

# CERTIFICATE of Conformity



Registration No.: A3 50570910 0001

Report No.: CN23L5GF 001

**Holder:** SINENG ELECTRIC CO., LTD.  
No.6, Hehui Road,  
Huishan District,  
Wuxi  
214174 Jiangsu  
P.R. China

**Product:** PV-Inverter  
(PV Grid-connected Inverter )

**Identification:** Type Designation: SN25PT-X, SN30PT, SN33PT,  
SN36PT, SN40PT  
Software version: V000B050D001  
Remark : Refer to test report CN23L5GF 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.

Date 13.01.2023

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

A. Chen

TÜV Rheinland LGA Products GmbH - Tillystraße 2 - 90431 Nürnberg

**Zertifikatsnummer: A3 50570910 0001**

*Certificate No.:*

## Konformitätsnachweis

|                                                    |                                                                                                          |
|----------------------------------------------------|----------------------------------------------------------------------------------------------------------|
| <b>Hersteller:</b><br><i>Manufacturer</i>          | <b>SINENG ELECTRIC CO., LTD.</b><br>No.6, Hehui Road, Huishan District, Wuxi, 214174 Jiangsu, P.R. China |
| <b>Produkttyp:</b><br><i>Type of product</i>       | Grid-connected PV inverter                                                                               |
| <b>Modell:</b><br><i>Model</i>                     | SN25PT-X, SN30PT, SN33PT, SN36PT, SN40PT                                                                 |
| <b>Softwareversion:</b><br><i>Software version</i> | V000B050D001                                                                                             |
| <b>Standard:</b><br><i>Standard</i>                | VDE-AR-N 4105:2018-11<br>DIN VDE V 0124-100 (VDE V 0124-100):2020-06                                     |
| <b>Prüfberichtsnummer:</b><br><i>Report No.</i>    | CN23L5GF 001                                                                                             |
| <b>Ausstellungsdatum:</b><br><i>Date of issue</i>  | 13.01.2023                                                                                               |

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.*



**A.Chen**  
Zertifizierungsstelle

**Zertifikatsnummer: A3 50570910 0001**

Certificate No.:

|                                                                         |                                                                                                                                                                                                                                 |                                                                           |      |      |      |      |     |
|-------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------|------|------|------|------|-----|
| <b>E.4 Einheitenzertifikat</b><br>E.4 Unit certificate                  |                                                                                                                                                                                                                                 |                                                                           |      |      |      |      |     |
| <b>Hersteller:</b><br>Manufacturer                                      | SINENG ELECTRIC CO., LTD.<br>No.6, Hehui Road, Huishan District, Wuxi, 214174 Jiangsu, P.R. China                                                                                                                               |                                                                           |      |      |      |      |     |
| <b>Typ Erzeugungseinheit:</b><br>Power generation unit type             | SN25PT-X, SN30PT, SN33PT, SN36PT, SN40PT                                                                                                                                                                                        |                                                                           |      |      |      |      |     |
| <input checked="" type="checkbox"/> <b>Umrichter</b><br>Inverter        | <input type="checkbox"/> <b>Asynchrongenerator</b><br>Asynchronous generator                                                                                                                                                    | <input type="checkbox"/> <b>Synchrongenerator</b><br>Synchronos generator |      |      |      |      |     |
| <input type="checkbox"/> <b>Stirlinggenerator</b><br>Stirling generator | <input type="checkbox"/> <b>Brennstoffzelle</b><br>Fuel cell                                                                                                                                                                    | <input type="checkbox"/> <b>Andere</b><br>Other                           |      |      |      |      |     |
| <b>Bemessungswerte:</b><br>Rated values                                 | <b>Max. Wirkleistung <math>P_{E_{max}}</math>:</b><br>max. Active power $P_{E_{max}}$                                                                                                                                           | 27.5                                                                      | 33   | 36.3 | 39.6 | 44   | kW  |
|                                                                         | <b>Max. Scheinleistung <math>S_{E_{max}}</math>:</b><br>max. Apparent powr $S_{E_{max}}$                                                                                                                                        | 27.5                                                                      | 33   | 36.3 | 39.6 | 44   | kVA |
|                                                                         | <b>Bemessungsspannung:</b><br>Rated voltage                                                                                                                                                                                     | 3L/N/PE, 230/400                                                          |      |      |      |      | V   |
|                                                                         | <b>Bemessungsstrom (AC) <math>I_r</math></b><br>Rated current (AC) $I_r$                                                                                                                                                        | 36.2                                                                      | 43.5 | 47.8 | 52.2 | 58.0 | A   |
|                                                                         | <b>Anfangs-Kurzschlusswechselstrom <math>I_k</math>"</b><br>Initial short-circuit AC current                                                                                                                                    | 39.9                                                                      | 47.8 | 52.6 | 57.4 | 63.8 | A   |
| <b>Netzanschlussregel:</b><br>Network connection rule                   | <b>VDE-AR-N 4105: 2018-11</b><br>„Erzeugungsanlagen am Niederspannungsnetz“<br>Technische Mindestanforderungen für Anschluss und Parallelbetrieb von Erzeugungsanlagen am Niederspannungsnetz                                   |                                                                           |      |      |      |      |     |
| <b>Prüfanforderung:</b><br>Test requirement                             | <b>DIN VDE V 0124-100 (VDE V 0124-100): 2020-06</b><br>„Netzintegration von Erzeugungsanlagen – Niederspannung“<br>Prüfanforderungen an Erzeugungseinheiten vorgesehen zum Anschluss und Parallelbetrieb am Niederspannungsnetz |                                                                           |      |      |      |      |     |
| <b>Prüfbericht:</b><br>Test report                                      | CN23L5GF 001                                                                                                                                                                                                                    |                                                                           |      |      |      |      |     |

