

Certificate of Conformity

No. ESY 090313 0032 Rev. 00

Holder of Certificate:	Autarco Group BV Torenallee 20 5617 BC Eindhoven THE NETHERLANDS
Product:	Converter Hybrid Inverter
Model(s):	S2.LQH12000, S2.LQH15000, S2.LQH20000, S2.LQH20000(D)
Parameters:	See next pages.
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.: 7040924107401-00

Date, 2024-12-12



(Zhengdong Ma)

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Model	S2.LQH12000	S2.LQH15000	S2.LQH20000
PV input parameters:			
Max. input voltage	DC 1000 V		
Mppt voltage range	DC 200, ..., 850 V		
Max. input current	DC 4*20 A		
Isc PV (absolute maximum)	DC 4*30 A		
Battery input parameters:			
Battery Type	Li-ion		
Battery Voltage range	DC 120, ..., 800 V		
Max. Charge/discharge current	DC 50/50 A		
AC output parameters:			
Max. (Rated) apparent output Power	12000 VA	15000 VA	20000 VA
Nominal output voltage	3/N/PE AC 230/400 V		
Nominal Frequency	50 Hz		
Max. (Rated) output current	AC 17.3 A	AC 21.7 A	AC 28.9 A
Power factor range	-0.8, ..., 1, ..., +0.8		

Model	S2.LQH20000(D)
PV input parameters:	
Max. input voltage	DC 1000 V
Mppt voltage range	DC 200, ..., 850 V
Max. input current	DC 4*20 A
Isc PV (absolute maximum)	DC 4*30 A
Battery input parameters:	
Battery Type	Li-ion
Battery Voltage range	DC 120, ..., 800 V
Max. Charge/discharge current	DC 50/50 A
AC output parameters:	
Max. (Rated) apparent output Power	20000 VA
Nominal output voltage	3/N/PE AC 230/400 V
Nominal Frequency	50 Hz
Max. (Rated) output current	AC 28.9 A
Power factor range	-0.8, ..., 1, ..., +0.8

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E.4 Unit certificate

Unit certificate	No. 7040924107401-00	
Manufacturer	Autarco Group BV Torenallee 20, 5617 BC, Eindhoven, THE NETHERLANDS	
Power generation unit type	[Hybrid Inverter]: S2.LQH12000, S2.LQH15000, S2.LQH20000, S2.LQH20000(D) Remark: certified on representative model S2.LQH20000(D) of family design products, results of the measurement of S2.LQH20000(D) can be transferred to the other models based on transferability rule of measurements in DIN VDE V 0124-100 (VDE V 0124-100):2020.	
<input checked="" type="checkbox"/> Inverter	<input type="checkbox"/> Asynchronous generator	<input type="checkbox"/> Synchronous generator
<input type="checkbox"/> Stirling generator	<input type="checkbox"/> Fuel cell	<input type="checkbox"/> others
Assessment values	Max. active power $P_{E_{max}}$	19.97 kW
	Max. apparent power $S_{E_{max}}$	20.18 kVA
	Rated voltage	3/N/PE AC 230/400 V
Rated values	Rated current (AC) I_r	28.9 Aa.c.
Rated values	Max. current (AC) I_{max}	30.4 Aa.c.
Rated values	Initial short-circuit current I_k	50.0 Aa.c.
Network connection rules	VDE-AR-N 4105:2018-11/Corrigendum 1:2020-10 Generators connected to the low-voltage distribution network - Technical requirements for the connection to and parallel operation with low-voltage distribution networks.	
Test requirement	DIN VDE V 0124-100 (VDE V 0124-100):2020-06 "Network integration of power generation system – Low voltage" Test requirements for power generation units intended for connection to and parallel operation on the low-voltage network.	
The above mentioned power generation unit meets the requirements of VDE-AR-N 4105.		

