PWHD	-	12.23	Phase B	23	22

CEI 0-21						
Clause	Requirement - Test			Result - Remark	Verdict	
<b>Normal ambient (EN 61000-3-12)</b>						
<b>Output power 66% Pn</b>						
<b>Model: EA30KTSI</b>						
Power (W)				6485.94		
Voltage (V)				230.35		
Current (A)				28.21		
Frequency (Hz)				50.0		
Harmonics	Current Magnitude (A)	% of Fundamental	Phase	Harmonic Current Limits (A) [%]		
				1 phase	3 phase	
2nd	0.051	0.181	Phase C	8	8	
3rd	0.030	0.106	Phase C	21.6	N/A	
4th	0.090	0.321	Phase C	4	4	
5th	0.106	0.376	Phase C	10.7	10.7	
6th	0.068	0.240	Phase C	2.67	2.67	
7th	0.345	1.224	Phase C	7.2	7.2	
8th	0.013	0.045	Phase C	2	2	
9th	0.080	0.286	Phase C	3.8	N/A	
10th	0.026	0.091	Phase C	1.6	1.6	
11th	0.123	0.436	Phase C	3.1	3.1	
12th	0.043	0.153	Phase C	1.33	1.33	
13th	0.093	0.332	Phase C	2	2	
14th	0.068	0.243	Phase C	N/A	N/A	
15th	0.022	0.079	Phase C	N/A	N/A	
16th	0.032	0.113	Phase C	N/A	N/A	
17th	0.374	1.328	Phase C	N/A	N/A	
18th	0.043	0.151	Phase C	N/A	N/A	
19th	0.372	1.320	Phase C	N/A	N/A	
20th	0.074	0.264	Phase C	N/A	N/A	
21th	0.045	0.159	Phase C	N/A	N/A	
22th	0.061	0.215	Phase C	N/A	N/A	
23th	0.060	0.214	Phase C	N/A	N/A	
24th	0.118	0.421	Phase C	N/A	N/A	
25th	0.082	0.290	Phase C	N/A	N/A	
26th	0.104	0.370	Phase C	N/A	N/A	
27th	0.109	0.388	Phase C	N/A	N/A	
28th	0.075	0.265	Phase C	N/A	N/A	
29th	0.178	0.633	Phase C	N/A	N/A	
30th	0.073	0.258	Phase C	N/A	N/A	
31th	0.287	1.021	Phase C	N/A	N/A	
32th	0.036	0.128	Phase C	N/A	N/A	
33th	0.047	0.168	Phase C	N/A	N/A	
34th	0.042	0.148	Phase C	N/A	N/A	
35th	0.244	0.865	Phase C	N/A	N/A	
36th	0.018	0.065	Phase C	N/A	N/A	
37th	0.152	0.540	Phase C	N/A	N/A	
38th	0.017	0.059	Phase C	N/A	N/A	
39th	0.035	0.124	Phase C	N/A	N/A	
40th	0.045	0.161	Phase C	N/A	N/A	
THD <sub>40</sub>	-	3.05	Phase C	23	13	
PWHD	-	13.06	Phase C	23	22	



CEI 0-21						
Clause	Requirement - Test			Result - Remark	Verdict	
<b>Normal ambient (EN 61000-3-12)</b>						
<b>Output power 100% Pn</b>						
<b>Model: EA30KTSI</b>						
Power (W)				9757.86		
Voltage (V)				230.38		
Current (A)				42.44		
Frequency (Hz)				50.0		
Harmonics	Current Magnitude (A)	% of Fundamental	Phase	Harmonic Current Limits (A) [%]		
				1 phase	3 phase	
2nd	0.212	0.502	Phase A	8	8	
3rd	0.089	0.211	Phase A	21.6	N/A	
4th	0.137	0.323	Phase A	4	4	
5th	0.266	0.628	Phase A	10.7	10.7	
6th	0.110	0.259	Phase A	2.67	2.67	
7th	0.623	1.471	Phase A	7.2	7.2	
8th	0.051	0.120	Phase A	2	2	
9th	0.022	0.051	Phase A	3.8	N/A	
10th	0.052	0.122	Phase A	1.6	1.6	
11th	0.076	0.179	Phase A	3.1	3.1	
12th	0.041	0.097	Phase A	1.33	1.33	
13th	0.176	0.417	Phase A	2	2	
14th	0.028	0.067	Phase A	N/A	N/A	
15th	0.022	0.052	Phase A	N/A	N/A	
16th	0.053	0.125	Phase A	N/A	N/A	
17th	0.586	1.384	Phase A	N/A	N/A	
18th	0.050	0.118	Phase A	N/A	N/A	
19th	0.499	1.178	Phase A	N/A	N/A	
20th	0.081	0.192	Phase A	N/A	N/A	
21th	0.056	0.132	Phase A	N/A	N/A	
22th	0.071	0.168	Phase A	N/A	N/A	
23th	0.064	0.150	Phase A	N/A	N/A	
24th	0.131	0.309	Phase A	N/A	N/A	
25th	0.169	0.400	Phase A	N/A	N/A	
26th	0.120	0.283	Phase A	N/A	N/A	
27th	0.083	0.197	Phase A	N/A	N/A	
28th	0.084	0.199	Phase A	N/A	N/A	
29th	0.338	0.798	Phase A	N/A	N/A	
30th	0.137	0.324	Phase A	N/A	N/A	
31th	0.538	1.270	Phase A	N/A	N/A	
32th	0.087	0.206	Phase A	N/A	N/A	
33th	0.028	0.067	Phase A	N/A	N/A	
34th	0.048	0.114	Phase A	N/A	N/A	
35th	0.410	0.969	Phase A	N/A	N/A	
36th	0.065	0.153	Phase A	N/A	N/A	
37th	0.261	0.616	Phase A	N/A	N/A	
38th	0.037	0.087	Phase A	N/A	N/A	
39th	0.047	0.112	Phase A	N/A	N/A	
40th	0.071	0.169	Phase A	N/A	N/A	
THD <sub>40</sub>	-	3.31	Phase A	23	13	
PWHD	-	13.98	Phase A	23	22	

CEI 0-21					
Clause	Requirement - Test			Result - Remark	Verdict
<b>Normal ambient (EN 61000-3-12)</b>					
<b>Output power 100% Pn</b>					
<b>Model: EA30KTSI</b>					
Power (W)			9725.69		
Voltage (V)			230.36		
Current (A)			42.30		
Frequency (Hz)			50.0		
Harmonics	Current Magnitude (A)	% of Fundamental	Phase	Harmonic Current Limits (A) [%]	
				1 phase	3 phase
2nd	0.269	0.636	Phase B	8	8
3rd	0.065	0.154	Phase B	21.6	N/A
4th	0.268	0.636	Phase B	4	4
5th	0.246	0.582	Phase B	10.7	10.7
6th	0.213	0.505	Phase B	2.67	2.67
7th	0.697	1.652	Phase B	7.2	7.2
8th	0.042	0.099	Phase B	2	2
9th	0.139	0.328	Phase B	3.8	N/A
10th	0.073	0.174	Phase B	1.6	1.6
11th	0.158	0.374	Phase B	3.1	3.1
12th	0.099	0.235	Phase B	1.33	1.33
13th	0.169	0.401	Phase B	2	2
14th	0.105	0.249	Phase B	N/A	N/A
15th	0.029	0.068	Phase B	N/A	N/A
16th	0.071	0.168	Phase B	N/A	N/A
17th	0.590	1.399	Phase B	N/A	N/A
18th	0.059	0.140	Phase B	N/A	N/A
19th	0.561	1.328	Phase B	N/A	N/A
20th	0.135	0.320	Phase B	N/A	N/A
21th	0.040	0.094	Phase B	N/A	N/A
22th	0.084	0.198	Phase B	N/A	N/A
23th	0.074	0.176	Phase B	N/A	N/A
24th	0.125	0.296	Phase B	N/A	N/A
25th	0.142	0.336	Phase B	N/A	N/A
26th	0.187	0.444	Phase B	N/A	N/A
27th	0.092	0.218	Phase B	N/A	N/A
28th	0.088	0.209	Phase B	N/A	N/A
29th	0.342	0.811	Phase B	N/A	N/A
30th	0.126	0.298	Phase B	N/A	N/A
31th	0.474	1.122	Phase B	N/A	N/A
32th	0.065	0.155	Phase B	N/A	N/A
33th	0.068	0.161	Phase B	N/A	N/A
34th	0.082	0.195	Phase B	N/A	N/A
35th	0.346	0.819	Phase B	N/A	N/A
36th	0.075	0.177	Phase B	N/A	N/A
37th	0.223	0.528	Phase B	N/A	N/A
38th	0.040	0.096	Phase B	N/A	N/A
39th	0.028	0.066	Phase B	N/A	N/A
40th	0.072	0.170	Phase B	N/A	N/A
THD <sub>40</sub>	-	3.50	Phase B	23	13
PWHD	-	13.57	Phase B	23	22

CEI 0-21						
Clause	Requirement - Test			Result - Remark		Verdict
<b>Normal ambient (EN 61000-3-12)</b>						
<b>Output power 100% Pn</b>						
<b>Model: EA30KTSI</b>						
Power (W)			9737.89			
Voltage (V)			230.49			
Current (A)			42.33			
Frequency (Hz)			50.0			
Harmonics	Current Magnitude (A)	% of Fundamental	Phase	Harmonic Current Limits (A) [%]		
				1 phase	3 phase	
2nd	0.067	0.159	Phase C	8	8	
3rd	0.052	0.123	Phase C	21.6	N/A	
4th	0.135	0.318	Phase C	4	4	
5th	0.245	0.580	Phase C	10.7	10.7	
6th	0.105	0.249	Phase C	2.67	2.67	
7th	0.600	1.421	Phase C	7.2	7.2	
8th	0.030	0.071	Phase C	2	2	
9th	0.122	0.289	Phase C	3.8	N/A	
10th	0.041	0.098	Phase C	1.6	1.6	
11th	0.158	0.374	Phase C	3.1	3.1	
12th	0.064	0.150	Phase C	1.33	1.33	
13th	0.200	0.473	Phase C	2	2	
14th	0.112	0.264	Phase C	N/A	N/A	
15th	0.029	0.069	Phase C	N/A	N/A	
16th	0.044	0.103	Phase C	N/A	N/A	
17th	0.625	1.479	Phase C	N/A	N/A	
18th	0.077	0.182	Phase C	N/A	N/A	
19th	0.602	1.424	Phase C	N/A	N/A	
20th	0.128	0.304	Phase C	N/A	N/A	
21th	0.052	0.122	Phase C	N/A	N/A	
22th	0.096	0.227	Phase C	N/A	N/A	
23th	0.067	0.159	Phase C	N/A	N/A	
24th	0.177	0.420	Phase C	N/A	N/A	
25th	0.137	0.324	Phase C	N/A	N/A	
26th	0.157	0.371	Phase C	N/A	N/A	
27th	0.124	0.293	Phase C	N/A	N/A	
28th	0.085	0.200	Phase C	N/A	N/A	
29th	0.321	0.761	Phase C	N/A	N/A	
30th	0.140	0.332	Phase C	N/A	N/A	
31th	0.565	1.336	Phase C	N/A	N/A	
32th	0.068	0.161	Phase C	N/A	N/A	
33th	0.070	0.165	Phase C	N/A	N/A	
34th	0.058	0.138	Phase C	N/A	N/A	
35th	0.398	0.942	Phase C	N/A	N/A	
36th	0.026	0.060	Phase C	N/A	N/A	
37th	0.235	0.556	Phase C	N/A	N/A	
38th	0.026	0.061	Phase C	N/A	N/A	
39th	0.043	0.103	Phase C	N/A	N/A	
40th	0.065	0.155	Phase C	N/A	N/A	
THD <sub>40</sub>	-	3.44	Phase C	23	13	
PWHD	-	14.70	Phase C	23	22	

CEI 0-21			
Clause	Requirement - Test	Result - Remark	Verdict

-25°C (EN 61000-3-12) Output power 33% Pn Model: EA30KTSI					
Power (W)			3081.35		
Voltage (V)			230.45		
Current (A)			13.39		
Frequency (Hz)			50.0		
Harmonics	Current Magnitude (A)	% of Fundamental	Phase	Harmonic Current Limits (A) [%]	
				1 phase	3 phase
2nd	0.062	0.462	Phase A	8	8
3rd	0.027	0.201	Phase A	21.6	N/A
4th	0.043	0.319	Phase A	4	4
5th	0.059	0.438	Phase A	10.7	10.7
6th	0.032	0.239	Phase A	2.67	2.67
7th	0.175	1.307	Phase A	7.2	7.2
8th	0.016	0.119	Phase A	2	2
9th	0.013	0.100	Phase A	3.8	N/A
10th	0.017	0.129	Phase A	1.6	1.6
11th	0.033	0.245	Phase A	3.1	3.1
12th	0.013	0.099	Phase A	1.33	1.33
13th	0.035	0.264	Phase A	2	2
14th	0.007	0.054	Phase A	N/A	N/A
15th	0.011	0.084	Phase A	N/A	N/A
16th	0.018	0.131	Phase A	N/A	N/A
17th	0.168	1.255	Phase A	N/A	N/A
18th	0.015	0.114	Phase A	N/A	N/A
19th	0.154	1.149	Phase A	N/A	N/A
20th	0.026	0.193	Phase A	N/A	N/A
21th	0.018	0.136	Phase A	N/A	N/A
22th	0.022	0.161	Phase A	N/A	N/A
23th	0.039	0.291	Phase A	N/A	N/A
24th	0.043	0.319	Phase A	N/A	N/A
25th	0.045	0.340	Phase A	N/A	N/A
26th	0.043	0.322	Phase A	N/A	N/A
27th	0.030	0.227	Phase A	N/A	N/A
28th	0.028	0.206	Phase A	N/A	N/A
29th	0.085	0.639	Phase A	N/A	N/A
30th	0.036	0.270	Phase A	N/A	N/A
31th	0.140	1.049	Phase A	N/A	N/A
32th	0.025	0.186	Phase A	N/A	N/A
33th	0.014	0.107	Phase A	N/A	N/A
34th	0.017	0.125	Phase A	N/A	N/A
35th	0.119	0.891	Phase A	N/A	N/A
36th	0.016	0.123	Phase A	N/A	N/A
37th	0.080	0.601	Phase A	N/A	N/A
38th	0.012	0.091	Phase A	N/A	N/A
39th	0.019	0.142	Phase A	N/A	N/A
40th	0.022	0.168	Phase A	N/A	N/A
THD <sub>40</sub>	-	2.98	Phase A	23	13
PWHD	-	12.67	Phase A	23	22

CEI 0-21			
Clause	Requirement - Test	Result - Remark	Verdict

-25°C (EN 61000-3-12) Output power 33% Pn Model: EA30KTSI					
Power (W)			3072.32		
Voltage (V)			230.33		
Current (A)			13.36		
Frequency (Hz)			50.0		
Harmonics	Current Magnitude (A)	% of Fundamental	Phase	Harmonic Current Limits (A) [%]	
				1 phase	3 phase
2nd	0.084	0.626	Phase B	8	8
3rd	0.021	0.160	Phase B	21.6	N/A
4th	0.083	0.619	Phase B	4	4
5th	0.050	0.374	Phase B	10.7	10.7
6th	0.064	0.482	Phase B	2.67	2.67
7th	0.192	1.438	Phase B	7.2	7.2
8th	0.013	0.100	Phase B	2	2
9th	0.045	0.339	Phase B	3.8	N/A
10th	0.024	0.177	Phase B	1.6	1.6
11th	0.054	0.408	Phase B	3.1	3.1
12th	0.032	0.237	Phase B	1.33	1.33
13th	0.038	0.285	Phase B	2	2
14th	0.031	0.234	Phase B	N/A	N/A
15th	0.014	0.106	Phase B	N/A	N/A
16th	0.023	0.174	Phase B	N/A	N/A
17th	0.167	1.255	Phase B	N/A	N/A
18th	0.022	0.162	Phase B	N/A	N/A
19th	0.163	1.226	Phase B	N/A	N/A
20th	0.039	0.290	Phase B	N/A	N/A
21th	0.019	0.141	Phase B	N/A	N/A
22th	0.029	0.220	Phase B	N/A	N/A
23th	0.051	0.386	Phase B	N/A	N/A
24th	0.045	0.336	Phase B	N/A	N/A
25th	0.050	0.376	Phase B	N/A	N/A
26th	0.061	0.458	Phase B	N/A	N/A
27th	0.041	0.307	Phase B	N/A	N/A
28th	0.036	0.272	Phase B	N/A	N/A
29th	0.078	0.588	Phase B	N/A	N/A
30th	0.034	0.253	Phase B	N/A	N/A
31th	0.120	0.898	Phase B	N/A	N/A
32th	0.021	0.158	Phase B	N/A	N/A
33th	0.025	0.186	Phase B	N/A	N/A
34th	0.025	0.189	Phase B	N/A	N/A
35th	0.102	0.768	Phase B	N/A	N/A
36th	0.021	0.155	Phase B	N/A	N/A
37th	0.068	0.509	Phase B	N/A	N/A
38th	0.014	0.102	Phase B	N/A	N/A
39th	0.015	0.116	Phase B	N/A	N/A
40th	0.023	0.170	Phase B	N/A	N/A
THD <sub>40</sub>	-	3.17	Phase B	23	13
PWHD	-	12.34	Phase B	23	22

CEI 0-21			
Clause	Requirement - Test	Result - Remark	Verdict

-25°C (EN 61000-3-12) Output power 33% Pn Model: EA30KTSI					
Power (W)			3068.98		
Voltage (V)			230.12		
Current (A)			13.36		
Frequency (Hz)			50.0		
Harmonics	Current Magnitude (A)	% of Fundamental	Phase	Harmonic Current Limits (A) [%]	
				1 phase	3 phase
2nd	0.023	0.175	Phase C	8	8
3rd	0.015	0.112	Phase C	21.6	N/A
4th	0.041	0.309	Phase C	4	4
5th	0.051	0.384	Phase C	10.7	10.7
6th	0.033	0.246	Phase C	2.67	2.67
7th	0.166	1.242	Phase C	7.2	7.2
8th	0.007	0.049	Phase C	2	2
9th	0.040	0.297	Phase C	3.8	N/A
10th	0.013	0.095	Phase C	1.6	1.6
11th	0.061	0.455	Phase C	3.1	3.1
12th	0.020	0.147	Phase C	1.33	1.33
13th	0.048	0.358	Phase C	2	2
14th	0.032	0.241	Phase C	N/A	N/A
15th	0.013	0.096	Phase C	N/A	N/A
16th	0.016	0.117	Phase C	N/A	N/A
17th	0.179	1.342	Phase C	N/A	N/A
18th	0.026	0.191	Phase C	N/A	N/A
19th	0.179	1.341	Phase C	N/A	N/A
20th	0.035	0.263	Phase C	N/A	N/A
21th	0.021	0.161	Phase C	N/A	N/A
22th	0.031	0.230	Phase C	N/A	N/A
23th	0.034	0.256	Phase C	N/A	N/A
24th	0.053	0.399	Phase C	N/A	N/A
25th	0.045	0.335	Phase C	N/A	N/A
26th	0.050	0.372	Phase C	N/A	N/A
27th	0.042	0.319	Phase C	N/A	N/A
28th	0.034	0.257	Phase C	N/A	N/A
29th	0.079	0.593	Phase C	N/A	N/A
30th	0.039	0.290	Phase C	N/A	N/A
31th	0.142	1.062	Phase C	N/A	N/A
32th	0.019	0.142	Phase C	N/A	N/A
33th	0.027	0.202	Phase C	N/A	N/A
34th	0.018	0.137	Phase C	N/A	N/A
35th	0.115	0.866	Phase C	N/A	N/A
36th	0.009	0.065	Phase C	N/A	N/A
37th	0.074	0.553	Phase C	N/A	N/A
38th	0.008	0.059	Phase C	N/A	N/A
39th	0.016	0.120	Phase C	N/A	N/A
40th	0.022	0.163	Phase C	N/A	N/A
THD <sub>40</sub>	-	3.09	Phase C	23	13
PWHD	-	13.22	Phase C	23	22

CEI 0-21			
Clause	Requirement - Test	Result - Remark	Verdict

-25°C (EN 61000-3-12) Output power 66% Pn Model: EA30KTSI					
Power (W)			6502.55		
Voltage (V)			230.52		
Current (A)			28.26		
Frequency (Hz)			50.0		
Harmonics	Current Magnitude (A)	% of Fundamental	Phase	Harmonic Current Limits (A) [%]	
				1 phase	3 phase
2nd	0.133	0.470	Phase A	8	8
3rd	0.059	0.210	Phase A	21.6	N/A
4th	0.090	0.320	Phase A	4	4
5th	0.118	0.417	Phase A	10.7	10.7
6th	0.068	0.240	Phase A	2.67	2.67
7th	0.354	1.254	Phase A	7.2	7.2
8th	0.034	0.121	Phase A	2	2
9th	0.023	0.081	Phase A	3.8	N/A
10th	0.036	0.128	Phase A	1.6	1.6
11th	0.063	0.223	Phase A	3.1	3.1
12th	0.028	0.098	Phase A	1.33	1.33
13th	0.077	0.272	Phase A	2	2
14th	0.017	0.059	Phase A	N/A	N/A
15th	0.028	0.100	Phase A	N/A	N/A
16th	0.036	0.128	Phase A	N/A	N/A
17th	0.349	1.236	Phase A	N/A	N/A
18th	0.029	0.104	Phase A	N/A	N/A
19th	0.319	1.129	Phase A	N/A	N/A
20th	0.051	0.179	Phase A	N/A	N/A
21th	0.044	0.155	Phase A	N/A	N/A
22th	0.046	0.162	Phase A	N/A	N/A
23th	0.073	0.260	Phase A	N/A	N/A
24th	0.083	0.293	Phase A	N/A	N/A
25th	0.093	0.331	Phase A	N/A	N/A
26th	0.080	0.282	Phase A	N/A	N/A
27th	0.081	0.288	Phase A	N/A	N/A
28th	0.052	0.185	Phase A	N/A	N/A
29th	0.180	0.638	Phase A	N/A	N/A
30th	0.074	0.261	Phase A	N/A	N/A
31th	0.279	0.989	Phase A	N/A	N/A
32th	0.055	0.195	Phase A	N/A	N/A
33th	0.041	0.146	Phase A	N/A	N/A
34th	0.033	0.119	Phase A	N/A	N/A
35th	0.245	0.868	Phase A	N/A	N/A
36th	0.035	0.125	Phase A	N/A	N/A
37th	0.168	0.595	Phase A	N/A	N/A
38th	0.025	0.090	Phase A	N/A	N/A
39th	0.037	0.133	Phase A	N/A	N/A
40th	0.051	0.180	Phase A	N/A	N/A
THD <sub>40</sub>	-	2.90	Phase A	23	13
PWHD	-	12.36	Phase A	23	22

CEI 0-21			
Clause	Requirement - Test	Result - Remark	Verdict

-25°C (EN 61000-3-12) Output power 66% Pn Model: EA30KTSI					
Power (W)			6482.44		
Voltage (V)			230.33		
Current (A)			28.20		
Frequency (Hz)			50.0		
Harmonics	Current Magnitude (A)	% of Fundamental	Phase	Harmonic Current Limits (A) [%]	
				1 phase	3 phase
2nd	0.179	0.635	Phase B	8	8
3rd	0.045	0.160	Phase B	21.6	N/A
4th	0.177	0.628	Phase B	4	4
5th	0.103	0.367	Phase B	10.7	10.7
6th	0.133	0.474	Phase B	2.67	2.67
7th	0.404	1.434	Phase B	7.2	7.2
8th	0.032	0.114	Phase B	2	2
9th	0.089	0.315	Phase B	3.8	N/A
10th	0.048	0.169	Phase B	1.6	1.6
11th	0.107	0.379	Phase B	3.1	3.1
12th	0.067	0.237	Phase B	1.33	1.33
13th	0.068	0.243	Phase B	2	2
14th	0.066	0.236	Phase B	N/A	N/A
15th	0.024	0.086	Phase B	N/A	N/A
16th	0.048	0.171	Phase B	N/A	N/A
17th	0.349	1.241	Phase B	N/A	N/A
18th	0.035	0.125	Phase B	N/A	N/A
19th	0.354	1.258	Phase B	N/A	N/A
20th	0.078	0.277	Phase B	N/A	N/A
21th	0.041	0.146	Phase B	N/A	N/A
22th	0.057	0.202	Phase B	N/A	N/A
23th	0.097	0.346	Phase B	N/A	N/A
24th	0.102	0.364	Phase B	N/A	N/A
25th	0.088	0.314	Phase B	N/A	N/A
26th	0.121	0.430	Phase B	N/A	N/A
27th	0.083	0.294	Phase B	N/A	N/A
28th	0.075	0.268	Phase B	N/A	N/A
29th	0.190	0.675	Phase B	N/A	N/A
30th	0.084	0.298	Phase B	N/A	N/A
31th	0.240	0.852	Phase B	N/A	N/A
32th	0.044	0.158	Phase B	N/A	N/A
33th	0.051	0.182	Phase B	N/A	N/A
34th	0.053	0.190	Phase B	N/A	N/A
35th	0.209	0.742	Phase B	N/A	N/A
36th	0.046	0.164	Phase B	N/A	N/A
37th	0.148	0.526	Phase B	N/A	N/A
38th	0.027	0.096	Phase B	N/A	N/A
39th	0.033	0.117	Phase B	N/A	N/A
40th	0.049	0.175	Phase B	N/A	N/A
THD <sub>40</sub>	-	3.15	Phase B	23	13
PWHD	-	12.31	Phase B	23	22



CEI 0-21			
Clause	Requirement - Test	Result - Remark	Verdict

-25°C (EN 61000-3-12) Output power 66% Pn Model: EA30KTSI					
Power (W)			6485.50		
Voltage (V)			230.38		
Current (A)			28.20		
Frequency (Hz)			50.0		
Harmonics	Current Magnitude (A)	% of Fundamental	Phase	Harmonic Current Limits (A) [%]	
				1 phase	3 phase
2nd	0.076	0.268	Phase C	8	8
3rd	0.016	0.056	Phase C	21.6	N/A
4th	0.093	0.332	Phase C	4	4
5th	0.113	0.402	Phase C	10.7	10.7
6th	0.069	0.244	Phase C	2.67	2.67
7th	0.359	1.275	Phase C	7.2	7.2
8th	0.003	0.011	Phase C	2	2
9th	0.056	0.199	Phase C	3.8	N/A
10th	0.027	0.097	Phase C	1.6	1.6
11th	0.114	0.403	Phase C	3.1	3.1
12th	0.038	0.135	Phase C	1.33	1.33
13th	0.110	0.389	Phase C	2	2
14th	0.075	0.267	Phase C	N/A	N/A
15th	0.030	0.108	Phase C	N/A	N/A
16th	0.032	0.114	Phase C	N/A	N/A
17th	0.411	1.458	Phase C	N/A	N/A
18th	0.043	0.151	Phase C	N/A	N/A
19th	0.383	1.361	Phase C	N/A	N/A
20th	0.060	0.213	Phase C	N/A	N/A
21th	0.050	0.178	Phase C	N/A	N/A
22th	0.079	0.281	Phase C	N/A	N/A
23th	0.092	0.325	Phase C	N/A	N/A
24th	0.126	0.448	Phase C	N/A	N/A
25th	0.037	0.131	Phase C	N/A	N/A
26th	0.137	0.487	Phase C	N/A	N/A
27th	0.070	0.248	Phase C	N/A	N/A
28th	0.106	0.375	Phase C	N/A	N/A
29th	0.254	0.903	Phase C	N/A	N/A
30th	0.032	0.115	Phase C	N/A	N/A
31th	0.277	0.984	Phase C	N/A	N/A
32th	0.046	0.165	Phase C	N/A	N/A
33th	0.047	0.166	Phase C	N/A	N/A
34th	0.040	0.142	Phase C	N/A	N/A
35th	0.238	0.846	Phase C	N/A	N/A
36th	0.013	0.045	Phase C	N/A	N/A
37th	0.175	0.622	Phase C	N/A	N/A
38th	0.021	0.074	Phase C	N/A	N/A
39th	0.041	0.146	Phase C	N/A	N/A
40th	0.060	0.212	Phase C	N/A	N/A
THD <sub>40</sub>	-	3.23	Phase C	23	13
PWHD	-	13.91	Phase C	23	22

CEI 0-21			
Clause	Requirement - Test	Result - Remark	Verdict

-25°C (EN 61000-3-12) Output power 100% Pn Model: EA30KTSI					
Power (W)			9761.01		
Voltage (V)			230.44		
Current (A)			42.45		
Frequency (Hz)			50.0		
Harmonics	Current Magnitude (A)	% of Fundamental	Phase	Harmonic Current Limits (A) [%]	
				1 phase	3 phase
2nd	0.214	0.506	Phase A	8	8
3rd	0.088	0.207	Phase A	21.6	N/A
4th	0.133	0.315	Phase A	4	4
5th	0.273	0.644	Phase A	10.7	10.7
6th	0.112	0.263	Phase A	2.67	2.67
7th	0.624	1.473	Phase A	7.2	7.2
8th	0.048	0.112	Phase A	2	2
9th	0.020	0.047	Phase A	3.8	N/A
10th	0.052	0.122	Phase A	1.6	1.6
11th	0.081	0.192	Phase A	3.1	3.1
12th	0.040	0.094	Phase A	1.33	1.33
13th	0.177	0.419	Phase A	2	2
14th	0.025	0.059	Phase A	N/A	N/A
15th	0.022	0.053	Phase A	N/A	N/A
16th	0.046	0.109	Phase A	N/A	N/A
17th	0.596	1.408	Phase A	N/A	N/A
18th	0.052	0.123	Phase A	N/A	N/A
19th	0.501	1.183	Phase A	N/A	N/A
20th	0.084	0.198	Phase A	N/A	N/A
21th	0.055	0.130	Phase A	N/A	N/A
22th	0.067	0.158	Phase A	N/A	N/A
23th	0.067	0.158	Phase A	N/A	N/A
24th	0.127	0.299	Phase A	N/A	N/A
25th	0.158	0.372	Phase A	N/A	N/A
26th	0.126	0.298	Phase A	N/A	N/A
27th	0.078	0.185	Phase A	N/A	N/A
28th	0.082	0.193	Phase A	N/A	N/A
29th	0.334	0.788	Phase A	N/A	N/A
30th	0.125	0.296	Phase A	N/A	N/A
31th	0.545	1.287	Phase A	N/A	N/A
32th	0.081	0.191	Phase A	N/A	N/A
33th	0.028	0.067	Phase A	N/A	N/A
34th	0.053	0.125	Phase A	N/A	N/A
35th	0.416	0.981	Phase A	N/A	N/A
36th	0.070	0.166	Phase A	N/A	N/A
37th	0.263	0.621	Phase A	N/A	N/A
38th	0.037	0.086	Phase A	N/A	N/A
39th	0.047	0.111	Phase A	N/A	N/A
40th	0.069	0.164	Phase A	N/A	N/A
THD <sub>40</sub>	-	3.33	Phase A	23	13
PWHD	-	14.05	Phase A	23	22

CEI 0-21			
Clause	Requirement - Test	Result - Remark	Verdict

-25°C (EN 61000-3-12) Output power 100% Pn Model: EA30KTSI					
Power (W)			9727.22		
Voltage (V)			230.34		
Current (A)			42.32		
Frequency (Hz)			50.0		
Harmonics	Current Magnitude (A)	% of Fundamental	Phase	Harmonic Current Limits (A) [%]	
				1 phase	3 phase
2nd	0.252	0.598	Phase B	8	8
3rd	0.065	0.155	Phase B	21.6	N/A
4th	0.260	0.615	Phase B	4	4
5th	0.247	0.586	Phase B	10.7	10.7
6th	0.215	0.510	Phase B	2.67	2.67
7th	0.701	1.661	Phase B	7.2	7.2
8th	0.034	0.079	Phase B	2	2
9th	0.140	0.331	Phase B	3.8	N/A
10th	0.075	0.176	Phase B	1.6	1.6
11th	0.158	0.373	Phase B	3.1	3.1
12th	0.099	0.235	Phase B	1.33	1.33
13th	0.171	0.406	Phase B	2	2
14th	0.103	0.244	Phase B	N/A	N/A
15th	0.027	0.065	Phase B	N/A	N/A
16th	0.067	0.159	Phase B	N/A	N/A
17th	0.598	1.417	Phase B	N/A	N/A
18th	0.062	0.148	Phase B	N/A	N/A
19th	0.565	1.339	Phase B	N/A	N/A
20th	0.131	0.311	Phase B	N/A	N/A
21th	0.043	0.102	Phase B	N/A	N/A
22th	0.082	0.194	Phase B	N/A	N/A
23th	0.086	0.203	Phase B	N/A	N/A
24th	0.140	0.332	Phase B	N/A	N/A
25th	0.136	0.321	Phase B	N/A	N/A
26th	0.203	0.480	Phase B	N/A	N/A
27th	0.084	0.200	Phase B	N/A	N/A
28th	0.087	0.205	Phase B	N/A	N/A
29th	0.333	0.788	Phase B	N/A	N/A
30th	0.116	0.274	Phase B	N/A	N/A
31th	0.485	1.148	Phase B	N/A	N/A
32th	0.052	0.123	Phase B	N/A	N/A
33th	0.066	0.156	Phase B	N/A	N/A
34th	0.086	0.204	Phase B	N/A	N/A
35th	0.352	0.834	Phase B	N/A	N/A
36th	0.077	0.182	Phase B	N/A	N/A
37th	0.225	0.533	Phase B	N/A	N/A
38th	0.042	0.100	Phase B	N/A	N/A
39th	0.029	0.068	Phase B	N/A	N/A
40th	0.071	0.168	Phase B	N/A	N/A
THD <sub>40</sub>	-	3.52	Phase B	23	13
PWHD	-	13.71	Phase B	23	22

CEI 0-21			
Clause	Requirement - Test	Result - Remark	Verdict

-25°C (EN 61000-3-12) Output power 100% Pn Model: EA30KTSI					
Power (W)			9739.35		
Voltage (V)			230.47		
Current (A)			42.34		
Frequency (Hz)			50.0		
Harmonics	Current Magnitude (A)	% of Fundamental	Phase	Harmonic Current Limits (A) [%]	
				1 phase	3 phase
2nd	0.058	0.136	Phase C	8	8
3rd	0.052	0.122	Phase C	21.6	N/A
4th	0.129	0.305	Phase C	4	4
5th	0.247	0.585	Phase C	10.7	10.7
6th	0.106	0.251	Phase C	2.67	2.67
7th	0.604	1.430	Phase C	7.2	7.2
8th	0.033	0.078	Phase C	2	2
9th	0.125	0.296	Phase C	3.8	N/A
10th	0.039	0.093	Phase C	1.6	1.6
11th	0.164	0.388	Phase C	3.1	3.1
12th	0.063	0.150	Phase C	1.33	1.33
13th	0.201	0.477	Phase C	2	2
14th	0.112	0.265	Phase C	N/A	N/A
15th	0.025	0.060	Phase C	N/A	N/A
16th	0.049	0.117	Phase C	N/A	N/A
17th	0.632	1.495	Phase C	N/A	N/A
18th	0.083	0.195	Phase C	N/A	N/A
19th	0.609	1.442	Phase C	N/A	N/A
20th	0.128	0.303	Phase C	N/A	N/A
21th	0.049	0.116	Phase C	N/A	N/A
22th	0.094	0.222	Phase C	N/A	N/A
23th	0.075	0.178	Phase C	N/A	N/A
24th	0.165	0.390	Phase C	N/A	N/A
25th	0.144	0.341	Phase C	N/A	N/A
26th	0.161	0.382	Phase C	N/A	N/A
27th	0.101	0.239	Phase C	N/A	N/A
28th	0.079	0.188	Phase C	N/A	N/A
29th	0.314	0.744	Phase C	N/A	N/A
30th	0.137	0.323	Phase C	N/A	N/A
31th	0.576	1.362	Phase C	N/A	N/A
32th	0.064	0.152	Phase C	N/A	N/A
33th	0.065	0.154	Phase C	N/A	N/A
34th	0.057	0.134	Phase C	N/A	N/A
35th	0.404	0.956	Phase C	N/A	N/A
36th	0.027	0.065	Phase C	N/A	N/A
37th	0.243	0.575	Phase C	N/A	N/A
38th	0.027	0.064	Phase C	N/A	N/A
39th	0.040	0.095	Phase C	N/A	N/A
40th	0.065	0.154	Phase C	N/A	N/A
THD <sub>40</sub>	-	3.47	Phase C	23	13
PWHD	-	14.83	Phase C	23	22

CEI 0-21			
Clause	Requirement - Test	Result - Remark	Verdict

60°C (EN 61000-3-12) Output power 33% Pn Model: EA30KTSI					
Power (W)			3082.86		
Voltage (V)			230.45		
Current (A)			13.40		
Frequency (Hz)			50.0		
Harmonics	Current Magnitude (A)	% of Fundamental	Phase	Harmonic Current Limits (A) [%]	
				1 phase	3 phase
2nd	0.062	0.462	Phase A	8	8
3rd	0.029	0.217	Phase A	21.6	N/A
4th	0.042	0.312	Phase A	4	4
5th	0.056	0.418	Phase A	10.7	10.7
6th	0.032	0.236	Phase A	2.67	2.67
7th	0.171	1.277	Phase A	7.2	7.2
8th	0.016	0.117	Phase A	2	2
9th	0.014	0.102	Phase A	3.8	N/A
10th	0.017	0.131	Phase A	1.6	1.6
11th	0.036	0.267	Phase A	3.1	3.1
12th	0.014	0.103	Phase A	1.33	1.33
13th	0.034	0.256	Phase A	2	2
14th	0.008	0.063	Phase A	N/A	N/A
15th	0.013	0.097	Phase A	N/A	N/A
16th	0.018	0.131	Phase A	N/A	N/A
17th	0.168	1.258	Phase A	N/A	N/A
18th	0.015	0.115	Phase A	N/A	N/A
19th	0.151	1.128	Phase A	N/A	N/A
20th	0.023	0.170	Phase A	N/A	N/A
21th	0.018	0.134	Phase A	N/A	N/A
22th	0.021	0.159	Phase A	N/A	N/A
23th	0.036	0.271	Phase A	N/A	N/A
24th	0.041	0.304	Phase A	N/A	N/A
25th	0.048	0.362	Phase A	N/A	N/A
26th	0.039	0.290	Phase A	N/A	N/A
27th	0.032	0.238	Phase A	N/A	N/A
28th	0.025	0.191	Phase A	N/A	N/A
29th	0.087	0.651	Phase A	N/A	N/A
30th	0.036	0.271	Phase A	N/A	N/A
31th	0.142	1.059	Phase A	N/A	N/A
32th	0.028	0.210	Phase A	N/A	N/A
33th	0.018	0.133	Phase A	N/A	N/A
34th	0.015	0.116	Phase A	N/A	N/A
35th	0.116	0.870	Phase A	N/A	N/A
36th	0.016	0.117	Phase A	N/A	N/A
37th	0.079	0.592	Phase A	N/A	N/A
38th	0.012	0.089	Phase A	N/A	N/A
39th	0.017	0.124	Phase A	N/A	N/A
40th	0.022	0.166	Phase A	N/A	N/A
THD <sub>40</sub>	-	2.95	Phase A	23	13
PWHD	-	12.59	Phase A	23	22

CEI 0-21			
Clause	Requirement - Test	Result - Remark	Verdict

60°C (EN 61000-3-12) Output power 33% Pn Model: EA30KTSI					
Power (W)			3071.35		
Voltage (V)			230.43		
Current (A)			13.35		
Frequency (Hz)			50.0		
Harmonics	Current Magnitude (A)	% of Fundamental	Phase	Harmonic Current Limits (A) [%]	
				1 phase	3 phase
2nd	0.081	0.606	Phase B	8	8
3rd	0.021	0.161	Phase B	21.6	N/A
4th	0.081	0.611	Phase B	4	4
5th	0.050	0.376	Phase B	10.7	10.7
6th	0.064	0.477	Phase B	2.67	2.67
7th	0.190	1.422	Phase B	7.2	7.2
8th	0.015	0.109	Phase B	2	2
9th	0.051	0.381	Phase B	3.8	N/A
10th	0.023	0.172	Phase B	1.6	1.6
11th	0.049	0.368	Phase B	3.1	3.1
12th	0.032	0.237	Phase B	1.33	1.33
13th	0.037	0.276	Phase B	2	2
14th	0.032	0.242	Phase B	N/A	N/A
15th	0.011	0.086	Phase B	N/A	N/A
16th	0.024	0.178	Phase B	N/A	N/A
17th	0.169	1.270	Phase B	N/A	N/A
18th	0.020	0.150	Phase B	N/A	N/A
19th	0.167	1.252	Phase B	N/A	N/A
20th	0.039	0.290	Phase B	N/A	N/A
21th	0.018	0.137	Phase B	N/A	N/A
22th	0.027	0.203	Phase B	N/A	N/A
23th	0.047	0.351	Phase B	N/A	N/A
24th	0.044	0.333	Phase B	N/A	N/A
25th	0.051	0.381	Phase B	N/A	N/A
26th	0.059	0.439	Phase B	N/A	N/A
27th	0.040	0.298	Phase B	N/A	N/A
28th	0.034	0.251	Phase B	N/A	N/A
29th	0.089	0.664	Phase B	N/A	N/A
30th	0.040	0.297	Phase B	N/A	N/A
31th	0.119	0.895	Phase B	N/A	N/A
32th	0.025	0.190	Phase B	N/A	N/A
33th	0.026	0.192	Phase B	N/A	N/A
34th	0.026	0.198	Phase B	N/A	N/A
35th	0.100	0.752	Phase B	N/A	N/A
36th	0.022	0.167	Phase B	N/A	N/A
37th	0.068	0.514	Phase B	N/A	N/A
38th	0.012	0.094	Phase B	N/A	N/A
39th	0.015	0.109	Phase B	N/A	N/A
40th	0.022	0.165	Phase B	N/A	N/A
THD <sub>40</sub>	-	3.18	Phase B	23	13
PWHD	-	12.48	Phase B	23	22

CEI 0-21			
Clause	Requirement - Test	Result - Remark	Verdict

60°C (EN 61000-3-12) Output power 33% Pn Model: EA30KTSI					
Power (W)			3069.98		
Voltage (V)			230.32		
Current (A)			13.35		
Frequency (Hz)			50.0		
Harmonics	Current Magnitude (A)	% of Fundamental	Phase	Harmonic Current Limits (A) [%]	
				1 phase	3 phase
2nd	0.022	0.163	Phase C	8	8
3rd	0.014	0.107	Phase C	21.6	N/A
4th	0.041	0.306	Phase C	4	4
5th	0.051	0.380	Phase C	10.7	10.7
6th	0.033	0.245	Phase C	2.67	2.67
7th	0.163	1.224	Phase C	7.2	7.2
8th	0.007	0.051	Phase C	2	2
9th	0.041	0.309	Phase C	3.8	N/A
10th	0.010	0.076	Phase C	1.6	1.6
11th	0.052	0.389	Phase C	3.1	3.1
12th	0.019	0.143	Phase C	1.33	1.33
13th	0.044	0.329	Phase C	2	2
14th	0.033	0.251	Phase C	N/A	N/A
15th	0.012	0.089	Phase C	N/A	N/A
16th	0.014	0.107	Phase C	N/A	N/A
17th	0.173	1.297	Phase C	N/A	N/A
18th	0.021	0.158	Phase C	N/A	N/A
19th	0.181	1.360	Phase C	N/A	N/A
20th	0.038	0.283	Phase C	N/A	N/A
21th	0.022	0.167	Phase C	N/A	N/A
22th	0.028	0.208	Phase C	N/A	N/A
23th	0.027	0.204	Phase C	N/A	N/A
24th	0.061	0.456	Phase C	N/A	N/A
25th	0.037	0.280	Phase C	N/A	N/A
26th	0.048	0.361	Phase C	N/A	N/A
27th	0.043	0.322	Phase C	N/A	N/A
28th	0.029	0.219	Phase C	N/A	N/A
29th	0.085	0.640	Phase C	N/A	N/A
30th	0.041	0.311	Phase C	N/A	N/A
31th	0.144	1.080	Phase C	N/A	N/A
32th	0.019	0.140	Phase C	N/A	N/A
33th	0.023	0.169	Phase C	N/A	N/A
34th	0.019	0.145	Phase C	N/A	N/A
35th	0.114	0.855	Phase C	N/A	N/A
36th	0.010	0.073	Phase C	N/A	N/A
37th	0.074	0.553	Phase C	N/A	N/A
38th	0.009	0.067	Phase C	N/A	N/A
39th	0.017	0.128	Phase C	N/A	N/A
40th	0.021	0.157	Phase C	N/A	N/A
THD <sub>40</sub>	-	3.07	Phase C	23	13
PWHD	-	13.23	Phase C	23	22

CEI 0-21			
Clause	Requirement - Test	Result - Remark	Verdict

60°C (EN 61000-3-12) Output power 66% Pn Model: EA30KTSI					
Power (W)			6504.56		
Voltage (V)			230.43		
Current (A)			28.27		
Frequency (Hz)			50.0		
Harmonics	Current Magnitude (A)	% of Fundamental	Phase	Harmonic Current Limits (A) [%]	
				1 phase	3 phase
2nd	0.134	0.474	Phase A	8	8
3rd	0.057	0.202	Phase A	21.6	N/A
4th	0.090	0.317	Phase A	4	4
5th	0.122	0.431	Phase A	10.7	10.7
6th	0.067	0.238	Phase A	2.67	2.67
7th	0.365	1.294	Phase A	7.2	7.2
8th	0.032	0.113	Phase A	2	2
9th	0.028	0.099	Phase A	3.8	N/A
10th	0.034	0.122	Phase A	1.6	1.6
11th	0.064	0.226	Phase A	3.1	3.1
12th	0.030	0.105	Phase A	1.33	1.33
13th	0.071	0.251	Phase A	2	2
14th	0.016	0.056	Phase A	N/A	N/A
15th	0.023	0.080	Phase A	N/A	N/A
16th	0.036	0.126	Phase A	N/A	N/A
17th	0.342	1.212	Phase A	N/A	N/A
18th	0.029	0.102	Phase A	N/A	N/A
19th	0.317	1.121	Phase A	N/A	N/A
20th	0.047	0.166	Phase A	N/A	N/A
21th	0.042	0.147	Phase A	N/A	N/A
22th	0.045	0.159	Phase A	N/A	N/A
23th	0.064	0.226	Phase A	N/A	N/A
24th	0.081	0.286	Phase A	N/A	N/A
25th	0.093	0.329	Phase A	N/A	N/A
26th	0.079	0.278	Phase A	N/A	N/A
27th	0.056	0.200	Phase A	N/A	N/A
28th	0.056	0.199	Phase A	N/A	N/A
29th	0.181	0.642	Phase A	N/A	N/A
30th	0.073	0.260	Phase A	N/A	N/A
31th	0.285	1.012	Phase A	N/A	N/A
32th	0.052	0.185	Phase A	N/A	N/A
33th	0.040	0.143	Phase A	N/A	N/A
34th	0.031	0.112	Phase A	N/A	N/A
35th	0.248	0.878	Phase A	N/A	N/A
36th	0.035	0.124	Phase A	N/A	N/A
37th	0.163	0.578	Phase A	N/A	N/A
38th	0.027	0.095	Phase A	N/A	N/A
39th	0.032	0.112	Phase A	N/A	N/A
40th	0.048	0.170	Phase A	N/A	N/A
THD <sub>40</sub>	-	2.90	Phase A	23	13
PWHD	-	12.28	Phase A	23	22



CEI 0-21			
Clause	Requirement - Test	Result - Remark	Verdict

60°C (EN 61000-3-12) Output power 66% Pn Model: EA30KTSI					
Power (W)			6490.55		
Voltage (V)			230.57		
Current (A)			28.20		
Frequency (Hz)			50.0		
Harmonics	Current Magnitude (A)	% of Fundamental	Phase	Harmonic Current Limits (A) [%]	
				1 phase	3 phase
2nd	0.177	0.629	Phase B	8	8
3rd	0.046	0.165	Phase B	21.6	N/A
4th	0.174	0.619	Phase B	4	4
5th	0.104	0.369	Phase B	10.7	10.7
6th	0.135	0.478	Phase B	2.67	2.67
7th	0.402	1.428	Phase B	7.2	7.2
8th	0.029	0.102	Phase B	2	2
9th	0.093	0.331	Phase B	3.8	N/A
10th	0.048	0.172	Phase B	1.6	1.6
11th	0.110	0.390	Phase B	3.1	3.1
12th	0.067	0.239	Phase B	1.33	1.33
13th	0.075	0.267	Phase B	2	2
14th	0.068	0.243	Phase B	N/A	N/A
15th	0.030	0.106	Phase B	N/A	N/A
16th	0.046	0.165	Phase B	N/A	N/A
17th	0.355	1.261	Phase B	N/A	N/A
18th	0.040	0.143	Phase B	N/A	N/A
19th	0.349	1.240	Phase B	N/A	N/A
20th	0.079	0.280	Phase B	N/A	N/A
21th	0.041	0.146	Phase B	N/A	N/A
22th	0.058	0.206	Phase B	N/A	N/A
23th	0.092	0.326	Phase B	N/A	N/A
24th	0.101	0.359	Phase B	N/A	N/A
25th	0.091	0.323	Phase B	N/A	N/A
26th	0.122	0.434	Phase B	N/A	N/A
27th	0.081	0.288	Phase B	N/A	N/A
28th	0.078	0.277	Phase B	N/A	N/A
29th	0.188	0.668	Phase B	N/A	N/A
30th	0.078	0.278	Phase B	N/A	N/A
31th	0.240	0.854	Phase B	N/A	N/A
32th	0.053	0.187	Phase B	N/A	N/A
33th	0.051	0.180	Phase B	N/A	N/A
34th	0.056	0.200	Phase B	N/A	N/A
35th	0.214	0.759	Phase B	N/A	N/A
36th	0.045	0.159	Phase B	N/A	N/A
37th	0.144	0.513	Phase B	N/A	N/A
38th	0.027	0.096	Phase B	N/A	N/A
39th	0.030	0.105	Phase B	N/A	N/A
40th	0.047	0.166	Phase B	N/A	N/A
THD <sub>40</sub>	-	3.16	Phase B	23	13
PWHD	-	12.31	Phase B	23	22

CEI 0-21			
Clause	Requirement - Test	Result - Remark	Verdict

60°C (EN 61000-3-12) Output power 66% Pn Model: EA30KTSI					
Power (W)			6485.45		
Voltage (V)			230.37		
Current (A)			28.19		
Frequency (Hz)			50.0		
Harmonics	Current Magnitude (A)	% of Fundamental	Phase	Harmonic Current Limits (A) [%]	
				1 phase	3 phase
2nd	0.049	0.173	Phase C	8	8
3rd	0.032	0.113	Phase C	21.6	N/A
4th	0.087	0.310	Phase C	4	4
5th	0.105	0.372	Phase C	10.7	10.7
6th	0.068	0.242	Phase C	2.67	2.67
7th	0.338	1.202	Phase C	7.2	7.2
8th	0.013	0.047	Phase C	2	2
9th	0.078	0.279	Phase C	3.8	N/A
10th	0.025	0.088	Phase C	1.6	1.6
11th	0.121	0.431	Phase C	3.1	3.1
12th	0.040	0.143	Phase C	1.33	1.33
13th	0.092	0.327	Phase C	2	2
14th	0.069	0.244	Phase C	N/A	N/A
15th	0.033	0.119	Phase C	N/A	N/A
16th	0.030	0.106	Phase C	N/A	N/A
17th	0.379	1.346	Phase C	N/A	N/A
18th	0.045	0.159	Phase C	N/A	N/A
19th	0.384	1.363	Phase C	N/A	N/A
20th	0.075	0.266	Phase C	N/A	N/A
21th	0.048	0.172	Phase C	N/A	N/A
22th	0.059	0.209	Phase C	N/A	N/A
23th	0.053	0.190	Phase C	N/A	N/A
24th	0.128	0.453	Phase C	N/A	N/A
25th	0.081	0.287	Phase C	N/A	N/A
26th	0.109	0.386	Phase C	N/A	N/A
27th	0.096	0.340	Phase C	N/A	N/A
28th	0.071	0.251	Phase C	N/A	N/A
29th	0.169	0.599	Phase C	N/A	N/A
30th	0.078	0.277	Phase C	N/A	N/A
31th	0.295	1.048	Phase C	N/A	N/A
32th	0.032	0.114	Phase C	N/A	N/A
33th	0.052	0.184	Phase C	N/A	N/A
34th	0.041	0.146	Phase C	N/A	N/A
35th	0.249	0.883	Phase C	N/A	N/A
36th	0.018	0.066	Phase C	N/A	N/A
37th	0.154	0.546	Phase C	N/A	N/A
38th	0.017	0.061	Phase C	N/A	N/A
39th	0.033	0.115	Phase C	N/A	N/A
40th	0.044	0.155	Phase C	N/A	N/A
THD <sub>40</sub>	-	3.08	Phase C	23	13
PWHD	-	13.24	Phase C	23	22

CEI 0-21			
Clause	Requirement - Test	Result - Remark	Verdict

60°C (EN 61000-3-12) Output power 100% Pn Model: EA30KTSI					
Power (W)			9753.09		
Voltage (V)			230.23		
Current (A)			42.45		
Frequency (Hz)			50.0		
Harmonics	Current Magnitude (A)	% of Fundamental	Phase	Harmonic Current Limits (A) [%]	
				1 phase	3 phase
2nd	0.211	0.499	Phase A	8	8
3rd	0.086	0.203	Phase A	21.6	N/A
4th	0.136	0.321	Phase A	4	4
5th	0.271	0.639	Phase A	10.7	10.7
6th	0.110	0.260	Phase A	2.67	2.67
7th	0.621	1.466	Phase A	7.2	7.2
8th	0.049	0.115	Phase A	2	2
9th	0.018	0.044	Phase A	3.8	N/A
10th	0.053	0.126	Phase A	1.6	1.6
11th	0.078	0.184	Phase A	3.1	3.1
12th	0.040	0.094	Phase A	1.33	1.33
13th	0.174	0.411	Phase A	2	2
14th	0.024	0.057	Phase A	N/A	N/A
15th	0.022	0.051	Phase A	N/A	N/A
16th	0.050	0.119	Phase A	N/A	N/A
17th	0.593	1.401	Phase A	N/A	N/A
18th	0.052	0.122	Phase A	N/A	N/A
19th	0.498	1.177	Phase A	N/A	N/A
20th	0.083	0.197	Phase A	N/A	N/A
21th	0.057	0.134	Phase A	N/A	N/A
22th	0.064	0.150	Phase A	N/A	N/A
23th	0.082	0.194	Phase A	N/A	N/A
24th	0.129	0.305	Phase A	N/A	N/A
25th	0.176	0.416	Phase A	N/A	N/A
26th	0.125	0.295	Phase A	N/A	N/A
27th	0.079	0.186	Phase A	N/A	N/A
28th	0.075	0.177	Phase A	N/A	N/A
29th	0.332	0.783	Phase A	N/A	N/A
30th	0.129	0.304	Phase A	N/A	N/A
31th	0.546	1.290	Phase A	N/A	N/A
32th	0.084	0.198	Phase A	N/A	N/A
33th	0.030	0.070	Phase A	N/A	N/A
34th	0.053	0.125	Phase A	N/A	N/A
35th	0.416	0.982	Phase A	N/A	N/A
36th	0.064	0.150	Phase A	N/A	N/A
37th	0.260	0.615	Phase A	N/A	N/A
38th	0.036	0.086	Phase A	N/A	N/A
39th	0.048	0.112	Phase A	N/A	N/A
40th	0.072	0.169	Phase A	N/A	N/A
THD <sub>40</sub>	-	3.32	Phase A	23	13
PWHD	-	14.07	Phase A	23	22

CEI 0-21			
Clause	Requirement - Test	Result - Remark	Verdict

60°C (EN 61000-3-12) Output power 100% Pn Model: EA30KTSI					
Power (W)			9734.70		
Voltage (V)			230.48		
Current (A)			42.32		
Frequency (Hz)			50.0		
Harmonics	Current Magnitude (A)	% of Fundamental	Phase	Harmonic Current Limits (A) [%]	
				1 phase	3 phase
2nd	0.257	0.608	Phase B	8	8
3rd	0.065	0.153	Phase B	21.6	N/A
4th	0.262	0.622	Phase B	4	4
5th	0.245	0.579	Phase B	10.7	10.7
6th	0.213	0.505	Phase B	2.67	2.67
7th	0.694	1.643	Phase B	7.2	7.2
8th	0.036	0.085	Phase B	2	2
9th	0.137	0.324	Phase B	3.8	N/A
10th	0.074	0.176	Phase B	1.6	1.6
11th	0.156	0.369	Phase B	3.1	3.1
12th	0.098	0.233	Phase B	1.33	1.33
13th	0.167	0.395	Phase B	2	2
14th	0.104	0.246	Phase B	N/A	N/A
15th	0.030	0.072	Phase B	N/A	N/A
16th	0.070	0.165	Phase B	N/A	N/A
17th	0.597	1.413	Phase B	N/A	N/A
18th	0.063	0.150	Phase B	N/A	N/A
19th	0.560	1.327	Phase B	N/A	N/A
20th	0.134	0.317	Phase B	N/A	N/A
21th	0.043	0.101	Phase B	N/A	N/A
22th	0.079	0.187	Phase B	N/A	N/A
23th	0.088	0.209	Phase B	N/A	N/A
24th	0.132	0.313	Phase B	N/A	N/A
25th	0.156	0.369	Phase B	N/A	N/A
26th	0.193	0.458	Phase B	N/A	N/A
27th	0.094	0.223	Phase B	N/A	N/A
28th	0.091	0.217	Phase B	N/A	N/A
29th	0.337	0.797	Phase B	N/A	N/A
30th	0.119	0.281	Phase B	N/A	N/A
31th	0.486	1.150	Phase B	N/A	N/A
32th	0.056	0.134	Phase B	N/A	N/A
33th	0.069	0.163	Phase B	N/A	N/A
34th	0.085	0.201	Phase B	N/A	N/A
35th	0.354	0.839	Phase B	N/A	N/A
36th	0.075	0.178	Phase B	N/A	N/A
37th	0.223	0.529	Phase B	N/A	N/A
38th	0.040	0.096	Phase B	N/A	N/A
39th	0.029	0.070	Phase B	N/A	N/A
40th	0.072	0.170	Phase B	N/A	N/A
THD <sub>40</sub>	-	3.51	Phase B	23	13
PWHD	-	13.73	Phase B	23	22

