

Certificate of compliance

Applicant: KACO new energy GmbH
Werner-von-Siemens-Allee 1, 74172 Neckarsulm
Germany

Product: Photovoltaic inverter

Model: blueplanet 25.0 NX3 M3 WM OD IIG0
blueplanet 30.0 NX3 M3 WM OD IIG0
blueplanet 33.0 NX3 M3 WM OD IIG0

Use in accordance with regulations:

Automatic disconnection device with three-phase mains surveillance in accordance with Engineering Recommendation G99/1 for photovoltaic systems with a three-phase parallel coupling via an inverter in the public mains supply. The automatic disconnection device is an integral part of the aforementioned inverter. This serves as a replacement for the disconnection device with isolating function, which can be accessed the distribution network provider at any time.

Applied rules and standards:

Engineering Recommendation G99/1-9:2022

Requirements for the connection of generation equipment in parallel with public distribution networks

DIN VDE V 0124-100:2020 (5.5.2.1 Functional safety of network and system protection)

Grid integration of generator plants - Low-voltage - Test requirements for generator units to be connected to and operated in parallel with low-voltage distribution networks

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

Report number: PVGB2407WDG0301-1-R1

Certificate number: U25-0762

Certification Program: NSOP-0032-DEU-ZE-V10

Date of issue: 2025-08-21

Certification body

Accreditation



Domenik Koll
Head of Energy Systems Germany



Accredited certification body by Deutsche Akkreditierungsstelle GmbH (DAkkS) according to ISO/IEC 17065. The accreditation is valid only for the scope listed in the annex of the accreditation certificate D-ZE-12024-01-00. The Deutsche Akkreditierungsstelle GmbH (DAkkS) is signatory of the multilateral arrangements of EA, ILAC and IAF for mutual recognition.

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Appendix A2-3 Compliance Verification Report for Inverter Connected Power Generating Modules				
Extract from test report according to the Engineering Recommendation G99/1				
Type Approval and declaration of compliance with the requirements of Engineering Recommendation G99/1.				
PGM Technology	Photovoltaic inverter			
Manufacturer	KACO new energy GmbH			
Address	Werner-von-Siemens-Allee 1, 74172 Neckarsulm Germany			
Tel	--	Fax	--	
Email	--	Website	--	
PGM Model	blueplanet 25.0 NX3 M3 WM OD IIG0	blueplanet 30.0 NX3 M3 WM OD IIG0	blueplanet 33.0 NX3 M3 WM OD IIG0	--
Input (DC photovoltaic)				
MPP voltage range [V]	450-850	450-850	450-850	--
Max. input voltage [V]	1100	1100	1100	--
Max. input current per MPPT [A]	32,0 / 32,0 / 32,0	32,0 / 32,0 / 32,0	32,0 / 32,0 / 40,0	--
Output (AC)				
Rated AC voltage [V]	3L/N/PE, 230/400	3L/N/PE, 230/400	3L/N/PE, 230/400	--
Max. output current [A]	39,9	47,8	52,6	--
Nom. converter output (P _{NINV}) [kW]	25,0	30,0	33,0	--
Rated apparent power [kVA]	25,0	30,0	33,0	--
Interface protection system and interface switch (Network and system protection “NS-protection”)				
Type of protection	integrated NS-protection			
Assigned to generation unit type	blueplanet 25.0 NX3 M3 WM OD IIG0 blueplanet 30.0 NX3 M3 WM OD IIG0 blueplanet 33.0 NX3 M3 WM OD IIG0			
Integrated interface switch	Type of switching equipment 1: Relay (Model HF-176F/12-H3F) Type of switching equipment 2: Relay (Model HF-176F/12-H3F)			
	Note: The output is switched off by the inverter bridge and two relay in series in each line and neutral.			
Firmware version	Master: V610-03041-18.000 Slave: V610-60015-00 Safety: V610-11007-08			

Differences between Generating Units

The models blueplanet 25.0 NX3 M3 WM OD IIG0 and blueplanet 30.0 NX3 M3 WM OD IIG0 and blueplanet 33.0 NX3 M3 WM OD IIG0 are almost identical in hardware and software, expected the components are description as below table and the output power derated by software.

