ZERTIFIKAT ◆ CERTIFICATE ◆ 認證證書 ◆ СЕРТИФИКАТ ◆ CERTIFICADO ◆ CERTIFICAT

DAkkS Deutsche Akkreditierungsstelle D-ZE-11321-01-00

TÜV SÜD Product Service

Certificate of Conformity

No. ESY 117464 0005 Rev. 00

Holder of Certificate: **Hunan Lenercom Technology Co.,Ltd.**
12th Floor, Building B1
Lugu Science & Technology Industrial Park
410000 Changsha
PEOPLE'S REPUBLIC OF CHINA

Product: **Energy Storage System**

Model(s): **LC-E2-615T, LC-E2-620T, LC-E2-625T, LC-E2-630T, LC-E2-815T, LC-E2-820T, LC-E2-825T, LC-E2-830T, LC-E2-835T, LC-E2-1020T, LC-E2-1025T, LC-E2-1030T, LC-E2-1035T, LC-E2-1225T, LC-E2-1230T, LC-E2-1235T, LC-E2-1535T, LC-E2-1540T, LC-E2-1545T**

Parameters: See page 2-6

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.: 64290223057401

Date, 2022-10-13

(Billy Qiu)

TÜV SÜD Product Service GmbH • Certification Body • Ridlerstraße 65 • 80339 Munich • Germany

TÜV®

DAkkS Deutsche Akkreditierungsstelle D-ZE-11321-01-00

TÜV SÜD Product Service

Certificate of Conformity

No. ESY 117464 0005 Rev. 00

Parameters:

Model	LC-E2-615T	LC-E2-620T	LC-E2-625T	LC-E2-630T
Battery parameters				
Rated battery DC voltage	153.6 Vd.c.	204.8 Vd.c.	256.0 Vd.c.	307.2 Vd.c.
Battery DC voltage range	125-175 Vd.c.	166-233 Vd.c.	208-292 Vd.c.	249-350 Vd.c.
Max charging / discharging current	50 Ad.c.			
Battery type	Lithium-ion			
Maximum charge/discharge power	6000 W			
PV terminal parameters				
Max. Input Power	9000 W			
Maximum DC input voltage	1000 Vd.c.			
MPPT Range	180~850 Vd.c.			
MPPT Range (full load)	250~850 Vd.c.			
Max. Input Current	2*13 Ad.c.			
Isc PV	2*16 Ad.c.			
Grid terminal parameters				
Rated output Power	6000 W			
Maximum continuous output apparent power	6600 VA			
Max. AC output current	9.5 Aa.c.			
Maximum continuous input apparent power	12600 VA			
Max. active power PEmax	5999.1 W			
Max. apparent power SEmax	6614.0 VA			
Max. AC input current	18.2 Aa.c.			
Rated AC voltage	230/400 Va.c., 3W+N+PE			
Rated AC frequency	50 Hz			
Power factor	0.9lagging to 0.9leading			
Backup terminal parameters				
Rated apparent power	6000 VA			
Maximum continuous output apparent power	6600 VA			
Max. AC current	9.5 Aa.c.			
Rated AC voltage	230/400 Va.c., 3W+N+PE			
Rated AC frequency	50 Hz			

DAkkS Deutsche Akkreditierungsstelle D-ZE-11321-01-00

TÜV SÜD Product Service

Certificate of Conformity

No. ESY 117464 0005 Rev. 00

Model	LC-E2-815T	LC-E2-820T	LC-E2-825T	LC-E2-830T	LC-E2-835T
Battery parameters					
Rated battery DC voltage	153.6 Vd.c.	204.8 Vd.c.	256.0 Vd.c.	307.2 Vd.c.	358.4 Vd.c.
Battery DC voltage range	125-175 Vd.c.	166-233 Vd.c.	208-292 Vd.c.	249-350 Vd.c.	291-409 Vd.c.
Max charging / discharging current	50 Ad.c.				
Battery type	Lithium-ion				
Maximum charge/discharge power	7680 W	8000 W			
PV terminal parameters					
Max. Input Power	12000 W				
Maximum DC input voltage	1000 Vd.c.				
MPPT Range	180~850 Vd.c.				
MPPT Range (full load)	330~850Vd.c.				
Max. Input Current	2*13 Ad.c.				
Isc PV	2*16 Ad.c.				
Grid terminal parameters					
Rated output Power	8000 W				
Maximum continuous output apparent power	8800 VA				
Max. AC output current	12.7 Aa.c.				
Maximum continuous input apparent power	16800 VA				
Max. active power PEmax	7980.2 W				
Max. apparent power SEmax	8837.8 VA				
Max. AC input current	24.3 Aa.c.				
Rated AC voltage	230/400 Va.c., 3W+N+PE				
Rated AC frequency	50 Hz				
Power factor	0.9lagging to 0.9leading				
Backup terminal parameters					
Rated apparent power	8000 VA				
Maximum continuous output apparent power	8800 VA				
Max. AC current	12.7 Aa.c.				
Rated AC voltage	230/400 Va.c., 3W+N+PE				
Rated AC frequency	50 Hz				

DAkkS Deutsche Akkreditierungsstelle D-ZE-11321-01-00

TÜV SÜD Product Service

Certificate of Conformity

No. ESY 117464 0005 Rev. 00

Model	LC-E2-1020T	LC-E2-1025T	LC-E2-1030T	LC-E2-1035T
Battery parameters				
Rated battery DC voltage	204.8 Vd.c.	256.0 Vd.c.	307.2 Vd.c.	358.4 Vd.c.
Battery DC voltage range	166-233 Vd.c.	208-292 Vd.c.	249-350 Vd.c.	291-409 Vd.c.
Max charging / discharging current	50 Ad.c.			
Battery type	Lithium-ion			
Maximum charge/discharge power	10000 W			
PV terminal parameters				
Max. Input Power	15000 W			
Maximum DC input voltage	1000 Vd.c.			
MPPT Range	180~850 Vd.c.			
MPPT Range (full load)	430~850Vd.c.			
Max. Input Current	2*13 Ad.c.			
Isc PV	2*16 Ad.c.			
Grid terminal parameters				
Rated output Power	10000 W			
Maximum continuous output apparent power	11000 VA			
Max. AC output current	15.9 Aa.c.			
Maximum continuous input apparent power	21000 VA			
Max. active power PEmax	9987.6 W			
Max. apparent power SEmax	11003.5 VA			
Max. AC input current	30.4 Aa.c.			
Rated AC voltage	230/400 Va.c., 3W+N+PE			
Rated AC frequency	50 Hz			
Power factor	0.9lagging to 0.9leading			
Backup terminal parameters				
Rated apparent power	10000 VA			
Maximum continuous output apparent power	11000 VA			
Max. AC current	15.9 Aa.c.			
Rated AC voltage	230/400 Va.c., 3W+N+PE			
Rated AC frequency	50 Hz			

