Product Service

Technical Report No.: 64.290.22.31560.01

Date: 2023-02-16

Client:	Huawei Technologies Co., Ltd. Administration Building, Headquarters of Huawei Technologies Co., Ltd., Bantian, Longgang District, Shenzhen, Guangdong, 518129,China
Factory:	Dongguan Yangtian Electron Technology Co., Ltd No.152, Luyuan Road, Tangxia Town, Dongguan City, Guangdong Province, China
Test object:	Product: Solar Inverter Model: SUN2000-100KTL-M2, SUN2000-115KTL-M2
Test specification:	P.O. 12.3:2006 PVVC:2018
Purpose of examination:	• Testing and evaluation visual according to the test specification
Test result:	The test results show that the presented product is in compliance with the above listed test specifications.

Any use for advertising purposes must be granted in writing. This technical report may only be quoted in full. This report is the result of a single examination of the object in question. It does not imply a general statement regarding the quality of products from regular production. For further details please see testing and certification regulation, chapter A-3.4.

Doc No.: ITC-TTW0902.02E - Rev. 11

Telephone : +86 20 38320668
Telefax : +86 20 38320478

http://www.tuv-sud.cn

TÜV SÜD Certification and Testing (China) Co., Ltd.
Guangzhou Branch, TÜV SÜD Group

5F, Communication Building, 163 Pingyun Rd,
Huangpu Ave. West,Guangzhou, 510656, P.R.China

1.2 Function

Manufacturer's specification for intended use:

(1) In order to protect the generator, user and installer, external AC circuit breaker shall be equipped at the end-use application.

(2) Software version: SUN2000ME V500R023C00SPC040, Firmware version: V500R023.

(3) The inverters are designed for floor standing and fixed mounted on the floor.

1.3 Consideration of the foreseeable use

☐ Not applicable
☒ Covered through the applied standard
☐ Covered by the following comment
☐ Covered by attached risk analysis

1.4 Technical Data

Model	SUN2000-100KTL-M2	SUN2000-115KTL-M2
PV terminal parameters		
Vmax PV	1100 Vd.c.	
PV input operating voltage range	200 - 1000 Vd.c.	
MPPT voltage range(full load)	540 - 800 Vd.c.	
I_{SC} PV	10 x 40 Ad.c.	
Grid terminal parameters		
Nominal a.c. output voltage	230/400 Va.c., 3/N/PE	
Nominal a.c. output frequency	50 Hz	
Nominal a.c. output current	144.4 Aa.c.	166.0 Aa.c.
Maximum continuous a.c. output current	160.4 Aa.c.	182.3 Aa.c.
Nominal a.c. output power	100 kW	115 kW
Maximum continuous a.c. output power	110 kW	125 kW
Maximum a.c. output apparent power	110 kVA	125 kVA
Power factor	0.8 inductive(under-excited) to 0.8 capacitive(over-excited)	

Telephone : +86 20 38320668
Telefax : +86 20 38320478
http://www.tuv-sud.cn

TÜV SÜD Certification and Testing (China) Co., Ltd.
Guangzhou Branch, TÜV SÜD Group
5F, Communication Building, 163 Pingyun Rd,
Huangpu Ave. West,Guangzhou, 510656, P.R.China

1.5 Rating Label

2. Order

2.1 Date of Purchase Order, Customer's Reference

2022-11-17

2.2 Test Sample(s)

- Reception date(s): 2022-12-08
- Location(s) of reception: TÜV SÜD Testing Center, D1 building, No. 63 Chuangqi Road, Shilou Town, Panyu District, Guangzhou 511447, P.R. China
- Condition of test sample(s): Intact

2.3 Date(s) of Testing

2022-12-08 to 2023-01-25

Telephone : +86 20 38320668
Telefax : +86 20 38320478

http://www.tuv-sud.cn

TÜV SÜD Certification and Testing (China) Co., Ltd.
Guangzhou Branch, TÜV SÜD Group

5F, Communication Building, 163 Pingyun Rd,
Huangpu Ave. West,Guangzhou, 510656, P.R.China

2.4 Location(s) of Testing

TÜV SÜD Testing Center, D1 building, No. 63 Chuangqi Road, Shilou Town, Panyu District, Guangzhou 511447, P.R. China

2.5 Points of Non-Compliance or Exceptions of the Test Procedure

- None

3. Test Results

- Decision rule according to IEC Guide 115:2021, clause 4.4.3, 4.5.1 was applied.

3.1 Positive Test Results

Test specification(s)	Report no. / Rev. No.	Date	Remark
Grid Code compliance	64.290.22.31560.01	2023-02-16	-

4. Remarks

4.1 General

The user manual has been examined according to the minimum requirements described in the product standard. The manufacturer is responsible for the accuracy of further particulars as well as of the composition and layout.

5. Documentation

- None

6. Summary

The test specifications are met.

Doc No.: ITC-TTW0902.02E - Rev. 11

Telephone : +86 20 38320668
Telefax : +86 20 38320478

http://www.tuv-sud.cn

TÜV SÜD Certification and Testing (China) Co., Ltd.
Guangzhou Branch, TÜV SÜD Group

5F, Communication Building, 163 Pingyun Rd,
Huangpu Ave. West,Guangzhou, 510656, P.R.China

Product Service

TÜV SÜD Certification and Testing (China) Co., Ltd. Guangzhou Branch
TÜV SÜD Group

Tested by: Yuneng Chen

printed name, function & signature

Approved by: Jinjing Peng

printed name, function & signature

--- End of Report ---

Telephone : +86 20 38320668
Telefax : +86 20 38320478

http://www.tuv-sud.cn

TÜV SÜD Certification and Testing (China) Co., Ltd.
Guangzhou Branch, TÜV SÜD Group

5F, Communication Building, 163 Pingyun Rd,
Huangpu Ave. West,Guangzhou, 510656, P.R.China

ZERTIFIKAT ◆ CERTIFICATE ◆ 認證證書 ◆ СЕРТИФИКАТ ◆ CERTIFICADO ◆ CERTIFICAT

DAkkS Deutsche Akkreditierungsstelle D-ZE-11321-01-00

TÜV SÜD Product Service

Certificado de Conformidad

No. ESY 041829 4968 Rev. 00

Titular del certificado: **Huawei Technologies Co., Ltd.**
Administration Building
Headquarters of Huawei Technologies Co., Ltd.
Bantian, Longgang District
518129 Shenzhen
REPÚBLICA POPULAR DE CHINA

Producto: **Convertidor (Inversor solar)**

Este certificado de conformidad certifica el cumplimiento de las normas antes mencionadas sobre la base de un examen voluntario del producto. Se refiere únicamente a la muestra enviada a TÜV SÜD Product Service GmbH y no certifica la calidad ni la seguridad de los productos de serie. Esta confirmación emitió de acuerdo con el programa de certificación de servicios de productos fotovoltaicos e integración en red de TÜV SÜD. Consulte para detalles: www.tuvsud.com/ps-cert

Este certificado de conformidad es una traducción, en caso de duda se aplica la versión original alemán/inglés.

