

Certificate of Conformity

No. ESY 087538 0003 Rev. 00

Holder of Certificate: **Shenzhen Senergy Technology Co., Ltd.**

Block D, BC Park, No.18, Xiusha Rd.
Shatian Kengzi Sub-district
Pingshan District
518112 Shenzhen
PEOPLE'S REPUBLIC OF CHINA

Product: **Converter
(Grid-Tied Solar Inverter)**

Model(s): SE 2KTL-S1/G2, SE 3KTL-S1/G2, SE 3.6KTL-S1/G2,
SE 4KTL-D1/G2, SE 5KTL-D1/G2, SE 6KTL-D1/G2
SE 1.5KTL-S1/G2P, SE 2KTL-S1/G2P,
SE 3KTL-S1/G2P, SE 3.6KTL-S1/G2P,
SE 3.68KTL-D1/G2P, SE 4KTL-D1/G2P,
SE 4.6KTL-D1/G2P, SE 5KTL-D1/G2P,
SE 6KTL-D1/G2P
VP 2KTL-S1/G2P, VP 3KTL-S1/G2P,
VP 3.6KTL-S1/G2P

Parameters: See page 2-5

Applicable standards: VDE-AR-N 4105:2018
DIN VDE V 0124-100 (VDE V 0124-100):2020

This Certificate of Conformity confirms the compliance with the above listed standards on a voluntary basis. It refers only to the sample submitted to TÜV SÜD Product Service GmbH and does not certify the quality or safety of the serial products. It was issued according to TÜV SÜD Product Service certification program Photovoltaics and Grid Integration. For details see: www.tuvsud.com/ps-cert

Test report no.: 64290223076001

Date, 2022-12-09



(Billy Qiu)

Certificate of Conformity

No. ESY 087538 0003 Rev. 00

Parameters:

Model	SE 2KTL-S1/G2	SE 3KTL-S1/G2	SE 3.6KTL-S1/G2	SE 4KTL-D1/G2	SE 5KTL-D1/G2	SE 6KTL-D1/G2
PV input terminal parameters						
Max. input voltage	500 Vd.c.			550 Vd.c.		
MPPT Voltage Range	50-490 Vd.c.			70-540 Vd.c.		
MPPT Voltage Range (full load)	180 ~ 430 Vd.c.	280 ~ 430 Vd.c.	330 ~ 430 Vd.c.	180 ~ 480 Vd.c.	230 ~ 480 Vd.c.	280 ~ 480 Vd.c.
MPPT Tracker number	1			2		
Maximum operating PV input current	13 Ad.c.			13/13 Ad.c.		
Maximum PV short circuit current	15 Ad.c.			15/15 Ad.c.		
AC output terminal parameters						
Rated voltage	230 Va.c.					
Rated frequency	50 Hz					
Rated output current	8.7 Aa.c.	13.0 Aa.c.	15.7 Aa.c.	17.4 Aa.c.	21.7 Aa.c.	26.1 Aa.c.
Maximum output current	10.0 Aa.c.	15.0 Aa.c.	16.0 Aa.c.	20.0 Aa.c.	25.0 Aa.c.	27.3 Aa.c.
Rated output active power	2000 W	3000 W	3600 W	4000 W	5000 W	6000 W
Maximum output active power $P_{E_{max}}$	2000 W	3000 W	3600 W	4000 W	5000 W	6000 W
Maximum output apparent power $S_{E_{max}}$	2200 VA	3300 VA	3600 VA	4400 VA	5500 VA	6000 VA
Power factor	0.8 leading ~ 0.8 lagging					