CEI 0-21			
Clause	Requirement - Test	Result - Remark	Verdict

60°C (EN 61000-3-12) Output power 100% Pn Model: EA30KTSI					
Power (W)			9734.79		
Voltage (V)			230.29		
Current (A)			42.35		
Frequency (Hz)			50.0		
Harmonics	Current Magnitude (A)	% of Fundamental	Phase	Harmonic Current Limits (A) [%]	
				1 phase	3 phase
2nd	0.058	0.138	Phase C	8	8
3rd	0.054	0.127	Phase C	21.6	N/A
4th	0.129	0.305	Phase C	4	4
5th	0.246	0.583	Phase C	10.7	10.7
6th	0.105	0.247	Phase C	2.67	2.67
7th	0.597	1.414	Phase C	7.2	7.2
8th	0.031	0.074	Phase C	2	2
9th	0.126	0.298	Phase C	3.8	N/A
10th	0.040	0.094	Phase C	1.6	1.6
11th	0.167	0.395	Phase C	3.1	3.1
12th	0.064	0.151	Phase C	1.33	1.33
13th	0.201	0.475	Phase C	2	2
14th	0.113	0.268	Phase C	N/A	N/A
15th	0.030	0.071	Phase C	N/A	N/A
16th	0.046	0.108	Phase C	N/A	N/A
17th	0.631	1.493	Phase C	N/A	N/A
18th	0.083	0.196	Phase C	N/A	N/A
19th	0.606	1.434	Phase C	N/A	N/A
20th	0.127	0.301	Phase C	N/A	N/A
21th	0.057	0.135	Phase C	N/A	N/A
22th	0.091	0.216	Phase C	N/A	N/A
23th	0.084	0.198	Phase C	N/A	N/A
24th	0.172	0.406	Phase C	N/A	N/A
25th	0.154	0.365	Phase C	N/A	N/A
26th	0.163	0.386	Phase C	N/A	N/A
27th	0.113	0.267	Phase C	N/A	N/A
28th	0.081	0.191	Phase C	N/A	N/A
29th	0.317	0.750	Phase C	N/A	N/A
30th	0.137	0.324	Phase C	N/A	N/A
31th	0.568	1.346	Phase C	N/A	N/A
32th	0.061	0.144	Phase C	N/A	N/A
33th	0.067	0.158	Phase C	N/A	N/A
34th	0.058	0.137	Phase C	N/A	N/A
35th	0.404	0.957	Phase C	N/A	N/A
36th	0.029	0.070	Phase C	N/A	N/A
37th	0.238	0.563	Phase C	N/A	N/A
38th	0.025	0.059	Phase C	N/A	N/A
39th	0.043	0.102	Phase C	N/A	N/A
40th	0.066	0.156	Phase C	N/A	N/A
THD <sub>40</sub>	-	3.46	Phase C	23	13
PWHD	-	14.80	Phase C	23	22

CEI 0-21						
Clause	Requirement - Test			Result - Remark		Verdict
<b>Normal ambient (EN 61000-3-12)</b>						
<b>Output power 33% Pn</b>						
<b>Model: EA20KTSI</b>						
Power (W)			2163.22			
Voltage (V)			230.47			
Current (A)			9.41			
Frequency (Hz)			50.0			
Harmonics	Current Magnitude (A)	% of Fundamental	Phase	Harmonic Current Limits (A) [%]		
				1 phase	3 phase	
2nd	0.046	0.492	Phase A	8	8	
3rd	0.020	0.211	Phase A	21.6	N/A	
4th	0.030	0.324	Phase A	4	4	
5th	0.057	0.610	Phase A	10.7	10.7	
6th	0.024	0.253	Phase A	2.67	2.67	
7th	0.138	1.470	Phase A	7.2	7.2	
8th	0.011	0.122	Phase A	2	2	
9th	0.005	0.049	Phase A	3.8	N/A	
10th	0.012	0.127	Phase A	1.6	1.6	
11th	0.019	0.199	Phase A	3.1	3.1	
12th	0.009	0.097	Phase A	1.33	1.33	
13th	0.039	0.414	Phase A	2	2	
14th	0.006	0.065	Phase A	N/A	N/A	
15th	0.005	0.054	Phase A	N/A	N/A	
16th	0.011	0.121	Phase A	N/A	N/A	
17th	0.127	1.354	Phase A	N/A	N/A	
18th	0.010	0.110	Phase A	N/A	N/A	
19th	0.109	1.162	Phase A	N/A	N/A	
20th	0.017	0.185	Phase A	N/A	N/A	
21th	0.010	0.108	Phase A	N/A	N/A	
22th	0.015	0.155	Phase A	N/A	N/A	
23th	0.017	0.185	Phase A	N/A	N/A	
24th	0.029	0.309	Phase A	N/A	N/A	
25th	0.038	0.409	Phase A	N/A	N/A	
26th	0.026	0.275	Phase A	N/A	N/A	
27th	0.016	0.174	Phase A	N/A	N/A	
28th	0.019	0.201	Phase A	N/A	N/A	
29th	0.075	0.794	Phase A	N/A	N/A	
30th	0.027	0.286	Phase A	N/A	N/A	
31th	0.117	1.252	Phase A	N/A	N/A	
32th	0.018	0.187	Phase A	N/A	N/A	
33th	0.007	0.074	Phase A	N/A	N/A	
34th	0.011	0.114	Phase A	N/A	N/A	
35th	0.089	0.950	Phase A	N/A	N/A	
36th	0.012	0.130	Phase A	N/A	N/A	
37th	0.055	0.587	Phase A	N/A	N/A	
38th	0.008	0.090	Phase A	N/A	N/A	
39th	0.010	0.103	Phase A	N/A	N/A	
40th	0.015	0.165	Phase A	N/A	N/A	
THD <sub>40</sub>	-	3.26	Phase A	23	13	
PWHD	-	13.69	Phase A	23	22	

CEI 0-21			
Clause	Requirement - Test	Result - Remark	Verdict

Normal ambient (EN 61000-3-12) Output power 33% Pn Model: EA20KTSI					
Power (W)			2156.04		
Voltage (V)			230.29		
Current (A)			9.38		
Frequency (Hz)			50.0		
Harmonics	Current Magnitude (A)	% of Fundamental	Phase	Harmonic Current Limits (A) [%]	
				1 phase	3 phase
2nd	0.061	0.647	Phase B	8	8
3rd	0.014	0.154	Phase B	21.6	N/A
4th	0.061	0.648	Phase B	4	4
5th	0.052	0.555	Phase B	10.7	10.7
6th	0.047	0.498	Phase B	2.67	2.67
7th	0.154	1.650	Phase B	7.2	7.2
8th	0.009	0.101	Phase B	2	2
9th	0.032	0.346	Phase B	3.8	N/A
10th	0.016	0.176	Phase B	1.6	1.6
11th	0.034	0.363	Phase B	3.1	3.1
12th	0.023	0.247	Phase B	1.33	1.33
13th	0.037	0.397	Phase B	2	2
14th	0.023	0.242	Phase B	N/A	N/A
15th	0.007	0.071	Phase B	N/A	N/A
16th	0.016	0.174	Phase B	N/A	N/A
17th	0.129	1.374	Phase B	N/A	N/A
18th	0.012	0.129	Phase B	N/A	N/A
19th	0.121	1.293	Phase B	N/A	N/A
20th	0.028	0.301	Phase B	N/A	N/A
21th	0.008	0.090	Phase B	N/A	N/A
22th	0.020	0.209	Phase B	N/A	N/A
23th	0.019	0.208	Phase B	N/A	N/A
24th	0.033	0.356	Phase B	N/A	N/A
25th	0.036	0.386	Phase B	N/A	N/A
26th	0.042	0.451	Phase B	N/A	N/A
27th	0.019	0.200	Phase B	N/A	N/A
28th	0.023	0.250	Phase B	N/A	N/A
29th	0.077	0.821	Phase B	N/A	N/A
30th	0.028	0.304	Phase B	N/A	N/A
31th	0.102	1.092	Phase B	N/A	N/A
32th	0.015	0.157	Phase B	N/A	N/A
33th	0.015	0.159	Phase B	N/A	N/A
34th	0.018	0.188	Phase B	N/A	N/A
35th	0.076	0.810	Phase B	N/A	N/A
36th	0.015	0.162	Phase B	N/A	N/A
37th	0.048	0.515	Phase B	N/A	N/A
38th	0.009	0.098	Phase B	N/A	N/A
39th	0.006	0.065	Phase B	N/A	N/A
40th	0.015	0.161	Phase B	N/A	N/A
THD <sub>40</sub>	-	3.48	Phase B	23	13
PWHD	-	13.45	Phase B	23	22

CEI 0-21			
Clause	Requirement - Test	Result - Remark	Verdict

Normal ambient (EN 61000-3-12) Output power 33% Pn Model: EA20KTSI					
Power (W)			2157.19		
Voltage (V)			230.32		
Current (A)			9.39		
Frequency (Hz)			50.0		
Harmonics	Current Magnitude (A)	% of Fundamental	Phase	Harmonic Current Limits (A) [%]	
				1 phase	3 phase
2nd	0.016	0.169	Phase C	8	8
3rd	0.011	0.121	Phase C	21.6	N/A
4th	0.031	0.331	Phase C	4	4
5th	0.053	0.562	Phase C	10.7	10.7
6th	0.023	0.248	Phase C	2.67	2.67
7th	0.135	1.437	Phase C	7.2	7.2
8th	0.006	0.062	Phase C	2	2
9th	0.029	0.312	Phase C	3.8	N/A
10th	0.009	0.097	Phase C	1.6	1.6
11th	0.036	0.387	Phase C	3.1	3.1
12th	0.015	0.157	Phase C	1.33	1.33
13th	0.045	0.475	Phase C	2	2
14th	0.024	0.257	Phase C	N/A	N/A
15th	0.007	0.077	Phase C	N/A	N/A
16th	0.011	0.113	Phase C	N/A	N/A
17th	0.136	1.456	Phase C	N/A	N/A
18th	0.015	0.162	Phase C	N/A	N/A
19th	0.130	1.386	Phase C	N/A	N/A
20th	0.028	0.300	Phase C	N/A	N/A
21th	0.011	0.115	Phase C	N/A	N/A
22th	0.021	0.229	Phase C	N/A	N/A
23th	0.019	0.200	Phase C	N/A	N/A
24th	0.042	0.445	Phase C	N/A	N/A
25th	0.035	0.369	Phase C	N/A	N/A
26th	0.033	0.352	Phase C	N/A	N/A
27th	0.025	0.265	Phase C	N/A	N/A
28th	0.020	0.212	Phase C	N/A	N/A
29th	0.073	0.775	Phase C	N/A	N/A
30th	0.027	0.287	Phase C	N/A	N/A
31th	0.124	1.323	Phase C	N/A	N/A
32th	0.013	0.137	Phase C	N/A	N/A
33th	0.014	0.147	Phase C	N/A	N/A
34th	0.013	0.139	Phase C	N/A	N/A
35th	0.087	0.928	Phase C	N/A	N/A
36th	0.006	0.068	Phase C	N/A	N/A
37th	0.051	0.546	Phase C	N/A	N/A
38th	0.006	0.065	Phase C	N/A	N/A
39th	0.008	0.086	Phase C	N/A	N/A
40th	0.014	0.151	Phase C	N/A	N/A
THD <sub>40</sub>	-	3.42	Phase C	23	13
PWHD	-	14.52	Phase C	23	22



CEI 0-21			
Clause	Requirement - Test	Result - Remark	Verdict

Normal ambient (EN 61000-3-12) Output power 66% Pn Model: EA20KTSI					
Power (W)			4349.56		
Voltage (V)			230.37		
Current (A)			18.92		
Frequency (Hz)			50.0		
Harmonics	Current Magnitude (A)	% of Fundamental	Phase	Harmonic Current Limits (A) [%]	
				1 phase	3 phase
2nd	0.092	0.486	Phase A	8	8
3rd	0.037	0.195	Phase A	21.6	N/A
4th	0.073	0.389	Phase A	4	4
5th	0.142	0.752	Phase A	10.7	10.7
6th	0.053	0.283	Phase A	2.67	2.67
7th	0.307	1.627	Phase A	7.2	7.2
8th	0.023	0.122	Phase A	2	2
9th	0.006	0.031	Phase A	3.8	N/A
10th	0.011	0.056	Phase A	1.6	1.6
11th	0.068	0.361	Phase A	3.1	3.1
12th	0.013	0.067	Phase A	1.33	1.33
13th	0.087	0.462	Phase A	2	2
14th	0.014	0.073	Phase A	N/A	N/A
15th	0.013	0.070	Phase A	N/A	N/A
16th	0.007	0.036	Phase A	N/A	N/A
17th	0.250	1.323	Phase A	N/A	N/A
18th	0.010	0.054	Phase A	N/A	N/A
19th	0.222	1.178	Phase A	N/A	N/A
20th	0.036	0.193	Phase A	N/A	N/A
21th	0.027	0.141	Phase A	N/A	N/A
22th	0.018	0.093	Phase A	N/A	N/A
23th	0.025	0.133	Phase A	N/A	N/A
24th	0.033	0.175	Phase A	N/A	N/A
25th	0.037	0.199	Phase A	N/A	N/A
26th	0.025	0.130	Phase A	N/A	N/A
27th	0.026	0.140	Phase A	N/A	N/A
28th	0.065	0.344	Phase A	N/A	N/A
29th	0.135	0.717	Phase A	N/A	N/A
30th	0.054	0.285	Phase A	N/A	N/A
31th	0.241	1.280	Phase A	N/A	N/A
32th	0.018	0.095	Phase A	N/A	N/A
33th	0.011	0.056	Phase A	N/A	N/A
34th	0.028	0.150	Phase A	N/A	N/A
35th	0.176	0.935	Phase A	N/A	N/A
36th	0.017	0.088	Phase A	N/A	N/A
37th	0.102	0.543	Phase A	N/A	N/A
38th	0.010	0.053	Phase A	N/A	N/A
39th	0.015	0.081	Phase A	N/A	N/A
40th	0.033	0.173	Phase A	N/A	N/A
THD <sub>40</sub>	-	3.32	Phase A	23	13
PWHD	-	13.29	Phase A	23	22

CEI 0-21			
Clause	Requirement - Test	Result - Remark	Verdict

Normal ambient (EN 61000-3-12) Output power 66% Pn Model: EA20KTSI					
Power (W)			4334.21		
Voltage (V)			230.33		
Current (A)			18.85		
Frequency (Hz)			50.0		
Harmonics	Current Magnitude (A)	% of Fundamental	Phase	Harmonic Current Limits (A) [%]	
				1 phase	3 phase
2nd	0.125	0.662	Phase B	8	8
3rd	0.029	0.155	Phase B	21.6	N/A
4th	0.124	0.657	Phase B	4	4
5th	0.108	0.573	Phase B	10.7	10.7
6th	0.093	0.495	Phase B	2.67	2.67
7th	0.315	1.673	Phase B	7.2	7.2
8th	0.020	0.106	Phase B	2	2
9th	0.064	0.338	Phase B	3.8	N/A
10th	0.033	0.177	Phase B	1.6	1.6
11th	0.069	0.369	Phase B	3.1	3.1
12th	0.045	0.241	Phase B	1.33	1.33
13th	0.074	0.395	Phase B	2	2
14th	0.047	0.248	Phase B	N/A	N/A
15th	0.012	0.064	Phase B	N/A	N/A
16th	0.032	0.168	Phase B	N/A	N/A
17th	0.261	1.388	Phase B	N/A	N/A
18th	0.028	0.149	Phase B	N/A	N/A
19th	0.244	1.294	Phase B	N/A	N/A
20th	0.060	0.319	Phase B	N/A	N/A
21th	0.017	0.091	Phase B	N/A	N/A
22th	0.040	0.210	Phase B	N/A	N/A
23th	0.042	0.222	Phase B	N/A	N/A
24th	0.061	0.323	Phase B	N/A	N/A
25th	0.071	0.376	Phase B	N/A	N/A
26th	0.082	0.438	Phase B	N/A	N/A
27th	0.039	0.207	Phase B	N/A	N/A
28th	0.046	0.243	Phase B	N/A	N/A
29th	0.145	0.772	Phase B	N/A	N/A
30th	0.050	0.267	Phase B	N/A	N/A
31th	0.208	1.108	Phase B	N/A	N/A
32th	0.029	0.153	Phase B	N/A	N/A
33th	0.032	0.168	Phase B	N/A	N/A
34th	0.035	0.184	Phase B	N/A	N/A
35th	0.152	0.808	Phase B	N/A	N/A
36th	0.031	0.167	Phase B	N/A	N/A
37th	0.095	0.504	Phase B	N/A	N/A
38th	0.018	0.098	Phase B	N/A	N/A
39th	0.011	0.061	Phase B	N/A	N/A
40th	0.032	0.168	Phase B	N/A	N/A
THD <sub>40</sub>	-	3.49	Phase B	23	13
PWHD	-	13.37	Phase B	23	22

CEI 0-21						
Clause	Requirement - Test			Result - Remark		Verdict
<b>Normal ambient (EN 61000-3-12)</b>						
<b>Output power 66% Pn</b>						
<b>Model: EA20KTSI</b>						
Power (W)			4339.20			
Voltage (V)			230.49			
Current (A)			18.86			
Frequency (Hz)			50.0			
Harmonics	Current Magnitude (A)	% of Fundamental	Phase	Harmonic Current Limits (A) [%]		
				1 phase	3 phase	
2nd	0.035	0.185	Phase C	8	8	
3rd	0.023	0.124	Phase C	21.6	N/A	
4th	0.062	0.331	Phase C	4	4	
5th	0.108	0.573	Phase C	10.7	10.7	
6th	0.047	0.247	Phase C	2.67	2.67	
7th	0.273	1.449	Phase C	7.2	7.2	
8th	0.011	0.060	Phase C	2	2	
9th	0.057	0.301	Phase C	3.8	N/A	
10th	0.018	0.093	Phase C	1.6	1.6	
11th	0.073	0.386	Phase C	3.1	3.1	
12th	0.028	0.149	Phase C	1.33	1.33	
13th	0.089	0.473	Phase C	2	2	
14th	0.049	0.260	Phase C	N/A	N/A	
15th	0.013	0.067	Phase C	N/A	N/A	
16th	0.021	0.110	Phase C	N/A	N/A	
17th	0.273	1.450	Phase C	N/A	N/A	
18th	0.036	0.189	Phase C	N/A	N/A	
19th	0.264	1.403	Phase C	N/A	N/A	
20th	0.051	0.270	Phase C	N/A	N/A	
21th	0.024	0.128	Phase C	N/A	N/A	
22th	0.041	0.216	Phase C	N/A	N/A	
23th	0.037	0.195	Phase C	N/A	N/A	
24th	0.078	0.413	Phase C	N/A	N/A	
25th	0.065	0.345	Phase C	N/A	N/A	
26th	0.068	0.359	Phase C	N/A	N/A	
27th	0.050	0.266	Phase C	N/A	N/A	
28th	0.041	0.216	Phase C	N/A	N/A	
29th	0.137	0.728	Phase C	N/A	N/A	
30th	0.058	0.309	Phase C	N/A	N/A	
31th	0.249	1.324	Phase C	N/A	N/A	
32th	0.028	0.148	Phase C	N/A	N/A	
33th	0.031	0.166	Phase C	N/A	N/A	
34th	0.027	0.141	Phase C	N/A	N/A	
35th	0.176	0.935	Phase C	N/A	N/A	
36th	0.011	0.061	Phase C	N/A	N/A	
37th	0.100	0.529	Phase C	N/A	N/A	
38th	0.012	0.063	Phase C	N/A	N/A	
39th	0.019	0.101	Phase C	N/A	N/A	
40th	0.030	0.160	Phase C	N/A	N/A	
THD <sub>40</sub>	-	3.41	Phase C	23	13	
PWHD	-	14.45	Phase C	23	22	

CEI 0-21			
Clause	Requirement - Test	Result - Remark	Verdict

Normal ambient (EN 61000-3-12) Output power 100% Pn Model: EA20KTSI					
Power (W)			6492.37		
Voltage (V)			230.37		
Current (A)			28.24		
Frequency (Hz)			50.0		
Harmonics	Current Magnitude (A)	% of Fundamental	Phase	Harmonic Current Limits (A) [%]	
				1 phase	3 phase
2nd	0.138	0.491	Phase A	8	8
3rd	0.060	0.141	Phase A	21.6	N/A
4th	0.093	0.219	Phase A	4	4
5th	0.175	0.414	Phase A	10.7	10.7
6th	0.073	0.171	Phase A	2.67	2.67
7th	0.418	0.986	Phase A	7.2	7.2
8th	0.036	0.086	Phase A	2	2
9th	0.015	0.036	Phase A	3.8	N/A
10th	0.034	0.081	Phase A	1.6	1.6
11th	0.054	0.126	Phase A	3.1	3.1
12th	0.026	0.061	Phase A	1.33	1.33
13th	0.116	0.274	Phase A	2	2
14th	0.015	0.037	Phase A	N/A	N/A
15th	0.015	0.035	Phase A	N/A	N/A
16th	0.032	0.077	Phase A	N/A	N/A
17th	0.387	0.914	Phase A	N/A	N/A
18th	0.030	0.071	Phase A	N/A	N/A
19th	0.335	0.792	Phase A	N/A	N/A
20th	0.053	0.125	Phase A	N/A	N/A
21th	0.036	0.086	Phase A	N/A	N/A
22th	0.047	0.110	Phase A	N/A	N/A
23th	0.043	0.103	Phase A	N/A	N/A
24th	0.091	0.214	Phase A	N/A	N/A
25th	0.102	0.241	Phase A	N/A	N/A
26th	0.080	0.189	Phase A	N/A	N/A
27th	0.054	0.128	Phase A	N/A	N/A
28th	0.052	0.124	Phase A	N/A	N/A
29th	0.220	0.521	Phase A	N/A	N/A
30th	0.080	0.188	Phase A	N/A	N/A
31th	0.350	0.827	Phase A	N/A	N/A
32th	0.057	0.135	Phase A	N/A	N/A
33th	0.019	0.046	Phase A	N/A	N/A
34th	0.035	0.082	Phase A	N/A	N/A
35th	0.272	0.641	Phase A	N/A	N/A
36th	0.040	0.095	Phase A	N/A	N/A
37th	0.173	0.409	Phase A	N/A	N/A
38th	0.025	0.059	Phase A	N/A	N/A
39th	0.032	0.075	Phase A	N/A	N/A
40th	0.049	0.115	Phase A	N/A	N/A
THD <sub>40</sub>	-	2.22	Phase A	23	13
PWHD	-	9.19	Phase A	23	22

CEI 0-21			
Clause	Requirement - Test	Result - Remark	Verdict

Normal ambient (EN 61000-3-12)					
Output power 100% Pn					
Model: EA20KTSI					
Power (W)			6471.52		
Voltage (V)			230.31		
Current (A)			28.16		
Frequency (Hz)			50.0		
Harmonics	Current Magnitude (A)	% of Fundamental	Phase	Harmonic Current Limits (A) [%]	
				1 phase	3 phase
2nd	0.183	0.653	Phase B	8	8
3rd	0.043	0.153	Phase B	21.6	N/A
4th	0.182	0.649	Phase B	4	4
5th	0.161	0.572	Phase B	10.7	10.7
6th	0.141	0.501	Phase B	2.67	2.67
7th	0.466	1.658	Phase B	7.2	7.2
8th	0.030	0.108	Phase B	2	2
9th	0.096	0.341	Phase B	3.8	N/A
10th	0.051	0.183	Phase B	1.6	1.6
11th	0.106	0.376	Phase B	3.1	3.1
12th	0.065	0.232	Phase B	1.33	1.33
13th	0.114	0.406	Phase B	2	2
14th	0.072	0.256	Phase B	N/A	N/A
15th	0.019	0.066	Phase B	N/A	N/A
16th	0.047	0.169	Phase B	N/A	N/A
17th	0.387	1.377	Phase B	N/A	N/A
18th	0.040	0.142	Phase B	N/A	N/A
19th	0.363	1.293	Phase B	N/A	N/A
20th	0.090	0.321	Phase B	N/A	N/A
21th	0.025	0.089	Phase B	N/A	N/A
22th	0.057	0.204	Phase B	N/A	N/A
23th	0.056	0.200	Phase B	N/A	N/A
24th	0.100	0.357	Phase B	N/A	N/A
25th	0.094	0.335	Phase B	N/A	N/A
26th	0.122	0.433	Phase B	N/A	N/A
27th	0.050	0.178	Phase B	N/A	N/A
28th	0.064	0.228	Phase B	N/A	N/A
29th	0.228	0.812	Phase B	N/A	N/A
30th	0.086	0.306	Phase B	N/A	N/A
31th	0.309	1.101	Phase B	N/A	N/A
32th	0.046	0.165	Phase B	N/A	N/A
33th	0.043	0.154	Phase B	N/A	N/A
34th	0.056	0.199	Phase B	N/A	N/A
35th	0.225	0.802	Phase B	N/A	N/A
36th	0.047	0.169	Phase B	N/A	N/A
37th	0.145	0.517	Phase B	N/A	N/A
38th	0.027	0.097	Phase B	N/A	N/A
39th	0.018	0.065	Phase B	N/A	N/A
40th	0.048	0.170	Phase B	N/A	N/A
THD <sub>40</sub>	-	3.49	Phase B	23	13
PWHD	-	13.40	Phase B	23	22

CEI 0-21					
Clause	Requirement - Test			Result - Remark	Verdict
<b>Normal ambient (EN 61000-3-12)</b>					
<b>Output power 100% Pn</b>					
<b>Model: EA20KTSI</b>					
Power (W)			6477.81		
Voltage (V)			230.47		
Current (A)			28.16		
Frequency (Hz)			50.0		
Harmonics	Current Magnitude (A)	% of Fundamental	Phase	Harmonic Current Limits (A) [%]	
				1 phase	3 phase
2nd	0.049	0.173	Phase C	8	8
3rd	0.035	0.123	Phase C	21.6	N/A
4th	0.093	0.329	Phase C	4	4
5th	0.160	0.570	Phase C	10.7	10.7
6th	0.069	0.246	Phase C	2.67	2.67
7th	0.405	1.440	Phase C	7.2	7.2
8th	0.018	0.064	Phase C	2	2
9th	0.084	0.297	Phase C	3.8	N/A
10th	0.028	0.100	Phase C	1.6	1.6
11th	0.105	0.372	Phase C	3.1	3.1
12th	0.041	0.148	Phase C	1.33	1.33
13th	0.134	0.477	Phase C	2	2
14th	0.073	0.261	Phase C	N/A	N/A
15th	0.020	0.070	Phase C	N/A	N/A
16th	0.030	0.108	Phase C	N/A	N/A
17th	0.409	1.456	Phase C	N/A	N/A
18th	0.051	0.181	Phase C	N/A	N/A
19th	0.399	1.420	Phase C	N/A	N/A
20th	0.088	0.312	Phase C	N/A	N/A
21th	0.036	0.128	Phase C	N/A	N/A
22th	0.061	0.218	Phase C	N/A	N/A
23th	0.049	0.175	Phase C	N/A	N/A
24th	0.126	0.448	Phase C	N/A	N/A
25th	0.095	0.337	Phase C	N/A	N/A
26th	0.102	0.364	Phase C	N/A	N/A
27th	0.071	0.254	Phase C	N/A	N/A
28th	0.053	0.187	Phase C	N/A	N/A
29th	0.218	0.775	Phase C	N/A	N/A
30th	0.083	0.296	Phase C	N/A	N/A
31th	0.375	1.332	Phase C	N/A	N/A
32th	0.038	0.134	Phase C	N/A	N/A
33th	0.045	0.161	Phase C	N/A	N/A
34th	0.038	0.137	Phase C	N/A	N/A
35th	0.261	0.928	Phase C	N/A	N/A
36th	0.018	0.065	Phase C	N/A	N/A
37th	0.154	0.549	Phase C	N/A	N/A
38th	0.018	0.065	Phase C	N/A	N/A
39th	0.029	0.102	Phase C	N/A	N/A
40th	0.045	0.159	Phase C	N/A	N/A
THD <sub>40</sub>	-	3.44	Phase C	23	13
PWHD	-	14.60	Phase C	23	22

CEI 0-21			
Clause	Requirement - Test	Result - Remark	Verdict

-25°C (EN 61000-3-12) Output power 33% Pn Model: EA20KTSI						
Power (W)			2162.18			
Voltage (V)			230.22			
Current (A)			9.41			
Frequency (Hz)			50.0			
Harmonics	Current Magnitude (A)	% of Fundamental	Phase	Harmonic Current Limits (A) [%]		
				1 phase	3 phase	
2nd	0.047	0.496	Phase A	8	8	
3rd	0.020	0.210	Phase A	21.6	N/A	
4th	0.031	0.333	Phase A	4	4	
5th	0.058	0.615	Phase A	10.7	10.7	
6th	0.024	0.253	Phase A	2.67	2.67	
7th	0.139	1.483	Phase A	7.2	7.2	
8th	0.012	0.127	Phase A	2	2	
9th	0.005	0.057	Phase A	3.8	N/A	
10th	0.012	0.130	Phase A	1.6	1.6	
11th	0.017	0.183	Phase A	3.1	3.1	
12th	0.009	0.098	Phase A	1.33	1.33	
13th	0.039	0.411	Phase A	2	2	
14th	0.005	0.053	Phase A	N/A	N/A	
15th	0.005	0.053	Phase A	N/A	N/A	
16th	0.013	0.133	Phase A	N/A	N/A	
17th	0.127	1.358	Phase A	N/A	N/A	
18th	0.012	0.131	Phase A	N/A	N/A	
19th	0.108	1.152	Phase A	N/A	N/A	
20th	0.019	0.200	Phase A	N/A	N/A	
21th	0.013	0.137	Phase A	N/A	N/A	
22th	0.016	0.171	Phase A	N/A	N/A	
23th	0.015	0.163	Phase A	N/A	N/A	
24th	0.029	0.310	Phase A	N/A	N/A	
25th	0.037	0.398	Phase A	N/A	N/A	
26th	0.029	0.306	Phase A	N/A	N/A	
27th	0.017	0.183	Phase A	N/A	N/A	
28th	0.018	0.191	Phase A	N/A	N/A	
29th	0.074	0.792	Phase A	N/A	N/A	
30th	0.029	0.305	Phase A	N/A	N/A	
31th	0.118	1.259	Phase A	N/A	N/A	
32th	0.019	0.201	Phase A	N/A	N/A	
33th	0.006	0.069	Phase A	N/A	N/A	
34th	0.011	0.113	Phase A	N/A	N/A	
35th	0.090	0.959	Phase A	N/A	N/A	
36th	0.013	0.141	Phase A	N/A	N/A	
37th	0.055	0.590	Phase A	N/A	N/A	
38th	0.009	0.093	Phase A	N/A	N/A	
39th	0.011	0.120	Phase A	N/A	N/A	
40th	0.016	0.173	Phase A	N/A	N/A	
THD <sub>40</sub>	-	3.27	Phase A	23	13	
PWHD	-	13.79	Phase A	23	22	

CEI 0-21						
Clause	Requirement - Test			Result - Remark		Verdict
<b>-25°C (EN 61000-3-12)</b>						
<b>Output power 33% Pn</b>						
<b>Model: EA20KTSI</b>						
Power (W)			2158.58			
Voltage (V)			230.49			
Current (A)			9.38			
Frequency (Hz)			50.0			
Harmonics	Current Magnitude (A)	% of Fundamental	Phase	Harmonic Current Limits (A) [%]		
				1 phase	3 phase	
2nd	0.084	0.670	Phase B	8	8	
3rd	0.021	0.153	Phase B	21.6	N/A	
4th	0.083	0.655	Phase B	4	4	
5th	0.050	0.567	Phase B	10.7	10.7	
6th	0.064	0.491	Phase B	2.67	2.67	
7th	0.192	1.660	Phase B	7.2	7.2	
8th	0.013	0.110	Phase B	2	2	
9th	0.045	0.340	Phase B	3.8	N/A	
10th	0.024	0.182	Phase B	1.6	1.6	
11th	0.054	0.369	Phase B	3.1	3.1	
12th	0.032	0.236	Phase B	1.33	1.33	
13th	0.038	0.399	Phase B	2	2	
14th	0.031	0.253	Phase B	N/A	N/A	
15th	0.014	0.066	Phase B	N/A	N/A	
16th	0.023	0.172	Phase B	N/A	N/A	
17th	0.167	1.385	Phase B	N/A	N/A	
18th	0.022	0.153	Phase B	N/A	N/A	
19th	0.163	1.305	Phase B	N/A	N/A	
20th	0.039	0.318	Phase B	N/A	N/A	
21th	0.019	0.093	Phase B	N/A	N/A	
22th	0.029	0.207	Phase B	N/A	N/A	
23th	0.051	0.203	Phase B	N/A	N/A	
24th	0.045	0.341	Phase B	N/A	N/A	
25th	0.050	0.380	Phase B	N/A	N/A	
26th	0.061	0.458	Phase B	N/A	N/A	
27th	0.041	0.188	Phase B	N/A	N/A	
28th	0.036	0.245	Phase B	N/A	N/A	
29th	0.078	0.815	Phase B	N/A	N/A	
30th	0.034	0.273	Phase B	N/A	N/A	
31th	0.120	1.095	Phase B	N/A	N/A	
32th	0.021	0.149	Phase B	N/A	N/A	
33th	0.025	0.155	Phase B	N/A	N/A	
34th	0.025	0.191	Phase B	N/A	N/A	
35th	0.102	0.800	Phase B	N/A	N/A	
36th	0.021	0.174	Phase B	N/A	N/A	
37th	0.068	0.497	Phase B	N/A	N/A	
38th	0.014	0.098	Phase B	N/A	N/A	
39th	0.015	0.064	Phase B	N/A	N/A	
40th	0.023	0.170	Phase B	N/A	N/A	
THD <sub>40</sub>	-	3.49	Phase B	23	13	
PWHD	-	13.42	Phase B	23	22	



CEI 0-21			
Clause	Requirement - Test	Result - Remark	Verdict

-25°C (EN 61000-3-12) Output power 33% Pn Model: EA20KTSI					
Power (W)			2156.60		
Voltage (V)			230.15		
Current (A)			9.39		
Frequency (Hz)			50.0		
Harmonics	Current Magnitude (A)	% of Fundamental	Phase	Harmonic Current Limits (A) [%]	
				1 phase	3 phase
2nd	0.017	0.181	Phase C	8	8
3rd	0.011	0.118	Phase C	21.6	N/A
4th	0.031	0.331	Phase C	4	4
5th	0.053	0.563	Phase C	10.7	10.7
6th	0.023	0.241	Phase C	2.67	2.67
7th	0.135	1.437	Phase C	7.2	7.2
8th	0.006	0.061	Phase C	2	2
9th	0.027	0.292	Phase C	3.8	N/A
10th	0.009	0.094	Phase C	1.6	1.6
11th	0.036	0.379	Phase C	3.1	3.1
12th	0.014	0.147	Phase C	1.33	1.33
13th	0.044	0.472	Phase C	2	2
14th	0.025	0.264	Phase C	N/A	N/A
15th	0.007	0.074	Phase C	N/A	N/A
16th	0.010	0.111	Phase C	N/A	N/A
17th	0.136	1.455	Phase C	N/A	N/A
18th	0.018	0.192	Phase C	N/A	N/A
19th	0.131	1.402	Phase C	N/A	N/A
20th	0.026	0.278	Phase C	N/A	N/A
21th	0.011	0.122	Phase C	N/A	N/A
22th	0.021	0.225	Phase C	N/A	N/A
23th	0.018	0.193	Phase C	N/A	N/A
24th	0.039	0.416	Phase C	N/A	N/A
25th	0.033	0.353	Phase C	N/A	N/A
26th	0.036	0.384	Phase C	N/A	N/A
27th	0.025	0.270	Phase C	N/A	N/A
28th	0.020	0.218	Phase C	N/A	N/A
29th	0.072	0.773	Phase C	N/A	N/A
30th	0.028	0.303	Phase C	N/A	N/A
31th	0.123	1.315	Phase C	N/A	N/A
32th	0.014	0.151	Phase C	N/A	N/A
33th	0.015	0.162	Phase C	N/A	N/A
34th	0.013	0.140	Phase C	N/A	N/A
35th	0.087	0.930	Phase C	N/A	N/A
36th	0.006	0.065	Phase C	N/A	N/A
37th	0.050	0.536	Phase C	N/A	N/A
38th	0.006	0.060	Phase C	N/A	N/A
39th	0.009	0.096	Phase C	N/A	N/A
40th	0.015	0.161	Phase C	N/A	N/A
THD <sub>40</sub>	-	3.42	Phase C	23	13
PWHD	-	14.52	Phase C	23	22

CEI 0-21			
Clause	Requirement - Test	Result - Remark	Verdict

-25°C (EN 61000-3-12) Output power 66% Pn Model: EA20KTSI					
Power (W)			4348.67		
Voltage (V)			230.41		
Current (A)			18.91		
Frequency (Hz)			50.0		
Harmonics	Current Magnitude (A)	% of Fundamental	Phase	Harmonic Current Limits (A) [%]	
				1 phase	3 phase
2nd	0.094	0.499	Phase A	8	8
3rd	0.040	0.212	Phase A	21.6	N/A
4th	0.061	0.326	Phase A	4	4
5th	0.117	0.621	Phase A	10.7	10.7
6th	0.048	0.256	Phase A	2.67	2.67
7th	0.282	1.494	Phase A	7.2	7.2
8th	0.023	0.123	Phase A	2	2
9th	0.008	0.045	Phase A	3.8	N/A
10th	0.024	0.128	Phase A	1.6	1.6
11th	0.034	0.179	Phase A	3.1	3.1
12th	0.020	0.104	Phase A	1.33	1.33
13th	0.077	0.407	Phase A	2	2
14th	0.012	0.062	Phase A	N/A	N/A
15th	0.010	0.051	Phase A	N/A	N/A
16th	0.023	0.120	Phase A	N/A	N/A
17th	0.258	1.367	Phase A	N/A	N/A
18th	0.021	0.112	Phase A	N/A	N/A
19th	0.220	1.164	Phase A	N/A	N/A
20th	0.035	0.188	Phase A	N/A	N/A
21th	0.022	0.116	Phase A	N/A	N/A
22th	0.030	0.161	Phase A	N/A	N/A
23th	0.027	0.143	Phase A	N/A	N/A
24th	0.054	0.284	Phase A	N/A	N/A
25th	0.076	0.402	Phase A	N/A	N/A
26th	0.051	0.271	Phase A	N/A	N/A
27th	0.035	0.186	Phase A	N/A	N/A
28th	0.034	0.180	Phase A	N/A	N/A
29th	0.141	0.746	Phase A	N/A	N/A
30th	0.054	0.284	Phase A	N/A	N/A
31th	0.236	1.253	Phase A	N/A	N/A
32th	0.037	0.195	Phase A	N/A	N/A
33th	0.012	0.063	Phase A	N/A	N/A
34th	0.020	0.108	Phase A	N/A	N/A
35th	0.181	0.958	Phase A	N/A	N/A
36th	0.027	0.142	Phase A	N/A	N/A
37th	0.110	0.581	Phase A	N/A	N/A
38th	0.017	0.089	Phase A	N/A	N/A
39th	0.021	0.112	Phase A	N/A	N/A
40th	0.032	0.169	Phase A	N/A	N/A
THD <sub>40</sub>	-	3.26	Phase A	23	13
PWHD	-	13.64	Phase A	23	22

CEI 0-21						
Clause	Requirement - Test			Result - Remark	Verdict	
<b>-25°C (EN 61000-3-12)</b>						
<b>Output power 66% Pn</b>						
<b>Model: EA20KTSI</b>						
Power (W)				4334.17		
Voltage (V)				230.29		
Current (A)				18.86		
Frequency (Hz)				50.0		
Harmonics	Current Magnitude (A)	% of Fundamental	Phase	Harmonic Current Limits (A) [%]		
				1 phase	3 phase	
2nd	0.123	0.656	Phase B	8	8	
3rd	0.029	0.152	Phase B	21.6	N/A	
4th	0.122	0.647	Phase B	4	4	
5th	0.107	0.567	Phase B	10.7	10.7	
6th	0.094	0.498	Phase B	2.67	2.67	
7th	0.314	1.667	Phase B	7.2	7.2	
8th	0.019	0.100	Phase B	2	2	
9th	0.063	0.338	Phase B	3.8	N/A	
10th	0.033	0.175	Phase B	1.6	1.6	
11th	0.070	0.374	Phase B	3.1	3.1	
12th	0.046	0.244	Phase B	1.33	1.33	
13th	0.075	0.399	Phase B	2	2	
14th	0.045	0.242	Phase B	N/A	N/A	
15th	0.015	0.078	Phase B	N/A	N/A	
16th	0.032	0.173	Phase B	N/A	N/A	
17th	0.260	1.382	Phase B	N/A	N/A	
18th	0.026	0.138	Phase B	N/A	N/A	
19th	0.246	1.308	Phase B	N/A	N/A	
20th	0.056	0.295	Phase B	N/A	N/A	
21th	0.016	0.087	Phase B	N/A	N/A	
22th	0.038	0.204	Phase B	N/A	N/A	
23th	0.040	0.211	Phase B	N/A	N/A	
24th	0.067	0.356	Phase B	N/A	N/A	
25th	0.064	0.342	Phase B	N/A	N/A	
26th	0.079	0.419	Phase B	N/A	N/A	
27th	0.042	0.224	Phase B	N/A	N/A	
28th	0.042	0.224	Phase B	N/A	N/A	
29th	0.148	0.786	Phase B	N/A	N/A	
30th	0.055	0.292	Phase B	N/A	N/A	
31th	0.211	1.122	Phase B	N/A	N/A	
32th	0.027	0.145	Phase B	N/A	N/A	
33th	0.029	0.156	Phase B	N/A	N/A	
34th	0.035	0.186	Phase B	N/A	N/A	
35th	0.154	0.817	Phase B	N/A	N/A	
36th	0.031	0.167	Phase B	N/A	N/A	
37th	0.095	0.506	Phase B	N/A	N/A	
38th	0.019	0.100	Phase B	N/A	N/A	
39th	0.013	0.067	Phase B	N/A	N/A	
40th	0.030	0.162	Phase B	N/A	N/A	
THD <sub>40</sub>	-	3.49	Phase B	23	13	
PWHD	-	13.43	Phase B	23	22	

CEI 0-21			
Clause	Requirement - Test	Result - Remark	Verdict

-25°C (EN 61000-3-12) Output power 66% Pn Model: EA20KTSI					
Power (W)			4339.16		
Voltage (V)			230.44		
Current (A)			18.87		
Frequency (Hz)			50.0		
Harmonics	Current Magnitude (A)	% of Fundamental	Phase	Harmonic Current Limits (A) [%]	
				1 phase	3 phase
2nd	0.032	0.172	Phase C	8	8
3rd	0.024	0.126	Phase C	21.6	N/A
4th	0.062	0.330	Phase C	4	4
5th	0.107	0.569	Phase C	10.7	10.7
6th	0.046	0.244	Phase C	2.67	2.67
7th	0.273	1.448	Phase C	7.2	7.2
8th	0.011	0.058	Phase C	2	2
9th	0.058	0.308	Phase C	3.8	N/A
10th	0.018	0.095	Phase C	1.6	1.6
11th	0.073	0.388	Phase C	3.1	3.1
12th	0.028	0.151	Phase C	1.33	1.33
13th	0.089	0.472	Phase C	2	2
14th	0.049	0.260	Phase C	N/A	N/A
15th	0.014	0.075	Phase C	N/A	N/A
16th	0.023	0.123	Phase C	N/A	N/A
17th	0.276	1.465	Phase C	N/A	N/A
18th	0.033	0.176	Phase C	N/A	N/A
19th	0.261	1.387	Phase C	N/A	N/A
20th	0.056	0.296	Phase C	N/A	N/A
21th	0.022	0.118	Phase C	N/A	N/A
22th	0.043	0.227	Phase C	N/A	N/A
23th	0.035	0.188	Phase C	N/A	N/A
24th	0.085	0.449	Phase C	N/A	N/A
25th	0.064	0.340	Phase C	N/A	N/A
26th	0.065	0.347	Phase C	N/A	N/A
27th	0.051	0.271	Phase C	N/A	N/A
28th	0.039	0.209	Phase C	N/A	N/A
29th	0.142	0.756	Phase C	N/A	N/A
30th	0.057	0.300	Phase C	N/A	N/A
31th	0.248	1.320	Phase C	N/A	N/A
32th	0.025	0.134	Phase C	N/A	N/A
33th	0.030	0.157	Phase C	N/A	N/A
34th	0.026	0.138	Phase C	N/A	N/A
35th	0.176	0.937	Phase C	N/A	N/A
36th	0.012	0.063	Phase C	N/A	N/A
37th	0.099	0.526	Phase C	N/A	N/A
38th	0.012	0.063	Phase C	N/A	N/A
39th	0.019	0.101	Phase C	N/A	N/A
40th	0.029	0.153	Phase C	N/A	N/A
THD <sub>40</sub>	-	3.42	Phase C	23	13
PWHD	-	14.49	Phase C	23	22

CEI 0-21			
Clause	Requirement - Test	Result - Remark	Verdict

-25°C (EN 61000-3-12) Output power 100% Pn Model: EA20KTSI					
Power (W)			6490.80		
Voltage (V)			230.26		
Current (A)			28.26		
Frequency (Hz)			50.0		
Harmonics	Current Magnitude (A)	% of Fundamental	Phase	Harmonic Current Limits (A) [%]	
				1 phase	3 phase
2nd	0.140	0.496	Phase A	8	8
3rd	0.059	0.138	Phase A	21.6	N/A
4th	0.092	0.216	Phase A	4	4
5th	0.176	0.415	Phase A	10.7	10.7
6th	0.073	0.171	Phase A	2.67	2.67
7th	0.414	0.977	Phase A	7.2	7.2
8th	0.034	0.079	Phase A	2	2
9th	0.012	0.028	Phase A	3.8	N/A
10th	0.033	0.079	Phase A	1.6	1.6
11th	0.053	0.126	Phase A	3.1	3.1
12th	0.026	0.062	Phase A	1.33	1.33
13th	0.116	0.274	Phase A	2	2
14th	0.015	0.036	Phase A	N/A	N/A
15th	0.016	0.037	Phase A	N/A	N/A
16th	0.034	0.079	Phase A	N/A	N/A
17th	0.389	0.920	Phase A	N/A	N/A
18th	0.033	0.077	Phase A	N/A	N/A
19th	0.336	0.793	Phase A	N/A	N/A
20th	0.053	0.125	Phase A	N/A	N/A
21th	0.036	0.086	Phase A	N/A	N/A
22th	0.044	0.104	Phase A	N/A	N/A
23th	0.047	0.112	Phase A	N/A	N/A
24th	0.087	0.206	Phase A	N/A	N/A
25th	0.123	0.292	Phase A	N/A	N/A
26th	0.078	0.185	Phase A	N/A	N/A
27th	0.049	0.117	Phase A	N/A	N/A
28th	0.052	0.123	Phase A	N/A	N/A
29th	0.219	0.517	Phase A	N/A	N/A
30th	0.084	0.198	Phase A	N/A	N/A
31th	0.365	0.862	Phase A	N/A	N/A
32th	0.054	0.127	Phase A	N/A	N/A
33th	0.019	0.044	Phase A	N/A	N/A
34th	0.034	0.081	Phase A	N/A	N/A
35th	0.272	0.643	Phase A	N/A	N/A
36th	0.041	0.096	Phase A	N/A	N/A
37th	0.169	0.398	Phase A	N/A	N/A
38th	0.024	0.057	Phase A	N/A	N/A
39th	0.033	0.079	Phase A	N/A	N/A
40th	0.050	0.117	Phase A	N/A	N/A
THD <sub>40</sub>	-	2.23	Phase A	23	13
PWHD	-	9.31	Phase A	23	22

CEI 0-21			
Clause	Requirement - Test	Result - Remark	Verdict

-25°C (EN 61000-3-12) Output power 100% Pn Model: EA20KTSI					
Power (W)			6474.55		
Voltage (V)			230.39		
Current (A)			28.17		
Frequency (Hz)			50.0		
Harmonics	Current Magnitude (A)	% of Fundamental	Phase	Harmonic Current Limits (A) [%]	
				1 phase	3 phase
2nd	0.175	0.624	Phase B	8	8
3rd	0.044	0.155	Phase B	21.6	N/A
4th	0.180	0.640	Phase B	4	4
5th	0.159	0.566	Phase B	10.7	10.7
6th	0.139	0.495	Phase B	2.67	2.67
7th	0.464	1.651	Phase B	7.2	7.2
8th	0.027	0.095	Phase B	2	2
9th	0.093	0.330	Phase B	3.8	N/A
10th	0.050	0.176	Phase B	1.6	1.6
11th	0.101	0.359	Phase B	3.1	3.1
12th	0.066	0.237	Phase B	1.33	1.33
13th	0.112	0.400	Phase B	2	2
14th	0.069	0.246	Phase B	N/A	N/A
15th	0.021	0.074	Phase B	N/A	N/A
16th	0.047	0.168	Phase B	N/A	N/A
17th	0.393	1.399	Phase B	N/A	N/A
18th	0.041	0.147	Phase B	N/A	N/A
19th	0.366	1.304	Phase B	N/A	N/A
20th	0.089	0.316	Phase B	N/A	N/A
21th	0.027	0.096	Phase B	N/A	N/A
22th	0.057	0.202	Phase B	N/A	N/A
23th	0.053	0.188	Phase B	N/A	N/A
24th	0.092	0.327	Phase B	N/A	N/A
25th	0.111	0.396	Phase B	N/A	N/A
26th	0.131	0.466	Phase B	N/A	N/A
27th	0.058	0.208	Phase B	N/A	N/A
28th	0.064	0.228	Phase B	N/A	N/A
29th	0.228	0.812	Phase B	N/A	N/A
30th	0.078	0.279	Phase B	N/A	N/A
31th	0.316	1.125	Phase B	N/A	N/A
32th	0.039	0.141	Phase B	N/A	N/A
33th	0.051	0.181	Phase B	N/A	N/A
34th	0.058	0.206	Phase B	N/A	N/A
35th	0.231	0.823	Phase B	N/A	N/A
36th	0.048	0.172	Phase B	N/A	N/A
37th	0.146	0.522	Phase B	N/A	N/A
38th	0.026	0.094	Phase B	N/A	N/A
39th	0.020	0.072	Phase B	N/A	N/A
40th	0.048	0.171	Phase B	N/A	N/A
THD <sub>40</sub>	-	3.50	Phase B	23	13
PWHD	-	13.62	Phase B	23	22

CEI 0-21					
Clause	Requirement - Test			Result - Remark	Verdict
<b>-25°C (EN 61000-3-12)</b>					
<b>Output power 100% Pn</b>					
<b>Model: EA20KTSI</b>					
Power (W)			6471.47		
Voltage (V)			230.06		
Current (A)			28.19		
Frequency (Hz)			50.0		
Harmonics	Current Magnitude (A)	% of Fundamental	Phase	Harmonic Current Limits (A) [%]	
				1 phase	3 phase
2nd	0.044	0.156	Phase C	8	8
3rd	0.036	0.128	Phase C	21.6	N/A
4th	0.090	0.322	Phase C	4	4
5th	0.160	0.568	Phase C	10.7	10.7
6th	0.067	0.240	Phase C	2.67	2.67
7th	0.398	1.417	Phase C	7.2	7.2
8th	0.019	0.069	Phase C	2	2
9th	0.085	0.301	Phase C	3.8	N/A
10th	0.027	0.095	Phase C	1.6	1.6
11th	0.109	0.387	Phase C	3.1	3.1
12th	0.042	0.149	Phase C	1.33	1.33
13th	0.134	0.478	Phase C	2	2
14th	0.074	0.262	Phase C	N/A	N/A
15th	0.021	0.075	Phase C	N/A	N/A
16th	0.031	0.110	Phase C	N/A	N/A
17th	0.413	1.470	Phase C	N/A	N/A
18th	0.055	0.196	Phase C	N/A	N/A
19th	0.398	1.415	Phase C	N/A	N/A
20th	0.081	0.288	Phase C	N/A	N/A
21th	0.038	0.137	Phase C	N/A	N/A
22th	0.065	0.230	Phase C	N/A	N/A
23th	0.056	0.198	Phase C	N/A	N/A
24th	0.116	0.414	Phase C	N/A	N/A
25th	0.113	0.403	Phase C	N/A	N/A
26th	0.110	0.390	Phase C	N/A	N/A
27th	0.076	0.271	Phase C	N/A	N/A
28th	0.059	0.210	Phase C	N/A	N/A
29th	0.213	0.759	Phase C	N/A	N/A
30th	0.081	0.288	Phase C	N/A	N/A
31th	0.375	1.335	Phase C	N/A	N/A
32th	0.041	0.145	Phase C	N/A	N/A
33th	0.045	0.159	Phase C	N/A	N/A
34th	0.039	0.138	Phase C	N/A	N/A
35th	0.268	0.952	Phase C	N/A	N/A
36th	0.018	0.063	Phase C	N/A	N/A
37th	0.154	0.547	Phase C	N/A	N/A
38th	0.017	0.060	Phase C	N/A	N/A
39th	0.028	0.101	Phase C	N/A	N/A
40th	0.044	0.157	Phase C	N/A	N/A
THD <sub>40</sub>	-	3.45	Phase C	23	13
PWHD	-	14.70	Phase C	23	22

CEI 0-21			
Clause	Requirement - Test	Result - Remark	Verdict

60°C (EN 61000-3-12) Output power 33% Pn Model: EA20KTSI					
Power (W)			2162.57		
Voltage (V)			230.49		
Current (A)			9.41		
Frequency (Hz)			50.0		
Harmonics	Current Magnitude (A)	% of Fundamental	Phase	Harmonic Current Limits (A) [%]	
				1 phase	3 phase
2nd	0.045	0.485	Phase A	8	8
3rd	0.019	0.202	Phase A	21.6	N/A
4th	0.031	0.336	Phase A	4	4
5th	0.058	0.622	Phase A	10.7	10.7
6th	0.024	0.256	Phase A	2.67	2.67
7th	0.140	1.491	Phase A	7.2	7.2
8th	0.012	0.125	Phase A	2	2
9th	0.005	0.052	Phase A	3.8	N/A
10th	0.012	0.125	Phase A	1.6	1.6
11th	0.018	0.187	Phase A	3.1	3.1
12th	0.009	0.099	Phase A	1.33	1.33
13th	0.039	0.413	Phase A	2	2
14th	0.005	0.057	Phase A	N/A	N/A
15th	0.005	0.057	Phase A	N/A	N/A
16th	0.012	0.126	Phase A	N/A	N/A
17th	0.127	1.353	Phase A	N/A	N/A
18th	0.011	0.122	Phase A	N/A	N/A
19th	0.109	1.160	Phase A	N/A	N/A
20th	0.019	0.202	Phase A	N/A	N/A
21th	0.013	0.141	Phase A	N/A	N/A
22th	0.015	0.157	Phase A	N/A	N/A
23th	0.016	0.165	Phase A	N/A	N/A
24th	0.029	0.307	Phase A	N/A	N/A
25th	0.034	0.358	Phase A	N/A	N/A
26th	0.029	0.306	Phase A	N/A	N/A
27th	0.016	0.169	Phase A	N/A	N/A
28th	0.018	0.189	Phase A	N/A	N/A
29th	0.072	0.765	Phase A	N/A	N/A
30th	0.030	0.319	Phase A	N/A	N/A
31th	0.118	1.254	Phase A	N/A	N/A
32th	0.018	0.190	Phase A	N/A	N/A
33th	0.006	0.069	Phase A	N/A	N/A
34th	0.011	0.114	Phase A	N/A	N/A
35th	0.089	0.948	Phase A	N/A	N/A
36th	0.013	0.137	Phase A	N/A	N/A
37th	0.055	0.582	Phase A	N/A	N/A
38th	0.009	0.093	Phase A	N/A	N/A
39th	0.010	0.111	Phase A	N/A	N/A
40th	0.017	0.176	Phase A	N/A	N/A
THD <sub>40</sub>	-	3.26	Phase A	23	13
PWHD	-	13.65	Phase A	23	22



CEI 0-21			
Clause	Requirement - Test	Result - Remark	Verdict

60°C (EN 61000-3-12) Output power 33% Pn Model: EA20KTSI					
Power (W)			2155.57		
Voltage (V)			230.31		
Current (A)			9.39		
Frequency (Hz)			50.0		
Harmonics	Current Magnitude (A)	% of Fundamental	Phase	Harmonic Current Limits (A) [%]	
				1 phase	3 phase
2nd	0.063	0.670	Phase B	8	8
3rd	0.014	0.149	Phase B	21.6	N/A
4th	0.062	0.661	Phase B	4	4
5th	0.053	0.563	Phase B	10.7	10.7
6th	0.046	0.497	Phase B	2.67	2.67
7th	0.156	1.668	Phase B	7.2	7.2
8th	0.010	0.109	Phase B	2	2
9th	0.032	0.341	Phase B	3.8	N/A
10th	0.017	0.181	Phase B	1.6	1.6
11th	0.035	0.371	Phase B	3.1	3.1
12th	0.023	0.241	Phase B	1.33	1.33
13th	0.037	0.399	Phase B	2	2
14th	0.022	0.239	Phase B	N/A	N/A
15th	0.006	0.069	Phase B	N/A	N/A
16th	0.016	0.171	Phase B	N/A	N/A
17th	0.129	1.377	Phase B	N/A	N/A
18th	0.014	0.144	Phase B	N/A	N/A
19th	0.122	1.299	Phase B	N/A	N/A
20th	0.028	0.300	Phase B	N/A	N/A
21th	0.010	0.106	Phase B	N/A	N/A
22th	0.019	0.204	Phase B	N/A	N/A
23th	0.019	0.207	Phase B	N/A	N/A
24th	0.033	0.350	Phase B	N/A	N/A
25th	0.035	0.374	Phase B	N/A	N/A
26th	0.041	0.438	Phase B	N/A	N/A
27th	0.019	0.198	Phase B	N/A	N/A
28th	0.023	0.244	Phase B	N/A	N/A
29th	0.074	0.786	Phase B	N/A	N/A
30th	0.025	0.268	Phase B	N/A	N/A
31th	0.102	1.095	Phase B	N/A	N/A
32th	0.013	0.136	Phase B	N/A	N/A
33th	0.014	0.155	Phase B	N/A	N/A
34th	0.018	0.195	Phase B	N/A	N/A
35th	0.076	0.811	Phase B	N/A	N/A
36th	0.016	0.170	Phase B	N/A	N/A
37th	0.047	0.505	Phase B	N/A	N/A
38th	0.009	0.099	Phase B	N/A	N/A
39th	0.006	0.063	Phase B	N/A	N/A
40th	0.017	0.179	Phase B	N/A	N/A
THD <sub>40</sub>	-	3.48	Phase B	23	13
PWHD	-	13.36	Phase B	23	22

CEI 0-21			
Clause	Requirement - Test	Result - Remark	Verdict

60°C (EN 61000-3-12) Output power 33% Pn Model: EA20KTSI					
Power (W)			2156.36		
Voltage (V)			230.37		
Current (A)			9.38		
Frequency (Hz)			50.0		
Harmonics	Current Magnitude (A)	% of Fundamental	Phase	Harmonic Current Limits (A) [%]	
				1 phase	3 phase
2nd	0.018	0.197	Phase C	8	8
3rd	0.012	0.123	Phase C	21.6	N/A
4th	0.032	0.339	Phase C	4	4
5th	0.053	0.563	Phase C	10.7	10.7
6th	0.023	0.244	Phase C	2.67	2.67
7th	0.136	1.449	Phase C	7.2	7.2
8th	0.005	0.056	Phase C	2	2
9th	0.028	0.302	Phase C	3.8	N/A
10th	0.009	0.097	Phase C	1.6	1.6
11th	0.036	0.383	Phase C	3.1	3.1
12th	0.014	0.152	Phase C	1.33	1.33
13th	0.045	0.475	Phase C	2	2
14th	0.023	0.247	Phase C	N/A	N/A
15th	0.007	0.071	Phase C	N/A	N/A
16th	0.010	0.110	Phase C	N/A	N/A
17th	0.136	1.448	Phase C	N/A	N/A
18th	0.017	0.184	Phase C	N/A	N/A
19th	0.132	1.411	Phase C	N/A	N/A
20th	0.025	0.265	Phase C	N/A	N/A
21th	0.013	0.134	Phase C	N/A	N/A
22th	0.021	0.227	Phase C	N/A	N/A
23th	0.018	0.189	Phase C	N/A	N/A
24th	0.037	0.399	Phase C	N/A	N/A
25th	0.030	0.325	Phase C	N/A	N/A
26th	0.031	0.332	Phase C	N/A	N/A
27th	0.025	0.263	Phase C	N/A	N/A
28th	0.019	0.204	Phase C	N/A	N/A
29th	0.072	0.772	Phase C	N/A	N/A
30th	0.028	0.298	Phase C	N/A	N/A
31th	0.124	1.329	Phase C	N/A	N/A
32th	0.014	0.147	Phase C	N/A	N/A
33th	0.015	0.159	Phase C	N/A	N/A
34th	0.013	0.144	Phase C	N/A	N/A
35th	0.087	0.933	Phase C	N/A	N/A
36th	0.006	0.066	Phase C	N/A	N/A
37th	0.050	0.539	Phase C	N/A	N/A
38th	0.006	0.060	Phase C	N/A	N/A
39th	0.008	0.089	Phase C	N/A	N/A
40th	0.015	0.164	Phase C	N/A	N/A
THD <sub>40</sub>	-	3.42	Phase C	23	13
PWHD	-	14.49	Phase C	23	22