DAkkS Deutsche Akkreditierungsstelle D-ZE-11321-01-00

TÜV SÜD Product Service

Certificate of Conformity

No. ESY 117464 0005 Rev. 00

Model	LC-E2-1225T	LC-E2-1230T	LC-E2-1235T
Battery parameters			
Rated battery DC voltage	256.0 Vd.c.	307.2 Vd.c.	358.4 Vd.c.
Battery DC voltage range	208-292 Vd.c.	249-350 Vd.c.	291-409 Vd.c.
Max charging / discharging current	50 Ad.c.		
Battery type	Lithium-ion		
Maximum charge/discharge power	12000 W		
PV terminal parameters			
Max. Input Power	18000 W		
Maximum DC input voltage	1000 Vd.c.		
MPPT Range	180~850 Vd.c.		
MPPT Range (full load)	510~850Vd.c.		
Max. Input Current	2*13 Ad.c.		
Isc PV	2*16 Ad.c.		
Grid terminal parameters			
Rated output Power	12000 W		
Maximum continuous output apparent power	13200 VA		
Max. AC output current	19.1 Aa.c.		
Maximum continuous input apparent power	25200 VA		
Max. active power PEmax	11992.4 W		
Max. apparent power SEmax	13192.0 VA		
Max. AC input current	36.5 Aa.c.		
Rated AC voltage	230/400 Va.c., 3W+N+PE		
Rated AC frequency	50 Hz		
Power factor	0.9lagging to 0.9leading		
Backup terminal parameters			
Rated apparent power	12000 VA		
Maximum continuous output apparent power	13200 VA		
Max. AC current	19.1 Aa.c.		
Rated AC voltage	230/400 Va.c., 3W+N+PE		
Rated AC frequency	50 Hz		

DAkkS Deutsche Akkreditierungsstelle D-ZE-11321-01-00

TÜV SÜD Product Service

Certificate of Conformity

No. ESY 117464 0005 Rev. 00

Model	LC-E2-1535T	LC-E2-1540T	LC-E2-1545T
Battery parameters			
Rated battery DC voltage	358.4 Vd.c.	409.6 Vd.c.	460.8 Vd.c.
Battery DC voltage range	291-409 Vd.c.	333-476 Vd.c.	347-525 Vd.c.
Max charging / discharging current	50 Ad.c.		
Battery type	Lithium-ion		
Maximum charge/discharge power	15000 W		
PV terminal parameters			
Max. Input Power	22500 W		
Maximum DC input voltage	1000 Vd.c.		
MPPT Range	180~850 Vd.c.		
MPPT Range (full load)	620~850Vd.c.		
Max. Input Current	2*13 Ad.c.		
Isc PV	2*25 Ad.c.		
Grid terminal parameters			
Rated output Power	15000 W		
Maximum continuous output apparent power	16500 VA		
Max. AC output current	23.8 Aa.c.		
Maximum continuous input apparent power	30000 VA		
Max. active power PEmax	15004.9 W		
Max. apparent power SEmax	16540.9 VA		
Max. AC input current	43.5 Aa.c.		
Rated AC voltage	230/400 Va.c., 3W+N+PE		
Rated AC frequency	50 Hz		
Power factor	0.9lagging to 0.9leading		
Backup terminal parameters			
Rated apparent power	15000 VA		
Maximum continuous output apparent power	16500 VA		
Max. AC current	23.8 Aa.c.		
Rated AC voltage	230/400 Va.c., 3W+N+PE		
Rated AC frequency	50 Hz		

DAkkS Deutsche Akkreditierungsstelle D-ZE-11321-01-00

TÜV SÜD Product Service

Certificate of Conformity

No. ESY 117464 0005 Rev. 00

Unit Certificate		
Manufacturer	Hunan Lenercom Technology Co.,Ltd.	
Power generation unit type	[converter]: LC-E2-615T, LC-E2-620T, LC-E2-625T, LC-E2-630T, LC-E2-815T, LC-E2-820T, LC-E2-825T, LC-E2-830T, LC-E2-835T, LC-E2-1020T, LC-E2-1025T, LC-E2-1030T, LC-E2-1035T, LC-E2-1225T, LC-E2-1230T, LC-E2-1235T, LC-E2-1535T, LC-E2-1540T, LC-E2-1545T Remark: certified on representative model LC-E2-1545T of family design products, results of the measurement of LC-E2-1545T can be transferred to other models based on transferability rule of measurements in DIN VDE V 0124-100 (VDE V 0124-100):2020.	
Technical data	Max. active power P_{Emax}	5999.1 W (LC-E2-615T, LC-E2-620T, LC-E2-625T, LC-E2-630T) 7980.2 W (LC-E2-815T, LC-E2-820T, LC-E2-825T, LC-E2-830T, LC-E2-835T) 9987.6 W (LC-E2-1020T, LC-E2-1025T, LC-E2-1030T, LC-E2-1035T) 11992.4 W (LC-E2-1225T, LC-E2-1230T, LC-E2-1235T) 15004.9 W (LC-E2-1535T, LC-E2-1540T, LC-E2-1545T)
	Max. apparent power S_{Emax}	6614.0 VA (LC-E2-615T, LC-E2-620T, LC-E2-625T, LC-E2-630T) 8837.8 VA (LC-E2-815T, LC-E2-820T, LC-E2-825T, LC-E2-830T, LC-E2-835T) 11003.5 VA (LC-E2-1020T, LC-E2-1025T, LC-E2-1030T, LC-E2-1035T) 13192.0 VA (LC-E2-1225T, LC-E2-1230T, LC-E2-1235T) 16540.9 VA (LC-E2-1535T, LC-E2-1540T, LC-E2-1545T)
	Rated voltage	230/400 Va.c., 3W+N+PE
	Rated current (AC) Ir	21.7 A (LC-E2-1535T, LC-E2-1540T, LC-E2-1545T)
	Initial short-circuit AC current	23.8 A (LC-E2-1535T, LC-E2-1540T, LC-E2-1545T)
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	64.290.22.30574.01 from 20.09.2022	
The above designated power generation unit meets the requirements of VDE-AR-N 4105		
This unit certificate includes extract report information of E.5 of VDE-AR-N 4105 for the power generation unit(s)		

TÜV SÜD Product Service GmbH • Certification Body • Ridlerstraße 65 • 80339 Munich • Germany

TÜV®

DAkkS Deutsche Akkreditierungsstelle D-ZE-11321-01-00

TÜV SÜD Product Service

Certificate of Conformity

No. ESY 117464 0005 Rev. 00

Certificate of NS protection		
Manufacturer	Hunan Lenercom Technology Co.,Ltd.	
Type of NS protection	Integrated NS protection	
Central NS protection	No	
Integrated NS protection	Yes	Assigned to power generation unit of type: LC-E2-615T, LC-E2-620T, LC-E2-625T, LC-E2-630T, LC-E2-815T, LC-E2-820T, LC-E2-825T, LC-E2-830T, LC-E2-835T, LC-E2-1020T, LC-E2-1025T, LC-E2-1030T, LC-E2-1035T, LC-E2-1225T, LC-E2-1230T, LC-E2-1235T, LC-E2-1535T, LC-E2-1540T, LC-E2-1545T
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	64.290.22.30574.01 from 20.09.2022	
The network and system protection designated above meets the requirements of VDE-AR-N 4105.		
This certificate of NS protection includes extract report information of E.7 of VDE-AR-N 4105 for the NS protection.		