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

Extract from test report for unit certificate "Determination of electrical properties"		No. <u>7040924107401-00</u>
Generation unit manufacturer:	<u>Autarco Group BV</u> <u>Torenallee 20, 5617 BC, Eindhoven, THE NETHERLANDS</u>	
Manufacturer indications:	Type of system	<u>Inverter for PV and Battery System</u>
	Max. active power P _{Emax}	<u>12 kW (S2.LQH12000)</u> <u>15 kW (S2.LQH15000)</u> <u>20 kW (S2.LQH20000,S2.LQH20000(D))</u>
	Rated voltage	<u>3/N/PE AC 230/400 V</u>
Period of measurement:	<u>From 2023-11-09 to 2024-01-11 and from 2024-07-31 to 2024-08-25, 2024-11-27</u>	

Rapid voltage changes and flicker (DIN EN 61000-3-11)				
Phase	P _{st}	d(t) - 500ms [%]	dc [%]	dmax [%]
Limit	1.0	3.3%	3.3%	4%
L1	0.57	0.00	0.23	0.75
L2	0.57	0.00	0.20	0.70
L3	0.58	0.00	0.21	0.72
P_{It} measured	0.41/0.41/0.41		P_{It} limit	0.65
	d(t) - 500ms [%]		dc [%]	dmax [%]
START	0.00		0.01	0.08
STOP	0.00		0.03	0.40
LIMIT	3.3%		3.3%	4%
Supplementary information:				

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Harmonics IEC 61000-3-12(>16 A and ≤75 A) (S2.LQH20000(D))													
L1													
Power P/Pn [%]	0-5	10	20	30	40	50	60	70	80	90	100	IEC 61000-3-12 limit	
Ordinal number	[%]	[%]	[%]	[%]	[%]	[%]	[%]	[%]	[%]	[%]	[%]	1 phase [%]	3 phase [%]
2	0.060	0.089	0.067	0.037	0.062	0.078	0.069	0.116	0.116	0.140	0.155	8%	8%
3	0.040	0.046	0.045	0.031	0.041	0.045	0.033	0.047	0.031	0.033	0.034	21.6%	Not stated
4	0.040	0.047	0.043	0.061	0.058	0.044	0.038	0.045	0.040	0.075	0.143	4%	4%
5	0.501	0.262	0.409	0.508	0.569	0.569	0.586	0.620	0.639	0.676	0.696	10.7%	10.7%
6	0.037	0.046	0.024	0.016	0.021	0.023	0.020	0.026	0.022	0.030	0.035	2.67%	2.67%
7	0.383	0.207	0.120	0.209	0.278	0.317	0.311	0.281	0.267	0.262	0.253	7.2%	7.2%
8	0.037	0.039	0.035	0.034	0.038	0.035	0.033	0.038	0.033	0.039	0.045	2%	2%
9	0.019	0.027	0.023	0.016	0.020	0.029	0.029	0.034	0.037	0.044	0.055	3.8%	Not stated
10	0.026	0.026	0.033	0.035	0.036	0.039	0.038	0.038	0.043	0.041	0.043	1.6%	1.6%
11	0.092	0.243	0.074	0.070	0.178	0.216	0.247	0.281	0.286	0.289	0.267	3.1%	3.1%
12	0.038	0.035	0.018	0.015	0.020	0.024	0.022	0.030	0.030	0.036	0.043	1.33%	1.33%
13	0.064	0.337	0.172	0.031	0.104	0.171	0.187	0.201	0.224	0.239	0.241	2%	2%
14	0.029	0.029	0.026	0.019	0.029	0.031	0.029	0.030	0.030	0.032	0.039	-	-
15	0.020	0.026	0.025	0.020	0.024	0.027	0.026	0.030	0.030	0.032	0.034	-	-
16	0.021	0.030	0.025	0.017	0.033	0.032	0.033	0.031	0.030	0.032	0.035	-	-
17	0.180	0.127	0.173	0.096	0.046	0.121	0.170	0.192	0.190	0.202	0.207	-	-
18	0.023	0.032	0.029	0.023	0.020	0.023	0.024	0.029	0.026	0.029	0.033	-	-
19	0.096	0.100	0.168	0.137	0.034	0.088	0.135	0.163	0.176	0.176	0.176	-	-
20	0.027	0.027	0.025	0.020	0.027	0.032	0.028	0.030	0.029	0.033	0.036	-	-