Nº. informe: 64290223156201

Fecha, 2023-03-17

(Billy Qiu)

ZERTIFIKAT ◆ CERTIFICATE ◆ 認證證書 ◆ СЕРТИФИКАТ ◆ CERTIFICADO ◆ CERTIFICAT

DAkkS Deutsche Akkreditierungsstelle D-ZE-11321-01-00

TÜV SÜD Product Service

Certificado de Conformidad

No. ESY 041829 4968 Rev. 00

Modelo(s): **SUN2000-100KTL-M2, SUN2000-115KTL-M2**

Parameters:

Modelo	SUN2000-100KTL-M2	SUN2000-115KTL-M2
Parámetros de terminal PV		
Vmax PV	1100 Vd.c.	
Rango de tensión de entrada PV	200 - 1000 Vd.c.	
Rango de tensión MPPT (carga completa)	540 - 800 Vd.c.	
I_{SC} PV	10 x 40 Ad.c.	
Parámetros del terminal de red		
a.c. Tensión nominal de salida	230/400 Va.c., 3/N/PE	
a.c. Frecuencia nominal de salida	50 Hz	
a.c. Corriente nominal de salida	144.4 Aa.c.	166.0 Aa.c.
a.c. Corriente de salida continua máxima	160.4 Aa.c.	182.3 Aa.c.
a.c. Potencia nominal de salida	100 kW	115 kW
a.c. Potencia máxima de salida continua	110 kW	125 kW
a.c. Potencia aparente de salida máxima	110 kVA	125 kVA
Factor de potencia	0.8 inductivo(subexcitado) to 0.8 capacitivo(sobreexcitado)	

Examinado según: UNE 217002:2020

TÜV SÜD Product Service GmbH · Certification Body · Ridlerstrasse 65 · Munich · Germany
TÜV®

CERTIFICATE
of Conformity

Registration No.: A3 50564049 0001

Report No.: CN224DKW 001

Holder:
HUAWEI TECHNOLOGIES CO., LTD.
Administration Building,
Headquarters of Huawei Technologies
Co., Ltd. Bantian,
Longgang District, Shenzhen, 518129
Guangdong
P.R. China

Product:
PV-Inverter
(SOLAR INVERTER)

Identification:
Type Designation: SUN2000-100KTL-M2, SUN2000-115KTL-M2
Firmware Version: V500R023
Software version: V500R023C00SPC010
Remark : Refer to test report CN224DKW 001 for details.

Tested acc. to:
VDE-AR-N 4105/11.18
DIN VDE V 0124-100/06.20

The certificate of conformity refers to the above mentioned product. This is to certify that the specimen is in conformity with the assessment requirement mentioned above. This certificate does not imply assessment of the production of the product and does not permit the use of a TÜV Rheinland mark of conformity.

Durch die DAkkS nach
DIN EN ISO/IEC 17065:2013
akkreditierte Zertifizierungsstelle
Die Akkreditierung gilt nur für den in der
Urkundenanlage D-ZE-14169-01-02
aufgeführten Akkreditierungsumfang.

Certification Body

Date 04.11.2022

Longie Lee

TÜV Rheinland LGA Products GmbH - Tillystraße 2 - 90431 Nürnberg

10/020 d 04.08 TÜV, TUEV and TÜV are registered trademarks. Utilisation and application requires prior approval.

TÜV Rheinland (China) Ltd.
Member of TÜV Rheinland Group

TÜVRheinland®
Precisely Right.

HUAWEI TECHNOLOGIES CO., LTD.

Administration Building,
Headquarters of Huawei Technologies
Co., Ltd. Bantian,
Longgang District, Shenzhen, 518129
Guangdong
P.R. China

Date : 04/11/2022
Our ref. : Lied 02
Your ref.: 168385936

Ref : A3 Grid Code Certificate

Type of Equipment : SOLAR INVERTER
Model Designation : See Certificate
Certificate No. : A3 50564049 0001
Report No. : CN224DKW 001

Dear Ladies and Gentlemen,

We herewith confirm that a sample of the above mentioned technical equipment has been tested and was found to be in accordance with the relevant requirements.

Enclosed please find your Certificate of Conformity.

We appreciate your kind support and would like to offer our assistance and continuous services in the future.

With kind regards,

Certification Body

Tongle Lee

Enclosure

证书的详细资料请登陆www.certipedia.com查阅，或拨打我司客服热线800 999 3668 / 400 883 1300咨询

TÜV Rheinland (China) Ltd.
莱茵检测认证服务（中国）有限公司

Room 301, 3F and Room 1203, 12F, Building C, CATIC Plaza , No. 15, Ronghua South Road, Beijing Economic-Technological Development Area, 100176, Beijing

北京市北京经济技术开发区荣华南路15号院中航技广场C座3层301室、12层1203室
邮编：100176

Tel: 86 10 8524 2222
Fax: 86 10 8524 2200
e-mail: info@bj.chn.tuv.com
Internet: http://www.chn.tuv.com

Zertifikatsnummer: A3 50564049 0001

Certificate No.:

Konformitätsnachweis

Hersteller: *Manufacturer*	**HUAWEI TECHNOLOGIES CO., LTD.** Administration Building, Headquarters of Huawei Technologies Co., Ltd. Bantian, Longgang District, Shenzhen, 518129 Guangdong, P.R. China
Produkttyp: *Type of product*	SOLAR INVERTER
Modell: *Model*	SUN2000-100KTL-M2, SUN2000-115KTL-M2
Firmwareversion: *Firmware version*	V500R023
Softwareversion: *Software version*	V500R023C00SPC010
Standard: *Standard*	VDE-AR-N 4105:2018-11 DIN VDE V 0124-100 (VDE V 0124-100):2020-06
Prüfberichtnummer: *Report No.*	CN224DKW 001
Ausstellungsdatum: *Date of issue*	04.11.2022

Die Konformitätsprüfung bezieht sich auf das oben genannte Produkt. Hiermit wird überprüft, ob die Probe den oben genannten Bewertungsanforderungen entspricht. Diese Überprüfung impliziert keine Beurteilung der Herstellung des Produkts und erlaubt nicht die Verwendung eines TÜV-Rheinland-Konformitätszeichens. *The verification of conformity refers to the above mentioned product. This is to verify that the specimen is in conformity with the assessment requirement mentioned above. This verification does not imply assessment of the production of the product and does not permit the use of a TÜV Rheinland mark of conformity.*

TÜV Rheinland LGA Products GmbH
TÜV Rheinland
Zertifizierungsstelle

Tongle Lee
Zertifizierungsstelle

TÜV Rheinland LGA Products GmbH
Tillystraße 2 · 90431 Nürnberg · Germany

DAkkS
Deutsche
Akkreditierungsstelle
D-ZE-14169-01-02

TÜVRheinland®
Precisely Right.

