

Certificate of Conformity

No. ESY 087538 0017 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**
(Hybrid Inverter)

Model(s): **SE 5KHB-D3, SE 6KHB-D3, SE 8KHB-D3,**
SE 10KHB-D3

Parameters: See page 2

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.: 64290233012901

Date, 2023-05-22



(Billy Qiu)

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Parameters:

Model	SE 5KHB-D3	SE 6KHB-D3	SE 8KHB-D3	SE 10KHB-D3
PV terminal parameters				
Vmax. PV	1000 Vd.c.			
MPPT Voltage Range	160 - 950 Vd.c.			
MPPT Voltage Range (full load)	330 - 800 Vd.c.		370 - 800 Vd.c.	
Max. continuous PV input current	15 Ad.c. / 15 Ad.c.		20 Ad.c. / 30 Ad.c.	
Isc PV	20 Ad.c. / 20 Ad.c.		30 Ad.c. / 40 Ad.c.	
Max. continuous PV input power	9000 W		15000 W	
Battery terminal parameter				
Battery type	Lithium-ion			
Voltage range	150 - 600 Vd.c.			
Rated voltage	504 Vd.c.			
Maximum charge/discharge current	25 Ad.c. / 25 Ad.c.		50 Ad.c. / 50 Ad.c.	
Maximum charge current from grid to battery	25 Ad.c.			
Maximum charge power	9000 W	9000 W	15000 W	15000 W
Maximum discharge power	5800 W	7000 W	9100 W	11300 W
Maximum charge power from grid to battery	5000 W	6000 W	8000 W	10000 W
Grid terminal parameter				
Rated voltage	230/400 Va.c., 3W+N+PE			
Rated frequency	50 Hz			
Rated current output to Grid	7.2 Aa.c.	8.7 Aa.c.	11.6 Aa.c.	14.5 Aa.c.
Maximum continuous current output to Grid	8.0 Aa.c.	9.6 Aa.c.	12.7 Aa.c.	16.0 Aa.c.
Rated active power output to Grid	5000 W	6000 W	8000 W	10000 W
Maximum active power output to Grid	5000 W	6000 W	8000 W	10000 W
Maximum apparent power output to Grid	5500 VA	6600 VA	8800 VA	11000 VA
P _{Emax}	4992 W	5999 W	8013 W	9940 W
S _{Emax}	5507 VA	6616 VA	8827 VA	11076 VA
Maximum continuous current from Grid to battery	8.0 Aa.c.	9.6 Aa.c.	12.7 Aa.c.	16.0 Aa.c.
Maximum continuous current from Grid	25.0 Aa.c.	25.0 Aa.c.	25.0 Aa.c.	25.0 Aa.c.
Maximum apparent power from Grid to battery	5500 VA	6600 VA	8800 VA	11000 VA
Maximum apparent power from Grid	15800 VA	15800 VA	15800 VA	15800 VA
Power factor (Cos phi), adjustable	0.8 under-excited to 0.8 over-excited			

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E.4 Unit certificate

Unit certificate		
Manufacturer	Shenzhen Senergy Technology Co., Ltd.	
Power generation unit type	[Hybrid Inverter] SE 5KHB-D3, SE 6KHB-D3, SE 8KHB-D3, SE 10KHB-D3 Remark: certified on representative model SE 10KHB-D3 of family design products, results of the measurement of SE 10KHB-D3 ferability rule of measurements in DIN VDE V 0124-100 (VDE V 0124-100):2020.	
Assessment values	max. active power $P_{E_{max}}$	9940 W (SE 10KHB-D3)
	max. apparent power $S_{E_{max}}$	11076 VA (SE 10KHB-D3)
	Rated voltage	3/N/PE~, 230/400 Va.c.
	Rated current (AC) I_r	14.5 A (SE 10KHB-D3)
	Initial short-circuit AC current I''_k	16.0 A (SE 10KHB-D3)
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	64.290.23.30219.01 from 2023-05-09	
The above designated power generation unit meets the requirements of VDE-AR-N 4105		

