

TEST REPORT
IEC 61727
Photovoltaic (PV) systems –
Characteristics of the utility interface

Report Number..... : KS2504S1786S

Date of issue : 2025-06-07

Total number of pages 29 pages

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Kevin Xie

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Hardy Ding

Name of Testing Laboratory
preparing the Report : KSIGN(Guangdong) Testing Co., Ltd.

West Side of 1/F., Building C, Zone A, Fuyuan New Factory,
Jiujiu Industrial Park, Minzhu, Shatou, Shajing, Bao'an District,
Shenzhen, Guangdong, China

Applicant's name : Zhejiang Hyxi Technology Co., Ltd.

Address : 9-10F, Building 3, Jiuyao Commercial Center, Zhuantang Street,
Xihu District, 310008 Hangzhou, Zhejiang, PEOPLE'S
REPUBLIC OF CHINA

Test specification:

Standard : IEC 61727:2004

Test procedure..... : CB Scheme

Non-standard test method..... : N/A

Test Report Form No...... : IEC61727B

Test Report Form(s) Originator.... : TÜV SÜD Product Service GmbH

Master TRF : Dated 2017-11-03

General disclaimer:

The test results presented in this report relate only to the object tested.
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Testing Co., Ltd. The authenticity of this Test Report and its contents can be verified by contacting the
KSIGN(Guangdong) Testing Co., Ltd., responsible for this Test Report.

TRF No. IEC 61727_R0

Add: West Side of 1/F., Building C, Zone A, Fuyuan New Factory, Jiujiu Industrial Park, Minzhu, Shatou,
Shajing, Bao'an District, Shenzhen, Guangdong, China
Tel: +(86) 0755-2985 2678 Fax: +(86) 0755-2985 2397 E-mail: info@gdksign.cn Web: www.gdksign.com

Test item description..... :	Three Phase String Inverter
Trade Mark..... :	
Manufacturer	Zhejiang Hyni Technology Co., Ltd. 9-10F, Building 3, Jiuyao Commercial Center, Zhuantang Street, Xihu District, 310008 Hangzhou, Zhejiang, PEOPLE'S REPUBLIC OF CHINA
Model/Type reference	HYX-S15K-T, HYX-S17K-T, HYX-S20K-T, HYX-S25K-T
Ratings	See marking

TRF No. IEC 61727_R0

Add: West Side of 1/F., Building C, Zone A, Fuyuan New Factory, Jiujiu Industrial Park, Minzhu, Shatou,
Shajing, Bao'an District, Shenzhen, Guangdong, China

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List of Attachments (including a total number of pages in each attachment): Attachment 1: photos	
Summary of testing:	
Tests performed (name of test and test clause): All applicable tests.	Testing location: K SIGN(Guangdong) Testing Co., Ltd. West Side of 1/F., Building C, Zone A, Fuyuan New Factory, Jiujiu Industrial Park, Minzhu, Shatou, Shajing, Bao'an District, Shenzhen, Guangdong, China
Summary of compliance with National Differences (List of countries addressed): N/A ☒ The product fulfils the requirements of __ IEC 61727:2004 __	

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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.



Model: HYX-S25K-T
Product: Three Phase String Inverter

Input (DC)

Max. Input Voltage:	d.c.1100V
Rated Input Voltage:	d.c.600V
Start Voltage:	d.c.160V
MPPT Voltage Range:	d.c.140-1000V
Max. Input Current:	d.c.2*40A
Isc PV(absolute max.):	d.c.2*50A

Output (AC)

Rated Output Power:	25kW
Max. Continuous Apparent Power:	27.5kVA
Max. Continuous Current:	a.c.42A, 380V a.c.39.9A, 400V
Rated Grid Frequency:	50/60Hz
Rated Grid Voltage:	a.c.380V/a.c.400V, 3L/N/PE
Power Factor:	0.8leading-0.8lagging

General Data

Operating Temperature Range:	-30 to +60°C
Protection Degree:	IP66
Max. Operating Altitude:	4000m
Topology:	Non-Isolation
Protection:	Class I
Overvoltage Category:	II(DC)/III(AC)
Communication:	RS485

P/N: X.X.XXXX.XXXXXX



S/N: XXXXXXXXXXXXXXXX X




Made in China

Zhejiang Hyxi Technology Co., Ltd. support@hyxipower.com
Building 3, Jiuyao Commercial Center, Hangzhou, China, 310008



Model: HYX-S20K-T
Product: Three Phase String Inverter

Input (DC)

Max. Input Voltage:	d.c.1100V
Rated Input Voltage:	d.c.600V
Start Voltage:	d.c.160V
MPPT Voltage Range:	d.c.140-1000V
Max. Input Current:	d.c.2*40A
Isc PV(absolute max.):	d.c.2*50A

Output (AC)

Rated Output Power:	20kW
Max. Continuous Apparent Power:	22kVA
Max. Continuous Current:	a.c.33.6A, 380V a.c.31.9A, 400V
Rated Grid Frequency:	50/60Hz
Rated Grid Voltage:	a.c.380V/a.c.400V, 3L/N/PE
Power Factor:	0.8leading-0.8lagging

General Data

Operating Temperature Range:	-30 to +60°C
Protection Degree:	IP66
Max. Operating Altitude:	4000m
Topology:	Non-Isolation
Protection:	Class I
Overvoltage Category:	II(DC)/III(AC)
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Made in China

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Tel: +(86) 0755-2985 2678 Fax: +(86) 0755-2985 2397 E-mail: info@gdksign.cn Web: www.gdksign.com