Zertifikatsnummer: A3 50564049 0001

Certificate No.:

E.4 Einheitenzertifikat *E.4 Unit certificate*				
Hersteller: *Manufacturer*	**HUAWEI TECHNOLOGIES CO., LTD.** Administration Building, Headquarters of Huawei Technologies Co., Ltd. Banti Longgang District, Shenzhen, 518129 Guangdong, P.R. China			
Typ Erzeugungseinheit: *Power generation unit type*	SUN2000-100KTL-M2, SUN2000-115KTL-M2			
☒ **Umrichter** *Inverter*	☐ **Asynchrongenerator** *Asynchronous generator*	☐ **Synchrongenerator** *Synchronos generator*		
☐ **Stirlinggenerator** *Stirling generator*	☐ **Brennstoffzelle** *Fuel cell*	☐ **Andere** *Other*		
Bemessungswerte: *Rated values*	**Max. Wirkleistung P_{Emax}:** *max. Active power P_{Emax}*	110	125	kW
	Max. Scheinleistung S_{Emax}: *max. Apparent powr S_{Emax}*	110	125	kVA
	Bemessungsspannung: *Rated voltage*	3L/N/PE, 230/400		V
	Bemessungsstrom (AC) Ir *Rated current (AC) Ir*	144.4	166.0	A
	Anfangs-Kurzschlusswechselstrom Ik" *Initial short-circuit AC current*	240.6	273.5	A
Netzanschlussregel: *Network connection rule*	**VDE-AR-N 4105: 2018-11** **„Erzeugungsanlagen am Niederspannungsnetz"** Technische Mindestanforderungen für Anschluss und Parallelbetrieb von Erzeugungsanlagen am Niederspannungsnetz			
Prüfanforderung: *Test requirement*	**DIN VDE V 0124-100 (VDE V 0124-100): 2020-06** **„Netzintegration von Erzeugungsanlagen – Niederspannung"** Prüfanforderungen an Erzeugungseinheiten vorgesehen zum Anschluss und Parallelbetrieb am Niederspannungsnetz			
Prüfbericht: *Test report*	CN224DKW 001			

Ort, Datum (TT.MM.JJJJ)
Place, date

04.11.2022

Zertifizierungsstelle
Certification body

Tongle Lee

TÜV Rheinland LGA Products GmbH Zertifizierungsstelle

TÜV Rheinland LGA Products GmbH
Tillystraße 2 · 90431 Nürnberg · Germany

DAkkS
Deutsche
Akkreditierungsstelle
D-ZE-14169-01-02

TÜVRheinland®
Precisely Right.

E.5 Prüfbericht „Netzrückwirkungen“ für Erzeugungseinheiten mit einem Eingangsstrom
E.5 Test report “System reactions” for power generation units with feeding current

Auszug aus dem Prüfbericht für Erzeugungseinheiten *Extract from the test report for power generation units* **“Bestimmung der elektrischen Eigenschaften”** *“Determination of electrical properties”*	CN224DKW 001

Anlagenhersteller: *Manufacturer:*	HUAWEI TECHNOLOGIES CO., LTD.			
Herstellerangaben: *Manufacturer's data:*	**Anlagenart (BHKW, PV-WR)** *Type(CHP, PV-Inverter)*	SUN2000-100KTL-M2, SUN2000-115KTL-M2		
	Maximale Wirkleistung P_{Emax} *Max. Active Power P_{Emax}*	110	125	[kW]
	Bemessungspannung *Rating voltage*	3L/N/PE, 230/400 [Vac]		
Messzeitraum: *Measuring period:*	**vom JJJJ-MM-TT bis JJJJ-MM-TT** *From yyyy-mm-dd to yyyy-mm-dd*	vom 2022-08-10 bis 2022-10-19		

Schnelle Spannungsänderungen *Rapid voltage changes*		
Einschalten ohne Vorgabe (zum Primärenergieträger) *Marking operation without default (to primary energy carrier)*	ki=	1.003
Einschalten bei Nennbedingungen (des primärenergieträger) *Marking operation at reference conditions(of primary energy carrier)*	ki=	1.106
Ausschalten bei Nennleistung *Breaking operation at nominal power*	ki=	1.054
Schlechtester Wert aller Schaltvorgänge *Worst case value of all switching operations*	kimax=	1.106

Flicker	**Netzimpedanzwinkel Ψk:** *Angle of network impedance Ψk:*	30°	50°	70°	85°
	Anlagenflickerbeiwert CΨ: *Flicker coefficient of system flicker CΨ:*	0.020	0.015	0.020	0.005

Oberschwingungen
Harmonics for model: SUN2000-115KTL-M2

Wirkleistung P/Pn [%] *Active power P/Pn [%]*	0	10	20	30	40	50	60	70	80	90	100
Ordnungszahl *Harmonic number*	Iv/In [%]										
2	0.560	0.186	0.109	0.121	0.145	0.139	0.120	0.114	0.115	0.126	0.124
3	0.688	0.144	0.054	0.079	0.137	0.099	0.153	0.119	0.150	0.107	0.101
4	1.328	0.290	0.138	0.101	0.084	0.077	0.063	0.070	0.051	0.032	0.029
5	0.834	0.185	0.203	0.139	0.181	0.112	0.331	0.184	0.118	0.275	0.444
6	1.194	0.290	0.134	0.086	0.078	0.069	0.053	0.068	0.060	0.046	0.048
7	0.856	0.206	0.200	0.125	0.169	0.155	0.234	0.100	0.133	0.242	0.453
8	0.796	0.185	0.086	0.056	0.046	0.036	0.028	0.019	0.025	0.026	0.021
9	0.467	0.083	0.041	0.028	0.064	0.111	0.053	0.060	0.033	0.035	0.066
10	0.258	0.067	0.035	0.022	0.018	0.022	0.016	0.015	0.014	0.015	0.023
11	0.429	0.110	0.063	0.081	0.099	0.129	0.134	0.086	0.077	0.205	0.104
12	0.249	0.071	0.028	0.020	0.015	0.016	0.017	0.017	0.017	0.019	0.013
13	0.329	0.082	0.048	0.053	0.047	0.126	0.124	0.077	0.066	0.128	0.144
14	0.398	0.083	0.041	0.027	0.025	0.026	0.020	0.022	0.014	0.016	0.020
15	0.628	0.083	0.053	0.025	0.035	0.064	0.062	0.034	0.042	0.037	0.037

16	0.288	0.064	0.033	0.019	0.015	0.016	0.013	0.011	0.010	0.012	0.015
17	0.655	0.134	0.111	0.138	0.148	0.181	0.210	0.144	0.116	0.119	0.147
18	0.275	0.063	0.026	0.018	0.016	0.015	0.012	0.012	0.012	0.013	0.010
19	0.352	0.082	0.083	0.107	0.108	0.126	0.164	0.144	0.152	0.163	0.179
20	0.238	0.050	0.025	0.020	0.017	0.016	0.014	0.012	0.013	0.012	0.012
21	0.653	0.097	0.061	0.050	0.086	0.068	0.075	0.048	0.068	0.070	0.065
22	0.298	0.064	0.030	0.040	0.026	0.024	0.015	0.014	0.011	0.013	0.013
23	0.723	0.094	0.079	0.099	0.151	0.170	0.173	0.159	0.129	0.108	0.158
24	0.307	0.070	0.040	0.047	0.034	0.030	0.023	0.022	0.016	0.017	0.010
25	0.588	0.111	0.095	0.111	0.106	0.141	0.178	0.172	0.210	0.191	0.157
26	0.649	0.130	0.060	0.021	0.016	0.015	0.015	0.019	0.019	0.017	0.011
27	0.749	0.157	0.087	0.051	0.101	0.067	0.077	0.073	0.073	0.076	0.098
28	0.667	0.155	0.042	0.022	0.016	0.015	0.012	0.013	0.015	0.021	0.018
29	0.959	0.174	0.074	0.092	0.135	0.203	0.172	0.167	0.148	0.151	0.186
30	0.282	0.076	0.032	0.022	0.017	0.016	0.014	0.014	0.017	0.020	0.020
31	0.663	0.158	0.085	0.092	0.123	0.233	0.218	0.237	0.234	0.200	0.160
32	0.264	0.061	0.031	0.021	0.016	0.015	0.019	0.015	0.014	0.012	0.012
33	1.268	0.210	0.094	0.042	0.051	0.058	0.075	0.093	0.075	0.071	0.097
34	0.266	0.059	0.030	0.020	0.018	0.014	0.013	0.012	0.013	0.017	0.012
35	1.219	0.149	0.055	0.082	0.135	0.176	0.178	0.182	0.159	0.173	0.204
36	0.268	0.062	0.028	0.020	0.018	0.016	0.014	0.016	0.016	0.021	0.017
37	0.648	0.249	0.092	0.084	0.140	0.219	0.208	0.223	0.233	0.194	0.136
38	0.253	0.063	0.027	0.018	0.016	0.016	0.015	0.017	0.016	0.018	0.021
39	1.311	0.314	0.183	0.088	0.037	0.026	0.065	0.074	0.066	0.058	0.068
40	0.364	0.086	0.035	0.020	0.015	0.016	0.014	0.015	0.020	0.027	0.022

Beachtung: Die maximalwerte der drei Phasen werden gewählt.
Remark: The maximal value of three phases is selected.