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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"		
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	Hybrid Inverter
	Max. active power $P_{E_{max}}$	4492W (SE 5KHB-D3)
		5999 W (SE 6KHB-D3)
		8013 W (SE 8KHB-D3)
Rated voltage	3/N/PE~, 230/400 Va.c.	
Measurement period:	From 2023-02-20 to 2023-04-28	

Rapid voltage change	
Model	SE 10KHB-D3
Connection without provisions (regarding the primary energy carrier)	$K_i=0.03$
Most adverse case when switching between generator levels	$K_i=1.02$
Connection at nominal conditions (of the primary energy carrier)	$K_i=0.01$
Disconnection at rated power	$K_i=0.99$
Worst value of all switching operations	$k_{i_{max}}=1.02$

Flicker (≤ 16 A) (SE 10KHB-D3)					
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	0	0	0.026	0.031
L2	0	0	0	0.032	0.031
L3	0	0	0	0.027	0.031

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Harmonics (≤16 A) (SE 10KHB-D3) Phase L1												
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	0.005	0.005	0.005	0.003	0.005	0.006	0.006	0.010	0.010	0.011	0.012	1.080
3	0.010	0.010	0.006	0.006	0.006	0.006	0.006	0.015	0.016	0.016	0.017	2.300
4	0.003	0.003	0.005	0.003	0.003	0.005	0.005	0.004	0.004	0.004	0.004	0.430
5	0.173	0.173	0.222	0.230	0.232	0.237	0.227	0.185	0.183	0.179	0.175	1.140
6	0.003	0.003	0.005	0.003	0.003	0.006	0.006	0.003	0.003	0.004	0.003	0.300
7	0.112	0.112	0.144	0.160	0.174	0.198	0.197	0.155	0.154	0.153	0.152	0.770
8	0.003	0.003	0.005	0.002	0.003	0.006	0.006	0.003	0.003	0.003	0.003	0.230
9	0.006	0.006	0.011	0.008	0.006	0.006	0.006	0.007	0.007	0.006	0.005	0.400
10	0.002	0.002	0.005	0.002	0.002	0.005	0.005	0.003	0.003	0.003	0.003	0.184
11	0.086	0.086	0.122	0.054	0.078	0.158	0.187	0.111	0.115	0.117	0.120	0.330
12	0.002	0.002	0.005	0.002	0.002	0.006	0.006	0.003	0.003	0.003	0.003	0.153
13	0.042	0.042	0.141	0.050	0.046	0.128	0.171	0.092	0.097	0.105	0.113	0.210
14	0.002	0.002	0.006	0.002	0.002	0.006	0.006	0.002	0.003	0.003	0.003	0.131