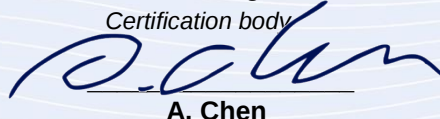
**Ort, Datum (TT.MM.JJJJ)**

Place, date

13.01.2023

**Zertifizierungsstelle**

Certification body



A. Chen

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| E.5 Prüfbericht „Netzurückwirkungen“ für Erzeugungseinheiten mit einem Eingangsstrom                                                                                                                     |  |                                                                                      |           |                                          |       |              |       |       |       |       |       |       |       |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--------------------------------------------------------------------------------------|-----------|------------------------------------------|-------|--------------|-------|-------|-------|-------|-------|-------|-------|
| E.5 Test report “System reactions” for power generation units with feeding current                                                                                                                       |  |                                                                                      |           |                                          |       |              |       |       |       |       |       |       |       |
| Auszug aus dem Prüfbericht für Erzeugungseinheiten<br>Extract from the test report for power generation units<br>“Bestimmung der elektrischen Eigenschaften”<br>“Determination of electrical properties” |  |                                                                                      |           |                                          |       | CN23L5GF 001 |       |       |       |       |       |       |       |
|                                                                                                                                                                                                          |  |                                                                                      |           |                                          |       |              |       |       |       |       |       |       |       |
| Anlagenhersteller:<br>Manufacturer:                                                                                                                                                                      |  | SINENG ELECTRIC CO., LTD.                                                            |           |                                          |       |              |       |       |       |       |       |       |       |
| Herstellerangaben:<br>Manufacturer's data:                                                                                                                                                               |  | Anlagenart (BHKW, PV-WR)<br>Type(CHP, PV-Inverter)                                   |           | SN25PT-X, SN30PT, SN33PT, SN36PT, SN40PT |       |              |       |       |       |       |       |       |       |
|                                                                                                                                                                                                          |  | Maximale Wirkleistung PEmax<br>Max. Active Power PEmax                               |           | 27.5                                     | 33    | 36.3         | 39.6  | 44    | [kW]  |       |       |       |       |
|                                                                                                                                                                                                          |  | Bemessungsspannung<br>Rating voltage                                                 |           | 3L/N/PE, 230/400 [Vac]                   |       |              |       |       |       |       |       |       |       |
| Messzeitraum:<br>Measuring period:                                                                                                                                                                       |  | vom JJJJ-MM-TT bis JJJJ-MM-TT<br>From yyyy-mm-dd to yyyy-mm-dd                       |           | vom 2022-10-18 bis 2023.01.11            |       |              |       |       |       |       |       |       |       |
|                                                                                                                                                                                                          |  |                                                                                      |           |                                          |       |              |       |       |       |       |       |       |       |
| Schnelle Spannungsänderungen<br>Rapid voltage changes                                                                                                                                                    |  |                                                                                      |           |                                          |       |              |       |       |       |       |       |       |       |
| Einschalten ohne Vorgabe (zum Primärenergieträger)<br>Marking operation without default (to primary energy carrier)                                                                                      |  |                                                                                      |           | ki=                                      |       | 0.485        |       |       |       |       |       |       |       |
| Einschalten bei Nennbedingungen (des primärenergieträger)<br>Marking operation at reference conditions(of primary energy carrier)                                                                        |  |                                                                                      |           | ki=                                      |       | 0.920        |       |       |       |       |       |       |       |
| Ausschalten bei Nennleistung<br>Breaking operation at nominal power                                                                                                                                      |  |                                                                                      |           | ki=                                      |       | 0.914        |       |       |       |       |       |       |       |
| Schlechtester Wert aller Schaltvorgänge<br>Worst case value of all switching operations                                                                                                                  |  |                                                                                      |           | kimax=                                   |       | 0.914        |       |       |       |       |       |       |       |
|                                                                                                                                                                                                          |  |                                                                                      |           |                                          |       |              |       |       |       |       |       |       |       |
| Flicker                                                                                                                                                                                                  |  | Netzimpedanzwinkel $\Psi_k$ :<br>Angle of network impedance $\Psi_k$ :               |           | 30°                                      |       | 50°          |       | 70°   |       | 85°   |       |       |       |