Oberschwingungen *Harmonics for model: SUN2000-100KTL-M2*											
Wirkleistung P/Pn [%] *Active power P/Pn [%]*	0	10	20	30	40	50	60	70	80	90	100
Ordnungszahl *Harmonic number*	Iv/In [%]										
2	1.469	0.540	0.227	0.163	0.140	0.083	0.090	0.094	0.113	0.084	0.089
3	1.786	0.399	0.397	0.385	0.241	0.151	0.249	0.162	0.046	0.097	0.115
4	1.370	0.350	0.209	0.176	0.145	0.094	0.088	0.124	0.150	0.110	0.121
5	6.408	0.979	0.734	0.493	0.350	0.412	0.461	0.305	0.209	0.164	0.066
6	1.030	0.252	0.133	0.096	0.077	0.057	0.045	0.040	0.037	0.026	0.024
7	6.707	0.335	0.446	0.426	0.321	0.322	0.547	0.270	0.090	0.082	0.056
8	0.524	0.103	0.069	0.050	0.042	0.032	0.028	0.046	0.029	0.019	0.023
9	1.940	0.292	0.310	0.320	0.273	0.044	0.104	0.102	0.054	0.036	0.027
10	0.515	0.117	0.104	0.064	0.044	0.025	0.027	0.032	0.031	0.030	0.025
11	21.45	2.445	2.584	1.612	1.096	0.255	0.212	0.118	0.121	0.062	0.115
12	0.760	0.216	0.205	0.157	0.111	0.022	0.028	0.026	0.020	0.023	0.020
13	20.31	2.475	2.568	1.586	1.051	0.338	0.314	0.167	0.088	0.114	0.074
14	0.435	0.098	0.093	0.062	0.042	0.022	0.016	0.017	0.022	0.022	0.032
15	1.736	0.278	0.358	0.339	0.293	0.093	0.091	0.109	0.095	0.071	0.044
16	0.492	0.105	0.065	0.047	0.036	0.030	0.023	0.020	0.014	0.013	0.011
17	3.173	0.387	0.160	0.192	0.199	0.207	0.179	0.199	0.198	0.185	0.222
18	0.444	0.088	0.069	0.048	0.035	0.020	0.017	0.017	0.013	0.016	0.019
19	2.126	0.163	0.319	0.244	0.290	0.159	0.151	0.220	0.202	0.171	0.158
20	0.468	0.086	0.063	0.041	0.029	0.017	0.018	0.021	0.025	0.023	0.016
21	1.073	0.290	0.207	0.202	0.157	0.064	0.091	0.100	0.096	0.075	0.069
22	0.463	0.097	0.070	0.043	0.030	0.027	0.023	0.026	0.026	0.040	0.034
23	1.779	0.378	0.487	0.320	0.240	0.158	0.131	0.114	0.161	0.179	0.178
24	0.692	0.121	0.123	0.083	0.053	0.019	0.017	0.022	0.022	0.016	0.015
25	2.288	0.406	0.490	0.344	0.273	0.191	0.129	0.202	0.197	0.188	0.202
26	0.684	0.169	0.094	0.051	0.033	0.029	0.023	0.022	0.027	0.029	0.023
27	1.660	0.215	0.252	0.226	0.165	0.066	0.078	0.063	0.083	0.079	0.073
28	0.500	0.167	0.085	0.060	0.045	0.039	0.035	0.033	0.032	0.033	0.027
29	3.021	0.364	0.154	0.107	0.134	0.126	0.131	0.108	0.175	0.181	0.183
30	0.515	0.098	0.060	0.040	0.043	0.024	0.019	0.030	0.034	0.026	0.026
31	2.109	0.186	0.167	0.143	0.153	0.135	0.150	0.196	0.224	0.205	0.209
32	0.489	0.102	0.055	0.039	0.029	0.021	0.019	0.022	0.023	0.029	0.024
33	1.638	0.294	0.152	0.140	0.110	0.072	0.047	0.052	0.069	0.075	0.070
34	0.357	0.098	0.055	0.035	0.029	0.026	0.030	0.030	0.033	0.032	0.028
35	4.039	0.633	0.307	0.159	0.123	0.127	0.152	0.152	0.165	0.181	0.170
36	0.450	0.097	0.055	0.038	0.029	0.024	0.020	0.020	0.023	0.023	0.024
37	2.682	0.409	0.260	0.169	0.128	0.123	0.114	0.176	0.221	0.207	0.202
38	0.450	0.085	0.049	0.037	0.035	0.023	0.022	0.029	0.023	0.023	0.021
39	1.210	0.358	0.203	0.153	0.124	0.098	0.053	0.049	0.068	0.067	0.060
40	0.421	0.120	0.062	0.039	0.035	0.031	0.029	0.031	0.029	0.025	0.024
Beachtung: Die maximalwerte der drei Phasen werden gewählt. Remark: The maximal value of three phases is selected.											