CEI 0-21			
Clause	Requirement - Test	Result - Remark	Verdict

60°C (EN 61000-3-12) Output power 66% Pn Model: EA20KTSI					
Power (W)			4350.68		
Voltage (V)			230.54		
Current (A)			18.91		
Frequency (Hz)			50.0		
Harmonics	Current Magnitude (A)	% of Fundamental	Phase	Harmonic Current Limits (A) [%]	
				1 phase	3 phase
2nd	0.093	0.490	Phase A	8	8
3rd	0.038	0.204	Phase A	21.6	N/A
4th	0.064	0.337	Phase A	4	4
5th	0.117	0.619	Phase A	10.7	10.7
6th	0.048	0.252	Phase A	2.67	2.67
7th	0.282	1.493	Phase A	7.2	7.2
8th	0.024	0.125	Phase A	2	2
9th	0.009	0.046	Phase A	3.8	N/A
10th	0.023	0.122	Phase A	1.6	1.6
11th	0.035	0.187	Phase A	3.1	3.1
12th	0.018	0.097	Phase A	1.33	1.33
13th	0.077	0.406	Phase A	2	2
14th	0.010	0.055	Phase A	N/A	N/A
15th	0.010	0.055	Phase A	N/A	N/A
16th	0.024	0.128	Phase A	N/A	N/A
17th	0.257	1.361	Phase A	N/A	N/A
18th	0.023	0.121	Phase A	N/A	N/A
19th	0.221	1.172	Phase A	N/A	N/A
20th	0.037	0.198	Phase A	N/A	N/A
21th	0.024	0.129	Phase A	N/A	N/A
22th	0.032	0.170	Phase A	N/A	N/A
23th	0.032	0.172	Phase A	N/A	N/A
24th	0.060	0.318	Phase A	N/A	N/A
25th	0.074	0.392	Phase A	N/A	N/A
26th	0.055	0.292	Phase A	N/A	N/A
27th	0.033	0.176	Phase A	N/A	N/A
28th	0.036	0.189	Phase A	N/A	N/A
29th	0.144	0.763	Phase A	N/A	N/A
30th	0.054	0.289	Phase A	N/A	N/A
31th	0.237	1.258	Phase A	N/A	N/A
32th	0.041	0.219	Phase A	N/A	N/A
33th	0.013	0.067	Phase A	N/A	N/A
34th	0.022	0.114	Phase A	N/A	N/A
35th	0.180	0.957	Phase A	N/A	N/A
36th	0.027	0.143	Phase A	N/A	N/A
37th	0.111	0.589	Phase A	N/A	N/A
38th	0.018	0.096	Phase A	N/A	N/A
39th	0.022	0.119	Phase A	N/A	N/A
40th	0.033	0.174	Phase A	N/A	N/A
THD <sub>40</sub>	-	3.27	Phase A	23	13
PWHD	-	13.75	Phase A	23	22

CEI 0-21			
Clause	Requirement - Test	Result - Remark	Verdict

60°C (EN 61000-3-12) Output power 66% Pn Model: EA20KTSI					
Power (W)			4332.44		
Voltage (V)			230.32		
Current (A)			18.84		
Frequency (Hz)			50.0		
Harmonics	Current Magnitude (A)	% of Fundamental	Phase	Harmonic Current Limits (A) [%]	
				1 phase	3 phase
2nd	0.126	0.671	Phase B	8	8
3rd	0.030	0.157	Phase B	21.6	N/A
4th	0.124	0.660	Phase B	4	4
5th	0.107	0.567	Phase B	10.7	10.7
6th	0.092	0.490	Phase B	2.67	2.67
7th	0.314	1.670	Phase B	7.2	7.2
8th	0.020	0.106	Phase B	2	2
9th	0.064	0.340	Phase B	3.8	N/A
10th	0.034	0.182	Phase B	1.6	1.6
11th	0.068	0.359	Phase B	3.1	3.1
12th	0.045	0.238	Phase B	1.33	1.33
13th	0.076	0.403	Phase B	2	2
14th	0.047	0.249	Phase B	N/A	N/A
15th	0.011	0.061	Phase B	N/A	N/A
16th	0.031	0.166	Phase B	N/A	N/A
17th	0.262	1.393	Phase B	N/A	N/A
18th	0.029	0.156	Phase B	N/A	N/A
19th	0.244	1.296	Phase B	N/A	N/A
20th	0.060	0.320	Phase B	N/A	N/A
21th	0.016	0.084	Phase B	N/A	N/A
22th	0.038	0.202	Phase B	N/A	N/A
23th	0.039	0.210	Phase B	N/A	N/A
24th	0.061	0.322	Phase B	N/A	N/A
25th	0.070	0.372	Phase B	N/A	N/A
26th	0.086	0.455	Phase B	N/A	N/A
27th	0.040	0.214	Phase B	N/A	N/A
28th	0.044	0.235	Phase B	N/A	N/A
29th	0.150	0.797	Phase B	N/A	N/A
30th	0.050	0.267	Phase B	N/A	N/A
31th	0.208	1.103	Phase B	N/A	N/A
32th	0.031	0.163	Phase B	N/A	N/A
33th	0.032	0.171	Phase B	N/A	N/A
34th	0.036	0.189	Phase B	N/A	N/A
35th	0.153	0.812	Phase B	N/A	N/A
36th	0.033	0.174	Phase B	N/A	N/A
37th	0.097	0.514	Phase B	N/A	N/A
38th	0.018	0.097	Phase B	N/A	N/A
39th	0.013	0.069	Phase B	N/A	N/A
40th	0.032	0.171	Phase B	N/A	N/A
THD <sub>40</sub>	-	3.50	Phase B	23	13
PWHD	-	13.45	Phase B	23	22

CEI 0-21			
Clause	Requirement - Test	Result - Remark	Verdict

60°C (EN 61000-3-12) Output power 66% Pn Model: EA20KTSI					
Power (W)			4336.35		
Voltage (V)			230.38		
Current (A)			18.86		
Frequency (Hz)			50.0		
Harmonics	Current Magnitude (A)	% of Fundamental	Phase	Harmonic Current Limits (A) [%]	
				1 phase	3 phase
2nd	0.036	0.189	Phase C	8	8
3rd	0.022	0.118	Phase C	21.6	N/A
4th	0.062	0.332	Phase C	4	4
5th	0.106	0.566	Phase C	10.7	10.7
6th	0.045	0.240	Phase C	2.67	2.67
7th	0.273	1.453	Phase C	7.2	7.2
8th	0.011	0.058	Phase C	2	2
9th	0.058	0.307	Phase C	3.8	N/A
10th	0.020	0.105	Phase C	1.6	1.6
11th	0.072	0.384	Phase C	3.1	3.1
12th	0.028	0.148	Phase C	1.33	1.33
13th	0.090	0.478	Phase C	2	2
14th	0.049	0.260	Phase C	N/A	N/A
15th	0.013	0.068	Phase C	N/A	N/A
16th	0.021	0.114	Phase C	N/A	N/A
17th	0.275	1.459	Phase C	N/A	N/A
18th	0.036	0.192	Phase C	N/A	N/A
19th	0.266	1.415	Phase C	N/A	N/A
20th	0.054	0.287	Phase C	N/A	N/A
21th	0.024	0.127	Phase C	N/A	N/A
22th	0.042	0.224	Phase C	N/A	N/A
23th	0.038	0.204	Phase C	N/A	N/A
24th	0.077	0.411	Phase C	N/A	N/A
25th	0.066	0.353	Phase C	N/A	N/A
26th	0.068	0.359	Phase C	N/A	N/A
27th	0.051	0.269	Phase C	N/A	N/A
28th	0.037	0.195	Phase C	N/A	N/A
29th	0.145	0.770	Phase C	N/A	N/A
30th	0.055	0.292	Phase C	N/A	N/A
31th	0.248	1.316	Phase C	N/A	N/A
32th	0.026	0.138	Phase C	N/A	N/A
33th	0.030	0.159	Phase C	N/A	N/A
34th	0.027	0.141	Phase C	N/A	N/A
35th	0.177	0.942	Phase C	N/A	N/A
36th	0.012	0.063	Phase C	N/A	N/A
37th	0.101	0.535	Phase C	N/A	N/A
38th	0.011	0.058	Phase C	N/A	N/A
39th	0.019	0.100	Phase C	N/A	N/A
40th	0.031	0.164	Phase C	N/A	N/A
THD <sub>40</sub>	-	3.44	Phase C	23	13
PWHD	-	14.55	Phase C	23	22

CEI 0-21			
Clause	Requirement - Test	Result - Remark	Verdict

60°C (EN 61000-3-12) Output power 100% Pn Model: EA20KTSI					
Power (W)			6492.43		
Voltage (V)			230.58		
Current (A)			28.22		
Frequency (Hz)			50.0		
Harmonics	Current Magnitude (A)	% of Fundamental	Phase	Harmonic Current Limits (A) [%]	
				1 phase	3 phase
2nd	0.141	0.500	Phase A	8	8
3rd	0.059	0.210	Phase A	21.6	N/A
4th	0.094	0.333	Phase A	4	4
5th	0.178	0.632	Phase A	10.7	10.7
6th	0.070	0.249	Phase A	2.67	2.67
7th	0.419	1.486	Phase A	7.2	7.2
8th	0.035	0.126	Phase A	2	2
9th	0.014	0.048	Phase A	3.8	N/A
10th	0.037	0.132	Phase A	1.6	1.6
11th	0.054	0.191	Phase A	3.1	3.1
12th	0.027	0.096	Phase A	1.33	1.33
13th	0.113	0.403	Phase A	2	2
14th	0.017	0.060	Phase A	N/A	N/A
15th	0.016	0.056	Phase A	N/A	N/A
16th	0.034	0.119	Phase A	N/A	N/A
17th	0.387	1.374	Phase A	N/A	N/A
18th	0.030	0.108	Phase A	N/A	N/A
19th	0.330	1.170	Phase A	N/A	N/A
20th	0.053	0.188	Phase A	N/A	N/A
21th	0.036	0.126	Phase A	N/A	N/A
22th	0.046	0.165	Phase A	N/A	N/A
23th	0.044	0.156	Phase A	N/A	N/A
24th	0.086	0.306	Phase A	N/A	N/A
25th	0.106	0.377	Phase A	N/A	N/A
26th	0.081	0.286	Phase A	N/A	N/A
27th	0.051	0.180	Phase A	N/A	N/A
28th	0.055	0.196	Phase A	N/A	N/A
29th	0.214	0.762	Phase A	N/A	N/A
30th	0.078	0.275	Phase A	N/A	N/A
31th	0.359	1.274	Phase A	N/A	N/A
32th	0.053	0.188	Phase A	N/A	N/A
33th	0.018	0.064	Phase A	N/A	N/A
34th	0.031	0.109	Phase A	N/A	N/A
35th	0.271	0.963	Phase A	N/A	N/A
36th	0.040	0.141	Phase A	N/A	N/A
37th	0.167	0.593	Phase A	N/A	N/A
38th	0.024	0.084	Phase A	N/A	N/A
39th	0.030	0.108	Phase A	N/A	N/A
40th	0.048	0.172	Phase A	N/A	N/A
THD <sub>40</sub>	-	3.28	Phase A	23	13
PWHD	-	13.78	Phase A	23	22

CEI 0-21			
Clause	Requirement - Test	Result - Remark	Verdict

60°C (EN 61000-3-12) Output power 100% Pn Model: EA20KTSI					
Power (W)			6475.17		
Voltage (V)			230.53		
Current (A)			28.15		
Frequency (Hz)			50.0		
Harmonics	Current Magnitude (A)	% of Fundamental	Phase	Harmonic Current Limits (A) [%]	
				1 phase	3 phase
2nd	0.191	0.684	Phase B	8	8
3rd	0.045	0.160	Phase B	21.6	N/A
4th	0.185	0.663	Phase B	4	4
5th	0.161	0.576	Phase B	10.7	10.7
6th	0.141	0.506	Phase B	2.67	2.67
7th	0.465	1.663	Phase B	7.2	7.2
8th	0.030	0.108	Phase B	2	2
9th	0.097	0.346	Phase B	3.8	N/A
10th	0.050	0.179	Phase B	1.6	1.6
11th	0.103	0.369	Phase B	3.1	3.1
12th	0.068	0.244	Phase B	1.33	1.33
13th	0.113	0.405	Phase B	2	2
14th	0.068	0.243	Phase B	N/A	N/A
15th	0.018	0.066	Phase B	N/A	N/A
16th	0.047	0.169	Phase B	N/A	N/A
17th	0.384	1.375	Phase B	N/A	N/A
18th	0.038	0.136	Phase B	N/A	N/A
19th	0.364	1.303	Phase B	N/A	N/A
20th	0.085	0.306	Phase B	N/A	N/A
21th	0.029	0.106	Phase B	N/A	N/A
22th	0.058	0.206	Phase B	N/A	N/A
23th	0.058	0.208	Phase B	N/A	N/A
24th	0.098	0.351	Phase B	N/A	N/A
25th	0.098	0.352	Phase B	N/A	N/A
26th	0.112	0.402	Phase B	N/A	N/A
27th	0.058	0.209	Phase B	N/A	N/A
28th	0.064	0.228	Phase B	N/A	N/A
29th	0.216	0.771	Phase B	N/A	N/A
30th	0.079	0.281	Phase B	N/A	N/A
31th	0.318	1.139	Phase B	N/A	N/A
32th	0.044	0.158	Phase B	N/A	N/A
33th	0.042	0.151	Phase B	N/A	N/A
34th	0.054	0.192	Phase B	N/A	N/A
35th	0.228	0.818	Phase B	N/A	N/A
36th	0.048	0.170	Phase B	N/A	N/A
37th	0.146	0.524	Phase B	N/A	N/A
38th	0.028	0.099	Phase B	N/A	N/A
39th	0.019	0.066	Phase B	N/A	N/A
40th	0.047	0.170	Phase B	N/A	N/A
THD <sub>40</sub>	-	3.50	Phase B	23	13
PWHD	-	13.45	Phase B	23	22

CEI 0-21			
Clause	Requirement - Test	Result - Remark	Verdict

60°C (EN 61000-3-12) Output power 100% Pn Model: EA20KTSI					
Power (W)			6472.62		
Voltage (V)			230.42		
Current (A)			28.15		
Frequency (Hz)			50.0		
Harmonics	Current Magnitude (A)	% of Fundamental	Phase	Harmonic Current Limits (A) [%]	
				1 phase	3 phase
2nd	0.049	0.175	Phase C	8	8
3rd	0.035	0.126	Phase C	21.6	N/A
4th	0.094	0.336	Phase C	4	4
5th	0.162	0.576	Phase C	10.7	10.7
6th	0.072	0.255	Phase C	2.67	2.67
7th	0.405	1.443	Phase C	7.2	7.2
8th	0.016	0.058	Phase C	2	2
9th	0.087	0.309	Phase C	3.8	N/A
10th	0.027	0.095	Phase C	1.6	1.6
11th	0.106	0.376	Phase C	3.1	3.1
12th	0.043	0.154	Phase C	1.33	1.33
13th	0.133	0.474	Phase C	2	2
14th	0.072	0.256	Phase C	N/A	N/A
15th	0.018	0.065	Phase C	N/A	N/A
16th	0.033	0.117	Phase C	N/A	N/A
17th	0.410	1.458	Phase C	N/A	N/A
18th	0.047	0.166	Phase C	N/A	N/A
19th	0.402	1.430	Phase C	N/A	N/A
20th	0.086	0.307	Phase C	N/A	N/A
21th	0.038	0.134	Phase C	N/A	N/A
22th	0.062	0.220	Phase C	N/A	N/A
23th	0.051	0.182	Phase C	N/A	N/A
24th	0.125	0.443	Phase C	N/A	N/A
25th	0.096	0.343	Phase C	N/A	N/A
26th	0.092	0.328	Phase C	N/A	N/A
27th	0.070	0.250	Phase C	N/A	N/A
28th	0.054	0.192	Phase C	N/A	N/A
29th	0.211	0.750	Phase C	N/A	N/A
30th	0.090	0.321	Phase C	N/A	N/A
31th	0.376	1.337	Phase C	N/A	N/A
32th	0.038	0.137	Phase C	N/A	N/A
33th	0.043	0.152	Phase C	N/A	N/A
34th	0.039	0.140	Phase C	N/A	N/A
35th	0.265	0.942	Phase C	N/A	N/A
36th	0.019	0.067	Phase C	N/A	N/A
37th	0.154	0.550	Phase C	N/A	N/A
38th	0.017	0.061	Phase C	N/A	N/A
39th	0.025	0.089	Phase C	N/A	N/A
40th	0.043	0.153	Phase C	N/A	N/A
THD <sub>40</sub>	-	3.45	Phase C	23	13
PWHD	-	14.61	Phase C	23	22



CEI 0-21			
Clause	Requirement - Test	Result - Remark	Verdict

<b>B.1 (c)</b>	<b>Voltage fluctuation and flicker</b>		<b>P</b>
----------------	--	--	----------

Model: EA30KTSI

**Test condition (Temp °C): Ambient temperature**

Output power:	Flicker limits according to:	Result:				
		Plt	Pst	dc%	dmax[%]	dt [ms]
33% phase A	EN 61000-3-11	0.50	0.58	0.27	1.00	0
33% phase B	EN 61000-3-11	0.49	0.55	0.26	1.17	0
33% phase C	EN 61000-3-11	0.48	0.52	0.26	0.89	0
66% phase A	EN 61000-3-11	0.45	0.51	0.25	1.03	0
66% phase B	EN 61000-3-11	0.47	0.52	0.25	1.06	0
66% phase C	EN 61000-3-11	0.47	0.51	0.27	0.97	0
100%* phase A	EN 61000-3-11	0.48	0.50	0.18	1.07	0
100%* phase B	EN 61000-3-11	0.49	0.51	0.19	1.41	0
100%* phase C	EN 61000-3-11	0.47	0.49	0.18	1.23	0
Limit	EN 61000-3-11	0.65	1.00	3.3	4.0	500

**Test condition (Temp °C): -25°C**

Output power:	Flicker limits according to:	Result:				
		Plt	Pst	dc%	dmax[%]	dt [ms]
33% phase A	EN 61000-3-11	0.51	0.54	0.28	1.17	0
33% phase B	EN 61000-3-11	0.53	0.55	0.26	1.03	0
33% phase C	EN 61000-3-11	0.50	0.52	0.24	1.06	0
66% phase A	EN 61000-3-11	0.49	0.54	0.27	1.14	0
66% phase B	EN 61000-3-11	0.52	0.58	0.30	1.11	0
66% phase C	EN 61000-3-11	0.50	0.55	0.24	0.95	0
100%* phase A	EN 61000-3-11	0.48	0.51	0.24	1.06	0
100%* phase B	EN 61000-3-11	0.49	0.51	0.22	1.33	0
100%* phase C	EN 61000-3-11	0.48	0.49	0.24	1.06	0
Limit	EN 61000-3-11	0.65	1.00	3.3	4.0	500

**Test condition (Temp °C): +60°C**

Output power:	Flicker limits according to:	Result:				
		Plt	Pst	dc%	dmax[%]	dt [ms]
33% phase A	EN 61000-3-11	0.45	0.53	0.32	1.04	0
33% phase B	EN 61000-3-11	0.48	0.55	0.30	1.02	0
33% phase C	EN 61000-3-11	0.49	0.54	0.34	1.06	0
66% phase A	EN 61000-3-11	0.47	0.52	0.28	1.15	0
66% phase B	EN 61000-3-11	0.49	0.52	0.25	1.03	0
66% phase C	EN 61000-3-11	0.48	0.52	0.26	1.02	0
100%* phase A	EN 61000-3-11	0.58	0.62	0.26	1.08	0
100%* phase B	EN 61000-3-11	0.56	0.61	0.25	1.23	0
100%* phase C	EN 61000-3-11	0.52	0.56	0.27	1.02	0
Limit	EN 61000-3-11	0.65	1.00	3.3	4.0	500

Note:

Calculation of the maximum permissible grid impedance at the point of common coupling based on  $d_c$ :

$$Z_{\max} = Z_{\text{ref}} * 3.3\% / d_c(P_n)$$

The tests should be based on the limits of the EN61000-3-3 for less than 16A and on EN 61000-3-11 for more than 16A.

The tests were performed on model EA30KTSI and are also applicable for all other models stated in this report

<b>CEI 0-21</b>			
Clause	Requirement - Test	Result - Remark	Verdict

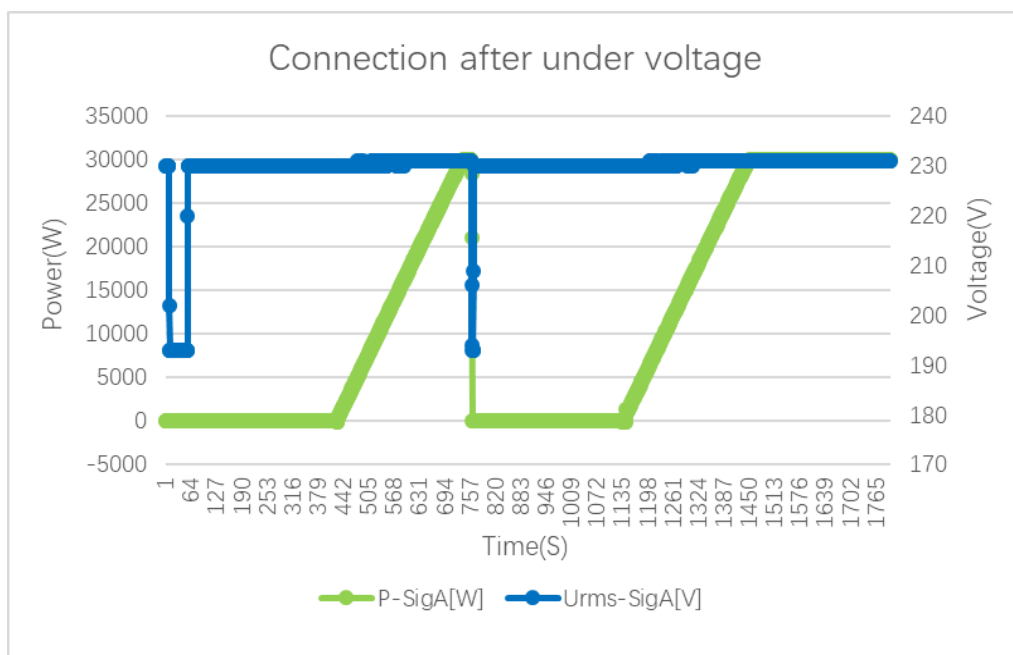
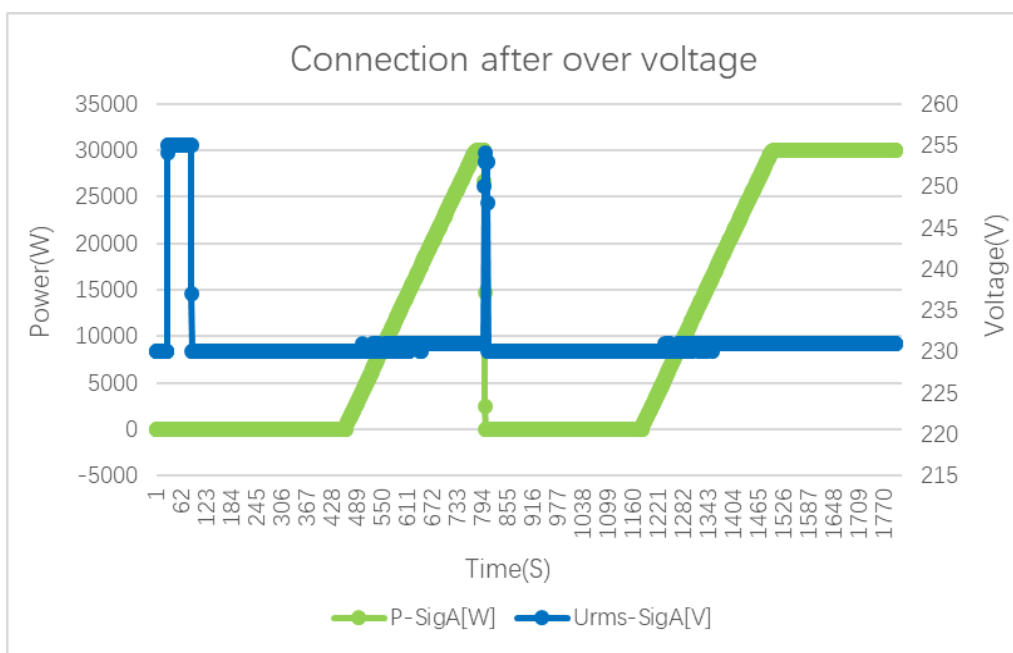
<b>B.1.1</b>	<b>Conditions of connection, reconnection and gradual power supply</b>		<b>P</b>
Clause	Test		Result
B.1.1.1	Checking of connection and reconnection conditions		P
B.1.1.2	Checking gradual supply of active power		P

CEI 0-21			
Clause	Requirement - Test	Result - Remark	Verdict

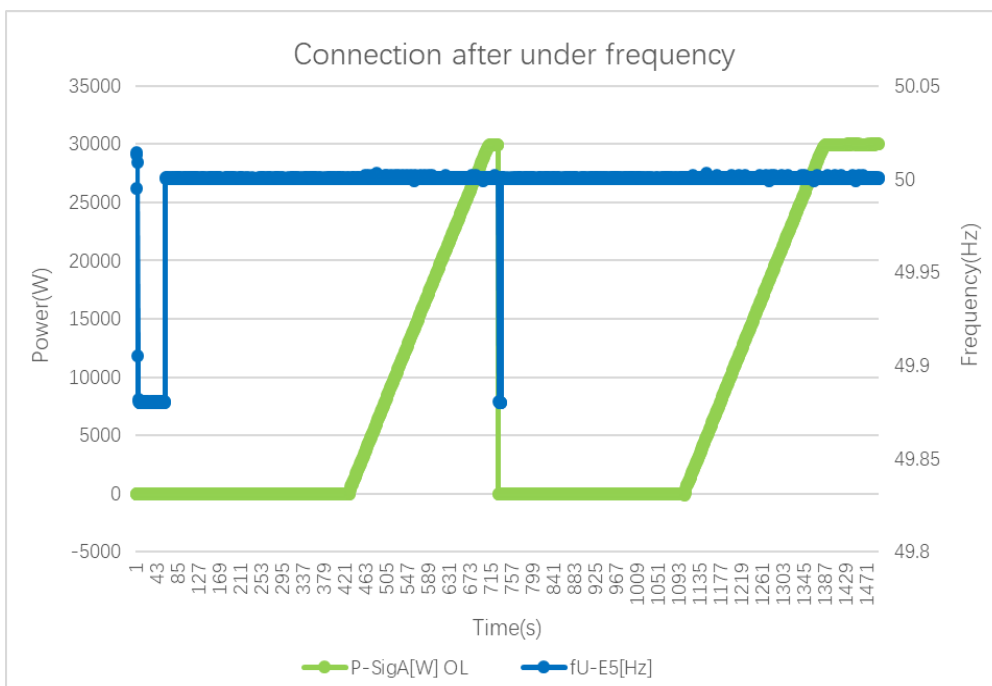
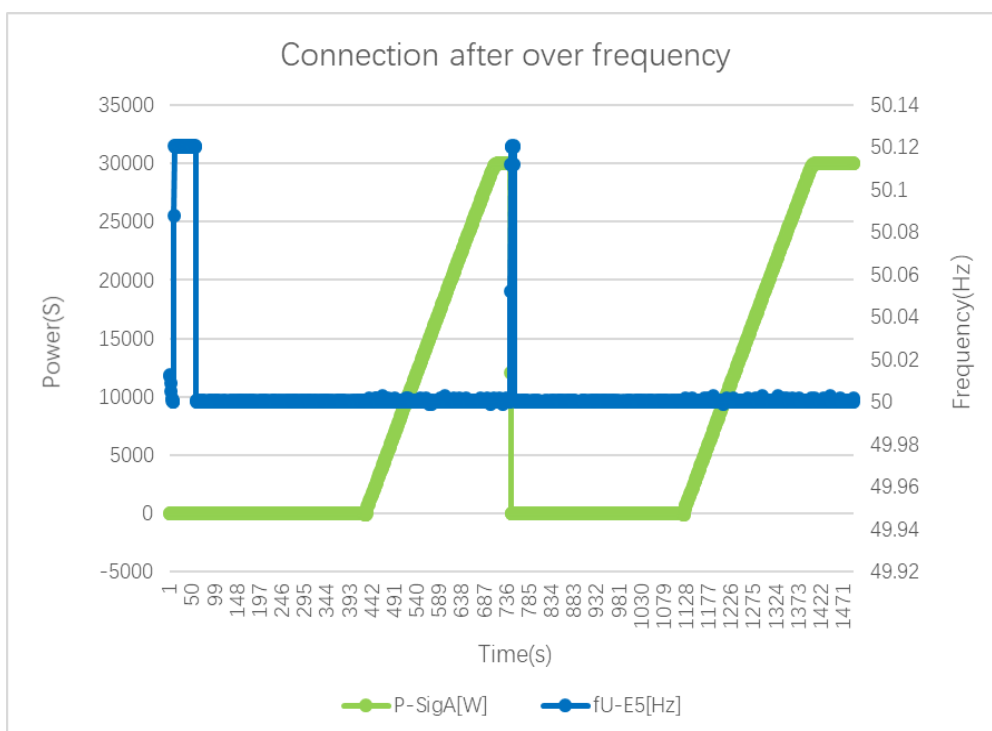
B.1.1.1 and B.1.1.2	Conditions of connection, reconnection and gradual power supply and gradual supply of active power		P
<b>Model:</b> EA30KTSI			
<b>Voltage conditions</b>			
a) Out of voltage range	84% $U_n$ for 30s	111% $U_n$ for 30s	
Connection:	No connection	No connection	
Limit	No connection allowed		
b) In voltage range at start-up	85% $U_n < U < 110\% U_n$		
Voltage limit	86% $U_n$	109% $U_n$	
Reconnection time [s]	31.00	31.00	
Limit:	Reconnection after 30s		
Gradient:	Gradient should be recorded for at least 300s until the inverter has the full output power. Max gradient: 20%Pn/min For recorded gradient see diagram underneath		
c) In voltage range after voltage failure	85% $U_n < U < 110\% U_n$		
Voltage limit	86% $U_n$	109% $U_n$	
Reconnection time [s]	365.50	371.50	
Limit:	Reconnection after 300s		
Gradient:	Gradient should be recorded for at least 300s until the inverter has the full output power. Max gradient: 20%Pn/min For recorded gradient see diagram underneath		
<b>Frequency conditions</b>			
d) Out of frequency range	49.88 ± 0.01	50.12 ± 0.01	
Connection:	No connection	No connection	
Limit	No connection allowed		
e) In frequency range at start-up	49.90 Hz < f < 50.10		
Frequency limit [Hz]	49.91	50.09	
Reconnection time [s]	31.25	33.00	
Limit:	Reconnection after 30s		
Gradient:	Gradient should be recorded for at least 300s until the inverter has the full output power. Max gradient: 20%Pn/min For recorded gradient see diagram underneath		
f) In frequency range after frequency failure	49.90 Hz < f < 50.10		
Frequency limit [Hz]	49.91	50.09	
Reconnection time [s]	390.50	382.00	
Limit:	Reconnection after 300s		
Gradient:	Gradient should be recorded for at least 300s until the inverter has the full output power. Max gradient: 20%Pn/min For recorded gradient see diagram underneath		
<b>Test:</b>			
Test condition b) and c): voltage within the limits of 85% to 110%			

CEI 0-21			
Clause	Requirement - Test	Result - Remark	Verdict
Test condition e) and f): frequency within the limits of 49.90Hz to 50.10Hz			
The tests were performed on model EA30KTSI and are also applicable for all other models stated in this report.			
<b>Assessment criterion:</b>			
In order to prevent network disruptions, operation in parallel of generators of any kind must take place ONLY when the frequency and voltage detected at the output terminals remain within the following limits for 300 s (or not less than 30 s, in accordance with the specifications in 8.4.1.3, letter a):			
<ul style="list-style-type: none"> <li>voltage between 85% and 110% of <math>U_n</math>; frequency between 49.90 Hz and 50.10 Hz (default setting, adjustment range between 49 Hz and 51 Hz).</li> </ul>			
In addition, the power supply for indirectly connected production systems should be gradual, with a transition from the initial "no-load" conditions at the time of parallel, to the power value available with a maximum positive ramp of 20% of the maximum load per minute.			

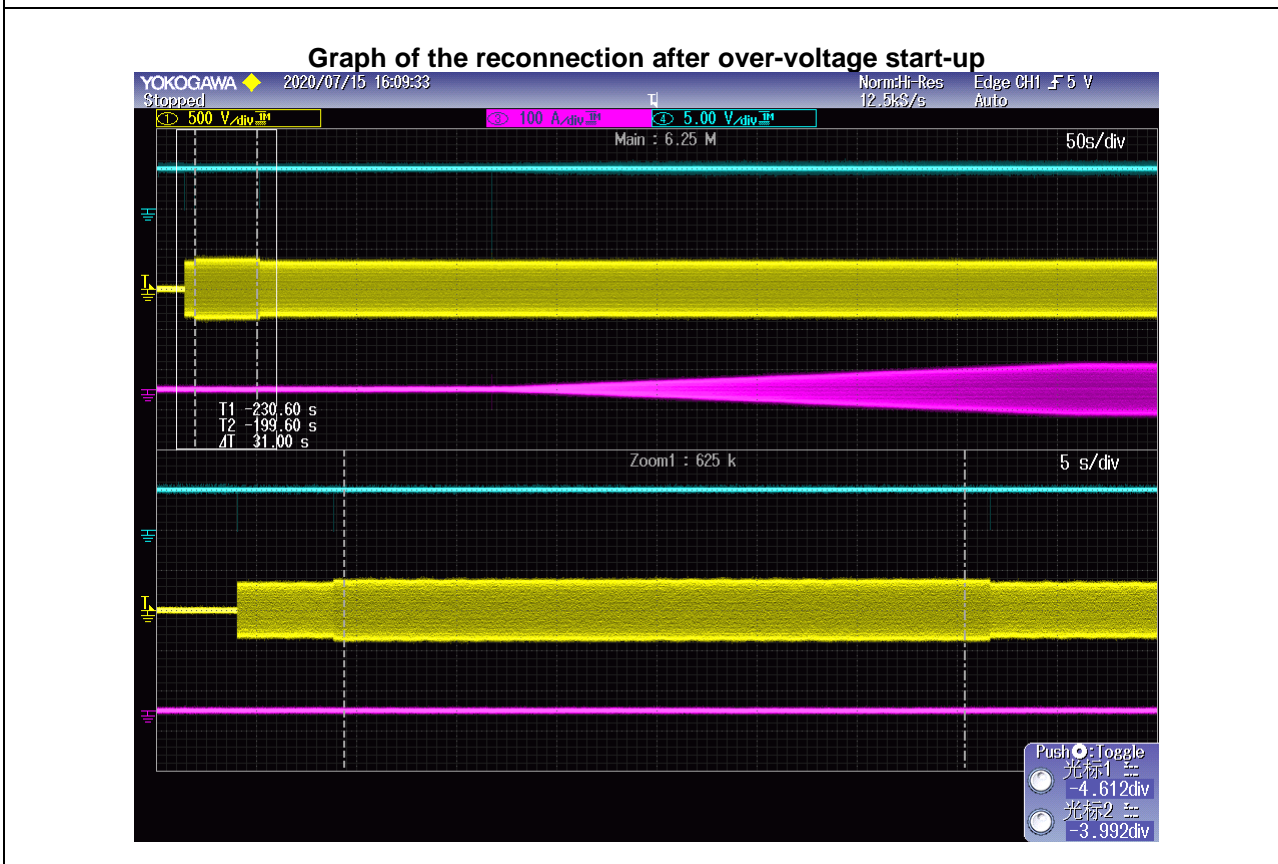
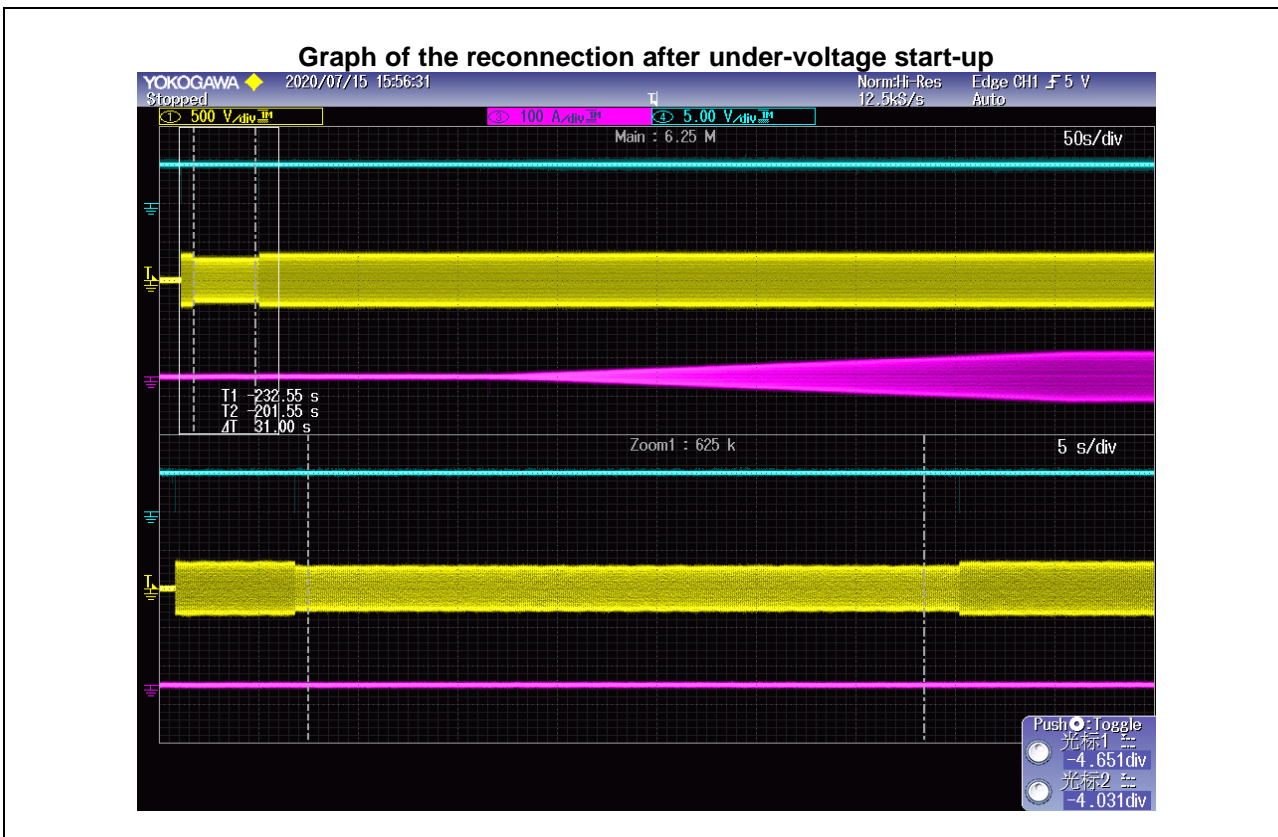
CEI 0-21			
Clause	Requirement - Test	Result - Remark	Verdict



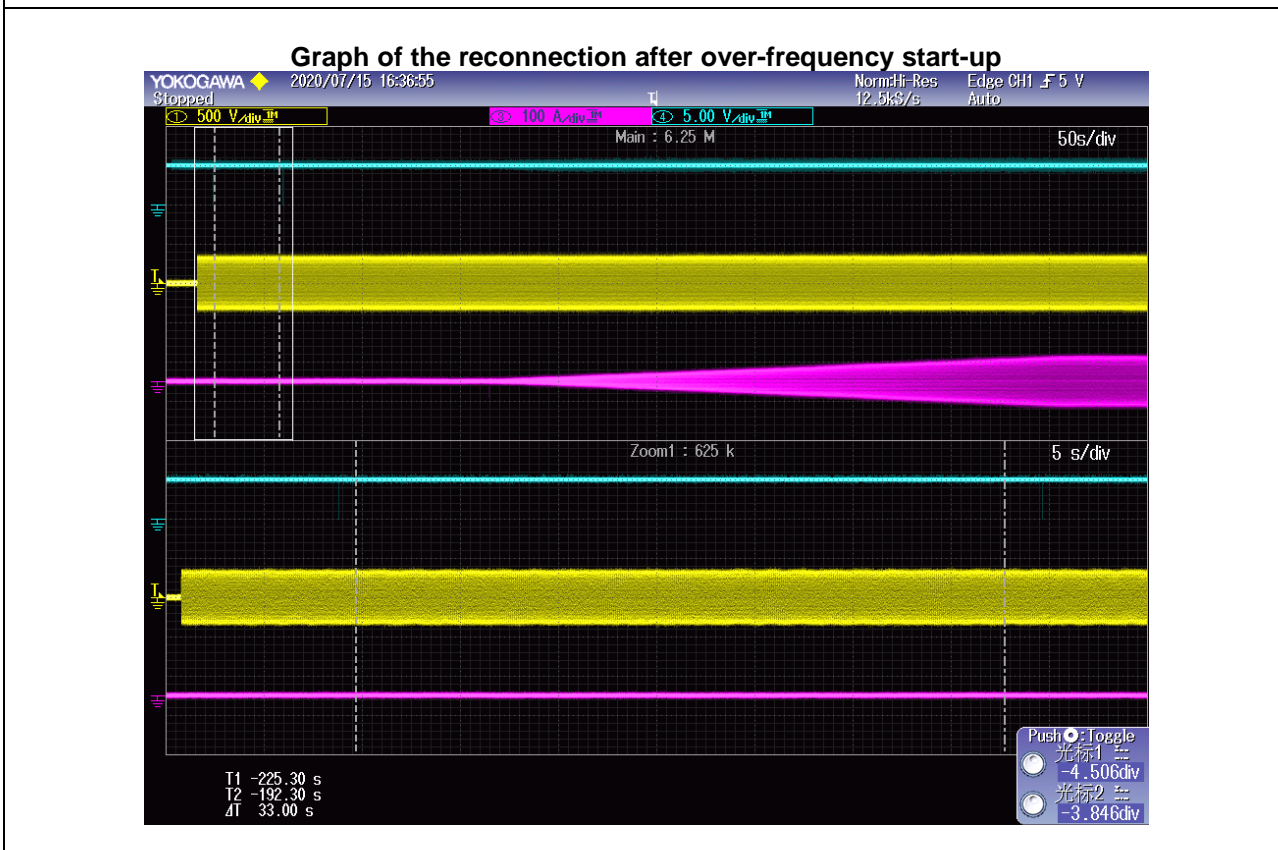
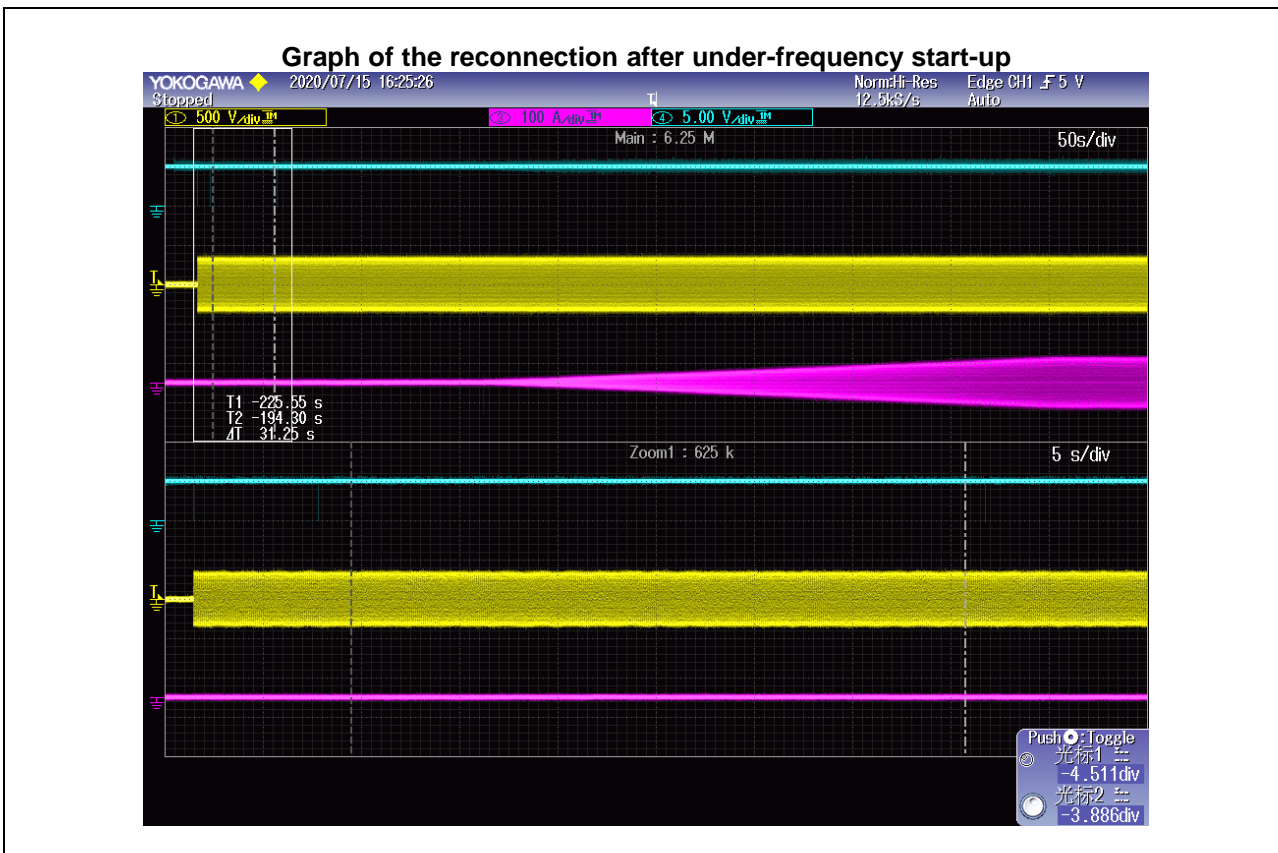
CEI 0-21			
Clause	Requirement - Test	Result - Remark	Verdict



CEI 0-21			
Clause	Requirement - Test	Result - Remark	Verdict



CEI 0-21			
Clause	Requirement - Test	Result - Remark	Verdict



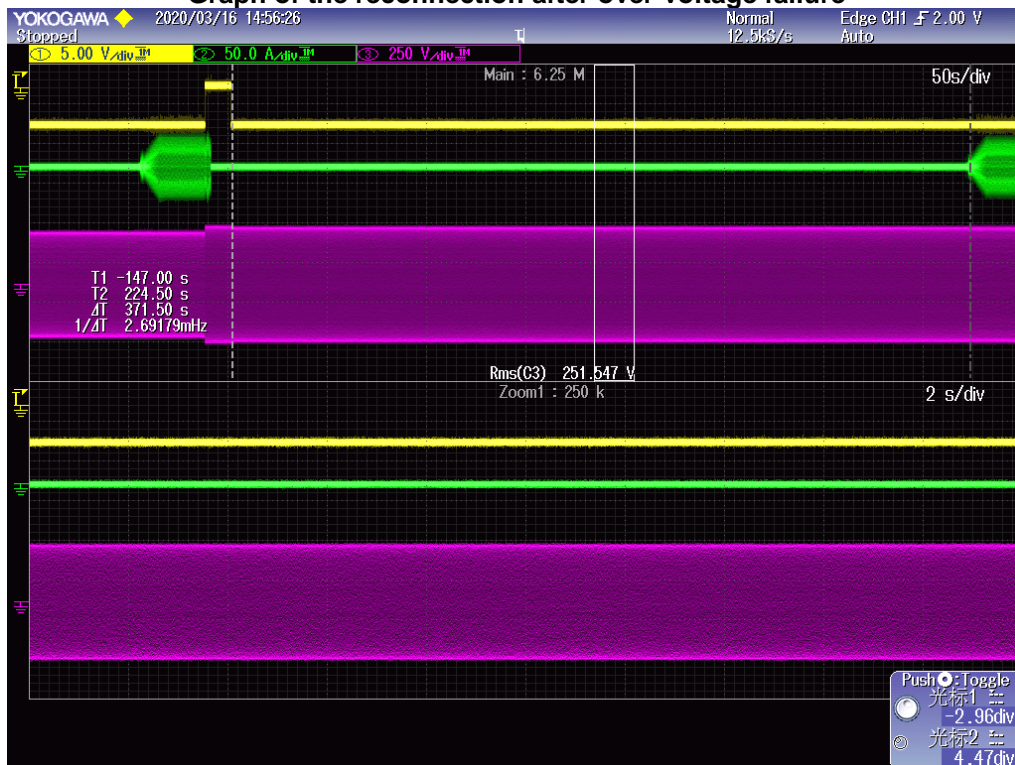


CEI 0-21			
Clause	Requirement - Test	Result - Remark	Verdict

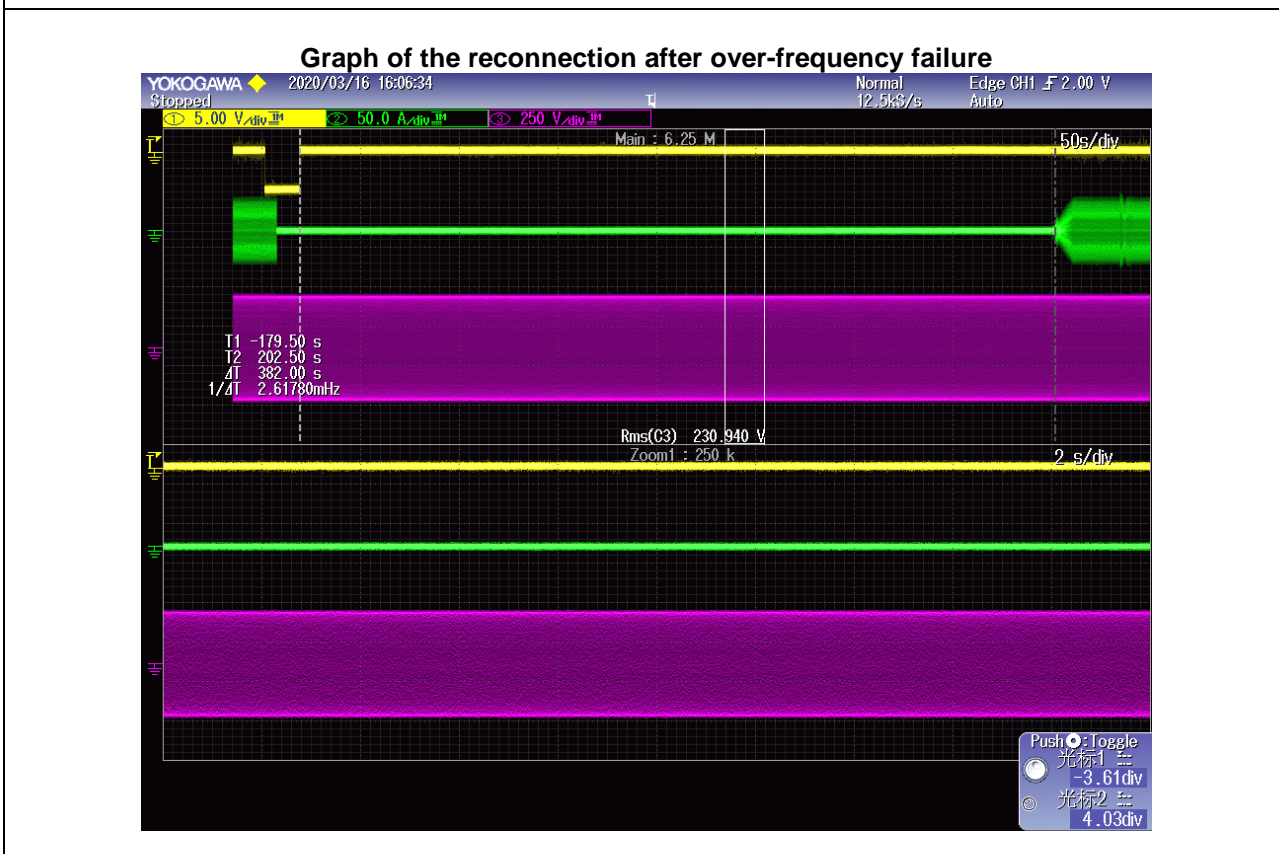
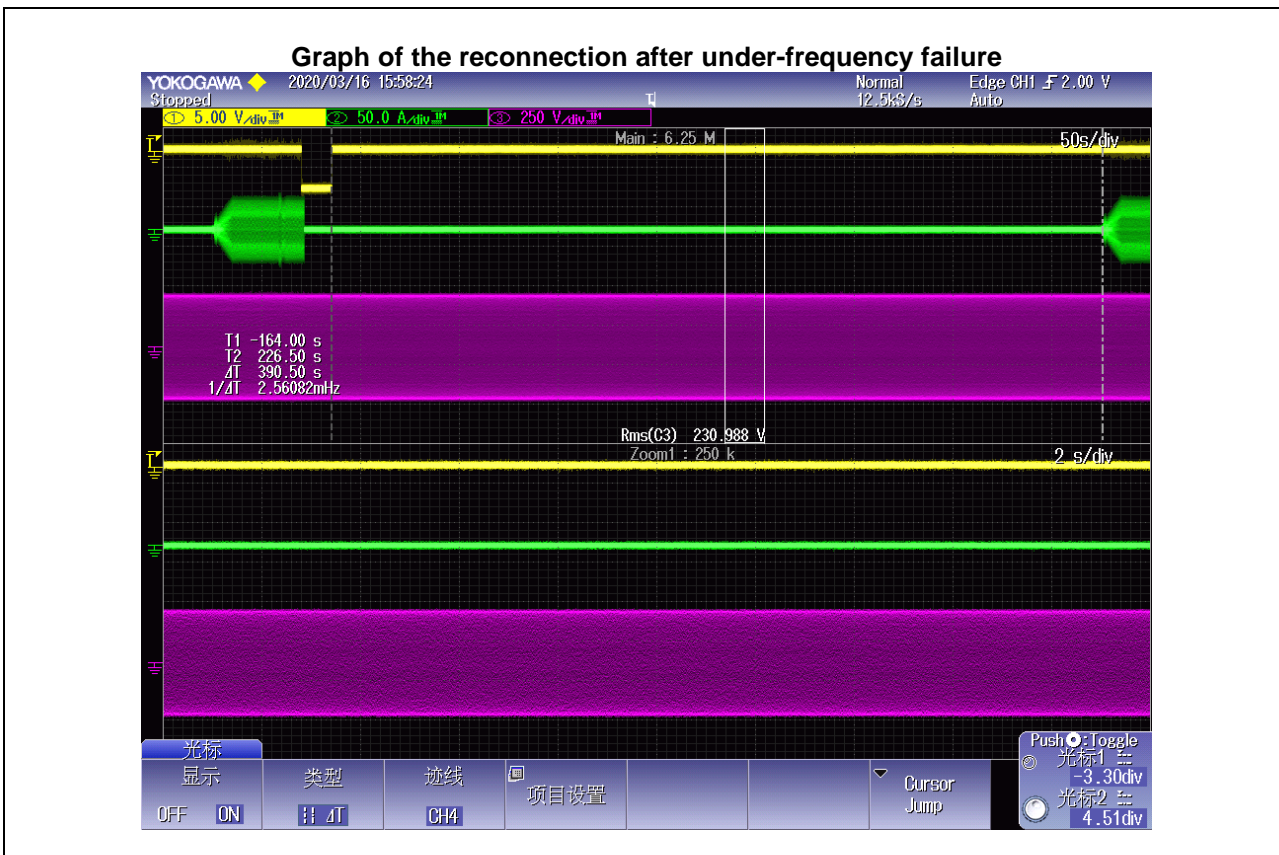
Graph of the reconnection after under-voltage failure



Graph of the reconnection after over-voltage failure



CEI 0-21			
Clause	Requirement - Test	Result - Remark	Verdict



CEI 0-21			
Clause	Requirement - Test	Result - Remark	Verdict
<b>B.1.2</b>	<b>Reactive power exchange</b>		<b>P</b>
Clause	Test		Result
B.1.2.1	Checking construction standards: Reactive power capability		P
B.1.2.2	Test performance and recording mode		P
B.1.2.2.1	Inverter in systems with total capacity up to 11.08 kW		N/A
B.1.2.2.2	Inverter in systems with total capacity greater than 11.08 kW		P
B.1.2.3	Reactive power exchange at a given level		P
B.1.2.3.1	Procedures for performing tests and recording results (hypothesis of adjustment by Q)		P
B.1.2.4	Response time to an assigned step level change		P
B.1.2.5	Automatic supply of reactive power according to a characteristic curve $\cos \varphi = f(P)$		P
B.1.2.5.1	Checking compliance with the rule for implementing the standard supply curve		P
B.1.2.6	Automatic exchange of reactive power according to a characteristic curve $Q = f(V)$		P
B.1.2.6.1	Checking compliance with the rules for the implementing the characteristic curve $Q = f(V)$		P

CEI 0-21			
Clause	Requirement - Test	Result - Remark	Verdict

<b>B.1.2.1</b>	<b>Checking construction standards: Reactive power capability</b>		<b>P</b>
	As established in 8.4.4.2, static converters set up for continuous operation in parallel with the distributor network must be able to operate with a power factor different from 1.		P

<b>B.1.2.2</b>	<b>Test performance and recording mode</b>		<b>P</b>
	The converter must be set so that it can, respectively, absorb (induction) and supply (resistance) the maximum reactive power available at each level of active power supplied according to its capability.		P
	At this point the DC source must be regulated so that the converter can supply active power in sequence included in the 10 intervals [0-10]%; [10-20]%;...; [90-100]% of nominal power (1-min average values calculated on the basis of the values measured at the fundamental frequency in a 200-ms window).		P
	For each of the 10 levels of active power at least 3 values for inductive reactive power and 3 for capacitive power shall be reported as 1-min average values calculated based on measurements at the fundamental frequency of a 200-ms window.		P
	In addition to measurements of reactive power limit values, the measured values should be recorded by setting the reactive power supplied to 0 ( $\cos \varphi = 1$ ).		P

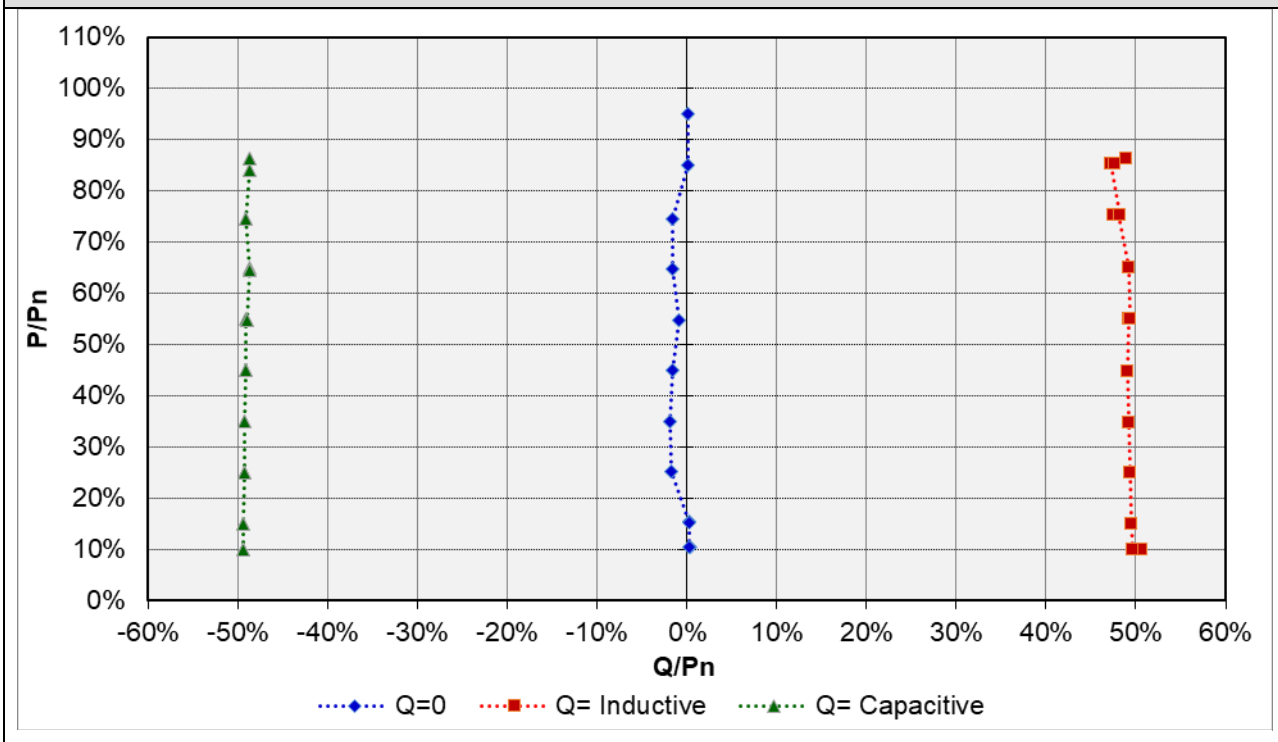
CEI 0-21			
Clause	Requirement - Test	Result - Remark	Verdict

B.1.2.2.2	Inverter in systems with total capacity greater than 11.08 kW					P
Model: EA30KTSI						
<b>Inductive reactive power absorption</b>						
Power-BIN	Active power [W]	Reactive power [Var]	Power factor (cos $\phi$ )	Q/P <sub>n</sub> (%)	DC power [W]	
0% -10%	2976.97	15171.88	0.19	50.57	3228.31	
	2976.85	14878.22	0.19	49.59	3229.11	
	2975.59	14880.99	0.19	49.60	3229.88	
10% -20%	4480.27	14865.66	0.28	49.55	4739.06	
	4479.99	14866.99	0.28	49.56	4741.08	
	4479.34	14868.43	0.28	49.56	4742.60	
20% -30%	7466.31	14818.11	0.44	49.39	7742.50	
	7464.97	14817.89	0.44	49.39	7742.79	
	7464.61	14817.89	0.44	49.39	7743.54	
30% -40%	10400.04	14769.99	0.57	49.23	10700.04	
	10400.04	14768.99	0.57	49.23	10700.04	
	10400.04	14768.55	0.57	49.23	10700.04	
40% -50%	13428.58	14704.67	0.67	49.02	13795.73	
	13425.35	14701.89	0.67	49.01	13799.84	
	13417.81	14701.77	0.67	49.01	13799.95	
50% -60%	16500.00	14785.11	0.74	49.28	16925.57	
	16500.00	14785.66	0.74	49.29	16931.09	
	16499.99	14786.44	0.74	49.29	16937.52	
60% -70%	19497.30	14778.55	0.79	49.26	19959.10	
	19499.97	14777.55	0.79	49.26	19961.86	
	19499.97	14779.11	0.79	49.26	19965.97	
70% -80%	22600.02	14419.22	0.84	48.06	23099.93	
	22600.03	14246.96	0.84	47.49	23099.94	
	22600.03	14464.25	0.84	48.21	23099.61	
80% -90%	25600.01	14185.82	0.87	47.29	26100.01	
	25600.02	14160.18	0.87	47.20	26100.02	
	25600.02	14303.39	0.87	47.68	26100.02	
90% -100%	25875.30	14696.99	0.86	48.99	26341.37	
	25885.52	14696.44	0.86	48.99	26399.97	
	25883.75	14697.88	0.86	48.99	26399.99	
<b>Capacitive reactive power supply</b>						
Power-BIN	Active power [W]	Reactive power [Var]	Power factor (cos $\phi$ )	Q/P <sub>n</sub> (%)	DC power [W]	
0% -10%	3002.44	-14822.23	0.19	-49.41	3387.43	
	3001.10	-14823.22	0.19	-49.41	3384.89	
	3001.29	-14823.22	0.19	-49.41	3385.75	
10% -20%	4506.75	-14811.11	0.29	-49.37	4895.36	
	4506.37	-14812.45	0.29	-49.37	4898.77	
	4506.02	-14813.00	0.29	-49.38	4900.94	
20% -30%	7507.53	-14797.44	0.45	-49.32	7919.12	
	7507.64	-14798.22	0.45	-49.33	7920.27	
	7508.25	-14798.33	0.45	-49.33	7925.71	
30% -40%	10497.42	-14768.60	0.58	-49.23	10941.80	
	10497.74	-14770.73	0.58	-49.24	10943.74	

CEI 0-21					
Clause	Requirement - Test			Result - Remark	Verdict
	10497.50	-14770.63	0.58	-49.24	10946.29
40% -50%	13478.67	-14744.57	0.67	-49.15	13962.64
	13478.49	-14745.48	0.67	-49.15	13963.03
	13477.28	-14746.06	0.67	-49.15	13964.91
50% -60%	16453.68	-14725.45	0.75	-49.08	16975.16
	16438.54	-14682.84	0.75	-48.94	16928.47
	16433.11	-14683.21	0.75	-48.94	16932.54
60% -70%	19454.87	-14623.23	0.80	-48.74	19958.93
	19367.97	-14629.03	0.80	-48.76	19878.98
	19361.87	-14629.93	0.80	-48.77	19881.11
70% -80%	22352.75	-14724.07	0.84	-49.08	23032.87
	22350.18	-14724.46	0.84	-49.08	23037.11
	22348.25	-14724.28	0.84	-49.08	23041.14
80% -90%	25201.36	-14617.78	0.86	-48.73	25801.18
	25200.59	-14618.56	0.86	-48.73	25861.11
	25201.36	-14617.89	0.86	-48.73	25899.86
90% -100%	25899.97	-14617.56	0.87	-48.73	26599.94
	25899.97	-14620.44	0.87	-48.73	26599.94
	25899.86	-14619.22	0.87	-48.73	26599.95
<b>Reactive power supply with set point Q = 0</b>					
Power-BIN	Active power [W]	Reactive power [Var]	Power factor (cos $\phi$ )	Q/P <sub>n</sub> (%)	DC power [W]
0% -10%	3085.01	104.70	0.98	0.35	3299.07
	3085.04	89.78	0.98	0.30	3299.95
	3084.99	96.71	0.98	0.32	3300.78
10% -20%	4594.60	66.20	0.99	0.22	4821.98
	4594.63	69.46	0.99	0.23	4823.55
	4516.37	64.71	0.99	0.22	4675.76
20% -30%	7552.00	-540.61	1.00	-1.80	7810.53
	7551.73	-538.76	1.00	-1.80	7811.90
	7551.58	-543.91	1.00	-1.81	7812.73
30% -40%	10467.51	-574.13	1.00	-1.91	10691.54
	10465.34	-575.17	1.00	-1.92	10689.60
	10463.58	-570.29	1.00	-1.90	10688.98
40% -50%	13458.68	-500.39	1.00	-1.67	13730.16
	13456.88	-500.74	1.00	-1.67	13730.76
	13456.29	-501.26	1.00	-1.67	13732.67
50% -60%	16437.20	-257.13	1.00	-0.86	16755.30
	16437.73	-262.37	1.00	-0.87	16759.73
	16436.88	-263.12	1.00	-0.88	16760.92
60% -70%	19402.28	-465.94	1.00	-1.55	19779.84
	19402.70	-467.01	1.00	-1.56	19784.74
	19399.94	-467.94	1.00	-1.56	19785.45
70% -80%	22356.27	-487.25	1.00	-1.62	22794.67
	22355.28	-488.26	1.00	-1.63	22796.15
	22354.71	-489.70	1.00	-1.63	22798.60
80% -90%	25500.00	18.39	1.00	0.06	25999.85
	25500.00	18.49	1.00	0.06	25988.21
	25500.00	18.88	1.00	0.06	25985.43
90% -100%	28499.98	21.32	1.00	0.07	29000.03
	28499.98	19.67	1.00	0.07	29000.13
	28499.98	16.73	1.00	0.06	29000.03

CEI 0-21			
Clause	Requirement - Test	Result - Remark	Verdict

**Graph of the Rectangular capability curves for inverter output power greater than 11.08 kW**



Note:  
 The tests were performed on model EA30KTSI and are also applicable for all other models stated in this report.