	blueplanet 25.0 NX3 M3 WM OD IIG0, blueplanet 30.0 NX3 M3 WM OD IIG0		blueplanet 33.0 NX3 M3 WM OD IIG0	
Item	Type	Quantity	Type	Quantity
AC current sensor	NACGL.50T-P6/VN	3	NACGL.75T-P6/VN	3
Relay	CHS01-V-112HA2(60G)	6	HF-176F/12-H3F	6
BUS CAP	Jianghai/ECS2YBB321MN4P23555 E (2PIN)	10	Jianghai/ECS2YBB321MN4P23555 E (2PIN)	14
INV inductor	P- CHOKE Taurus 220uH 1,2mm*6mm FeSi NPH60 CLASS F 30K INV U Yunlu/02-05-096-00	1	P- CHOKE Taurus 200uH 1,5mm*8mm FeSi NPH60 CLASS F 40K INV U Yunlu/02-05-087-00	1
	P- CHOKE Taurus 220uH 1,2mm*6mm FeSi NPH60 CLASS F 30K INV V Yunlu/02-05-104-00	1	P- CHOKE Taurus 200uH 1,5mm*8mm FeSi NPH60 CLASS F 40K INV V Yunlu/02-05-091-00	1
	P- CHOKE Taurus 220uH 1,2mm*6mm FeSi NPH60 CLASS F 30K INV W Yunlu/02-05-105-00	1	P- CHOKE Taurus 200uH 1,5mm*8mm FeSi NPH60 CLASS F 40K INV W Yunlu/02-05-092-00	1

The above stated Generating Units are tested according the requirements in the Engineering Recommendation G99/1. Any modification that affects the stated tests must be named by the manufacturer/supplier of the product to ensure that the product meets all requirements of the Engineering Recommendation G99/1.

Operating Range.	
Test 1	Voltage = 85% of nominal (195,5V) Frequency = 47Hz Power Factor = 1 Period of test 20 s
Connection	Always connected
Limit	No disconnection allowed
Test 2	Voltage = 85% of nominal (195,5V) Frequency = 47,5Hz Power Factor = 1 Period of test 90 minutes
Connection	Always connected
Limit	No disconnection allowed
Test 3	Voltage = 110% of nominal (253V) Frequency = 51,5Hz Power Factor = 1 Period of test 90 minutes
Connection	Always connected
Limit	No disconnection allowed
Test 4	Voltage = 110% of nominal (253V) Frequency = 52,0Hz Power Factor = 1 Period of test 15 minutes
Connection	Always connected
Limit	No disconnection allowed
Test 5	Voltage = 100% of nominal (230 V) Frequency = 50,0 Hz Power Factor = 1 Period of test 90 minutes
Connection	Always connected
Limit	No disconnection allowed
Test 6	Confirm that the Power Generating Module is capable of staying connected to the Distribution Network and operate at rates of change of frequency up to 1 Hzs-1 as measured over a period of 500ms. Note that this is not expected to be demonstrated on site.
Connection	Always connected
Limit	No disconnection allowed

Protection. Voltage tests.						
Phase 1						
Function	Setting		Trip test		No trip test	
	Voltage [V]	Time delay [s]	Voltage [V]	Time delay [s]	Voltage / time	Confirm no trip
U/V	184	2,5	184,7	2,542	188V / 5,0s	No trip
					180V / 2,45s	No trip
O/V stage 1	262,2	1,0	262,4	1,027	258,2V 5,0s	No trip
O/V stage 2	273,7	0,5	274,0	0,539	269,7V 0,95s	No trip
					277,7V 0,45s	No trip

Protection. Voltage tests.						
Phase 2						
Function	Setting		Trip test		No trip test	
	Voltage [V]	Time delay [s]	Voltage [V]	Time delay [s]	Voltage / time	Confirm no trip
U/V	184	2,5	184,2	2,519	188V / 5,0s	No trip
					180V / 2,45s	No trip
O/V stage 1	262,2	1,0	261,9	1,037	258,2V 5,0s	No trip
O/V stage 2	273,7	0,5	273,5	0,535	269,7V 0,95s	No trip
					277,7V 0,45s	No trip