Zwischenharmonische
Interim-harmonics for model: SUN2000-115KTL-M2

Wirkleistung P/Pn [%] *Active power P/Pn [%]*	0	10	20	30	40	50	60	70	80	90	100
Frequenz [Hz] *Frequency [Hz]*	Iv/In [%]										
75	1.566	0.355	0.154	0.147	0.110	0.113	0.093	0.096	0.113	0.090	0.078
125	1.691	0.372	0.158	0.144	0.110	0.082	0.087	0.091	0.093	0.082	0.071
175	0.864	0.200	0.098	0.153	0.122	0.127	0.107	0.110	0.115	0.109	0.092
225	0.754	0.153	0.074	0.116	0.092	0.089	0.091	0.124	0.129	0.089	0.067
275	0.807	0.169	0.094	0.134	0.147	0.104	0.201	0.173	0.142	0.156	0.193
325	0.683	0.146	0.077	0.121	0.105	0.063	0.100	0.128	0.128	0.125	0.133
375	0.734	0.152	0.085	0.099	0.122	0.041	0.155	0.141	0.109	0.142	0.185
425	0.695	0.155	0.078	0.101	0.081	0.037	0.075	0.053	0.047	0.106	0.125
475	0.679	0.158	0.073	0.062	0.048	0.060	0.039	0.035	0.032	0.036	0.041
525	0.734	0.163	0.073	0.058	0.044	0.050	0.033	0.033	0.029	0.030	0.030
575	0.774	0.164	0.079	0.079	0.068	0.059	0.067	0.061	0.056	0.063	0.064
625	0.736	0.173	0.085	0.094	0.064	0.050	0.055	0.043	0.040	0.063	0.072
675	0.743	0.170	0.081	0.079	0.067	0.041	0.063	0.058	0.054	0.064	0.062
725	0.814	0.187	0.090	0.099	0.067	0.040	0.054	0.041	0.038	0.064	0.076
775	0.812	0.192	0.089	0.061	0.051	0.043	0.034	0.031	0.029	0.030	0.030
825	0.847	0.200	0.091	0.060	0.051	0.044	0.033	0.030	0.028	0.028	0.027
875	0.884	0.206	0.094	0.063	0.054	0.046	0.036	0.031	0.029	0.030	0.030
925	0.881	0.207	0.097	0.066	0.055	0.046	0.036	0.032	0.030	0.030	0.027
975	0.884	0.207	0.100	0.064	0.056	0.051	0.038	0.034	0.030	0.030	0.028
1025	0.905	0.212	0.103	0.067	0.058	0.077	0.038	0.035	0.031	0.030	0.027
1075	0.938	0.217	0.107	0.076	0.061	0.128	0.038	0.035	0.031	0.029	0.026
1125	1.005	0.235	0.110	0.131	0.092	0.131	0.047	0.036	0.032	0.030	0.027
1175	1.036	0.243	0.113	0.217	0.157	0.122	0.080	0.048	0.035	0.033	0.030
1225	1.026	0.238	0.133	0.213	0.162	0.067	0.106	0.084	0.045	0.035	0.030
1275	1.171	0.255	0.231	0.194	0.152	0.055	0.109	0.095	0.070	0.045	0.030
1325	1.980	0.390	0.340	0.103	0.088	0.058	0.085	0.091	0.082	0.067	0.031
1375	2.516	0.602	0.312	0.085	0.058	0.060	0.049	0.057	0.077	0.075	0.037
1425	2.228	0.633	0.279	0.089	0.060	0.059	0.047	0.041	0.052	0.069	0.054
1475	1.840	0.570	0.144	0.093	0.062	0.059	0.049	0.043	0.041	0.049	0.070
1525	0.998	0.371	0.124	0.088	0.064	0.062	0.050	0.044	0.041	0.041	0.067
1575	0.890	0.245	0.124	0.082	0.066	0.058	0.051	0.045	0.043	0.041	0.055
1625	0.857	0.228	0.120	0.077	0.067	0.062	0.051	0.046	0.044	0.042	0.039
1675	0.783	0.202	0.110	0.073	0.066	0.061	0.051	0.047	0.043	0.041	0.038
1725	0.751	0.189	0.107	0.075	0.069	0.060	0.053	0.047	0.045	0.043	0.041
1775	0.746	0.185	0.098	0.071	0.066	0.058	0.054	0.049	0.048	0.048	0.043
1825	0.733	0.187	0.093	0.068	0.065	0.061	0.055	0.051	0.051	0.049	0.044
1875	0.704	0.175	0.092	0.066	0.061	0.055	0.058	0.055	0.052	0.051	0.046
1925	0.683	0.173	0.088	0.063	0.058	0.057	0.057	0.055	0.056	0.049	0.072
1975	0.675	0.190	0.081	0.061	0.054	0.052	0.058	0.059	0.051	0.052	0.073

Beachtung: Die maximalwerte der drei Phasen werden gewählt.
Remark: The maximal value of three phases is selected.

Zwischenharmonische
Interim-harmonics for model: SUN2000-100KTL-M2

Wirkleistung P/Pn [%] *Active power P/Pn [%]*	0	10	20	30	40	50	60	70	80	90	100
Frequenz [Hz] *Frequency [Hz]*	Iv/In [%]										
75	3.987	1.124	0.624	0.466	0.350	0.151	0.125	0.106	0.078	0.061	0.055
125	3.473	0.774	0.724	0.423	0.339	0.145	0.122	0.105	0.080	0.062	0.058
175	4.310	1.219	0.427	0.515	0.374	0.136	0.117	0.107	0.105	0.051	0.034
225	2.201	0.458	0.689	0.330	0.267	0.117	0.108	0.096	0.081	0.036	0.028
275	3.974	0.842	0.368	0.529	0.398	0.141	0.229	0.208	0.162	0.071	0.037
325	2.414	0.331	0.408	0.285	0.230	0.123	0.148	0.113	0.095	0.059	0.031
375	2.355	0.362	0.236	0.346	0.268	0.123	0.192	0.163	0.125	0.063	0.040
425	1.915	0.246	0.184	0.183	0.158	0.092	0.119	0.083	0.067	0.056	0.030
475	1.246	0.285	0.161	0.124	0.094	0.055	0.049	0.044	0.038	0.033	0.034
525	1.117	0.293	0.355	0.115	0.086	0.050	0.043	0.038	0.035	0.028	0.025
575	1.932	0.393	0.327	0.253	0.214	0.083	0.071	0.063	0.057	0.036	0.027
625	1.871	0.402	0.363	0.253	0.187	0.103	0.081	0.062	0.048	0.039	0.027
675	1.987	0.488	0.320	0.262	0.217	0.081	0.070	0.062	0.057	0.037	0.028
725	1.790	0.400	0.163	0.248	0.180	0.114	0.081	0.062	0.048	0.040	0.031
775	1.122	0.401	0.158	0.121	0.087	0.054	0.045	0.040	0.038	0.033	0.029
825	1.133	0.312	0.164	0.113	0.086	0.053	0.044	0.039	0.036	0.032	0.030
875	1.231	0.303	0.158	0.119	0.089	0.054	0.047	0.041	0.038	0.033	0.030
925	1.243	0.302	0.151	0.113	0.089	0.055	0.048	0.041	0.038	0.033	0.030
975	1.272	0.319	0.156	0.110	0.085	0.055	0.048	0.042	0.039	0.034	0.031
1025	1.228	0.303	0.159	0.104	0.084	0.057	0.047	0.043	0.040	0.036	0.032
1075	1.237	0.326	0.168	0.108	0.082	0.057	0.046	0.043	0.040	0.035	0.032
1125	1.192	0.341	0.172	0.106	0.081	0.059	0.049	0.044	0.042	0.037	0.034
1175	1.297	0.346	0.177	0.118	0.093	0.060	0.053	0.047	0.043	0.037	0.034
1225	1.576	0.339	0.205	0.115	0.092	0.063	0.056	0.049	0.045	0.038	0.035
1275	2.102	0.417	0.329	0.122	0.097	0.066	0.056	0.050	0.047	0.040	0.036
1325	2.198	0.684	0.353	0.138	0.094	0.098	0.069	0.053	0.049	0.041	0.037
1375	1.969	0.726	0.338	0.215	0.106	0.158	0.116	0.061	0.051	0.042	0.038
1425	1.416	0.693	0.255	0.248	0.173	0.149	0.131	0.102	0.064	0.047	0.043
1475	1.281	0.502	0.182	0.232	0.195	0.137	0.124	0.122	0.104	0.070	0.067
1525	1.192	0.348	0.179	0.181	0.182	0.086	0.095	0.115	0.110	0.097	0.087
1575	1.161	0.343	0.177	0.123	0.138	0.073	0.067	0.094	0.108	0.094	0.084
1625	1.103	0.351	0.163	0.120	0.098	0.077	0.067	0.069	0.086	0.085	0.073
1675	1.072	0.320	0.157	0.120	0.093	0.075	0.066	0.068	0.069	0.063	0.057
1725	0.971	0.288	0.162	0.119	0.091	0.074	0.067	0.071	0.073	0.059	0.056
1775	0.981	0.286	0.153	0.115	0.091	0.073	0.070	0.072	0.073	0.063	0.059
1825	0.959	0.285	0.152	0.113	0.085	0.073	0.069	0.070	0.075	0.070	0.065
1875	0.967	0.279	0.145	0.106	0.086	0.068	0.065	0.074	0.097	0.106	0.096
1925	0.913	0.264	0.133	0.106	0.104	0.067	0.067	0.104	0.118	0.089	0.092
1975	0.793	0.247	0.153	0.128	0.115	0.075	0.088	0.109	0.092	0.090	0.084

Beachtung: Die maximalwerte der drei Phasen werden gewählt.
Remark: The maximal value of three phases is selected.