Certificate of Conformity

No. ESY 087538 0003 Rev. 00

Model	SE 1.5KTL-S1/G2P	SE 2KTL-S1/G2P	SE 3KTL-S1/G2P	SE 3.6KTL-S1/G2P
PV input terminal parameters				
Max. input voltage	500 Vd.c.			
MPPT Voltage Range	50-490 Vd.c.			
MPPT Voltage Range (full load)	100 ~ 430 Vd.c.	140 ~ 430 Vd.c.	210 ~ 430 Vd.c.	250 ~ 430 Vd.c.
MPPT Tracker number	1			
Maximum operating PV input current	15 Ad.c.			
Maximum PV short circuit current	20 Ad.c.			
AC output terminal parameters				
Rated voltage	230 Va.c.			
Rated frequency	50 Hz			
Rated output current	6.5 Aa.c.	8.7 Aa.c.	13.0 Aa.c.	15.7 Aa.c.
Maximum output current	7.5 Aa.c.	10.0 Aa.c.	15.0 Aa.c.	16.0 Aa.c.
Rated output active power	1500 W	2000 W	3000 W	3600 W
Maximum output active power $P_{E_{max}}$	1500 W	2000 W	3000 W	3600 W
Maximum output apparent power $S_{E_{max}}$	1650 VA	2200 VA	3300 VA	3600 VA
Power factor	0.8 leading ~ 0.8 lagging			

Certificate of Conformity

No. ESY 087538 0003 Rev. 00

Model	SE 3.68KTL-D1/G2P	SE 4KTL-D1/G2P	SE 4.6KTL-D1/G2P	SE 5KTL-D1/G2P	SE 6KTL-D1/G2P
PV input terminal parameters					
Max. input voltage	550 Vd.c.				
MPPT Voltage Range	70-540 Vd.c.				
MPPT Voltage Range (full load)	120 ~ 480 Vd.c.	140 ~ 480 Vd.c.	160 ~ 480 Vd.c.	170 ~ 480 Vd.c.	210 ~ 480 Vd.c.
MPPT Tracker number	2				
Maximum operating PV input current	15/15 Ad.c.				
Maximum PV short circuit current	20/20 Ad.c.				
AC output terminal parameters					
Rated voltage	230 Va.c.				
Rated frequency	50 Hz				
Rated output current	16.0 Aa.c.	17.4 Aa.c.	20.0 Aa.c.	21.7 Aa.c.	26.1 Aa.c.
Maximum output current	18.4 Aa.c.	20.0 Aa.c.	23.0 Aa.c.	25.0 Aa.c.	27.0 Aa.c.
Rated output power	3680 W	4000 W	4600 W	5000 W	6000 W
Maximum output active power $P_{E_{max}}$	3680 W	4000 W	4600 W	5000 W	6000 W
Maximum output apparent power $S_{E_{max}}$	4048 VA	4400 VA	5060 VA	5500 VA	6000 VA
Power factor	0.8 leading ~ 0.8 lagging				

Certificate of Conformity

No. ESY 087538 0003 Rev. 00

Model	VP 2KTL-S1/G2P	VP 3KTL-S1/G2P	VP 3.6KTL-S1/G2P
PV input terminal parameters			
Max. input voltage	500 Vd.c.		
MPPT Voltage Range	50-490 Vd.c.		
MPPT Voltage Range (full load)	140 ~ 430 Vd.c.	210 ~ 430 Vd.c.	250 ~ 430 Vd.c.
MPPT Tracker number	1		
Maximum operating PV input current	15 Ad.c.		
Maximum PV short circuit current	20 Ad.c.		
AC output terminal parameters			
Rated voltage	230 Va.c.		
Rated frequency	50 Hz		
Rated output current	8.7 Aa.c.	13.0 Aa.c.	15.7 Aa.c.
Maximum output current	10.0 Aa.c.	15.0 Aa.c.	16.0 Aa.c.
Rated output power	2000 W	3000 W	3600 W
Maximum output active power $P_{E_{max}}$	2000 W	3000 W	3600 W
Maximum output apparent power $S_{E_{max}}$	2200 VA	3300 VA	3600 VA
Power factor	0.8 leading ~ 0.8 lagging		