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21	0.019	0.023	0.025	0.024	0.025	0.026	0.028	0.031	0.030	0.031	0.033	-	-
22	0.016	0.026	0.026	0.030	0.024	0.033	0.035	0.036	0.035	0.035	0.039	-	-
23	0.108	0.076	0.070	0.137	0.068	0.054	0.106	0.148	0.168	0.195	0.193	-	-
24	0.025	0.034	0.027	0.029	0.029	0.029	0.030	0.033	0.032	0.033	0.036	-	-
25	0.092	0.127	0.022	0.140	0.099	0.035	0.076	0.132	0.148	0.161	0.169	-	-
26	0.015	0.030	0.018	0.028	0.022	0.029	0.032	0.035	0.036	0.042	0.051	-	-
27	0.014	0.021	0.024	0.027	0.028	0.027	0.030	0.033	0.033	0.039	0.045	-	-
28	0.016	0.029	0.022	0.030	0.025	0.029	0.034	0.040	0.038	0.048	0.062	-	-
29	0.099	0.071	0.073	0.090	0.105	0.041	0.061	0.101	0.134	0.150	0.162	-	-
30	0.018	0.024	0.027	0.020	0.025	0.021	0.022	0.026	0.028	0.032	0.036	-	-
31	0.062	0.057	0.099	0.064	0.109	0.050	0.035	0.079	0.111	0.137	0.147	-	-
32	0.021	0.022	0.020	0.020	0.022	0.023	0.029	0.032	0.035	0.037	0.048	-	-
33	0.014	0.019	0.021	0.020	0.027	0.026	0.026	0.029	0.030	0.031	0.033	-	-
34	0.019	0.027	0.027	0.019	0.032	0.024	0.028	0.034	0.036	0.042	0.049	-	-
35	0.070	0.041	0.073	0.025	0.088	0.061	0.028	0.052	0.082	0.106	0.129	-	-
36	0.015	0.019	0.018	0.010	0.022	0.017	0.017	0.023	0.025	0.029	0.033	-	-
37	0.042	0.044	0.065	0.032	0.084	0.067	0.025	0.042	0.071	0.094	0.109	-	-
38	0.019	0.023	0.020	0.015	0.026	0.023	0.024	0.029	0.033	0.042	0.052	-	-
39	0.013	0.019	0.016	0.018	0.021	0.024	0.024	0.026	0.029	0.030	0.033	-	-
40	0.019	0.024	0.017	0.015	0.027	0.022	0.018	0.030	0.033	0.041	0.052	-	-
THC/lref	0.715	0.612	0.572	0.638	0.724	0.753	0.795	0.865	0.901	0.960	0.991	23%	13%
PWHD	1.422	1.303	1.495	1.449	1.404	1.120	1.344	1.790	2.059	2.332	2.504	23%	22%

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L2													
Power P/Pn [%]	0-5	10	20	30	40	50	60	70	80	90	100	IEC 61000-3-12 limit	
Ordinal number	[%]	[%]	[%]	[%]	[%]	[%]	[%]	[%]	[%]	[%]	[%]	1 phase [%]	3 phase [%]
2	0.057	0.084	0.074	0.056	0.086	0.120	0.120	0.171	0.181	0.187	0.174	8%	8%
3	0.046	0.052	0.049	0.038	0.048	0.055	0.043	0.053	0.050	0.056	0.056	21.6%	Not stated
4	0.043	0.051	0.045	0.051	0.054	0.051	0.047	0.046	0.042	0.077	0.152	4%	4%
5	0.521	0.278	0.393	0.499	0.561	0.557	0.574	0.610	0.632	0.661	0.677	10.7%	10.7%
6	0.038	0.050	0.040	0.035	0.037	0.040	0.036	0.041	0.040	0.050	0.067	2.67%	2.67%
7	0.394	0.219	0.128	0.228	0.299	0.336	0.324	0.296	0.285	0.282	0.265	7.2%	7.2%
8	0.054	0.048	0.047	0.051	0.058	0.047	0.045	0.050	0.044	0.049	0.057	2%	2%
9	0.036	0.039	0.035	0.035	0.036	0.038	0.038	0.044	0.050	0.060	0.073	3.8%	Not stated
10	0.036	0.043	0.041	0.039	0.041	0.044	0.044	0.046	0.046	0.045	0.044	1.6%	1.6%
11	0.100	0.243	0.080	0.075	0.183	0.218	0.250	0.285	0.287	0.291	0.265	3.1%	3.1%
12	0.040	0.041	0.038	0.036	0.037	0.038	0.037	0.042	0.043	0.054	0.069	1.33%	1.33%
13	0.067	0.346	0.177	0.036	0.109	0.177	0.199	0.217	0.242	0.255	0.256	2%	2%
14	0.039	0.043	0.039	0.037	0.040	0.041	0.040	0.042	0.041	0.042	0.049	-	-
15	0.035	0.038	0.036	0.035	0.036	0.037	0.036	0.037	0.038	0.041	0.045	-	-
16	0.038	0.038	0.038	0.037	0.039	0.039	0.039	0.039	0.040	0.039	0.040	-	-
17	0.183	0.125	0.177	0.096	0.054	0.122	0.166	0.190	0.184	0.196	0.206	-	-
18	0.038	0.042	0.040	0.038	0.039	0.041	0.040	0.044	0.045	0.044	0.056	-	-
19	0.102	0.102	0.172	0.138	0.042	0.097	0.147	0.173	0.184	0.184	0.190	-	-
20	0.038	0.043	0.042	0.041	0.041	0.045	0.043	0.044	0.044	0.041	0.043	-	-