|                                                                                                                                                                                                          |  | Anlagenflickerbeiwert C $\Psi$ :<br>Flicker coefficient of system flicker C $\Psi$ : |           | 0.075                                    |       | N/A          |       | N/A   |       | N/A   |       |       |       |
|                                                                                                                                                                                                          |  |                                                                                      |           |                                          |       |              |       |       |       |       |       |       |       |
| Oberschwingungen<br>Harmonics for model: SN40PT                                                                                                                                                          |  |                                                                                      |           |                                          |       |              |       |       |       |       |       |       |       |
| Wirkleistung P/Pn [%]<br>Active power P/Pn [%]                                                                                                                                                           |  |                                                                                      | 0         | 10                                       | 20    | 30           | 40    | 50    | 60    | 70    | 80    | 90    | 100   |
| Ordnungszahl<br>Harmonic number                                                                                                                                                                          |  |                                                                                      | Iv/In [%] |                                          |       |              |       |       |       |       |       |       |       |
| 2                                                                                                                                                                                                        |  |                                                                                      | 0.155     | 0.177                                    | 0.113 | 0.187        | 0.196 | 0.202 | 0.210 | 0.215 | 0.222 | 0.229 | 0.238 |
| 3                                                                                                                                                                                                        |  |                                                                                      | 0.014     | 0.052                                    | 0.060 | 0.025        | 0.029 | 0.027 | 0.027 | 0.027 | 0.025 | 0.024 | 0.024 |
| 4                                                                                                                                                                                                        |  |                                                                                      | 0.089     | 0.143                                    | 0.133 | 0.101        | 0.116 | 0.118 | 0.120 | 0.121 | 0.120 | 0.124 | 0.127 |
| 5                                                                                                                                                                                                        |  |                                                                                      | 0.015     | 0.017                                    | 0.028 | 0.040        | 0.043 | 0.046 | 0.050 | 0.053 | 0.055 | 0.057 | 0.058 |
| 6                                                                                                                                                                                                        |  |                                                                                      | 0.017     | 0.012                                    | 0.010 | 0.008        | 0.008 | 0.007 | 0.007 | 0.007 | 0.007 | 0.008 | 0.012 |
| 7                                                                                                                                                                                                        |  |                                                                                      | 0.020     | 0.008                                    | 0.007 | 0.007        | 0.014 | 0.019 | 0.020 | 0.023 | 0.025 | 0.026 | 0.025 |
| 8                                                                                                                                                                                                        |  |                                                                                      | 0.036     | 0.049                                    | 0.054 | 0.048        | 0.046 | 0.045 | 0.046 | 0.046 | 0.047 | 0.047 | 0.049 |
| 9                                                                                                                                                                                                        |  |                                                                                      | 0.017     | 0.011                                    | 0.012 | 0.011        | 0.015 | 0.013 | 0.016 | 0.014 | 0.014 | 0.014 | 0.014 |
| 10                                                                                                                                                                                                       |  |                                                                                      | 0.013     | 0.026                                    | 0.032 | 0.032        | 0.032 | 0.032 | 0.032 | 0.030 | 0.031 | 0.032 | 0.032 |
| 11                                                                                                                                                                                                       |  |                                                                                      | 0.051     | 0.074                                    | 0.045 | 0.040        | 0.105 | 0.164 | 0.201 | 0.235 | 0.250 | 0.267 | 0.284 |
| 12                                                                                                                                                                                                       |  |                                                                                      | 0.016     | 0.017                                    | 0.008 | 0.007        | 0.009 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.009 |
| 13                                                                                                                                                                                                       |  |                                                                                      | 0.021     | 0.099                                    | 0.085 | 0.044        | 0.083 | 0.134 | 0.165 | 0.196 | 0.209 | 0.220 | 0.234 |
| 14                                                                                                                                                                                                       |  |                                                                                      | 0.013     | 0.023                                    | 0.016 | 0.016        | 0.016 | 0.017 | 0.016 | 0.017 | 0.015 | 0.014 | 0.015 |
| 15                                                                                                                                                                                                       |  |                                                                                      | 0.006     | 0.013                                    | 0.011 | 0.007        | 0.006 | 0.010 | 0.013 | 0.014 | 0.018 | 0.017 | 0.019 |