Protection. Voltage tests.						
Phase 3						
Function	Setting		Trip test		No trip test	
	Voltage [V]	Time delay [s]	Voltage [V]	Time delay [s]	Voltage / time	Confirm no trip
U/V	184	2,5	183,9	2,555	188V / 5,0s	No trip
					180V / 2,45s	No trip
O/V stage 1	262,2	1,0	262,0	1,021	258,2V 5,0s	No trip
O/V stage 2	273,7	0,5	273,6	0,527	269,7V 0,95s	No trip
					277,7V 0,45s	No trip
Note. For Voltage tests the Voltage required to trip is the setting $\pm 3,45V$. The time delay can be measured at a larger deviation than the minimum required to operate the protection. The No trip tests need to be carried out at the setting $\pm 4V$ and for the relevant times as shown in the table above to ensure that the protection will not trip in error.						

Protection. Frequency tests.						
Function	Setting		Trip test		No trip test	
	Frequency [Hz]	Time delay [s]	Frequency [Hz]	Time delay [s]	Frequency / time	Confirm no trip
U/F stage 1	47,5	20	47,50	20,027	47,7Hz / 30s	No trip
U/F stage 2	47	0,5	47,00	0,536	47,2Hz / 19,5s	No trip
					46,8Hz / 0,45s	No trip
O/F stage 2	52	0,5	52,00	0,535	51,8Hz / 120s	No trip
					52,2Hz / 0,45s	No trip
Note. For Frequency Trip tests the Frequency required to trip is the setting $\pm 0,1Hz$. In order to measure the time delay a larger deviation than the minimum required to operate the projection can be used. The "No-trip tests" need to be carried out at the setting $\pm 0,2Hz$ and for the relevant times as shown in the table above to ensure that the protection will not trip in error.						

Protection. Loss of Mains.

Inverters tested according to BS EN 62116.

Balancing load on islanded network	33% of -5% Q Test 22	66% of -5% Q Test 12	100% of -5% P Test 5	33% of +5% Q Test 31	66% of +5% Q Test 21	100% of +5% P Test 10
Trip time. Ph1 fuse removed [ms]	447	461	482	480	471	479

Note. Trip time limit is 0,5s.

Protection. Re-connection timer.

Test should prove that the reconnection sequence starts in no less than 20 seconds for restoration of voltage and frequency to within the stage 1 settings of table 10.1.

Over Voltage (258,2 V)				
Time delay setting		Measured delay		
60s		62,2s		
Under Voltage (188,0 V)				
Time delay setting		Measured delay		
60s		60,8s		
Over Frequency (51,9 Hz)				
Time delay setting		Measured delay		
60s		61,0s		
Under Frequency (47,6 Hz)				
Time delay setting		Measured delay		
60s		65,6s		
	Checks on no reconnection when voltage or frequency is brought to just outside stage 1 limits of table 1.			
	At 266,2V	At 180,0V	At 47,4Hz	At 52,1Hz
Confirmation that the Generating Unit does not re-connect.	No reconnection	No reconnection	No reconnection	No reconnection

Protection. Frequency change, Stability test.

	Start Frequency [Hz]	Change	Test Duration	Confirm no trip
Positive Vector Shift	49,5	+50 degrees		No trip
Negative Vector Shift	50,5	-50 degrees		No trip
Positive Frequency drift	49,0 to 51,0	+0,95Hz/sec	2,1s	No trip
Negative Frequency drift	51,0 to 49,0	-0,95Hz/sec	2,1s	No trip

Limited Frequency Sensitive Mode – Over Frequency							
1-min mean value [Hz]:	a) 50,00	b) 50,45	c) 50,70	d) 51,15	e) 50,70	f) 50,45	g) 50,00
1. Measurement a) to g): Active power output > 80% P_n							
Frequency [Hz]	50,00	50,45	50,70	51,15	50,70	50,45	50,00
P _{expected} [kW]	N/A	32,67	31,02	28,05	31,02	32,67	N/A
P _{measured} [kW]	33,04	32,57	30,77	27,70	30,77	32,56	33,04
2. Measurement a) to g): Active power output 40% and 60% P_n							
Frequency [Hz]	50,00	50,45	50,70	51,15	50,70	50,45	50,00
P _{expected} [kW]	N/A	16,17	14,52	11,55	14,52	16,17	N/A
P _{measured} [kW]	16,48	16,06	14,40	11,40	14,40	16,06	33,04

Output Power with falling Frequency						
Frequency setpoint [Hz]	50,00	49,50	49,00	48,00	47,60	47,10
Frequency [Hz]	50,00	49,50	49,00	48,00	47,60	47,10
Active power [kW]	33,04	33,03	33,03	33,03	33,03	33,03
ΔP/P _{max} [%]		0,09	0,09	0,09	0,09	0,09
Note. No Power reduction take place for electronic inverter						

Power Quality. Harmonics.