DAkkS Deutsche Akkreditierungsstelle D-ZE-11321-01-00

TÜV SÜD Product Service

Certificate of Conformity

No. ESY 117464 0005 Rev. 00

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. 64.290.22.30574.01
Generation unit manufacturer:	Hunan Lenercom Technology Co.,Ltd.	
Manufacturer indications:	Type of system	Hybrid Solar Inverter
	Max. active power P_{Emax}	5999.1 W (LC-E2-615T, LC-E2-620T, LC-E2-625T, LC-E2-630T) 7980.2 W (LC-E2-815T, LC-E2-820T, LC-E2-825T, LC-E2-830T, LC-E2-835T) 9987.6 W (LC-E2-1020T, LC-E2-1025T, LC-E2-1030T, LC-E2-1035T) 11992.4 W (LC-E2-1225T, LC-E2-1230T, LC-E2-1235T) 15004.9 W (LC-E2-1535T, LC-E2-1540T, LC-E2-1545T)
	Rated voltage	230/400 Va.c., 3W+N+PE
Period of measurement:	From 2022-07-26 to 2022-08-22	
Rapid voltage change (LC-E2-1545T)		
Connection without provisions (regarding the primary energy carrier)		k_i=0.50
Most adverse case when switching between generator levels Remark: Not applicable for PV system		k_i=0.50
Connection at nominal conditions (of the primary energy carrier)		k_i=1.00
Disconnection at rated power		k_i=1.00
Worst case value of all switching operations		k_{imax}=1.00

DAkkS Deutsche Akkreditierungsstelle D-ZE-11321-01-00

TÜV SÜD Product Service

Certificate of Conformity

No. ESY 117464 0005 Rev. 00

Flicker – EN 61000-3-3									
-		Starting			Stopping			Running	
		d_{max}(%)	d_c(%)	$d_{(t)}$ (%)	d_{max}(%)	d_c(%)	$d_{(t)}$ (%)	P_{st}	P_{lt} 2 hours
Measured Values	L1	0.187	0.110	0	0.168	0.107	0	0.078	0.068
	L2	0.140	0.027	0	0.133	0.025	0	0.154	0.148
	L3	0.000	0.000	0	0.000	0.000	0	0.066	0.059
Limits		4%	3.3%	3.3% 500ms	4%	3.3%	3.3% 500ms	1.0	0.65
Remark: This table is applied to devices with rated current of ≤16A									

Flicker – EN 61000-3-11					
Simulated network voltage (V)	L1 (P-N)	230.0	Network impedance	L1	0.24Ω+j0.15Ω
	L2 (P-N)	230.0		L2	0.24Ω+j0.15Ω
	L3 (P-N)	230.0		L3	0.24Ω+j0.15Ω
	--	--		N	0.16Ω+j0.10Ω
EZE operating current (A)	L1	21.7	EZE operating power (kVA)	L1	5000
	L2	21.7		L2	5000
	L3	21.7		L3	5000
Simulated network frequency (Hz)	50		Short circuit power Sk (VA)	495000	
Plt (Maximum measured Pst)	L1	0.078	EZE nominal power (Pn/W)	15000	
	L2	0.154			
	L3	0.067			
Maximum flicker coefficient Cφk	L1	2.574	--	--	
	L2	5.082			
	L3	2.211			

Pst	#1	#2	#3	#4	#5	#6
L1	0.075	0.076	0.078	0.078	0.070	0.064
L2	0.154	0.154	0.153	0.153	0.150	0.145
L3	0.064	0.065	0.066	0.067	0.061	0.054
Pst	#7	#8	#9	#10	#11	#12
L1	0.065	0.059	0.059	0.058	0.060	0.065
L2	0.147	0.143	0.143	0.141	0.143	0.148
L3	0.057	0.052	0.051	0.050	0.052	0.058
Remark: This table is applied to devices with rated current of >16A and ≤75A						

DAkkS Deutsche Akkreditierungsstelle D-ZE-11321-01-00

TÜV SÜD Product Service

Certificate of Conformity

No. ESY 117464 0005 Rev. 00

Harmonics												
Phase L1												
Harmo n. Nr.	P/P_{Emax}											Limit (A)
	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	
0	0.0239	0.0038	0.0060	0.0068	0.0067	0.0062	0.0053	0.0644	0.0513	0.0446	0.0336	0.5% IR
1	0.5038	1.6536	2.9267	4.4431	5.9722	7.2822	8.8009	10.1076	11.6460	13.1659	14.4701	-
2	0.0278	0.0280	0.0141	0.0302	0.0455	0.0525	0.0590	0.0624	0.0666	0.0697	0.0737	1.08
3	0.0475	0.0431	0.0372	0.0394	0.0433	0.0398	0.0352	0.0366	0.0400	0.0357	0.0367	2.30
4	0.0063	0.0153	0.0384	0.0397	0.0249	0.0171	0.0144	0.0134	0.0142	0.0167	0.0183	0.43
5	0.0426	0.0433	0.0424	0.0391	0.0407	0.0450	0.0477	0.0442	0.0433	0.0479	0.0466	1.14
6	0.0056	0.0117	0.0102	0.0233	0.0227	0.0214	0.0176	0.0162	0.0160	0.0139	0.0127	0.30
7	0.0147	0.0260	0.0303	0.0301	0.0255	0.0256	0.0296	0.0343	0.0322	0.0300	0.0335	0.77
8	0.0030	0.0140	0.0093	0.0125	0.0188	0.0181	0.0163	0.0152	0.0137	0.0138	0.0130	0.23
9	0.0100	0.0142	0.0198	0.0217	0.0202	0.0177	0.0174	0.0198	0.0253	0.0249	0.0228	0.40
10	0.0048	0.0138	0.0118	0.0082	0.0116	0.0124	0.0122	0.0106	0.0106	0.0096	0.0104	0.18
11	0.0073	0.0127	0.0179	0.0216	0.0217	0.0197	0.0178	0.0163	0.0189	0.0242	0.0238	0.33
12	0.0074	0.0074	0.0128	0.0083	0.0116	0.0124	0.0124	0.0115	0.0091	0.0100	0.0104	0.15
13	0.0167	0.0268	0.0636	0.0288	0.0807	0.1169	0.1479	0.1643	0.1843	0.2067	0.2245	0.21
14	0.0065	0.0053	0.0087	0.0071	0.0068	0.0080	0.0075	0.0082	0.0076	0.0064	0.0070	0.13
15	0.0093	0.0209	0.0278	0.0187	0.0336	0.0589	0.0771	0.0908	0.0976	0.1052	0.1135	0.15
16	0.0062	0.0099	0.0059	0.0059	0.0064	0.0075	0.0079	0.0070	0.0074	0.0063	0.0058	0.12
17	0.0143	0.0237	0.0183	0.0153	0.0183	0.0380	0.0516	0.0634	0.0710	0.0714	0.0751	0.13
18	0.0053	0.0057	0.0036	0.0056	0.0053	0.0054	0.0051	0.0049	0.0047	0.0052	0.0046	0.10
19	0.0201	0.0193	0.0100	0.0093	0.0066	0.0192	0.0329	0.0390	0.0513	0.0549	0.0536	0.12
20	0.0042	0.0028	0.0036	0.0057	0.0038	0.0049	0.0056	0.0055	0.0052	0.0056	0.0061	0.09
21	0.0212	0.0138	0.0035	0.0098	0.0052	0.0138	0.0228	0.0286	0.0365	0.0464	0.0476	0.11
22	0.0032	0.0047	0.0042	0.0045	0.0044	0.0047	0.0041	0.0038	0.0035	0.0035	0.0039	0.08
23	0.0196	0.0178	0.0122	0.0105	0.0038	0.0115	0.0181	0.0239	0.0266	0.0347	0.0421	0.10
24	0.0026	0.0038	0.0049	0.0043	0.0033	0.0038	0.0043	0.0044	0.0041	0.0037	0.0044	0.08
25	0.0190	0.0194	0.0167	0.0105	0.0059	0.0106	0.0131	0.0164	0.0178	0.0189	0.0253	0.09
26	0.0022	0.0023	0.0037	0.0031	0.0032	0.0034	0.0034	0.0035	0.0035	0.0032	0.0035	0.07
27	0.0165	0.0121	0.0139	0.0094	0.0026	0.0084	0.0127	0.0155	0.0183	0.0185	0.0204	0.08
28	0.0017	0.0022	0.0028	0.0025	0.0029	0.0030	0.0034	0.0033	0.0036	0.0029	0.0027	0.07
29	0.0141	0.0126	0.0093	0.0083	0.0026	0.0084	0.0111	0.0126	0.0152	0.0159	0.0154	0.08
30	0.0017	0.0023	0.0020	0.0019	0.0029	0.0030	0.0033	0.0032	0.0031	0.0035	0.0028	0.06
31	0.0124	0.0137	0.0067	0.0080	0.0028	0.0084	0.0107	0.0115	0.0138	0.0133	0.0131	0.07
32	0.0016	0.0026	0.0023	0.0018	0.0025	0.0025	0.0026	0.0029	0.0027	0.0033	0.0032	0.06
33	0.0100	0.0087	0.0083	0.0075	0.0032	0.0061	0.0097	0.0114	0.0127	0.0142	0.0143	0.07
34	0.0015	0.0018	0.0029	0.0021	0.0025	0.0023	0.0029	0.0028	0.0029	0.0026	0.0033	0.05
35	0.0079	0.0063	0.0088	0.0069	0.0035	0.0053	0.0090	0.0105	0.0096	0.0128	0.0124	0.06
36	0.0016	0.0017	0.0025	0.0024	0.0026	0.0022	0.0024	0.0026	0.0027	0.0020	0.0026	0.05
37	0.0073	0.0085	0.0089	0.0079	0.0051	0.0052	0.0092	0.0107	0.0102	0.0113	0.0128	0.06
38	0.0016	0.0024	0.0019	0.0022	0.0024	0.0021	0.0021	0.0020	0.0022	0.0022	0.0019	0.05
39	0.0057	0.0058	0.0061	0.0074	0.0053	0.0033	0.0073	0.0091	0.0106	0.0088	0.0116	0.06
40	0.0013	0.0015	0.0014	0.0024	0.0026	0.0017	0.0023	0.0025	0.0027	0.0028	0.0022	0.05
THD	2.360%	0.699%	0.801%	0.715%	0.907%	1.176%	1.432%	1.067%	1.769%	1.933%	2.072%	5%
Phase L2												
Harmo n. Nr.	P/P_{Emax}											Limit (A)
	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	