|    |       |       |       |       |       |       |       |       |       |       |       |
|----|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 16 | 0.015 | 0.021 | 0.018 | 0.017 | 0.017 | 0.017 | 0.017 | 0.018 | 0.017 | 0.018 | 0.019 |
| 17 | 0.052 | 0.091 | 0.074 | 0.037 | 0.027 | 0.049 | 0.077 | 0.100 | 0.110 | 0.123 | 0.141 |
| 18 | 0.008 | 0.011 | 0.009 | 0.007 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.007 |
| 19 | 0.048 | 0.079 | 0.078 | 0.053 | 0.036 | 0.038 | 0.070 | 0.098 | 0.111 | 0.126 | 0.143 |
| 20 | 0.020 | 0.017 | 0.016 | 0.012 | 0.013 | 0.013 | 0.014 | 0.015 | 0.014 | 0.014 | 0.015 |
| 21 | 0.007 | 0.010 | 0.012 | 0.009 | 0.006 | 0.006 | 0.008 | 0.010 | 0.010 | 0.011 | 0.012 |
| 22 | 0.015 | 0.013 | 0.013 | 0.008 | 0.012 | 0.011 | 0.011 | 0.013 | 0.013 | 0.013 | 0.014 |
| 23 | 0.029 | 0.031 | 0.044 | 0.052 | 0.039 | 0.022 | 0.036 | 0.054 | 0.063 | 0.078 | 0.096 |
| 24 | 0.013 | 0.007 | 0.007 | 0.007 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.006 |
| 25 | 0.014 | 0.024 | 0.032 | 0.050 | 0.033 | 0.014 | 0.028 | 0.044 | 0.044 | 0.050 | 0.067 |
| 26 | 0.012 | 0.014 | 0.009 | 0.010 | 0.010 | 0.009 | 0.011 | 0.012 | 0.012 | 0.012 | 0.011 |
| 27 | 0.005 | 0.005 | 0.006 | 0.007 | 0.008 | 0.006 | 0.006 | 0.005 | 0.007 | 0.009 | 0.010 |
| 28 | 0.012 | 0.010 | 0.008 | 0.007 | 0.007 | 0.008 | 0.009 | 0.008 | 0.008 | 0.009 | 0.011 |
| 29 | 0.018 | 0.022 | 0.015 | 0.038 | 0.032 | 0.028 | 0.031 | 0.042 | 0.044 | 0.040 | 0.050 |
| 30 | 0.011 | 0.006 | 0.005 | 0.005 | 0.006 | 0.004 | 0.004 | 0.004 | 0.004 | 0.005 | 0.005 |
| 31 | 0.015 | 0.039 | 0.031 | 0.029 | 0.017 | 0.031 | 0.016 | 0.014 | 0.015 | 0.032 | 0.052 |
| 32 | 0.015 | 0.009 | 0.008 | 0.007 | 0.006 | 0.007 | 0.007 | 0.007 | 0.007 | 0.008 | 0.008 |
| 33 | 0.004 | 0.011 | 0.009 | 0.007 | 0.010 | 0.006 | 0.004 | 0.003 | 0.006 | 0.007 | 0.007 |
| 34 | 0.006 | 0.008 | 0.008 | 0.007 | 0.008 | 0.008 | 0.008 | 0.008 | 0.009 | 0.010 | 0.011 |
| 35 | 0.017 | 0.030 | 0.035 | 0.020 | 0.005 | 0.027 | 0.012 | 0.004 | 0.006 | 0.027 | 0.041 |
| 36 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.004 | 0.003 | 0.004 | 0.004 | 0.004 | 0.004 |
| 37 | 0.016 | 0.029 | 0.032 | 0.006 | 0.023 | 0.051 | 0.039 | 0.035 | 0.033 | 0.026 | 0.039 |
| 38 | 0.005 | 0.006 | 0.006 | 0.006 | 0.008 | 0.007 | 0.006 | 0.005 | 0.006 | 0.007 | 0.008 |
| 39 | 0.006 | 0.009 | 0.005 | 0.007 | 0.009 | 0.008 | 0.006 | 0.006 | 0.004 | 0.005 | 0.004 |
| 40 | 0.009 | 0.004 | 0.005 | 0.007 | 0.008 | 0.008 | 0.005 | 0.003 | 0.004 | 0.005 | 0.006 |