 Model: HYX-S17K-T Product: Three Phase String Inverter Input (DC) <table> <tr><td>Max. Input Voltage:</td><td>d.c.1100V</td></tr> <tr><td>Rated Input Voltage:</td><td>d.c.600V</td></tr> <tr><td>Start Voltage:</td><td>d.c.160V</td></tr> <tr><td>MPPT Voltage Range:</td><td>d.c.140-1000V</td></tr> <tr><td>Max. Input Current:</td><td>d.c.2*40A</td></tr> <tr><td>Isc PV(absolute max.):</td><td>d.c.2*50A</td></tr> </table> Output (AC) <table> <tr><td>Rated Output Power:</td><td>17kW</td></tr> <tr><td>Max. Continuous Apparent Power:</td><td>18.7kVA</td></tr> <tr><td>Max. Continuous Current:</td><td>a.c.28.6A, 380V a.c.27.1A, 400V</td></tr> <tr><td>Rated Grid Frequency:</td><td>50/60Hz</td></tr> <tr><td>Rated Grid Voltage:</td><td>a.c.380V/a.c.400V, 3L/N/PE</td></tr> <tr><td>Power Factor:</td><td>0.8leading-0.8lagging</td></tr> </table> General Data <table> <tr><td>Operating Temperature Range:</td><td>-30 to +60°C</td></tr> <tr><td>Protection Degree:</td><td>IP66</td></tr> <tr><td>Max. Operating Altitude:</td><td>4000m</td></tr> <tr><td>Topology:</td><td>Non-Isolation</td></tr> <tr><td>Protection:</td><td>Class I</td></tr> <tr><td>Overvoltage Category:</td><td>II(DC)/III(AC)</td></tr> <tr><td>Communication:</td><td>RS485</td></tr> </table> P/N: X.X.XXXX.XXXXXX  S/N: XXXXXXXXXXXXXXXX X   Made in China Zhejiang Hyxi Technology Co., Ltd. support@hyxipower.com Building 3, Jiuyao Commercial Center, Hangzhou, China, 310008	Max. Input Voltage:	d.c.1100V	Rated Input Voltage:	d.c.600V	Start Voltage:	d.c.160V	MPPT Voltage Range:	d.c.140-1000V	Max. Input Current:	d.c.2*40A	Isc PV(absolute max.):	d.c.2*50A	Rated Output Power:	17kW	Max. Continuous Apparent Power:	18.7kVA	Max. Continuous Current:	a.c.28.6A, 380V a.c.27.1A, 400V	Rated Grid Frequency:	50/60Hz	Rated Grid Voltage:	a.c.380V/a.c.400V, 3L/N/PE	Power Factor:	0.8leading-0.8lagging	Operating Temperature Range:	-30 to +60°C	Protection Degree:	IP66	Max. Operating Altitude:	4000m	Topology:	Non-Isolation	Protection:	Class I	Overvoltage Category:	II(DC)/III(AC)	Communication:	RS485	 Model: HYX-S15K-T Product: Three Phase String Inverter Input (DC) <table> <tr><td>Max. Input Voltage:</td><td>d.c.1100V</td></tr> <tr><td>Rated Input Voltage:</td><td>d.c.600V</td></tr> <tr><td>Start Voltage:</td><td>d.c.160V</td></tr> <tr><td>MPPT Voltage Range:</td><td>d.c.140-1000V</td></tr> <tr><td>Max. Input Current:</td><td>d.c.2*40A</td></tr> <tr><td>Isc PV(absolute max.):</td><td>d.c.2*50A</td></tr> </table> Output (AC) <table> <tr><td>Rated Output Power:</td><td>15kW</td></tr> <tr><td>Max. Continuous Apparent Power:</td><td>16.5kVA</td></tr> <tr><td>Max. Continuous Current:</td><td>a.c.25.2A, 380V a.c.23.9A, 400V</td></tr> <tr><td>Rated Grid Frequency:</td><td>50/60Hz</td></tr> <tr><td>Rated Grid Voltage:</td><td>a.c.380V/a.c.400V, 3L/N/PE</td></tr> <tr><td>Power Factor:</td><td>0.8leading-0.8lagging</td></tr> </table> General Data <table> <tr><td>Operating Temperature Range:</td><td>-30 to +60°C</td></tr> <tr><td>Protection Degree:</td><td>IP66</td></tr> <tr><td>Max. Operating Altitude:</td><td>4000m</td></tr> <tr><td>Topology:</td><td>Non-Isolation</td></tr> <tr><td>Protection:</td><td>Class I</td></tr> <tr><td>Overvoltage Category:</td><td>II(DC)/III(AC)</td></tr> <tr><td>Communication:</td><td>RS485</td></tr> </table> P/N: X.X.XXXX.XXXXXX  S/N: XXXXXXXXXXXXXXXX X   Made in China Zhejiang Hyxi Technology Co., Ltd. support@hyxipower.com Building 3, Jiuyao Commercial Center, Hangzhou, China, 310008	Max. Input Voltage:	d.c.1100V	Rated Input Voltage:	d.c.600V	Start Voltage:	d.c.160V	MPPT Voltage Range:	d.c.140-1000V	Max. Input Current:	d.c.2*40A	Isc PV(absolute max.):	d.c.2*50A	Rated Output Power:	15kW	Max. Continuous Apparent Power:	16.5kVA	Max. Continuous Current:	a.c.25.2A, 380V a.c.23.9A, 400V	Rated Grid Frequency:	50/60Hz	Rated Grid Voltage:	a.c.380V/a.c.400V, 3L/N/PE	Power Factor:	0.8leading-0.8lagging	Operating Temperature Range:	-30 to +60°C	Protection Degree:	IP66	Max. Operating Altitude:	4000m	Topology:	Non-Isolation	Protection:	Class I	Overvoltage Category:	II(DC)/III(AC)	Communication:	RS485
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Note:

1. The above markings are the minimum requirements by the safety standard. For the final production samples, additional markings which do not give rise to misunderstanding may be added.
2. The height of WEEE mark at least 7mm, height of other marks at least 5mm, height of letters and numerals at least 2mm.
3. Manufacturer information (name/registered trademark/registered trade name and postal address) and importer information for manufacturer outside of the EU (name/registered trademark/registered trade name and postal address) should be pasted on product when sell the product to the EU market.

TRF No. IEC 61727_R0

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Tel: +(86) 0755-2985 2678 Fax: +(86) 0755-2985 2397 E-mail: info@gdksign.cn Web: www.gdksign.com

Test item particulars.....: Three Phase String Inverter	
Classification of installation and use.....: Fixed (permanent connection)	
Supply Connection DC: PV	
.....: AC: Grid connection	
Possible test case verdicts:	
- 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)	
Testing.....:	
Date of receipt of test item 2025-04-16	
Date (s) of performance of tests 2025-04-16~2025-05-28	
General remarks:	
"(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 ☐ comma / ☒ point is used as the decimal separator.	
Manufacturer's Declaration per sub-clause 4.2.5 of IEC 61727:	
The application for obtaining a CB Test Certificate includes more than one factory location and a declaration from the Manufacturer stating that the sample(s) submitted for evaluation is (are) representative of the products from each factory has been provided	☐ Yes ☒ Not applicable
When differences exist; they shall be identified in the General product information section.	
Name and address of factory (ies) DBG (Jiaxing) Technology Electronics Co, Ltd. Building A, No. 148, Tianshu Road, Jiaxing Economic and Technology Development Zone, Jiaxing City, Zhejiang, P.R. China	

General product information:

Brief description:

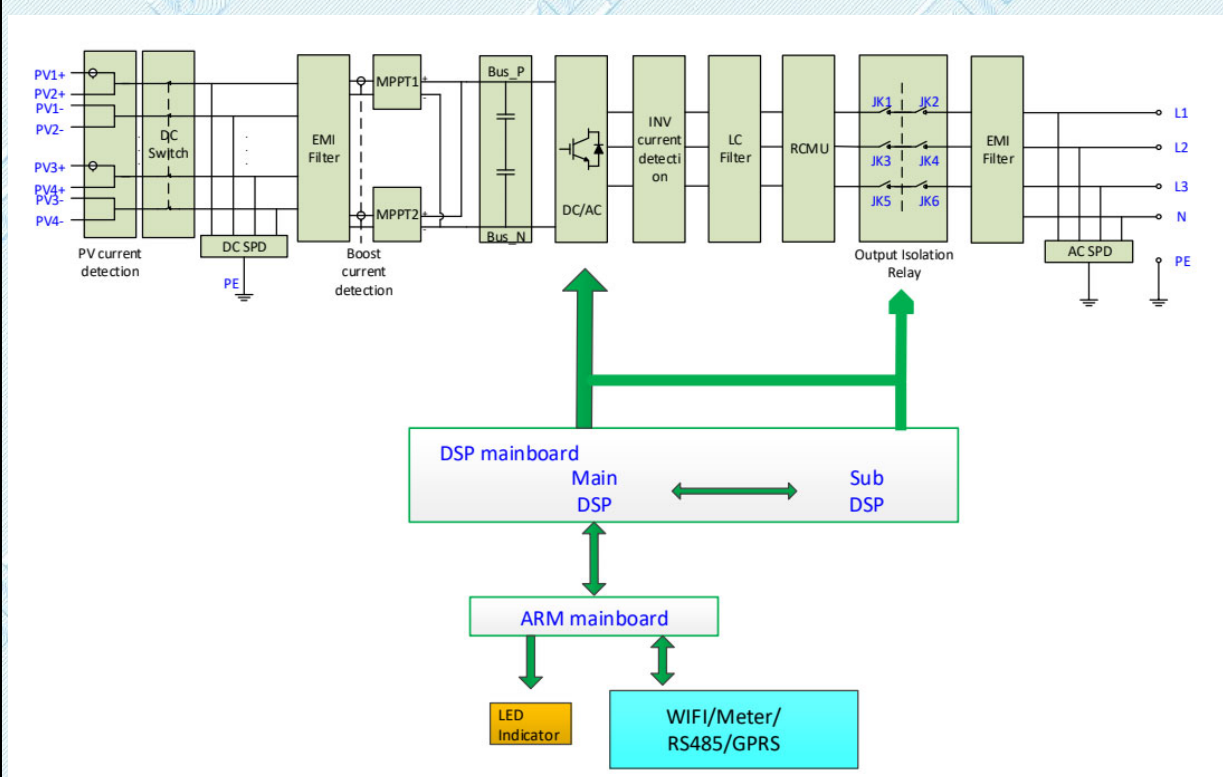
The PCEs under test (EUTs) are three-phase Grid-connected Photovoltaic Inverter which utilizes the advanced power electronics conversion components such as MOSFET, IGBT to convert the variable DC power generated from the photovoltaic (PV) arrays to the stable utility AC power which can be fed into the commercial electrical grid.