TÜV SÜD Product Service GmbH • Certification Body • Ridlerstraße 65 • 80339 Munich • Germany

TÜV®

DAkkS Deutsche Akkreditierungsstelle D-ZE-11321-01-00

TÜV SÜD Product Service

Certificate of Conformity

No. ESY 117464 0005 Rev. 00

0	0.0696	0.0120	0.0189	0.0217	0.0232	0.0242	0.0251	0.0172	0.0262	0.0267	0.0271	0.5% IR
1	0.2577	1.4779	2.7720	4.3107	5.8618	7.1901	8.7268	10.0517	0.8005	13.1430	14.4615	-
2	0.0360	0.0965	0.1353	0.1389	0.1334	0.1321	0.1332	0.1368	0.0096	0.1416	0.1429	1.08
3	0.0944	0.0936	0.0883	0.0925	0.0974	0.0944	0.0887	0.0918	0.0065	0.0881	0.0910	2.30
4	0.0120	0.0600	0.0273	0.0354	0.0290	0.0228	0.0196	0.0164	0.0011	0.0153	0.0164	0.43
5	0.0635	0.0688	0.0689	0.0664	0.0692	0.0736	0.0751	0.0696	0.0048	0.0762	0.0726	1.14
6	0.0076	0.0105	0.0056	0.0241	0.0305	0.0315	0.0298	0.0285	0.0018	0.0253	0.0249	0.30
7	0.0260	0.0350	0.0423	0.0445	0.0446	0.0454	0.0513	0.0561	0.0037	0.0503	0.0554	0.77
8	0.0146	0.0294	0.0142	0.0079	0.0179	0.0209	0.0227	0.0221	0.0015	0.0227	0.0232	0.23
9	0.0187	0.0208	0.0302	0.0358	0.0367	0.0363	0.0343	0.0370	0.0029	0.0418	0.0397	0.40
10	0.0181	0.0195	0.0176	0.0064	0.0123	0.0161	0.0189	0.0185	0.0012	0.0161	0.0165	0.18
11	0.0127	0.0125	0.0156	0.0207	0.0255	0.0249	0.0250	0.0233	0.0017	0.0302	0.0304	0.33
12	0.0158	0.0060	0.0168	0.0113	0.0080	0.0134	0.0155	0.0208	0.0016	0.0222	0.0215	0.15
13	0.0194	0.0150	0.0706	0.0252	0.0440	0.0881	0.1261	0.1464	0.0119	0.1958	0.2130	0.21
14	0.0134	0.0162	0.0086	0.0097	0.0060	0.0080	0.0108	0.0096	0.0009	0.0142	0.0139	0.13
15	0.0335	0.0335	0.0420	0.0214	0.0101	0.0349	0.0597	0.0745	0.0058	0.0964	0.1056	0.15
16	0.0101	0.0151	0.0035	0.0102	0.0046	0.0072	0.0099	0.0103	0.0007	0.0131	0.0150	0.12
17	0.0379	0.0477	0.0177	0.0275	0.0056	0.0246	0.0401	0.0554	0.0042	0.0664	0.0736	0.13
18	0.0068	0.0028	0.0039	0.0076	0.0055	0.0053	0.0062	0.0074	0.0004	0.0065	0.0087	0.10
19	0.0357	0.0329	0.0096	0.0270	0.0035	0.0142	0.0249	0.0337	0.0031	0.0469	0.0491	0.12
20	0.0049	0.0064	0.0060	0.0066	0.0055	0.0043	0.0057	0.0075	0.0006	0.0072	0.0073	0.09
21	0.0309	0.0250	0.0233	0.0261	0.0026	0.0112	0.0181	0.0225	0.0022	0.0380	0.0385	0.11
22	0.0035	0.0043	0.0065	0.0051	0.0051	0.0046	0.0050	0.0060	0.0004	0.0065	0.0057	0.08
23	0.0225	0.0271	0.0245	0.0209	0.0071	0.0077	0.0164	0.0205	0.0018	0.0334	0.0370	0.10
24	0.0034	0.0049	0.0043	0.0028	0.0052	0.0037	0.0046	0.0045	0.0004	0.0064	0.0067	0.08
25	0.0196	0.0194	0.0202	0.0183	0.0085	0.0090	0.0149	0.0170	0.0012	0.0210	0.0247	0.09
26	0.0034	0.0043	0.0027	0.0022	0.0051	0.0039	0.0037	0.0038	0.0004	0.0056	0.0061	0.07
27	0.0152	0.0106	0.0092	0.0128	0.0111	0.0042	0.0115	0.0157	0.0011	0.0185	0.0216	0.08
28	0.0029	0.0033	0.0027	0.0027	0.0046	0.0036	0.0037	0.0047	0.0003	0.0062	0.0053	0.07
29	0.0121	0.0124	0.0102	0.0126	0.0126	0.0035	0.0110	0.0145	0.0010	0.0158	0.0178	0.08
30	0.0029	0.0051	0.0031	0.0033	0.0041	0.0037	0.0030	0.0038	0.0002	0.0050	0.0059	0.06
31	0.0106	0.0088	0.0142	0.0141	0.0139	0.0041	0.0107	0.0138	0.0012	0.0139	0.0155	0.07
32	0.0023	0.0020	0.0033	0.0036	0.0037	0.0036	0.0032	0.0033	0.0003	0.0034	0.0056	0.06
33	0.0094	0.0042	0.0114	0.0131	0.0126	0.0046	0.0073	0.0107	0.0010	0.0136	0.0126	0.07
34	0.0022	0.0032	0.0026	0.0035	0.0031	0.0033	0.0031	0.0032	0.0003	0.0028	0.0039	0.05
35	0.0071	0.0062	0.0068	0.0118	0.0116	0.0057	0.0058	0.0100	0.0008	0.0148	0.0120	0.06
36	0.0021	0.0025	0.0023	0.0026	0.0022	0.0033	0.0026	0.0024	0.0002	0.0036	0.0027	0.05
37	0.0067	0.0056	0.0060	0.0105	0.0112	0.0077	0.0058	0.0106	0.0008	0.0157	0.0144	0.06
38	0.0019	0.0017	0.0018	0.0023	0.0020	0.0032	0.0029	0.0026	0.0002	0.0041	0.0027	0.05
39	0.0055	0.0034	0.0071	0.0077	0.0091	0.0078	0.0036	0.0079	0.0007	0.0116	0.0138	0.06
40	0.0017	0.0032	0.0021	0.0015	0.0015	0.0032	0.0024	0.0027	0.0002	0.0042	0.0044	0.05
THD	1.383%	1.329%	1.463%	1.438%	1.410%	1.522%	1.710%	1.248%	2.036%	2.186%	2.309%	5%