**Beachtung: Die maximalwerte der drei Phasen werden gewählt.**

Remark: The maximal value of three phases is selected.

| <b>Oberschwingungen</b><br><i>Harmonics for model: SN25PT-X</i>                                                                     |                  |       |       |       |       |       |       |       |       |       |       |
|-------------------------------------------------------------------------------------------------------------------------------------|------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| <b>Wirkleistung P/Pn [%]</b><br><i>Active power P/Pn [%]</i>                                                                        | 0                | 10    | 20    | 30    | 40    | 50    | 60    | 70    | 80    | 90    | 100   |
| <b>Ordnungszahl</b><br><i>Harmonic number</i>                                                                                       | <b>Iv/In [%]</b> |       |       |       |       |       |       |       |       |       |       |
| 2                                                                                                                                   | 0.155            | 0.177 | 0.113 | 0.187 | 0.196 | 0.202 | 0.210 | 0.215 | 0.222 | 0.229 | 0.238 |
| 3                                                                                                                                   | 0.014            | 0.052 | 0.060 | 0.025 | 0.029 | 0.027 | 0.027 | 0.027 | 0.025 | 0.024 | 0.024 |
| 4                                                                                                                                   | 0.089            | 0.143 | 0.133 | 0.101 | 0.116 | 0.118 | 0.120 | 0.121 | 0.120 | 0.124 | 0.127 |
| 5                                                                                                                                   | 0.015            | 0.017 | 0.028 | 0.040 | 0.043 | 0.046 | 0.050 | 0.053 | 0.055 | 0.057 | 0.058 |
| 6                                                                                                                                   | 0.017            | 0.012 | 0.010 | 0.008 | 0.008 | 0.007 | 0.007 | 0.007 | 0.007 | 0.008 | 0.012 |
| 7                                                                                                                                   | 0.020            | 0.008 | 0.007 | 0.007 | 0.014 | 0.019 | 0.020 | 0.023 | 0.025 | 0.026 | 0.025 |
| 8                                                                                                                                   | 0.036            | 0.049 | 0.054 | 0.048 | 0.046 | 0.045 | 0.046 | 0.046 | 0.047 | 0.047 | 0.049 |
| 9                                                                                                                                   | 0.017            | 0.011 | 0.012 | 0.011 | 0.015 | 0.013 | 0.016 | 0.014 | 0.014 | 0.014 | 0.014 |
| 10                                                                                                                                  | 0.013            | 0.026 | 0.032 | 0.032 | 0.032 | 0.032 | 0.032 | 0.030 | 0.031 | 0.032 | 0.032 |
| 11                                                                                                                                  | 0.051            | 0.074 | 0.045 | 0.040 | 0.105 | 0.164 | 0.201 | 0.235 | 0.250 | 0.267 | 0.284 |
| 12                                                                                                                                  | 0.016            | 0.017 | 0.008 | 0.007 | 0.009 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.009 |
| 13                                                                                                                                  | 0.021            | 0.099 | 0.085 | 0.044 | 0.083 | 0.134 | 0.165 | 0.196 | 0.209 | 0.220 | 0.234 |
| 14                                                                                                                                  | 0.013            | 0.023 | 0.016 | 0.016 | 0.016 | 0.017 | 0.016 | 0.017 | 0.015 | 0.014 | 0.015 |
| 15                                                                                                                                  | 0.006            | 0.013 | 0.011 | 0.007 | 0.006 | 0.010 | 0.013 | 0.014 | 0.018 | 0.017 | 0.019 |
| 16                                                                                                                                  | 0.015            | 0.021 | 0.018 | 0.017 | 0.017 | 0.017 | 0.017 | 0.018 | 0.017 | 0.018 | 0.019 |
| 17                                                                                                                                  | 0.052            | 0.091 | 0.074 | 0.037 | 0.027 | 0.049 | 0.077 | 0.100 | 0.110 | 0.123 | 0.141 |
| 18                                                                                                                                  | 0.008            | 0.011 | 0.009 | 0.007 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.007 |
| 19                                                                                                                                  | 0.048            | 0.079 | 0.078 | 0.053 | 0.036 | 0.038 | 0.070 | 0.098 | 0.111 | 0.126 | 0.143 |