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21	0.035	0.036	0.036	0.035	0.037	0.037	0.038	0.039	0.041	0.040	0.043	-	-
22	0.038	0.039	0.039	0.039	0.040	0.042	0.042	0.042	0.043	0.041	0.042	-	-
23	0.113	0.087	0.072	0.140	0.069	0.058	0.110	0.148	0.163	0.186	0.182	-	-
24	0.046	0.051	0.049	0.049	0.050	0.051	0.051	0.053	0.055	0.050	0.056	-	-
25	0.097	0.134	0.038	0.151	0.100	0.046	0.090	0.142	0.161	0.174	0.181	-	-
26	0.036	0.039	0.038	0.039	0.040	0.041	0.042	0.046	0.048	0.054	0.065	-	-
27	0.035	0.036	0.036	0.035	0.036	0.037	0.038	0.040	0.041	0.046	0.052	-	-
28	0.038	0.039	0.039	0.038	0.039	0.042	0.045	0.049	0.050	0.053	0.060	-	-
29	0.102	0.070	0.076	0.093	0.108	0.047	0.063	0.102	0.134	0.148	0.158	-	-
30	0.036	0.038	0.039	0.038	0.039	0.040	0.040	0.042	0.044	0.048	0.057	-	-
31	0.066	0.063	0.102	0.069	0.120	0.057	0.046	0.086	0.121	0.148	0.159	-	-
32	0.036	0.039	0.039	0.037	0.039	0.038	0.039	0.041	0.047	0.043	0.050	-	-
33	0.034	0.034	0.034	0.034	0.034	0.035	0.036	0.036	0.037	0.039	0.042	-	-
34	0.035	0.036	0.035	0.036	0.036	0.037	0.039	0.040	0.044	0.046	0.047	-	-
35	0.075	0.048	0.077	0.034	0.091	0.062	0.036	0.059	0.085	0.108	0.128	-	-
36	0.034	0.035	0.035	0.035	0.036	0.036	0.036	0.038	0.040	0.047	0.058	-	-
37	0.055	0.050	0.066	0.038	0.090	0.071	0.036	0.053	0.080	0.100	0.117	-	-
38	0.035	0.035	0.036	0.035	0.037	0.037	0.036	0.038	0.041	0.046	0.050	-	-
39	0.033	0.033	0.033	0.033	0.034	0.034	0.034	0.035	0.036	0.038	0.042	-	-
40	0.034	0.035	0.034	0.034	0.035	0.035	0.035	0.038	0.039	0.043	0.049	-	-
THC/lref	0.756	0.648	0.590	0.661	0.749	0.778	0.819	0.893	0.933	0.982	1.007	23%	13%
PWHD	1.648	1.503	1.683	1.652	1.599	1.351	1.557	1.951	2.210	2.441	2.626	23%	22%