Certificate of Conformity

No. ESY 087538 0003 Rev. 00

E.4 Unit certificate

Unit Certificate		
Manufacturer	Shenzhen Senergy Technology Co., Ltd	
Power generation unit type	[Inverter]: Remark: certified on representative model SE 6KTL-D1/G2P of family design products, results of the measurement of SE 6KTL-D1/G2P can be transferred to other models based on transferability rule of measurements in DIN VDE V 0124-100 (VDE V 0124-100):2020.	
Assessment values	max. active power $P_{E_{max}}$	6000 W (SE 6KTL-D1/G2P)
	max. apparent power $S_{E_{max}}$	6000 VA (SE 6KTL-D1/G2P)
	Rated voltage	230 Va.c.
	Rated current (AC) I_r	26.1 A (SE 6KTL-D1/G2P)
	Initial short-circuit AC current I''_k	27.0 A (SE 6KTL-D1/G2P)
Network connection rule	VDE-AR-N 4105 “Generators connected to the low-voltage distribution network” Technical minimum requirements for connection and parallel operation of power generation systems connected to the low-voltage network	
Test requirement	DIN VDE V 0124-100 (VDE V 0124-100) “Network integration of power generation systems – Low voltage” Test requirements for power generation units intended for connection to and parallel operation on the low-voltage network	
Test report	64.290.22.30760.01 from 2022-11-21	
The above designated power generation unit meets the requirements of VDE-AR-N 4105		
The model SE 5KTL-D1/G2, SE 6KTL-D1/G2, SE 5KTL-D1/G2P and SE 6KTL-D1/G2P may be connected single-phase, a storage unit and a balancing device must be used to ensure that the requirements of maximum permissible unbalance $\leq 4.6\text{kVA}$ according to 5.5.2 of VDE-AR-N 4100 are met and a registration with the grid operator in the final installation.		

Certificate of Conformity

No. ESY 087538 0003 Rev. 00

E.5 Test report "Network interactions" for power generation units with an input current > 75 A

Extract of the test report for power generation units "Determination of electrical properties"		No. 64.290.22.30760.01
System manufacturer:	Shenzhen Senergy Technology Co., Ltd Block D, BC Park, No. 18, Xiusha Rd., Shatian Kengzi Sub-district, Pingshan District, Shenzhen 518112, P. R. CHINA	
Manufacturer indications:	Type of system	Manufacturer indications:
	Max. active power $P_{E_{max}}$	1500 W (SE 1.5KTL-S1/G2P) 2000 W (SE 2KTL-S1/G2, SE 2KTL-S1/G2P, VP 2KTL-S1/G2P) 3000 W (SE 3KTL-S1/G2, SE 3KTL-S1/G2P, VP 3KTL-S1/G2P) 3600 W (SE 3.6KTL-S1/G2, SE 3.6KTL- S1/G2P, VP 3.6KTL-S1/G2P) 3680 W (SE 3.68KTL-D1/G2P) 4000 W (SE 4KTL-D1/G2, SE 4KTL-D1/G2P) 4600 W (SE 4.6KTL-D1/G2P) 5000 W (SE 5KTL-D1/G2, SE 5KTL-D1/G2P) 6000 W (SE 6KTL-D1/G2, SE 6KTL-D1/G2P)
	Rated voltage	230 Va.c.
Measurement period:	From 2022-06-25 to 2022-11-18	

Certificate of Conformity

No. **ESY 087538 0003 Rev. 00**

Rapid voltage change –DIN EN 61000-3-3(SE 3.6KTL-S1/G2P)	
Connection without provisions (regarding the primary energy carrier)	$K_i=0.52$
Most adverse case when switching between generator levels	$K_i=0.07$
Connection at nominal conditions (of the primary energy carrier)	$K_i=1.03$
Disconnection at rated power	$K_i=0.07$
Worst value of all switching operations	$k_{i\max}=1.03$

Rapid voltage change –DIN EN 61000-3-11(SE 6KTL-D1/G2P)	
Connection without provisions (regarding the primary energy carrier)	$K_i=0.50$
Most adverse case when switching between generator levels	$K_i=0.04$
Connection at nominal conditions (of the primary energy carrier)	$K_i=1.01$
Disconnection at rated power	$K_i=0.04$
Worst value of all switching operations	$k_{i\max}=1.01$

Flicker–DIN EN 61000-3-3(SE 3.6KTL-S1/G2P)					
Test items	$d_{(t) - 500ms} [\%]$	$d_c [\%]$	$d_{\max} [\%]$	P_{st}	P_{it}
Limit value	3.30	3.30	4.00	1.00	0.65
L1	0.00	0.06	0.26	0.19	0.18

Flicker–DIN EN 61000-3-11(SE 6KTL-D1/G2P)					
Test items	$d_{(t) - 500ms} [\%]$	$d_c [\%]$	$d_{\max} [\%]$	P_{st}	P_{it}
Limit value	3.30	3.30	4.00	1.00	0.65
L1	0.00	0.02	0.42	0.31	0.29