| 20                                                                                                                                  | 0.020            | 0.017 | 0.016 | 0.012 | 0.013 | 0.013 | 0.014 | 0.015 | 0.014 | 0.014 | 0.015 |
| 21                                                                                                                                  | 0.007            | 0.010 | 0.012 | 0.009 | 0.006 | 0.006 | 0.008 | 0.010 | 0.010 | 0.011 | 0.012 |
| 22                                                                                                                                  | 0.015            | 0.013 | 0.013 | 0.008 | 0.012 | 0.011 | 0.011 | 0.013 | 0.013 | 0.013 | 0.014 |
| 23                                                                                                                                  | 0.029            | 0.031 | 0.044 | 0.052 | 0.039 | 0.022 | 0.036 | 0.054 | 0.063 | 0.078 | 0.096 |
| 24                                                                                                                                  | 0.013            | 0.007 | 0.007 | 0.007 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.006 |
| 25                                                                                                                                  | 0.014            | 0.024 | 0.032 | 0.050 | 0.033 | 0.014 | 0.028 | 0.044 | 0.044 | 0.050 | 0.067 |
| 26                                                                                                                                  | 0.012            | 0.014 | 0.009 | 0.010 | 0.010 | 0.009 | 0.011 | 0.012 | 0.012 | 0.012 | 0.011 |
| 27                                                                                                                                  | 0.005            | 0.005 | 0.006 | 0.007 | 0.008 | 0.006 | 0.006 | 0.005 | 0.007 | 0.009 | 0.010 |
| 28                                                                                                                                  | 0.012            | 0.010 | 0.008 | 0.007 | 0.007 | 0.008 | 0.009 | 0.008 | 0.008 | 0.009 | 0.011 |
| 29                                                                                                                                  | 0.018            | 0.022 | 0.015 | 0.038 | 0.032 | 0.028 | 0.031 | 0.042 | 0.044 | 0.040 | 0.050 |
| 30                                                                                                                                  | 0.011            | 0.006 | 0.005 | 0.005 | 0.006 | 0.004 | 0.004 | 0.004 | 0.004 | 0.005 | 0.005 |
| 31                                                                                                                                  | 0.015            | 0.039 | 0.031 | 0.029 | 0.017 | 0.031 | 0.016 | 0.014 | 0.015 | 0.032 | 0.052 |
| 32                                                                                                                                  | 0.015            | 0.009 | 0.008 | 0.007 | 0.006 | 0.007 | 0.007 | 0.007 | 0.007 | 0.008 | 0.008 |
| 33                                                                                                                                  | 0.004            | 0.011 | 0.009 | 0.007 | 0.010 | 0.006 | 0.004 | 0.003 | 0.006 | 0.007 | 0.007 |
| 34                                                                                                                                  | 0.006            | 0.008 | 0.008 | 0.007 | 0.008 | 0.008 | 0.008 | 0.008 | 0.009 | 0.010 | 0.011 |
| 35                                                                                                                                  | 0.017            | 0.030 | 0.035 | 0.020 | 0.005 | 0.027 | 0.012 | 0.004 | 0.006 | 0.027 | 0.041 |
| 36                                                                                                                                  | 0.005            | 0.005 | 0.005 | 0.005 | 0.005 | 0.004 | 0.003 | 0.004 | 0.004 | 0.004 | 0.004 |
| 37                                                                                                                                  | 0.016            | 0.029 | 0.032 | 0.006 | 0.023 | 0.051 | 0.039 | 0.035 | 0.033 | 0.026 | 0.039 |
| 38                                                                                                                                  | 0.005            | 0.006 | 0.006 | 0.006 | 0.008 | 0.007 | 0.006 | 0.005 | 0.006 | 0.007 | 0.008 |
| 39                                                                                                                                  | 0.006            | 0.009 | 0.005 | 0.007 | 0.009 | 0.008 | 0.006 | 0.006 | 0.004 | 0.005 | 0.004 |
| 40                                                                                                                                  | 0.009            | 0.004 | 0.005 | 0.007 | 0.008 | 0.008 | 0.005 | 0.003 | 0.004 | 0.005 | 0.006 |
| <b>Beachtung: Die maximalwerte der drei Phasen werden gewählt.</b><br><i>Remark: The maximal value of three phases is selected.</i> |                  |       |       |       |       |       |       |       |       |       |       |