Phase 1						
Generating Unit rating per phase (rpp)			blueplanet 33.0 NX3 M3 WM OD IIG0			
	At 45-55% of rated output 16,5 kW		100% of rated output 33,0kW			
Harmonic	Measured Value (MV) in [A]	Measured Value (MV) in [%]	Measured Value (MV) in [A]	Measured Value (MV) in [%]	Limit in BS EN61000-3-12 in %	
					1 phase	3 phase
2nd	0,153	0,320	0,225	0,471	8%	8%
3rd	0,023	0,049	0,045	0,094	21,6%	N/A
4th	0,019	0,040	0,122	0,255	4%	4%
5th	0,242	0,505	0,461	0,964	10,7%	10,7%
6th	0,017	0,036	0,028	0,059	2,67%	2,67%
7th	0,148	0,310	0,090	0,188	7,2%	7,2%
8th	0,046	0,096	0,142	0,296	2%	2%
9th	0,017	0,036	0,026	0,054	3,8%	N/A
10th	0,009	0,019	0,093	0,194	1,6%	1,6%
11th	0,368	0,770	0,284	0,593	3,1%	3,1%
12th	0,014	0,030	0,024	0,050	1,33%	1,33%
13th	0,075	0,157	0,153	0,319	2%	2%
14th	0,023	0,049	0,091	0,191	N/A	N/A
15th	0,026	0,054	0,029	0,061	N/A	N/A
16th	0,006	0,012	0,097	0,202	N/A	N/A
17th	0,101	0,210	0,069	0,143	N/A	N/A
18th	0,008	0,017	0,019	0,039	N/A	N/A
19th	0,074	0,156	0,279	0,584	N/A	N/A
20th	0,015	0,031	0,058	0,121	N/A	N/A
21th	0,011	0,022	0,018	0,038	N/A	N/A
22th	0,006	0,013	0,073	0,154	N/A	N/A
23th	0,088	0,184	0,105	0,220	N/A	N/A
24th	0,005	0,011	0,016	0,033	N/A	N/A
25th	0,084	0,177	0,195	0,408	N/A	N/A
26th	0,016	0,032	0,053	0,110	N/A	N/A
27th	0,008	0,017	0,018	0,037	N/A	N/A
28th	0,017	0,036	0,081	0,170	N/A	N/A
29th	0,096	0,202	0,116	0,243	N/A	N/A
30th	0,005	0,010	0,020	0,042	N/A	N/A
31th	0,078	0,163	0,312	0,653	N/A	N/A
32th	0,023	0,048	0,062	0,129	N/A	N/A
33th	0,007	0,015	0,023	0,049	N/A	N/A
34th	0,017	0,036	0,055	0,116	N/A	N/A
35th	0,057	0,120	0,108	0,226	N/A	N/A
36th	0,004	0,008	0,024	0,050	N/A	N/A
37th	0,046	0,096	0,282	0,589	N/A	N/A
38th	0,015	0,031	0,055	0,115	N/A	N/A
39th	0,006	0,012	0,024	0,051	N/A	N/A
40th	0,010	0,020	0,098	0,204	N/A	N/A
THD ₄₀ [%]	--	1,163	--	1,997	23%	13%
PWHD [%]	--	2,651	--	8,187	23%	22%