CEI 0-21			
Clause	Requirement - Test	Result - Remark	Verdict

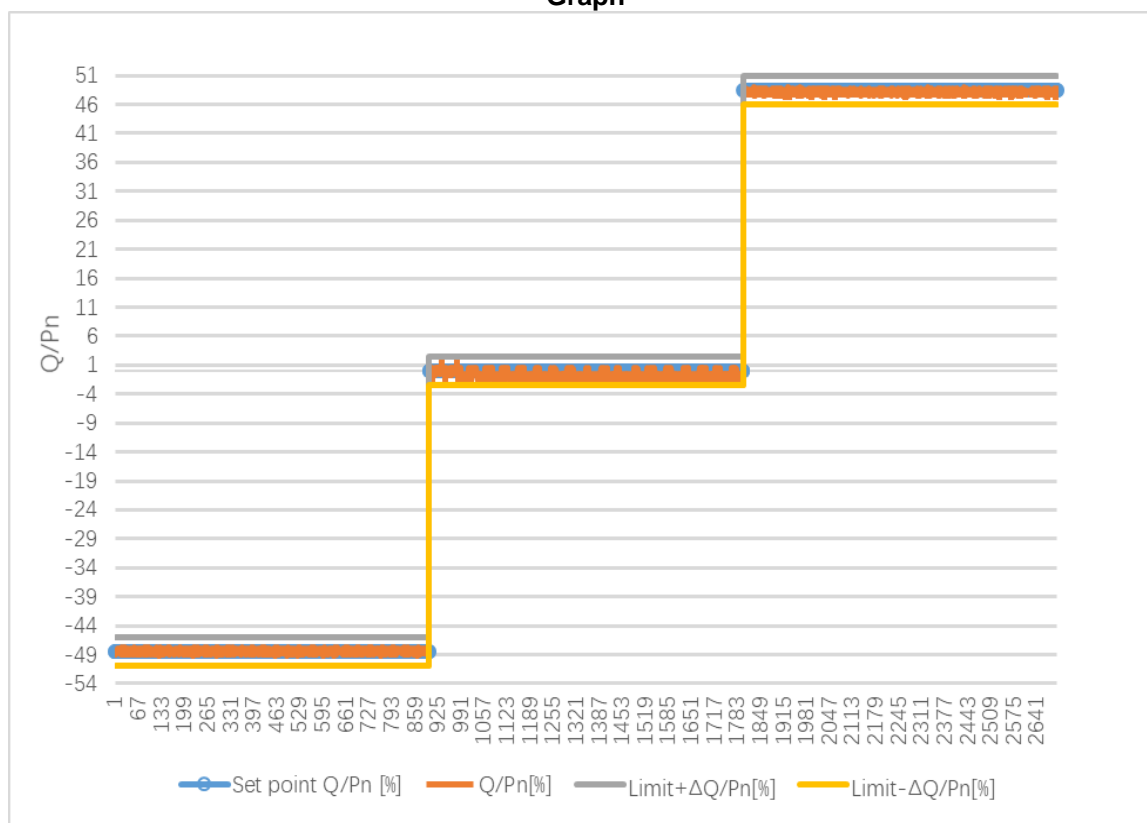
<b>B.1.2.3.1</b>	<b>Procedures for performing tests and recording results (hypothesis of adjustment by Q)</b>		<b>P</b>
------------------	--	--	----------

Model: EA30KTSI

	Reactive power set point Q/Pn [%]	Measured reactive power Q/Pn [%]	Deviation compared to set- point $\Delta Q/Pn$ [%]
-Qmin	-48.43	-48.39	0.04
0	0	-0.78	-0.78
+Qmax	+48.43	48.19	-0.24
Limit	$\Delta Q \leq \pm 2.5\% P_n$		

**Test:**

DC source should be set to 50% output power

Starting with  $Q_{min} \leq -0,4843 P_n$  to  $Q=0$  and then to  $Q_{max} \geq 0,4843 P_n$ , in doing so each point must be kept for at least 3 minute.The total tolerance is  $\Delta Q \leq \pm 2,5\%$  of  $P_n$  or  $\Delta \cos\phi \leq \pm 0.01$ **Graph****Note:**

The tests were performed on model EA30KTSI and are also applicable for all other models stated in this report.

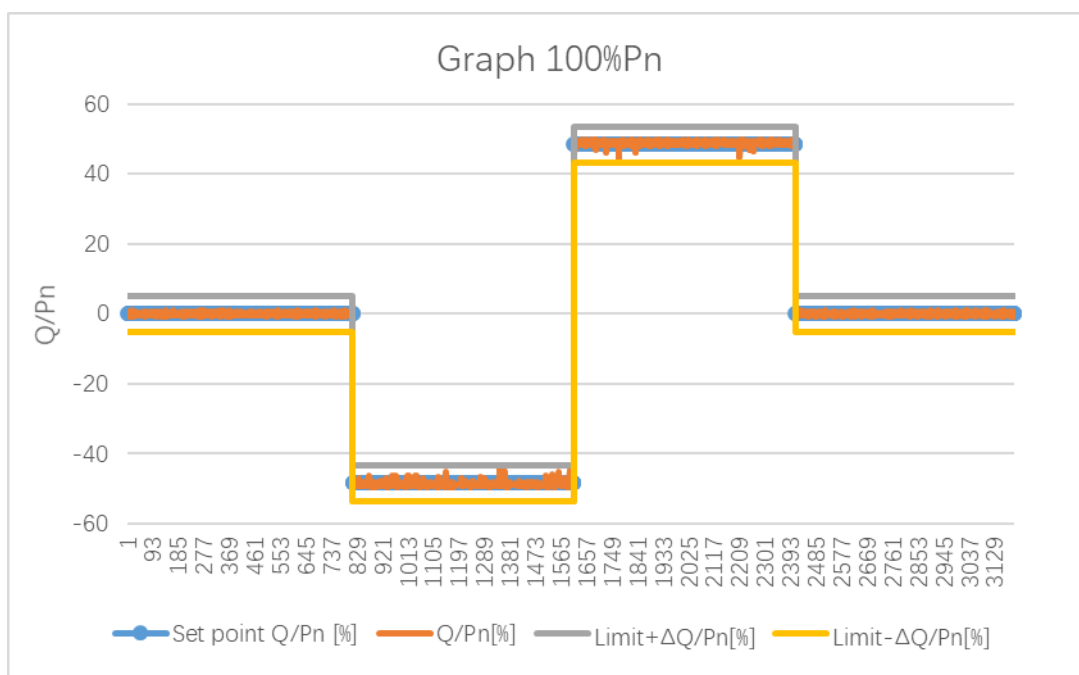
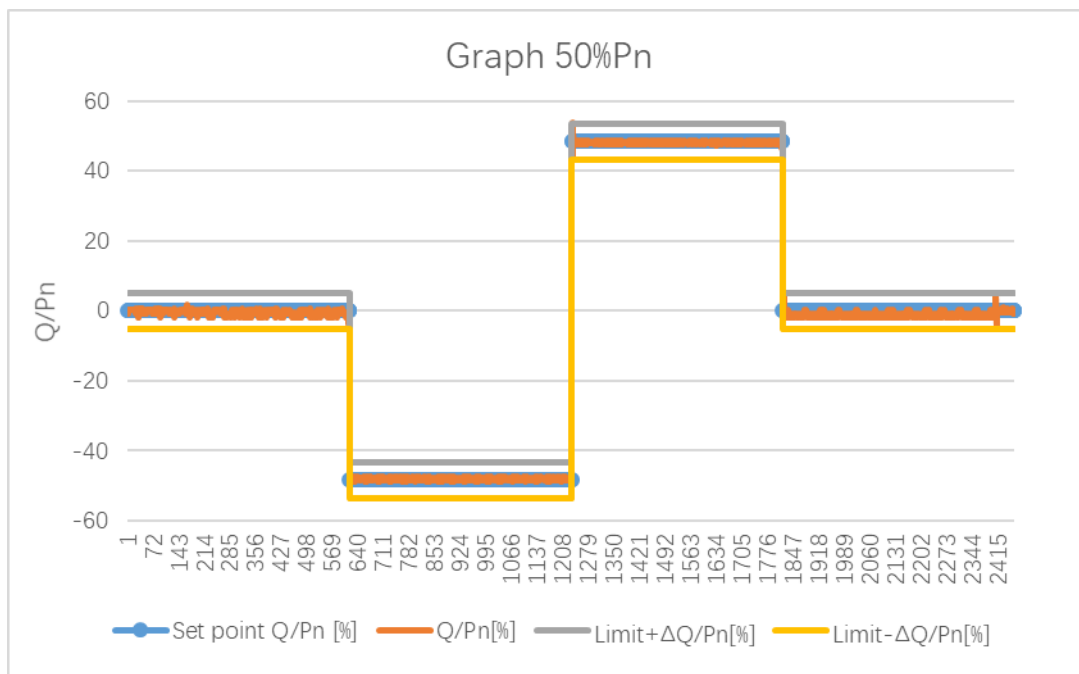


CEI 0-21			
Clause	Requirement - Test	Result - Remark	Verdict

B.1.2.4	Response time to an assigned step level change (greater 11.08 kW systems)			P
Model: EA30KTSI				
<b>Test result : 50% P<sub>n</sub></b>				
	Reactive power set point Q/P <sub>n</sub> [%]	Measured reactive power Q/P <sub>n</sub> [%]	Deviation compared to setpoint $\Delta Q/P_n$ [%]	
0	0	-0.28	-0.28	
-Q <sub>min</sub>	-48.43	-48.00	0.43	
+Q <sub>max</sub>	+48.43	48.19	-0.24	
0	0	-1.03	-1.03	
Response time [s]	Q=0 to -Q <sub>min</sub>	-Q <sub>min</sub> to +Q <sub>max</sub>	+Q <sub>max</sub> to Q=0	
	1.0	1.0	3.0	
<b>Test result : 100% P<sub>n</sub></b>				
	Reactive power set point Q/P <sub>n</sub> [%]	Measured reactive power Q/P <sub>n</sub> [%]	Deviation compared to setpoint $\Delta Q/P_n$ [%]	
0	0	1.08	1.08	
-Q <sub>min</sub>	-48.43	-49.62	-0.19	
+Q <sub>max</sub>	+48.43	49.95	1.52	
0	0	-1.65	-1.65	
Response time [s]	Q=0 to -Q <sub>min</sub>	-Q <sub>min</sub> to +Q <sub>max</sub>	+Q <sub>max</sub> to Q=0	
	2.0	2.0	2.0	
Limit	$\Delta Q \leq \pm 5\%$ of P <sub>n</sub> Max response time 10s			
<b>Test:</b> DC source should be set to 50%(test1) and 100%(test2) output power Starting with Q=0 then Q <sub>min</sub> ≤ -0,4843 P <sub>n</sub> to to Q <sub>max</sub> ≥ 0,4843 P <sub>n</sub> , and then back to Q=0 in doing so each point must be kept for at least 2 minute.  The total tolerance is $\Delta Q \leq \pm 5,0\%$ of P <sub>n</sub> or $\Delta \cos\phi \leq \pm 0.01$ The maximum response time is 10s.  As for the requirements of the previous paragraph, also in this case the tests are required to inverters used in plants with a total power greater than 11.08 kW, which must also be able to implement a centralized control strategy via remote control signal, issued by the Distributor. However, the manufacturer has the right to voluntarily carry out tests even for smaller inverters.  The tests were performed on model EA30KTSI and are also applicable for all other models stated in this report.				

CEI 0-21			
Clause	Requirement - Test	Result - Remark	Verdict

**Test Graph:**



CEI 0-21			
Clause	Requirement - Test	Result - Remark	Verdict

<b>B.1.2.5</b>	<b>Automatic supply of reactive power according to a characteristic curve <math>\cos \varphi = f(P)</math></b>		<b>P</b>
----------------	--	--	----------

All static converters must be able to absorb reactive power automatically and independently (local control logic) in accordance with a characteristic curve of the power/active power factor =  $f(P)$ .

The purpose of the test is to check that the converter follows the methods for automatic supply of reactive power according to the standard characteristic curve  $\cos \varphi = f(P)$  outlined in E.2, according to method a).

The standard curve is uniquely defined by linear interpolation of the three characteristic points:

**A:**  $P = 0,2 P_n$ ;  $\cos \varphi = 1$

**B:**  $P = 0,5 P_n$ ;  $\cos \varphi = 1$

**C:**  $P = P_n$ ;  $\cos \varphi = \cos \varphi_{\max}$

where  $\cos \varphi_{\max}$  is equal to 0.90 for all converters.

Adjustment along the characteristic curve is enabled when the voltage detected at the output terminals exceeds the "critical" lock-in value (e.g. set to  $V_n = 1.05 V_n$ , see paragraph E.2).

The lock-in voltage value that enables the automatic supply of reactive power and that during testing must be set to  $1.05 V_n$  (default setting also for production), must be adjustable in the range between  $V_n$  and  $1.1 V_n$  at intervals of  $0.01 V_n$ .

The Distributor shall specify the required lock-in voltage value in the Operating Regulations.

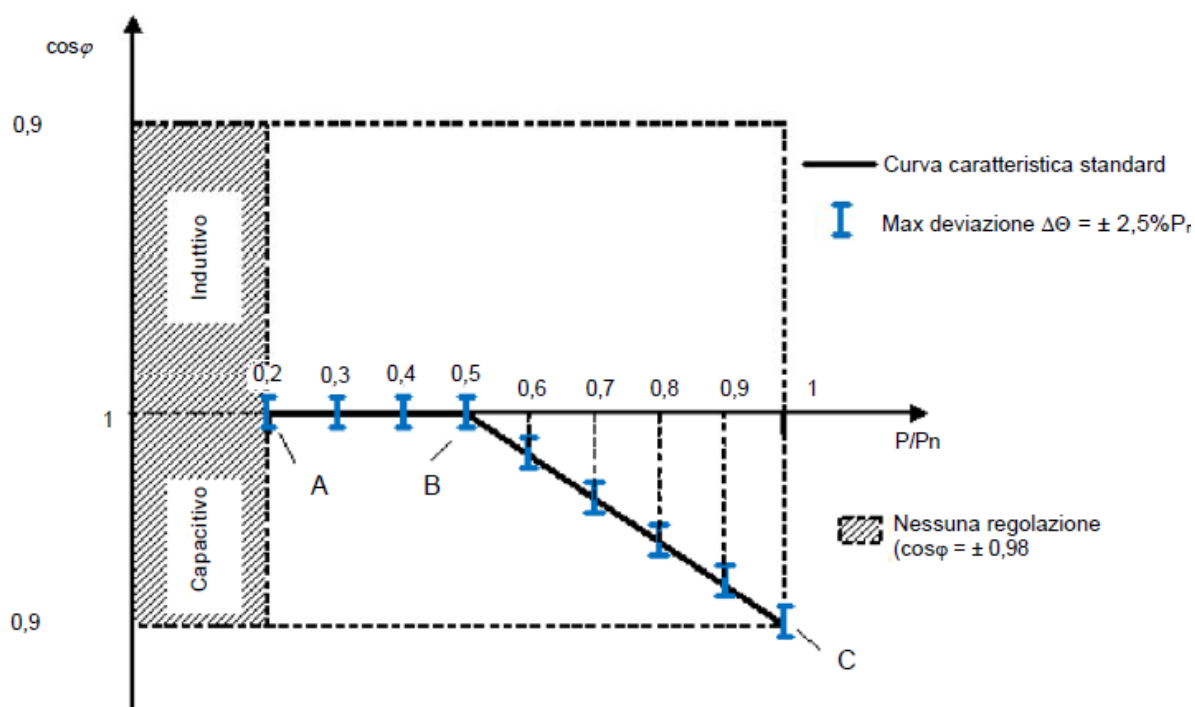


Figure 27 - Standard characteristic curve  $\cos \varphi = f(P)$

CEI 0-21			
Clause	Requirement - Test	Result - Remark	Verdict

<b>B.1.2.5.1</b>	<b>Checking compliance with the rules for implementing the standard supply curve</b>		<b>P</b>
------------------	--	--	----------

Model: EA30KTSI

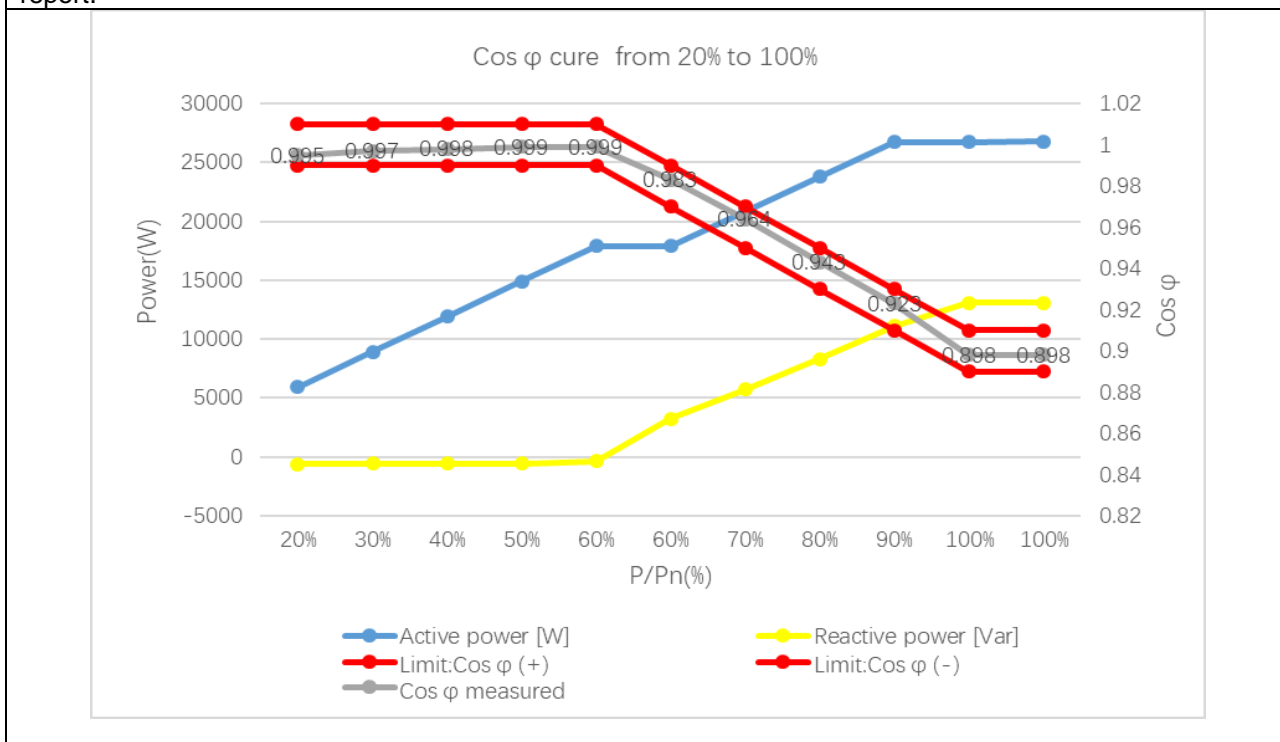
**Inductive reactive power absorption**

Power-BIN	Output voltage	Active power [W]	Reactive power [Var]	Cos $\varphi$ measured	Cos $\varphi$ expected	$\Delta$ Cos $\varphi$
20%	1.04 V <sub>n</sub>	5948.36	-603.44	0.995	1.000	0.005
30%	1.04 V <sub>n</sub>	8935.20	-559.56	0.997	1.000	0.003
40%	1.04 V <sub>n</sub>	11929.46	-560.04	0.998	1.000	0.002
50%	1.04 V <sub>n</sub>	14917.75	-547.56	0.999	1.000	0.001
60%	1.04 V <sub>n</sub>	17897.17	-385.07	0.999	1.000	0.001
60%	1.06 V <sub>n</sub>	17886.76	3240.01	0.983	0.980	0.003
70%	1.06 V <sub>n</sub>	20851.50	5745.27	0.964	0.960	0.004
80%	1.06 V <sub>n</sub>	23800.67	8336.99	0.943	0.940	0.003
90%	1.06 V <sub>n</sub>	26748.82	11100.12	0.923	0.920	0.003
100%	1.06 V <sub>n</sub>	26742.02	13081.39	0.898	0.900	0.002
100%	1.06 V <sub>n</sub>	26782.66	13072.38	0.898	0.900	0.002

Note:

The lock-in value is adjustable between V<sub>n</sub> and 1.1V<sub>n</sub> and the lock-out value between V<sub>n</sub> and 0.9V<sub>n</sub> in 0.01V steps.

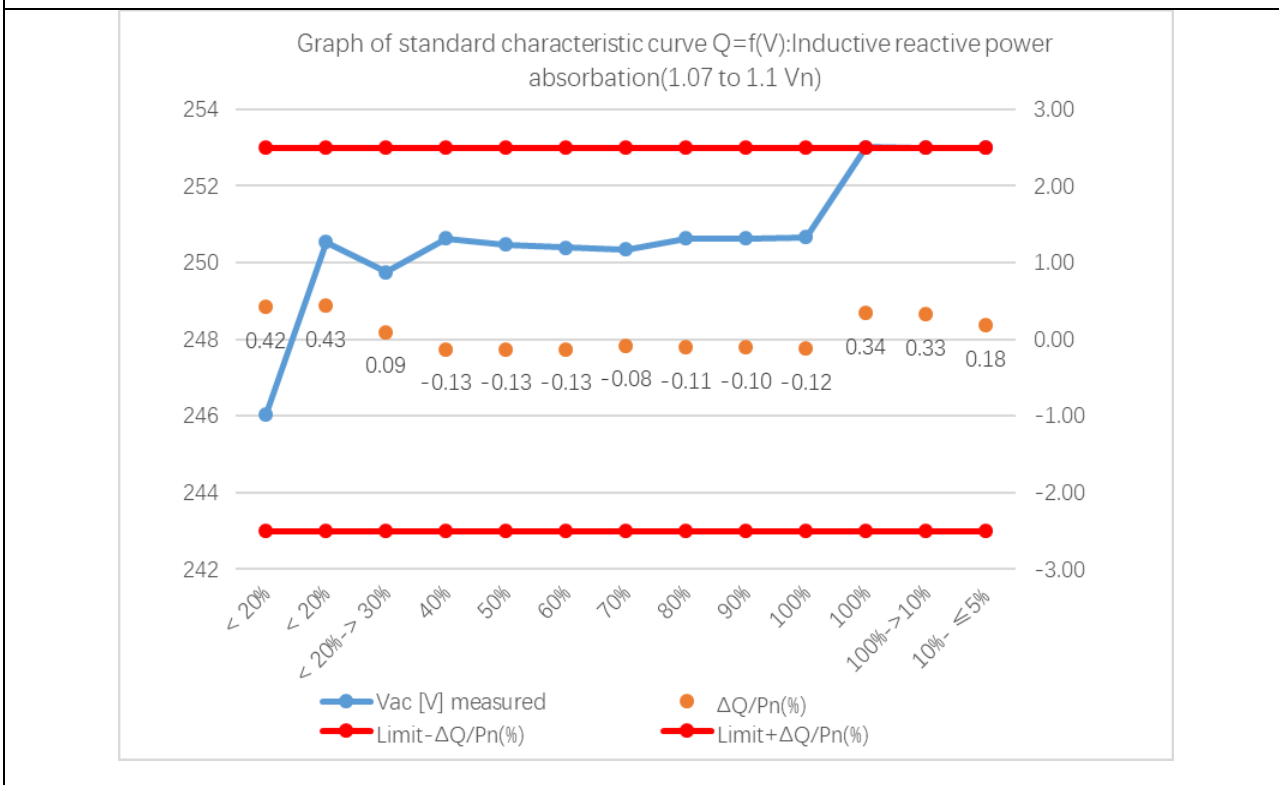
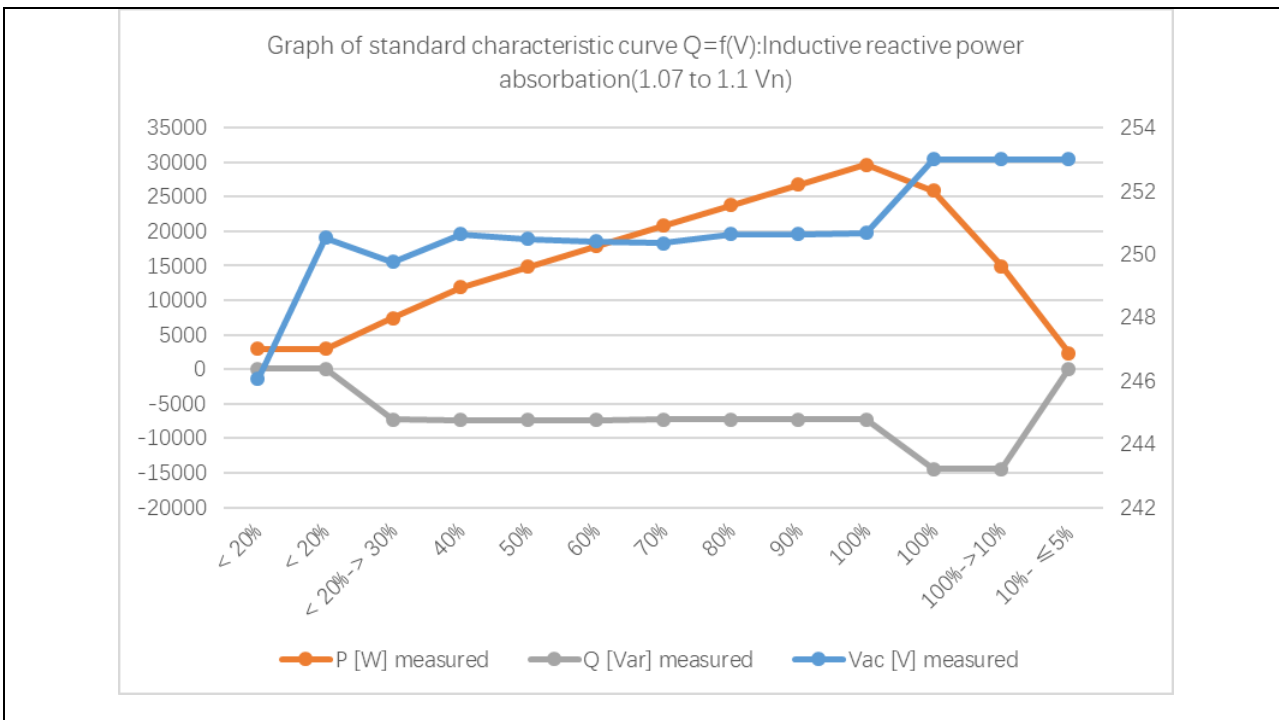
The tests were performed on model EA30KTSI and are also applicable for all other models stated in this report.



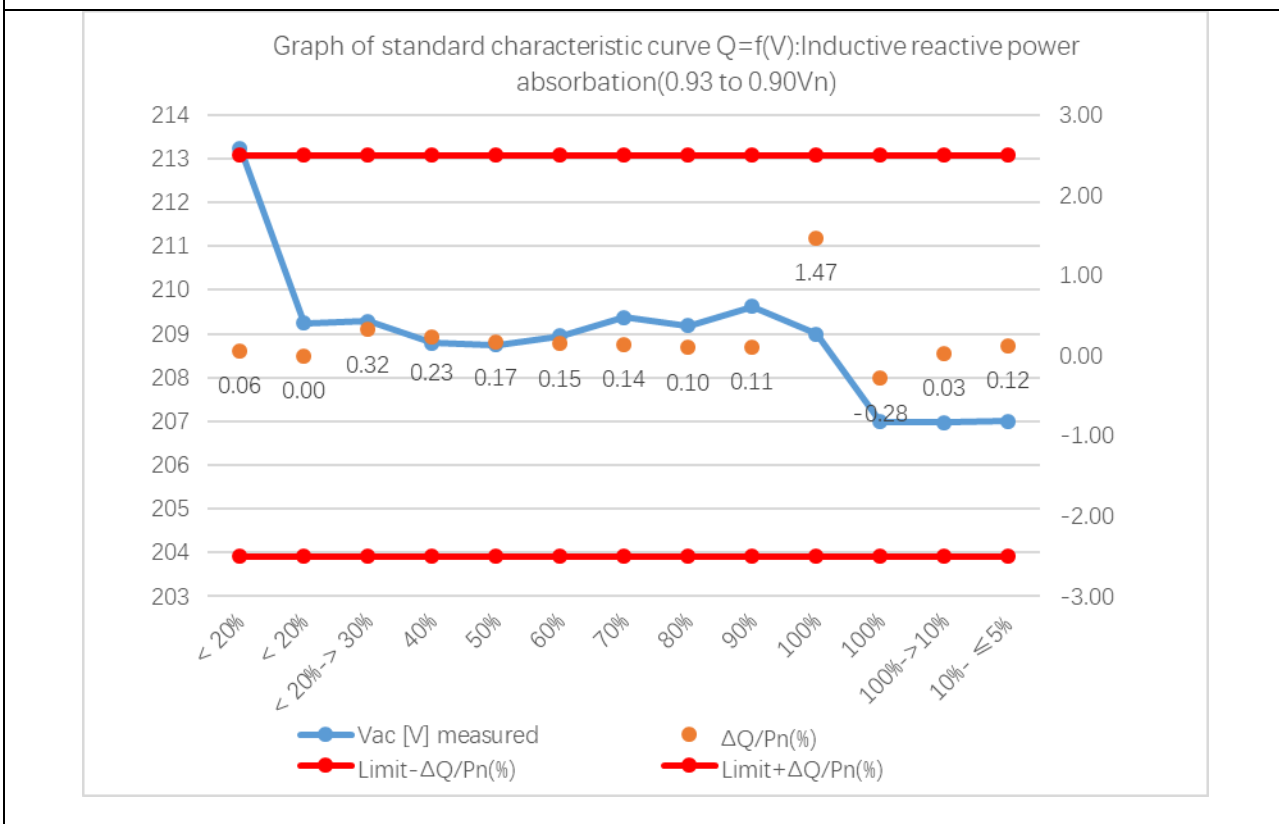
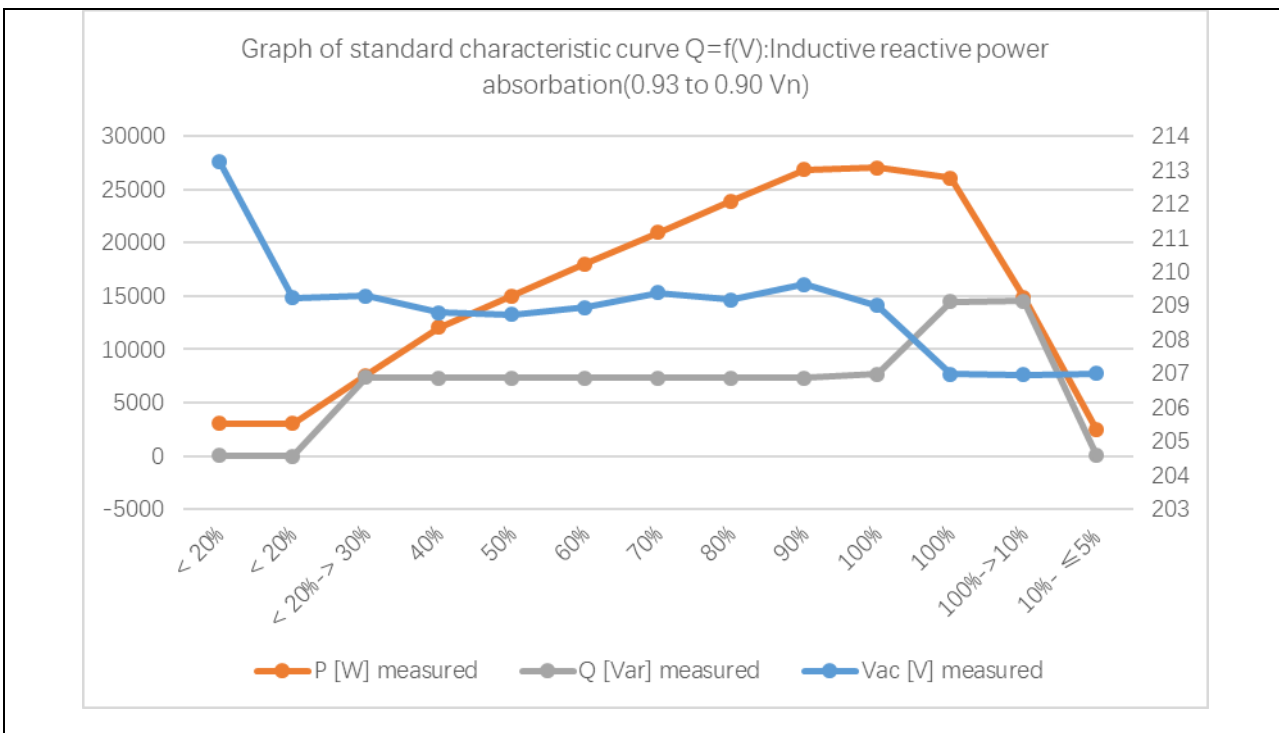
CEI 0-21						
Clause	Requirement - Test			Result - Remark		Verdict
<b>B.1.2.6.1</b>	<b>Checking compliance with the rules for implementing the standard curve <math>Q = f(V)</math></b>					<b>P</b>
Model: EA30KTSI						
Test result:						<b>P</b>
<b>Qmin reactive power in accordance to standard characteristic curve <math>Q=f(V)</math></b>						
P/Pn Set-point	Vac [V] Set point	P/Pn [%] measured	Vac [V] measured	Q [Var] measured	Q [Var] expected	$\Delta Q [\leq \pm 2.5\%Pn]$
< 20%	1.07Vn	10	246.05	126.85	$\approx 0 (< \pm 2.5\%Pn)$	126.85
< 20%	1.09Vn	9.97	250.53	130.39	$\approx 0 (< \pm 2.5\%Pn)$	130.39
< 20%-> 30%	1.09Vn	24.69	249.76	-7236.73	-0.5 Qmin (within 10s)	27.77
40%	1.09Vn	39.6	250.64	-7303.15	-0.5 Qmin	-38.65
50%	1.09Vn	49.53	250.48	-7302.80	-0.5 Qmin	-38.30
60%	1.09Vn	59.45	250.40	-7303.08	-0.5 Qmin	-38.58
70%	1.09Vn	69.33	250.35	-7289.30	-0.5 Qmin	-24.80
80%	1.09Vn	79.21	250.64	-7297.22	-0.5 Qmin	-32.72
90%	1.09Vn	89.05	250.63	-7295.96	-0.5 Qmin	-31.46
100%	1.09Vn	98.93	250.67	-7299.92	-0.5 Qmin	-35.42
100%	1.1 Vn	86.37	253.01	-14425.80	- Qmin	103.20
100%->10%	1.1 Vn	49.92	253.00	-14430.29	- Qmin	98.71
10%- ≤5%	1.1 Vn	7.73	253.00	53.95	$\approx 0 (< \pm 2.5\%Pn)$	53.95
<b>Qmax reactive power in accordance to standard characteristic curve <math>Q=f(V)</math></b>						
P/Pn Set-point	Vac [V] Set point	P/Pn [%] measured	Vac [V] measured	Q [Var] measured	Q [Var] expected	$\Delta Q [\leq \pm 2.5\%Pn]$
< 20%	0.93Vn	10.22	213.24	19.30	$\approx 0 (< \pm 2.5\%Pn)$	19.30
< 20%	0.91Vn	10.24	209.24	-0.05	$\approx 0 (< \pm 2.5\%Pn)$	-0.05
< 20%-30%	0.91Vn	25.2	209.29	7361.75	0.5 Qmax (within 10s)	97.25
40%	0.91Vn	40.16	208.79	7334.70	0.5 Qmax	70.20
50%	0.91Vn	50.09	208.74	7315.94	0.5 Qmax	51.44
60%	0.91Vn	59.98	208.95	7310.17	0.5 Qmax	45.67
70%	0.91Vn	69.85	209.38	7307.14	0.5 Qmax	42.64
80%	0.91Vn	79.71	209.18	7295.60	0.5 Qmax	31.10
90%	0.91Vn	89.55	209.63	7297.50	0.5 Qmax	33.00
100%	0.91Vn	90.16	209.00	7705.99	0.5 Qmax	441.49
100%	0.90Vn	86.95	206.99	14443.99	Qmax	-85.01
100%->10%	0.90Vn	49.67	206.97	14537.90	Qmax	8.9

CEI 0-21						
Clause	Requirement - Test			Result - Remark		Verdict
10%- ≤5%	0.90Vn	8.13	207.00	37.36	≈0(<±2.5%Pn)	37.36
<p><b>Note:</b></p> <p>The lock-in value is adjustable between Vn and 1.1Vn and the lock-out value between Vn and 0.9Vn in 0.01V steps.</p> <p>The inverter voltage on the AC side of the (inverter) is rated to 400V line to line.</p> <p>In reference to the circular characteristic, the inverter reduces the active output power to maintain the reactive output power.</p> <p>The under voltage measurement effects the active output power in reference to the reactive output power since the reactive output power has always priority. Therefore the inverter must lower the active output power.</p> <p>The tests were performed on model EA30KTSI and are also applicable for all other models stated in this report.</p>						

CEI 0-21			
Clause	Requirement - Test	Result - Remark	Verdict



CEI 0-21			
Clause	Requirement - Test	Result - Remark	Verdict





CEI 0-21			
Clause	Requirement - Test	Result - Remark	Verdict

<b>B.1.3</b>	<b>Limitation of power</b>	<b>P</b>
Clause	Test	Result
B.1.3.1	Automatic limitation of active power for voltage values close to 110% of the rated voltage	P
B.1.3.2	Adjusting active power in the presence of transients on the transmission network	P
B.1.3.2.2	Test results	P
B.1.3.3.1	Reduction of active power in the presence of under-frequency transients on transmission network	P
B.1.3.4	Limitation of the active power by an external control from the distributor	P

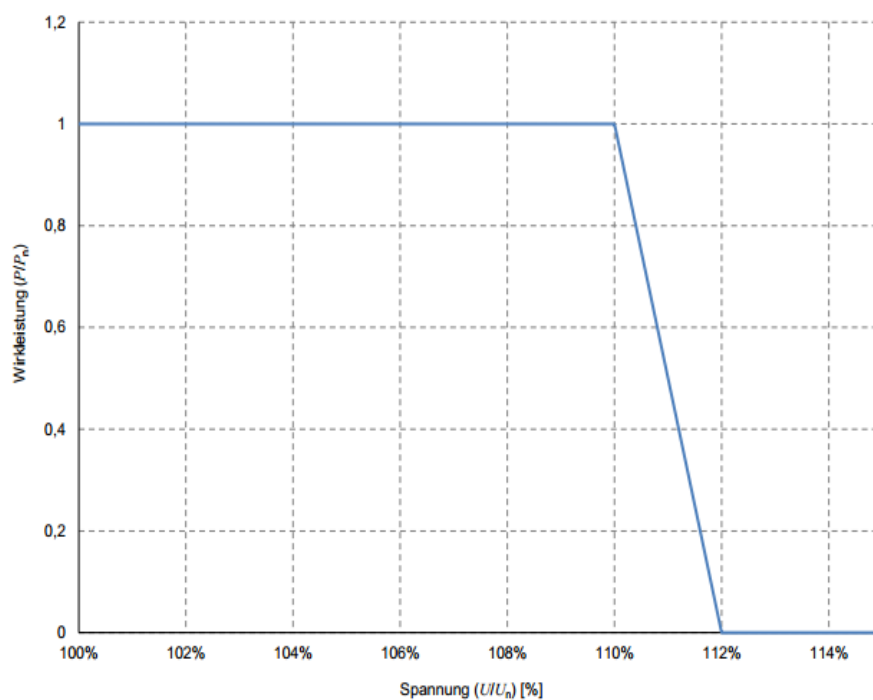
CEI 0-21			
Clause	Requirement - Test	Result - Remark	Verdict

<b>B.1.3.1</b>	<b>Automatic limitation of active power for voltage values close to 110% of the rated voltage</b>	<b>P</b>
----------------	---	----------

<b>Model</b>	EA30KTSI
--------------	----------

Threshold set @ 110%  $U_n$ .

Test voltage (% $U_n$ )	Measured voltage (V)	Measured current (A)	Measured P (W)	Measured Q (Var)	Target P / P <sub>n</sub>	Deviation $\Delta P / P_n$
100	231.01	43.30	29977.77	-261.517	100%	0.07%
108	248.95	40.09	29917.73	302.02	100%	0.27%
110	253.95	39.42	30004.41	311.52	100%	0.01%
112	257.56	0.41	0.19	121.52	0%	0%
110	253.92	39.40	29986.15	282.56	100%	0.04%
108	248.97	40.18	29989.58	290.76	100%	0.02%
100	231.12	43.28	29983.73	-378.15	100%	0.05%



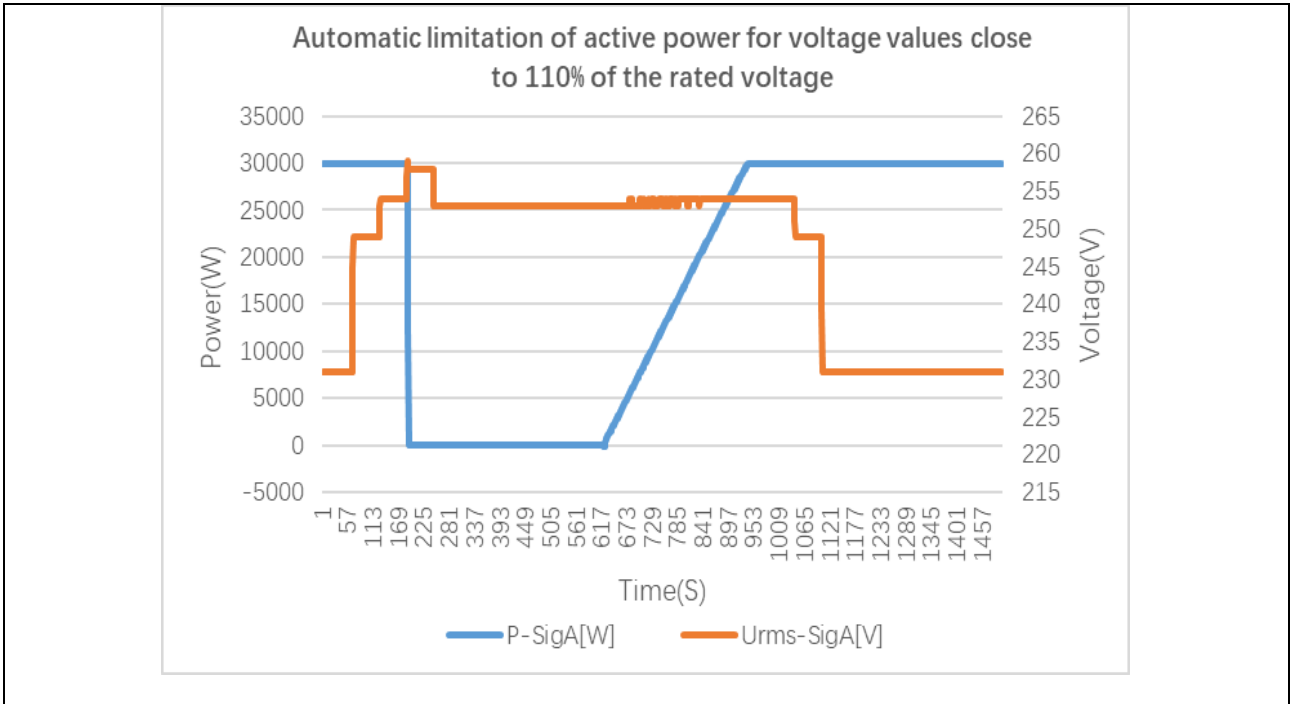
**Notes:**

within 5 min from the moment of application of the voltage 2% of the activation threshold declared by the manufacturer, verify that the active power supplied by the inverter has been reduced to a value not exceeding 20% \* P<sub>n</sub>;

**Test Graph:**

**CEI 0-21**

Clause	Requirement - Test	Result - Remark	Verdict
--------	--------------------	-----------------	---------



CEI 0-21			
Clause	Requirement - Test	Result - Remark	Verdict

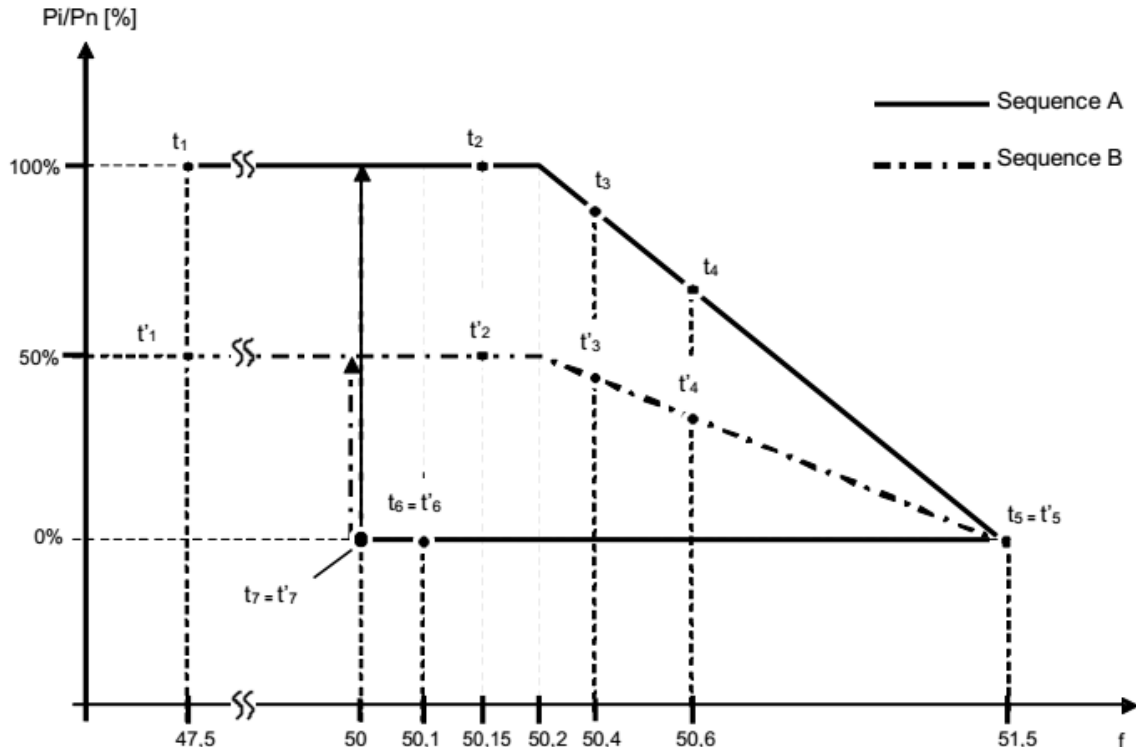
B.1.3.2	Adjusting active power in the presence of transients on the transmission network	P
---------	--	---

- Connect the test object following the manufacturer's instructions.
- Set all parameters of the simulated network to the respective normal operation values.
- Set all the parameters of the test object to the respective normal operation values, so that the output AC power of the inverter is equal to the maximum AC output for sequence A, and 50% in the case of sequence B.
- Take measurements at 7 points (the frequency value should have a maximum uncertainty of  $\pm 10$  mHz) consecutively over time:

- 1)  $f = 47.51$  Hz ( $t_1$  for sequence A,  $t'_1$  for sequence B)
- 2)  $f = 50$  Hz + 0.15 Hz ( $t_2$  for sequence A,  $t'_2$  for sequence B)
- 3)  $f = 50$  Hz + 0.40 Hz ( $t_3$  for sequence A,  $t'_3$  for sequence B)
- 4)  $f = 50$  Hz + 0.60 Hz ( $t_4$  for sequence A,  $t'_4$  for sequence B)
- 5)  $f = 50$  Hz + 1.49 Hz ( $t_5$  for sequence A,  $t'_5$  for sequence B)
- 6)  $f = 50$  Hz + 0.11 Hz ( $t_6$  for sequence A,  $t'_6$  for sequence B)

At this point, perform step 7 bringing the frequency back to the nominal value in order to check the conditions for a gradual recovery of the maximum supply (sequence A), or 50% of the maximum power (sequence B):

- 7)  $f = 50$  Hz ( $t_7$  for sequence A,  $t'_7$  for sequence B)

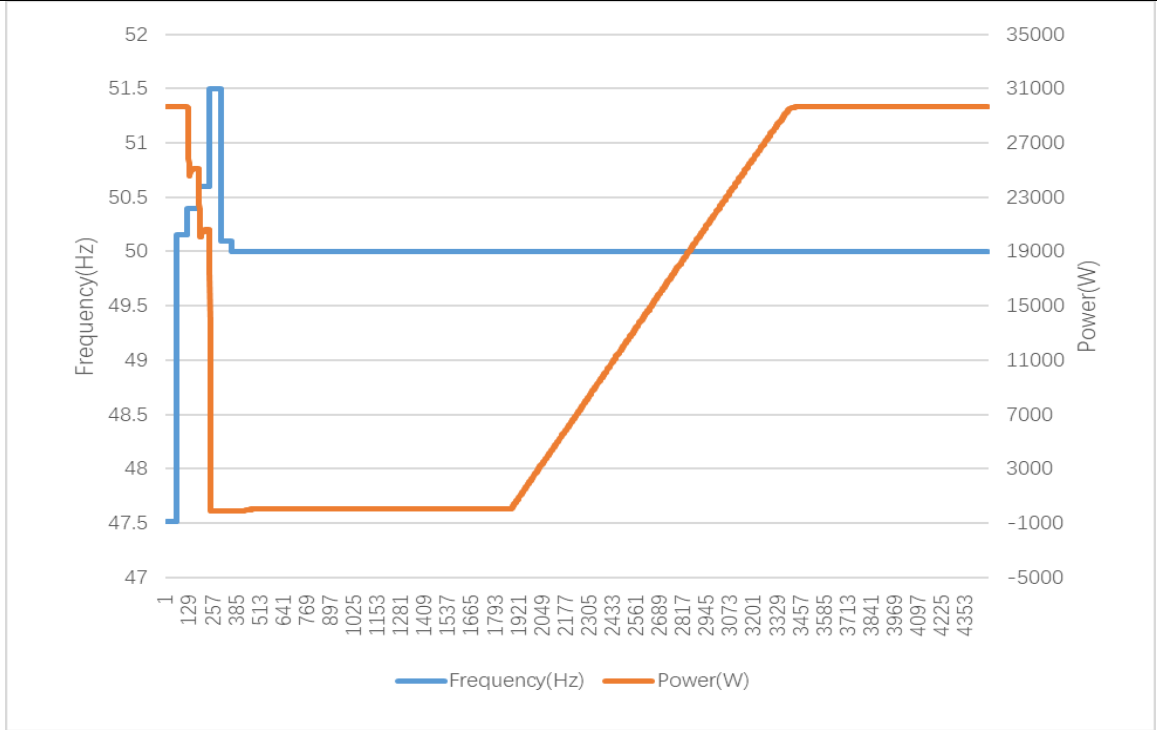


CEI 0-21			
Clause	Requirement - Test	Result - Remark	Verdict

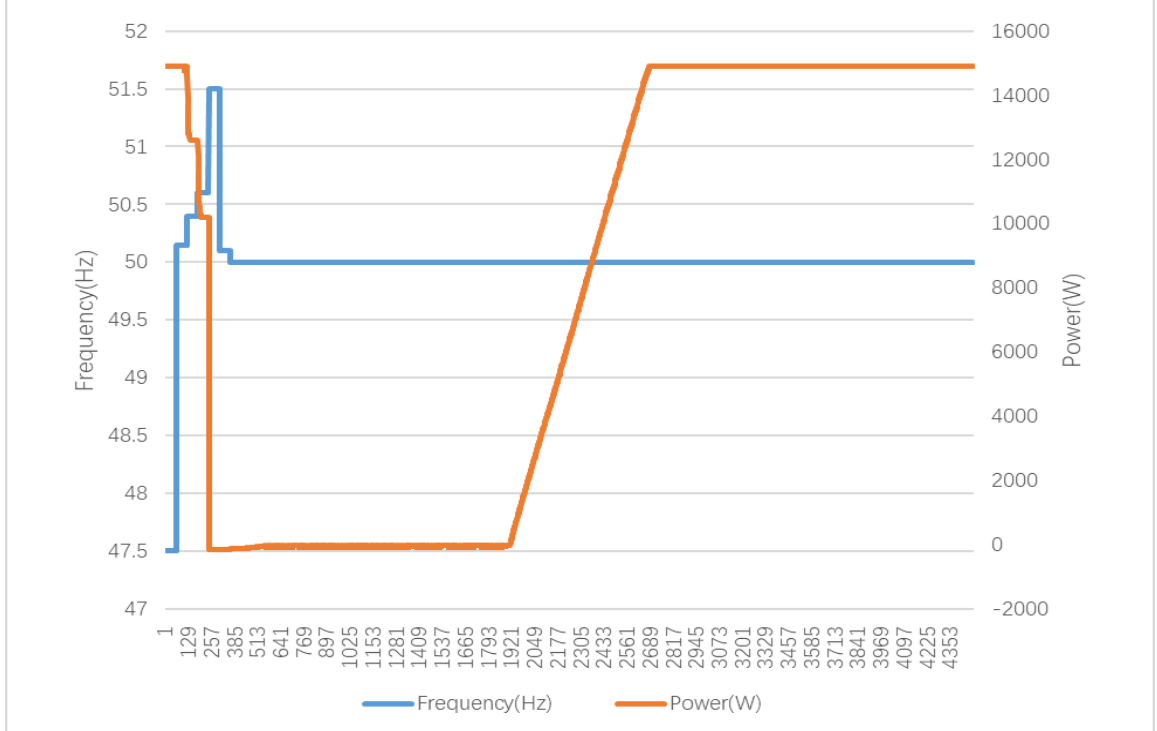
B.1.3.2.2	Test results							P
Model: EA30KTSI								
1-min mean value[Hz]	47.51	50.15	50.40	50.60	51.49	50.11	50.00	
1. Measurement sequence A: Active power output = 100% P <sub>n</sub>								
Frequency [Hz]:	47.51	50.15	50.40	50.60	51.49	50.11	50.00	
P <sub>setpoint</sub> [W]:	30000	30000	25384	20769	232	232	30000	
P <sub>E60</sub> [W]:	29698	29657	25043	20575	-137	-132	29697	
ΔP <sub>E60</sub> /P <sub>n</sub> [%]:	-1.01	-1.15	-1.13	-0.64	-1.23	-1.22	-1.01	
2. Measurement sequence B: Active power output = 50% P <sub>n</sub>								
Frequency [Hz]:	47.51	50.15	50.40	50.60	51.49	50.11	50.00	
P <sub>setpoint</sub> [W]:	15000	15000	12692	10384	115	115	15000	
P <sub>E60</sub> [W]:	14893	14862	12567	10190	-128	-129	14892	
ΔP <sub>E60</sub> /P <sub>n</sub> [%]:	-0.36	-0.45	-0.42	-0.64	-0.81	-0.81	-0.35	
Limit ΔP <sub>E60</sub> /P <sub>n</sub> :	± 2.5% % of P <sub>n</sub>							
Note: The tests were performed on model EA30KTSI and are also applicable for all other models stated in this report.								