15	0.005	0.005	0.010	0.005	0.008	0.018	0.014	0.003	0.004	0.004	0.004	0.150
16	0.002	0.002	0.006	0.002	0.002	0.008	0.008	0.002	0.002	0.002	0.002	0.115
17	0.038	0.038	0.093	0.048	0.035	0.091	0.118	0.042	0.045	0.048	0.050	0.132
18	0.002	0.002	0.006	0.002	0.002	0.008	0.008	0.002	0.002	0.002	0.002	0.102
19	0.016	0.016	0.059	0.034	0.035	0.101	0.099	0.030	0.032	0.036	0.039	0.118
20	0.002	0.002	0.006	0.002	0.002	0.008	0.008	0.001	0.001	0.001	0.001	0.092
21	0.003	0.003	0.014	0.003	0.003	0.018	0.021	0.002	0.002	0.002	0.002	0.107
22	0.002	0.002	0.008	0.002	0.002	0.008	0.008	0.001	0.001	0.001	0.001	0.084
23	0.014	0.014	0.083	0.011	0.018	0.080	0.058	0.007	0.008	0.010	0.012	0.098
24	0.002	0.002	0.006	0.002	0.002	0.006	0.006	0.001	0.001	0.001	0.001	0.077
25	0.008	0.008	0.051	0.006	0.008	0.037	0.022	0.006	0.008	0.011	0.012	0.090
26	0.000	0.000	0.006	0.000	0.000	0.006	0.006	0.001	0.001	0.001	0.001	0.071
27	0.002	0.002	0.014	0.002	0.002	0.011	0.014	0.001	0.001	0.001	0.002	0.083
28	0.000	0.000	0.006	0.000	0.000	0.006	0.006	0.000	0.000	0.001	0.001	0.066
29	0.005	0.005	0.022	0.003	0.002	0.019	0.024	0.004	0.005	0.006	0.007	0.078
30	0.000	0.000	0.005	0.000	0.000	0.005	0.005	0.000	0.000	0.000	0.001	0.061
31	0.003	0.003	0.027	0.002	0.002	0.021	0.029	0.003	0.002	0.001	0.001	0.073
32	0.000	0.000	0.005	0.000	0.000	0.006	0.005	0.000	0.000	0.000	0.000	0.058
33	0.002	0.002	0.008	0.002	0.000	0.008	0.006	0.000	0.000	0.000	0.000	0.068
34	0.000	0.000	0.005	0.000	0.000	0.006	0.006	0.000	0.000	0.000	0.000	0.054
35	0.002	0.002	0.019	0.002	0.002	0.016	0.022	0.002	0.002	0.001	0.001	0.064
36	0.000	0.000	0.003	0.000	0.000	0.008	0.008	0.001	0.001	0.001	0.001	0.051
37	0.002	0.002	0.011	0.002	0.002	0.019	0.021	0.002	0.002	0.001	0.001	0.061
38	0.000	0.000	0.006	0.000	0.000	0.006	0.006	0.000	0.000	0.000	0.000	0.048
39	0.000	0.000	0.008	0.000	0.000	0.006	0.008	0.000	0.000	0.000	0.000	0.058
40	0.000	0.000	0.008	0.000	0.000	0.008	0.008	0.000	0.000	0.000	0.000	0.046
THD	1.45%	1.45%	2.25%	1.85%	1.93%	2.55%	2.72%	1.98%	2.00%	2.00%	2.02%	5%