Model difference:

Model HYX-S15K-T, HYX-S17K-T, HYX-S20K-T and HYX-S25K-T with same construction and cooling method, except software settings for different output power and current.

Unless otherwise specified, all the tests were conducted on the basic model of HYX-S25K-T represent the others.

Block diagram:



Hardware Version:

Model:	HYX-S15K-T, HYX-S17K-T, HYX-S20K-T, HYX-S25K-T
Hardware Version	V1.0

Software Version:

Model:	HYX-S15K-T, HYX-S17K-T, HYX-S20K-T, HYX-S25K-T
Hardware Version	V1.0

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Tel: +(86) 0755-2985 2678 Fax: +(86) 0755-2985 2397 E-mail: info@gdksign.cn Web: www.gdksign.com

Series number used:

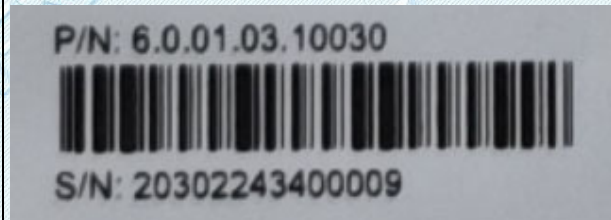
HYX-S25K-T:



HYX-S20K-T:



HYX-S17K-T:



HYX-S15K-T:



IEC 61727			
Clause	Requirement + Test	Result - Remark	Verdict
4	UTILITY COMPATIBILITY		P
	The quality of power provided by the PV system for the on-site AC loads and for power delivered to the utility is governed by practices and standards on voltage, flicker, frequency, harmonics and power factor.		P
	Deviation from these standards represents out-of-bounds conditions and may require the PV system to sense the deviation and properly disconnect from the utility system.		P
4.1	Voltage, current and frequency		P
	The PV system AC voltage, current and frequency are compatible with the utility system.		P
4.2	Normal voltage operating range		P
	Utility-interconnected PV systems do not normally regulate voltage, they inject current into the utility. Therefore, the voltage operating range for PV inverters is selected as a protection function that responds to abnormal utility conditions, not as a voltage regulation function.		P
4.3	Flicker		P
	The operation of the PV system is not cause voltage flicker in excess of limits stated in the relevant sections of IEC 61000-3-3 for systems less than 16 A or IEC 61000-3-5 for systems with current of 16 A and above.		P
4.4	DC injection		P
	The PV system is not inject DC current greater than 1 % of the rated inverter output current, into the utility AC interface under any operating condition.		P
4.5	Normal frequency operating range		P
	The PV system operates in synchronism with the utility system, and within the frequency trip limits defined in 5.2.2.		P
4.6	Harmonics and waveform distortion		P
	Total harmonic current distortion is less than 5 % at rated inverter output. Each individual harmonic is limited to the percentages listed in Table 1.		P
	Even harmonics in these ranges is less than 25 % of the lower odd harmonic limits listed.		P

IEC 61727																					
Clause	Requirement + Test	Result - Remark	Verdict																		
	<table><tr><th colspan="2">Table 1 – Current distortion limits</th></tr><tr><th>Odd harmonics</th><th>Distortion limit</th></tr><tr><td>3rd through 9th</td><td>Less than 4,0 %</td></tr><tr><td>11th through 15th</td><td>Less than 2,0 %</td></tr><tr><td>17th through 21st</td><td>Less than 1,5 %</td></tr><tr><td>23rd through 33rd</td><td>Less than 0,6 %</td></tr><tr><th>Even harmonics</th><th>Distortion limit</th></tr><tr><td>2rd through 8th</td><td>Less than 1,0 %</td></tr><tr><td>10th through 32nd</td><td>Less than 0,5 %</td></tr></table>	Table 1 – Current distortion limits		Odd harmonics	Distortion limit	3 rd through 9 th	Less than 4,0 %	11 th through 15 th	Less than 2,0 %	17 th through 21 st	Less than 1,5 %	23 rd through 33 rd	Less than 0,6 %	Even harmonics	Distortion limit	2 rd through 8 th	Less than 1,0 %	10 th through 32 nd	Less than 0,5 %		P
Table 1 – Current distortion limits																					
Odd harmonics	Distortion limit																				
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23 rd through 33 rd	Less than 0,6 %																				
Even harmonics	Distortion limit																				
2 rd through 8 th	Less than 1,0 %																				
10 th through 32 nd	Less than 0,5 %																				
4.7	The PV system has a lagging power factor greater than 0,9 when the output is greater than 50 % of the rated inverter output power.		P																		
5	PERSONNEL SAFETY AND EQUIPMENT PROTECTION		P																		
	This Clause provides information and considerations for the safe and proper operation of the utility-connected PV systems.		P																		
5.1	Loss of utility voltage		P																		
	To prevent islanding, a utility connected PV system ceases to energize the utility system from a de-energized distribution line irrespective of connected loads or other generators within specified time limits.		P																		
	A utility distribution line can become de-energized for several reasons. For example, a substation breaker opening due to fault conditions or the distribution line switched out during maintenance.		P																		
5.2	Over/under voltage and frequency		P																		
	The abnormal utility conditions of concern are voltage and frequency excursions above or below the values stated in this Clause, and the complete disconnection of the utility, presenting the potential for a distributed resource island.		P																		
5.2.1	Over/under voltage		P																		
	When the interface voltage deviates outside the conditions specified in Table 2, the photovoltaic system ceases to energize the utility distribution system. This applies to any phase of a multiphase system.		P																		
	<table><tr><th colspan="2">Table 2 – Response to abnormal voltages</th></tr><tr><th>Voltage (at point of utility connection)</th><th>Maximum trip time*</th></tr><tr><td>$V < 0,5 \times V_{nominal}$</td><td>0,1 s</td></tr><tr><td>$50 \% \leq V < 85 \%$</td><td>2,0 s</td></tr><tr><td>$85 \% \leq V \leq 110 \%$</td><td>Continuous operation</td></tr><tr><td>$110 \% < V < 135 \%$</td><td>2,0 s</td></tr><tr><td>$135 \% \leq V$</td><td>0,05 s</td></tr></table> * Trip time refers to the time between the abnormal condition occurring and the inverter ceasing to energize the utility line. The PV system control circuits shall actually remain connected to the utility to allow sensing of utility electrical conditions for use by the "reconnect" feature.	Table 2 – Response to abnormal voltages		Voltage (at point of utility connection)	Maximum trip time*	$V < 0,5 \times V_{nominal}$	0,1 s	$50 \% \leq V < 85 \%$	2,0 s	$85 \% \leq V \leq 110 \%$	Continuous operation	$110 \% < V < 135 \%$	2,0 s	$135 \% \leq V$	0,05 s		P				
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IEC 61727			
Clause	Requirement + Test	Result - Remark	Verdict
5.2.2	Over/under frequency		P
	When the utility frequency deviates outside the specified conditions the photovoltaic system ceases to energize the utility line. The unit does not have to cease to energize if the frequency returns to the normal utility continuous operation condition within the specified trip time.		P
	When the utility frequency is outside the range of ± 1 Hz, the system ceases to energize the utility line within 0,2 s. The purpose of the allowed range and time delay is to allow continued operation for short-term disturbances and to avoid excessive nuisance tripping in weak-utility system conditions.		P
5.3	Islanding protection		P
	The PV system must cease to energize the utility line within 2 s of loss of utility.	Test according to IEC 62116:2014	P
5.4	Response to utility recovery		P
	Following an out-of-range utility condition that has caused the photovoltaic system to cease energizing, the photovoltaic system is not energize the utility line for 20 s to 5 min after the utility service voltage and frequency have recovered to within the specified ranges.		P
5.5	Earthing		P
	The utility interface equipment is earthed/grounded in accordance with IEC 60364-7-712.		P
5.6	Short circuit protection		P
	The photovoltaic system has short-circuit protection in accordance with IEC 60364-7-712.		P
5.7	Isolation and switching		P
	A method of isolation and switching is provided in accordance with IEC 60364-7-712.		P