Höhere Frequenzen
Higher frequencies for model: SUN2000-115KTL-M2

Wirkleistung P/Pn [%] *Active power P/Pn [%]*	0	10	20	30	40	50	60	70	80	90	100
Frequenz [kHz] *Frequency [kHz]*	Iv/In [%]										
2,1	2.227	0.504	0.251	0.174	0.230	0.302	0.272	0.302	0.294	0.282	0.242
2,3	2.156	0.497	0.265	0.205	0.222	0.209	0.189	0.195	0.161	0.155	0.179
2,5	1.772	0.447	0.245	0.171	0.165	0.198	0.161	0.171	0.178	0.161	0.130
2,7	1.862	0.345	0.189	0.150	0.164	0.197	0.174	0.165	0.160	0.146	0.155
2,9	1.989	0.419	0.322	0.235	0.204	0.171	0.101	0.085	0.072	0.077	0.130
3,1	1.646	0.304	0.226	0.183	0.170	0.150	0.161	0.163	0.171	0.149	0.103
3,3	1.133	0.297	0.242	0.220	0.193	0.198	0.136	0.140	0.126	0.117	0.136
3,5	1.329	0.373	0.157	0.159	0.138	0.156	0.173	0.182	0.192	0.172	0.157
3,7	1.348	0.287	0.181	0.122	0.103	0.077	0.101	0.083	0.084	0.091	0.086
3,9	1.211	0.183	0.085	0.095	0.117	0.124	0.151	0.131	0.124	0.114	0.121
4,1	1.375	0.261	0.147	0.110	0.117	0.112	0.136	0.126	0.130	0.128	0.117
4,3	0.925	0.221	0.127	0.106	0.091	0.091	0.075	0.071	0.079	0.081	0.083
4,5	1.241	0.196	0.095	0.084	0.087	0.097	0.124	0.120	0.136	0.134	0.120
4,7	1.144	0.193	0.127	0.124	0.117	0.098	0.105	0.112	0.117	0.132	0.125
4,9	0.747	0.176	0.091	0.102	0.103	0.106	0.088	0.084	0.094	0.095	0.095
5,1	0.978	0.196	0.088	0.072	0.091	0.086	0.128	0.131	0.133	0.131	0.115
5,3	0.775	0.182	0.096	0.093	0.091	0.106	0.091	0.101	0.091	0.110	0.123
5,5	0.645	0.170	0.098	0.073	0.084	0.100	0.096	0.099	0.101	0.096	0.104
5,7	0.759	0.169	0.088	0.058	0.057	0.053	0.080	0.083	0.095	0.096	0.090
5,9	0.734	0.175	0.077	0.069	0.072	0.069	0.065	0.064	0.069	0.078	0.108
6,1	0.859	0.187	0.065	0.054	0.046	0.037	0.045	0.052	0.064	0.066	0.075
6,3	0.584	0.148	0.075	0.049	0.053	0.051	0.040	0.041	0.041	0.044	0.051
6,5	0.804	0.196	0.079	0.055	0.051	0.055	0.042	0.044	0.047	0.047	0.043
6,7	0.923	0.238	0.102	0.059	0.049	0.037	0.027	0.031	0.032	0.032	0.026
6,9	0.512	0.178	0.080	0.043	0.039	0.041	0.032	0.030	0.029	0.031	0.025
7,1	0.892	0.243	0.120	0.073	0.050	0.040	0.025	0.029	0.028	0.030	0.027
7,3	0.913	0.252	0.145	0.087	0.058	0.036	0.025	0.025	0.022	0.021	0.018
7,5	0.519	0.167	0.068	0.042	0.030	0.026	0.022	0.021	0.022	0.022	0.019
7,7	0.864	0.239	0.149	0.096	0.064	0.040	0.023	0.023	0.018	0.018	0.017
7,9	0.850	0.227	0.144	0.103	0.071	0.044	0.023	0.020	0.016	0.014	0.015
8,1	0.501	0.158	0.074	0.040	0.033	0.026	0.021	0.019	0.016	0.014	0.015
8,3	0.788	0.217	0.136	0.102	0.076	0.053	0.028	0.023	0.015	0.013	0.014
8,5	0.735	0.214	0.128	0.098	0.079	0.058	0.028	0.023	0.016	0.012	0.014
8,7	0.450	0.163	0.081	0.041	0.030	0.025	0.024	0.019	0.016	0.013	0.012
8,9	0.643	0.200	0.126	0.096	0.081	0.063	0.038	0.030	0.020	0.014	0.012

Beachtung: Die maximalwerte der drei Phasen werden gewählt.
Remark: The maximal value of three phases is selected.

Höhere Frequenzen
Higher frequencies for model: SUN2000-100KTL-M2

Wirkleistung P/Pn [%] *Active power P/Pn [%]*	0	10	20	30	40	50	60	70	80	90	100
Frequenz [kHz] *Frequency [kHz]*	Iv/In [%]										
2,1	5.022	0.875	0.469	0.320	0.223	0.244	0.273	0.279	0.287	0.267	0.266
2,3	3.437	0.968	0.481	0.337	0.240	0.223	0.206	0.170	0.176	0.168	0.166
2,5	2.147	0.647	0.309	0.241	0.201	0.196	0.200	0.202	0.207	0.190	0.190
2,7	3.046	0.827	0.411	0.296	0.224	0.203	0.197	0.202	0.203	0.207	0.217
2,9	2.721	0.852	0.447	0.346	0.289	0.207	0.175	0.157	0.165	0.160	0.147
3,1	1.990	0.491	0.263	0.215	0.177	0.201	0.208	0.186	0.151	0.142	0.138
3,3	1.932	0.514	0.366	0.285	0.258	0.244	0.199	0.199	0.189	0.167	0.148
3,5	1.776	0.556	0.381	0.351	0.318	0.310	0.295	0.246	0.194	0.163	0.156
3,7	1.578	0.279	0.223	0.198	0.164	0.160	0.167	0.148	0.132	0.122	0.118
3,9	1.732	0.374	0.229	0.216	0.190	0.177	0.144	0.168	0.187	0.179	0.167
4,1	1.621	0.272	0.214	0.203	0.177	0.184	0.175	0.170	0.157	0.148	0.137
4,3	1.526	0.299	0.170	0.166	0.120	0.103	0.121	0.109	0.110	0.102	0.103
4,5	2.037	0.450	0.182	0.159	0.148	0.162	0.144	0.149	0.145	0.141	0.136
4,7	1.507	0.320	0.186	0.171	0.149	0.163	0.172	0.152	0.119	0.113	0.110
4,9	1.693	0.427	0.173	0.143	0.120	0.105	0.129	0.106	0.099	0.086	0.089
5,1	1.903	0.456	0.192	0.147	0.116	0.119	0.138	0.148	0.132	0.121	0.119
5,3	1.247	0.356	0.187	0.153	0.131	0.113	0.149	0.132	0.095	0.088	0.088
5,5	1.357	0.381	0.186	0.146	0.124	0.107	0.100	0.099	0.114	0.097	0.095
5,7	1.294	0.329	0.173	0.129	0.116	0.088	0.089	0.107	0.122	0.112	0.103
5,9	1.008	0.287	0.140	0.105	0.088	0.079	0.067	0.066	0.065	0.054	0.058
6,1	1.002	0.315	0.131	0.096	0.086	0.082	0.071	0.071	0.085	0.091	0.094
6,3	0.814	0.244	0.119	0.073	0.064	0.065	0.056	0.058	0.067	0.069	0.072
6,5	0.776	0.185	0.120	0.082	0.066	0.065	0.050	0.047	0.048	0.045	0.045
6,7	0.678	0.212	0.110	0.069	0.060	0.066	0.060	0.048	0.045	0.046	0.049
6,9	0.583	0.195	0.108	0.073	0.048	0.033	0.040	0.042	0.042	0.046	0.049
7,1	0.570	0.228	0.126	0.089	0.056	0.048	0.051	0.039	0.035	0.031	0.033
7,3	0.512	0.196	0.113	0.082	0.064	0.044	0.039	0.043	0.035	0.030	0.033
7,5	0.452	0.170	0.102	0.080	0.056	0.041	0.032	0.029	0.028	0.029	0.029
7,7	0.455	0.182	0.118	0.088	0.065	0.046	0.033	0.040	0.036	0.030	0.028
7,9	0.408	0.146	0.111	0.085	0.069	0.061	0.042	0.039	0.035	0.028	0.026
8,1	0.389	0.141	0.099	0.077	0.052	0.053	0.047	0.031	0.022	0.021	0.020
8,3	0.367	0.130	0.115	0.084	0.064	0.055	0.031	0.038	0.038	0.030	0.025
8,5	0.334	0.117	0.107	0.090	0.068	0.059	0.048	0.043	0.040	0.031	0.025
8,7	0.312	0.111	0.101	0.083	0.051	0.041	0.044	0.031	0.020	0.019	0.017
8,9	0.309	0.108	0.109	0.092	0.064	0.052	0.039	0.039	0.042	0.034	0.059