Phase L3

Harmo n. Nr.	P/P_{Emax}											Limit (A)
	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	
0	0.0627	0.0147	0.0226	0.0268	0.0286	0.0295	0.0299	0.0200	0.0300	0.0303	0.0299	0.5% IR
1	0.2019	1.4238	2.7221	4.2646	5.8170	7.1462	8.6874	10.0127	11.5691	13.1088	14.4264	-
2	0.0256	0.1642	0.2213	0.2229	0.2054	0.1923	0.1795	0.1725	0.1633	0.1586	0.1605	1.08
3	0.2096	0.2090	0.2047	0.2072	0.2110	0.2074	0.2043	0.2077	0.2106	0.2108	0.2136	2.30

TÜV SÜD Product Service GmbH • Certification Body • Ridlerstraße 65 • 80339 Munich • Germany

TÜV®

DAkkS Deutsche Akkreditierungsstelle D-ZE-11321-01-00

TÜV SÜD Product Service

Certificate of Conformity

No. ESY 117464 0005 Rev. 00

4	0.0399	0.0648	0.0206	0.0546	0.0659	0.0685	0.0660	0.0638	0.0663	0.0675	0.0668	0.43
5	0.1002	0.1092	0.1069	0.1079	0.1115	0.1158	0.1176	0.1141	0.1141	0.1168	0.1146	1.14
6	0.0042	0.0176	0.0396	0.0284	0.0316	0.0332	0.0347	0.0333	0.0288	0.0279	0.0254	0.30
7	0.0491	0.0588	0.0681	0.0728	0.0735	0.0751	0.0778	0.0814	0.0790	0.0787	0.0816	0.77
8	0.0055	0.0435	0.0227	0.0220	0.0273	0.0274	0.0266	0.0242	0.0232	0.0209	0.0196	0.23
9	0.0366	0.0345	0.0460	0.0522	0.0565	0.0557	0.0559	0.0565	0.0608	0.0603	0.0596	0.40
10	0.0047	0.0236	0.0273	0.0212	0.0164	0.0174	0.0176	0.0202	0.0190	0.0201	0.0182	0.18
11	0.0224	0.0196	0.0240	0.0285	0.0347	0.0369	0.0368	0.0355	0.0354	0.0389	0.0392	0.33
12	0.0041	0.0139	0.0337	0.0232	0.0168	0.0197	0.0200	0.0205	0.0238	0.0236	0.0219	0.15
13	0.0188	0.0167	0.0741	0.0311	0.0190	0.0619	0.1072	0.1341	0.1621	0.1888	0.2090	0.21
14	0.0025	0.0189	0.0145	0.0179	0.0125	0.0113	0.0133	0.0114	0.0116	0.0133	0.0132	0.13
15	0.0344	0.0312	0.0430	0.0282	0.0050	0.0191	0.0440	0.0657	0.0781	0.0900	0.1004	0.15
16	0.0034	0.0124	0.0129	0.0137	0.0123	0.0105	0.0097	0.0096	0.0081	0.0085	0.0094	0.12
17	0.0403	0.0496	0.0168	0.0370	0.0062	0.0140	0.0316	0.0458	0.0590	0.0627	0.0678	0.13
18	0.0030	0.0087	0.0127	0.0126	0.0106	0.0080	0.0085	0.0097	0.0095	0.0088	0.0079	0.10
19	0.0370	0.0445	0.0203	0.0343	0.0071	0.0084	0.0188	0.0266	0.0402	0.0473	0.0488	0.12
20	0.0026	0.0067	0.0083	0.0100	0.0089	0.0087	0.0070	0.0079	0.0074	0.0072	0.0063	0.09
21	0.0309	0.0298	0.0310	0.0293	0.0118	0.0059	0.0138	0.0187	0.0255	0.0355	0.0395	0.11
22	0.0024	0.0048	0.0090	0.0062	0.0095	0.0071	0.0064	0.0057	0.0076	0.0080	0.0082	0.08
23	0.0217	0.0290	0.0250	0.0213	0.0164	0.0028	0.0114	0.0180	0.0222	0.0289	0.0359	0.10
24	0.0020	0.0072	0.0084	0.0053	0.0075	0.0067	0.0067	0.0056	0.0068	0.0059	0.0060	0.08
25	0.0188	0.0239	0.0176	0.0189	0.0178	0.0034	0.0117	0.0161	0.0168	0.0189	0.0220	0.09
26	0.0018	0.0044	0.0052	0.0052	0.0066	0.0064	0.0053	0.0061	0.0048	0.0064	0.0052	0.07
27	0.0156	0.0141	0.0107	0.0150	0.0173	0.0054	0.0077	0.0124	0.0153	0.0170	0.0187	0.08
28	0.0016	0.0032	0.0055	0.0052	0.0053	0.0059	0.0050	0.0049	0.0036	0.0053	0.0057	0.07
29	0.0143	0.0140	0.0111	0.0140	0.0162	0.0074	0.0059	0.0112	0.0155	0.0152	0.0167	0.08
30	0.0015	0.0044	0.0056	0.0050	0.0046	0.0054	0.0049	0.0046	0.0054	0.0039	0.0057	0.06
31	0.0142	0.0096	0.0114	0.0139	0.0159	0.0097	0.0053	0.0112	0.0155	0.0152	0.0150	0.07
32	0.0015	0.0034	0.0044	0.0045	0.0038	0.0050	0.0045	0.0040	0.0051	0.0032	0.0036	0.06
33	0.0130	0.0061	0.0083	0.0113	0.0128	0.0099	0.0032	0.0080	0.0112	0.0146	0.0133	0.07
34	0.0015	0.0024	0.0042	0.0039	0.0033	0.0042	0.0042	0.0038	0.0036	0.0042	0.0028	0.05
35	0.0113	0.0083	0.0060	0.0099	0.0111	0.0102	0.0030	0.0066	0.0098	0.0139	0.0140	0.06
36	0.0013	0.0025	0.0036	0.0031	0.0028	0.0041	0.0041	0.0040	0.0035	0.0047	0.0033	0.05
37	0.0111	0.0071	0.0054	0.0089	0.0108	0.0112	0.0047	0.0063	0.0109	0.0129	0.0157	0.06
38	0.0013	0.0020	0.0028	0.0025	0.0026	0.0038	0.0036	0.0033	0.0033	0.0044	0.0047	0.05
39	0.0091	0.0040	0.0053	0.0065	0.0086	0.0095	0.0046	0.0042	0.0088	0.0091	0.0119	0.06
40	0.0012	0.0018	0.0032	0.0018	0.0024	0.0027	0.0037	0.0037	0.0029	0.0029	0.0032	0.05
THD	1.520%	2.226%	2.442%	2.451%	2.378%	2.354%	2.403%	1.667%	2.604%	2.721%	2.834%	5%

Remark: Iref=14.5 Aa.c. Harmonics of PGU test according to IEC 61000-3-2; This table is applied to devices with rated current of ≤16A