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IEC 61727				
Clause	Requirement + Test		Result - Remark	Verdict
4.3	TABLE: Flicker			P
	Starting	Stopping	Running	
Limit	4%	4%	Pst = 1.0	Plt = 0.65
Sample model: HYX-S25K-T				
L1 Test value	0.406%	0.299%	0.249	0.167
L2 Test value	0.337%	0.361%	0.138	0.131
L3 Test value	0.416%	0.492%	0.209	0.170
Supplementary information:				

4.4	TABLE: Direct current injection								P
Rated output current (A)	Ratio of rated output power (VA)	Measured DC output current between terminals						Isolated transformer ? (Yes/No)	Limit (mA)
		L1-L2	L1-L3	L2-L3	L1-N	L2-N	L3-N		
Sample model: HYX-S25K-T									
39.9	25%	0.065	0.086	0.022	0.055	0.077	0.016	No	0.399
39.9	50%	0.122	0.127	0.089	0.022	0.067	0.040	No	0.399
39.9	100%	0.131	0.124	0.103	0.065	0.092	0.023	No	0.399
Sample model: HYX-S15K-T									
23.9	25%	0.168	0.019	0.120	0.033	0.046	0.010	No	0.239
23.9	50%	0.052	0.053	0.029	0.014	0.041	0.024	No	0.239
23.9	100%	0.071	0.051	0.073	0.035	0.050	0.012	No	0.239
Supplementary information:									

4.6	TABLE: Harmonics and waveform distortion (model HYX-S25K-T)								P
Harmonic	% of fundamental			Limits (% of fundamental)	Harmonic	% of fundamental			Limits (% of fundamental)
	L1	L2	L3			L1	L2	L3	
--	L1	L2	L3	--	--	L1	L2	L3	--
02	0.92	0.65	0.89	1.0%	03	0.47	0.42	0.21	4.0%
04	0.21	0.42	0.30	1.0%	05	0.97	0.76	0.85	4.0%
06	0.20	0.25	0.08	1.0%	07	1.05	1.10	1.07	4.0%
08	0.10	0.11	0.06	1.0%	09	0.05	0.03	0.04	4.0%

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Clause	Requirement + Test				Result - Remark				Verdict
10	0.10	0.07	0.07	0.5%	11	0.61	0.60	0.62	2.0%
12	0.10	0.11	0.04	0.5%	13	0.38	0.41	0.42	2.0%
14	0.06	0.04	0.05	0.5%	15	0.04	0.03	0.04	2.0%
16	0.05	0.07	0.07	0.5%	17	0.21	0.20	0.21	1.5%
18	0.05	0.04	0.04	0.5%	19	0.09	0.12	0.13	1.5%
20	0.03	0.02	0.03	0.5%	21	0.02	0.02	0.03	1.5%
22	0.02	0.03	0.03	0.5%	23	0.08	0.08	0.08	0.6%
24	0.04	0.03	0.02	0.5%	25	0.06	0.07	0.07	0.6%
26	0.02	0.02	0.02	0.5%	27	0.02	0.02	0.02	0.6%
28	0.02	0.02	0.02	0.5%	29	0.03	0.04	0.03	0.6%
30	0.03	0.02	0.01	0.5%	31	0.03	0.03	0.04	0.6%
32	0.02	0.02	0.02	0.5%	33	0.02	0.01	0.02	0.6%
THD	2.19	2.03	2.09	5%	--	--	--	--	--

Supplementary information:

Sample model: HYX-S25K-T output power at 100% Pout.

4.6	TABLE: Harmonics and waveform distortion (model HYX-S25K-T)								P
Harmonic	% of fundamental			Limits (% of fundamental)	Harmonic	% of fundamental			Limits (% of fundamental)
--	L1	L2	L3	--	--	L1	L2	L3	--
02	0.19	0.33	0.16	1.0%	03	0.10	0.11	0.07	4.0%
04	0.24	0.04	0.25	1.0%	05	1.7	1.60	1.73	4.0%
06	0.09	0.06	0.06	1.0%	07	1.23	1.21	1.21	4.0%
08	0.09	0.10	0.03	1.0%	09	0.03	0.07	0.08	4.0%
10	0.07	0.02	0.08	0.5%	11	0.30	0.31	0.31	2.0%
12	0.05	0.03	0.08	0.5%	13	0.26	0.24	0.24	2.0%
14	0.04	0.06	0.02	0.5%	15	0.02	0.04	0.03	2.0%
16	0.02	0.03	0.04	0.5%	17	0.12	0.13	0.13	1.5%
18	0.03	0.02	0.05	0.5%	19	0.03	0.04	0.02	1.5%
20	0.01	0.03	0.03	0.5%	21	0.01	0.02	0.02	1.5%
22	0.01	0.03	0.02	0.5%	23	0.01	0.02	0.02	0.6%
24	0.02	0.01	0.02	0.5%	25	0.02	0.02	0.03	0.6%

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IEC 61727									
Clause	Requirement + Test				Result - Remark				Verdict
26	0.01	0.01	0.01	0.5%	27	0.01	0.02	0.02	0.6%
28	0.01	0.02	0.01	0.5%	29	0.03	0.02	0.03	0.6%
30	0.01	0.01	0.02	0.5%	31	0.03	0.02	0.03	0.6%
32	0.01	0.01	0.01	0.5%	33	0.01	0.01	0.01	0.6%
THD	3.61	3.46	3.63	5%	--	--	--	--	--
Supplementary information: Sample model: HYX-S25K-T output power at 66% Pout.									

4.6	TABLE: Harmonics and waveform distortion (model HYX-S25K-T)								P
Harmonic	% of fundamental			Limits (% of fundamental)	Harmonic	% of fundamental			Limits (% of fundamental)
--	L1	L2	L3	--	--	L1	L2	L3	--
02	0.10	0.20	0.11	1.0%	03	0.07	0.06	0.03	4.0%
04	0.15	0.03	0.14	1.0%	05	0.92	0.86	0.92	4.0%
06	0.05	0.04	0.04	1.0%	07	0.65	0.64	0.64	4.0%
08	0.06	0.05	0.02	1.0%	09	0.02	0.04	0.05	4.0%
10	0.04	0.01	0.04	0.5%	11	0.14	0.14	0.14	2.0%
12	0.03	0.01	0.04	0.5%	13	0.13	0.12	0.12	2.0%
14	0.03	0.03	0.01	0.5%	15	0.01	0.02	0.02	2.0%
16	0.02	0.01	0.03	0.5%	17	0.04	0.04	0.04	1.5%
18	0.01	0.01	0.02	0.5%	19	0.02	0.01	0.02	1.5%
20	0.01	0.01	0.01	0.5%	21	0.01	0.01	0.01	1.5%
22	0.01	0.01	0.01	0.5%	23	0.02	0.02	0.02	0.6%
24	0.01	0.01	0.01	0.5%	25	0.03	0.02	0.03	0.6%
26	0.01	0.01	0.01	0.5%	27	0.01	0.01	0.01	0.6%
28	0.01	0.01	0.01	0.5%	29	0.03	0.03	0.03	0.6%
30	0.01	0.01	0.01	0.5%	31	0.03	0.02	0.03	0.6%
32	0.01	0.01	0.01	0.5%	33	0.01	0.01	0.01	0.6%
THD	3.88	3.71	3.86	5%	--	--	--	--	--
Supplementary information: Sample model: HYX-S25K-T output power at 33% Pout.									

