LYNS-TCi

CERTIFICAT DE CONFORMITÉ / *CERTIFICATE OF CONFORMITY*

Numéro de certificate / *Certificate No.*: **LS250016GCC-2**

Date de délivrance / *Date of issue*: 2025-07-25

Valide jusqu'au / *Valid until*: Indéfiniment / *Indefinitely*

Demandeur / *Applicant*:	**Shenzhen SOFARSOLAR Co., Ltd.** 11/F., Gaoxinqi Technology Building, No.67 Area, Xingdong Community, Xin'an Sub-district, Bao'an District, Shenzhen City, P.R.China
Produit / *Product*:	L'onduleur hybride (couplage DC) / *Hybrid inverter (PV + DC coupled storage)*:
Modèle(s) / *Model(s)*:	**ESI-5K-T1, ESI-6K-T1, ESI-6.5K-T1, ESI-8K-T1, ESI-9.9K-T1-A, ESI-10K-T1, ESI-12K-T1**
Données techniques / *Technical data*:	Puissance assignée / *Rated output power* [kW]: 5.0 ~ 12.0 Tension nominale AC / *Nominal output AC voltage* [V]: 230 / 400 (3L + N + PE, 50 Hz) (Pour plus de détails, voir A.2 à la p.2 / For further details see A.2 on p.2.)
Marque / *Trademark*:	SOFAR
Version du logiciel / Software Version:	V000001
Règlements et normes appliqués / *Regulations and standards applied:*	**EN 50549-1:2019 + A1:2023** Requirements for generating plants to be connected in parallel with distribution networks - Part 1-1: Connection to a LV distribution network - Generating plants up to and including Type B **EN 50549-10,** October 2022 Requirements for generating plants to be connected in parallel with distribution networks - Part 10: Tests for conformity assessment of generating units
Schéma de certification / *Certification scheme*:	**CMPD-01**
Numéro du rapport de test / *Test report no.*:	**HC2411270269GC01-R1** (2025-07-15)

Les unités de production mentionnées ci-dessus sont certifiées pour les modules de production de **type A**.
Ce certificat confirme que les unités de production mentionnées, avec le logiciel correspondant, répondent aux exigences des normes / directives de référence au moment de l'émission du certificat.
Les unités de production sont considérées conformes aux articles pertinents (voir Annexe H, EN 50549-1:2019) du Règlement (UE) 2016/631 de la Commission du 14 avril 2016 établissant un code de réseau relatif aux exigences de raccordement au réseau pour les générateurs (NC RfG), à condition que tous les paramètres définis par le gestionnaire de réseau de distribution (GRD) et la partie responsable soient respectés. /
*The above-mentioned generating unit(s) are certified for **type A** generating modules.*
This certificate confirms that the above-mentioned generating unit(s) with corresponding software meet the requirements of the referenced standard(s) / guideline(s) at the time of issuance of the certificate.
The generating units are considered to be compliant with the relevant articles (see Annex H, EN 50549-1:2019) of Commission Regulation (EU) 2016/631 of 14 April 2016 establishing a network code on requirements for grid connection of generators (NC RfG), provided that all settings as specified by the DSO and responsible party are complied with.

This certificate relates to type testing and does not imply LYNS's endorsement, approval, certification or on-going control of the product(s), either in terms of performance, design, manufacture or materials used. This certificate and the results stated herein relate solely to the sample product(s) tested and to the specific tests undertaken.
The certificate will remain valid for the stated period providing no changes are made to the product, production method etc. This certificate is only valid when this is also found at http://www.lyns-tci.com/en/certificate-search or contact Lyns-tci Technology Guangdong Co., Ltd..
This certificate is for the exclusive use of LYNS's Client and is provided pursuant to the agreement between LYNS and its Client. LYNS's responsibility and liability are limited to the terms and conditions of the agreement. LYNS assumes no liability to any party, other than to the Client in accordance with the agreement, for any loss, expense or damage occasioned using this verification.

The certificate is comprised of 5 pages (including Annex of 4 pages).

Dongguan, 2025-07-25

Digitally signed by Weizhao Zheng
Date: 2025.07.25 10:13:16 +08'00'

Dipl.-Ing. Weizhao Zheng
Head of certification body

IAS ACCREDITED Product Certification Agency PCA-159

Certification body Lyns-tci Technology Guangdong Co., Ltd. accredited according to ISO/IEC 17065 for product certification.