TÜV SÜD Product Service GmbH • Certification Body • Ridlerstraße 65 • 80339 Munich • Germany

TÜV®

DAkkS Deutsche Akkreditierungsstelle D-ZE-11321-01-00

TÜV SÜD Product Service

Certificate of Conformity

No. ESY 117464 0005 Rev. 00

Harmonics

Phase L1

Harmo n. Nr.	P/P$_{Emax}$ 0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	Limit (%)
0	0.048%	0.143%	0.111%	0.097%	0.112%	0.111%	0.112%	0.119%	0.134%	0.125%	0.127%	0.5% IR
1	1.825%	10.562%	20.576%	30.673%	40.700%	50.806%	59.857%	69.935%	80.000%	89.991%	100.074%	-
2	0.037%	0.194%	0.244%	0.267%	0.318%	0.323%	0.346%	0.364%	0.415%	0.373%	0.401%	8.0
3	0.097%	0.166%	0.194%	0.212%	0.194%	0.212%	0.203%	0.212%	0.221%	0.226%	0.249%	-
4	0.018%	0.060%	0.041%	0.041%	0.060%	0.083%	0.097%	0.106%	0.134%	0.106%	0.138%	4.0
5	0.092%	0.111%	0.124%	0.157%	0.189%	0.166%	0.189%	0.184%	0.212%	0.221%	0.235%	10.7
6	0.014%	0.018%	0.032%	0.028%	0.051%	0.018%	0.028%	0.037%	0.051%	0.051%	0.065%	2.67
7	0.028%	0.074%	0.097%	0.088%	0.115%	0.129%	0.115%	0.129%	0.124%	0.129%	0.129%	7.2
8	0.014%	0.009%	0.014%	0.018%	0.018%	0.041%	0.028%	0.018%	0.028%	0.041%	0.041%	2.0
9	0.018%	0.051%	0.074%	0.074%	0.083%	0.106%	0.106%	0.097%	0.115%	0.106%	0.115%	-
10	0.009%	0.009%	0.018%	0.018%	0.018%	0.028%	0.023%	0.023%	0.018%	0.018%	0.023%	1.6
11	0.018%	0.051%	0.074%	0.078%	0.078%	0.074%	0.101%	0.092%	0.088%	0.101%	0.088%	3.1
12	0.009%	0.009%	0.014%	0.014%	0.023%	0.018%	0.028%	0.023%	0.028%	0.023%	0.023%	1.33
13	0.180%	0.171%	0.166%	0.364%	0.498%	0.562%	0.724%	0.839%	0.848%	0.857%	0.903%	2.0
14	0.009%	0.009%	0.009%	0.009%	0.018%	0.014%	0.023%	0.023%	0.018%	0.028%	0.018%	-
15	0.120%	0.157%	0.083%	0.203%	0.263%	0.304%	0.295%	0.373%	0.424%	0.406%	0.355%	-
16	0.005%	0.009%	0.009%	0.009%	0.009%	0.014%	0.009%	0.014%	0.018%	0.023%	0.023%	-
17	0.129%	0.124%	0.051%	0.138%	0.194%	0.240%	0.240%	0.258%	0.323%	0.373%	0.359%	-
18	0.005%	0.005%	0.005%	0.009%	0.009%	0.014%	0.009%	0.009%	0.018%	0.018%	0.018%	-
19	0.051%	0.074%	0.037%	0.097%	0.138%	0.171%	0.194%	0.194%	0.221%	0.272%	0.300%	-
20	0.005%	0.005%	0.005%	0.009%	0.014%	0.009%	0.009%	0.009%	0.009%	0.018%	0.014%	-
21	0.051%	0.046%	0.023%	0.074%	0.101%	0.124%	0.143%	0.152%	0.161%	0.184%	0.217%	-
22	0.005%	0.005%	0.005%	0.005%	0.009%	0.005%	0.009%	0.009%	0.009%	0.014%	0.018%	-
23	0.023%	0.060%	0.014%	0.065%	0.078%	0.097%	0.115%	0.129%	0.143%	0.157%	0.180%	-
24	0.005%	0.005%	0.005%	0.005%	0.009%	0.005%	0.009%	0.009%	0.009%	0.009%	0.014%	-
25	0.023%	0.069%	0.018%	0.055%	0.069%	0.078%	0.088%	0.101%	0.120%	0.129%	0.138%	-
26	0.005%	0.005%	0.005%	0.005%	0.009%	0.009%	0.005%	0.009%	0.009%	0.009%	0.009%	-
27	0.018%	0.055%	0.028%	0.051%	0.055%	0.065%	0.069%	0.083%	0.097%	0.111%	0.115%	-
28	0.005%	0.005%	0.005%	0.005%	0.005%	0.005%	0.005%	0.005%	0.009%	0.009%	0.009%	-
29	0.023%	0.032%	0.032%	0.046%	0.051%	0.055%	0.060%	0.065%	0.083%	0.097%	0.106%	-
30	0.005%	0.005%	0.005%	0.005%	0.005%	0.005%	0.005%	0.005%	0.009%	0.009%	0.009%	-
31	0.018%	0.018%	0.037%	0.037%	0.051%	0.046%	0.051%	0.055%	0.065%	0.083%	0.092%	-
32	0.005%	0.005%	0.005%	0.005%	0.005%	0.005%	0.005%	0.005%	0.005%	0.009%	0.009%	-
33	0.023%	0.028%	0.041%	0.032%	0.046%	0.046%	0.046%	0.046%	0.051%	0.069%	0.078%	-
34	0.005%	0.005%	0.005%	0.005%	0.005%	0.005%	0.005%	0.005%	0.005%	0.005%	0.009%	-
35	0.023%	0.028%	0.041%	0.028%	0.041%	0.041%	0.037%	0.041%	0.046%	0.055%	0.074%	-
36	0.000%	0.005%	0.005%	0.005%	0.005%	0.005%	0.005%	0.005%	0.009%	0.005%	0.009%	-
37	0.018%	0.018%	0.037%	0.023%	0.041%	0.037%	0.037%	0.037%	0.041%	0.046%	0.060%	-
38	0.000%	0.005%	0.005%	0.005%	0.005%	0.005%	0.005%	0.005%	0.009%	0.005%	0.005%	-
39	0.018%	0.009%	0.032%	0.018%	0.037%	0.037%	0.032%	0.032%	0.037%	0.046%	0.051%	-
40	0.005%	0.005%	0.005%	0.005%	0.005%	0.005%	0.005%	0.005%	0.009%	0.009%	0.005%	-
THD	0.307%	0.429%	0.430%	0.623%	0.787%	0.873%	1.004%	1.131%	1.211%	1.235%	1.286%	13
PWHD	0.201%	0.251%	0.146%	0.303%	0.404%	0.476%	0.491%	0.561%	0.651%	0.704%	0.705%	22