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IEC 61727									
Clause	Requirement + Test				Result - Remark				Verdict
4.6	TABLE: Harmonics and waveform distortion (Model HYX-S15K-T)								P
Harmoni c	% of fundamental			Limits (% of fundamental)	Harmonic	% of fundamental			Limits (% of fundamental)
--	L1	L2	L3	--	--	L1	L2	L3	--
02	0.92	0.66	0.90	1.0%	03	0.47	0.42	0.21	4.0%
04	0.21	0.42	0.30	1.0%	05	0.97	0.76	0.85	4.0%
06	0.20	0.25	0.08	1.0%	07	1.05	1.10	1.07	4.0%
08	0.10	0.11	0.06	1.0%	09	0.05	0.03	0.04	4.0%
10	0.10	0.07	0.07	0.5%	11	0.61	0.60	0.62	2.0%
12	0.10	0.11	0.04	0.5%	13	0.38	0.41	0.42	2.0%
14	0.06	0.04	0.05	0.5%	15	0.04	0.03	0.04	2.0%
16	0.05	0.07	0.07	0.5%	17	0.21	0.20	0.21	1.5%
18	0.05	0.04	0.04	0.5%	19	0.09	0.12	0.13	1.5%
20	0.03	0.02	0.03	0.5%	21	0.02	0.02	0.03	1.5%
22	0.02	0.03	0.03	0.5%	23	0.08	0.08	0.08	0.6%
24	0.04	0.03	0.02	0.5%	25	0.06	0.07	0.07	0.6%
26	0.02	0.02	0.02	0.5%	27	0.02	0.02	0.02	0.6%
28	0.02	0.02	0.02	0.5%	29	0.03	0.04	0.03	0.6%
30	0.03	0.02	0.01	0.5%	31	0.03	0.03	0.04	0.6%
32	0.02	0.02	0.02	0.5%	33	0.02	0.01	0.02	0.6%
THD	1.32	1.22	1.26	5%	--	--	--	--	--
Supplementary information:									
Sample model: HYX-S15K-T output power at 100% Pout.									

4.6	TABLE: Harmonics and waveform distortion (Model HYX-S15K-T)								P
Harmoni c	% of fundamental			Limits (% of fundamental)	Harmonic	% of fundamental			Limits (% of fundamental)
--	L1	L2	L3	--	--	L1	L2	L3	--
02	0.19	0.34	0.16	1.0%	03	0.11	0.11	0.06	4.0%
04	0.24	0.04	0.25	1.0%	05	1.71	1.61	1.73	4.0%
06	0.08	0.06	0.06	1.0%	07	1.23	1.21	1.21	4.0%
08	0.09	0.10	0.03	1.0%	09	0.03	0.07	0.07	4.0%

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Clause	Requirement + Test				Result - Remark				Verdict
10	0.07	0.02	0.08	0.5%	11	0.30	0.31	0.31	2.0%
12	0.05	0.03	0.08	0.5%	13	0.26	0.24	0.24	2.0%
14	0.04	0.06	0.02	0.5%	15	0.02	0.04	0.03	2.0%
16	0.02	0.03	0.04	0.5%	17	0.11	0.12	0.12	1.5%
18	0.03	0.02	0.05	0.5%	19	0.01	0.03	0.01	1.5%
20	0.01	0.03	0.03	0.5%	21	0.01	0.02	0.02	1.5%
22	0.01	0.03	0.02	0.5%	23	0.02	0.01	0.02	0.6%
24	0.02	0.01	0.02	0.5%	25	0.02	0.02	0.04	0.6%
26	0.01	0.01	0.01	0.5%	27	0.01	0.02	0.02	0.6%
28	0.01	0.01	0.01	0.5%	29	0.03	0.03	0.04	0.6%
30	0.01	0.01	0.02	0.5%	31	0.04	0.02	0.04	0.6%
32	0.01	0.02	0.01	0.5%	33	0.01	0.01	0.01	0.6%
THD	3.65	3.50	3.67	5%	--	--	--	--	--

Supplementary information:

Sample model: HYX-S15K-T output power at 66% Pout.

4.6	TABLE: Harmonics and waveform distortion (Model HYX-S15K-T)								P
Harmonic	% of fundamental			Limits (% of fundamental)	Harmonic	% of fundamental			Limits (% of fundamental)
--	L1	L2	L3	--	--	L1	L2	L3	--
02	0.12	0.33	0.25	1.0%	03	0.10	0.06	0.08	4.0%
04	0.29	0.11	0.20	1.0%	05	1.02	0.95	0.95	4.0%
06	0.08	0.05	0.08	1.0%	07	0.58	0.64	0.59	4.0%
08	0.09	0.07	0.05	1.0%	09	0.04	0.08	0.11	4.0%
10	0.07	0.06	0.03	0.5%	11	0.08	0.06	0.09	2.0%
12	0.02	0.01	0.02	0.5%	13	0.02	0.04	0.05	2.0%
14	0.04	0.02	0.03	0.5%	15	0.02	0.04	0.04	2.0%
16	0.06	0.04	0.03	0.5%	17	0.08	0.10	0.12	1.5%
18	0.01	0.02	0.03	0.5%	19	0.07	0.05	0.06	1.5%
20	0.01	0.01	0.02	0.5%	21	0.01	0.03	0.03	1.5%
22	0.03	0.02	0.01	0.5%	23	0.04	0.05	0.05	0.6%
24	0.02	0.01	0.03	0.5%	25	0.04	0.05	0.05	0.6%

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IEC 61727									
Clause	Requirement + Test				Result - Remark				Verdict
26	0.01	0.01	0.02	0.5%	27	0.01	0.02	0.01	0.6%
28	0.01	0.01	0.01	0.5%	29	0.03	0.03	0.03	0.6%
30	0.01	0.01	0.02	0.5%	31	0.03	0.02	0.04	0.6%
32	0.01	0.01	0.01	0.5%	33	0.01	0.01	0.01	0.6%
THD	4.17	4.12	4.07	5%	--	--	--	--	--
Supplementary information: Sample model: HYX-S15K-T output power at 33% Pout.									

4.7	TABLE: Power factor (Sample model: HYX-S25K-T)							P
	Input			Output				
No	Voltage (V d.c.)	Current (A d.c.)	Power (W)	Voltage (V a.c.)	Current (A a.c.)	Power (W)	Power factor (+/-)	Rated output (V.A)
1	600.62	8.78	5271	230.11	7.32	5028	0.9999	(20±5)%
2	600.61	12.71	7630	230.15	10.67	7350	0.9999	(30±5)%
3	600.59	16.97	10185	230.21	14.31	9865	0.9999	(40±5)%
4	600.15	21.98	13133	230.29	18.58	12817	0.9999	(50±5)%
5	600.58	25.65	15404	230.31	21.72	14994	0.9999	(60±5)%
6	600.59	29.99	18011	230.36	25.42	17549	0.9999	(70±5)%
7	600.59	34.32	20608	230.42	29.09	20091	0.9999	(80±5)%
8	600.61	38.68	23227	230.47	32.78	22653	0.9999	(90±5)%
9	600.21	42.41	25417	230.59	35.91	24820	0.9999	(100±5)%
Supplementary information: Power factor with "+" indicating leading and "-" indicating lagging.								