**Zertifikatsnummer: A3 50570910 0001**

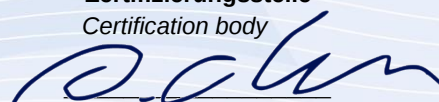
Certificate No.:

|                                                                                    |                                                                                                                                                                                                                                        |                                                                                                 |
|------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|
| <b>E.6 Zertifikat für den NA-Schutz</b><br><i>E.6 Certificate of NS protection</i> |                                                                                                                                                                                                                                        |                                                                                                 |
| <b>Hersteller:</b><br><i>Manufacturer</i>                                          | <b>SINENG ELECTRIC CO., LTD.</b><br>No.6, Hehui Road, Huishan District, Wuxi, 214174 Jiangsu, P.R. China                                                                                                                               |                                                                                                 |
| <b>Typ NA-Schutz:</b><br><i>Type of NS protection</i>                              |                                                                                                                                                                                                                                        |                                                                                                 |
| <b>Zentraler NA-Schutz:</b><br><i>Central NS protection</i>                        | <input type="checkbox"/>                                                                                                                                                                                                               |                                                                                                 |
| <b>Integrierter NA-Schutz:</b><br><i>Integrated NS protection</i>                  | <input checked="" type="checkbox"/>                                                                                                                                                                                                    | <b>Zugeordnet zu Erzeugungseinheit Typ:</b><br><i>Assigned to power generation unit of type</i> |
|                                                                                    |                                                                                                                                                                                                                                        |                                                                                                 |
| <b>Netzanschlussregel:</b><br><i>Network connection rule</i>                       | <b>VDE-AR-N 4105: 2018-11</b><br><b>„Erzeugungsanlagen am Niederspannungsnetz“</b><br>Technische Mindestanforderungen für Anschluss und Parallelbetrieb von Erzeugungsanlagen am Niederspannungsnetz                                   |                                                                                                 |
| <b>Prüfanforderung:</b><br><i>Test requirement</i>                                 | <b>DIN VDE V 0124-100 (VDE V 0124-100): 2020-06</b><br><b>„Netzintegration von Erzeugungsanlagen – Niederspannung“</b><br>Prüfanforderungen an Erzeugungseinheiten vorgesehen zum Anschluss und Parallelbetrieb am Niederspannungsnetz |                                                                                                 |
| <b>Prüfbericht:</b><br><i>Test report</i>                                          | CN23L5GF 001                                                                                                                                                                                                                           |                                                                                                 |

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

13.01.2023

**Zertifizierungsstelle**  
*Certification body*

  
**A. Chen**

Seite 6 von 7

**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** CN23L5GF 001  
*Extract from the test report for the NS-protection*  
**“Bestimmung der elektrischen Eigenschaften”**  
*“Determination of electrical properties”*

**Prüfbericht NA-Schutz**
*Test report NS-Protection*

|                                                        |                                                                       |                                                                      |
|--------------------------------------------------------|-----------------------------------------------------------------------|----------------------------------------------------------------------|
| <b>Typ NA-Schutz:</b><br><i>Type of NS protection:</i> | Integrierter NA-Schutz                                                | <b>Weitere Herstellerangaben</b><br><i>Other manufacturer's data</i> |
| <b>Software version:</b><br><i>Software Version:</i>   | V000B050D001                                                          | --                                                                   |
| <b>Hersteller:</b><br><i>Manufacturer:</i>             | SINENG ELECTRIC CO., LTD.                                             |                                                                      |
| <b>Messzeitraum:</b><br><i>Measuring period:</i>       | vom JJJJ-MM-TT bis JJJJ-MM-TT<br><i>From yyyy-mm-dd to yyyy-mm-dd</i> | vom 2022-10-18 bis 2023.01.11                                        |