CEI 0-21			
Clause	Requirement - Test	Result - Remark	Verdict

**Graph of Measurement sequence A: Active power output = 100% P<sub>n</sub>**



**Graph of Measurement sequence B: Active power output = 50% P<sub>n</sub>**



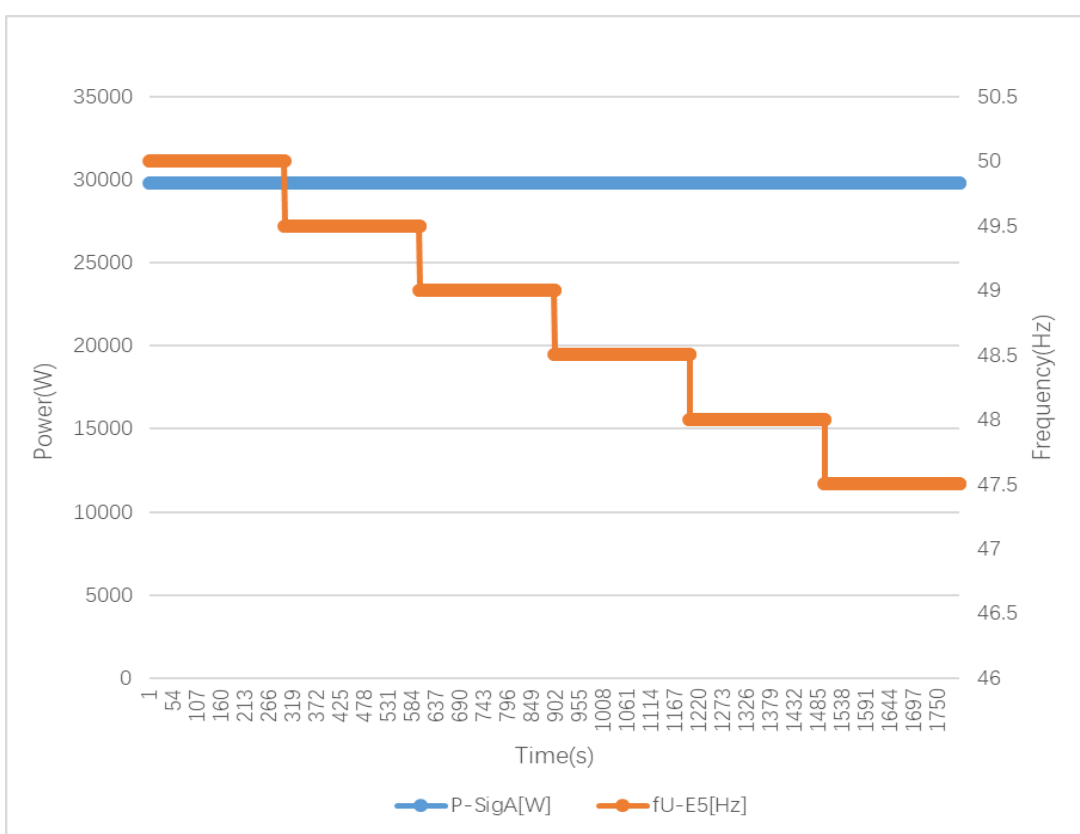
CEI 0-21			
Clause	Requirement - Test	Result - Remark	Verdict

<b>B.1.3.3.1</b>	<b>Reduction of active power in the presence of under-frequency transients on transmission network</b>	<b>P</b>
------------------	--	----------

Model: EA30KTSI

5-min mean value	50.0 Hz	49.5 Hz	49.0 Hz	48.5 Hz	48.0 Hz	47.5 Hz
Frequency [Hz]:	50.0 Hz	49.5 Hz	49.0 Hz	48.5 Hz	48.0 Hz	47.5 Hz
Active power [W]:	29800.01	29800.01	29800.02	29800.01	29800.02	29800.02

Graph of frequency and power from step 50.0Hz to 47.5Hz:



Test:

The test must be carried out at 100%  $P_n$ .

Measurements are carried out at the following operating points:

- Connect the object under test according to the instructions provided by the manufacturer.
- Set all the parameters of the simulated network to the respective values of normal exercise.
- Bring all the parameters of the object under test to the respective values of normal performance, such that the out power of the inverter is equal to the maximum deliverable power.
- Implement measures of active power on 6 points of time from each other on the basis of 50 Hz, and by reducing the frequency of 0.5 Hz with a step up to the minimum value of 47.5 Hz.

The each operating point shall be maintained for at least 5 min.

The tests were performed on model EA30KTSI and are also applicable for all other models stated in this report.

## CEI 0-21

Clause	Requirement - Test	Result - Remark	Verdict
--------	--------------------	-----------------	---------

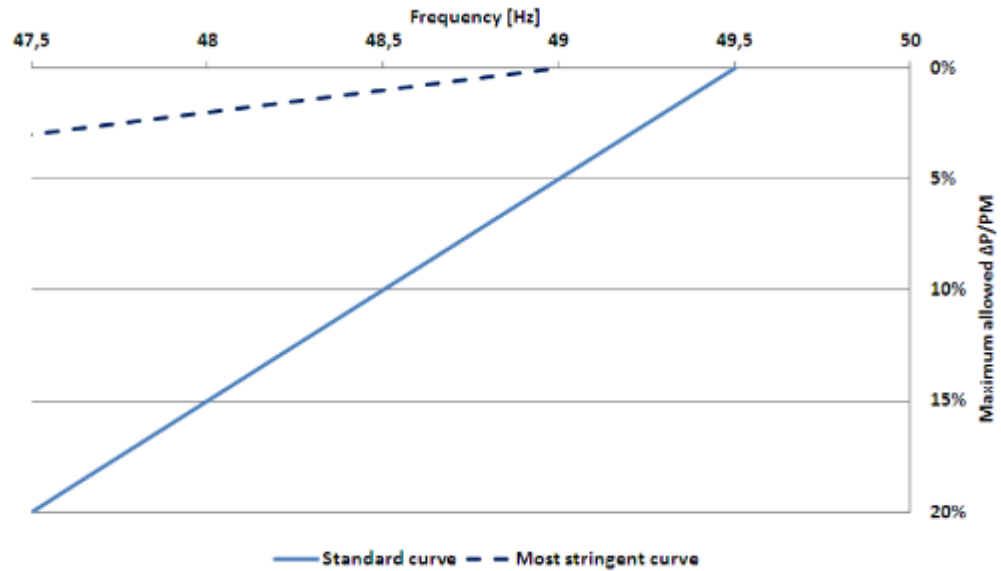
Assessment criterion:

The test is regarded as passed if:

the results should be presented in a table, and on the basis they must extrapolate the trend on a graph that must be greater than the threshold identified by continuous tract of fig. 12bis contained in the 8.4.4.

- the power reduction in point c) is less or equal to the allowed power reduction according to 8.4.4.

The power reduction in point c) is less or equal to the power reduction of 10 %  $P_M$  per 1 Hz drop.



Maximum allowable power reduction in case of under-frequency



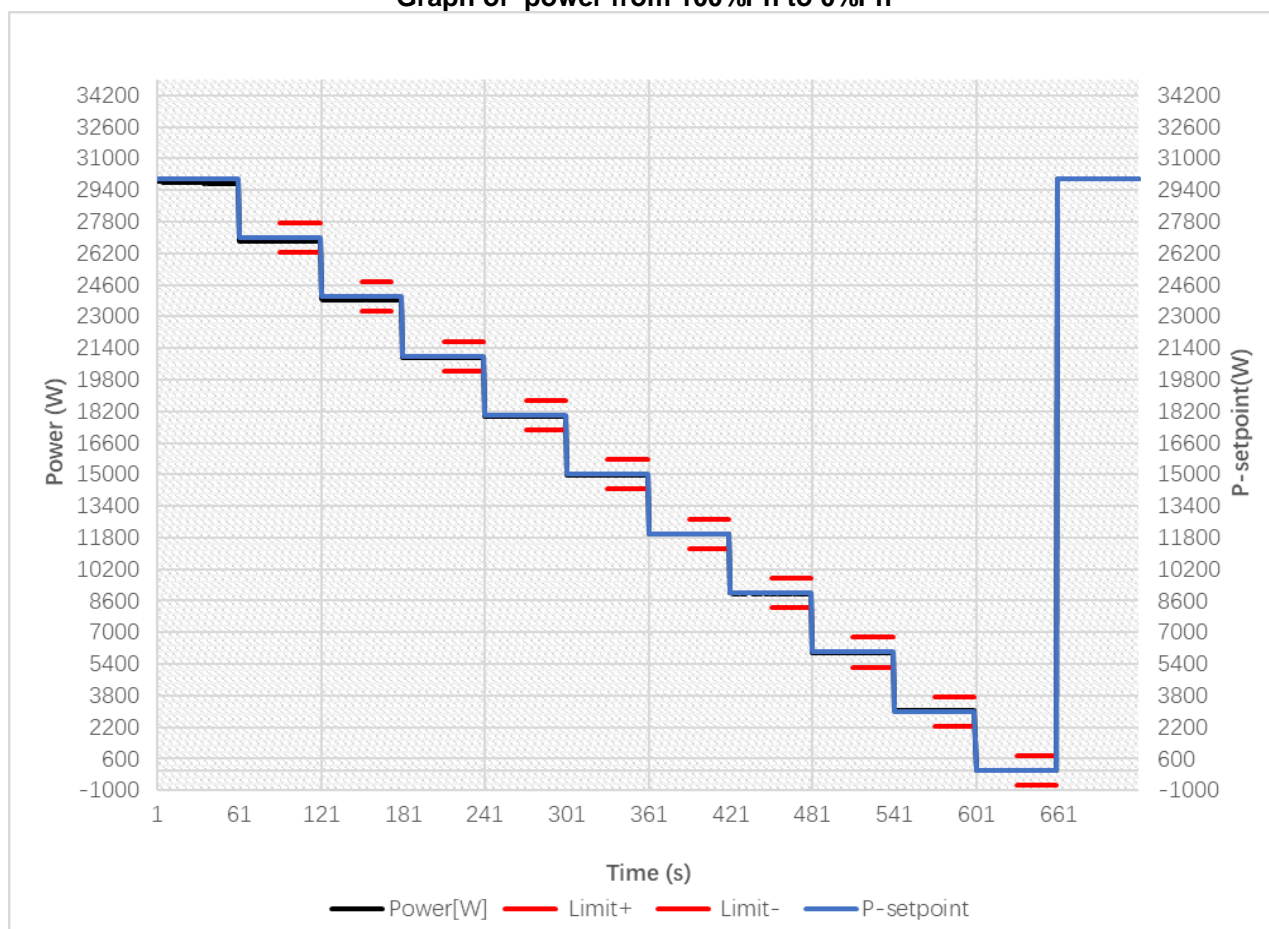
CEI 0-21			
Clause	Requirement - Test	Result - Remark	Verdict

<b>B.1.3.4</b>	<b>Limitation of active power by external control from the distributor</b>	<b>P</b>
----------------	--	----------

Model: EA30KTSI

Set point P [P/Pn]	Set point P [W]	P measured [W]	Accuracy[%]
100%	30000	28768.90	-4.10
90%	27000	26797.12	-0.75
80%	24000	23848.46	-0.63
70%	21000	20893.85	-0.51
60%	18000	17932.06	-0.37
50%	15000	14953.45	-0.31
40%	12000	11965.55	-0.29
30%	9000	8970.43	-0.32
20%	6000	5980.12	-0.33
10%	3000	3038.69	1.28
0%	0	1.585	--

Graph of power from 100%Pn to 0%Pn

**Note:**

The tests were performed on model EA30KTSI and are also applicable for all other models stated in this report.

CEI 0-21			
Clause	Requirement - Test	Result - Remark	Verdict

<b>B.1.4</b>	<b>Output of the DC component in the output current</b>		<b>P</b>
Clause	Test		Result
B.1.4.1	Checking the DC component output		P
B.1.4.2	Checking the protection against DC input		P

CEI 0-21			
Clause	Requirement - Test	Result - Remark	Verdict

B.1.4.1	Checking the DC component output			P
Model: EA30KTSI				
<b>Phase A</b>				
Power Level	(33 ± 5)%	(66 ± 5)%	(100 ± 5)%	
<b>Ambient</b>				
Power (W)	3080.00	6611.02	9828.43	
Voltage (V)	230.46	225.39	225.54	
Current (A)	13.26	28.28	42.05	
PF	0.997	0.998	0.997	
Cosp	0.997	0.998	0.997	
DC Component (A)	0.033	0.075	0.094	
DC Component (% In)	0.230	0.261	0.216	
<b>Minimum ambient rating or -25°C</b>				
Power (W)	3081.53	6610.45	9828.87	
Voltage (V)	225.05	224.64	224.91	
Current (A)	13.20	28.21	41.95	
PF	0.998	0.997	0.997	
Cosp	0.998	0.998	0.997	
DC Component (A)	0.033	0.063	0.089	
DC Component (% In)	0.230	0.219	0.205	
<b>Maximum ambient rating or 60°C</b>				
Power (W)	3080.87	6610.34	9827.48	
Voltage (V)	226.32	224.62	224.74	
Current (A)	13.24	28.21	41.92	
PF	0.998	0.997	0.997	
Cosp	0.998	0.998	0.997	
DC Component (A)	0.035	0.064	0.096	
DC Component (% In)	0.244	0.223	0.221	
<b>Phase B</b>				
Power Level	(33 ± 5)%	(66 ± 5)%	(100 ± 5)%	
<b>Ambient</b>				
Power (W)	3070.31	6591.03	9799.03	
Voltage (V)	230.22	230.42	230.43	
Current (A)	13.36	28.66	42.61	
PF	0.998	0.998	0.998	
Cosp	0.998	0.998	0.998	
DC Component (A)	0.040	0.065	0.122	
DC Component (% In)	0.278	0.226	0.281	
<b>Minimum ambient rating or -25°C</b>				
Power (W)	3072.76	6589.59	9798.26	
Voltage (V)	230.42	230.42	230.42	
Current (A)	13.36	28.65	42.61	
PF	0.998	0.998	0.998	
Cosp	0.998	0.998	0.998	
DC Component (A)	0.038	0.068	0.092	
DC Component (% In)	0.264	0.237	0.212	
<b>Maximum ambient rating or 60°C</b>				

<b>CEI 0-21</b>			
Clause	Requirement - Test	Result - Remark	Verdict
Power (W)	3071.96	6590.38	9797.26
Voltage (V)	230.42	230.42	230.42
Current (A)	13.36	28.66	42.60
PF	0.998	0.998	0.997
Cosφ	0.998	0.998	0.997
DC Component (A)	0.040	0.065	0.118
DC Component (% In)	0.278	0.226	0.271
<b>Phase C</b>			
Power Level	(33 ± 5)%	(66 ± 5)%	(100 ± 5)%
<b>Ambient</b>			
Power (W)	3070.11	6592.51	9800.75
Voltage (V)	230.17	230.38	230.39
Current (A)	13.36	28.67	42.62
PF	0.998	0.998	0.998
Cosφ	0.998	0.998	0.998
DC Component (A)	0.024	0.067	0.073
DC Component (% In)	0.167	0.233	0.167
<b>Minimum ambient rating or -25°C</b>			
Power (W)	3072.99	6591.29	9799.82
Voltage (V)	230.38	230.39	230.38
Current (A)	13.36	28.66	42.62
PF	0.998	0.998	0.998
Cosφ	0.998	0.998	0.998
DC Component (A)	0.024	0.046	0.063
DC Component (% In)	0.167	0.161	0.145
<b>Maximum ambient rating or 60°C</b>			
Power (W)	3072.31	6591.48	9798.98
Voltage (V)	230.38	230.38	230.38
Current (A)	13.36	28.66	42.61
PF	0.998	0.998	0.998
Cosφ	0.998	0.998	0.998
DC Component (A)	0.027	0.057	0.080
DC Component (% In)	0.188	0.198	0.184

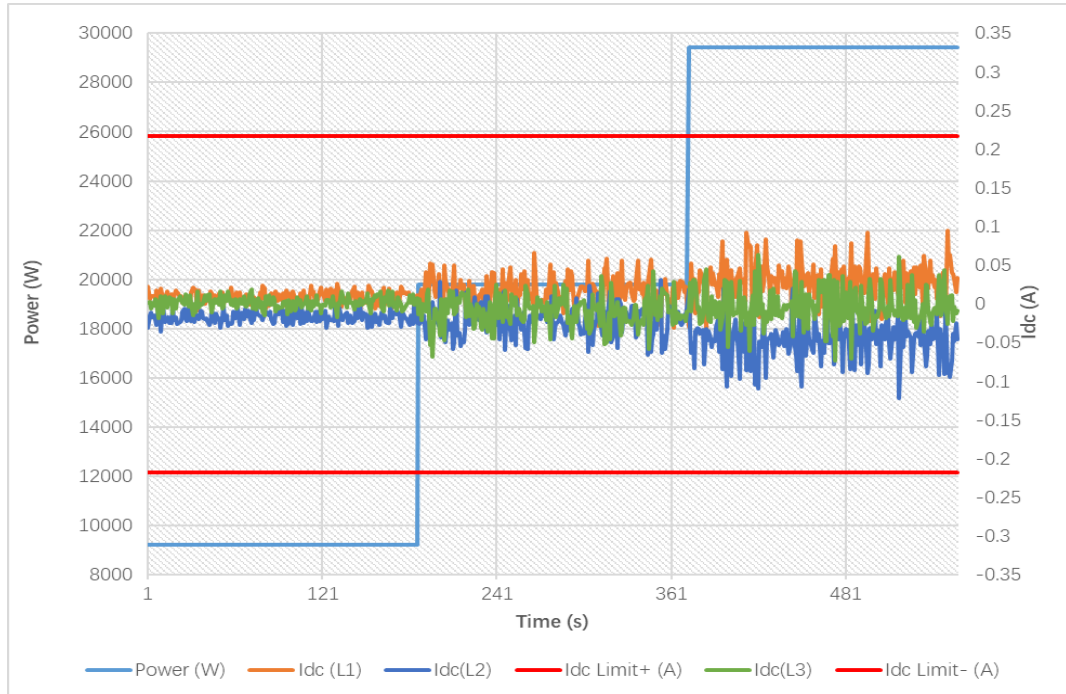
CEI 0-21			
Clause	Requirement - Test	Result - Remark	Verdict

B.1.4.1	Checking the DC component output			P
Model: EA20KTSI				
<b>Phase A</b>				
Power Level	(33 ± 5)%	(66 ± 5)%	(100 ± 5)%	
<b>Ambient</b>				
Power (W)	2060.06	4504.67	6611.26	
Voltage (V)	227.19	224.63	226.46	
Current (A)	8.883	19.221	28.381	
PF	0.998	0.998	0.997	
Cosp	0.998	0.998	0.998	
DC Component (A)	0.017	0.029	0.053	
DC Component (% In)	0.177	0.151	0.182	
<b>Minimum ambient rating or -25°C</b>				
Power (W)	2062.16	4499.24	6610.68	
Voltage (V)	223.30	221.96	225.27	
Current (A)	8.813	19.043	28.274	
PF	0.998	0.998	0.998	
Cosp	0.998	0.998	0.998	
DC Component (A)	0.016	0.039	0.042	
DC Component (% In)	0.167	0.203	0.145	
<b>Maximum ambient rating or 60°C</b>				
Power (W)	2060.69	4499.80	6612.24	
Voltage (V)	222.96	224.53	224.91	
Current (A)	8.799	19.194	28.248	
PF	0.998	0.998	0.998	
Cosp	0.998	0.998	0.998	
DC Component (A)	0.019	0.031	0.052	
DC Component (% In)	0.198	0.162	0.179	
<b>Phase B</b>				
Power Level	(33 ± 5)%	(66 ± 5)%	(100 ± 5)%	
<b>Ambient</b>				
Power (W)	2053.19	4487.32	6590.86	
Voltage (V)	230.34	230.51	230.42	
Current (A)	8.928	19.496	28.660	
PF	0.998	0.998	0.998	
Cosp	0.996	0.998	0.998	
DC Component (A)	0.017	0.031	0.056	
DC Component (% In)	0.178	0.162	0.193	
<b>Minimum ambient rating or -25°C</b>				
Power (W)	2054.98	4482.44	6590.61	
Voltage (V)	230.48	230.51	230.42	
Current (A)	8.930	19.474	28.659	
PF	0.998	0.998	0.998	
Cosp	0.998	0.998	0.998	
DC Component (A)	0.019	0.040	0.066	
DC Component (% In)	0.198	0.209	0.227	
<b>Maximum ambient rating or 60°C</b>				

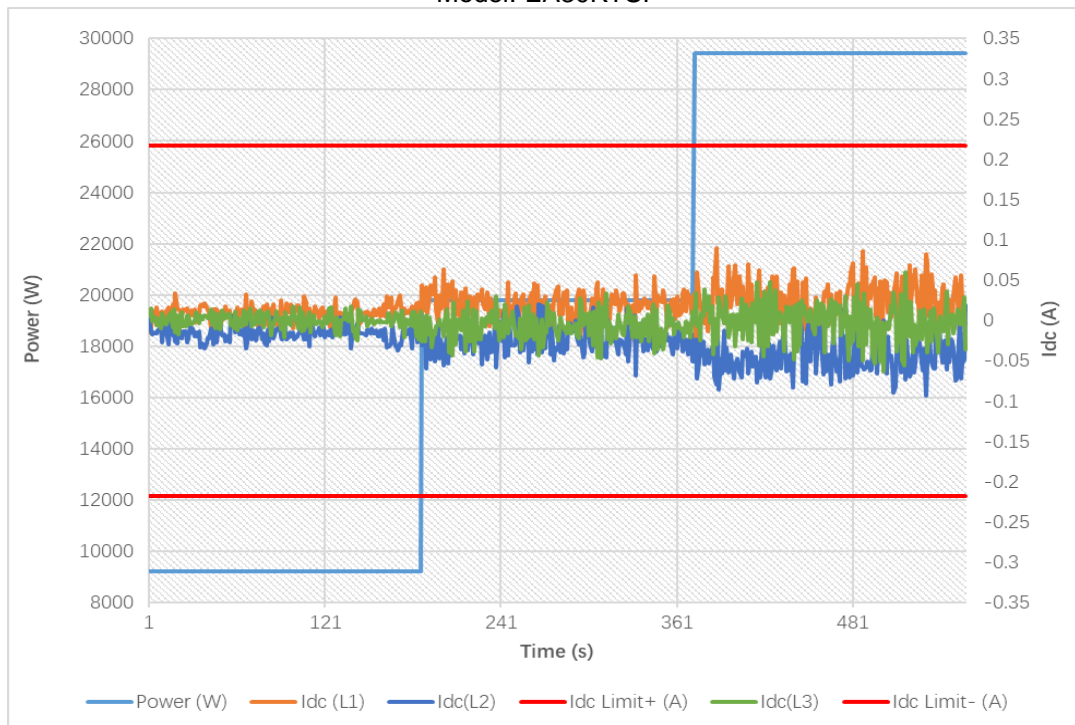
<b>CEI 0-21</b>			
Clause	Requirement - Test	Result - Remark	Verdict
Power (W)	2053.99	4483.21	6592.47
Voltage (V)	230.49	230.51	230.42
Current (A)	8.926	19.477	28.667
PF	0.998	0.998	0.998
Cosφ	0.998	0.998	0.998
DC Component (A)	0.020	0.038	0.054
DC Component (% In)	0.209	0.198	0.186
<b>Phase C</b>			
Power Level	(33 ± 5)%	(66 ± 5)%	(100 ± 5)%
<b>Ambient</b>			
Power (W)	2057.41	4494.98	6592.63
Voltage (V)	230.40	230.48	230.38
Current (A)	8.935	19.529	28.670
PF	0.998	0.998	0.998
Cosφ	0.998	0.998	0.998
DC Component (A)	0.014	0.036	0.053
DC Component (% In)	0.146	0.188	0.183
<b>Minimum ambient rating or -25°C</b>			
Power (W)	2056.71	4489.26	6592.51
Voltage (V)	230.45	230.48	230.38
Current (A)	8.938	19.504	28.669
PF	0.998	0.998	0.998
Cosφ	0.998	0.998	0.998
DC Component (A)	0.016	0.037	0.049
DC Component (% In)	0.167	0.193	0.169
<b>Maximum ambient rating or 60°C</b>			
Power (W)	2055.26	4489.84	6593.60
Voltage (V)	230.45	230.48	230.38
Current (A)	8.932	19.507	28.674
PF	0.998	0.998	0.998
Cosφ	0.998	0.998	0.998
DC Component (A)	0.018	0.030	0.060
DC Component (% In)	0.188	0.157	0.207
Note: The internal temperature of the EUT must be stabilized. The tests were performed on model EA30KTSI and EA20KTSI are also applicable for all other models stated in this report.			

CEI 0-21			
Clause	Requirement - Test	Result - Remark	Verdict

**Diagram of permanent DC-Injection (ambient): 33%/66%/100%Pn**  
 Model: EA30KTSI

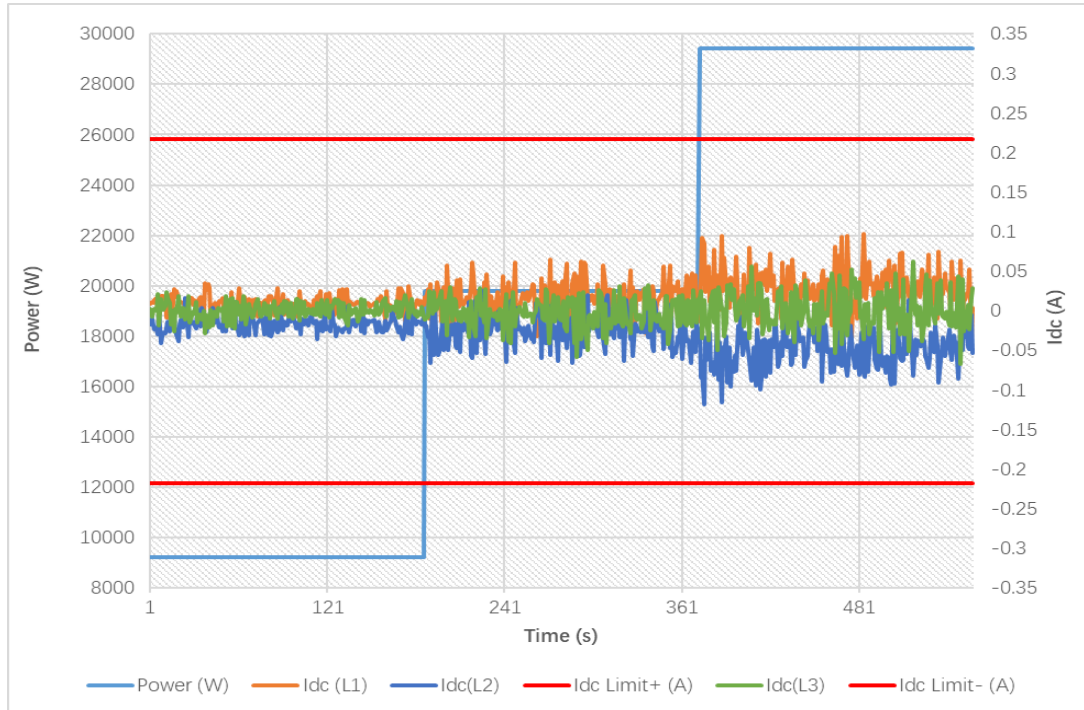


**Diagram of permanent DC-Injection (-25°C): 33%/66%/100%Pn**  
 Model: EA30KTSI

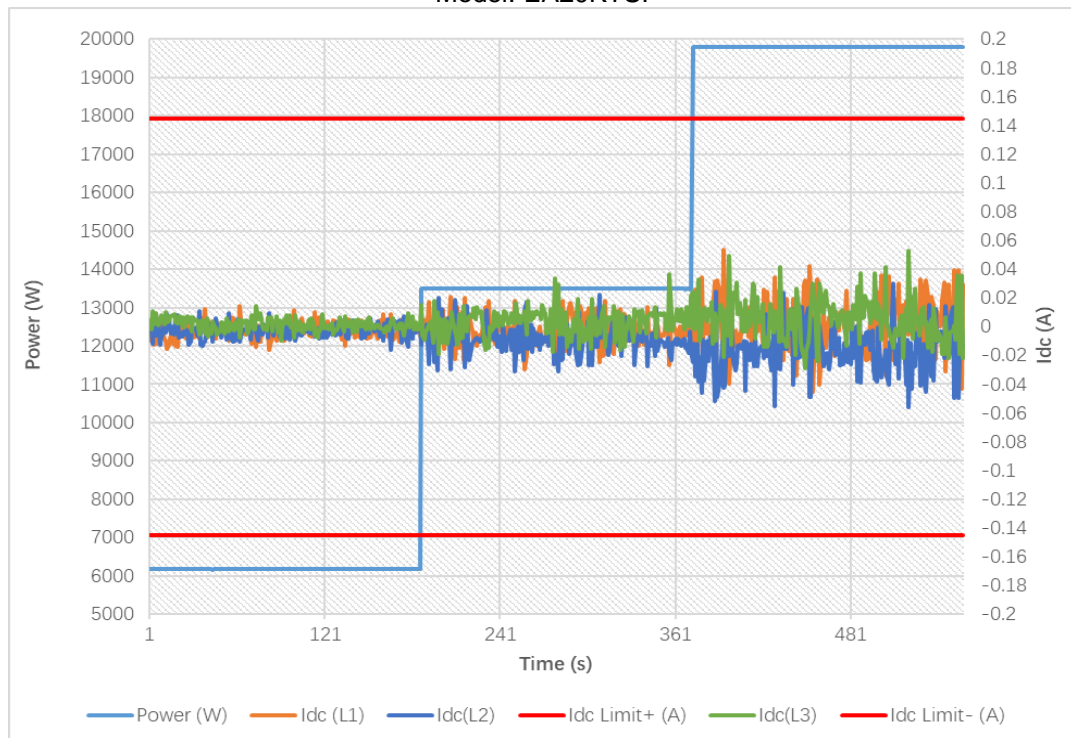


CEI 0-21			
Clause	Requirement - Test	Result - Remark	Verdict

**Diagram of permanent DC-Injection (+60°C): 33%/66%/100%Pn**  
 Model: EA30KTSI



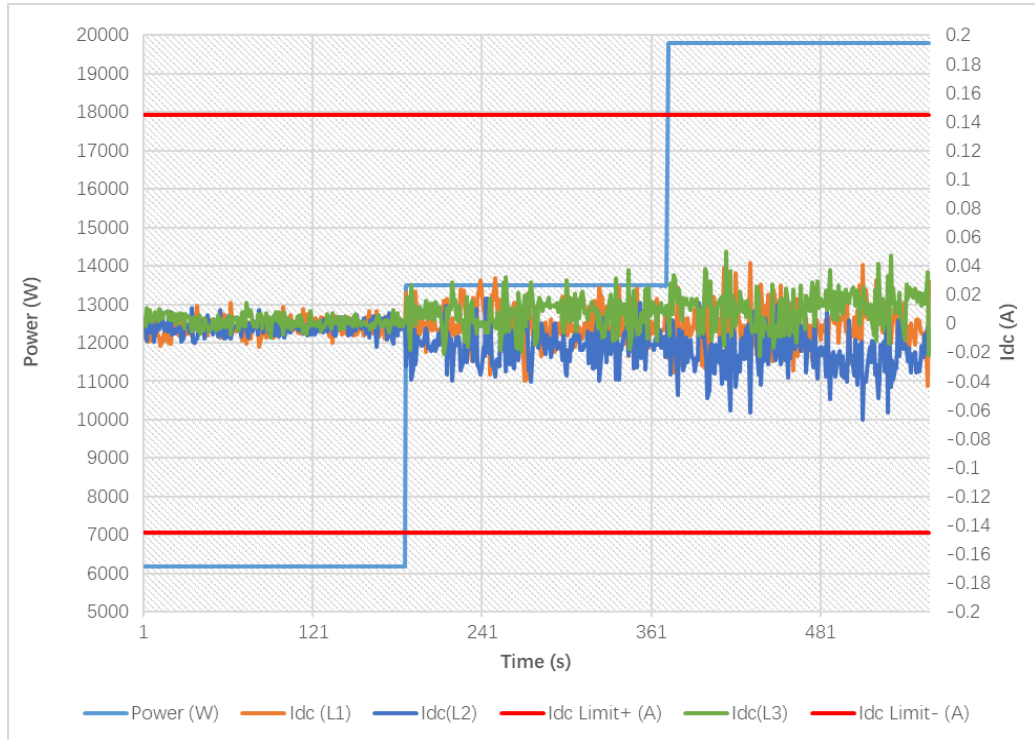
**Diagram of permanent DC-Injection (ambient): 33%/66%/100%**  
 Model: EA20KTSI



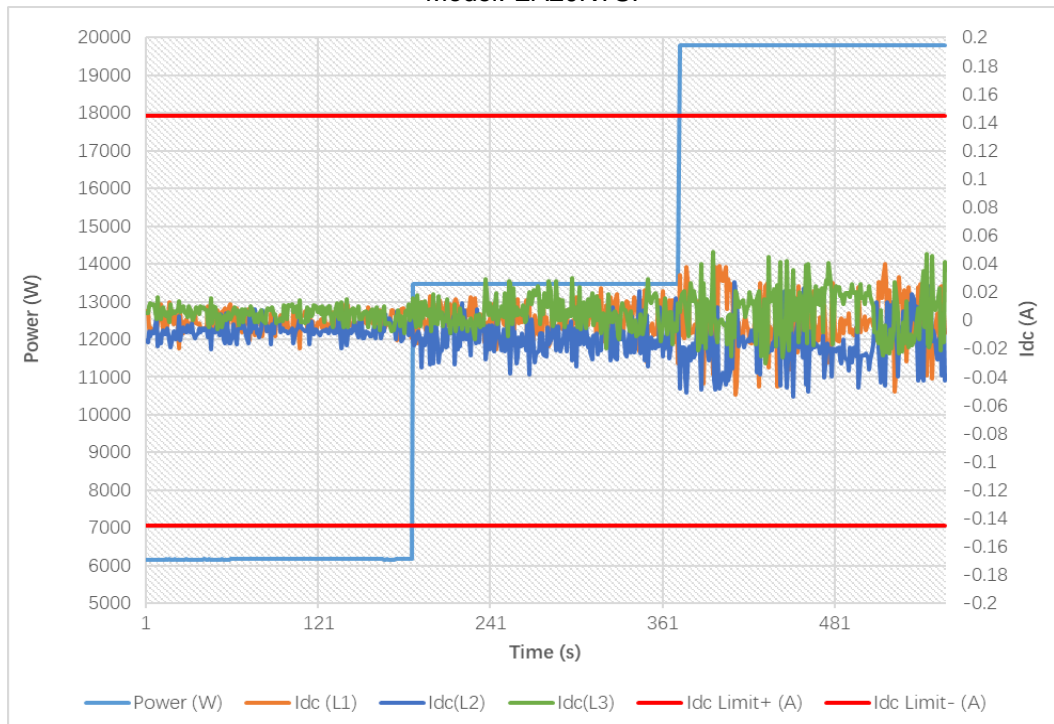


CEI 0-21			
Clause	Requirement - Test	Result - Remark	Verdict

**Diagram of permanent DC-Injection (-25°C): 33%/66%/100%Pn**  
Model: EA20KTSI



**Diagram of permanent DC-Injection(+60°C): 33%/66%/100%Pn**  
Model: EA20KTSI



CEI 0-21			
Clause	Requirement - Test	Result - Remark	Verdict

<b>B.1.4.2</b>	<b>Checking the protection against DC input</b>		<b>P</b>
----------------	---	--	----------

Model: EA30KTSI

Actual Power	Trip time limits	Measurement: (mA)	Limiting value: (mA)	Disconnection time: (ms)
<b><math>I_{dc} = 0,5\% \text{ of } I_{nom}</math></b>				
33%	+0.5% $I_{nom}$ /1s	232	217	860
66%	+0.5% $I_{nom}$ /1s	234	217	992
100%	+0.5% $I_{nom}$ /1s	249	217	892
33%	-0.5% $I_{nom}$ /1s	-214	217	876
66%	-0.5% $I_{nom}$ /1s	-231	217	644
100%	-0.5% $I_{nom}$ /1s	-259	217	910
<b><math>I_{dc} = 1A</math></b>				
33%	+1A Idc/200ms	1018	1000	132
66%	+1A Idc/200ms	1080	1000	146
100%	+1A Idc/200ms	1013	1000	140
33%	-1A Idc/200ms	-1168	1000	136
66%	-1A Idc/200ms	-1017	1000	132
100%	-1A Idc/200ms	-1186	1000	132

Model: EA20KTSI

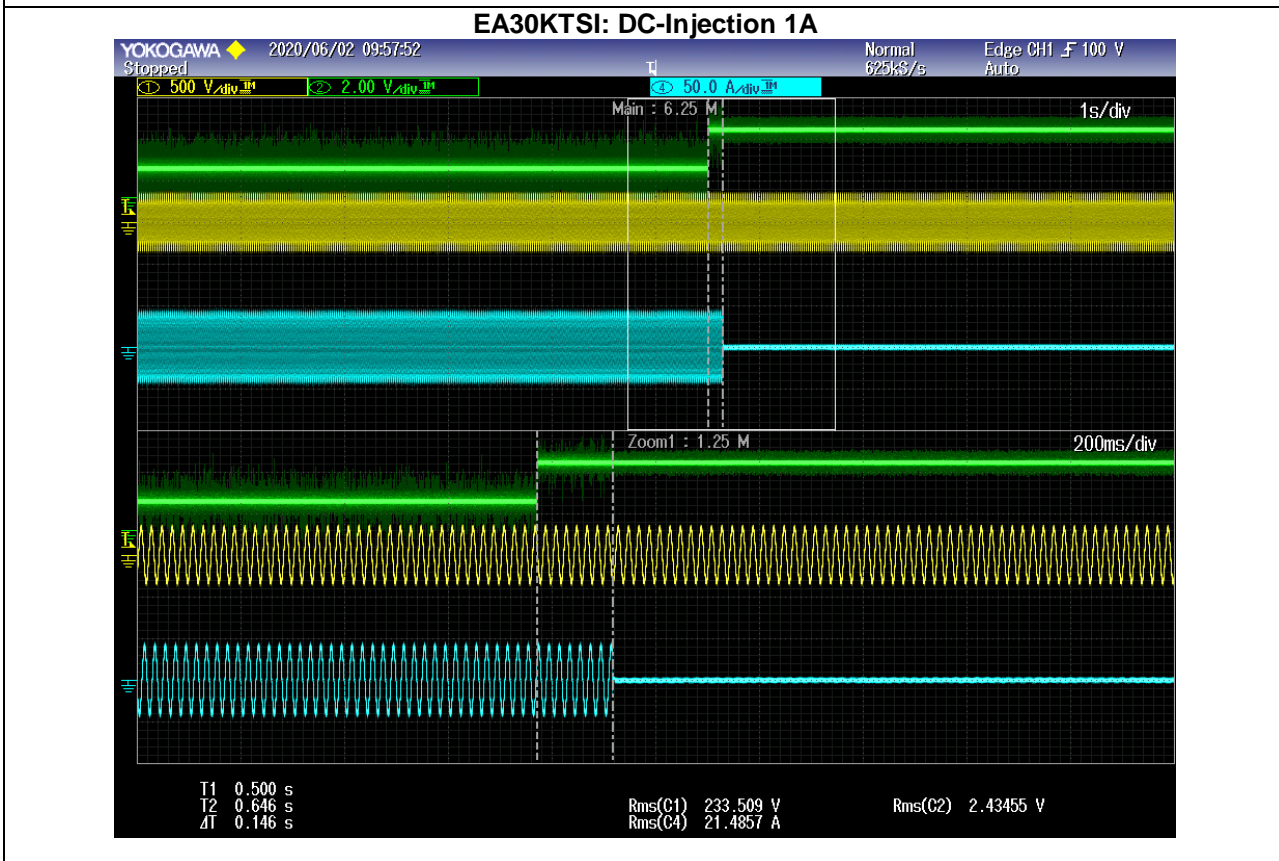
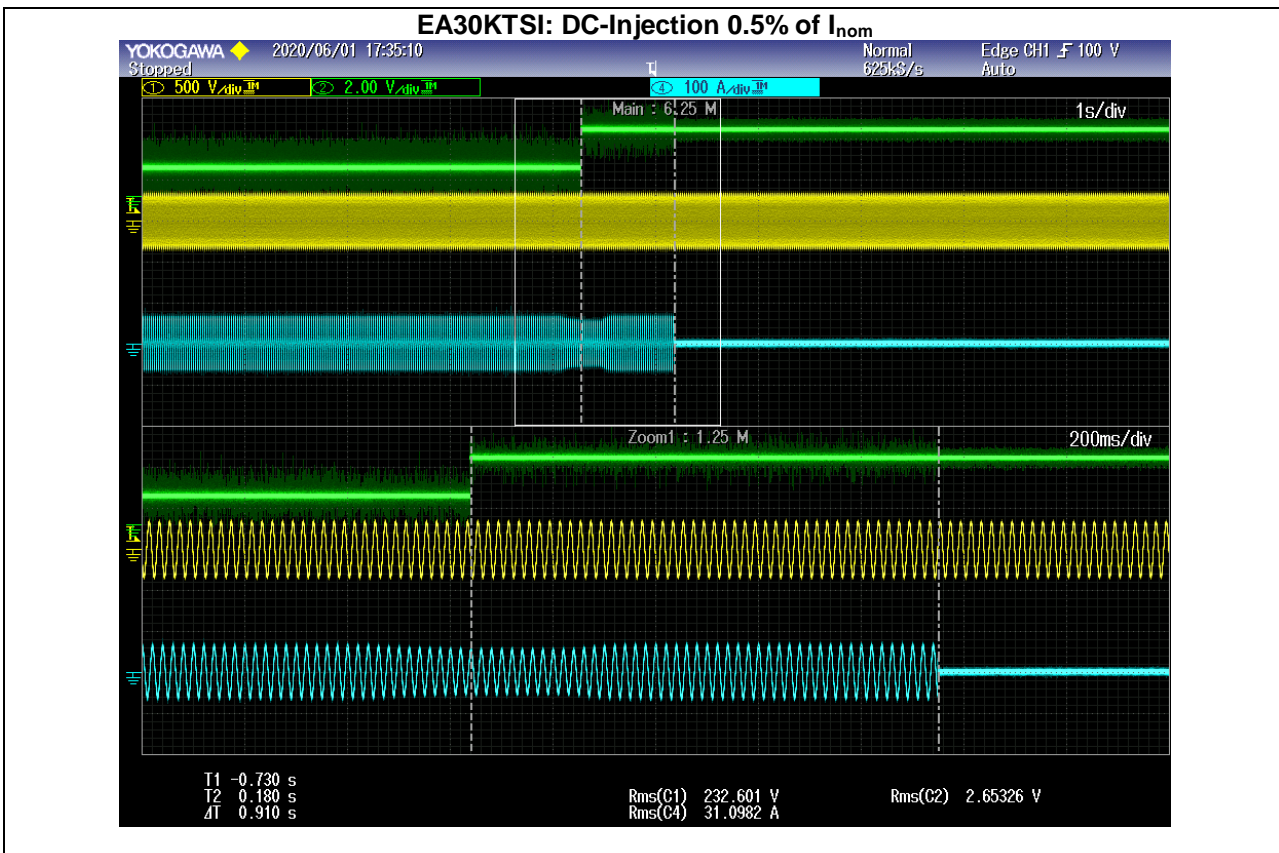
Actual Power	Trip time limits	Measurement: (mA)	Limiting value: (mA)	Disconnection time: (ms)
<b><math>I_{dc} = 0,5\% \text{ of } I_{nom}</math></b>				
33%	+0.5% $I_{nom}$ /1s	166	145	880
66%	+0.5% $I_{nom}$ /1s	173	145	596
100%	+0.5% $I_{nom}$ /1s	188	145	988
33%	-0.5% $I_{nom}$ /1s	-153	145	542
66%	-0.5% $I_{nom}$ /1s	-149	145	886
100%	-0.5% $I_{nom}$ /1s	-182	145	894
<b><math>I_{dc} = 1A</math></b>				
33%	+1A Idc/200ms	1012	1000	142
66%	+1A Idc/200ms	1052	1000	132
100%	+1A Idc/200ms	1007	1000	138
33%	-1A Idc/200ms	-1055	1000	134
66%	-1A Idc/200ms	-1083	1000	148
100%	-1A Idc/200ms	-1014	1000	142

Note:

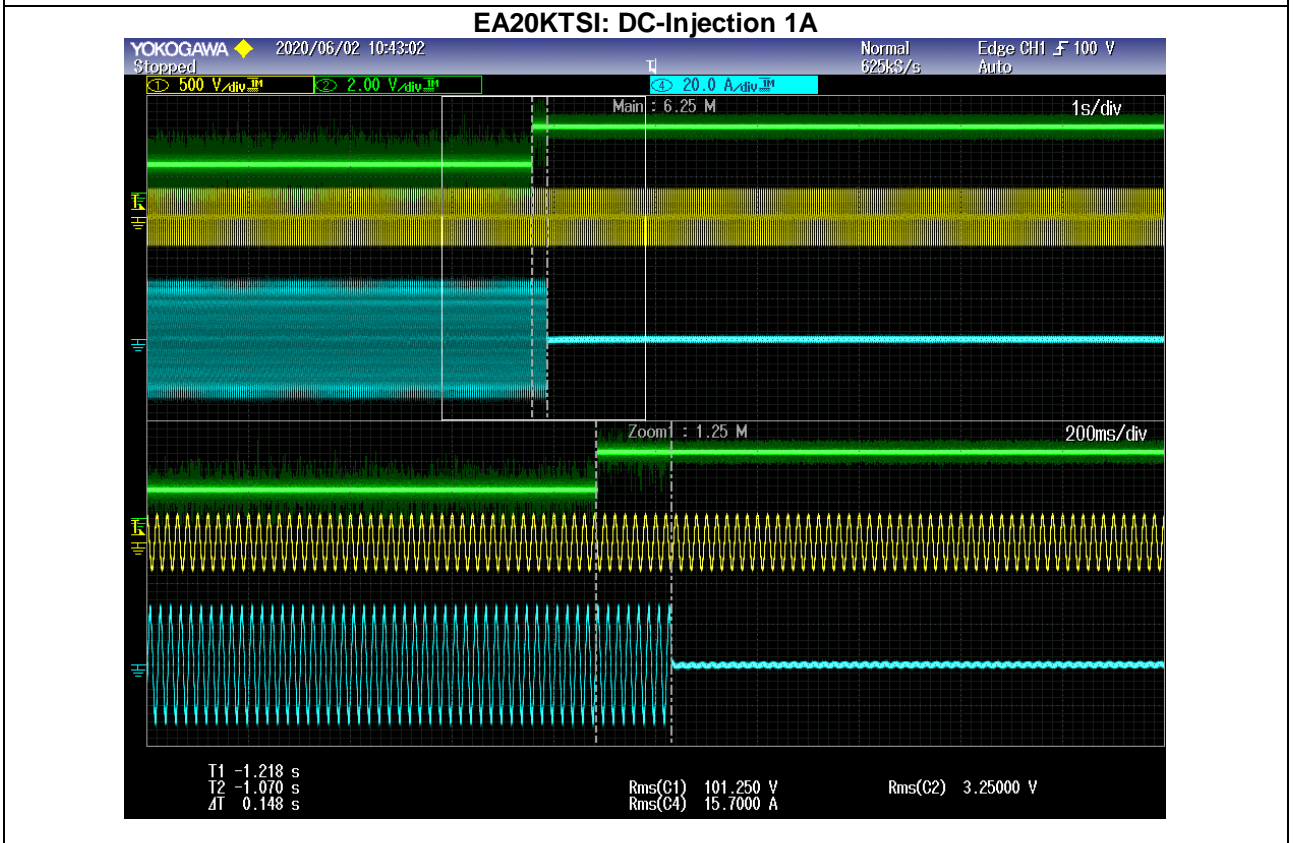
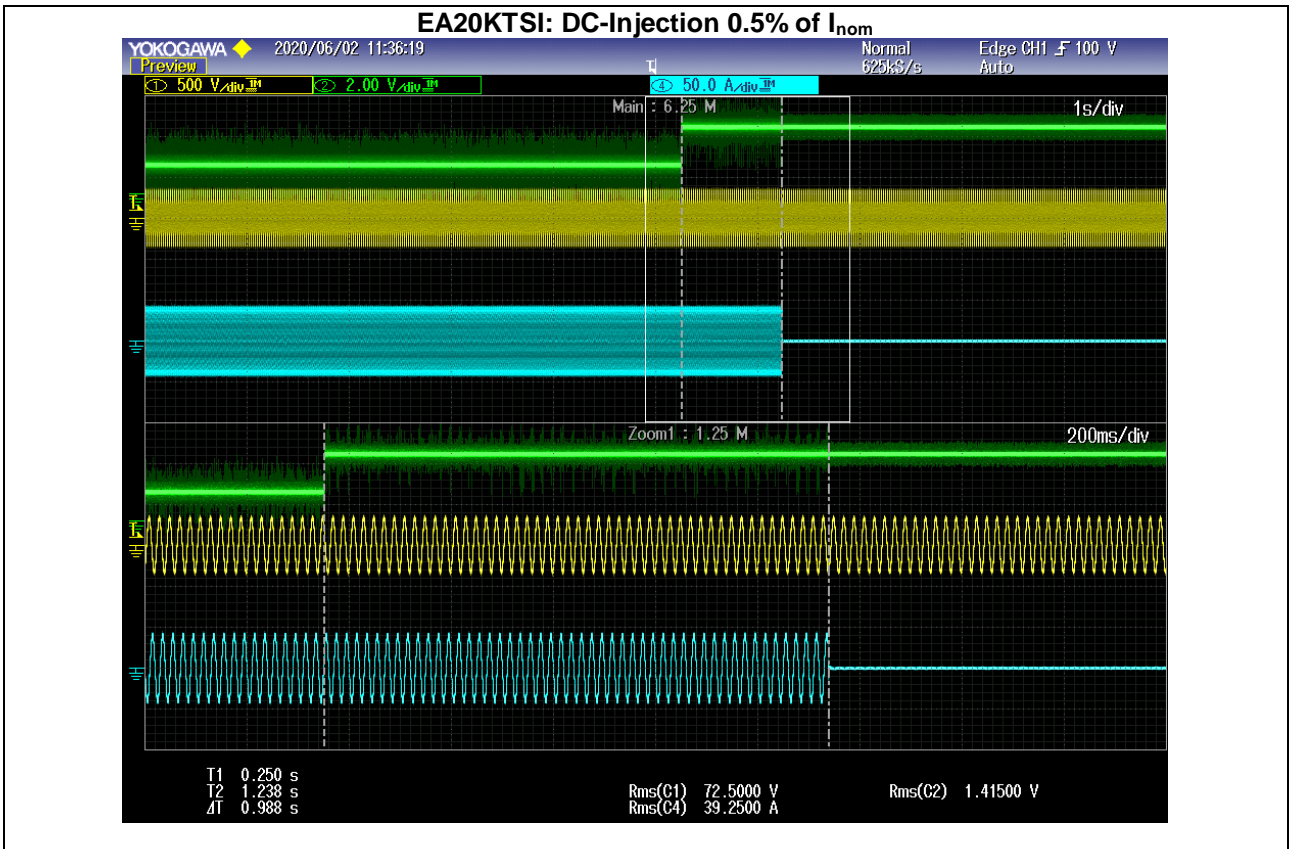
The internal temperature of the EUT must be stabilized.

The tests were performed on model EA30KTSI and EA20KTSI are also applicable for all other models stated in this report.