Beachtung: Die maximalwerte der drei Phasen werden gewählt.
Remark: The maximal value of three phases is selected.

Zertifikatsnummer: A3 50564049 0001

Certificate No.:

E.6 Zertifikat für den NA-Schutz *E.6 Certificate of NS protection*		
Hersteller: *Manufacturer*	HUAWEI TECHNOLOGIES CO., LTD.	
Typ NA-Schutz: *Type of NS protection*		
Zentraler NA-Schutz: *Central NS protection*	☐	
Integrierter NA-Schutz: *Integrated NS protection*	☒	**Zugeordnet zu Erzeugungseinheit Typ:** *Assigned to power generation unit of type*
Netzanschlussregel: *Network connection rule*	**VDE-AR-N 4105: 2018-11** **„Erzeugungsanlagen am Niederspannungsnetz"** Technische Mindestanforderungen für Anschluss und Parallelbetrieb von Erzeugungsanlagen am Niederspannungsnetz	
Prüfanforderung: *Test requirement*	**DIN VDE V 0124-100 (VDE V 0124-100): 2020-06** **„Netzintegration von Erzeugungsanlagen – Niederspannung"** Prüfanforderungen an Erzeugungseinheiten vorgesehen zum Anschluss und Parallelbetrieb am Niederspannungsnetz	
Prüfbericht: *Test report*	CN224DKW 001	

Ort, Datum (TT.MM.JJJJ)
Place, date

04.11.2022

Zertifizierungsstelle
Certification body

Tongle Lee

TÜV Rheinland LGA Products GmbH Zertifizierungsstelle TÜVRheinland

TÜV Rheinland LGA Products GmbH
Tillystraße 2 · 90431 Nürnberg · Germany

DAkkS
Deutsche
Akkreditierungsstelle
D-ZE-14169-01-02

TÜVRheinland®
Precisely Right.

E.7 Anforderungen an den Prüfbericht zum NA-Schutz
E.7 Requirement for the test report for the NS protection

Auszug aus dem Prüfbericht für den NA-Schutz *Extract from the test report for the NS-protection* **"Bestimmung der elektrischen Eigenschaften"** *"Determination of electrical properties"*	CN224DKW 001

Prüfbericht NA-Schutz
Test report NS-Protection

Typ NA-Schutz: *Type of NS protection:*	Integrierter NA-Schutz	**Weitere Herstellerangaben** *Other manufacturer's data*
Software version: *Software Version:*	V500R023C00SPC010	--
Hersteller: *Manufacturer:*	HUAWEI TECHNOLOGIES CO., LTD.	
Messzeitraum: *Measuring period:*	**vom JJJJ-MM-TT bis JJJJ-MM-TT** *From yyyy-mm-dd to yyyy-mm-dd*	vom 2022-08-10 bis 2022-10-19

Beachtung:

	Stirlinggeneratoren, Brennstoffzellen *Stirling engines, fuel cell systems*			**Umrichter** *Converter*		
	direkt oder über Umrichter gekoppelte Synchron- und Asynchrongeneratoren mit Pn ⩽ 50 kW *Direct or by converter coupled synchronous- and asynchronous generators with Pn ⩽ 50 kW*			**direkt gekoppelte Synchron- und Asynchrongeneratoren mit *Pn* > 50 kW** *Direct or coupled synchronous- and asynchronous generators with Pn> 50 kW*		
Schutzfunktion *Protection function*	**Einstellwert** *Setting value*	**Auslösewert** *Tripping value*	**Auslösewert NA Schutz*** *Tripping time**	**Einstellwert** *Setting value*	**Auslösewert** *Tripping value*	**Auslösezeit NA Schutz*** *Tripping time**
Spannungssteigerungsschutz U>> *Voltage increase protection U >>*	1,15 * U_n			1,25 * U_n	286,9V	< 100ms
Spannungssteigerungsschutz U> *Voltage increase protection U >*	1,1 * U_n			1,1 * U_n	253,0V	< 100ms
Spannungsrückgangsschutz U< *Voltage decrease protection U <*	0,8 * U_n			0,8 * U_n	185,4V	3000ms
Spannungsrückgangsschutz U<< *Voltage decrease protection U <<*	**Entfällt** *Not applicable*			0,45 * U_n	104.8V	300ms
Frequenzrückgangsschutz f< *Frequency decrease protection f <*	47,5Hz			47,5Hz	47,50Hz	< 100ms
Frequenzsteigerungsschutz f> *Frequency increase protection f >*	51,5Hz			51,5Hz	51,49Hz	< 100ms

[a] Die Auslösezeit umfasst den Zeitraum von der Grenzwertverletzung U/f bis zum Auslösesignal an den Kuppelschalter.
[a] The tripping time comprises the period before limit violation U/f until tripping signal to interface switch.
Bei der Planung der Erzeugungsanlage ist die Eigenzeit des Kuppelschalters zum höchsten oben ermittelten Zeitwert zu addieren.
During planning of power generation system the proper time of interface switch shall be added to the highest value of time determined above.
Die Abschaltzeit (Summe der Auslösezeit NA-Schutz zzgl. Eigenzeit des Kuppelschalts) darf 200ms nicht überschreiten.
The break time (sum of tripping time NS protection plus proper time of interface switch) should not exceed 200 ms.