Certificate of Conformity

No. **ESY 087538 0003 Rev. 00**

Harmonics (DIN EN 61000-3-12(16A < I ≤ 75A))- SE 6KTL-D1/G2P														
Description	Permissible individual harmonic current I_H/I_{ref} %												Permissible harmonics Parameter (%)	
	I_2	I_3	I_4	I_5	I_6	I_7	I_8	I_9	I_{10}	I_{11}	I_{12}	I_{13}	THC/ I_{ref}	PWHC/ I_{ref}
Limit value	8.0	21.6	4.0	10.7	2.67	7.2	2.0	3.8	1.6	3.1	1.33	2.0	23	23
Actual value	0.350	1.010	0.180	0.600	0.160	0.330	0.080	0.370	0.090	0.240	0.050	0.200	1.92	0.60

Harmonics (DIN EN 61000-3-2 (I ≤ 16A))- SE 3.6KTL-S1/G2P												
Active power P/Pn[%]	0	10	20	30	40	50	60	70	80	90	100	Limit value
Ordinal number	A	A	A	A	A	A	A	A	A	A	A	A
2	0.000	0.031	0.031	0.030	0.043	0.045	0.045	0.050	0.057	0.063	0.043	1.08
3	0.000	0.117	0.138	0.143	0.118	0.115	0.111	0.107	0.103	0.148	0.156	2.30
4	0.000	0.013	0.015	0.024	0.020	0.026	0.024	0.028	0.040	0.041	0.045	0.43
5	0.000	0.070	0.097	0.100	0.089	0.080	0.067	0.057	0.061	0.072	0.108	1.14
6	0.000	0.027	0.023	0.020	0.023	0.025	0.032	0.031	0.024	0.023	0.021	0.30
7	0.000	0.064	0.023	0.047	0.050	0.056	0.062	0.061	0.052	0.049	0.037	0.77
8	0.000	0.008	0.007	0.006	0.004	0.008	0.009	0.009	0.010	0.006	0.004	0.23
9	0.000	0.064	0.042	0.028	0.044	0.038	0.032	0.039	0.048	0.054	0.062	0.40
10	0.000	0.006	0.012	0.007	0.007	0.008	0.012	0.014	0.011	0.006	0.005	0.18
11	0.000	0.028	0.039	0.018	0.026	0.035	0.030	0.022	0.026	0.037	0.048	0.33
12	0.000	0.003	0.005	0.005	0.002	0.004	0.004	0.004	0.006	0.004	0.005	0.15
13	0.000	0.024	0.030	0.020	0.021	0.025	0.028	0.026	0.022	0.022	0.031	0.21
14	0.000	0.004	0.003	0.004	0.003	0.004	0.005	0.005	0.004	0.004	0.003	0.13
15	0.000	0.026	0.020	0.021	0.015	0.021	0.021	0.023	0.025	0.023	0.024	0.15
16	0.000	0.002	0.003	0.003	0.003	0.003	0.005	0.005	0.004	0.002	0.002	0.12
17	0.000	0.016	0.013	0.018	0.013	0.016	0.019	0.018	0.021	0.023	0.025	0.13
18	0.000	0.002	0.003	0.002	0.002	0.002	0.002	0.003	0.003	0.002	0.002	0.10
19	0.000	0.010	0.013	0.013	0.011	0.014	0.017	0.018	0.018	0.019	0.025	0.12
20	0.000	0.002	0.003	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.09
21	0.000	0.011	0.012	0.010	0.010	0.012	0.012	0.016	0.017	0.017	0.021	0.11
22	0.000	0.002	0.003	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.003	0.08
23	0.000	0.007	0.009	0.007	0.009	0.010	0.012	0.013	0.016	0.016	0.018	0.10
24	0.000	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.08
25	0.000	0.004	0.006	0.006	0.008	0.008	0.011	0.011	0.013	0.015	0.018	0.09
26	0.000	0.002	0.002	0.002	0.003	0.010	0.002	0.002	0.002	0.002	0.002	0.07
27	0.000	0.004	0.004	0.006	0.007	0.008	0.009	0.012	0.029	0.013	0.015	0.08
28	0.000	0.002	0.002	0.002	0.003	0.012	0.002	0.003	0.003	0.004	0.002	0.07
29	0.000	0.003	0.004	0.004	0.006	0.006	0.008	0.011	0.039	0.012	0.014	0.08
30	0.000	0.002	0.002	0.002	0.002	0.003	0.002	0.002	0.002	0.004	0.002	0.06
31	0.000	0.002	0.004	0.004	0.005	0.006	0.007	0.008	0.014	0.010	0.012	0.07
32	0.000	0.002	0.002	0.003	0.002	0.002	0.002	0.002	0.002	0.003	0.002	0.06
33	0.000	0.003	0.003	0.003	0.004	0.005	0.006	0.007	0.009	0.009	0.009	0.07
34	0.000	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.004	0.005	0.05
35	0.000	0.015	0.015	0.013	0.016	0.015	0.014	0.012	0.009	0.010	0.013	0.06
36	0.000	0.004	0.004	0.004	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.05
37	0.000	0.130	0.132	0.130	0.141	0.143	0.146	0.146	0.137	0.122	0.087	0.06
38	0.000	0.003	0.003	0.003	0.002	0.003	0.003	0.002	0.002	0.005	0.010	0.05
39	0.000	0.175	0.187	0.241	0.189	0.197	0.195	0.213	0.261	0.325	0.471	0.06
40	0.000	0.013	0.014	0.019	0.015	0.016	0.016	0.017	0.020	0.025	0.035	0.05
THD	0.000	2.404	2.447	2.500	2.438	2.515	2.509	2.542	2.680	2.775	2.985	5%