CEI 0-21			
Clause	Requirement - Test	Result - Remark	Verdict



CEI 0-21			
Clause	Requirement - Test	Result - Remark	Verdict













CEI 0-21			
Clause	Requirement - Test	Result - Remark	Verdict

<b>B.1.5</b>	<b>Checking insensitivity to voltage dips (LVRT capability) [greater 11.08kW systems]</b>		<b>P</b>
--------------	---	--	----------

Model: EA30KTSI

Requirement of LVRT test:

Table 24 - Test sequences to verify immunity to temporary voltage dips. The amplitude, duration and shape relate to no-load test conditions

List of tests	Residual amplitude of phase-to-phase voltage $V/V_{nom}$	Drop duration limit [ms]	Power re-supply time after restoring network [ms]	Form (*)
1s – three-phase symmetrical fault	$0.10 \pm 0.05 (V_1/V_n)$	$200 \pm 20$	400	
1a – two-phase asymmetric failure	$0.10 \pm 0.05 (V_1/V_n)$	$200 \pm 20$	400	
2s – three-phase symmetrical fault	$0.25 \pm 0.05 (V_2/V_n)$	$400 \pm 20$	400	
2a – two-phase asymmetric failure	$0.25 \pm 0.05 (V_2/V_n)$	$400 \pm 20$	400	
3s – three-phase asymmetrical fault	$0.50 \pm 0.05 (V_3/V_n)$	$850 \pm 20$	400	
3a – two-phase asymmetric failure	$0.50 \pm 0.05 (V_3/V_n)$	$850 \pm 20$	400	
4s – three-phase asymmetrical fault	$0.75 \pm 0.05 (V_4/V_n)$	$1300 \pm 20$	400	
4a – two-phase asymmetric failure	$0.75 \pm 0.05 (V_4/V_n)$	$1300 \pm 20$	400	
5 – LV two-phase asymmetrical fault	$0.10 \pm 0.05 (V_5/V_n)$	$200 \pm 20$	400	
6 – LV two-phase asymmetrical fault	$0.50 \pm 0.05 (V_6/V_n)$	$850 \pm 20$	400	

Test No.	$V/V_{nom}$	Phase-to-earth voltages			Phase angles		
		$U_1/U_{1,nom}$	$U_2/U_{2,nom}$	$U_3/U_{3,nom}$	$\varphi_{U1}$	$\varphi_{U2}$	$\varphi_{U3}$
1s	$0.10 \pm 0.05$	$0.10 \pm 0.05$	$0.10 \pm 0.05$	$0.10 \pm 0.05$	$0^\circ$	$-120^\circ$	$120^\circ$
1a	$0.10 \pm 0.05$	$0.87 \pm 0.05$	$0.87 \pm 0.05$	$0.10 \pm 0.05$	$27^\circ$	$-147^\circ$	$120^\circ$
2s	$0.25 \pm 0.05$	$0.25 \pm 0.05$	$0.25 \pm 0.05$	$0.25 \pm 0.05$	$0^\circ$	$-120^\circ$	$120^\circ$
2a	$0.25 \pm 0.05$	$0.88 \pm 0.05$	$0.88 \pm 0.05$	$0.25 \pm 0.05$	$22^\circ$	$-142^\circ$	$120^\circ$
3s	$0.50 \pm 0.05$	$0.50 \pm 0.05$	$0.50 \pm 0.05$	$0.50 \pm 0.05$	$0^\circ$	$-120^\circ$	$120^\circ$
3a	$0.50 \pm 0.05$	$0.90 \pm 0.05$	$0.90 \pm 0.05$	$0.50 \pm 0.05$	$14^\circ$	$-134^\circ$	$120^\circ$
4s	$0.75 \pm 0.05$	$0.75 \pm 0.05$	$0.75 \pm 0.05$	$0.75 \pm 0.05$	$0^\circ$	$-120^\circ$	$120^\circ$
4a	$0.75 \pm 0.05$	$0.94 \pm 0.05$	$0.94 \pm 0.05$	$0.75 \pm 0.05$	$7^\circ$	$-127^\circ$	$120^\circ$
5	$0.10 \pm 0.05$	1	$0.10 \pm 0.05$	$0.10 \pm 0.05$	$0^\circ$	$-120^\circ$	$120^\circ$
6	$0.50 \pm 0.05$	1	$0.50 \pm 0.05$	$0.50 \pm 0.05$	$0^\circ$	$-120^\circ$	$120^\circ$
normal condition	1	1	1	1	$0^\circ$	$-120^\circ$	$120^\circ$

CEI 0-21			
Clause	Requirement - Test	Result - Remark	Verdict

Graph of LVRT test:				
List of tests	Residual amplitude of phase-to-phase voltage $V/V_{nom}$	Drop duration limit [ms]	Measured drop duration [ms]	Duration of restoring network [ms]
1s – three-phase symmetrical fault ( $P = 0.1 - 0.3$ )	$0.10 \pm 0.05 (V_1/V_n)$	200 +20	200.576	329.569
1s – three-phase symmetrical fault ( $P > 0.9$ )	$0.10 \pm 0.05 (V_1/V_n)$	200 +20	200.422	82.499
1a – two-phase asymmetrical fault ( $P = 0.1 - 0.3$ )	$0.10 \pm 0.05 (V_1/V_n)$	200 +20	200.222	272.709
1a – two-phase asymmetrical fault ( $P > 0.9$ )	$0.10 \pm 0.05 (V_1/V_n)$	200 +20	200.534	59.836
2s – three-phase symmetrical fault ( $P = 0.1 - 0.3$ )	$0.25 \pm 0.05 (V_2/V_n)$	400 +20	400.297	274.511
2s – three-phase symmetrical fault ( $P > 0.9$ )	$0.25 \pm 0.05 (V_2/V_n)$	400 +20	400.211	61.322
2a – three-phase symmetrical fault ( $P = 0.1 - 0.3$ )	$0.25 \pm 0.05 (V_2/V_n)$	400 +20	400.625	281.156
2a – three-phase symmetrical fault ( $P > 0.9$ )	$0.25 \pm 0.05 (V_2/V_n)$	400 +20	400.581	59.396
3s – three-phase symmetrical fault ( $P = 0.1 - 0.3$ )	$0.50 \pm 0.05 (V_3/V_n)$	850 ± 20	850.199	318.311
3s – three-phase symmetrical fault ( $P > 0.9$ )	$0.50 \pm 0.05 (V_3/V_n)$	850 ± 20	850.115	195.048
3a – two-phase asymmetrical fault ( $P = 0.1 - 0.3$ )	$0.50 \pm 0.05 (V_3/V_n)$	850 ± 20	851.472	300.520
3a – two-phase asymmetrical fault ( $P > 0.9$ )	$0.50 \pm 0.05 (V_3/V_n)$	850 ± 20	850.304	129.539
4s – three-phase symmetrical fault ( $P = 0.1 - 0.3$ )	$0.75 \pm 0.05 (V_4/V_n)$	1300 ± 20	1301.923	279.959
4s – three-phase symmetrical fault ( $P > 0.9$ )	$0.75 \pm 0.05 (V_4/V_n)$	1300 ± 20	1304.765	328.000
4a – two-phase asymmetrical fault ( $P = 0.1 - 0.3$ )	$0.75 \pm 0.05 (V_4/V_n)$	1300 ± 20	1300.882	271.640
4a – two-phase asymmetrical fault ( $P > 0.9$ )	$0.75 \pm 0.05 (V_4/V_n)$	1300 ± 20	1303.736	244.295
5 – LV two-phase asymmetrical fault ( $P = 0.1 - 0.3$ )	$0.10 \pm 0.05 (V_5/V_n)$	200 +20	200.736	280.606
5 – LV two-phase asymmetrical fault ( $P > 0.9$ )	$0.10 \pm 0.05 (V_5/V_n)$	200 +20	200.434	62.531
6 – LV two-phase asymmetrical fault ( $P = 0.1 - 0.3$ )	$0.50 \pm 0.05 (V_6/V_n)$	400 +20	400.917	272.476
6 – LV two-phase asymmetrical fault ( $P > 0.9$ )	$0.50 \pm 0.05 (V_6/V_n)$	400 +20	400.179	67.074

**Note:**  
 (\*) Regardless of the method used to simulate transients (simulator or impedance network), the rise and fall time of the voltage must be less than 10 ms  
 The interface protection shall be disabled or adjusted to avoid spurious tripping during testing.  
 The test conditions are performed as worst case conditions. The inverter feeds maximal active and reactive power during the complete test.  
 The tests were performed on model EA30KTSI and are also applicable for all other models stated in this report.  
 The purpose of these tests is to ensure that the converter, when used in systems with total capacity

## CEI 0-21

Clause	Requirement - Test	Result - Remark	Verdict
--------	--------------------	-----------------	---------

greater than 11.08 kW, is insensitive to voltage dips according to the time-amplitude profile shown in the diagram.

In particular, the tests must verify that the following functional requirements are met:

- in the cross-hatched area the generator must not disconnect from the network. Supply of active and reactive power prior to the occurrence of the fault can be temporarily interrupted in this area.
- in the area below (grey) the generator can disconnect from the network.
- within 400 ms from restoring network voltage to within the range of +10% and -15% of nominal voltage, the generator must return to supplying active and reactive power to the network as before the fault, with a maximum tolerance of  $\pm 10\%$  of the nominal voltage of the generator. If voltage returns but remains in the range between 85% and 90%, power distribution may be reduced in relation to the generator limits of output power.

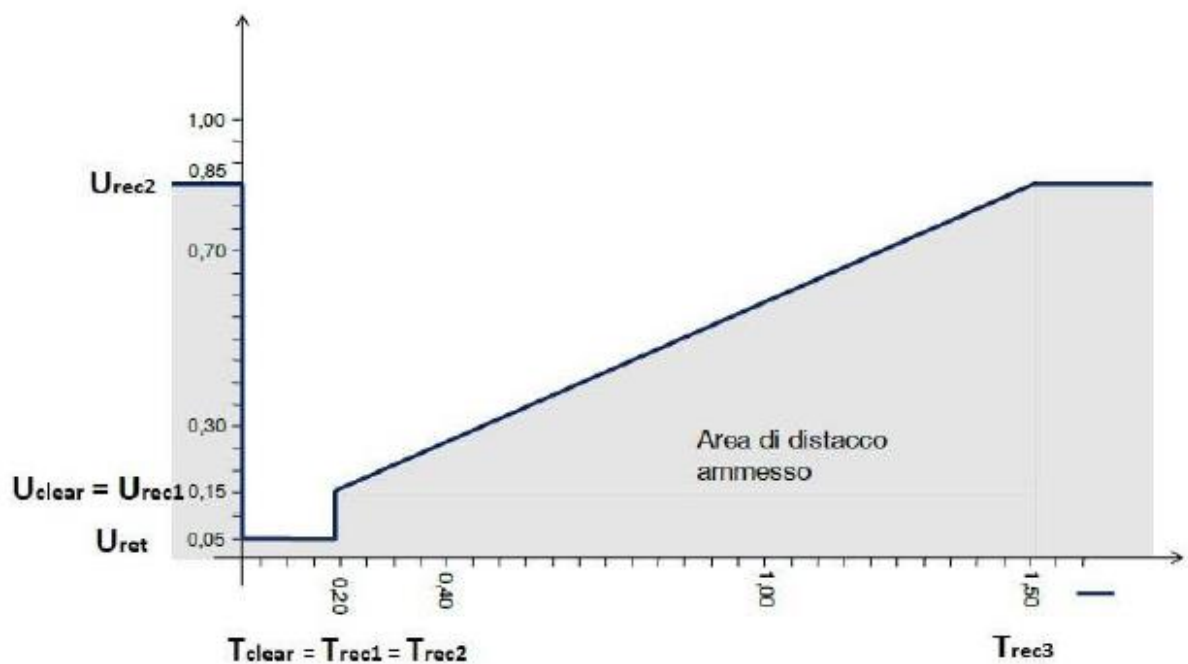
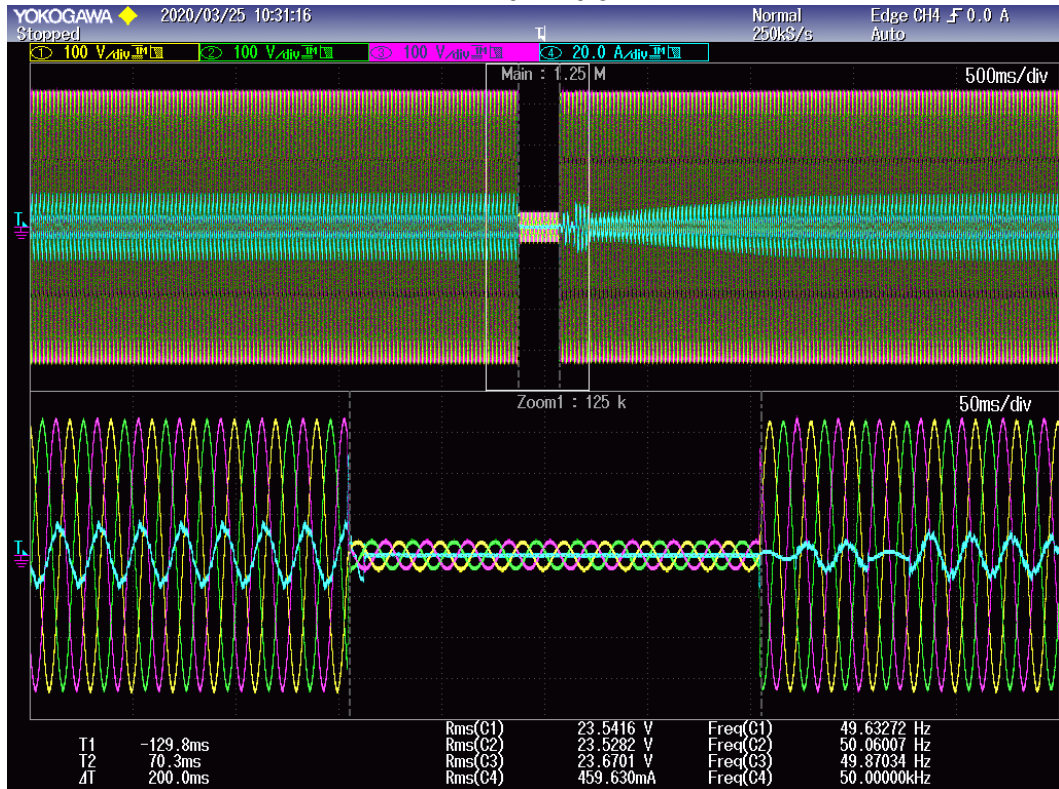


Figure 14 b - Fault-ride-through profile of the generation parks over 11.08kW

CEI 0-21

Clause	Requirement - Test	Result - Remark	Verdict
--------	--------------------	-----------------	---------

Test 1s – three-phase symmetrical fault ( $V_1/V_{nom} = 0.10$ ) - Phase current wave  
 $P = 0.1 - 0.3$



Test 1s – three-phase symmetrical fault ( $V_1/V_{nom} = 0.10$ ) - Return to supplying power  
 $P = 0.1 - 0.3$

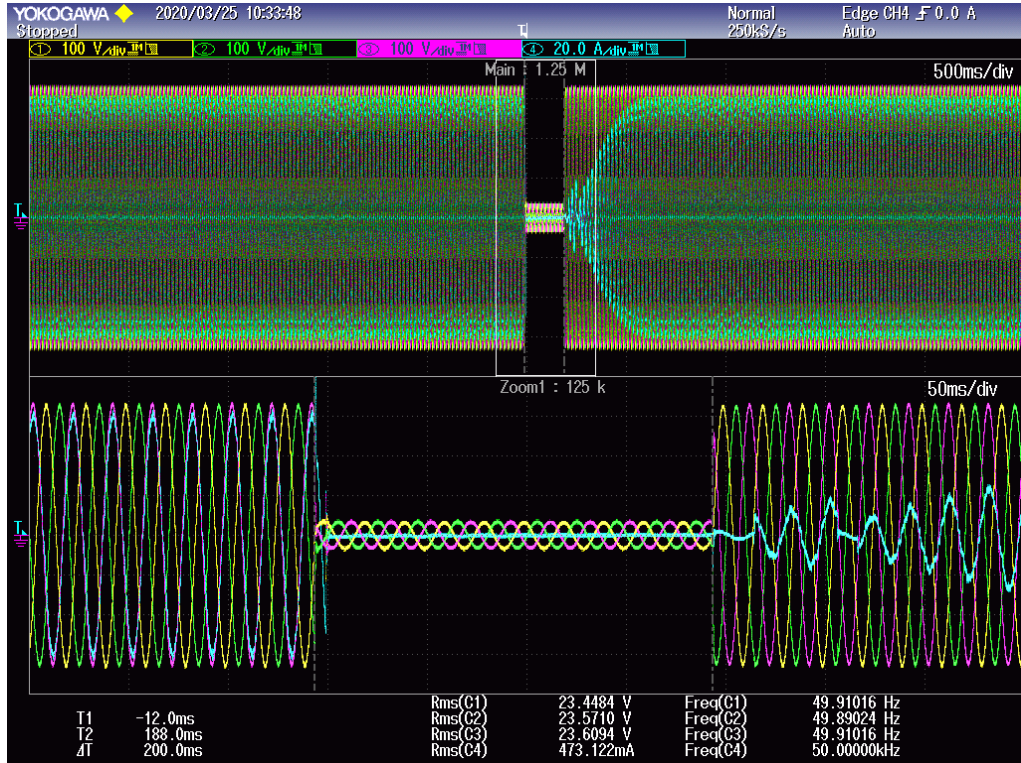




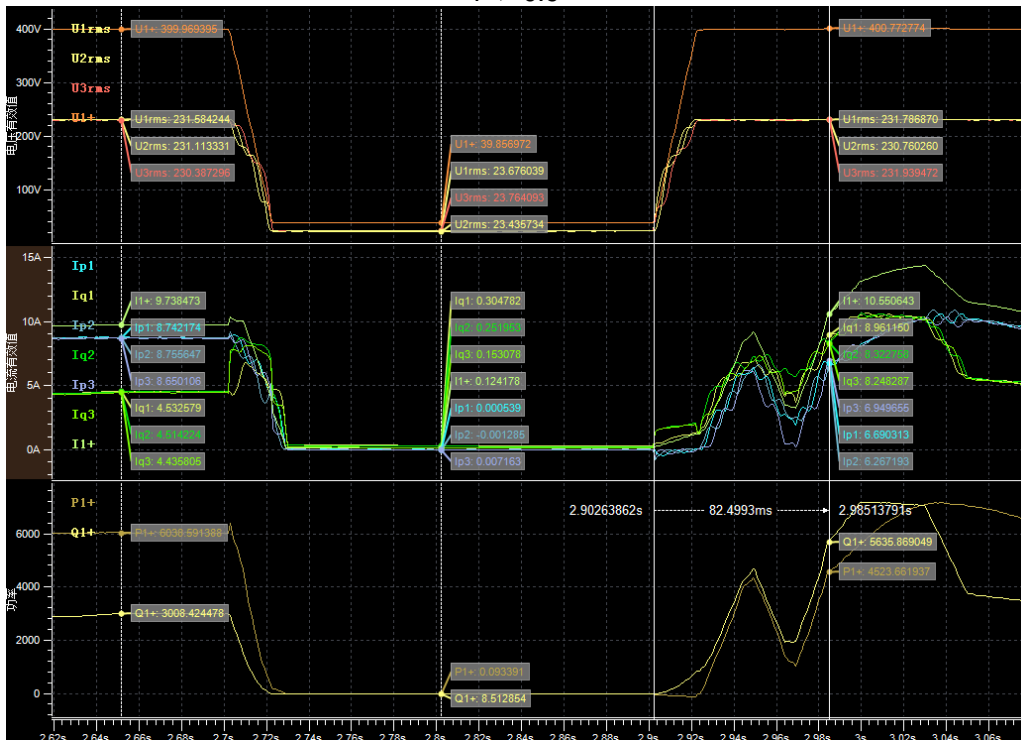
CEI 0-21

Clause	Requirement - Test	Result - Remark	Verdict
--------	--------------------	-----------------	---------

Test 1s – three-phase symmetrical fault ( $V_1/V_{nom} = 0.10$ ) - Phase current wave  
 $P > 0.9$



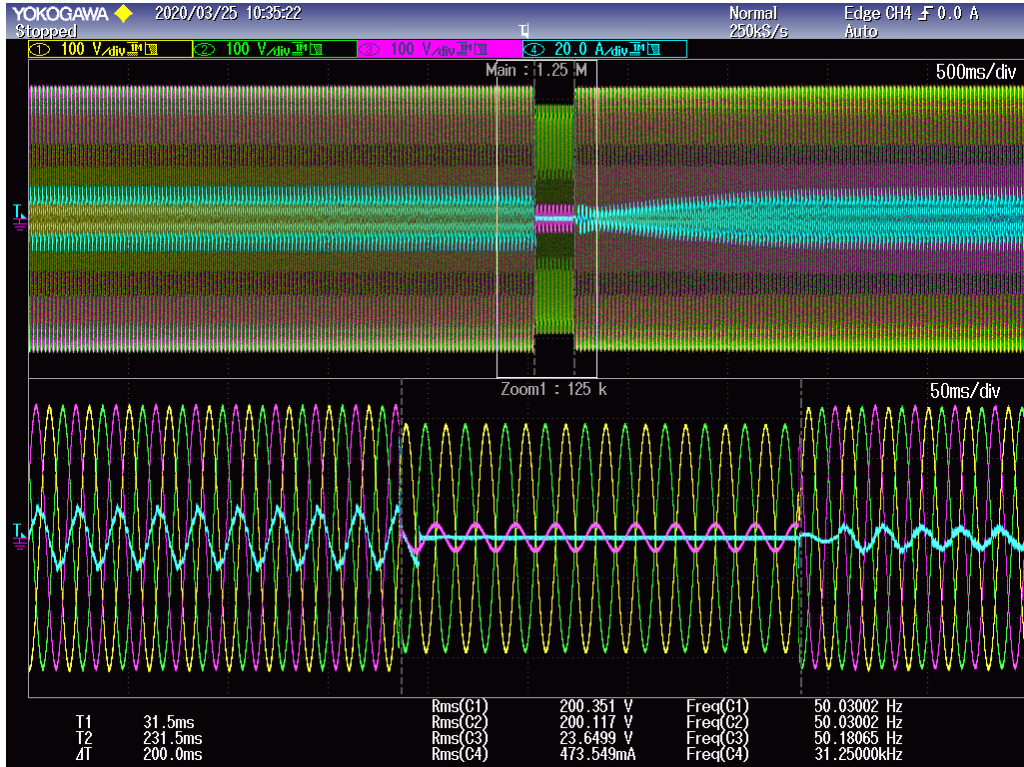
Test 1s – three-phase symmetrical fault ( $V_1/V_{nom} = 0.10$ ) - Return to supplying power  
 $P > 0.9$



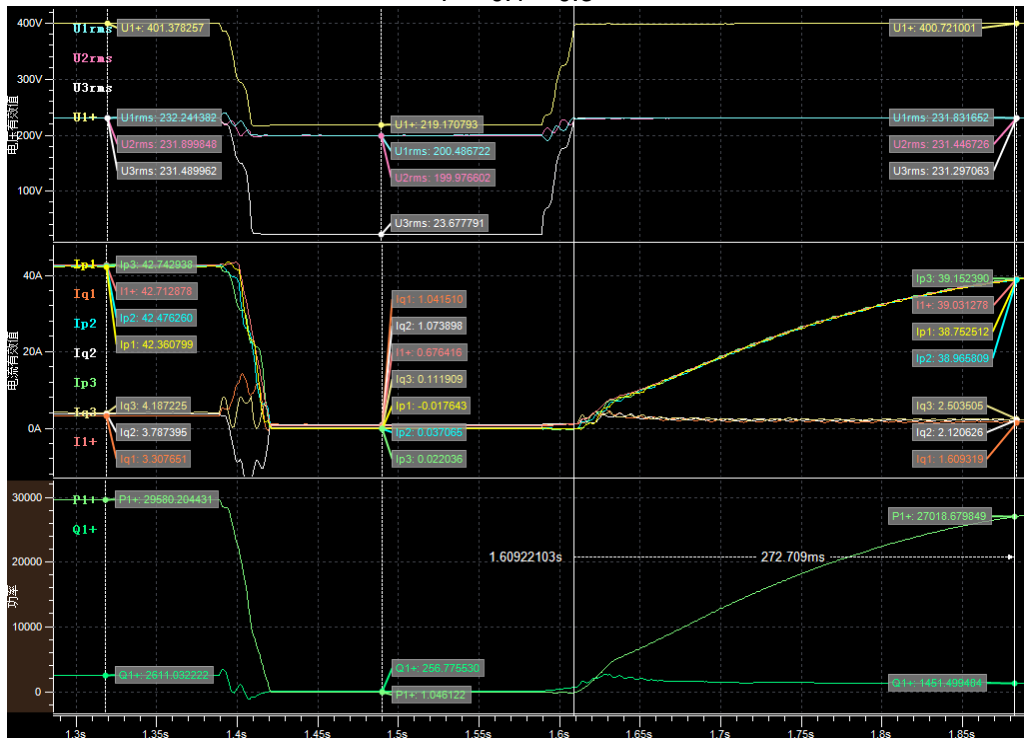
CEI 0-21

Clause	Requirement - Test	Result - Remark	Verdict
--------	--------------------	-----------------	---------

Test 1a – two-phase asymmetrical fault ( $V_1/V_{nom} = 0.10$ ) - Phase current wave  
 $P = 0.1 - 0.3$

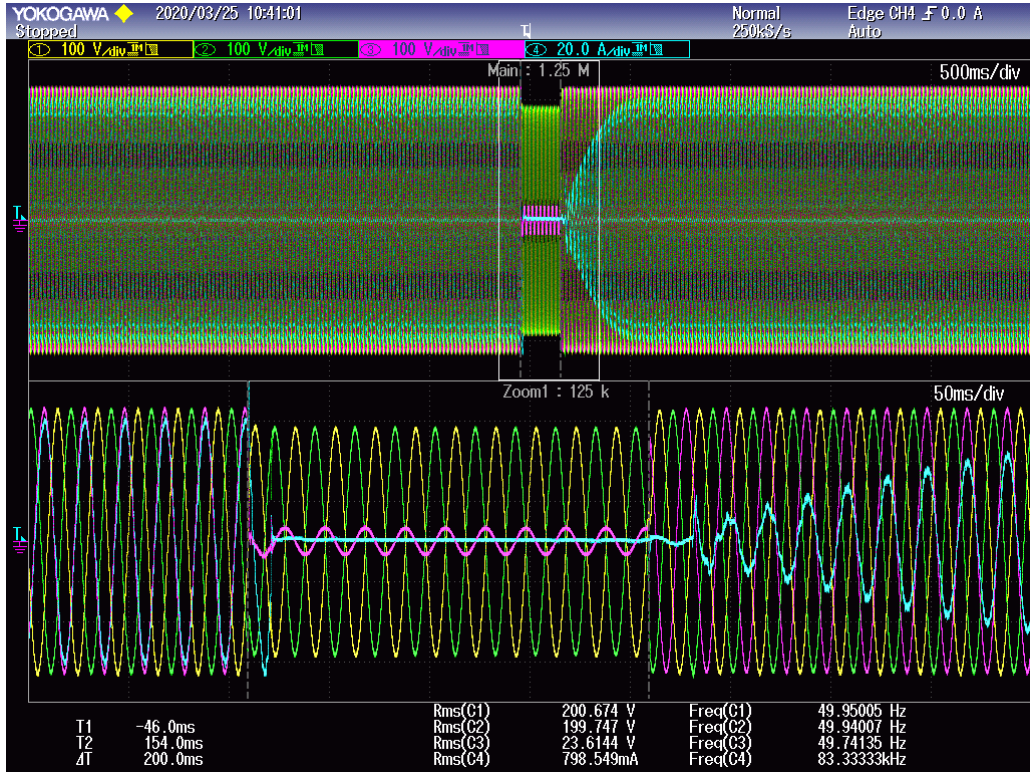


Test 1a – two-phase asymmetrical fault ( $V_1/V_{nom} = 0.10$ ) - Return to supplying power  
 $P = 0.1 - 0.3$

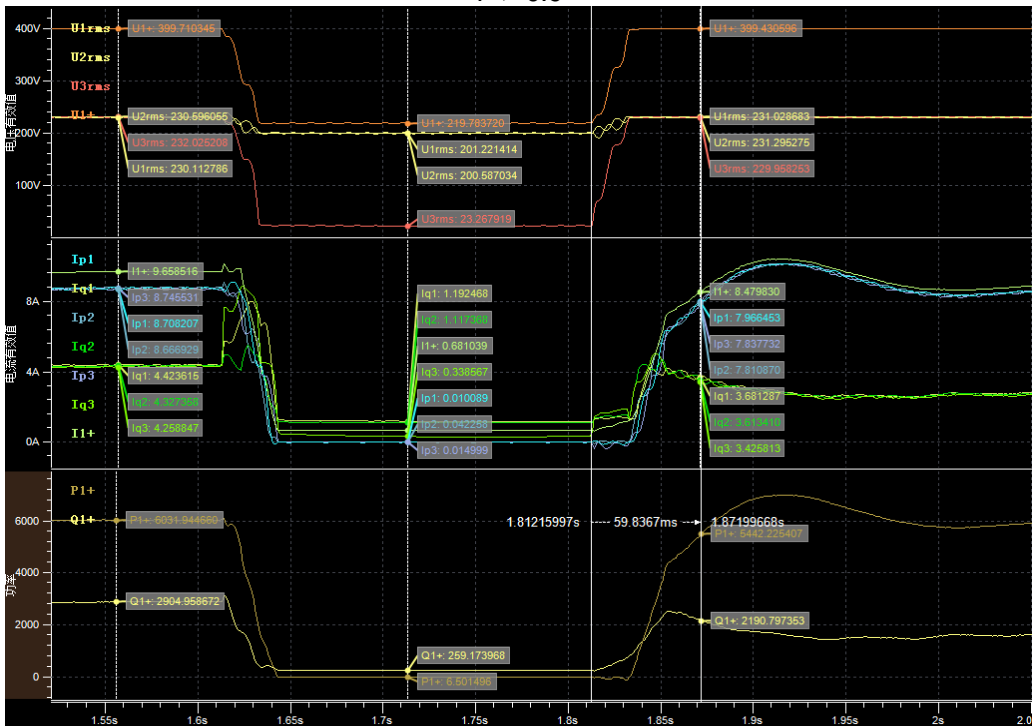


CEI 0-21			
Clause	Requirement - Test	Result - Remark	Verdict

Test 1a – two-phase asymmetrical fault ( $V_1/V_{nom} = 0.10$ ) - Phase current wave  
 $P > 0.9$



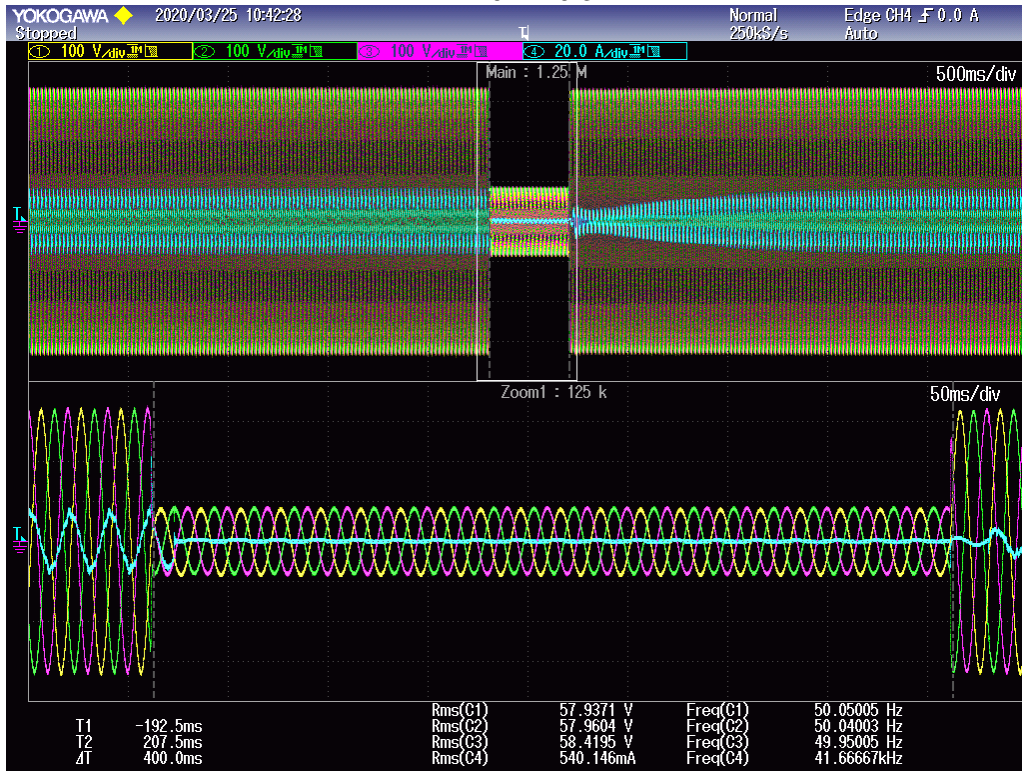
Test 1a – two-phase asymmetrical fault ( $V_1/V_{nom} = 0.10$ ) - Return to supplying power  
 $P > 0.9$



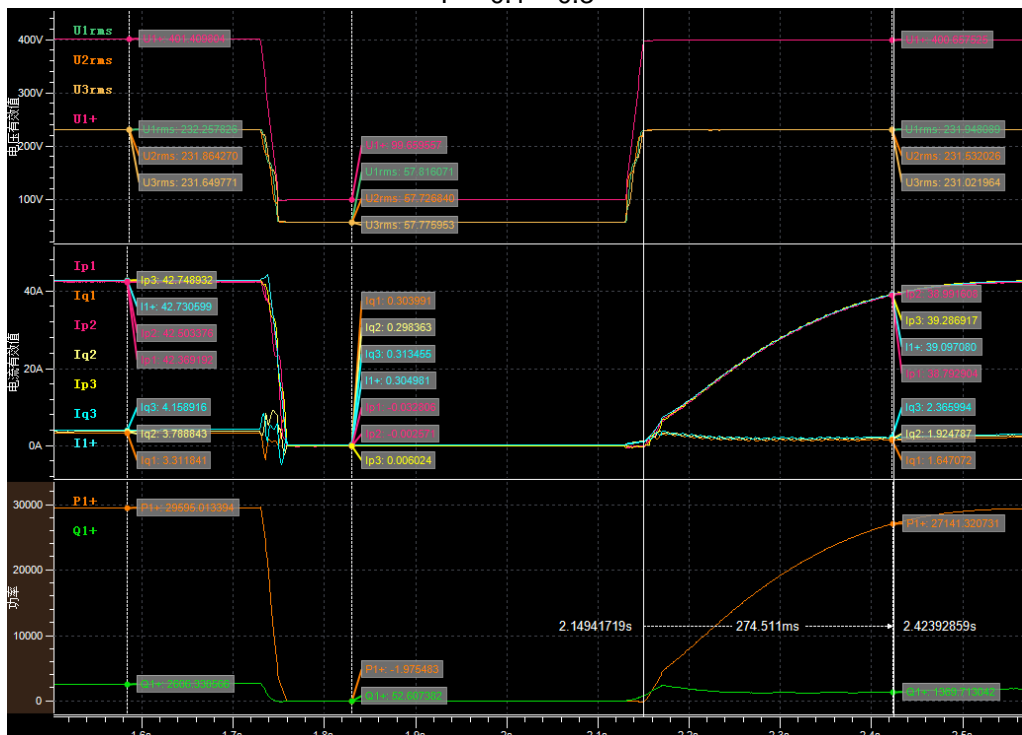
CEI 0-21

Clause	Requirement - Test	Result - Remark	Verdict
--------	--------------------	-----------------	---------

Test 2s – three-phase symmetrical fault ( $V_2/V_{nom} = 0.25$ ) - Phase current wave  
P = 0.1 – 0.3

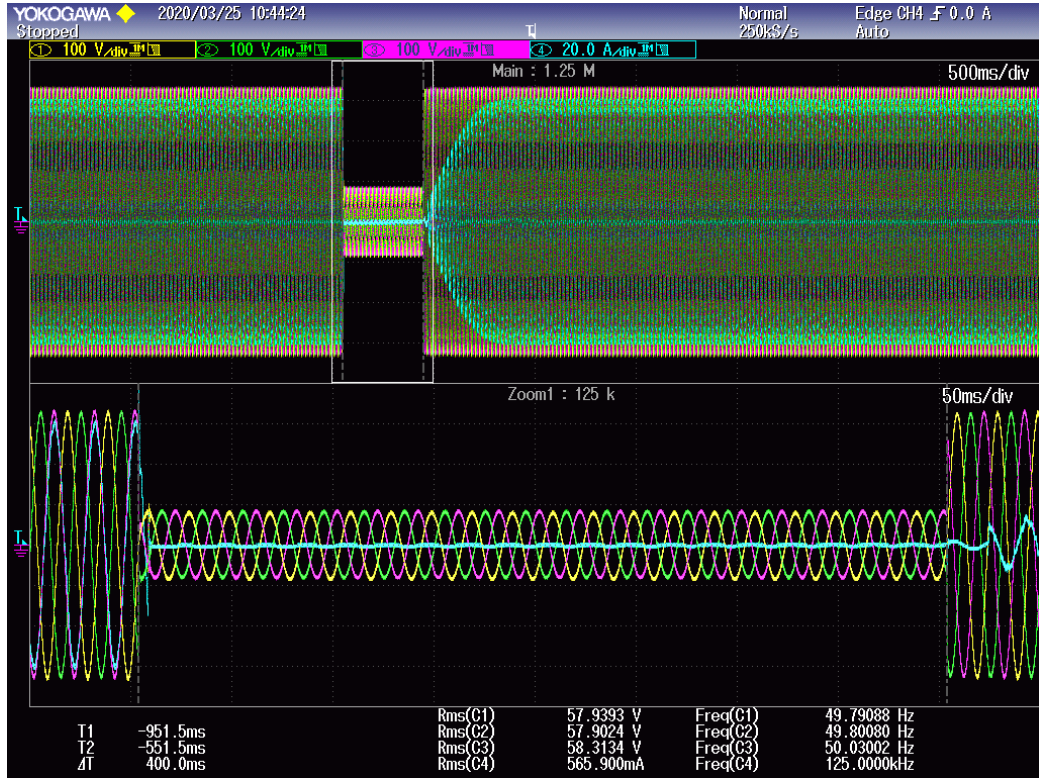


Test 2s – three-phase symmetrical fault ( $V_2/V_{nom} = 0.25$ ) - Return to supplying power  
P = 0.1 – 0.3

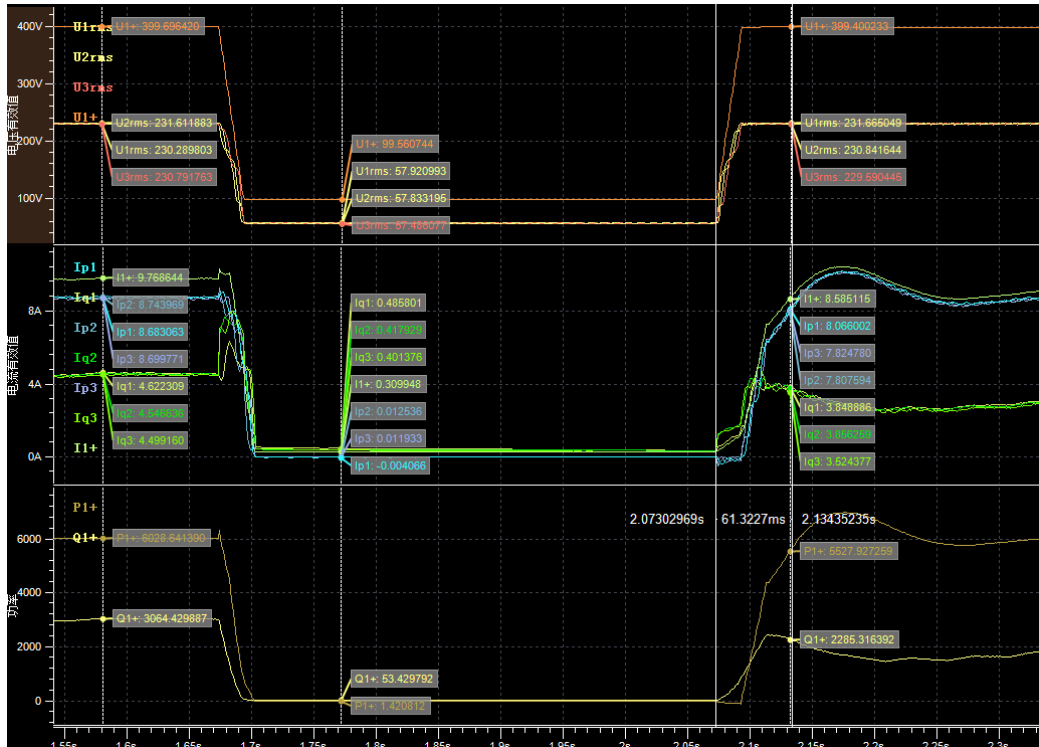


CEI 0-21			
Clause	Requirement - Test	Result - Remark	Verdict

Test 2s – three-phase symmetrical fault ( $V_2/V_{nom} = 0.25$ ) - Phase current wave  
 $P > 0.9$



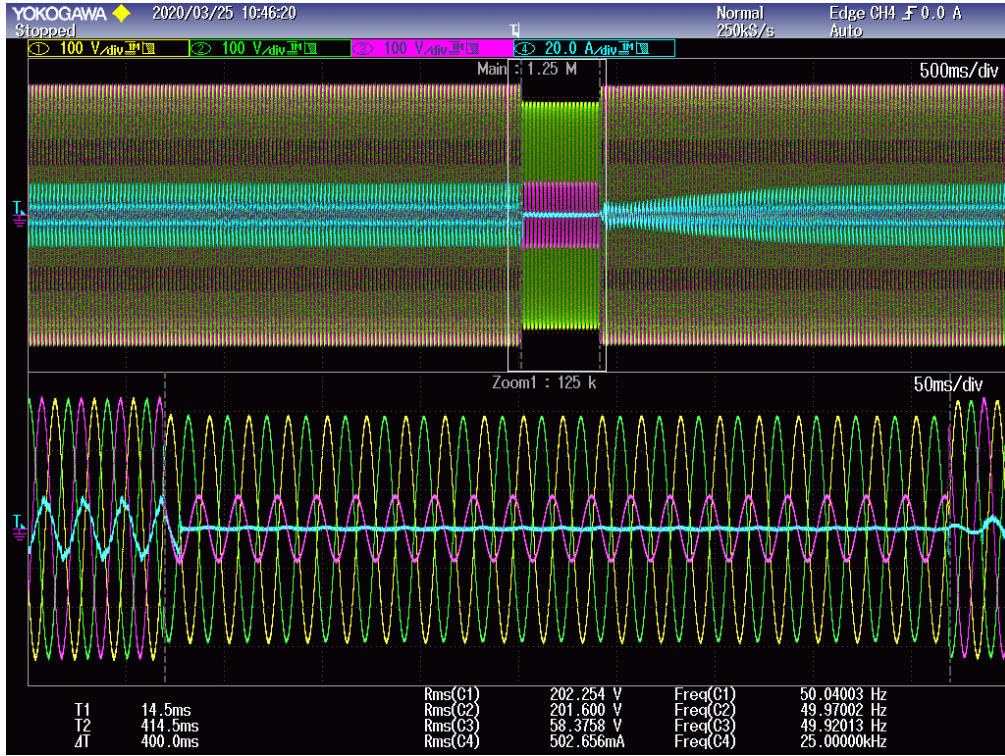
Test 2s – three-phase symmetrical fault ( $V_2/V_{nom} = 0.25$ ) - Return to supplying power  
 $P > 0.9$



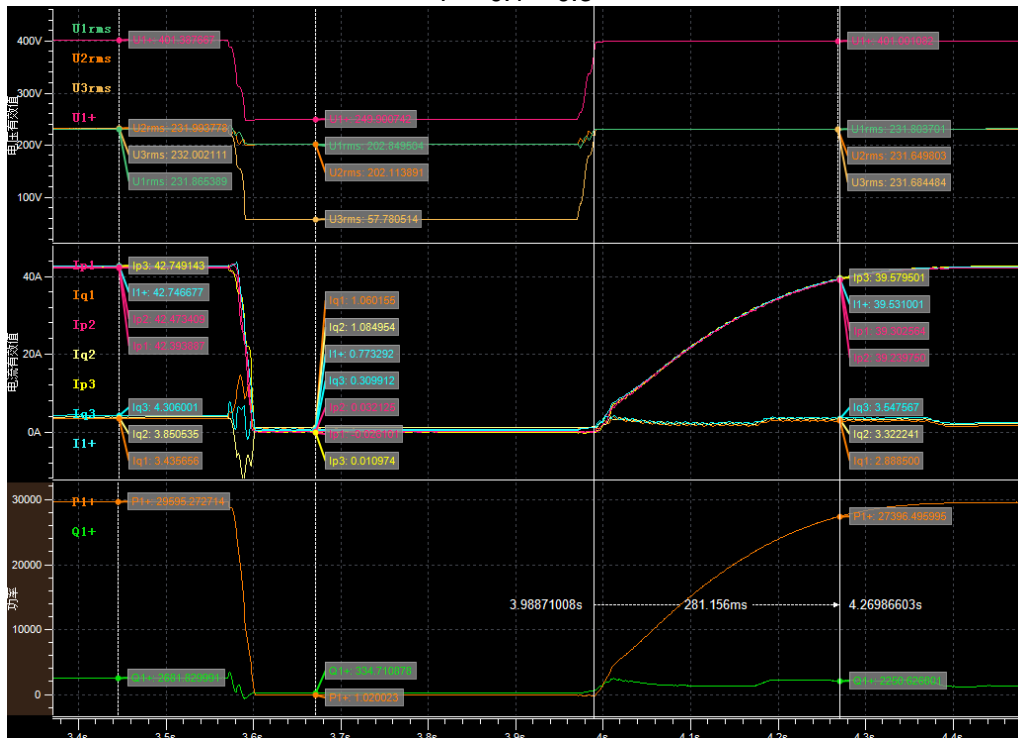
CEI 0-21

Clause	Requirement - Test	Result - Remark	Verdict
--------	--------------------	-----------------	---------

Test 2a – two-phase asymmetrical fault ( $V_2/V_{nom} = 0.25$ ) - Phase current wave  
 $P = 0.1 - 0.3$



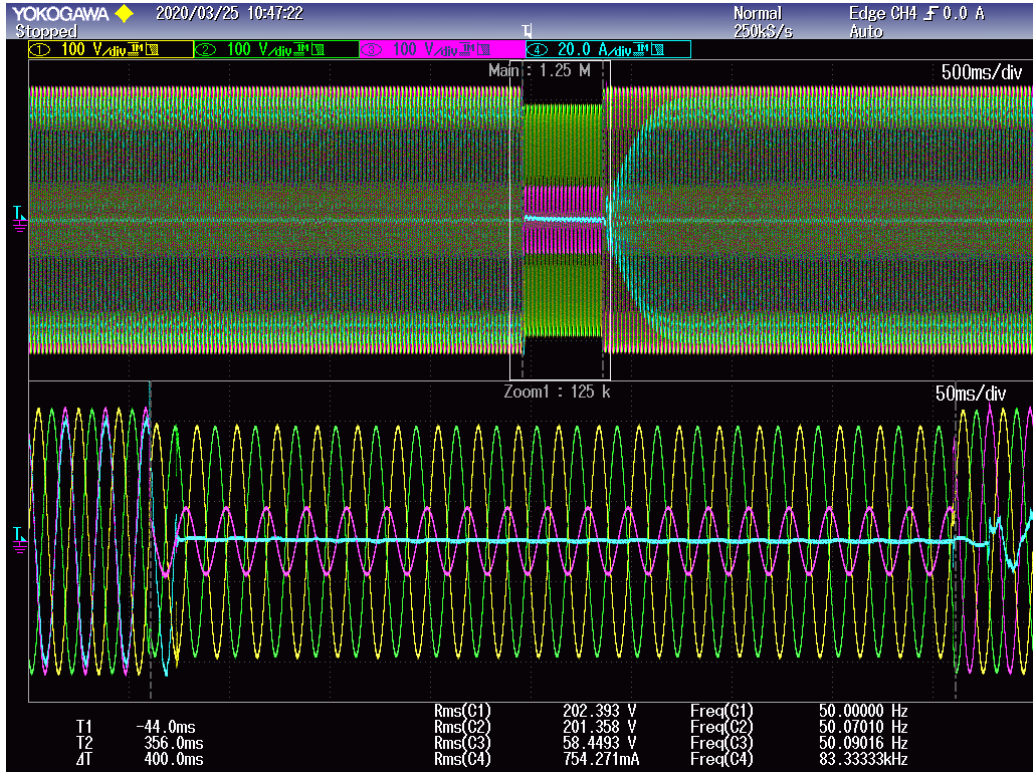
Test 2a – two-phase asymmetrical fault ( $V_2/V_{nom} = 0.25$ ) - Return to supplying power  
 $P = 0.1 - 0.3$



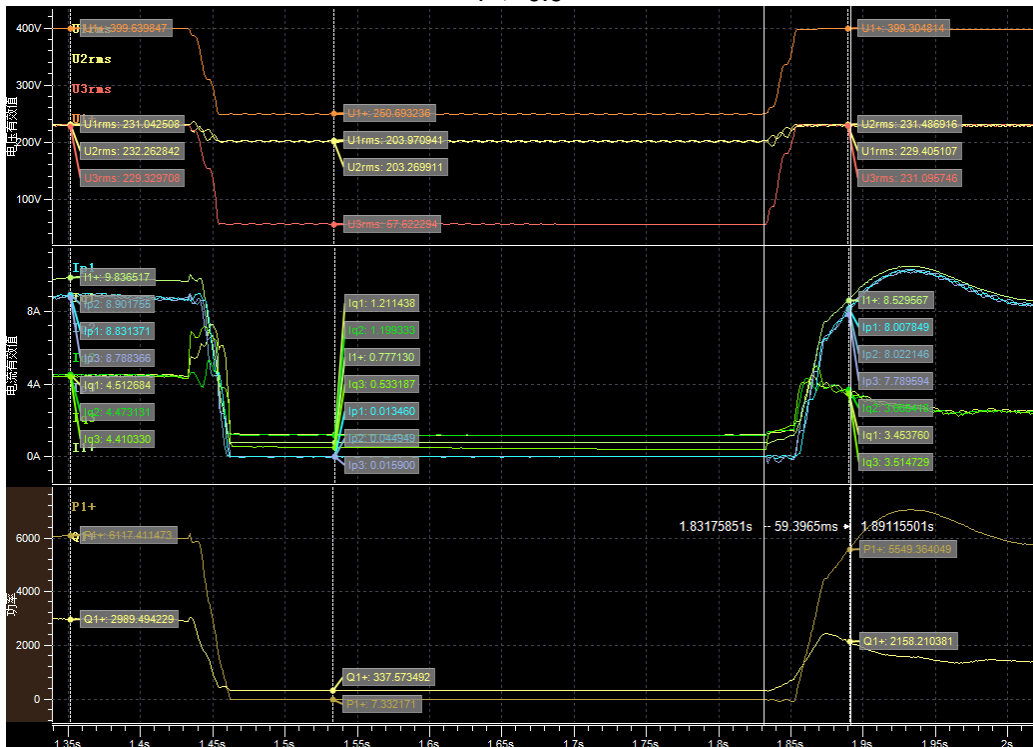
CEI 0-21

Clause	Requirement - Test	Result - Remark	Verdict
--------	--------------------	-----------------	---------

Test 2a – two-phase asymmetrical fault ( $V_2/V_{nom} = 0.25$ ) - Phase current wave  
 $P > 0.9$

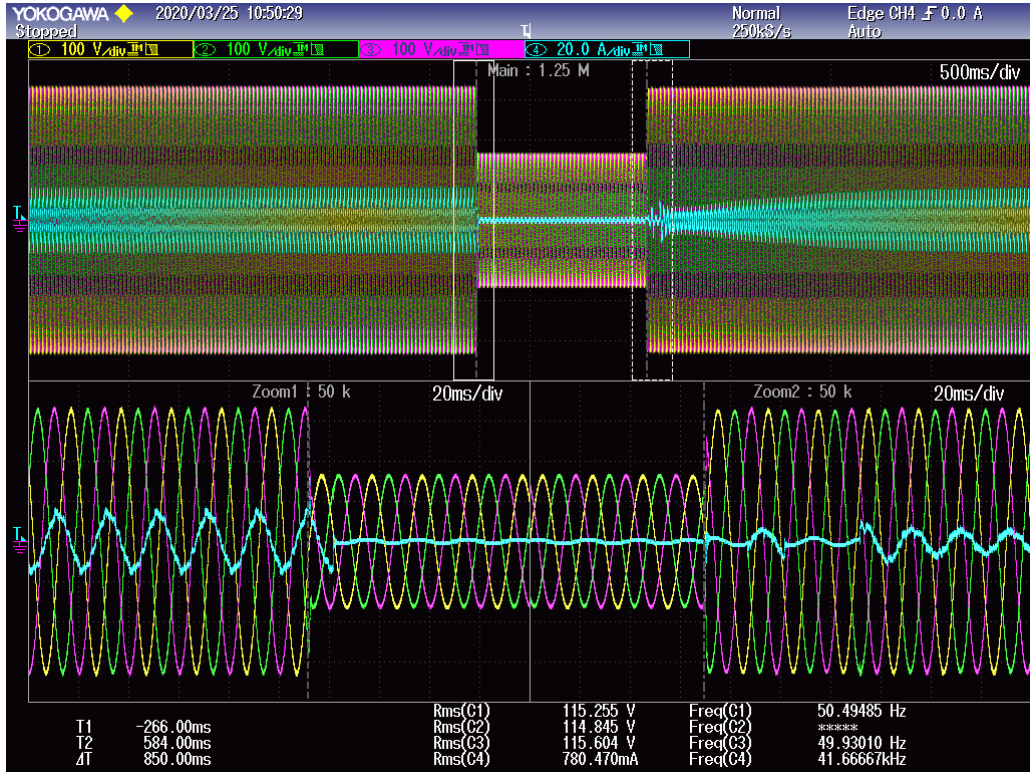


Test 2a – two-phase asymmetrical fault ( $V_2/V_{nom} = 0.25$ ) - Return to supplying power  
 $P > 0.9$

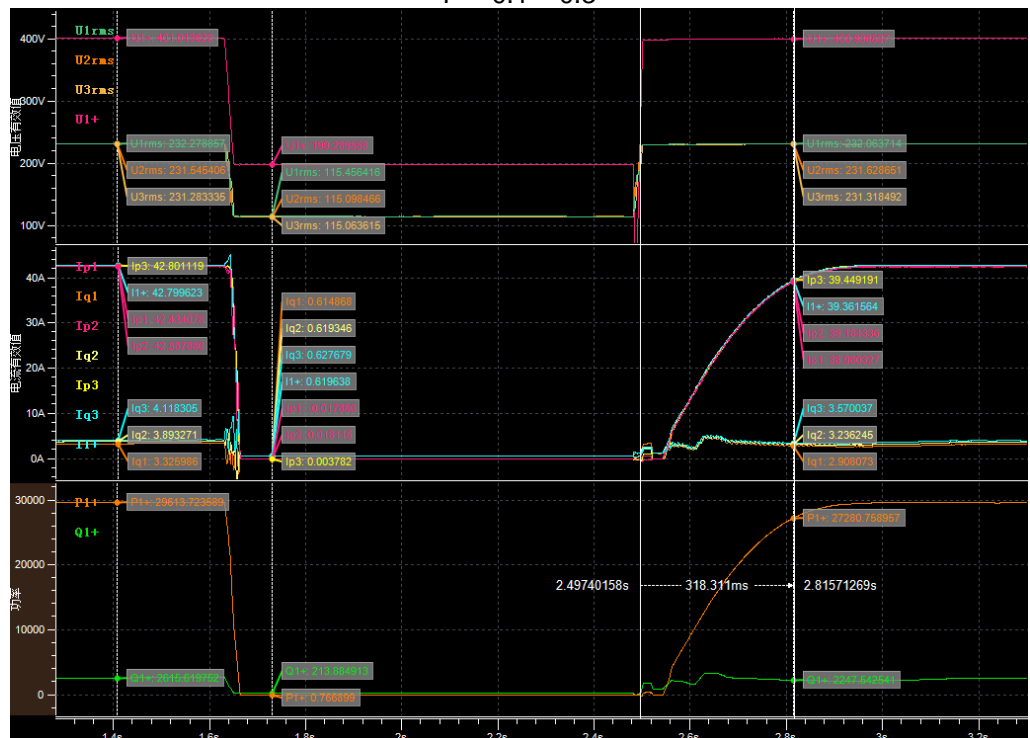


CEI 0-21			
Clause	Requirement - Test	Result - Remark	Verdict

Test 3s – three-phase symmetrical fault ( $V_3/V_{nom} = 0.50$ ) - Phase current wave  
P = 0.1 – 0.3



Test 3s – three-phase symmetrical fault ( $V_3/V_{nom} = 0.50$ ) - Return to supplying power  
P = 0.1 – 0.3

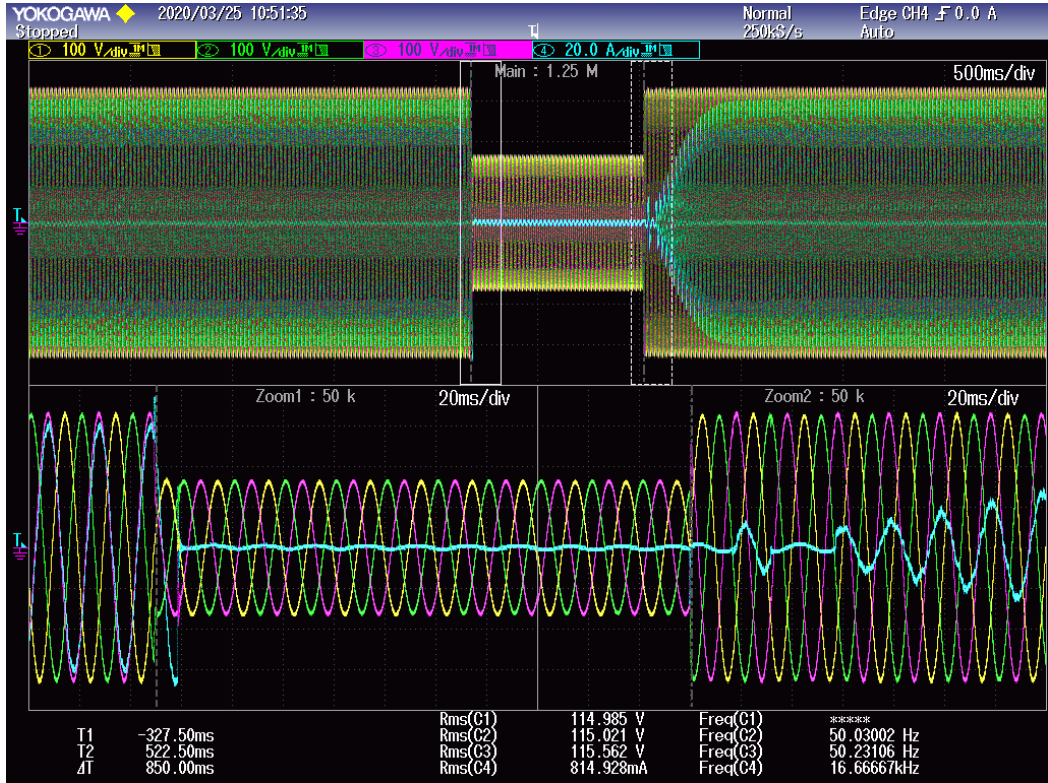




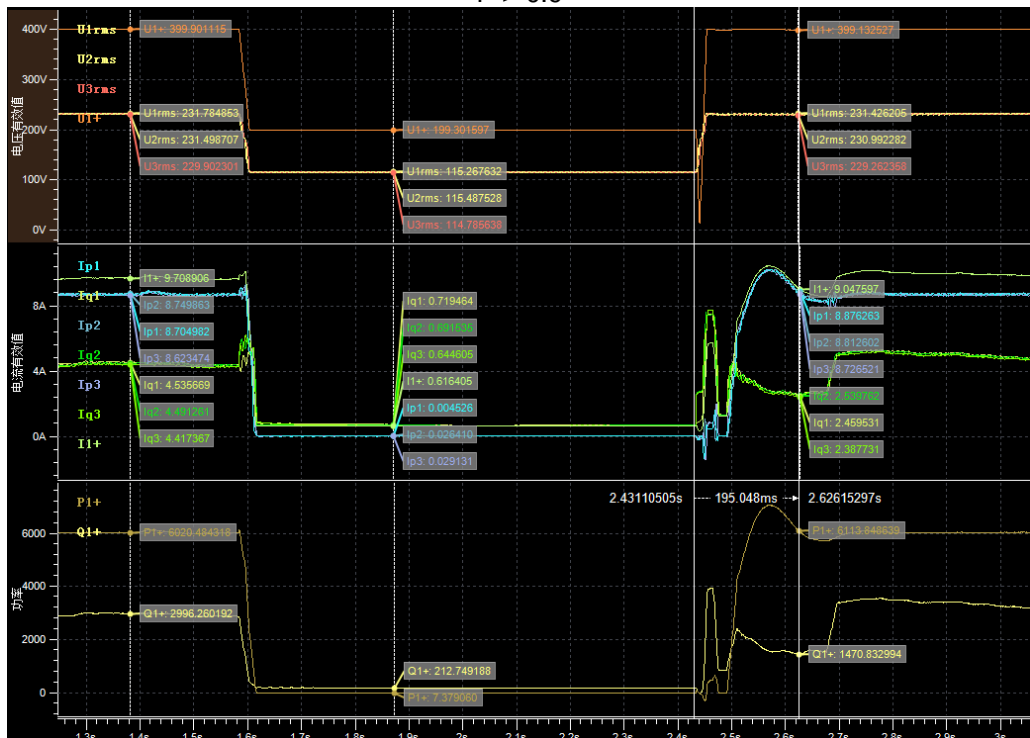
CEI 0-21

Clause	Requirement - Test	Result - Remark	Verdict
--------	--------------------	-----------------	---------

Test 3s – three-phase symmetrical fault ( $V_3/V_{nom} = 0.50$ ) - Phase current wave  
 $P > 0.9$

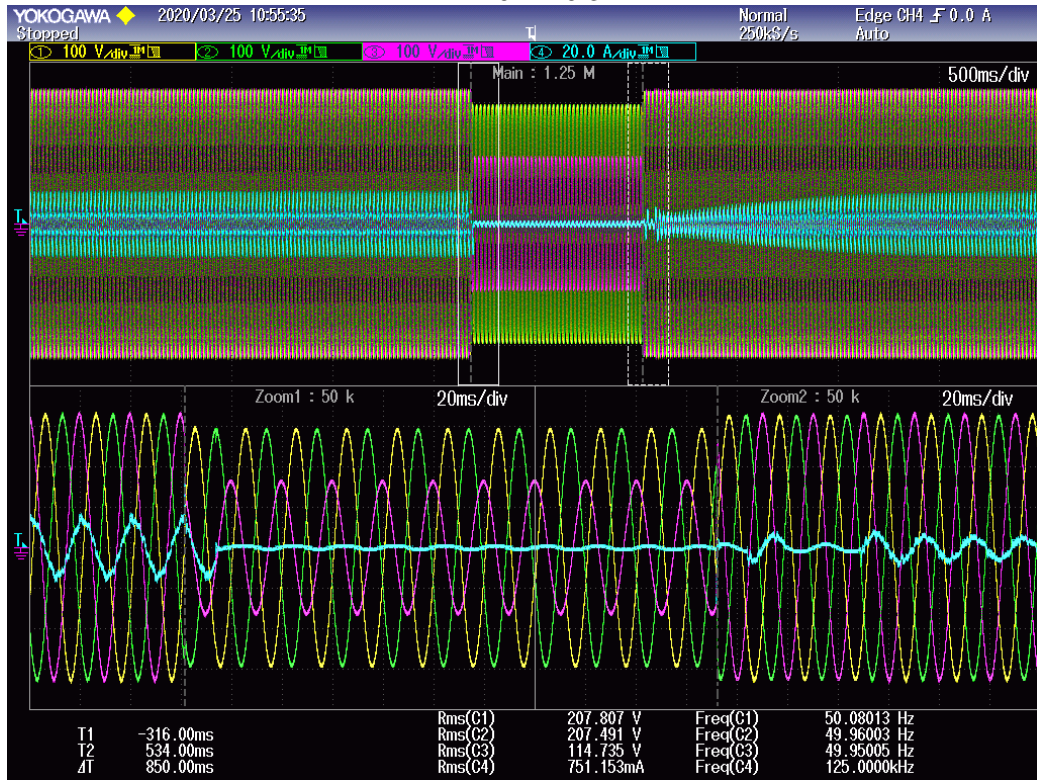


Test 3s – three-phase symmetrical fault ( $V_3/V_{nom} = 0.50$ ) - Return to supplying power  
 $P > 0.9$

