Certificate of compliance

Applicant:	**Shenzhen Senergy Technology Co., Ltd** Room 405, Building A, Co-talent Creative Park, No.2, LiuXianRoad, Block 68, Xin an Street, Bao' an District, ShenZhen. **China**
Product:	**SOLAR INVERTER**
Model:	**SE 1KTL-S1, SE 1K5TL-S1, SE 2KTL-S1, SE 2K5TL-S1, SE 3KTL-S1, SE 3K6TL-S1, SE 3KTL-D1, SE 3K6TL-D1, SE 4KTL-D1, SE 4K6TL-D1, SE 5KTL-D1, SE 6KTL-D1, PV-3000S-V, PV-3600S-V, PV-5000S-V, PVT-SE2KTL, PVT-SE3KTL, PVT-SE4KTL, PVT-SE5KTL**

Use in accordance with regulations:

Automatic disconnection device with single-phase mains surveillance in accordance with EN50549-1:2019 for photovoltaic systems with a single-phase parallel coupling via an inverter in the public mains supply. The automatic disconnection device is an integral part of the aforementioned inverter.

Applied rules and standards:

EN 50549-1:2019
Requirements for parallel connection of installations with distribution networks - Part 1: Connection to an LV distribution network - Production of installations up to and including Type B

EN 50438:2013
Requirements for micro-generating plants to be connected in parallel with public low-voltage distribution networks

DIN V VDE V 0126-1-1:2006 (4.1 Functional safety)
Automatic disconnection device between a generator and the public low-voltage grid

At the time of issue of this certificate the safety concept of an aforementioned representative product corresponds to the valid safety specifications for the specified use in accordance with regulations.

Report number:	**PV191119N044**	**Certification Program:**	**NSOP-0032-DEU-ZE-V01**
Certificate number:	**U20-0108**	**Date of issue:**	**2020-02-28**

Certification body

Holger Schaffer

DAkkS Deutsche Akkreditierungsstelle D-ZE-12024-01-00

Certification body Bureau Veritas Consumer Products Services Germany GmbH accreditation to DIN EN ISO/IEC 17065

Appendix

Extract from test report according to EN 50549-1 **No. PV191119N044**

Type Approval and declaration of compliance with the requirements of EN 50549-1.						
Manufacturer / applicant:	Shenzhen Senergy Technology Co., Ltd Room 405, Building A, Co-talent Creative Park, No.2, LiuXianRoad, Block 68, Xin an Street, Bao' an District, ShenZhen. China					
Micro-generator Type	SOLAR INVERTER					
	SE 1KTL-S1	SE 1K5TL-S1	SE 2KTL-S1, PVT-SE2KTL	SE 2K5TL-S1	SE 3KTL-S1, PV-3000S-V, PVT-SE3KTL	SE 3K6TL-S1, PV-3600S-V
MPP DC voltage range [V]	70~580					
Input DC voltage range [V]	Max. 600					
Input DC current [A]	Max.12,5				12,5	11
Output AC voltage [V]	230V, 50Hz					
Output AC current [A]	Max 4,8	Max.7,2	Max.9,5	Max.11,9	Max.14,3	Max. 17,2
Output power [VA]	1000	1500	2000	2500	3000	3600
	SE 3KTL-D1	SE 3K6TL-D1	SE 4KTL-D1, PVT-SE4KTL	SE 4K6TL-D1	SE 5KTL-D1, PV-5000S-V, PVT-SE5KTL	SE 6KTL-D1
MPP DC voltage range [V]	70~580					
Input DC voltage range [V]	Max. 600					
Input DC current [A]	11x2					
Output AC voltage [V]	230V, 50Hz					
Output AC current [A]	Max.14,3	Max.16,7	Max. 19,1	Max.21,95	Max.23,8	Max.28,6
Output power [VA]	3000	3680	4000	4600	5000	6000
Firmware version	01					
Measurement period:	2019-11-19 to 2020-02-14					

Description of the structure of the power generation unit:

The power generation unit is equipped with a PV and line-side EMC filter. The power generation unit has no galvanic isolation between DC input and AC output. Output switch-off is performed with single-fault tolerance based on two series-connected relays in each line and neutral. This enables a safe disconnection of the power generation unit from the network in case of error.

Appendix

Extract from test report according to EN 50549-1 **No. PV191119N044**

Setting of the interface protection:

Parameter	Max. disconnection time	Min. operate time	Trip value
Over voltage (stage 1) [a]	3s	-	230V +10% (253V)
Over voltage (stage 2)	0,2s	0,1s	230V +15% (264,5V)
Under voltage	1,5 s	1,2 s	230V -15% (195,5V)
Over frequency	0,5 s	0,3 s	50Hz +4% (52 Hz)
Under frequency	0,5 s	0,3 s	50Hz -5% (47,5 Hz)
Reconnection settings for voltage	0,85Un (195,5V) ≤ U ≤ 1,10Un (253V)		
Reconnection settings for frequency	49,5 Hz ≤ f ≤ 50,1 Hz		
Reconnection time	≥ 60 s		
Active power gradient after reconnection	10% P_{Emax} / per minute		
Permanent DC-injection	0,5% of rated inverter output current or 20mA		
Loss of mains according EN 62116 (LoM)	2,0 s		

Note:

[a] Over voltage – stage1: 10 min-mean-value corresponding to EN 50160.

Default interface setting according to EN 50438:2013 are used.

The settings of the interface protection are password protected adjustable.

In case the above stated generators are used with an external protection device, the protection settings of the inverters are to be adjusted according to the manufacturer's declaration.

The above stated generators are tested according to the requirements in the EN 50549-1:2019. Any modification that affects the stated tests must be named by the manufacturer/supplier of the product to ensure that the product meets all requirements of the EN 50549-1:2019.