Remark: Iref=14.5

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Harmonics (≤ 16 A) (SE 10KHB-D3) Phase L2												
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	0.010	0.010	0.011	0.011	0.013	0.014	0.014	0.005	0.005	0.006	0.007	1.080
3	0.008	0.008	0.008	0.008	0.010	0.010	0.010	0.007	0.007	0.007	0.007	2.300
4	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.004	0.004	0.005	0.006	0.430
5	0.170	0.170	0.221	0.229	0.230	0.232	0.222	0.189	0.187	0.183	0.179	1.140
6	0.003	0.003	0.006	0.005	0.005	0.006	0.006	0.003	0.003	0.003	0.003	0.300
7	0.128	0.128	0.149	0.165	0.184	0.213	0.214	0.160	0.160	0.160	0.161	0.770
8	0.002	0.002	0.005	0.002	0.002	0.005	0.005	0.003	0.003	0.003	0.003	0.230
9	0.011	0.011	0.013	0.010	0.010	0.013	0.014	0.010	0.011	0.012	0.013	0.400
10	0.003	0.003	0.005	0.003	0.003	0.005	0.005	0.003	0.003	0.003	0.003	0.184
11	0.080	0.080	0.120	0.050	0.070	0.147	0.179	0.114	0.118	0.121	0.123	0.330
12	0.002	0.002	0.006	0.003	0.003	0.005	0.006	0.002	0.002	0.002	0.003	0.153
13	0.043	0.043	0.150	0.058	0.050	0.130	0.176	0.092	0.096	0.101	0.106	0.210
14	0.002	0.002	0.006	0.003	0.003	0.006	0.006	0.002	0.002	0.002	0.002	0.131
15	0.003	0.003	0.006	0.005	0.003	0.006	0.008	0.008	0.009	0.010	0.011	0.150
16	0.002	0.002	0.006	0.003	0.003	0.008	0.008	0.002	0.002	0.002	0.002	0.115
17	0.035	0.035	0.075	0.045	0.035	0.078	0.110	0.043	0.046	0.049	0.050	0.132
18	0.002	0.002	0.008	0.002	0.003	0.010	0.008	0.002	0.002	0.002	0.002	0.102
19	0.019	0.019	0.074	0.035	0.038	0.118	0.112	0.030	0.032	0.034	0.036	0.118
20	0.002	0.002	0.006	0.002	0.002	0.008	0.008	0.001	0.001	0.001	0.001	0.092
21	0.002	0.002	0.008	0.002	0.002	0.008	0.008	0.004	0.004	0.004	0.004	0.107
22	0.002	0.002	0.008	0.002	0.002	0.006	0.006	0.001	0.001	0.001	0.001	0.084
23	0.013	0.013	0.077	0.010	0.016	0.072	0.042	0.009	0.010	0.011	0.013	0.098
24	0.002	0.002	0.008	0.002	0.002	0.006	0.006	0.001	0.001	0.001	0.001	0.077
25	0.010	0.010	0.054	0.008	0.008	0.050	0.037	0.004	0.007	0.009	0.011	0.090
26	0.002	0.002	0.006	0.002	0.000	0.006	0.005	0.001	0.001	0.001	0.001	0.071
27	0.002	0.002	0.008	0.002	0.002	0.006	0.006	0.002	0.002	0.002	0.002	0.083
28	0.000	0.000	0.006	0.000	0.000	0.005	0.005	0.000	0.000	0.000	0.001	0.066
29	0.003	0.003	0.019	0.003	0.002	0.016	0.027	0.003	0.005	0.006	0.007	0.078
30	0.000	0.000	0.006	0.000	0.000	0.005	0.005	0.000	0.000	0.000	0.000	0.061
31	0.003	0.003	0.037	0.003	0.002	0.022	0.032	0.003	0.002	0.002	0.002	0.073
32	0.000	0.000	0.005	0.000	0.000	0.005	0.005	0.000	0.000	0.000	0.000	0.058
33	0.000	0.000	0.005	0.000	0.000	0.005	0.005	0.001	0.001	0.001	0.001	0.068
34	0.000	0.000	0.005	0.000	0.000	0.005	0.005	0.000	0.000	0.000	0.000	0.054
35	0.002	0.002	0.014	0.002	0.002	0.014	0.019	0.002	0.001	0.001	0.001	0.064
36	0.000	0.000	0.005	0.000	0.000	0.008	0.008	0.000	0.000	0.000	0.000	0.051
37	0.002	0.002	0.019	0.002	0.002	0.024	0.024	0.002	0.002	0.001	0.001	0.061
38	0.000	0.000	0.005	0.000	0.000	0.005	0.005	0.000	0.000	0.000	0.000	0.048
39	0.000	0.000	0.006	0.000	0.000	0.005	0.005	0.001	0.000	0.000	0.000	0.058
40	0.000	0.000	0.008	0.000	0.000	0.006	0.006	0.000	0.000	0.000	0.000	0.046
THD	1.47%	1.47%	2.27%	1.87%	1.96%	2.56%	2.73%	2.02%	2.04%	2.05%	2.06%	5%