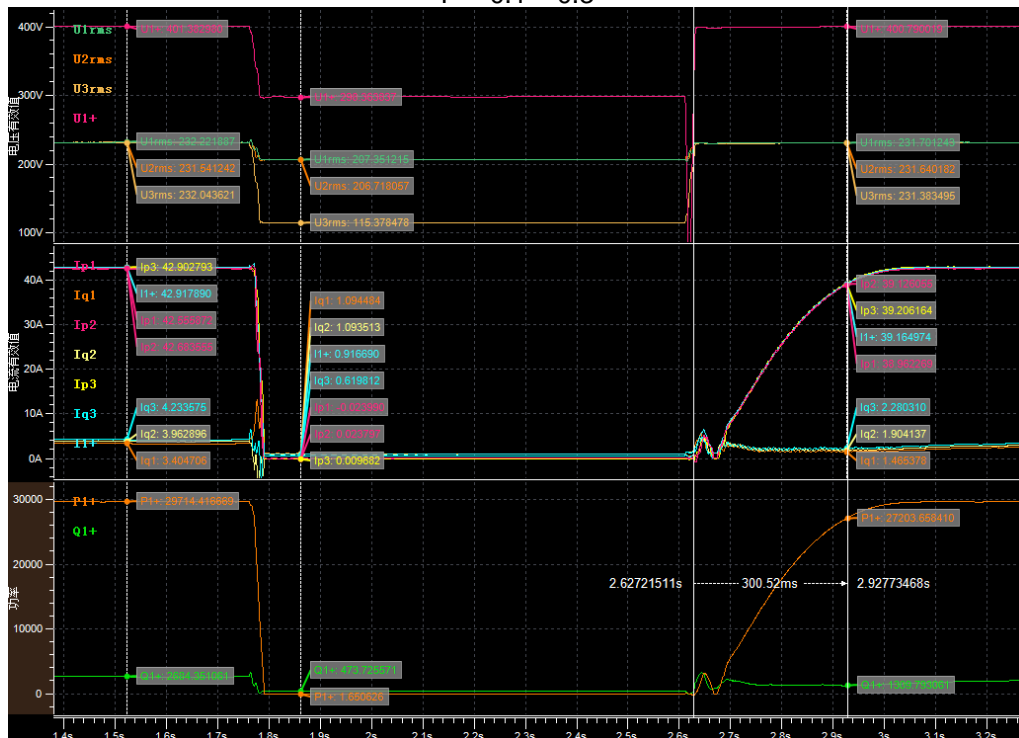


CEI 0-21			
Clause	Requirement - Test	Result - Remark	Verdict

Test 3a – two-phase asymmetrical fault ( $V_3/V_{nom} = 0.50$ ) - Phase current wave  
 $P = 0.1 - 0.3$

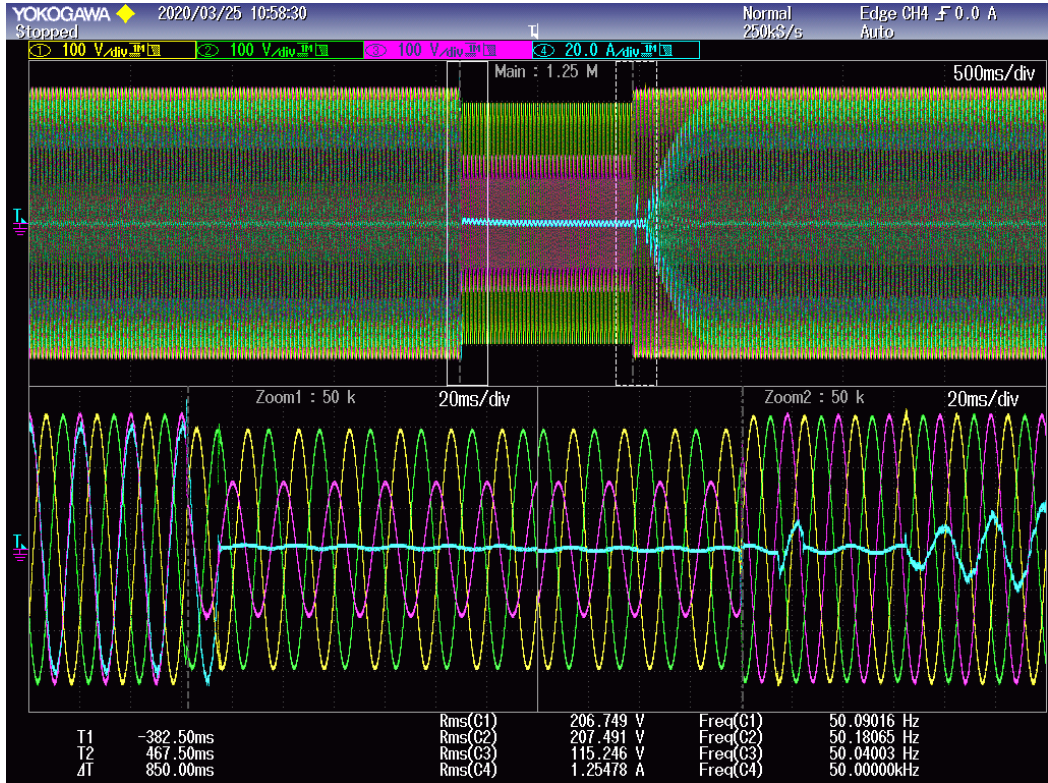


Test 3a – two-phase asymmetrical fault ( $V_3/V_{nom} = 0.50$ ) - Return to supplying power  
 $P = 0.1 - 0.3$

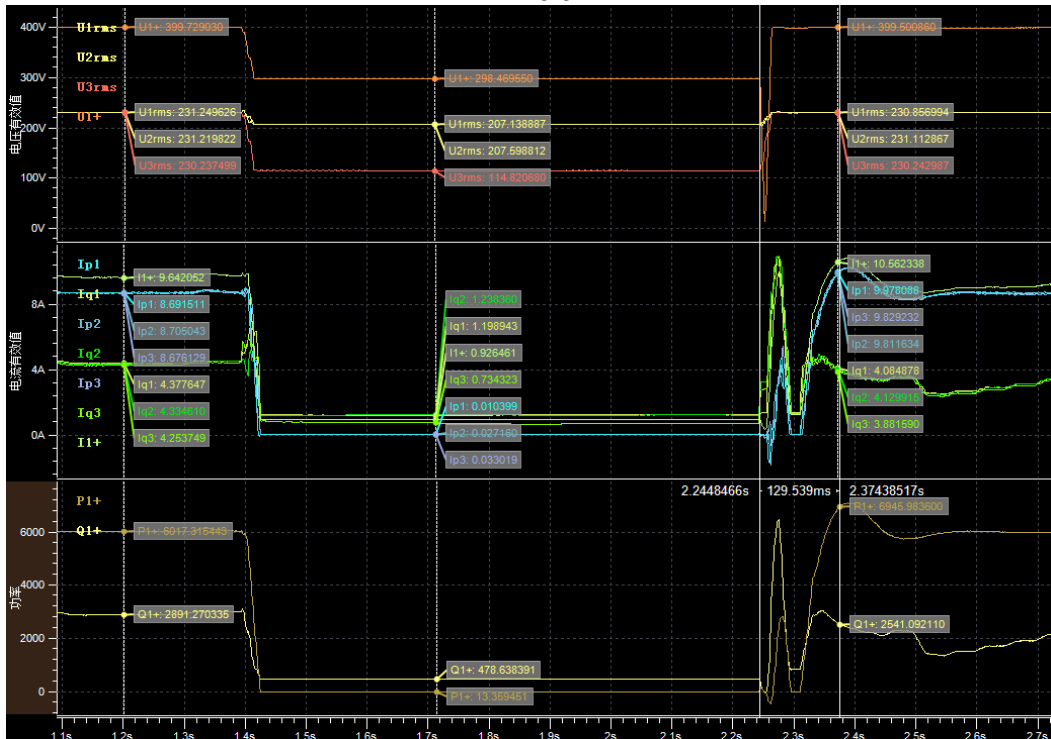


CEI 0-21			
Clause	Requirement - Test	Result - Remark	Verdict

Test 3a – two-phase asymmetrical fault ( $V_3/V_{nom} = 0.50$ ) - Phase current wave  
 $P > 0.9$

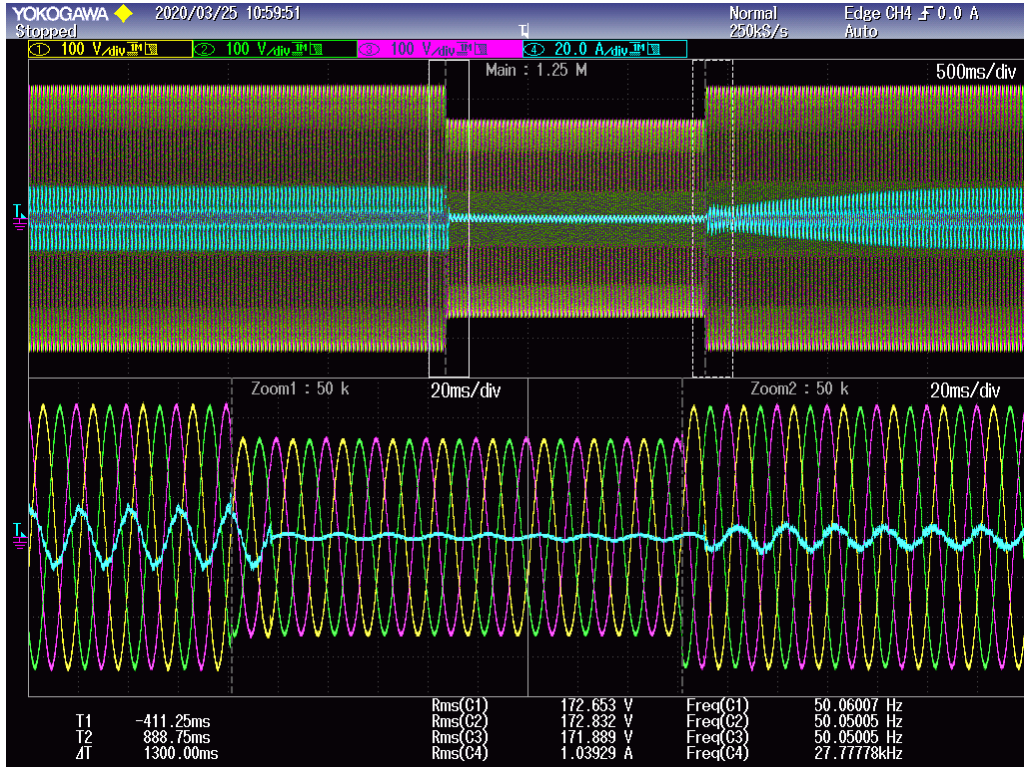


Test 3a – two-phase asymmetrical fault ( $V_3/V_{nom} = 0.50$ ) - Return to supplying power  
 $P > 0.9$

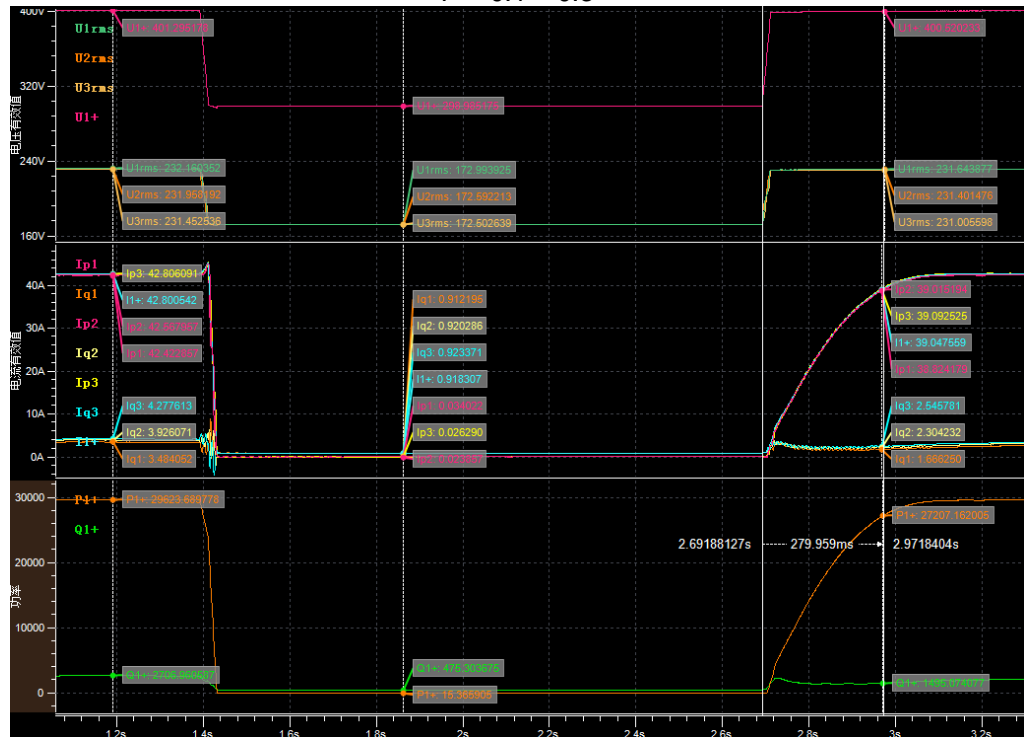


CEI 0-21			
Clause	Requirement - Test	Result - Remark	Verdict

Test 4s – three-phase symmetrical fault ( $V_4/V_{nom} = 0.75$ ) - Phase current wave  
 $P = 0.1 - 0.3$

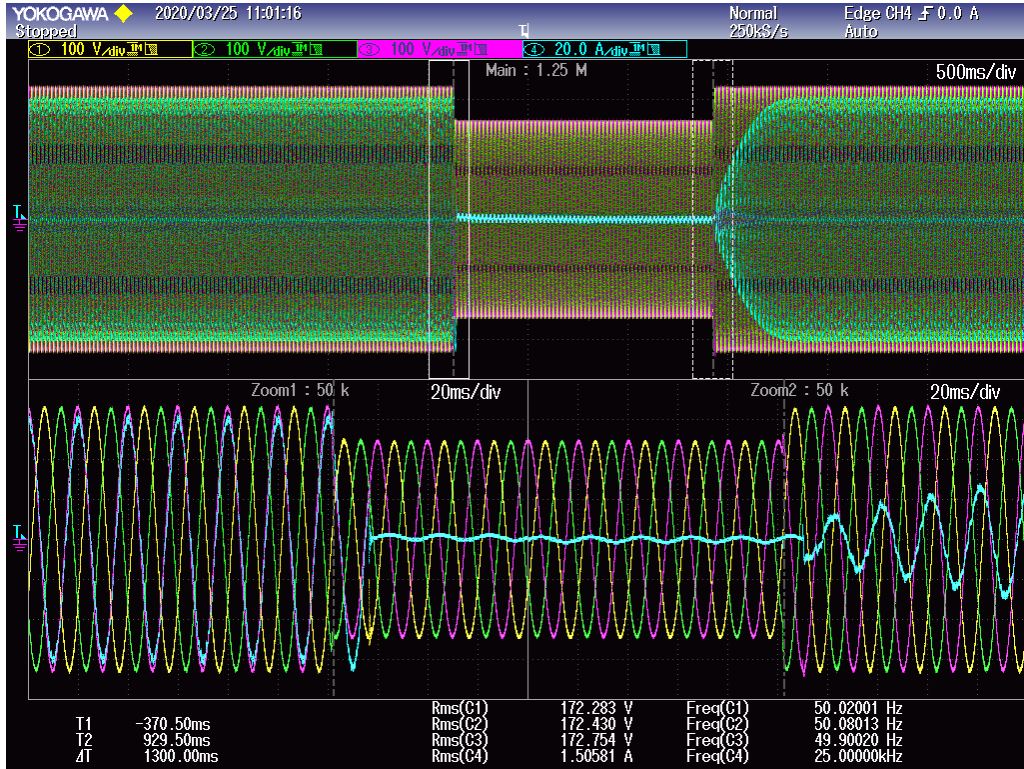


Test 4s – three-phase symmetrical fault ( $V_4/V_{nom} = 0.75$ ) - Return to supplying power  
 $P = 0.1 - 0.3$

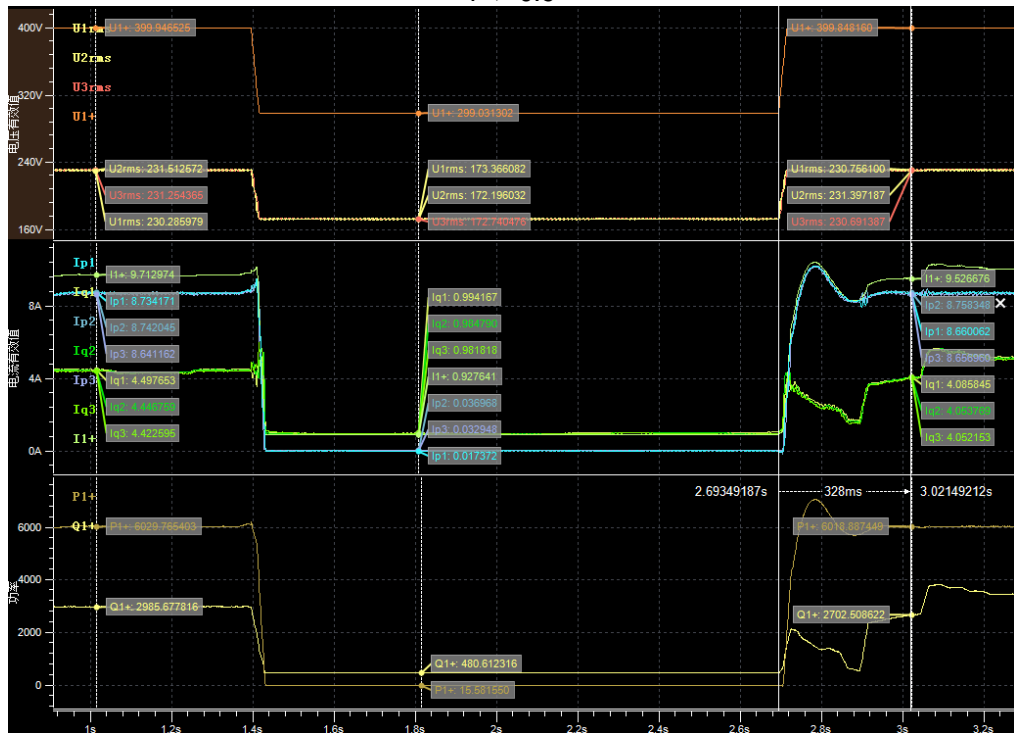


CEI 0-21			
Clause	Requirement - Test	Result - Remark	Verdict

Test 4s – three-phase symmetrical fault ( $V_4/V_{nom} = 0.75$ ) - Phase current wave  
 $P > 0.9$



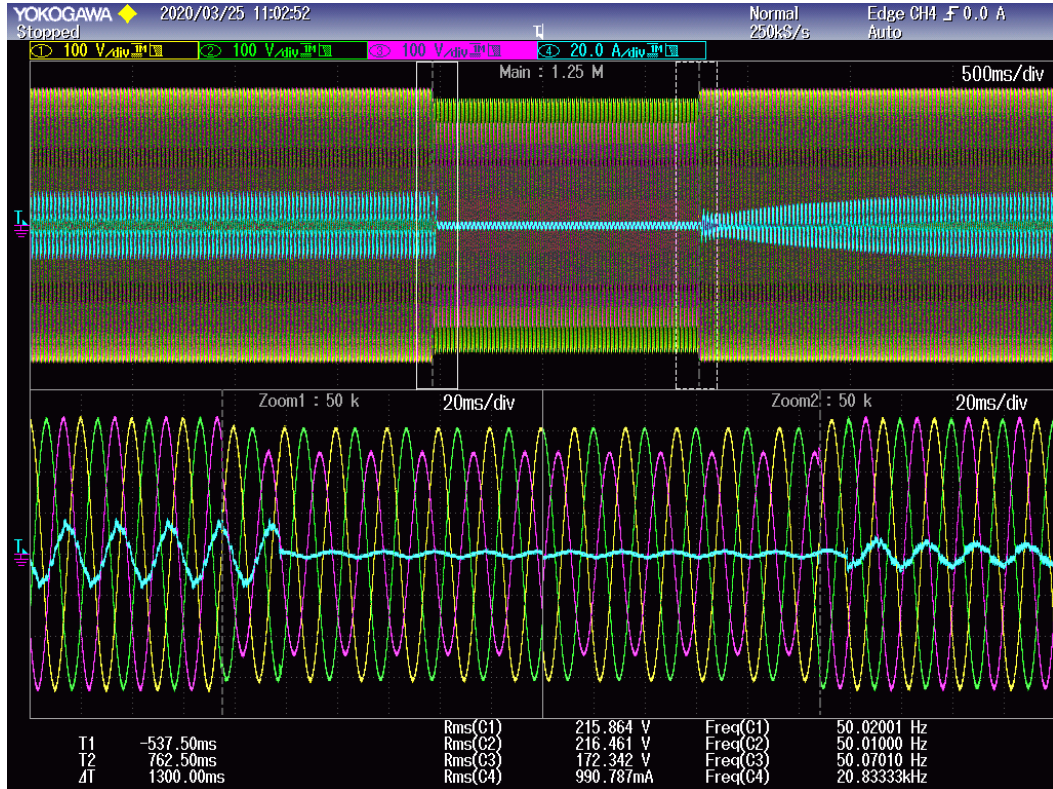
Test 4s – three-phase symmetrical fault ( $V_4/V_{nom} = 0.75$ ) - Return to supplying power  
 $P > 0.9$



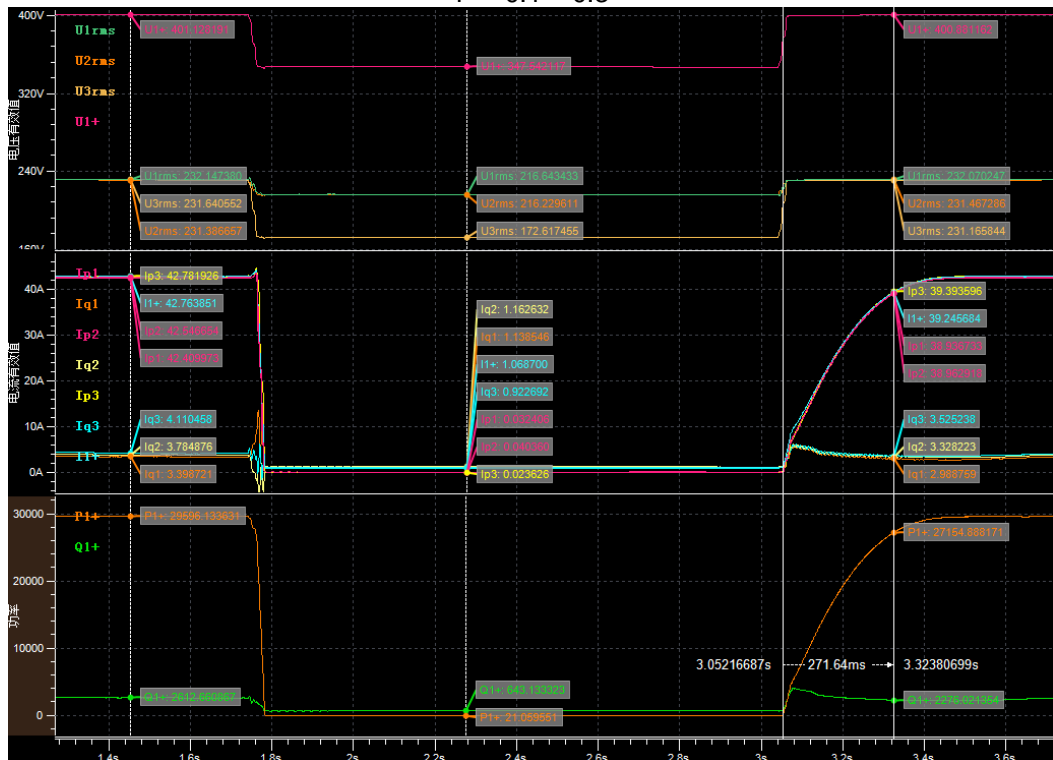
CEI 0-21

Clause	Requirement - Test	Result - Remark	Verdict
--------	--------------------	-----------------	---------

Test 4a – two-phase asymmetrical fault ( $V_4/V_{nom} = 0.75$ ) - Phase current wave  
 $P = 0.1 - 0.3$

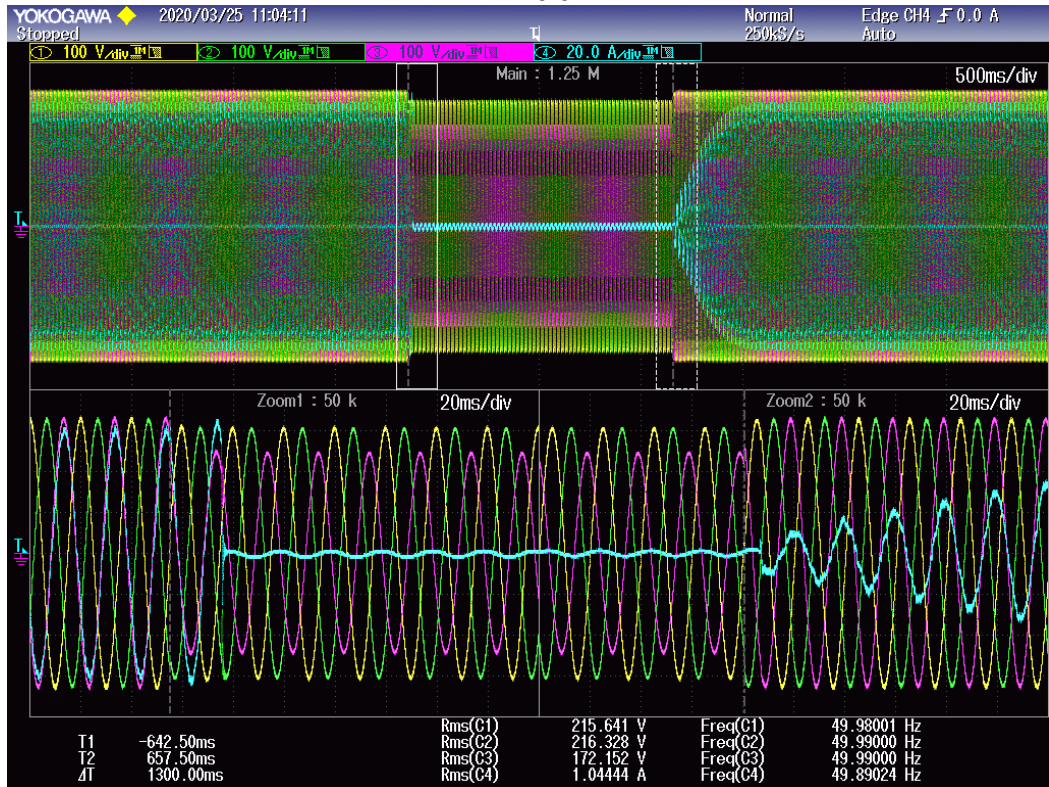


Test 4a – two-phase asymmetrical fault ( $V_4/V_{nom} = 0.75$ ) - Return to supplying power  
 $P = 0.1 - 0.3$

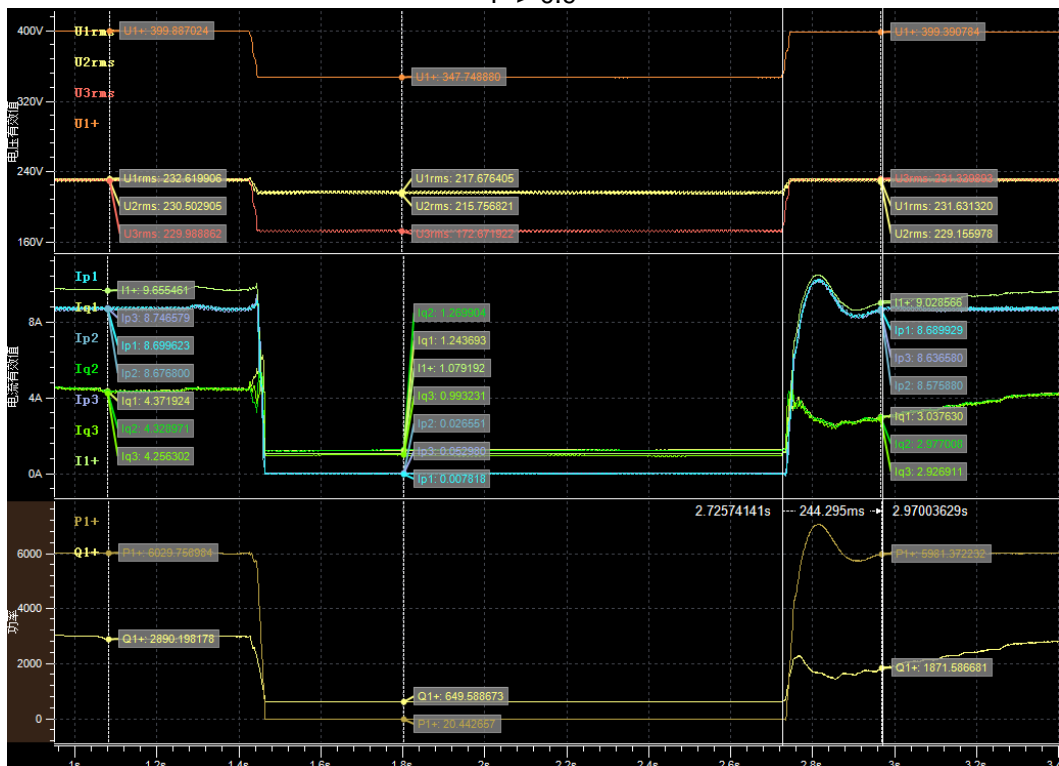


CEI 0-21			
Clause	Requirement - Test	Result - Remark	Verdict

Test 4a – two-phase asymmetrical fault ( $V_4/V_{nom} = 0.75$ ) - Phase current wave  
 $P > 0.9$

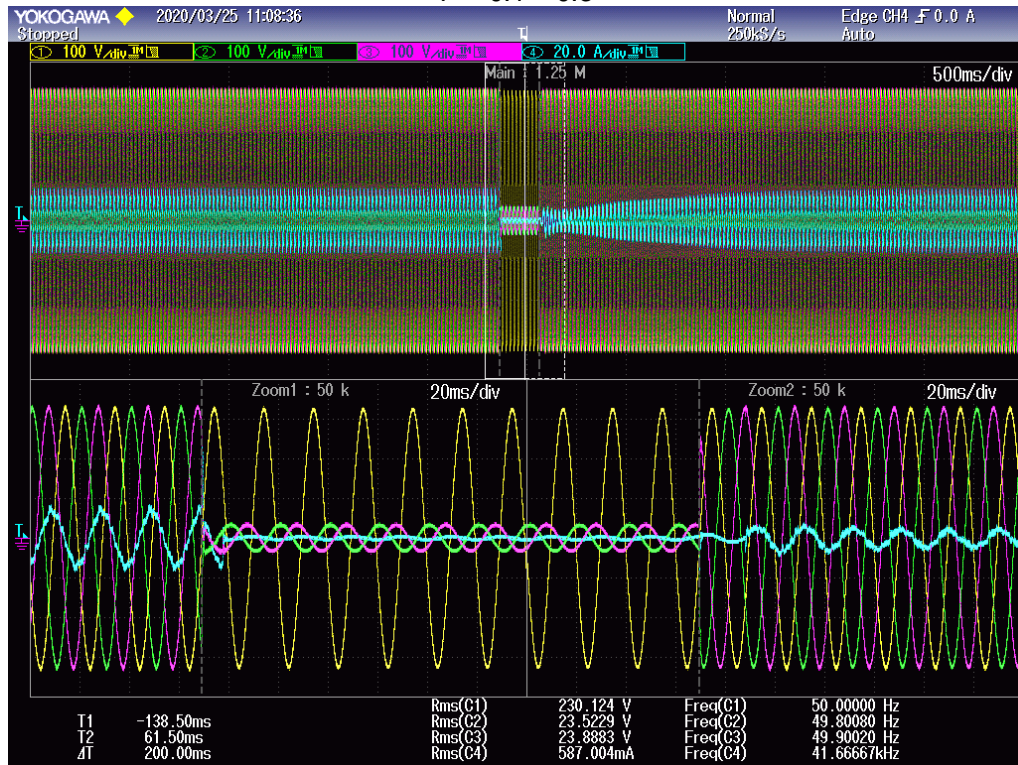


Test 4a – two-phase asymmetrical fault ( $V_4/V_{nom} = 0.75$ ) - Return to supplying power  
 $P > 0.9$

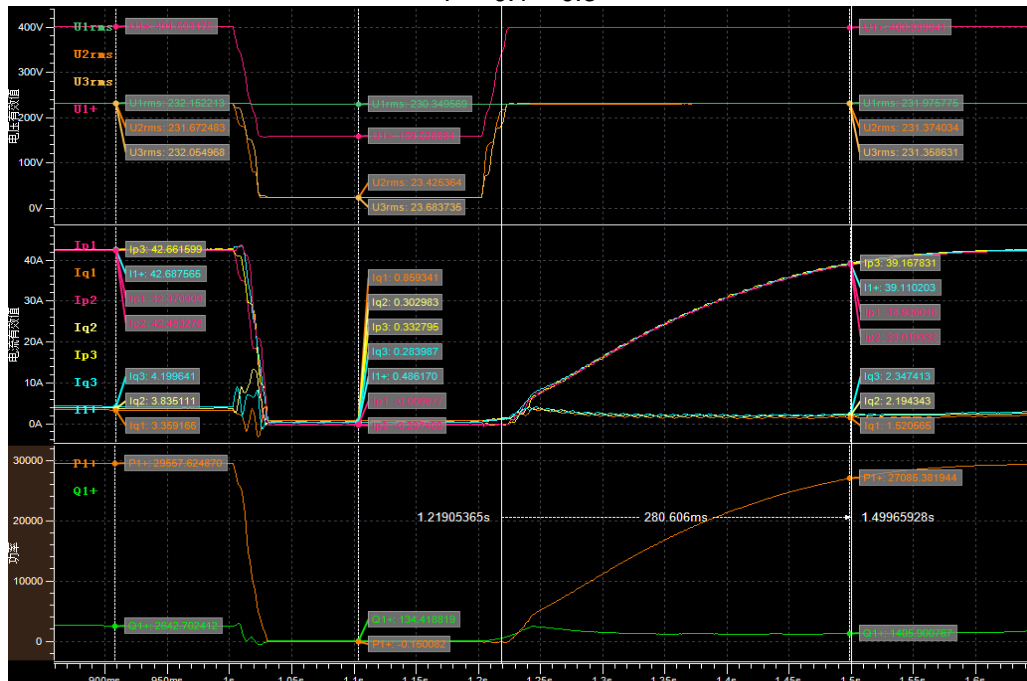


CEI 0-21			
Clause	Requirement - Test	Result - Remark	Verdict

Test 5 – LV two-phase asymmetrical fault ( $V_s/V_{nom} = 0.10$ ) - Phase current wave  
 $P = 0.1 - 0.3$



Test 5 – LV two-phase asymmetrical fault ( $V_s/V_{nom} = 0.10$ ) - Return to supplying power  
 $P = 0.1 - 0.3$

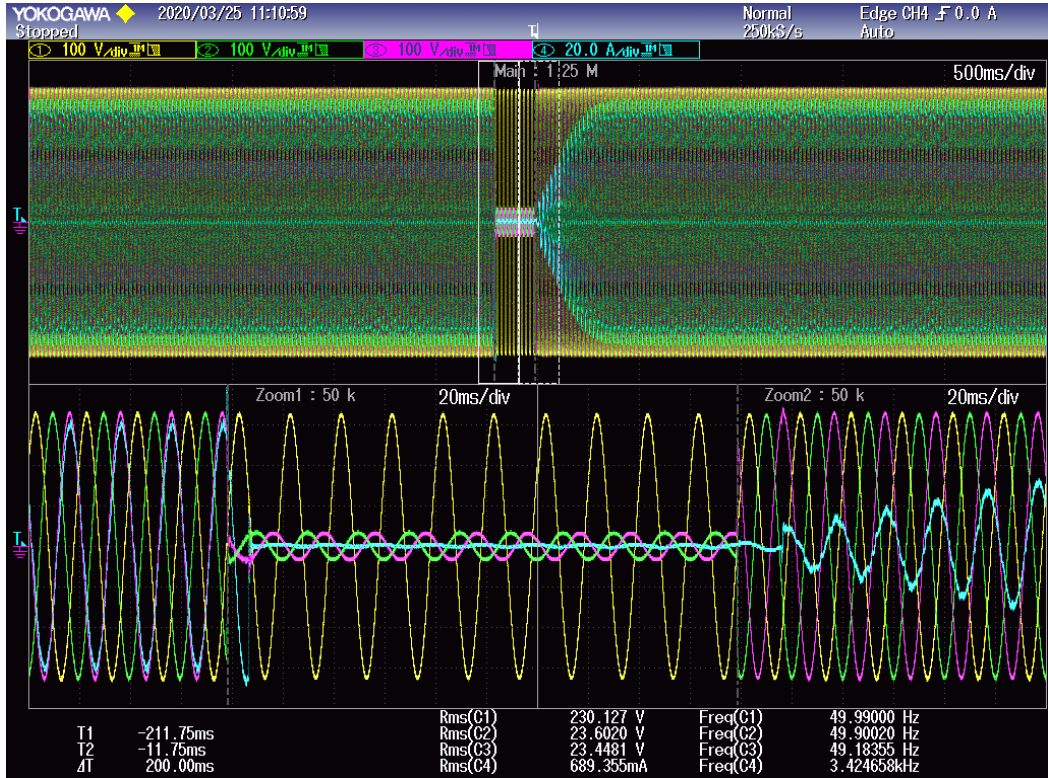




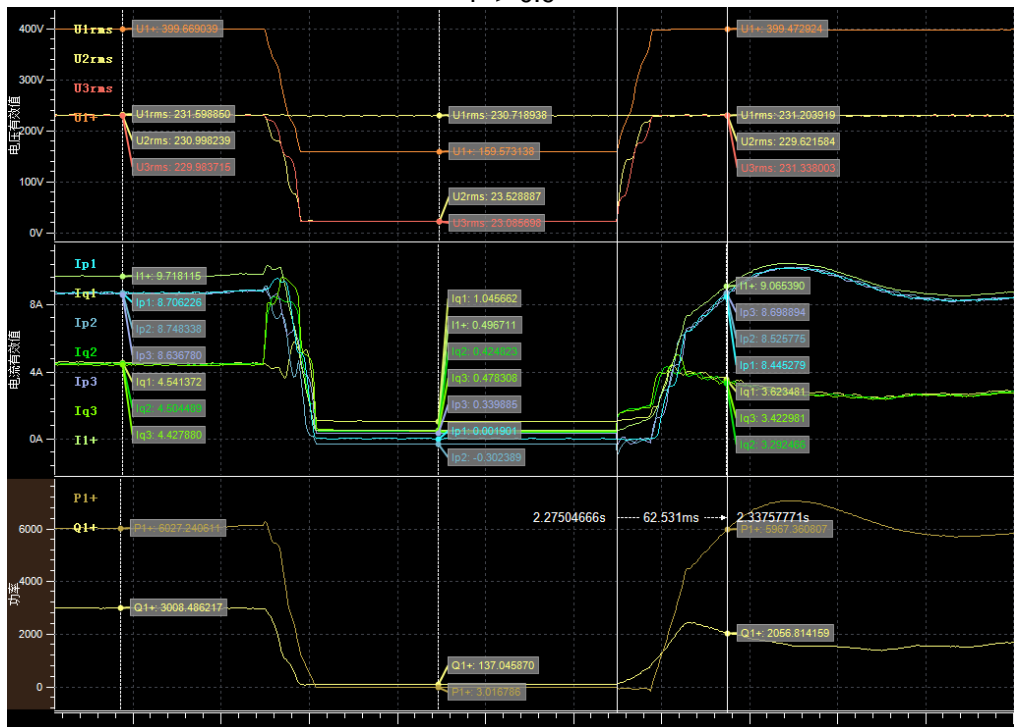
CEI 0-21

Clause	Requirement - Test	Result - Remark	Verdict
--------	--------------------	-----------------	---------

Test 5 – LV two-phase asymmetrical fault ( $V_s/V_{nom} = 0.10$ ) - Phase current wave  
 $P > 0.9$

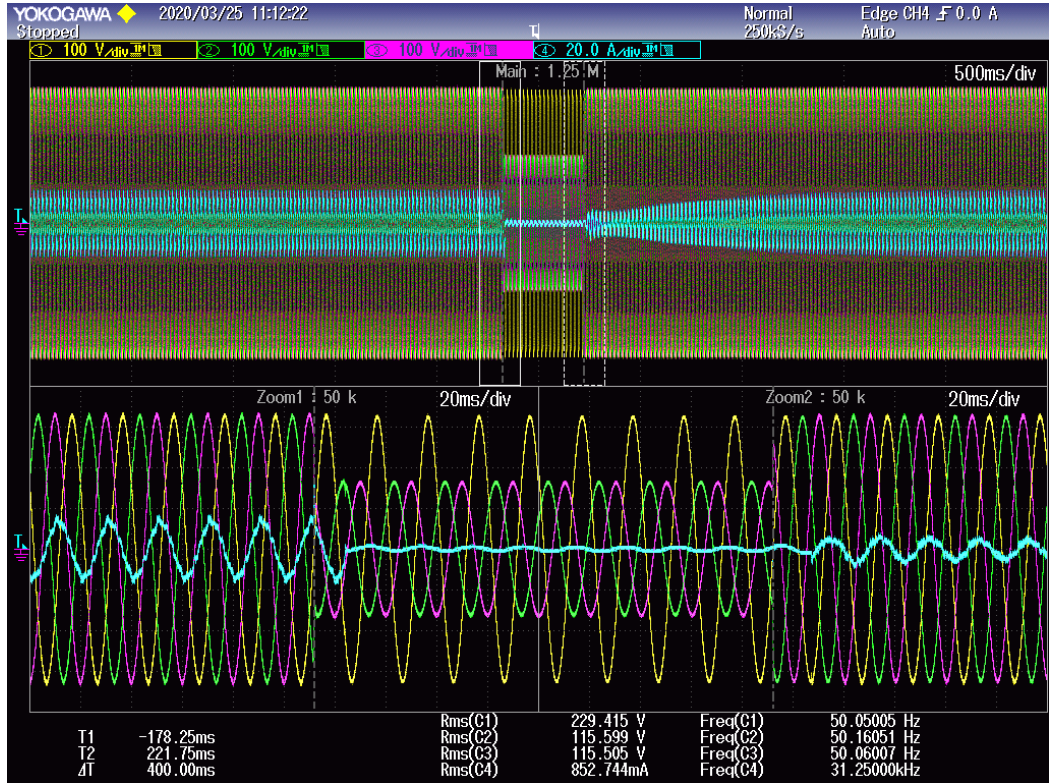


Test 5 – LV two-phase asymmetrical fault ( $V_s/V_{nom} = 0.10$ ) - Return to supplying power  
 $P > 0.9$

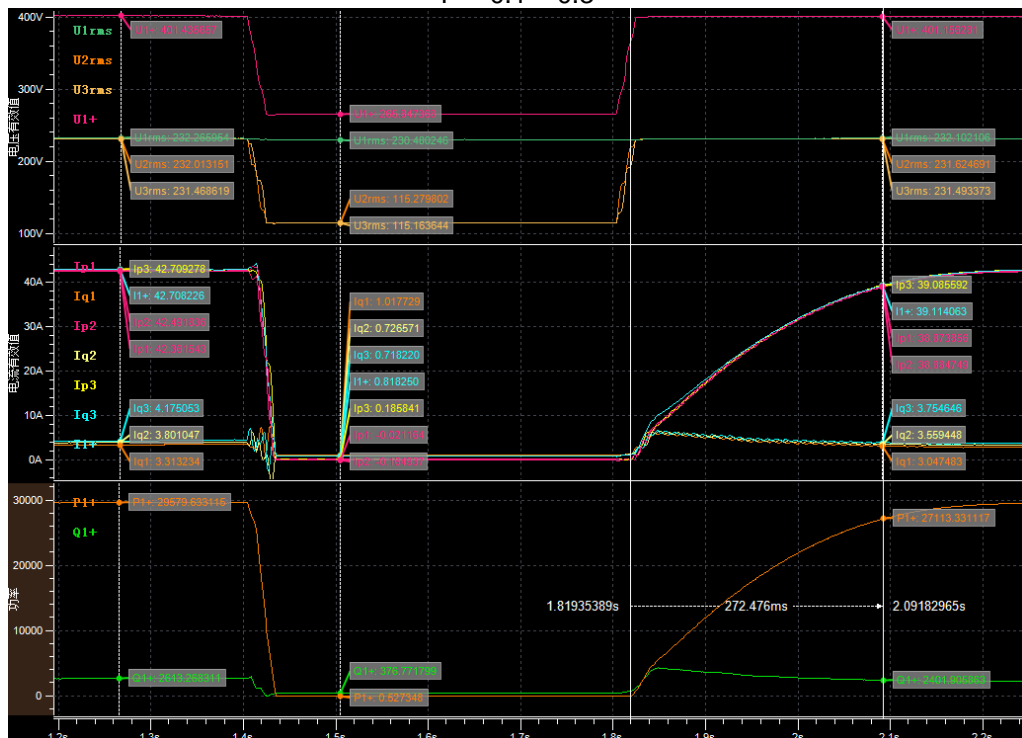


CEI 0-21			
Clause	Requirement - Test	Result - Remark	Verdict

Test 6 – LV two-phase asymmetrical fault ( $V_6/V_{nom} = 0.50$ ) - Phase current wave  
 $P = 0.1 - 0.3$



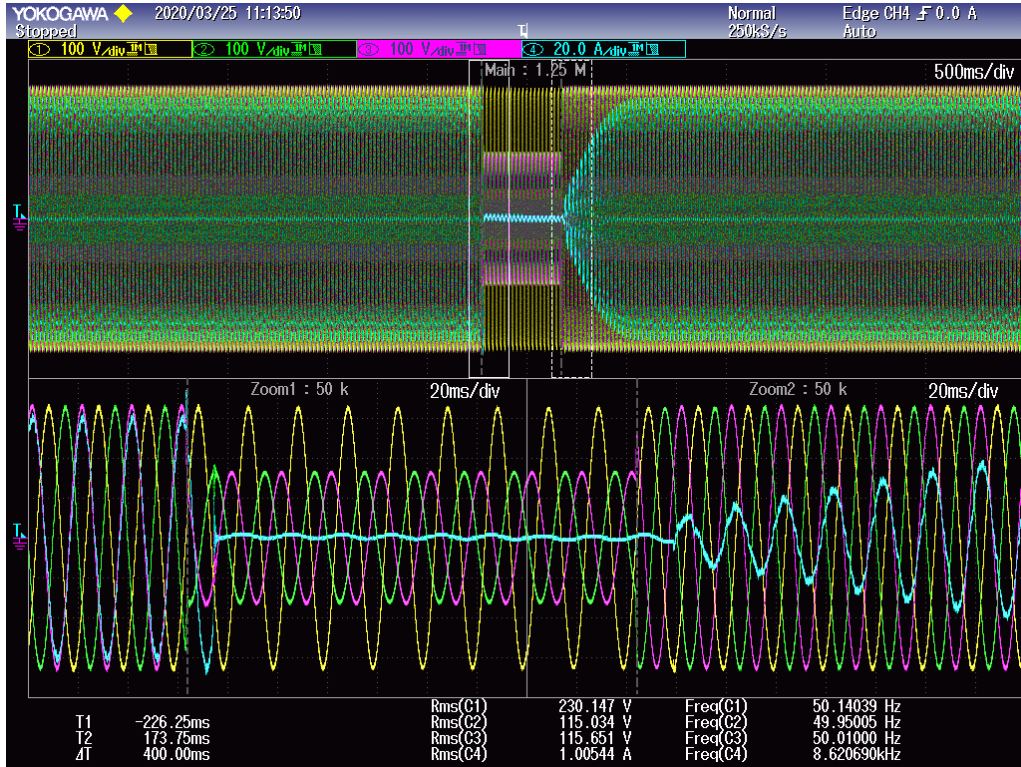
Test 6 – LV two-phase asymmetrical fault ( $V_6/V_{nom} = 0.50$ ) - Return to supplying power  
 $P = 0.1 - 0.3$



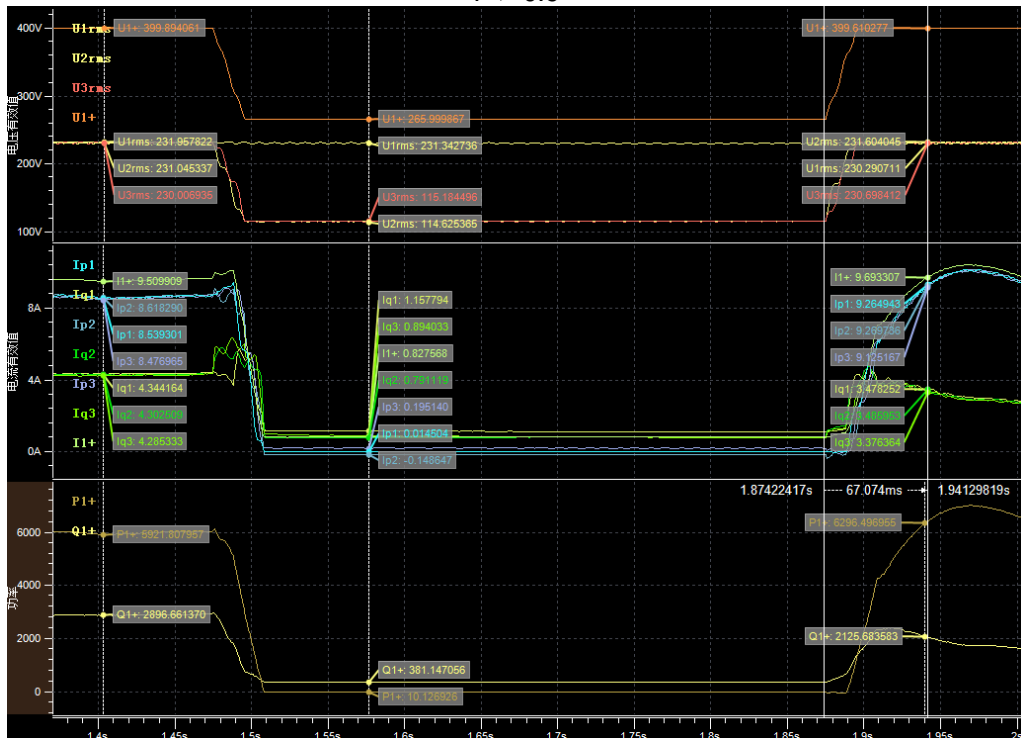
CEI 0-21

Clause	Requirement - Test	Result - Remark	Verdict
--------	--------------------	-----------------	---------

Test 6 – LV two-phase asymmetrical fault ( $V_6/V_{nom} = 0.50$ ) - Phase current wave  
 $P > 0.9$



Test 6 – LV two-phase asymmetrical fault ( $V_6/V_{nom} = 0.50$ ) - Return to supplying power  
 $P > 0.9$



CEI 0-21			
Clause	Requirement - Test	Result - Remark	Verdict

B.1.6	Checking the insensitivity to automatic reclosing during phase accordance	P
Clause	Test	Result
B.1.6.1	Test on the simulation network	P

B.1.6	Checking the insensitivity to automatic reclosing during phase accordance	P
-------	---	---

**General:**

This type of test can be performed in two ways:

1. with the inverter connected to a simulated network (B.1.6.1)
2. with the inverter connected to the distribution network (B.1.6.2 and alternatively B.1.6.3).

The generator must not be damaged as a result of the tests. Protective devices may be switched off or released.

With reference to the diagram in Figure 35 – Using the simulated network:

- The network simulator should be able to produce phase shifts in of the output voltage at the inverter terminals of 90° and 180°, respectively.
- Generator: inverter operating at nominal power with unity power factor ( $\cos\varphi= 1$ )
- VR: simulated network voltage
- The generator must start operating at nominal power. Let the system operate under the conditions set for at least 5 minutes or the time needed to stabilise the internal temperature of the converter.

After the stabilisation period two tests should be performed in sequence, by inducing the transient that produces a phase shift angle on the simulated network voltage VR of 180° and 90°.

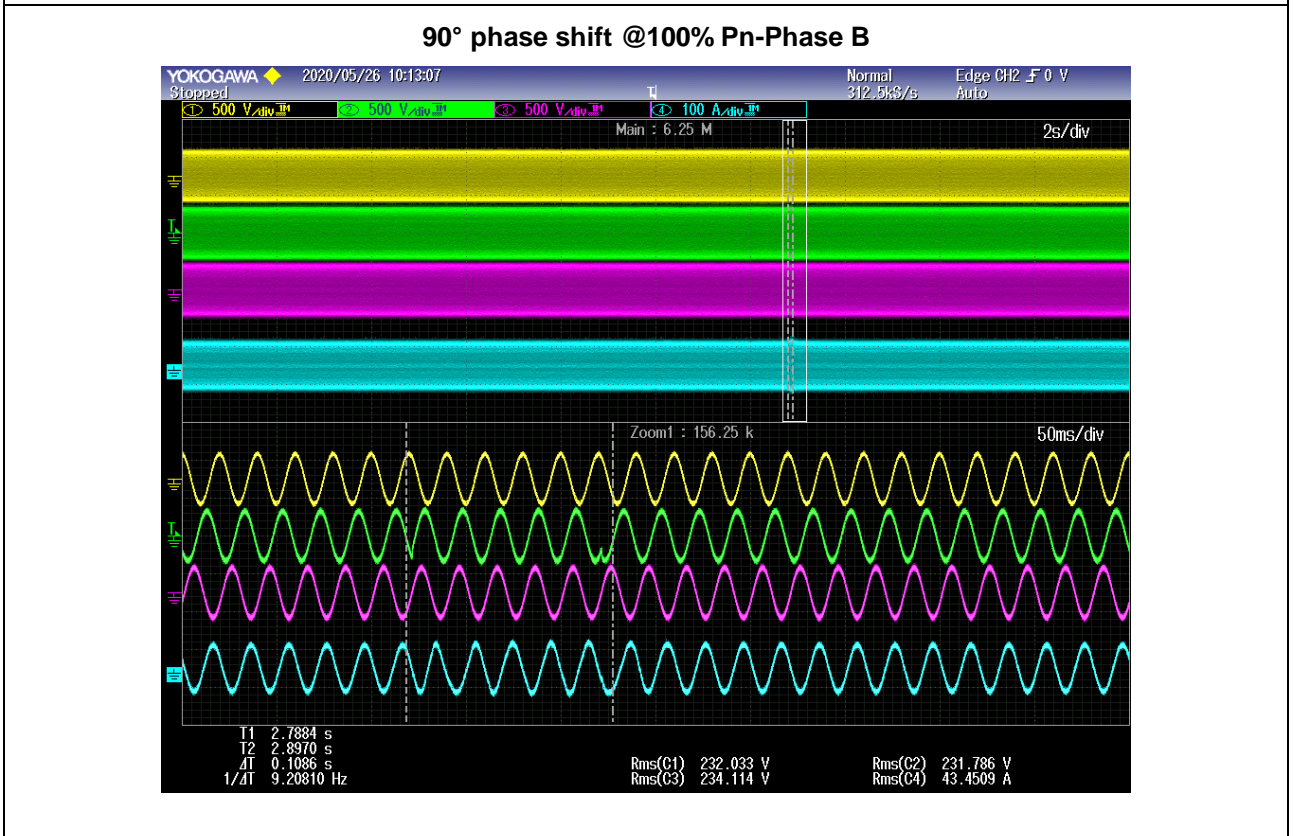
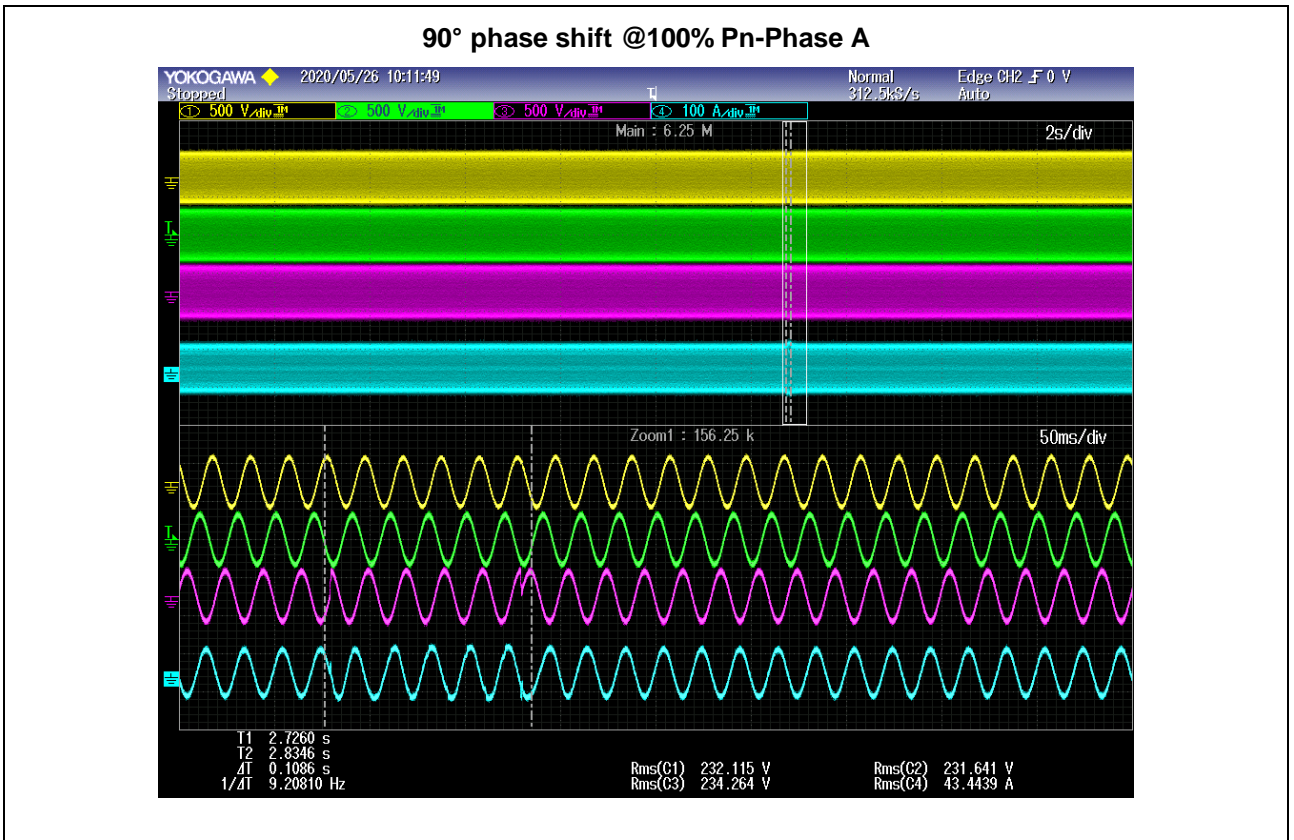
In the test report the following data for each of the two test sequences shall be indicated:

- the angle between the voltage before and after the phase shift, with an instrument with a 1° error;
- the generator current on a time window starting from 20 ms before until at least 200 ms after the phase shift of the simulated network voltage.