4.7	TABLE: Power factor (Sample model: HYX-S20K-T)							P
	Input			Output				
No	Voltage (V d.c.)	Current (A d.c.)	Power (W)	Voltage (V a.c.)	Current (A a.c.)	Power (W)	Power factor (+/-)	Rated output (V.A)
1	600.59	7.20	4322	230.15	6.08	4161	0.9999	(20±5)%
2	600.58	10.48	6289	230.22	8.86	6097	0.9999	(30±5)%
3	600.57	13.73	8245	230.29	11.64	8019	0.9999	(40±5)%
4	600.15	17.07	10179	230.15	14.40	9920	0.9999	(50±5)%

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Clause	Requirement + Test					Result - Remark		Verdict
5	600.58	20.59	12361	230.31	17.43	12027	0.9999	(60±5)%
6	600.59	24.04	14440	230.36	20.37	14065	0.9999	(70±5)%
7	600.60	27.51	16523	230.42	23.32	16105	0.9999	(80±5)%
8	600.61	30.57	18363	230.47	25.92	17904	0.9999	(90±5)%
9	600.18	34.24	20514	230.47	29.01	20036	0.9999	(100±5)%
Supplementary information: Power factor with "+" indicating leading and "-" indicating lagging.								

4.7	TABLE: Power factor (Sample model: HYX-S17K-T)							P
No	Input			Output				Rated output (V.A)
	Voltage (V d.c.)	Current (A d.c.)	Power (W)	Voltage (V a.c.)	Current (A a.c.)	Power (W)	Power factor (+/-)	
1	600.56	5.83	3499	230.11	4.92	3351	0.9999	(20±5)%
2	600.56	8.85	5314	230.17	7.48	5138	0.9999	(30±5)%
3	600.56	11.86	7124	230.24	10.05	6917	0.9999	(40±5)%
4	600.16	14.64	8684	230.18	12.28	8452	0.9999	(50±5)%
5	600.57	17.57	10549	230.36	14.89	10275	0.9999	(60±5)%
6	600.58	20.29	12187	230.42	17.21	11876	0.9999	(70±5)%
7	600.60	23.31	13997	230.49	19.76	13644	0.9999	(80±5)%
8	600.62	26.04	15637	230.56	22.06	15243	0.9999	(90±5)%
9	600.16	28.96	17338	230.39	24.53	16933	0.9999	(100±5)%
Supplementary information: Power factor with "+" indicating leading and "-" indicating lagging.								

4.7	TABLE: Power factor (Sample model: HYX-S15K-T)							P
No	Input			Output				Rated output (V.A)
	Voltage (V d.c.)	Current (A d.c.)	Power (W)	Voltage (V a.c.)	Current (A a.c.)	Power (W)	Power factor (+/-)	
1	600.57	5.16	3097	230.10	4.38	2967	0.9999	(20±5)%
2	600.58	7.81	4688	230.17	6.16	4532	0.9999	(30±5)%
3	600.57	10.47	6284	230.24	8.87	6100	0.9999	(40±5)%
4	600.15	12.98	7703	230.15	10.88	7487	0.9999	(50±5)%

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IEC 61727								
Clause		Requirement + Test				Result - Remark		Verdict
5	600.58	15.49	9298	230.37	13.14	9056	0.9999	(60±5)%
6	600.59	17.91	10759	230.43	15.19	10485	0.9999	(70±5)%
7	600.61	20.58	12359	230.49	17.45	12046	0.9999	(80±5)%
8	600.62	22.98	13798	230.56	19.47	13450	0.9999	(90±5)%
9	600.16	25.67	15355	230.34	21.73	14995	0.9999	(100±5)%
Supplementary information: Power factor with "+" indicating leading and "-" indicating lagging.								

5.2.1 & 5.4		TABLE: Under-and over-voltage trip settings and reconnection test						P
(1) Under voltage disconnection procedure								
Rated output voltage (V)	Output power (VA)	Required min. voltage (V)	Value of PCE trip settings (V)	Ratio of decreased (V / s)	Interval time (ms)	Measured tripped voltage (V)	Measured disconnection time (ms)	
50% Vn≤ V < 85% Vn Phase L1-N								
230	8322	195.5	195.0	0.2	2000	195.0	1450	
230	8341	195.5	195.0	0.2	2000	195.0	1433	
230	8328	195.5	195.0	0.2	2000	195.0	1440	
50% Vn≤ V < 85% Vn Phase L2-N								
230	8372	195.5	195	0.2	2000	195.2	1445	
230	8354	195.5	195	0.2	2000	195.0	1451	
230	8367	195.5	195	0.2	2000	194.9	1430	
50% Vn≤ V < 85% Vn Phase L3-N								
230	8401	195.5	195	0.2	2000	194.1	1440	
230	8398	195.5	195	0.2	2000	194.2	1444	
230	8398	195.5	195	0.2	2000	193.9	1436	
V < 50 % Vn Phase L1-N								
230	8320	115.0	114.0	0.6	100	113.7	33	
230	8311	115.0	114.0	0.6	100	113.9	45	
230	8332	115.0	114.0	0.6	100	114.4	25	
V < 50 % Vn Phase L2-N								
230	8350	115.0	114.0	0.6	100	114.5	30	
230	8345	115.0	114.0	0.6	100	113.9	38	
230	8356	115.0	114.0	0.6	100	113.9	45	

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Clause	Requirement + Test				Result - Remark		Verdict
V < 50 % Vn Phase L3-N							
230	8366	115.0	114.0	0.6	100	114.2	31
230	8351	115.0	114.0	0.6	100	113.7	25
230	8368	115.0	114.0	0.6	100	112.9	38
(2) Under voltage reconnection procedure							
Ratio of voltage rapidly decreased (V / s)			Reconnection voltage (V)		Reconnection time (ms)		
--			195.5		74.9		
(3) Over voltage disconnection procedure							
Rated output voltage (V)	Output power (VA)	Required max. voltage (V)	Value of PCE trip settings (V)	Ratio of increased (V / s)	Interval time (ms)	Measured tripped voltage (V)	Measured disconnection time (ms)
110% Vn < V < 135% Vn Phase L1-N							
230	8320	254.0	253.0	0.2	2000	253.0	1472
230	8304	254.0	253.0	0.2	2000	252.8	1479
230	8330	254.0	253.0	0.2	2000	253.0	1478
110 % Vn < V < 135 % Vn Phase L2-N							
230	8353	254.0	253.0	0.2	2000	252.8	1454
230	8351	254.0	253.0	0.2	2000	253.0	1455
230	8370	254.0	253.0	0.2	2000	253.1	1472
110 % Vn < V < 135 % Vn Phase L3-N							
230	8366	254.0	253.0	0.2	2000	252.9	1454
230	8387	254.0	253.0	0.2	2000	252.9	1458
230	8368	254.0	253.0	0.2	2000	252.8	1452
135 % ≤ Vn L1-N							
230	8338	310.5	310.5	0.2	50	310.8	44
230	8332	310.5	310.5	0.2	50	310.7	35
230	8359	310.5	310.5	0.2	50	310.8	35
135 % ≤ Vn L2-N							
230	8320	310.5	310.5	0.2	50	310.7	33
230	8326	310.5	310.5	0.2	50	310.8	48
230	8337	310.5	310.5	0.2	50	310.8	43
135 % ≤ Vn L3-N							
230	8326	310.5	310.5	0.2	50	310.9	28
230	8325	310.5	310.5	0.2	50	310.9	48

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IEC 61727							
Clause	Requirement + Test				Result - Remark		Verdict
230	8339	310.5	310.5	0.2	50	310.9	32
(4) Over voltage reconnection procedure							
Ratio of voltage rapidly decreased (V / s)			Reconnection voltage (V)		Reconnection time (ms)		
--			253.0		74.8		
Supplementary information:							