Note: $I_{ref} = 15.7A$

Certificate of Conformity

No. **ESY 087538 0003 Rev. 00**

Harmonics-DIN EN 61000-3-12(>16 A and ≤75 A) (SE 6KTL-D1/G2P)												
Active power P/Pn[%]	0	10	20	30	40	50	60	70	80	90	100	Limit value
Ordinal number	I [%]	I [%]	I [%]	I [%]	I [%]	I [%]	I [%]	I [%]	I [%]	I [%]	I [%]	[%]
2	0.220	0.230	0.240	0.250	0.250	0.260	0.290	0.300	0.300	0.320	0.350	8
3	0.740	0.680	0.710	0.700	0.600	0.610	0.590	0.600	0.620	0.910	1.010	21.6
4	0.120	0.110	0.120	0.130	0.120	0.120	0.130	0.120	0.130	0.170	0.180	4
5	0.600	0.540	0.610	0.600	0.620	0.600	0.600	0.590	0.600	0.430	0.420	10.7
6	0.090	0.130	0.110	0.110	0.130	0.140	0.140	0.160	0.160	0.110	0.110	2.67
7	0.330	0.280	0.280	0.320	0.290	0.260	0.250	0.210	0.190	0.230	0.200	7.2
8	0.060	0.060	0.050	0.050	0.050	0.050	0.060	0.070	0.080	0.070	0.080	2
9	0.310	0.370	0.310	0.360	0.370	0.360	0.360	0.360	0.370	0.330	0.330	3.8
10	0.060	0.070	0.070	0.060	0.080	0.080	0.080	0.090	0.090	0.050	0.060	1.6
11	0.210	0.210	0.200	0.230	0.240	0.220	0.210	0.200	0.180	0.180	0.180	3.1
12	0.040	0.030	0.040	0.040	0.040	0.040	0.040	0.050	0.050	0.050	0.050	1.33
13	0.160	0.160	0.190	0.190	0.200	0.200	0.190	0.180	0.170	0.180	0.170	2
14	0.040	0.030	0.050	0.030	0.030	0.040	0.040	0.040	0.040	0.040	0.040	-
15	0.130	0.150	0.160	0.140	0.160	0.170	0.160	0.160	0.150	0.140	0.130	-
16	0.030	0.020	0.040	0.030	0.030	0.030	0.030	0.030	0.040	0.030	0.030	-
17	0.090	0.110	0.120	0.100	0.120	0.130	0.130	0.120	0.120	0.130	0.130	-
18	0.030	0.030	0.030	0.020	0.030	0.030	0.030	0.030	0.030	0.030	0.030	-
19	0.070	0.080	0.090	0.090	0.100	0.110	0.120	0.110	0.110	0.110	0.110	-
20	0.020	0.030	0.030	0.020	0.020	0.030	0.030	0.030	0.030	0.030	0.030	-
21	0.040	0.050	0.060	0.080	0.080	0.090	0.100	0.100	0.110	0.110	0.110	-
22	0.020	0.020	0.020	0.020	0.020	0.020	0.030	0.030	0.030	0.030	0.030	-
23	0.030	0.040	0.050	0.070	0.070	0.080	0.090	0.090	0.090	0.100	0.100	-
24	0.020	0.020	0.020	0.020	0.020	0.030	0.030	0.030	0.030	0.030	0.030	-
25	0.020	0.030	0.050	0.060	0.060	0.070	0.080	0.080	0.090	0.100	0.100	-
26	0.020	0.030	0.030	0.020	0.020	0.030	0.030	0.030	0.030	0.030	0.030	-
27	0.020	0.030	0.040	0.050	0.050	0.060	0.070	0.070	0.080	0.080	0.090	-
28	0.020	0.030	0.030	0.020	0.030	0.030	0.030	0.030	0.030	0.030	0.030	-
29	0.030	0.030	0.030	0.050	0.050	0.060	0.070	0.070	0.080	0.080	0.090	-