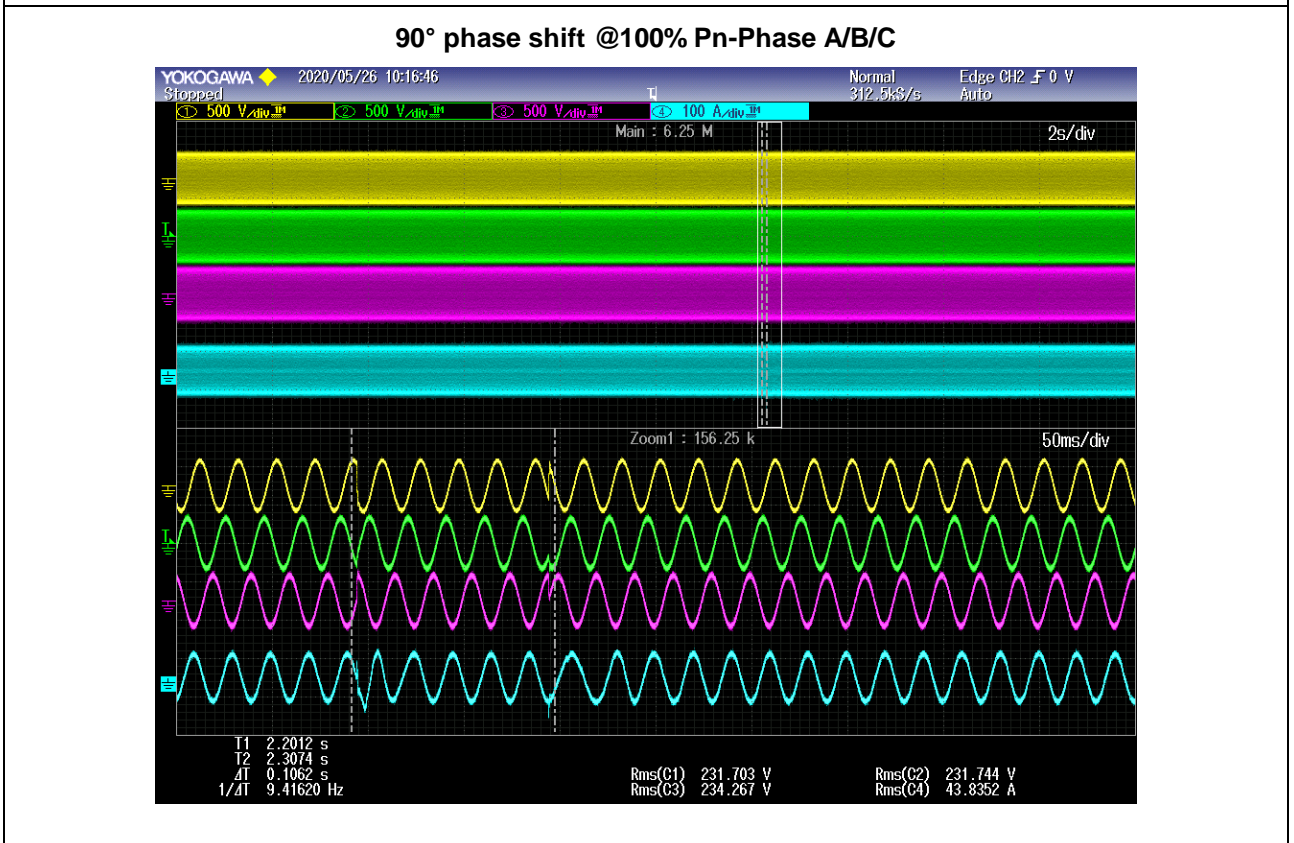
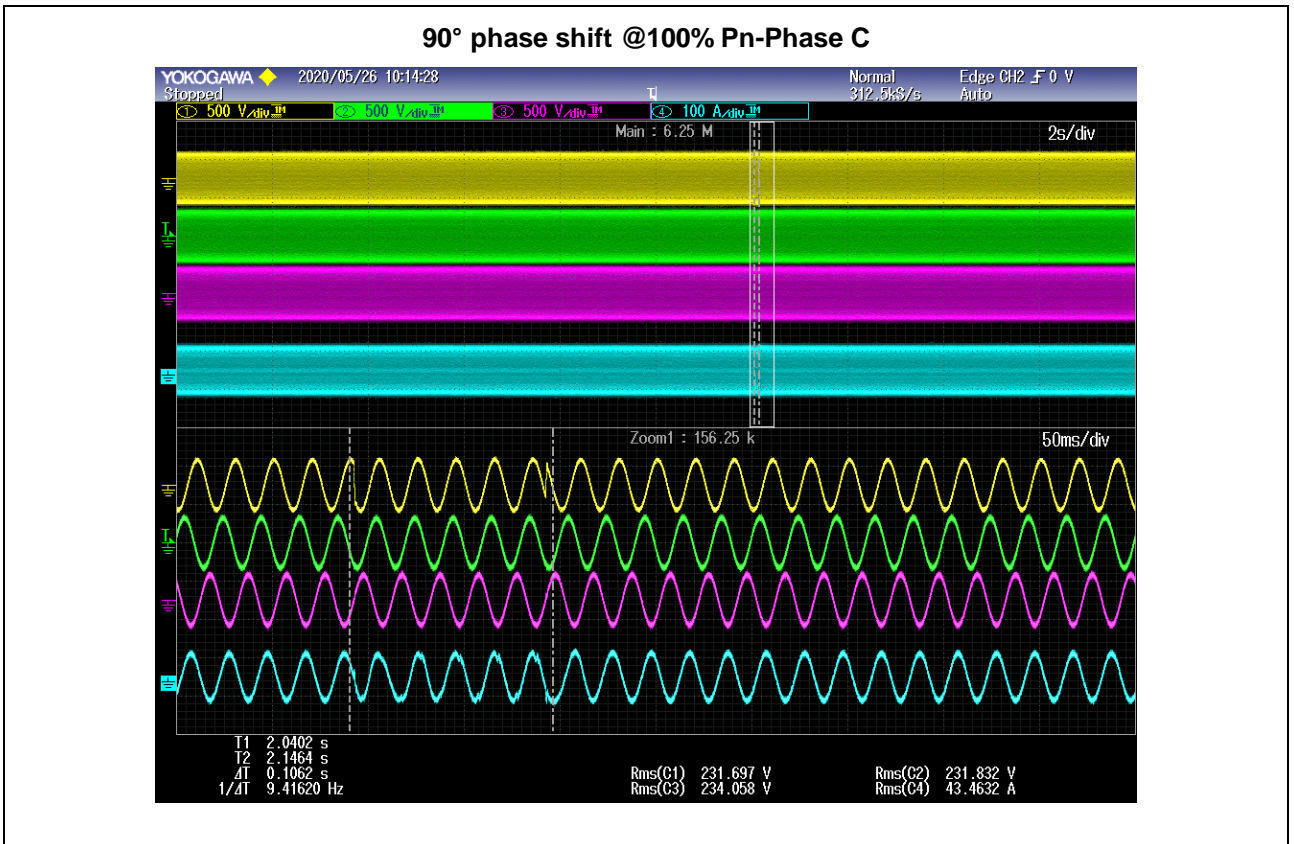
CEI 0-21			
Clause	Requirement - Test	Result - Remark	Verdict

B.1.6.1		Test on the simulation network				P
Model: EA30KTSI						
Test results						
Test 1 - phase shift angle of 90°						
Power	Phase shift angle	Current 20 ms before phase shift (A)		Current 200ms after phase shift (A)		Result
100% Pn	90°	Phase A	43.0	Phase A	43.0	Normal situation
		Phase B	42.7	Phase B	42.7	Normal situation
		Phase C	42.9	Phase C	42.9	Normal situation
		Phase A/B/C	42.9	Phase A/B/C	43.5	Normal situation
Test 2 - phase shift angle of 180°						
Power	Phase shift angle	Current 20 ms before phase shift (A)		Current 200ms after phase shift (A)		Result
100% Pn	180°	Phase A	42.9	Phase A	43.0	Normal situation
		Phase B	42.7	Phase B	42.7	Normal situation
		Phase C	42.9	Phase C	42.9	Normal situation
		Phase A/B/C	42.8	Phase A/B/C	0.28	The inverter was stopped and restarted after the test has been performed. No damage, no hazard.
Note: The tests were performed on model EA30KTSI and are also applicable for all other models stated in this report.						

CEI 0-21			
Clause	Requirement - Test	Result - Remark	Verdict

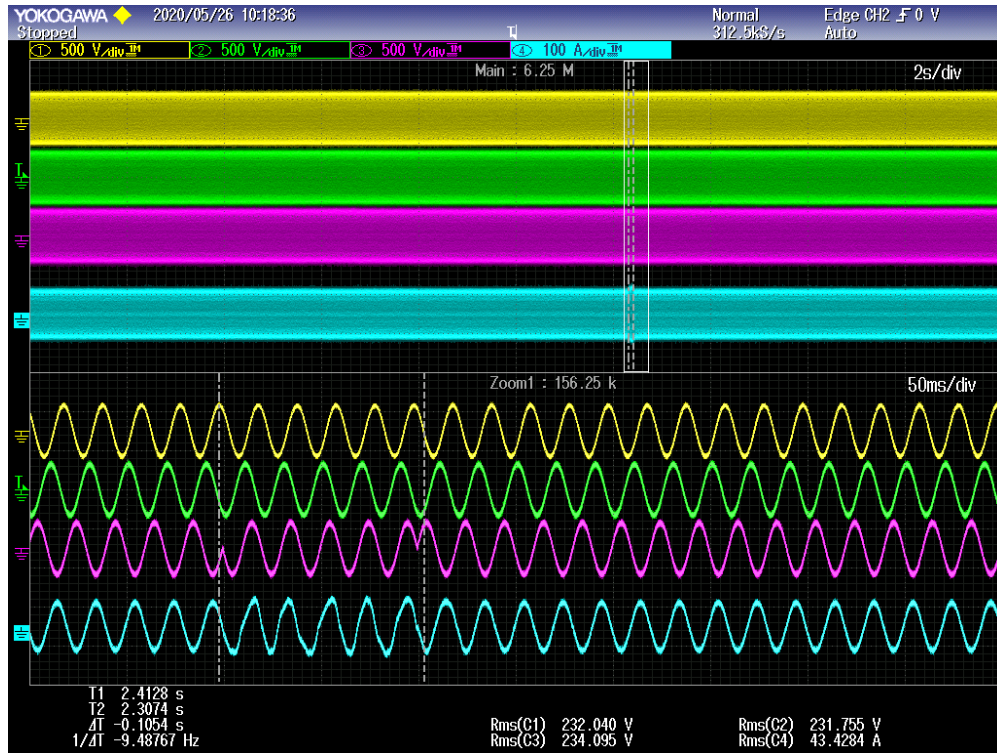


CEI 0-21			
Clause	Requirement - Test	Result - Remark	Verdict

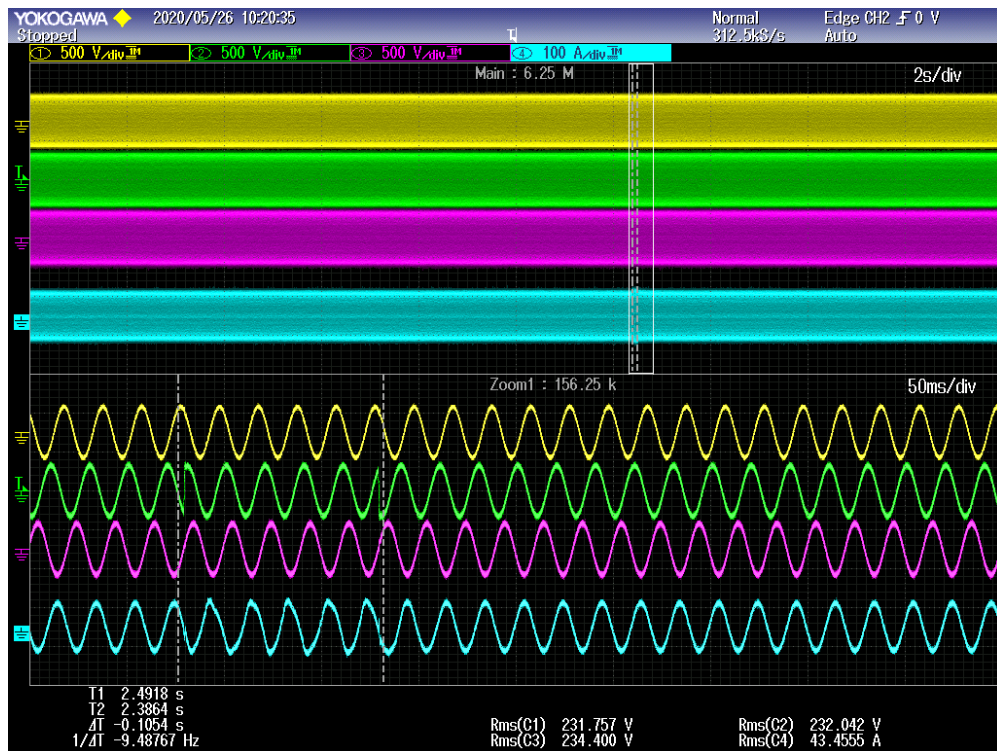


CEI 0-21			
Clause	Requirement - Test	Result - Remark	Verdict

180° phase shift @100% Pn- Phase A

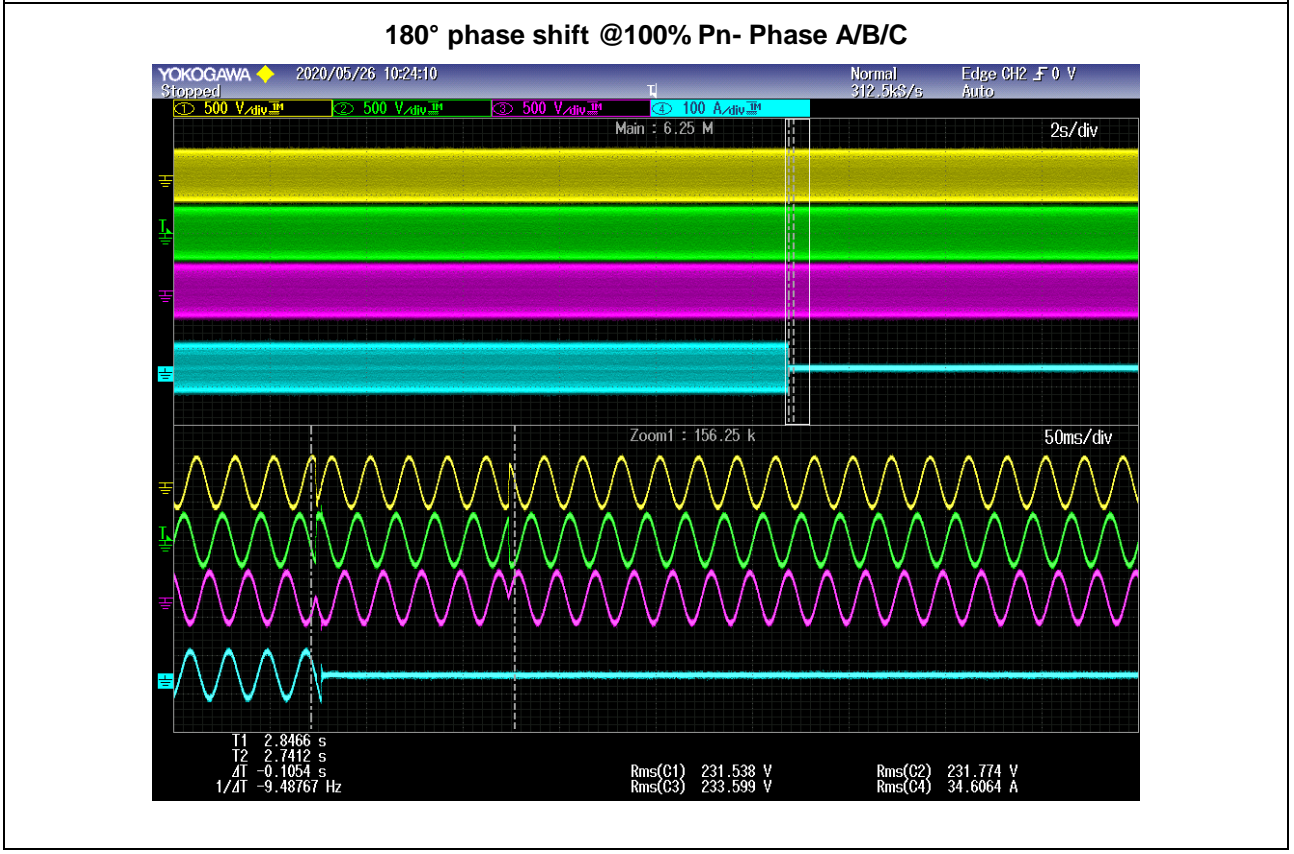
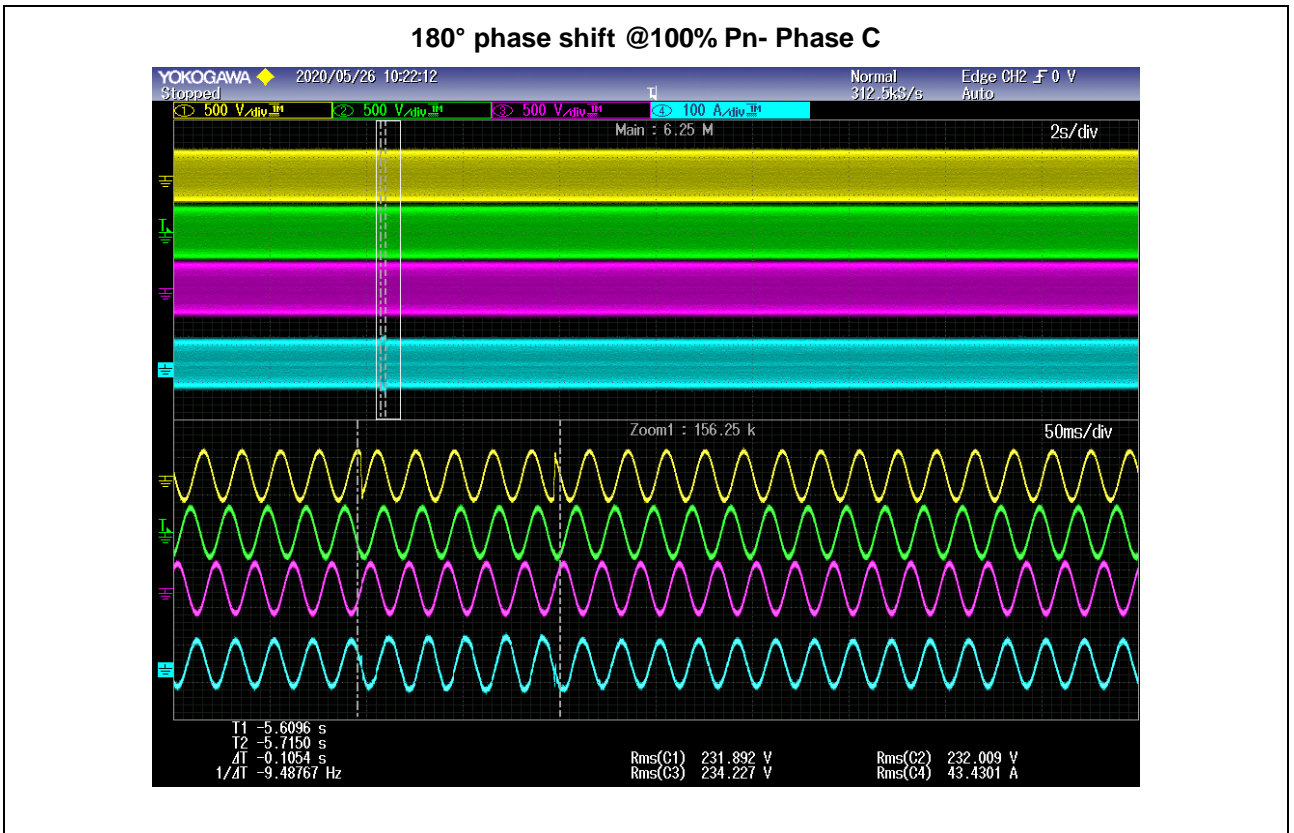


180° phase shift @100% Pn- Phase B







CEI 0-21			
Clause	Requirement - Test	Result - Remark	Verdict



# Annex 1

## ISO 9001 certificate


Continuing validity of this certificate depends on reception regular surveillance audit and qualified, please scan the QR code to get the related validity.

Registration Number: 01217Q30597R4L  
 Issue Date: August 23, 2017  
 Expiry Date: August 22, 2020  
 Re-Issue Date: October 17, 2018

Note: Further clarifications regarding the scope of this certificate and the applicability of ISO 9001:2015 requirements may be obtained by consulting the organization.

The information of this certificate may be verified by visiting Official CNCA Website ([www.cnca.gov.cn](http://www.cnca.gov.cn)).

The Certification Body is Accredited by China National Accreditation Service for Conformity Assessment.  
 P.O. 1501-33 GZ 510610 P.R.C

  
 Zhao Guoxiang  
 General Manager  
**CEPREI CERTIFICATION BODY**

JTB2-1  
K8

### Quality Management System Certificate

(Original)  
 This is to certify that

**EAST GROUP CO., LTD./ EAST ELECTRIC SYSTEM TECHNOLOGY CO., LTD./GUANGDONG OREMA POWER TECHNOLOGY CO., LTD/ZHONGNENG E-POWER NEW ENERGY TECHNOLOGY CO., LTD**

Unified Social Credit Identifier: 914419007292294758 / 91441900791186672D / 914419005591413579 / 914419003149304703

Registration Address: NO.6, NORTHERN INDUSTRY ROAD, SONGSHAN LAKE SCI & TECH INDUSTRIAL PARK, DONGGUAN CITY, GUANGDONG PROVINCE, P.R.CHINA / A ZONE, NORTHERN INDUSTRY CITY, SONGSHAN LAKE SCI & TECH INDUSTRIAL PARK, DONGGUAN CITY, GUANGDONG PROVINCE, P.R.CHINA / 2/F, BLOCK B, NO. 6 NORTHERN INDUSTRY ROAD, SONGSHAN LAKE HIGH-TECH INDUSTRIAL DEVELOPMENTAL ZONE, DONGGUAN CITY, GUANGDONG, CHINA / 3/F, BUILDING C-1, NO.6, NORTHERN INDUSTRY ROAD, SONGSHAN LAKE SCI & TECH INDUSTRIAL PARK, DONGGUAN CITY, GUANGDONG CHINA

Has implemented and maintains a Quality Management System in compliance with **GB/T19001-2016 idt ISO 9001:2015**

The Quality Management System is applicable to:

**DESIGN, PRODUCTION AND SERVICING OF UNINTERRUPTIBLE POWER SYSTEM (UPS), EMERGENCY POWER SYSTEM (EPS), HIGH-FREQUENCY SWITCHING RECTIFYING POWER FOR COMMUNICATION, POWER DISTRIBUTION CABINET, INTEGRATED POWER SUPPLY FOR DATA ROOM, POWER INTEGRATED SYSTEM, PHOTOVOLTAIC INVERTER AND COMBINER BOX, ELECTRIC CAR CHARGING POINT, POWER ENVIRONMENT MONITORING SYSTEM, COMPOSITE ENERGY STORAGE SYSTEM, INTELLIGENT MICRO GRID; DESIGN, SALES SERVICING OF PRECISION AIR CONDITIONING; PRODUCTION AND SERVICING OF REGULATED POWER SUPPLY; SALES SERVICING OF SEALED VALVE-REGULATED LEAD-ACID STORAGE BATTERY AND LITHIUM BATTERY**

Involved site (s) and relevant activities

Address	Zip Code	Main Activities
NO.6, NORTHERN INDUSTRY ROAD, SONGSHAN LAKE SCI & TECH INDUSTRIAL PARK, DONGGUAN CITY, GUANGDONG PROVINCE, P.R.CHINA	523808	DESIGN, PRODUCTION AND SERVICING OF UNINTERRUPTIBLE POWER SYSTEM (UPS), EMERGENCY POWER SYSTEM (EPS), HIGH-FREQUENCY SWITCHING RECTIFYING POWER FOR COMMUNICATION, POWER DISTRIBUTION CABINET, INTEGRATED POWER SUPPLY FOR DATA ROOM, POWER INTEGRATED SYSTEM, PHOTOVOLTAIC INVERTER AND COMBINER BOX, ELECTRIC CAR CHARGING POINT, POWER ENVIRONMENT MONITORING SYSTEM, COMPOSITE ENERGY STORAGE SYSTEM, INTELLIGENT MICRO GRID; DESIGN, SALES SERVICING OF PRECISION AIR CONDITIONING; PRODUCTION AND SERVICING OF REGULATED POWER SUPPLY; SALES SERVICING OF SEALED VALVE-REGULATED LEAD-ACID STORAGE BATTERY AND LITHIUM BATTERY



# Annex 2

## Datasheet of the relay

**HF176F****SOLAR RELAY**


File No.:E133481



File No.: R50411032

**Features**

- 65A swithing capitabl.
- Applicable to solar photovoltaic inverter
- 3mm contact gap
- Low coil holding voltage contributes to saving energy of equipment.
- UL insulation system: class F.

**CONTACT DATA**

Contact arrangement	1A
Contact resistance (Initial)	≤10mΩ max( 6VDC 2A)
Contact material	AgSnO <sub>2</sub> , AgNi
Contact rating (Res. load)	Making 20A, Carrying 65A, Breaking 20A, 277VAC 85°C
Max. switching voltage	400VAC
Max. switching current	65A
Max. switching power	18005VA
Mechanical endurance	1 x 10 <sup>6</sup> ops
Electrical endurance	3 x 10 <sup>4</sup> ops (Making 20A, Carrying 65A, Breaking 20A, Resistive load, at 85°C, 1s on 9s off)

**CHARACTERISTICS**

Insulation resistance	1000MΩ (at 500VDC)	
Dielectric strength	Between coil & contacts	5000VAC 1min
	Between open contacts	2000VAC 1min
Surge voltage (between coil & contacts)	10kV(1.2 / 50μs)	
Operate time (at nomi. volt.)	30ms max.	
Release time (at nomi. volt.)	10ms max.	
Temperature rise (at nomi. volt.)	70K max.(Contact load current 65A, 50% to 60% of rated voltage excitation, at 85°C)	
Shock resistance	Functional	98m/s <sup>2</sup>
	Destructive	980m/s <sup>2</sup>
Vibration resistance	10Hz to 55Hz 1.5mm DA	
Humidity	5% to 85% RH	
Ambient temperature	-40°C to 85°C (Apply holding voltage to coil)	
Termination	PCB	
Unit weight	Approx.100g	
Construction	Flux proofed	

Notes: The data shown above are initial values.

**COIL**

Coil power	Approx.1.92W
Holding voltage	40% to 100%U <sub>N</sub> (at 25°C) 50% to 60%U <sub>N</sub> (at 85°C)

Notes: 1)The coil holding voltage is the voltage applied to coil 100ms after the rated voltage.  
2)To avoid overheating and burning, the coil can not be consistently applied to with voltage larger than maximum holding voltage.

**COIL DATA**

at 23°C

Nominal Voltage VDC <sup>1)</sup>	Pick-up Voltage VDC max. <sup>1)</sup>	Drop-out Voltage VDC min. <sup>1)</sup>	Max. Voltage VDC <sup>2)</sup>	Coil Resistance Ω
6	≤4.2	≥0.6	6.6	18.8 x (1±10%)
9	≤6.3	≥0.9	9.9	42.2 x (1±10%)
12	≤8.4	≥1.2	13.2	75 x (1±10%)
24	≤16.8	≥2.4	26.4	300 x (1±10%)

Notes: 1)The data shown above are initial values.  
2)\*Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

**SAFETY APPROVAL RATINGS**

UL/CUL	Material	Rating
UL/CUL	AgNi	Making 20A, Carrying 65A, Breaking 20A, 400VAC Resistive at 85°C 48A 277VAC General use at 85°C 60A 277VAC General use at 85°C
	AgSnO <sub>2</sub>	Making 20A, Carrying 65A, Breaking 20A, 400VAC Resistive at 85°C 65A 277VAC Resistive at 85°C 65A 30VDC Resistive at 85°C 65A 60VDC Resistive at 85°C
TÜV	AgNi	Making 20A, Carrying 65A, Breaking 20A, 400VAC Resistive at 85°C 48A 277VAC 85°C, cos φ =0.8 60A 277VAC 85°C, cos φ =0.8
	AgSnO <sub>2</sub>	Making 20A, Carrying 65A, Breaking 20A, 400VAC Resistive at 85°C 65A 277VAC 85°C, cos φ =0.8 65A 30VDC 85°C, L/R=0 65A 60VDC 85°C, L/R=0

Notes: 1) All values unspecified are at room temperature.  
2) Only typical loads are listed above. Other load specifications can be available upon request.



HONGFA RELAY

ISO9001, ISO/TS16949, ISO14001, OHSAS18001, IECQ QC 080000 CERTIFIED

2019 Rev. 1.00

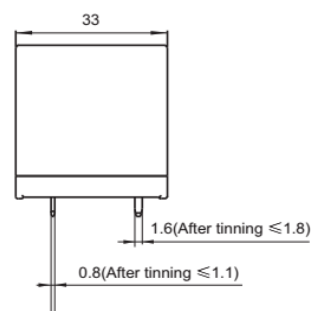
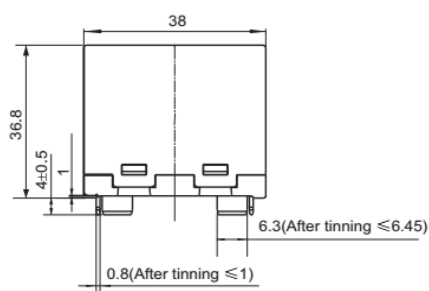
ORDERING INFORMATION	
Type	HF176F/ 12 -H 3 F (XXX)
Coil voltage	6, 9, 12, 24VDC
Contact arrangement	H:1 Form A
Contact material	3: AgNi T: AgSnO <sub>2</sub>
Insulation standard	F: Class F
Special code	XXX: Customer special requirement Nil: Standard

Notes: 1) Water cleaning or surface process is not suggested after the flux-proofed relays are assembled on PCB.  
 2) Flux-proofed relays can not be used in the environment with pollutants like H<sub>2</sub>S, SO<sub>2</sub>, NO<sub>2</sub>, dust, etc.  
 3) The customer special requirement express as special code after evaluating by Hongfa.

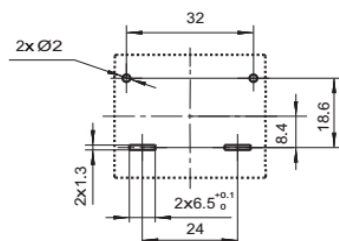
## OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

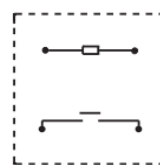
### Outline Dimensions



PCB Layout (Bottom view)



Wiring Diagram (Bottom view)



Notes: 1) In case of no tolerance shown in outline dimension: outline dimension  $\leq 1$ mm, tolerance should be  $\pm 0.2$ mm; outline dimension  $> 1$ mm and  $\leq 5$ mm, tolerance should be  $\pm 0.3$ mm; outline dimension  $> 5$ mm, tolerance should be  $\pm 0.4$ mm.  
 2) The tolerance without indicating for PCB layout is always  $\pm 0.1$ mm.

### Disclaimer

The specification is for reference only. See to "Terminology and Guidelines" for more information. Specifications subject to change without notice. We could not evaluate all the performance and all the parameters for every possible application. Thus the user should be in a right position to choose the suitable product for their own application. If there is any query, please contact Hongfa for the technical service. However, it is the user's responsibility to determine which product should be used only.

© Xiamen Hongfa Electroacoustic Co., Ltd. All rights of Hongfa are reserved.

# Annex 3

## Pictures of the unit

EA20KTSI / EA25KTSI / EA30KTSI  
Enclosure – Front View



EA20KTSI / EA25KTSI / EA30KTSI  
Enclosure – Rear View



**EA30KTSI  
Enclosure – Bottom View**



**EA25KTSI  
Enclosure –Bottom View**



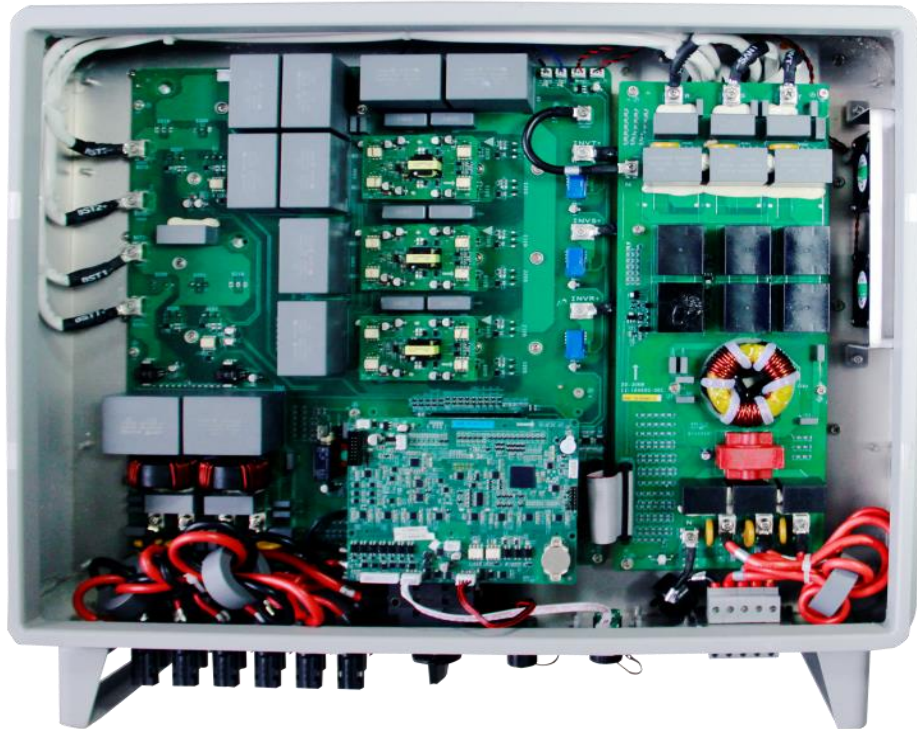
**EA20KTSI  
Enclosure – Bottom View**



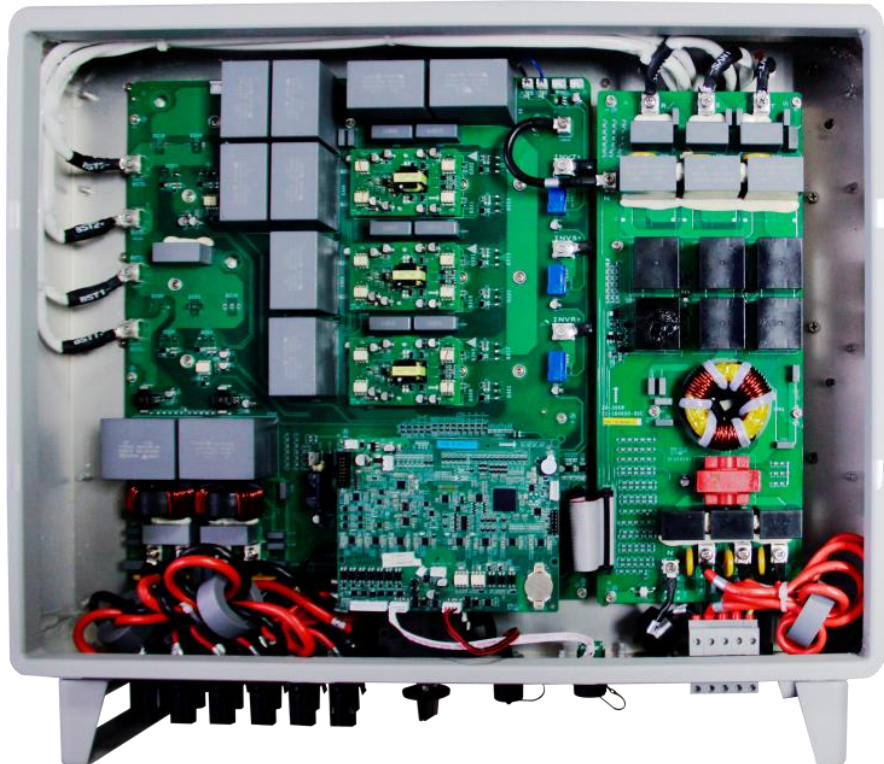
**EA20KTSI / EA25KTSI / EA30KTSI  
Cover**



**EA30KTSI  
Open View**

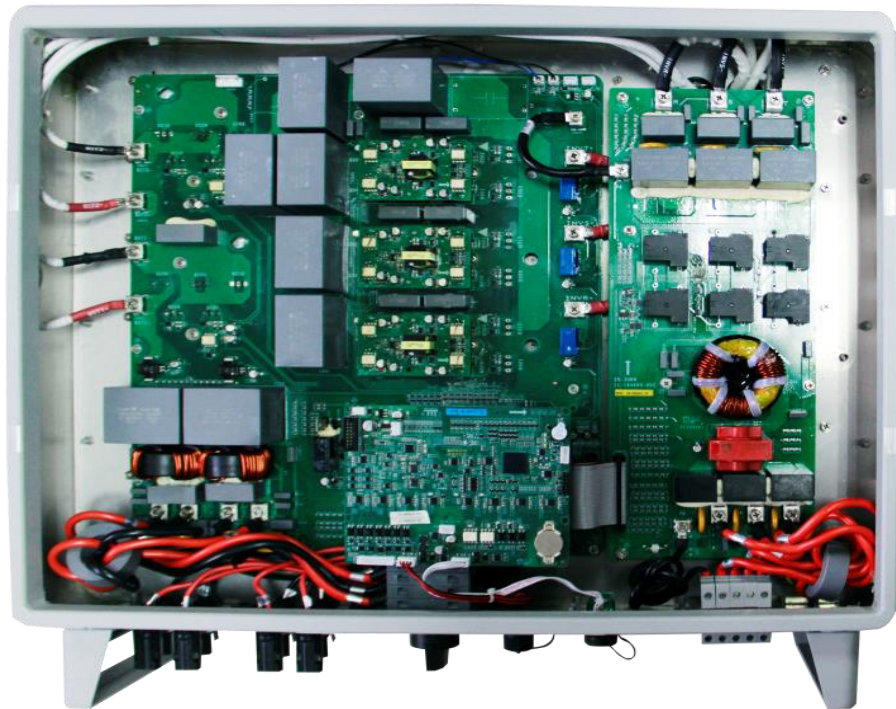


**EA25KTSI  
Open View**

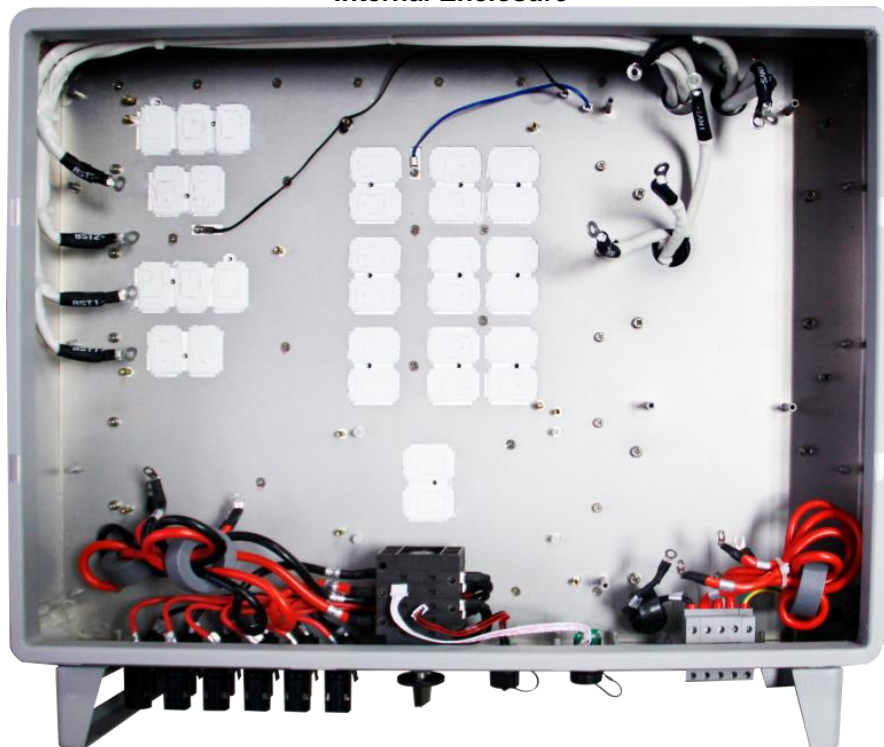




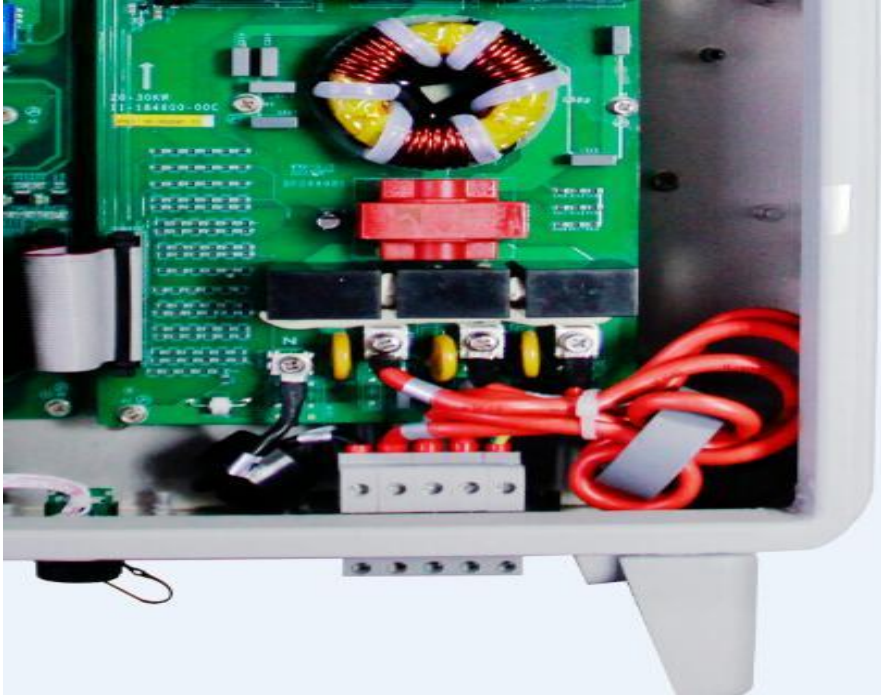
**EA20KTSI  
Open View**



**EA20KTSI / EA25KTSI / EA30KTSI  
Internal Enclosure**



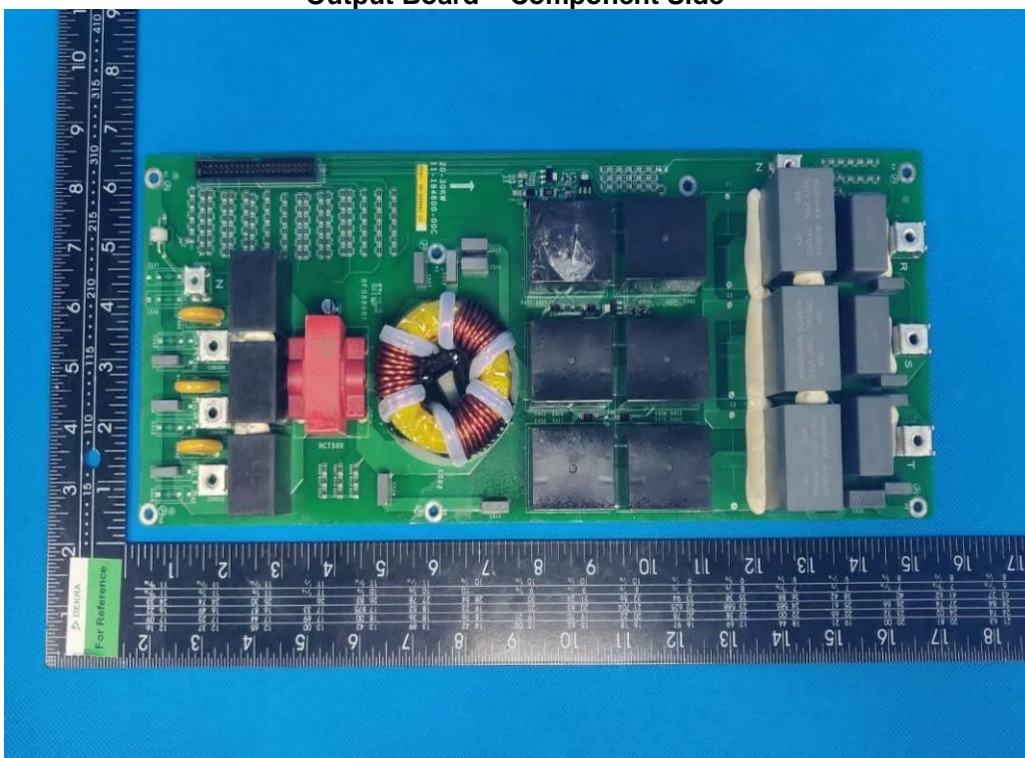
**EA20KTSI / EA25KTSI / EA30KTSI  
AC Output and Protective Bonding**



**EA20KTSI / EA25KTSI / EA30KTSI  
AC Output and Protective Earthing**



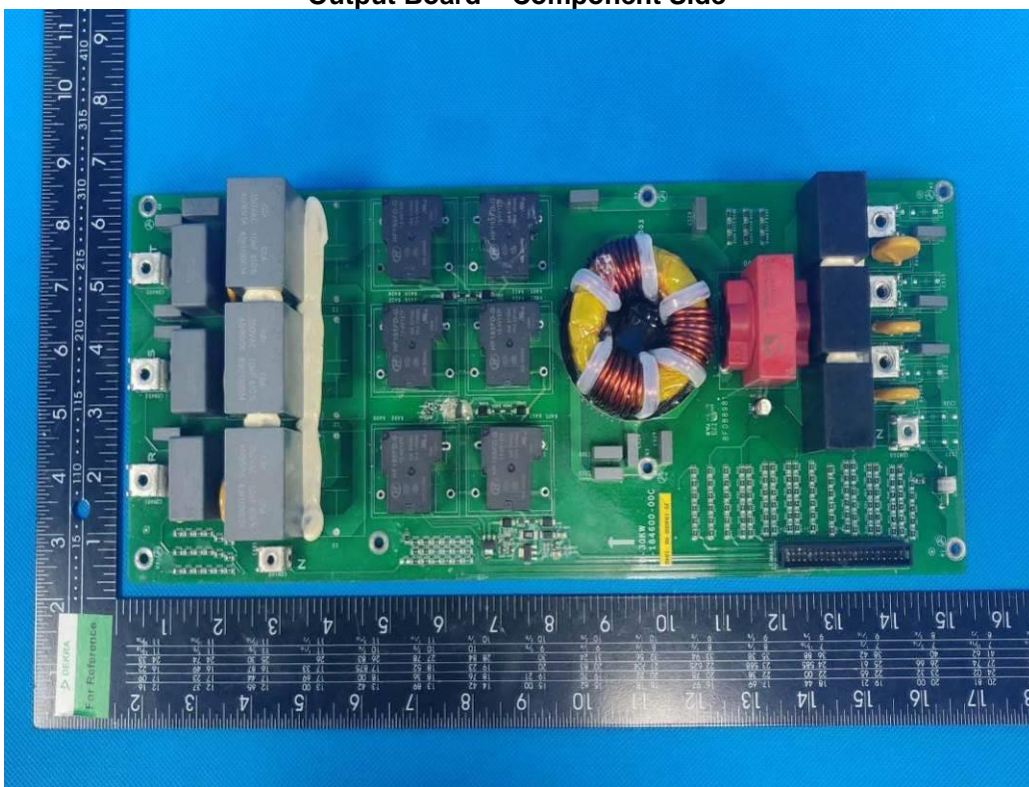
**EA25KTSI / EA30KTSI  
Output Board – Component Side**



**Output Board – Solder Side**



**EA20KTSI**  
**Output Board – Component Side**



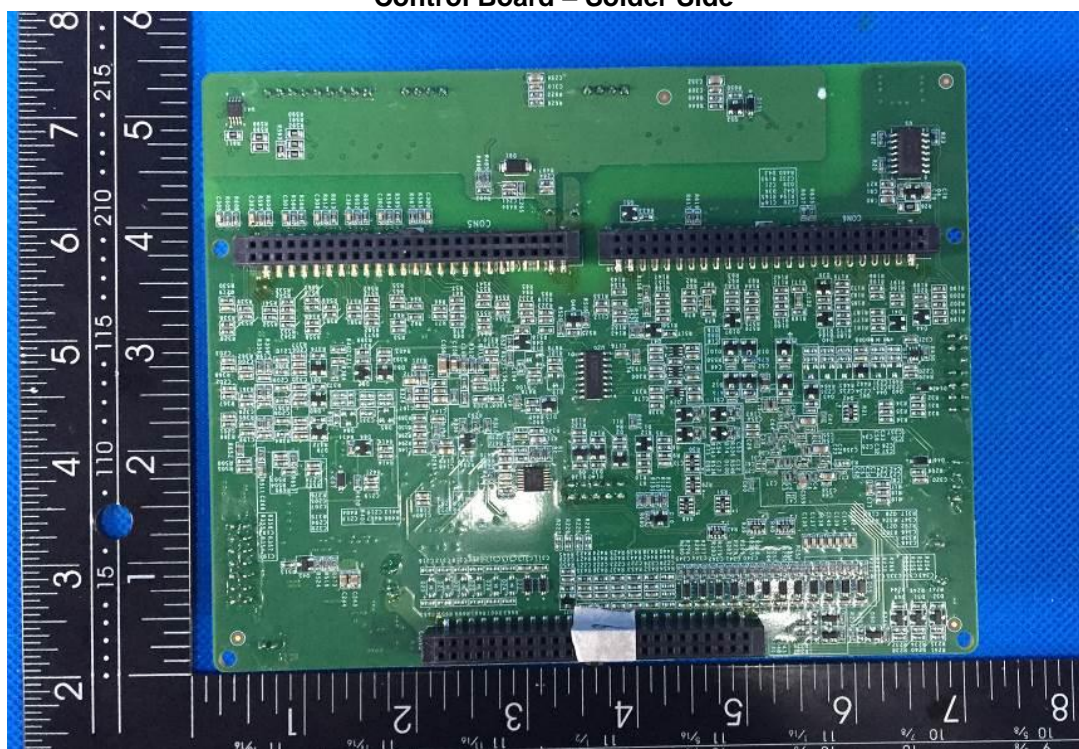
**Output Board – Solder Side**



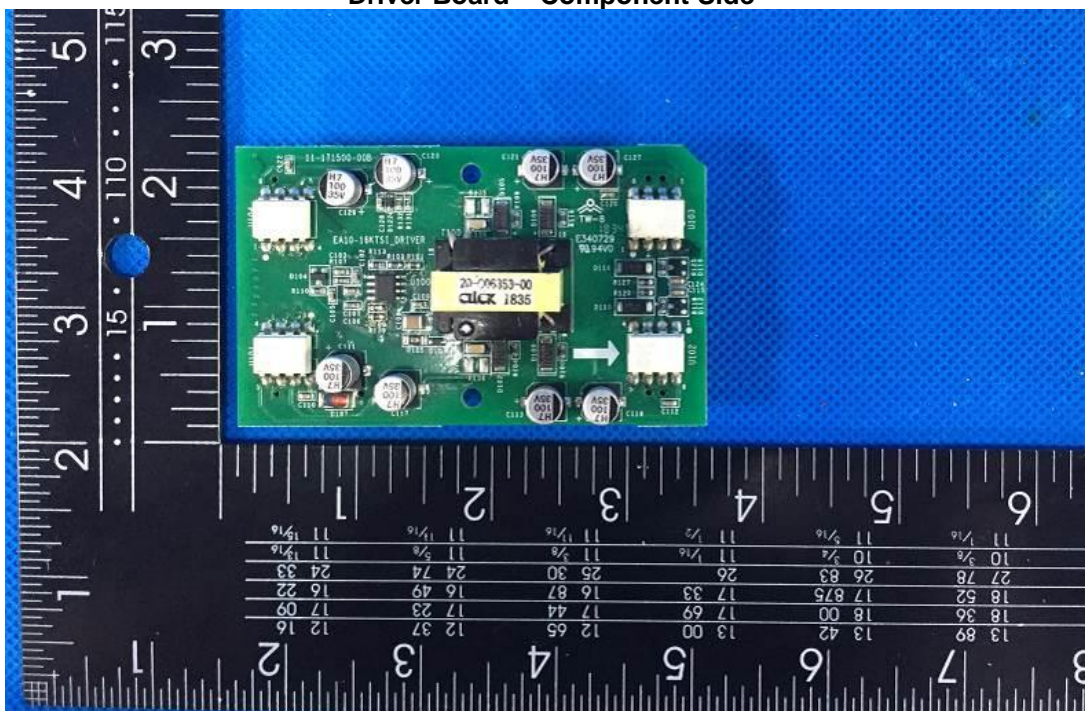
**EA20KTSI / EA25KTSI / EA30KTSI  
Control Board – Component Side**



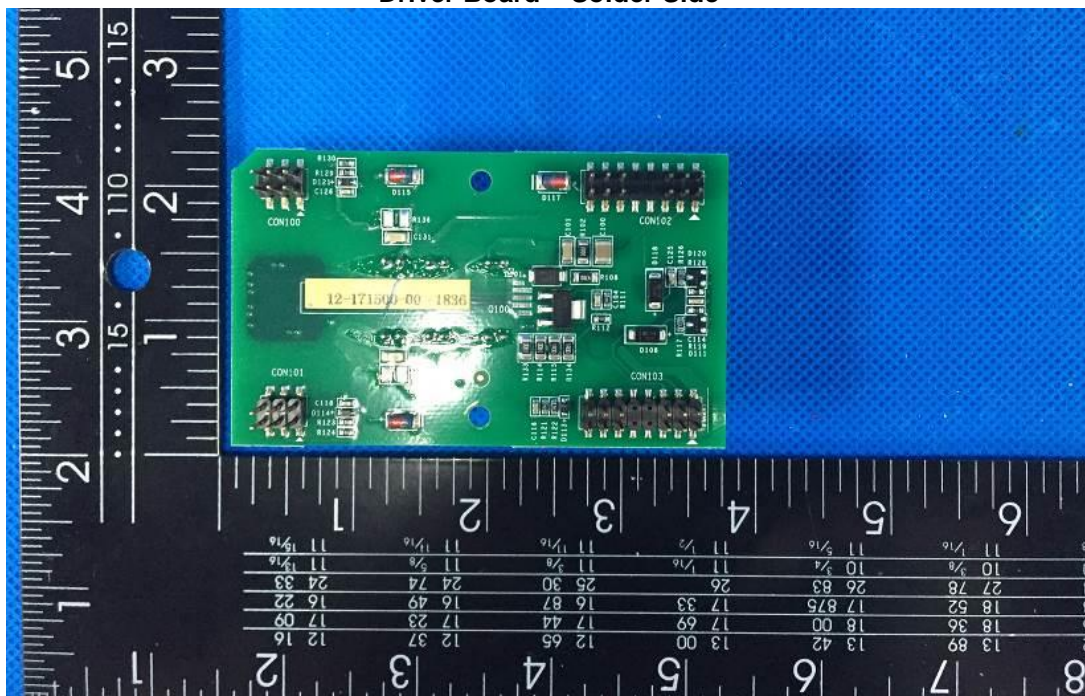
**EA20KTSI / EA25KTSI / EA30KTSI  
Control Board – Solder Side**



EA20KTSI / EA25KTSI / EA30KTSI  
Driver Board – Component Side



EA20KTSI / EA25KTSI / EA30KTSI  
Driver Board – Solder Side



# Annex 4

## Test equipment list

Equipment	Internal no.	Manufacturer	Type	Measurement uncertainty $U_{rel}$ (k=2)	Last calibration
Power Analyzer	SuZ-0705	YOKOGWA	WT3000	Current [A]: 0.12% Voltage [V]: 0.04% Power [W]: 0.12% Frequency [Hz]: 0.01% Power factor [1]: 0.01%	2019/09/25
Precision power analyzer	E-3604	Zhiyuan Electronics Co., Ltd	PA6000H	ACV:Urel=0.1%, ACI: Ure=0.2%,ACW:Urel=0.2%, cosφ:Urel=0.5%, f:Urel=0.06% Harmonic voltage: Urel=0.13% Harmonic current: Urel=0.13%	2019/12/13
Digital Oscilloscope	E-3561	YOKOGAWA	DLM2024	Time [ms]: 0.07%	2019/10/29
AC Simulation Power Supply	SuZ-0754	Chroma	61845	Current [A]: 0.2% Voltage [V]: 0.1% Power [W]: 0.3% Frequency[Hz]: 0.05%	2019/12/12
DC Simulation Power	SuZ-1148	KEYSIGHT	N8957APV	Current [A]: 0.5% Voltage [V]: 0.6%	2019/10/30
DC Simulation Power	SuZ-1149	KEYSIGHT	N8957APV	Current [A]: 0.5% Voltage [V]: 0.6%	2019/10/30
Digital Oscilloscope	SuZ-1128	Tektronix	MDO3014	Time [ms]: 0.01%	2019/07/11
Oscilloscope current Probel	SuZ-1134	Tektronix	A622	Current [A]: 1.57%	2019/07/11
Oscilloscope voltage Probel	SuZ-1131	Tektronix	P5200A	Attenuation ration: 1.2%	2019/07/11
Islanding Load	SuZ-0708	PARWA TECHNOLOGY	PV-RLC225-10KW	Voltage [V]: 0.13% Current [A]: 0.35% Power [kW]: 0.13%	2019/09/25
Insulation resistance tester	SuZ-0800	PARWA TECHNOLOGY	TOS7200	Res [MΩ] : 2.3% Voltage [V]: 0.49%	2019/07/27
Impulse test	SuZ-0706	Shanghai Guantu	GT10	Voltage [kV] : 3.9% Time [μs] : 6%	2019/11/08
MultiMeter	SuZ-0634	FLUKE	177	DC Voltage [V]: 0.1% AC Voltage [V]: 0.33% Res [Ω] : 0.23% DC current [A]: 0.3% AC current [A]:0.4%	2019/07/27
Temp & Humi Chamber	SuZ-0663	Giant Force	ETH-1000-40-SP-AR	Temperture: 0.23°C; Humidity: 1.5%	2019/07/27
Temperature and humidity recorder	SuZ-0860	Testo	174H	Temperture: 1%; Humidity: 1.66%	2019/09/03
Thermocouple	SuZ-01150	/	TT-K-30-1000-ROHS	Temperture: 0.06%	2019/11/01
Vernier caliper	SuZ-0737	Mitutoyo	CD-6ASX	Fine error:0.2% Reading error of depth gauge:0.05%	2019/10/31

-----END-----