5.2.2 & 5.4		TABLE: Over/under frequency trip settings and reconnection test (50Hz)						P
(1) Under frequency disconnection procedure								
Rated output frequency (Hz)	Output power (VA)	Required min. frequency (Hz)	Value of PCE trip settings (Hz)	Ratio of decreased (Hz / s)	Interval time (ms)	Measured tripped frequency (Hz)	Measured disconnection time (ms)	
50	25058	49.00	49.00	0.02	200	49.00	116	
(2) Under frequency reconnection procedure								
Ratio of frequency rapidly decreased (Hz / s)			Reconnection frequency (Hz)			Reconnection time (s)		
--			49.10			74.9		
(3) Over frequency disconnection procedure								
Rated output frequency (Hz)	Output power (VA)	Required max. frequency (Hz)	Value of PCE trip settings (Hz)	Ratio of increased (Hz / s)	Interval time (ms)	Measured tripped frequency (Hz)	Measured disconnection time (s)	
50	25141	51.00	51.00	0.02	200	51.00	109	
(4) Over frequency reconnection procedure								
Ratio of frequency rapidly decreased (V / s)			Reconnection frequency (Hz)			Reconnection time (s)		
--			50.90			75.1		
Supplementary information:								

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IEC 61727			
Clause	Requirement + Test	Result - Remark	Verdict

5.2.2 & 5.4		TABLE: Over/under frequency trip settings and reconnection test (60Hz)					P
(1) Under frequency disconnection procedure							
Rated output frequency (Hz)	Output power (VA)	Required min. frequency (Hz)	Value of PCE trip settings (Hz)	Ratio of decreased (Hz / s)	Interval time (ms)	Measured tripped frequency (Hz)	Measured disconnection time (ms)
60	24953	59.00	59.00	0.02	200	59.0	192
(2) Under frequency reconnection procedure							
Ratio of frequency rapidly decreased (Hz / s)			Reconnection frequency (Hz)		Reconnection time (s)		
--			59.10		74.5		
(3) Over frequency disconnection procedure							
Rated output frequency (Hz)	Output power (VA)	Required max. frequency (Hz)	Value of PCE trip settings (Hz)	Ratio of increased (Hz / s)	Interval time (ms)	Measured tripped frequency (Hz)	Measured disconnection time (s)
60	24933	61.00	61.00	0.02	200	61.0	181
(4) Over frequency reconnection procedure							
Ratio of frequency rapidly decreased (V / s)			Reconnection frequency (Hz)		Reconnection time (s)		
--			60.90		74.5		
Supplementary information:							

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IEC 61727			
Clause	Requirement + Test	Result - Remark	Verdict

5.3		TABLE: tested condition and run-on time							
No.	P _{EUT} (% of EUT rating)	Reactive load (% of normal)	P _{AC}	Q _{AC}	Run-on time(ms)	P _{EUT} (W)	Actual Q _f (Var)	V _{DC}	Which load is selected to be adjusted (R or L)
Test condition A									
1	100	100	0	0	1244	25k	0.99	450	--
2	100	100	-5	-5	270	25k	1.01	450	R/L
3	100	100	-5	0	380	25k	1.04	450	R
4	100	100	-5	+5	286	25k	1.06	450	R/L
5	100	100	0	-5	269	25k	0.96	450	L
6	100	100	0	+5	264	25k	1.01	450	L
7	100	100	+5	-5	272	25k	0.92	450	R/L
8	100	100	+5	0	599	25k	0.93	450	R
9	100	100	+5	+5	258	25k	0.96	450	R/L
10	100	100	-10	+10	188	25k	1.14	450	R/L
11	100	100	-5	+10	177	25k	1.08	450	R/L
12	100	100	0	+10	171	25k	1.03	450	L
13	100	100	+10	+10	164	25k	0.94	450	R/L
14	100	100	+10	+5	245	25k	0.92	450	R/L
15	100	100	+10	0	492	25k	0.90	450	R
16	100	100	+10	-5	272	25k	0.88	450	R/L
17	100	100	+10	-10	241	25k	0.86	450	R/L
18	100	100	+5	-10	243	25k	0.89	450	R/L
19	100	100	0	-10	248	25k	0.93	450	L
20	100	100	-5	-10	240	25k	0.98	450	R/L
21	100	100	-10	-10	140	25k	1.03	450	R/L
22	100	100	-10	-5	159	25k	1.06	450	R/L
23	100	100	-10	0	249	25k	1.09	450	R
24	100	100	-10	+5	260	25k	1.11	450	R/L
Test condition B									
10	66	66	0	0	477	16.5k	1.00	450	--
11	66	66	0	-5	197	16.5k	0.98	450	L
12	66	66	0	-4	201	16.5k	0.98	450	L
13	66	66	0	-3	226	16.5k	0.99	450	L
14	66	66	0	-2	231	16.5k	0.99	450	L
15	66	66	0	-1	290	16.5k	1.00	450	L
16	66	66	0	1	691	16.5k	1.01	450	L
17	66	66	0	2	458	16.5k	1.01	450	L
18	66	66	0	3	412	16.5k	1.02	450	L
19	66	66	0	4	455	16.5k	1.02	450	L
20	66	66	0	5	424	16.5k	1.03	450	L
Test condition C									
21	33	33	0	0	1073	8.25k	1.00	450	/

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IEC 61727									
Clause		Requirement + Test				Result - Remark			Verdict
22	33	33	0	-5	160	8.25k	0.99	450	L
23	33	33	0	-4	172	8.25k	0.98	450	L
24	33	33	0	-3	186	8.25k	0.99	450	L
25	33	33	0	-2	207	8.25k	1.01	450	L
26	33	33	0	-1	187	8.25k	1.01	450	L
27	33	33	0	1	178	8.25k	1.01	450	L
28	33	33	0	2	165	8.25k	1.02	450	L
29	33	33	0	3	180	8.25k	1.03	450	L
30	33	33	0	4	177	8.25k	1.02	450	L
31	33	33	0	5	167	8.25k	1.03	450	L
Supplementary information: For test condition A: If any of the recorded run-on times are longer than the one recorded for the rated balance condition, then the non-shaded parameter combinations also require testing. For test condition B and C: If run-on times are still increasing at the 95 % or 105 % points, additional 1 % increments is taken until run-on times begin decreasing.									