30	0.020	0.030	0.030	0.020	0.030	0.030	0.030	0.030	0.030	0.030	0.030	-
31	0.030	0.020	0.030	0.040	0.040	0.050	0.060	0.060	0.070	0.080	0.080	-
32	0.020	0.030	0.030	0.030	0.030	0.030	0.030	0.030	0.030	0.030	0.030	-
33	0.040	0.020	0.030	0.040	0.040	0.050	0.060	0.070	0.070	0.080	0.080	-
34	0.020	0.030	0.030	0.030	0.030	0.030	0.030	0.030	0.030	0.030	0.030	-
35	0.040	0.030	0.030	0.030	0.040	0.050	0.050	0.060	0.060	0.070	0.080	-
36	0.020	0.030	0.030	0.030	0.030	0.030	0.030	0.030	0.030	0.030	0.030	-
37	0.040	0.030	0.020	0.030	0.040	0.050	0.060	0.060	0.070	0.070	0.080	-
38	0.020	0.030	0.030	0.030	0.030	0.030	0.030	0.030	0.030	0.030	0.030	-
39	0.040	0.030	0.030	0.030	0.030	0.040	0.050	0.050	0.060	0.070	0.070	-
40	0.020	0.030	0.030	0.030	0.030	0.030	0.030	0.030	0.030	0.030	0.030	-
THC/I _{ref}	1.150	1.090	1.140	1.160	1.120	1.110	1.110	1.100	1.120	1.230	1.310	23
PWHC/I _{ref}	0.220	0.250	0.280	0.270	0.300	0.330	0.340	0.340	0.350	0.360	0.370	23

Note: I_{ref} = 26.1 A

Certificate of Conformity

No. ESY 087538 0003 Rev. 00

E.6 Certificate of the network and system protection

Certificate of NS protection	
Manufacturer	Shenzhen Senergy Technology Co., Ltd
Type of NS protection	Integrated NS protection
Central NS protection	<input type="checkbox"/>
Integrated NS protection	<input checked="" type="checkbox"/> Assigned to power generation unit of type: <u>SE 2KTL-S1/G2, SE 3KTL-S1/G2, SE 3.6KTL-S1/G2, SE 4KTL-D1/G2, SE 5KTL-D1/G2, SE 6KTL-D1/G2</u> <u>SE 1.5KTL-S1/G2P, SE 2KTL-S1/G2P, SE 3KTL-S1/G2P, SE 3.6KTL-S1/G2P, SE 3.68KTL-D1/G2P, SE 4KTL-D1/G2P, SE 4.6KTL-D1/G2P, SE 5KTL-D1/G2P, SE 6KTL-D1/G2P</u> <u>VP 2KTL-S1/G2P, VP 3KTL-S1/G2P, VP 3.6KTL-S1/G2P</u>
Network connection rule	VDE-AR-N 4105 “Generators connected to the low-voltage distribution network” Technical minimum requirements for connection and parallel operation of power generation systems connected to the low-voltage network
Test requirement	DIN VDE V 0124-100 (VDE V 0124-100) “Network integration of power generation systems – Low voltage” Test requirements for power generation units intended for connection to and parallel operation on the low-voltage network
Test report	<u>64.290.22.30760.01</u> from <u>2022-11-21</u>
The network and system protection designated above meets the requirements of VDE-AR-N 4105.	