Remark: Iref=14.5

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Harmonics (≤16 A) (SE 10KHB-D3) Phase L3												
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	0.011	0.011	0.011	0.011	0.013	0.016	0.016	0.009	0.010	0.011	0.012	1.080
3	0.011	0.011	0.013	0.013	0.013	0.014	0.013	0.013	0.014	0.016	0.017	2.300
4	0.005	0.005	0.006	0.005	0.005	0.006	0.006	0.004	0.004	0.004	0.004	0.430
5	0.162	0.162	0.213	0.219	0.222	0.226	0.218	0.196	0.194	0.190	0.186	1.140
6	0.005	0.005	0.008	0.003	0.003	0.006	0.006	0.003	0.003	0.003	0.003	0.300
7	0.104	0.104	0.125	0.146	0.162	0.186	0.187	0.167	0.167	0.166	0.166	0.770
8	0.003	0.003	0.005	0.002	0.003	0.006	0.006	0.003	0.003	0.003	0.003	0.230
9	0.006	0.006	0.008	0.008	0.008	0.010	0.010	0.015	0.015	0.015	0.015	0.400
10	0.002	0.003	0.005	0.003	0.003	0.005	0.005	0.003	0.003	0.003	0.003	0.184
11	0.083	0.083	0.128	0.058	0.075	0.155	0.187	0.118	0.123	0.126	0.129	0.330
12	0.003	0.003	0.005	0.002	0.003	0.006	0.006	0.003	0.003	0.003	0.003	0.153
13	0.038	0.038	0.142	0.050	0.040	0.117	0.162	0.084	0.089	0.095	0.102	0.210
14	0.002	0.002	0.006	0.003	0.002	0.006	0.008	0.003	0.003	0.003	0.003	0.131
15	0.003	0.003	0.010	0.005	0.006	0.014	0.013	0.006	0.007	0.007	0.009	0.150
16	0.002	0.002	0.006	0.002	0.002	0.008	0.008	0.002	0.002	0.002	0.003	0.115
17	0.037	0.035	0.082	0.046	0.040	0.098	0.122	0.047	0.050	0.054	0.056	0.132
18	0.002	0.002	0.006	0.002	0.002	0.008	0.008	0.002	0.002	0.002	0.002	0.102
19	0.016	0.016	0.061	0.034	0.037	0.102	0.091	0.026	0.028	0.032	0.035	0.118
20	0.002	0.002	0.008	0.002	0.002	0.008	0.008	0.001	0.001	0.001	0.001	0.092
21	0.003	0.003	0.011	0.002	0.002	0.016	0.019	0.002	0.002	0.002	0.003	0.107
22	0.002	0.002	0.008	0.002	0.002	0.006	0.006	0.001	0.001	0.001	0.001	0.084
23	0.014	0.014	0.075	0.010	0.016	0.080	0.059	0.010	0.011	0.013	0.015	0.098
24	0.002	0.002	0.006	0.002	0.002	0.006	0.006	0.001	0.001	0.001	0.001	0.077
25	0.006	0.006	0.040	0.005	0.006	0.042	0.038	0.005	0.007	0.010	0.011	0.090
26	0.000	0.002	0.006	0.000	0.000	0.006	0.006	0.001	0.001	0.001	0.001	0.071
27	0.002	0.002	0.013	0.002	0.002	0.011	0.013	0.001	0.001	0.001	0.001	0.083
28	0.000	0.000	0.006	0.000	0.000	0.006	0.006	0.001	0.000	0.001	0.001	0.066
29	0.005	0.005	0.026	0.003	0.002	0.021	0.029	0.004	0.005	0.006	0.007	0.078
30	0.000	0.000	0.006	0.000	0.000	0.005	0.005	0.000	0.000	0.000	0.001	0.061
31	0.003	0.003	0.030	0.002	0.002	0.018	0.029	0.002	0.002	0.001	0.001	0.073
32	0.000	0.000	0.006	0.000	0.000	0.006	0.006	0.000	0.000	0.000	0.000	0.058
33	0.002	0.000	0.006	0.000	0.000	0.005	0.005	0.000	0.000	0.000	0.000	0.068
34	0.000	0.000	0.006	0.000	0.000	0.006	0.006	0.000	0.000	0.000	0.000	0.054
35	0.002	0.002	0.018	0.002	0.002	0.019	0.022	0.002	0.002	0.002	0.001	0.064
36	0.000	0.000	0.006	0.000	0.000	0.010	0.011	0.000	0.000	0.000	0.000	0.051
37	0.002	0.002	0.013	0.002	0.002	0.019	0.018	0.002	0.002	0.001	0.001	0.061
38	0.000	0.000	0.008	0.000	0.000	0.008	0.006	0.000	0.000	0.000	0.000	0.048
39	0.000	0.000	0.006	0.000	0.000	0.005	0.005	0.000	0.000	0.000	0.000	0.058
40	0.000	0.000	0.008	0.000	0.000	0.008	0.006	0.000	0.000	0.000	0.000	0.046
THD	1.36%	1.36%	2.15%	1.76%	1.84%	2.46%	2.62%	2.79%	2.10%	2.05%	2.12%	5%