Release No.: 1.1 (2023)

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Annexe au certificat n°. / *Annex to the Certificate No.*: **LS250016GCC-2**

A.1 Historique de la révision du certificat / *Revision history of the certificate*

Rév. n°. / *Rev. No.*	Date / *Date*	Modifications / *Changes*
0	2025-03-12	Première édition / *Initial issue*
1	2025-03-21	Certificat mis à jour en format bilingue. / *Certificate updated to a bilingual format*
2	2025-07-25	Rapport de test mis à jour, format du certificat mis à jour / *Test report updated, certificate format updated*

A.2 Données techniques de la (des) unité(s) de génération / *Technical data of the generating unit(s)*

Modèle / Model	ESI-5K-T1	ESI-6K-T1	ESI-6.5K-T1	ESI-8K-T1
Entrée photovoltaïque (DC)				
Tension d'entrée max / *Max. DC input voltage* [V]	1000			
Plage de tension MPP / *Operating MPPT voltage range* [V]	160 ~ 950			
Courant d'entrée max. utile / *Max. input DC current* [A]	20 / 20 / 20			
Connexion batterie / Battery connection				
Tension nominale de la batterie / *Battery rated voltage [V]*	350 ~ 435			
Courant de charge de la batterie / *Battery charging current [A]*	max. 25.0			
Courant de décharge de la batterie / *Battery discharging current [A]*	max. 15.0	max. 18.0	max. 19.5	max. 24.0
Type de batterie / *Battery type*	Batterie lithium-ion / *Lithium-ion*			
Connexion AC / *AC connection*				
Phases de connexion / Connection phases	☐ Monophasé / *Single-phase*		☒ • Triphasé / *Three-phase*	
Tension nominale AC / *Nominal output AC voltage* [V]	230 / 400 (3L + N + PE, 50 Hz)			
Courant de sortie max. / *Max. output AC current* [A]	8.0	9.6	10.3	12.8
Puissance assignée / *Nominal active output power* [kW]	5.0	6.0	6.5	8.0
Puissance apparente max. / *Max. apparent output power* [kVA]	5.5	6.6	7.15	8.8

Model	ESI-9.9K-T1-A	ESI-10K-T1	ESI-12K-T1
Entrée photovoltaïque (DC)			
Tension d'entrée max / *Max. DC input voltage* [V]	1000		
Plage de tension MPP / *Operating MPPT voltage range* [V]	160 ~ 950		
Courant d'entrée max. utile / *Max. input DC current* [A]	20 / 20 / 20		
Connexion batterie / Battery connection			
Tension nominale de la batterie / *Battery rated voltage [V]*	350 ~ 435		
Courant de charge de la batterie / *Battery charging current [A]*	max. 25.0		
Courant de décharge de la batterie / *Battery discharging current [A]*	max. 29.7	max. 30.0	max. 30.0
Type de batterie / *Battery type*	Batterie lithium-ion / *Lithium-ion*		

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Connexion AC / *AC connection*			
Phases de connexion / Connection phases	☐ Monophasé / *Single-phase*	☒ • Triphasé / *Three-phase*	
Tension nominale AC / *Nominal output AC voltage* [V]	230 / 400 (3L + N + PE, 50 Hz)		
Courant de sortie max. / *Max. output AC current* [A]	14.3	15.9	19.1
Puissance assignée / *Nominal active output power* [kW]	9.9	10.0	12.0
Puissance apparente max. / *Max. apparent output power* [kVA]	9.9	11.0	13.2

Plage de température de fonctionnement / *Operating temperature range*	-30°C ~ +60°C
Indice de protection / *Degree of protection*	IP66
Classe de protection / *Protection class*	I
Catégorie de surtension / *Overvoltage category*	AC: III; DC: II
Topologie / *Topology*	Sans transformateur / *No galvanic isolation*

Version du logiciel / *Software Version*	V000001

Fabricant / *Manufacturer*	**Guangdong Sofar Smart Solar Technology Co., Ltd.** No.1, Dongsheng North Road, Chenjiang Street, Zhongkai High-tech Zone, Huizhou City, Guangdong Province, P.R.China (Jedna licencja, wiele adresów / *One license multiple addresses*)

A.3 Remarques pour l'essai de type / *Remarks for type testing*

Laboratoire d'essais / *Testing laboratory*	**Lyns-tci Technology Guangdong Co., Ltd.** Room 1201, Unit 2, Building 18, No. 7, Science and Technology Boulevard, Houjie Town, Dongguan City, Guangdong, 523960 P.R.C (Accrédité selon / *Accredited acc.* ISO/IEC 17025: A2LA Accréditation n°. / *Accreditation no.* 5200.02)
Lieu d'essai / *Testing location*	Idem que ci-dessus / *Same as above*
Période de mesure / *Measurement period*	2024-12-18 ~ 2025-01-21

A.4 Évaluation de la conformité / *Conformity assessment*

Sur la base des résultats d'essai soumis, le présent certificat atteste de la conformité suivante selon les normes EN 50549-1 / *Based on the test results submitted, this certificate provides the following conformity assessment according to EN 50549-1*:

Clause(s) / subclause(s) of EN 50549-1:2019 or EN 50549-2:2019	Applicable Clause(s) / subclause(s) of EN 50549-10:2022	Remark	Verdict
4.4.2 Operating frequency range	5.2.1 Frequency operating range	---	PASS
4.4.3 Minimal requirement for active power delivery at underfrequency	5.2.1 Frequency operating range	---	PASS
4.4.4 Continuous operating voltage range	5.2.2 Voltage operating range	---	PASS
4.5.2 Rate of change of frequency (ROCOF) immunity	5.3.1 Immunity to disturbances - Rate of change of frequency (ROCOF)	---	PASS
4.5.3.2 Generating plant with non-synchronous generating technology	5.3.3 Immunity to disturbances - Fault ride through, over-voltage (OVRT) and under-voltage (UVRT)	Generating units of non-synchronous generating technology.	PASS
4.5.3.3 Generating plant with synchronous generating technology	5.3.3 Immunity to disturbances - Fault ride through, over-voltage (OVRT) and under-voltage (UVRT)	---	N/A
4.5.4 Over-voltage ride through (OVRT)	5.3.3 Immunity to disturbances - Fault ride through, over-voltage (OVRT) and under-voltage (UVRT)	---	PASS
4.5.5 Phase jump immunity	5.3.2 Phase jump	---	PASS
4.6.1 Power response to overfrequency	5.4 Active response to frequency deviation	---	PASS
4.6.2 Power response to underfrequency	5.4 Active response to frequency deviation	---	PASS
4.7.2.2 Voltage support by reactive power, Capabilities	5.5.1 Power capabilities assessment	---	PASS
4.7.2.3 Voltage support by reactive power, Control modes	5.5.2 Voltage support by reactive power - test to determine the reactive power control modes	Available modes: • Q setpoint • Q(U) • cosφ setpoint • cosφ(P)	PASS
4.7.2.3.2 Set point control modes	5.5.2.3 Verification procedure for Set point control	---	PASS
4.7.2.3.3 Voltage related control modes	5.5.2.5 Verification procedure for power related control modes for reactive power	---	PASS
4.7.2.3.4 Power related control mode	5.5.2.5 Verification procedure for power related control modes for reactive power	---	PASS
4.7.3 Voltage related active power reduction	5.6 Voltage related active power reduction - P(U)	---	PASS
only EN 50549-2:2019 4.7.4.2.1.1 Voltage support during faults and voltage steps – General	5.3.3 Immunity to disturbances - Fault ride through, over-voltage (OVRT) and under-voltage (UVRT)	EN 50549-2 is not within the scope of this certification.	N/A
only EN 50549-2:2019 4.7.4.2.1.2 Voltage support during faults and voltage steps - Optional Modes	5.3.3 Immunity to disturbances - Fault ride through, over-voltage (OVRT) and under-voltage (UVRT)	EN 50549-2 is not within the scope of this certification.	N/A
4.7.4.2.2 Zero current mode for converter connected generating technology	5.3.3 Immunity to disturbances - Fault ride through, over-voltage (OVRT) and under-voltage (UVRT)	---	PASS
4.8 EMC and power quality	5.7 EMC and power quality	---	PASS
only EN 50549-1:2019 4.9.3 Requirements on voltage and frequency protection	5.8.3 Verification procedure for generating plants to be connected to a LV distribution network with Interface protection as internal device or	The AC output is redundantly switched off by: • a high-power switching bridge • two relays for both the line conductor and the neutral	PASS

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Clause(s) / subclause(s) of EN 50549-1:2019 or EN 50549-2:2019	Applicable Clause(s) / subclause(s) of EN 50549-10:2022	Remark	Verdict
	5.8.4 Verification procedure for generating plants to be connected to a LV distribution network with Interface protection as dedicated device	conductor (Relay Model: Hongfa *HF161F-40W.* Alternative: *AZSR143*, *CHFN-x-1yDA2zu*, *AZSR131-1AE-12D*, *HF161F-W/12-HT(477)*, *HF165F/xx-HT*, *CHSa-b-1ccdefff*). This ensures that the output circuit will be opened even in the event of a single failure. Available protection functions: • Voltage protection • Overvoltage 10 min mean protection • Frequency protection The settings of the function, as well as the enabling and disabling of the function, are field adjustable and are protected from unauthorized interference through password.	
only EN 50549-2:2019, 4.9.3. Requirements on voltage and frequency protection	5.8.5 Verification procedure for generating plants to be connected to a MV distribution network	EN 50549-2 is not within the scope of this certification.	N/A
4.9.4 Means to detect island situation	5.8.6 Islanding detection	Islanding Detection Technique: Active Frequency Drift	PASS
4.10.2 Automatic reconnection after tripping	5.9.3 Automatic reconnection after tripping	---	PASS
4.10.3 Starting to generate electrical power	5.9.4 Starting to generate electrical power	---	PASS
4.11.1 Ceasing active power	5.10 Active power reduction on set point	The units provide logic interface for terminating active power output.	PASS
4.11.2 Reduction of active power on set point	5.10 Active power reduction on set point	---	PASS
4.12 Remote information exchange	5.11 Remote information exchange	Need to be evaluated at the project level.	N/A
only EN 50549-1:2019, 4.13 single fault tolerance of interface protection system and interface switch	5.12 Requirements regarding single fault tolerance of interface protection system and interface switch	---	PASS
	5.13 Model definition and model validation for generating units of synchronous generating technology	Generating units of non-synchronous generating technology.	N/A