Certificate of Conformity

No. ESY 087538 0003 Rev. 00

E.7 Requirements for the test report for the NS protection

Extract from test report for NS protection "Determination of electrical properties"		No: 64.290.22.30760.01	
NS protection test report			
Type of NS system:	Integrated NS protection	Other Manufacturer indications	
Software version:	CN0101		
Manufacturer:	Shenzhen Senergy Technology Co., Ltd Block D, BC Park, No.18, Xiusha Rd., Shatian Kengzi Sub-district, Pingshan District, Shenzhen 518112, P. R. CHINA		
Measuring period:	From 2022-06-25 to 2022-11-18		
		Inverter	
Protection function	Setting value	Tripping value	Tripping time NS protection*
Rise-in-voltage protection $U >>$	$1.25 \cdot U_n$	286.54 V; 286.54 V; 286.53 V;	123.50 ms; 123.50 ms; 118.25 ms;
Rise-in-voltage protection $U >$	$1.10 \cdot U_n$	$1.12 \cdot U_n$	ms**
Voltage drop protection $U <$	$0.8 \cdot U_n$	183.08 V; 183.09 V; 182.73 V;	3.00 s; 3.00 s; 3.00 s;
Voltage drop protection $U <<$	$0.45 \cdot U_n$	103.15 V; 103.14 V; 103.14 V;	305.00 ms; 305.00 ms; 305.00 ms;
Frequency decrease protection $f <$	47.5 Hz	47.50 Hz; 47.50 Hz; 47.50 Hz;	127.75 ms; 125.25 ms; 139.00 ms;
Frequency increase protection $f >$	51.5 Hz	51.50 Hz; 51.50 Hz; 51.50 Hz;	114.50 ms; 116.25 ms; 131.25 ms;
<p> *: The tripping time includes the period from the limit value violation U/f until the tripping signal to the interface switch. When planning the power generation system, the response time of the interface switch shall be added to the maximum time value obtained as indicated above. The disconnection time (sum of tripping time of the NS protection plus response time of the interface switch) shall not exceed 200 ms. </p> <p> **: Verification disconnection time of moving 10-min-average value. Disconnecting time as below: </p> <ol style="list-style-type: none"> 457.00 s (600s@U_n to 112%U_n) Continuous operation (600s@U_n to 108%U_n) 355.70 s (@106%U_n to 114%U_n) 			

Certificate of Conformity

No. ESY 087538 0003 Rev. 00

<input checked="" type="checkbox"/> as integrated NS protection	
Assigned to power generation unit type	<p><u>SE 2KTL-S1/G2, SE 3KTL-S1/G2,</u> <u>SE 3.6KTL-S1/G2, SE 4KTL-D1/G2,</u> <u>SE 5KTL-D1/G2, SE 6KTL-D1/G2</u></p> <p><u>SE 1.5KTL-S1/G2P, SE 2KTL-S1/G2P,</u> <u>SE 3KTL-S1/G2P, SE 3.6KTL-S1/G2P,</u> <u>SE 3.68KTL-D1/G2P,</u> <u>SE 4KTL-D1/G2P, SE 4.6KTL-D1/G2P,</u> <u>SE 5KTL-D1/G2P, SE 6KTL-D1/G2P</u></p> <p><u>VP 2KTL-S1/G2P, VP 3KTL-S1/G2P,</u> <u>VP 3.6KTL-S1/G2P</u></p>
Integrated interface switch type	<p>Series-connected relays for all phase conductors each</p> <p>Relay type: HF161F-W</p>
Response time of interface switch for integrated NS protection	Release time: Max. 10 ms
Verification of the entire functional chain "integrated NS protection – interface switch" has resulted in successful disconnection.	<input checked="" type="checkbox"/>