Remark: Iref=14.5

Certificate of Conformity

No. ESY 087538 0017 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: SE 5KHB-D3, SE 6KHB-D3, SE 8KHB-D3, SE 10KHB-D3
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	64.290.23.30129.01 from 2023-05-09
The network and system protection designated above meets the requirements of VDE-AR-N 4105.	

Certificate of Conformity

No. ESY 087538 0017 Rev. 00

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

Extract from test report for NS protection			
"Determination of electrical properties"			
NS protection test report			
Type of NS system:	Integrated NS protection	Other Manufacturer indications	
Software version:	062511		
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 2023-02-20 to 2023-04-28		
		Inverter	
Protection function	Setting value	Tripping value	Tripping time NS protection*
Rise-in-voltage protection $U >>$	$1.25 * U_n$	L1-N/L2-N/L3-N: 286.0V/285.9V/286.2V; L1-N: 287.1V; L2-N: 286.9V; L3-N: 287.1V;	L1-N/L2-N/L3-N: 151.2ms; L1-N: 150.4ms; L2-N: 155.7ms; L3-N: 147.1ms;
Rise-in-voltage protection $U >$	$1.10 * U_n$	$1.10 * U_n$	ms**
Voltage drop protection $U <$	$0.8 * U_n$	L1-N/L2-N/L3-N: 185.0V/185.0V/185.1V; L1-N: 184.0V; L2-N: 184.8V; L3-N: 185.0V;	L1-N/L2-N/L3-N: 3010.0ms; L1-N: 3020.0ms; L2-N: 3030.0ms; L3-N: 3020.0ms;
Voltage drop protection $U <<$	$0.45 * U_n$	L1-N/L2-N/L3-N: 105.1V/105.0V/105.1V; L1-N: 104.9V; L2-N: 103.8V; L3-N: 103.9V;	L1-N/L2-N/L3-N: 322.5ms; L1-N: 338.5ms; L2-N: 334.5ms; L3-N: 332.5ms;
Frequency decrease protection $f <$	47.5 Hz	47.50Hz	150.5ms
Frequency increase protection $f >$	51.5 Hz	51.48Hz	150.0ms

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<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: <u>500.03s</u> (L1-N&L2-N&L3-N from 600s@U_n to 112%U_n) Continuous operation (L1-N&L2-N&L3-N from 600s@U_n to 108%U_n) <u>300.04s</u> (L1-N&L2-N&L3-N from 600s@106%U_n to 114%U_n)</p>	
<p><input checked="" type="checkbox"/> as integrated NS protection</p>	
Assigned to power generation unit type	<p><u>SE 5KHB-D3, SE 6KHB-D3,</u> <u>SE 8KHB-D3, SE 10KHB-D3</u></p>
Integrated interface switch type	<p>Series-connected relays for all phase conductors each</p> <p>Relay type: AZSR143-1AE-12D</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"/>