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L3													
Power P/Pn [%]	0-5	10	20	30	40	50	60	70	80	90	100	IEC 61000-3-12 limit	
Ordinal number	[%]	[%]	[%]	[%]	[%]	[%]	[%]	[%]	[%]	[%]	[%]	1 phase [%]	3 phase [%]
2	0.078	0.091	0.094	0.082	0.107	0.133	0.141	0.192	0.199	0.208	0.201	8%	8%
3	0.059	0.057	0.048	0.036	0.041	0.044	0.038	0.056	0.041	0.046	0.048	21.6%	Not stated
4	0.044	0.060	0.057	0.071	0.068	0.061	0.057	0.058	0.052	0.084	0.147	4%	4%
5	0.496	0.257	0.396	0.504	0.564	0.558	0.577	0.615	0.632	0.671	0.681	10.7%	10.7%
6	0.046	0.049	0.039	0.035	0.037	0.038	0.035	0.042	0.036	0.040	0.044	2.67%	2.67%
7	0.400	0.211	0.121	0.220	0.287	0.328	0.314	0.289	0.276	0.272	0.258	7.2%	7.2%
8	0.044	0.051	0.044	0.044	0.048	0.040	0.041	0.047	0.045	0.044	0.057	2%	2%
9	0.042	0.040	0.036	0.035	0.035	0.037	0.038	0.047	0.051	0.068	0.078	3.8%	Not stated
10	0.042	0.039	0.037	0.036	0.037	0.044	0.044	0.045	0.046	0.047	0.052	1.6%	1.6%
11	0.092	0.252	0.088	0.073	0.186	0.219	0.262	0.292	0.291	0.293	0.269	3.1%	3.1%
12	0.041	0.041	0.037	0.035	0.037	0.038	0.037	0.042	0.041	0.042	0.054	1.33%	1.33%
13	0.070	0.343	0.176	0.036	0.103	0.170	0.191	0.210	0.238	0.250	0.248	2%	2%
14	0.037	0.041	0.037	0.037	0.038	0.038	0.038	0.040	0.040	0.039	0.042	-	-
15	0.035	0.036	0.035	0.035	0.035	0.036	0.036	0.039	0.038	0.040	0.046	-	-
16	0.039	0.040	0.040	0.037	0.040	0.039	0.042	0.042	0.042	0.039	0.040	-	-
17	0.179	0.125	0.179	0.101	0.050	0.124	0.171	0.191	0.191	0.209	0.216	-	-
18	0.038	0.041	0.040	0.038	0.038	0.042	0.040	0.042	0.042	0.039	0.044	-	-
19	0.100	0.105	0.167	0.138	0.044	0.094	0.139	0.168	0.184	0.183	0.189	-	-
20	0.043	0.047	0.044	0.044	0.045	0.046	0.043	0.045	0.045	0.040	0.040	-	-

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21	0.043	0.038	0.037	0.036	0.037	0.037	0.038	0.040	0.040	0.038	0.039	-	-
22	0.038	0.042	0.040	0.043	0.040	0.042	0.045	0.045	0.047	0.042	0.045	-	-
23	0.116	0.092	0.072	0.148	0.079	0.061	0.109	0.152	0.170	0.195	0.186	-	-
24	0.057	0.065	0.064	0.065	0.065	0.064	0.065	0.066	0.067	0.049	0.048	-	-
25	0.098	0.130	0.040	0.144	0.102	0.046	0.084	0.134	0.149	0.164	0.173	-	-
26	0.039	0.043	0.041	0.042	0.044	0.044	0.045	0.048	0.048	0.048	0.055	-	-
27	0.035	0.036	0.037	0.036	0.037	0.037	0.038	0.041	0.041	0.042	0.046	-	-
28	0.039	0.040	0.042	0.043	0.043	0.042	0.045	0.052	0.050	0.050	0.056	-	-
29	0.102	0.070	0.085	0.094	0.114	0.050	0.059	0.100	0.133	0.150	0.161	-	-
30	0.036	0.038	0.038	0.037	0.039	0.038	0.040	0.041	0.041	0.041	0.046	-	-
31	0.067	0.063	0.099	0.064	0.115	0.058	0.044	0.084	0.116	0.140	0.151	-	-
32	0.036	0.038	0.037	0.036	0.037	0.037	0.038	0.039	0.043	0.041	0.046	-	-
33	0.034	0.034	0.035	0.034	0.035	0.035	0.035	0.037	0.037	0.037	0.039	-	-
34	0.035	0.037	0.037	0.035	0.037	0.038	0.038	0.041	0.045	0.047	0.050	-	-
35	0.078	0.049	0.078	0.035	0.095	0.069	0.036	0.056	0.084	0.106	0.130	-	-
36	0.034	0.035	0.035	0.034	0.036	0.036	0.035	0.035	0.036	0.038	0.041	-	-
37	0.054	0.048	0.063	0.038	0.085	0.068	0.036	0.050	0.076	0.095	0.112	-	-
38	0.034	0.034	0.035	0.034	0.034	0.035	0.035	0.036	0.036	0.041	0.047	-	-
39	0.033	0.034	0.034	0.033	0.033	0.034	0.034	0.035	0.036	0.036	0.038	-	-
40	0.034	0.035	0.034	0.036	0.035	0.036	0.035	0.037	0.039	0.043	0.051	-	-
THC/lref	0.746	0.643	0.596	0.668	0.752	0.777	0.822	0.899	0.934	0.987	1.004	23%	13%
PWHD	1.666	1.526	1.701	1.676	1.626	1.375	1.546	1.937	2.194	2.409	2.570	23%	22%