☒ **Bei integriertem NA-Schutz**
By integrated NS Protection

Zugeordnet zu Erzeugungseinhalt Typ: *Assigned to PGU type:*	SUN2000-100KTL-M2, SUN2000-115KTL-M2
Typ integrierter Kuppelschalter: *Type of integrated interface switch:*	HF167F-200/12-H3F Xiamen Hongfa Electroacoustic Co., Ltd
Eigenzeit des Kuppelschalters bei integriertem NA-Schutz *Proper time of interface switch by integrated NS-protection*	< 20ms

Die überprüfung der Gesamtwirkungskette "NA-Schutz-Kuppelschalter" führte zu einer ergolgreichen Abschaltung.
The verification of the full function chain "NS protection- Interface switch" has yield to intended disconnection.

CERTIFICATE OF CONFORMITY

Issued to:	Huawei Technologies Co., Ltd. Administration Building, Headquarters of Huawei Technologies Co., Ltd., Bantian, Longgang District, Shenzhen, Guangdong, 518129, China
For the product:	SOLAR INVERTER
Trade name:	HUAWEI
Type/Model:	SUN2000-100KTL-M2, SUN2000-115KTL-M2
Ratings:	Operating temperature range: - 25°C to + 60°C Protective class: I Ingress protection rating: IP66 Power factor range (adjustable): 0.8 leading…0.8 lagging SUN2000-100KTL-M2: PV input: max 1100 Vdc, MPPT voltage range: 200-1000 Vdc, Isc PV: 40 A × 10, max 30 A × 10 AC output: 3/N/PE, 400 Vac, 50 Hz, rated 144.4 A, 100 kW, max 160.4 A, max 110 kVA SUN2000-115KTL-M2: PV input: max 1100 Vdc, MPPT voltage range: 200-1000 Vdc, Isc PV: 40 A × 10, max 30 A × 10 AC output: 3/N/PE, 400 Vac, 50 Hz, rated 166.0 A, 115 kW, max 182.3 A, max 125 kVA
Manufactured by:	Huawei Technologies Co., Ltd. Administration Building, Headquarters of Huawei Technologies Co., Ltd., Bantian, Longgang District, Shenzhen, Guangdong, 518129, China
Requirements:	EN 50549-1:2019

This Test Certificate is granted on account of an examination by DEKRA, the results of which are laid down in a confidential file no. 6138142.50

The examination has been carried out on one single specimen or several specimens of the product, submitted by the manufacturer. The certificate does not include an assessment of the manufacturer's production. Conformity of his production with the specimen tested by DEKRA is not the responsibility of DEKRA.

Shanghai, 25 October 2022 Certificate Number: 6138142.01COC
It expires at the latest on: 25 October 2027

DEKRA Testing and Certification (Shanghai) Ltd.

Cliff Lin
Certification Manager

IAS ACCREDITED Product Certification Agency
PCA-141

© Integral publication of this certificate and adjoining reports is allowed

Accreditation of the certification body by IAS according to ISO/IEC 17065 for products.
Accreditation is valid in the areas of certification mentioned in the certificate.

DEKRA Testing and Certification (Shanghai) Ltd.
3F #250 Jiangchangsan Road Shibei Hi-Tech Park, 200436 Jing'an District, Shanghai, China
T +86 21 6056 7666 F +86 21 6056 7555 www.dekra-product-safety.com

CERTIFICATE OF CONFORMITY

Issued to:	Huawei Technologies Co., Ltd. Administration Building, Headquarters of Huawei Technologies Co., Ltd., Bantian, Longgang District, Shenzhen, Guangdong, 518129, China
For the product:	SOLAR INVERTER
Trade name:	HUAWEI
Type/Model:	SUN2000-100KTL-M2, SUN2000-115KTL-M2
Ratings:	Operating temperature range: - 25°C to + 60°C Protective class: I Ingress protection rating: IP66 Power factor range (adjustable): 0.8 leading…0.8 lagging SUN2000-100KTL-M2: PV input: max 1100 Vdc, MPPT voltage range: 200-1000 Vdc, Isc PV: 10 × 40 A, max 10 × 30 A AC output: 3/N/PE, 400 Vac, rated 144.4 A, max 160.4 A, 480 Vac, rated 120.3 A, max 133.7 A, 50 Hz, rated power 100 kW, max 110 kVA SUN2000-115KTL-M2: PV input: max 1100 Vdc, MPPT voltage range: 200-1000 Vdc, Isc PV: 10 × 40 A, max 10 × 30 A AC output: 3/N/PE, 400 Vac, rated 166.0 A, max 182.3 A, 480 Vac, rated 138.4 A, max 151.9 A, 50 Hz, rated power 115 kW, max 125 kVA
Manufactured by:	Huawei Technologies Co., Ltd. Administration Building, Headquarters of Huawei Technologies Co., Ltd., Bantian, Longgang District, Shenzhen, Guangdong, 518129, China
Requirements:	EN 50549-2:2019

This Test Certificate is granted on account of an examination by DEKRA, the results of which are laid down in a confidential file no. 6138142.51V1.1

The examination has been carried out on one single specimen or several specimens of the product, submitted by the manufacturer. The certificate does not include an assessment of the manufacturer's production. Conformity of his production with the specimen tested by DEKRA is not the responsibility of DEKRA.

Shanghai, 5 May 2023 Certificate Number: 6138142.02COCV1.1
It expires at the latest on: 5 May 2028

DEKRA Testing and Certification (Shanghai) Ltd.

Cliff Lin
Certification Manager

IAS ACCREDITED Product Certification Agency
PCA-141

© Integral publication of this certificate and adjoining reports is allowed

Accreditation of the certification body by IAS according to ISO/IEC 17065 for products.
Accreditation is valid in the areas of certification mentioned in the certificate.

DEKRA Testing and Certification (Shanghai) Ltd.
3F #250 Jiangchangsan Road Shibei Hi-Tech Park, 200436 Jing'an District, Shanghai, China
T +86 21 6056 7666 F +86 21 6056 7555 www.dekra-product-safety.com

EU Declaration of Conformity

(No. CE-10228758)

We **Huawei Technologies Co., Ltd.**

Administration Building, Headquarters of Huawei Technologies Co., Ltd., Bantian, Longgang District, Shenzhen, 518129, P.R.C

declare that the product

Name/Trademark SOLAR INVERTER/HUAWEI

Model SUN2000-100KTL-M2, SUN2000-115KTL-M2

complies with the following directives:

- **2014/35/EU (Low Voltage Directive)**
- **2014/30/EU (EMC Directive)**
- **2011/65/EU & (EU) 2015/863 (RoHS Directive)**

For the evaluation of the compliance with these Directives, the following standards have been applied:

Safety	EN 62109-2:2011 EN 62109-1:2010
EMC	EN 62920:2017+A11:2020 EN 55011:2016+A11:2020(Group 1) EN IEC 61000-6-3:2021(Telecom Port) EN IEC 61000-6-4:2019(Telecom Port) EN 61000-3-12:2011 EN IEC 61000-3-11:2019 EN IEC 61000-6-2:2019
RoHS	EN IEC 63000:2018

This declaration of conformity is issued under the sole responsibility of the manufacturer.

CE Marking Date: 2023-02-02

Responsible for making this declaration is the:

☑ Manufacturer ☐ Authorised representative established within the EU

Signed for and on behalf of: Huawei Technologies Co., Ltd.

Print name/Title : LingHongDong / Regulation Compliance Manager

Shenzhen, China	2023-02-02	Ling Hong Dong
(Place)	(Date)	(Signature)