Phase L2

Harmo	P/P$_{Emax}$	Limit

TÜV®

DAkkS Deutsche Akkreditierungsstelle D-ZE-11321-01-00

TÜV SÜD Product Service

Certificate of Conformity

No. ESY 117464 0005 Rev. 00

n. Nr.	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	(%)
0	0.071%	0.447%	0.529%	0.559%	0.580%	0.607%	0.617%	0.625%	0.628%	0.541%	0.537%	0.5% IR
1	0.198%	9.945%	19.949%	30.083%	40.124%	50.249%	59.304%	69.392%	79.433%	89.424%	99.507%	-
2	0.046%	0.309%	0.309%	0.318%	0.350%	0.332%	0.350%	0.364%	0.387%	0.369%	0.387%	8.0
3	0.157%	0.309%	0.355%	0.382%	0.355%	0.382%	0.369%	0.387%	0.406%	0.406%	0.429%	-
4	0.051%	0.065%	0.041%	0.037%	0.074%	0.065%	0.060%	0.083%	0.129%	0.157%	0.194%	4.0
5	0.074%	0.189%	0.207%	0.249%	0.276%	0.249%	0.281%	0.263%	0.281%	0.281%	0.276%	10.7
6	0.009%	0.014%	0.028%	0.032%	0.023%	0.060%	0.092%	0.092%	0.083%	0.051%	0.037%	2.67
7	0.092%	0.088%	0.129%	0.138%	0.175%	0.194%	0.175%	0.203%	0.194%	0.207%	0.203%	7.2
8	0.009%	0.014%	0.014%	0.018%	0.023%	0.028%	0.018%	0.051%	0.074%	0.083%	0.069%	2.0
9	0.078%	0.069%	0.111%	0.120%	0.120%	0.152%	0.161%	0.152%	0.171%	0.157%	0.161%	-
10	0.009%	0.018%	0.014%	0.018%	0.028%	0.014%	0.037%	0.023%	0.023%	0.041%	0.055%	1.6
11	0.157%	0.041%	0.065%	0.078%	0.083%	0.078%	0.106%	0.101%	0.106%	0.124%	0.106%	3.1
12	0.005%	0.018%	0.009%	0.014%	0.018%	0.032%	0.018%	0.028%	0.028%	0.028%	0.046%	1.33
13	0.078%	0.286%	0.152%	0.304%	0.442%	0.539%	0.687%	0.774%	0.797%	0.834%	0.917%	2.0
14	0.009%	0.014%	0.005%	0.009%	0.014%	0.009%	0.023%	0.014%	0.023%	0.023%	0.018%	-
15	0.060%	0.217%	0.088%	0.171%	0.235%	0.267%	0.295%	0.359%	0.387%	0.369%	0.346%	-
16	0.009%	0.009%	0.005%	0.009%	0.009%	0.009%	0.009%	0.018%	0.014%	0.014%	0.018%	-
17	0.028%	0.124%	0.051%	0.124%	0.175%	0.217%	0.230%	0.263%	0.318%	0.346%	0.336%	-
18	0.005%	0.005%	0.005%	0.005%	0.009%	0.009%	0.009%	0.009%	0.018%	0.009%	0.014%	-
19	0.028%	0.055%	0.032%	0.097%	0.124%	0.157%	0.175%	0.189%	0.221%	0.258%	0.281%	-
20	0.005%	0.005%	0.005%	0.005%	0.009%	0.005%	0.009%	0.009%	0.014%	0.009%	0.009%	-
21	0.032%	0.074%	0.046%	0.078%	0.097%	0.115%	0.129%	0.143%	0.157%	0.180%	0.207%	-
22	0.005%	0.009%	0.005%	0.005%	0.009%	0.005%	0.005%	0.009%	0.009%	0.014%	0.014%	-
23	0.028%	0.078%	0.060%	0.069%	0.083%	0.097%	0.106%	0.120%	0.134%	0.152%	0.175%	-
24	0.005%	0.005%	0.005%	0.005%	0.005%	0.005%	0.005%	0.005%	0.009%	0.009%	0.009%	-
25	0.028%	0.046%	0.069%	0.055%	0.074%	0.074%	0.088%	0.092%	0.111%	0.120%	0.138%	-
26	0.005%	0.005%	0.005%	0.005%	0.005%	0.005%	0.005%	0.005%	0.005%	0.009%	0.009%	-
27	0.028%	0.014%	0.074%	0.041%	0.065%	0.065%	0.069%	0.078%	0.088%	0.097%	0.106%	-
28	0.005%	0.005%	0.005%	0.005%	0.005%	0.005%	0.005%	0.005%	0.005%	0.005%	0.009%	-
29	0.028%	0.023%	0.065%	0.032%	0.060%	0.065%	0.060%	0.065%	0.074%	0.088%	0.101%	-
30	0.005%	0.005%	0.005%	0.005%	0.005%	0.005%	0.005%	0.005%	0.005%	0.005%	0.009%	-
31	0.023%	0.028%	0.055%	0.023%	0.055%	0.055%	0.055%	0.051%	0.060%	0.074%	0.088%	-
32	0.005%	0.005%	0.005%	0.005%	0.005%	0.005%	0.005%	0.005%	0.005%	0.005%	0.005%	-
33	0.023%	0.018%	0.041%	0.018%	0.051%	0.051%	0.051%	0.046%	0.046%	0.060%	0.074%	-
34	0.000%	0.005%	0.005%	0.005%	0.005%	0.005%	0.005%	0.005%	0.005%	0.005%	0.005%	-
35	0.018%	0.014%	0.032%	0.018%	0.046%	0.051%	0.046%	0.041%	0.037%	0.051%	0.069%	-
36	0.005%	0.005%	0.005%	0.005%	0.005%	0.005%	0.005%	0.005%	0.005%	0.005%	0.005%	-
37	0.018%	0.023%	0.023%	0.018%	0.041%	0.051%	0.041%	0.041%	0.032%	0.037%	0.055%	-
38	0.005%	0.005%	0.005%	0.005%	0.005%	0.005%	0.005%	0.005%	0.005%	0.005%	0.005%	-
39	0.198%	0.023%	0.018%	0.023%	0.037%	0.046%	0.041%	0.037%	0.032%	0.032%	0.046%	-
40	0.046%	0.005%	0.005%	0.005%	0.005%	0.005%	0.005%	0.005%	0.005%	0.005%	0.009%	-
THD	0.365%	0.640%	0.601%	0.720%	0.850%	0.937%	1.057%	1.159%	1.231%	1.272%	1.352%	13
PWHD	0.230%	0.288%	0.196%	0.270%	0.377%	0.439%	0.476%	0.546%	0.615%	0.651%	0.671%	22

Phase L3

Harmo n. Nr.	P/P_{Emax}											Limit (%)
	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	
0	0.065%	0.335%	0.445%	0.506%	0.525%	0.566%	0.593%	0.599%	0.612%	0.782%	0.806%	0.5% IR