Certificate of Conformity

No. ESY 090313 0032 Rev. 00

E.6 Certificate of the network and system protection

Certificate of NS protection	No. 7040924107401-00		
Manufacturer	Autarco Group BV Torenallee 20, 5617 BC, Eindhoven, THE NETHERLANDS		
Type of NS protection			
Central NS protection	<input type="checkbox"/>		
Integrated NS protection	<input checked="" type="checkbox"/>	Assigned to power generation unit type	S2.LQH12000, S2.LQH15000, S2.LQH20000, S2.LQH20000(D)
Network connection rules	VDE-AR-N 4105:2018-11/Corrigendum 1:2020-10 Generators connected to the low-voltage distribution network - Technical requirements for the connection to and parallel operation with low-voltage distribution networks.		
Test requirement	DIN VDE V 0124-100 (VDE V 0124-100):2020-06 "Network integration of power generation system – Low voltage" Test requirements for power generation units intended for connection to and parallel operation on the low-voltage network.		
The network and system protection mentioned above meets the requirements of VDE-AR-N 4105.			

Certificate of Conformity

No. ESY 090313 0032 Rev. 00

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

Extract from test report for NS protection "Determination of electrical properties"		No. <u>7040924107401-00</u>	
NS protection test report			
Type of NS system:	Integrated NS protection	Other Manufacturer indications	
Software version:	A1		
Manufacturer:	Autarco Group BV Torenallee 20, 5617 BC, Eindhoven, THE NETHERLANDS		
Measuring period:	From 2023-11-09 to 2024-01-11 and from 2024-07-31 to 2024-08-25, 2024-11-27		
Inverter(s) (S2.LQH20000(D))			
Protection function	Setting value	Tripping value	Break time NS protection *
Rise-in-voltage protection $U >>$	$1.25 \cdot U_n$	L1-N/L2-N/L3-N: 287.60 V / 287.44 V / 287.51 V L1-N: 286.82 V L2-N: 287.01 V L3-N: 286.79 V	L1-N/L2-N/L3-N: 125 ms L1-N: 124 ms L2-N: 128 ms L3-N: 127 ms
Rise-in-voltage protection $U >$	$1.10 \cdot U_n$	$1,10 \cdot U_n$	ms**
Voltage drop protection $U <$	$0.8 \cdot U_n$	L1-N/L2-N/L3-N: 183.68 V / 183.69 V / 183.59 V L1-N: 183.86 V L2-N: 183.30 V L3-N: 182.82 V	L1-N/L2-N/L3-N: 3031 ms L1-N: 3026 ms L2-N: 3016 ms L3-N: 3019 ms
Voltage drop protection $U <<$	$0.45 \cdot U_n$	L1-N/L2-N/L3-N: 103.84 V / 103.83 V / 103.82 V L1-N: 103.18 V L2-N: 103.44 V L3-N: 103.77 V	L1-N/L2-N/L3-N: 328 ms L1-N: 327 ms L2-N: 325 ms L3-N: 325 ms
Frequency decrease protection $f <$	47.5 Hz	47.50 Hz	132 ms
Frequency increase protection $f >$	51.5 Hz	51.50 Hz	135 ms

Certificate of Conformity

No. ESY 090313 0032 Rev. 00

<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.</p> <p>Disconnecting time as below:</p> <ol style="list-style-type: none"> 494.6 s (L1-N) / 493.8 s (L2-N) / 471.2 s (L3-N) (from 600s@Un to 112%Un) Continuous operation (L1-N/L2-N/L3-N) (from 600s@Un to 108%Un) 298.5 s (L1-N) / 302.5 s (L2-N) / 263.8 s (L3-N) (from 600s@106%Un to 114%Un) 	
<input checked="" type="checkbox"/> as integrated NS protection	
Assigned to power generation unit type	Hybrid Inverter: S2.LQH12000, S2.LQH15000, S2.LQH20000, S2.LQH20000(D)
Integrated interface switch type	Series-connected relays for both the neutral conductor and the line conductor; Power relay type: HF161F-40W/12-HTF(967)(A38)
Response time of interface switch for integrated NS protection	The response time of the interface switch: Operate time: Max. 10 ms Release time: Max. 20 ms
Verification of the entire functional chain "integrated NS protection – interface switch" has resulted in successful disconnection.	<input checked="" type="checkbox"/>