**Beachtung:**

|                                                                                              | Stirlinggeneratoren, Brennstoffzellen<br><i>Stirling engines, fuel cell systems</i>                                                                                                                                                    |                                             |                                                            | Umrichter<br><i>Converter</i>                                                                                                                                                                   |                                             |                                                            |
|----------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|------------------------------------------------------------|
|                                                                                              | direkt oder über Umrichter gekoppelte<br>Synchron- und Asynchrongeneratoren mit<br>$P_n \leq 50 \text{ kW}$<br><i>Direct or by converter coupled synchronous- and asynchronous generators with <math>P_n \leq 50 \text{ kW}</math></i> |                                             |                                                            | direkt gekoppelte Synchron- und<br>Asynchrongeneratoren mit $P_n > 50 \text{ kW}$<br><i>Direct or coupled synchronous- and asynchronous generators with <math>P_n &gt; 50 \text{ kW}</math></i> |                                             |                                                            |
| <b>Schutzfunktion</b><br><i>Protection function</i>                                          | <b>Einstellwert</b><br><i>Setting value</i>                                                                                                                                                                                            | <b>Auslösewert</b><br><i>Tripping value</i> | <b>Auslösewert<br/>NA Schutz*</b><br><i>Tripping time*</i> | <b>Einstellwert</b><br><i>Setting value</i>                                                                                                                                                     | <b>Auslösewert</b><br><i>Tripping value</i> | <b>Auslösezeit<br/>NA Schutz*</b><br><i>Tripping time*</i> |
| <b>Spannungssteigerungsschutz U&gt;&gt;</b><br><i>Voltage increase protection U &gt;&gt;</i> | $1,15 * U_n$                                                                                                                                                                                                                           |                                             |                                                            | $1,25 * U_n$                                                                                                                                                                                    | 287.34V                                     | < 100ms                                                    |
| <b>Spannungssteigerungsschutz U&gt;</b><br><i>Voltage increase protection U &gt;</i>         | $1,1 * U_n$                                                                                                                                                                                                                            |                                             |                                                            | $1,1 * U_n$                                                                                                                                                                                     | 253,0V                                      | < 100ms                                                    |
| <b>Spannungsrückgangsschutz U&lt;</b><br><i>Voltage decrease protection U &lt;</i>           | $0,8 * U_n$                                                                                                                                                                                                                            |                                             |                                                            | $0,8 * U_n$                                                                                                                                                                                     | 184.34V                                     | 3000ms                                                     |
| <b>Spannungsrückgangsschutz U&lt;&lt;</b><br><i>Voltage decrease protection U &lt;&lt;</i>   | Entfällt<br><i>Not applicable</i>                                                                                                                                                                                                      |                                             |                                                            | $0,45 * U_n$                                                                                                                                                                                    | 103.1V                                      | 300ms                                                      |
| <b>Frequenzrückgangsschutz f&lt;</b><br><i>Frequency decrease protection f &lt;</i>          | 47,5Hz                                                                                                                                                                                                                                 |                                             |                                                            | 47,5Hz                                                                                                                                                                                          | 47,50Hz                                     | < 100ms                                                    |
| <b>Frequenzsteigerungsschutz f&gt;</b><br><i>Frequency increase protection f &gt;</i>        | 51,5Hz                                                                                                                                                                                                                                 |                                             |                                                            | 51,5Hz                                                                                                                                                                                          | 51,48Hz                                     | < 100ms                                                    |

\* Die Auslösezeit umfasst den Zeitraum von der Grenzwertverletzung U/f bis zum Auslösesignal an den Kuppelschalter.

\* 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 Kuppelschalters) 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*

|                                                                                                                                       |                                              |
|---------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|
| <b>Zugeordnet zu Erzeugungseinheit Typ:</b><br><i>Assigned to PGU type:</i>                                                           | SN25PT-X, SN30PT, SN33PT, SN36PT, SN40PT     |
| <b>Typ integrierter Kuppelschalter:</b><br><i>Type of integrated interface switch:</i>                                                | CHAR-112A75C<br>Churod Electronics Co., Ltd. |
| <b>Eigenzeit des Kuppelschalters bei integriertem NA-Schutz</b><br><i>Proper time of interface switch by integrated NS-protection</i> | < 20ms                                       |

**Die Überprüfung der Gesamtwirkungskette “NA-Schutz-Kuppelschalter” führte zu einer erfolgreichen Abschaltung.**

*The verification of the full function chain “NS protection- Interface switch” has yield to intended disconnection.*

SINENG ELECTRIC CO., LTD.

Date : 13.01.2023

Our ref. : ZRP 02

Your ref.: 168394978

No.6, Hehui Road,  
Huishan District,  
Wuxi  
214174 Jiangsu  
P.R. China

**Ref : A3 Grid Code Certificate**

Type of Equipment : PV Grid-connected Inverter

Model Designation : See Certificate

Certificate No. : A3 50570910 0001

Report No. : CN23L5GF 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



A. Chen

Enclosure

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