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Attachment 1: Photos



Front View



Back View

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Attachment 1: Photos



Side View



Side View

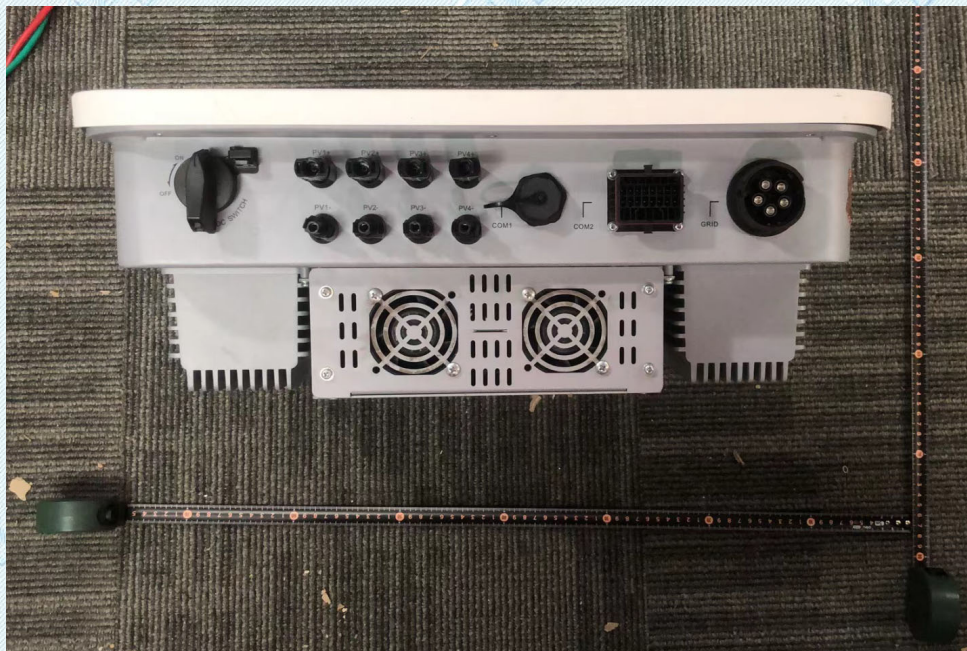
TRF No. IEC 61727_R0

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Attachment 1: Photos



Side View

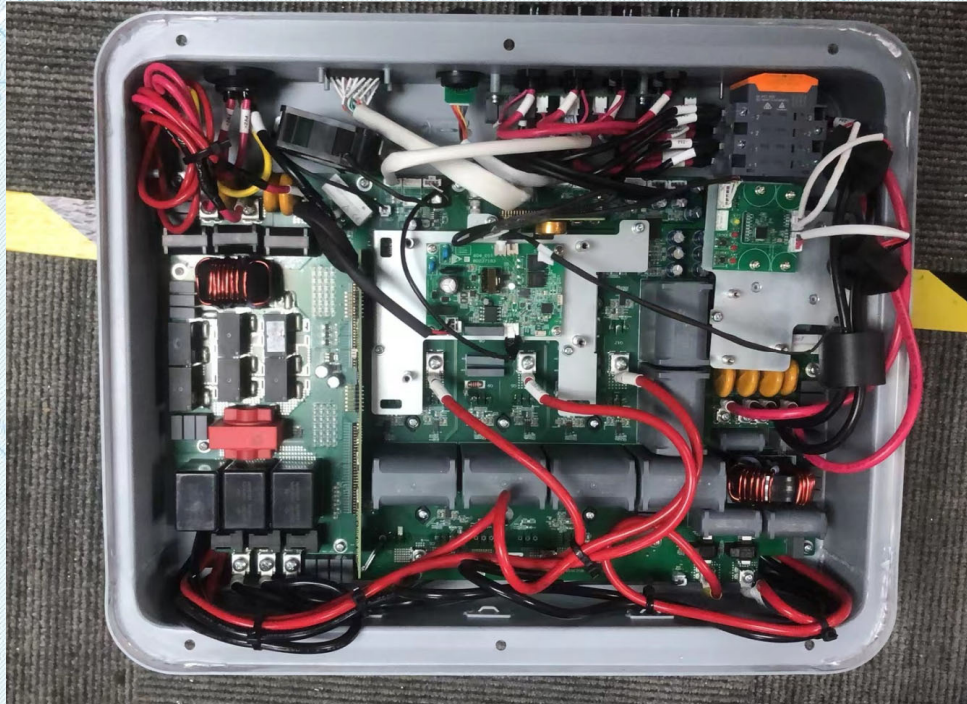


Terminal view

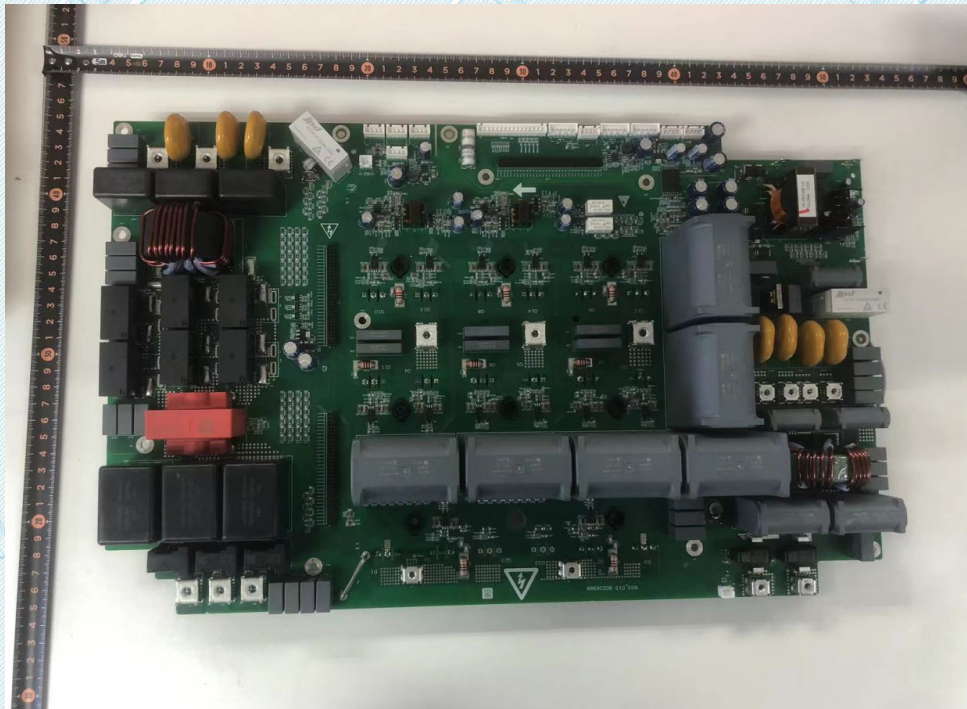
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Attachment 1: Photos



Internal View

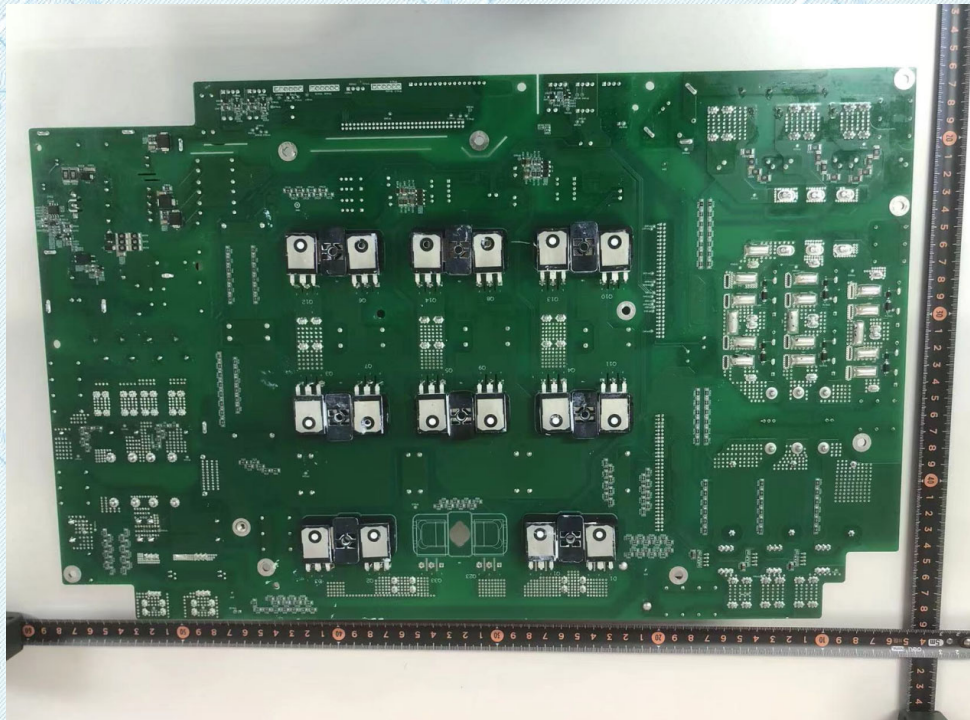


Power board View

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Attachment 1: Photos



Power board View

--- End of test report---

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