TÜV®

DAkkS Deutsche Akkreditierungsstelle D-ZE-11321-01-00

TÜV SÜD Product Service

Certificate of Conformity

No. ESY 117464 0005 Rev. 00

1	1.028%	9.788%	19.857%	30.051%	40.157%	50.336%	59.433%	69.571%	79.650%	89.659%	99.751%	-
2	0.055%	0.318%	0.359%	0.355%	0.387%	0.419%	0.452%	0.484%	0.516%	0.558%	0.576%	8.0
3	0.507%	0.594%	0.659%	0.696%	0.687%	0.719%	0.714%	0.747%	0.779%	0.806%	0.839%	-
4	0.023%	0.037%	0.069%	0.088%	0.088%	0.106%	0.092%	0.078%	0.111%	0.143%	0.180%	4.0
5	0.253%	0.281%	0.313%	0.359%	0.396%	0.369%	0.401%	0.378%	0.401%	0.401%	0.396%	10.7
6	0.028%	0.055%	0.037%	0.023%	0.023%	0.023%	0.065%	0.092%	0.078%	0.060%	0.028%	2.67
7	0.147%	0.161%	0.207%	0.221%	0.253%	0.272%	0.258%	0.281%	0.263%	0.276%	0.267%	7.2
8	0.018%	0.037%	0.032%	0.028%	0.037%	0.014%	0.032%	0.023%	0.065%	0.083%	0.092%	2.0
9	0.157%	0.120%	0.152%	0.166%	0.171%	0.198%	0.203%	0.198%	0.212%	0.198%	0.203%	-
10	0.009%	0.032%	0.018%	0.014%	0.014%	0.037%	0.028%	0.041%	0.023%	0.032%	0.055%	1.6
11	0.106%	0.088%	0.088%	0.106%	0.111%	0.111%	0.138%	0.129%	0.138%	0.147%	0.124%	3.1
12	0.009%	0.028%	0.023%	0.018%	0.018%	0.018%	0.041%	0.014%	0.041%	0.032%	0.028%	1.33
13	0.157%	0.323%	0.175%	0.281%	0.424%	0.498%	0.645%	0.797%	0.834%	0.848%	0.899%	2.0
14	0.005%	0.018%	0.018%	0.014%	0.014%	0.009%	0.014%	0.023%	0.014%	0.028%	0.032%	-
15	0.055%	0.240%	0.097%	0.161%	0.217%	0.267%	0.272%	0.332%	0.401%	0.396%	0.364%	-
16	0.005%	0.018%	0.014%	0.009%	0.014%	0.009%	0.014%	0.018%	0.023%	0.018%	0.018%	-
17	0.037%	0.124%	0.051%	0.120%	0.161%	0.207%	0.226%	0.240%	0.300%	0.350%	0.355%	-
18	0.005%	0.014%	0.014%	0.009%	0.009%	0.009%	0.009%	0.014%	0.014%	0.023%	0.014%	-
19	0.041%	0.055%	0.041%	0.097%	0.120%	0.152%	0.175%	0.184%	0.203%	0.249%	0.290%	-
20	0.005%	0.014%	0.014%	0.009%	0.009%	0.005%	0.009%	0.009%	0.014%	0.018%	0.018%	-
21	0.037%	0.069%	0.060%	0.078%	0.097%	0.111%	0.124%	0.143%	0.147%	0.166%	0.203%	-
22	0.005%	0.009%	0.009%	0.009%	0.009%	0.005%	0.009%	0.005%	0.014%	0.014%	0.014%	-
23	0.041%	0.065%	0.074%	0.065%	0.083%	0.088%	0.106%	0.120%	0.134%	0.143%	0.161%	-
24	0.005%	0.009%	0.009%	0.009%	0.009%	0.005%	0.005%	0.005%	0.009%	0.009%	0.009%	-
25	0.032%	0.032%	0.083%	0.046%	0.074%	0.074%	0.083%	0.092%	0.111%	0.120%	0.129%	-
26	0.005%	0.009%	0.009%	0.009%	0.005%	0.005%	0.005%	0.005%	0.009%	0.005%	0.009%	-
27	0.032%	0.009%	0.078%	0.032%	0.065%	0.069%	0.065%	0.074%	0.083%	0.097%	0.106%	-
28	0.005%	0.009%	0.005%	0.005%	0.005%	0.005%	0.005%	0.005%	0.005%	0.005%	0.009%	-
29	0.023%	0.028%	0.069%	0.023%	0.060%	0.060%	0.060%	0.060%	0.074%	0.088%	0.101%	-
30	0.005%	0.009%	0.005%	0.005%	0.005%	0.005%	0.005%	0.005%	0.005%	0.009%	0.009%	-
31	0.023%	0.028%	0.051%	0.018%	0.051%	0.055%	0.055%	0.055%	0.055%	0.069%	0.088%	-
32	0.005%	0.005%	0.005%	0.005%	0.005%	0.005%	0.005%	0.005%	0.005%	0.009%	0.009%	-
33	0.018%	0.014%	0.037%	0.018%	0.046%	0.055%	0.051%	0.046%	0.046%	0.055%	0.069%	-
34	0.005%	0.005%	0.005%	0.005%	0.005%	0.005%	0.005%	0.005%	0.005%	0.005%	0.009%	-
35	0.023%	0.023%	0.023%	0.023%	0.041%	0.051%	0.046%	0.046%	0.041%	0.046%	0.060%	-
36	0.000%	0.005%	0.005%	0.005%	0.005%	0.005%	0.005%	0.005%	0.005%	0.005%	0.009%	-
37	0.018%	0.028%	0.014%	0.028%	0.032%	0.046%	0.046%	0.041%	0.037%	0.037%	0.051%	-
38	0.000%	0.005%	0.005%	0.005%	0.005%	0.005%	0.005%	0.005%	0.005%	0.005%	0.005%	-
39	0.023%	0.023%	0.014%	0.032%	0.028%	0.046%	0.041%	0.037%	0.032%	0.032%	0.041%	-
40	0.000%	0.005%	0.005%	0.005%	0.005%	0.005%	0.005%	0.005%	0.005%	0.005%	0.005%	-
THD	0.650%	0.886%	0.906%	0.992%	1.095%	1.183%	1.282%	1.410%	1.501%	1.564%	1.626%	13
PWHD	0.120%	0.302%	0.216%	0.260%	0.355%	0.430%	0.458%	0.515%	0.606%	0.660%	0.686%	22

Remark: Iref=21.7 Aa.c. Harmonics of PGU test according to IEC 61000-3-12; This table is applied to devices with rated current of >16A and ≤75A.

TÜV SÜD Product Service GmbH • Certification Body • Ridlerstraße 65 • 80339 Munich • Germany

TÜV®

DAkkS Deutsche Akkreditierungsstelle D-ZE-11321-01-00

TÜV SÜD Product Service

Certificate of Conformity

No. ESY 117464 0005 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. 64.290.22.30574.01
NS protection test report			
Type of NS system:	Integrated NS protection		**Other Manufacturer indications**
Firmware version & Software version:	ARM: V1.03.08, DSP: V1.02.11		
Manufacturer:	Hunan Lenercom Technology Co.,Ltd. 12th Floor, Building B1, Lugu Science & Technology Industrial Park 410000 Changsha, PEOPLE'S REPUBLIC OF CHINA		
Measuring period:	From 2022-07-26 to 2022-08-22		
	Inverter		
Protection function	**Setting value**	**Tripping value**	**Break time NS protection**
Rise-in-voltage protection *U* >>	1.25 U_n	L1-N/L2-N/L3-N: 288.0V L1-N: 287.8 V L2-N: 287.7 V L3-N: 287.8 V	L1-N/L2-N/L3-N: 129.0 ms L1-N: 121.2 ms L2-N: 129.2 ms L3-N: 110.4 ms
Rise-in-voltage protection *U* >	1.10 * U_n	1.00Un – 1.12Un 230 V – 257.6 V	L1-N/L2-N/L3-N: 498.0 s
		1.00Un – 1.08Un 230 V – 248.4 V	L1-N/L2-N/L3-N: No disconnection
		1.06Un - 1.14Un 243.8 V - 262.2 V	L1-N/L2-N/L3-N: 299.0 s
Voltage drop protection *U* <	0.8 U_n	L1-N/L2-N/L3-N: 183.0 V L1-N: 183.1 V L2-N: 183.0 V L3-N: 183.0 V	L1-N/L2-N/L3-N: 3030 ms L1-N: 3024 ms L2-N: 3028 ms L3-N: 3048 ms
Voltage drop protection *U* <<	0.45 U_n	L1-N/L2-N/L3-N: 101.1 V L1-N: 101.0 V L2-N: 101.1 V L3-N: 101.0 V	L1-N/L2-N/L3-N: 354.0 ms L1-N: 312.0 ms L2-N: 310.0 ms L3-N: 384.0 ms
Frequency decrease protection *f* <	47.5 Hz	47.50 Hz	151.0 ms
Frequency increase protection *f* >	51.5 Hz	51.51 Hz	149.0 ms
*: The above tripping time includes the entire function chain “integrated NS protection – interface switch”			
☑ **as integrated NS protection**			
Assigned to power generation unit type			Type 2
Integrated interface switch type			Series-connected relays for both the neutral conductor and the line conductor Relay type: azsr143
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.			☑ Yes