Power Quality. Harmonics.						
Phase 2						
Generating Unit rating per phase (rpp)			blueplanet 33.0 NX3 M3 WM OD IIG0			
	At 45-55% of rated output 16,5 kW		100% of rated output 33,0kW			
Harmonic	Measured Value (MV) in [A]	Measured Value (MV) in [%]	Measured Value (MV) in [A]	Measured Value (MV) in [%]	Limit in BS EN61000-3-12 in %	
					1 phase	3 phase
2nd	0,139	0,292	0,245	0,511	8%	8%
3rd	0,130	0,271	0,049	0,103	21,6%	N/A
4th	0,017	0,035	0,101	0,210	4%	4%
5th	0,247	0,517	0,478	0,999	10,7%	10,7%
6th	0,017	0,035	0,041	0,087	2,67%	2,67%
7th	0,148	0,310	0,105	0,219	7,2%	7,2%
8th	0,039	0,081	0,143	0,298	2%	2%
9th	0,063	0,132	0,063	0,132	3,8%	N/A
10th	0,020	0,043	0,114	0,238	1,6%	1,6%
11th	0,354	0,741	0,297	0,620	3,1%	3,1%
12th	0,009	0,019	0,033	0,070	1,33%	1,33%
13th	0,079	0,166	0,145	0,304	2%	2%
14th	0,022	0,046	0,075	0,157	N/A	N/A
15th	0,025	0,052	0,052	0,110	N/A	N/A
16th	0,007	0,014	0,095	0,198	N/A	N/A
17th	0,108	0,226	0,080	0,167	N/A	N/A
18th	0,009	0,020	0,028	0,058	N/A	N/A
19th	0,078	0,162	0,284	0,593	N/A	N/A
20th	0,019	0,040	0,074	0,155	N/A	N/A
21th	0,012	0,025	0,029	0,061	N/A	N/A
22th	0,013	0,028	0,063	0,131	N/A	N/A
23th	0,080	0,167	0,113	0,236	N/A	N/A
24th	0,004	0,009	0,021	0,045	N/A	N/A
25th	0,090	0,188	0,216	0,451	N/A	N/A
26th	0,016	0,034	0,067	0,140	N/A	N/A
27th	0,009	0,020	0,026	0,054	N/A	N/A
28th	0,021	0,045	0,067	0,140	N/A	N/A
29th	0,085	0,179	0,121	0,252	N/A	N/A
30th	0,008	0,016	0,030	0,062	N/A	N/A
31th	0,077	0,161	0,309	0,646	N/A	N/A
32th	0,020	0,042	0,090	0,188	N/A	N/A
33th	0,011	0,023	0,028	0,058	N/A	N/A
34th	0,019	0,040	0,034	0,071	N/A	N/A
35th	0,050	0,105	0,115	0,241	N/A	N/A
36th	0,007	0,015	0,034	0,071	N/A	N/A
37th	0,037	0,078	0,275	0,575	N/A	N/A
38th	0,014	0,029	0,091	0,190	N/A	N/A
39th	0,009	0,018	0,028	0,059	N/A	N/A
40th	0,011	0,023	0,066	0,138	N/A	N/A
THD ₄₀ [%]	--	1,176	--	2,054	23%	13%
PWHD [%]	--	2,584	--	8,262	23%	22%

Power Quality. Harmonics.

Phase 3						
Generating Unit rating per phase (rpp)			blueplanet 33.0 NX3 M3 WM OD IIG0			
	At 45-55% of rated output 16,5 kW		100% of rated output 33,0kW			
Harmonic	Measured Value (MV) in [A]	Measured Value (MV) in [%]	Measured Value (MV) in [A]	Measured Value (MV) in [%]	Limit in BS EN61000-3-12 in %	
					1 phase	3 phase
2nd	0,052	0,109	0,114	0,239	8%	8%
3rd	0,120	0,251	0,052	0,110	21,6%	N/A
4th	0,008	0,017	0,129	0,269	4%	4%
5th	0,206	0,432	0,435	0,910	10,7%	10,7%
6th	0,015	0,032	0,040	0,083	2,67%	2,67%
7th	0,136	0,284	0,074	0,155	7,2%	7,2%
8th	0,033	0,069	0,162	0,338	2%	2%
9th	0,048	0,100	0,076	0,158	3,8%	N/A
10th	0,016	0,034	0,109	0,228	1,6%	1,6%
11th	0,343	0,716	0,333	0,696	3,1%	3,1%
12th	0,008	0,018	0,026	0,054	1,33%	1,33%
13th	0,078	0,162	0,153	0,321	2%	2%
14th	0,019	0,041	0,082	0,171	N/A	N/A
15th	0,006	0,012	0,061	0,127	N/A	N/A
16th	0,007	0,016	0,081	0,168	N/A	N/A
17th	0,102	0,214	0,092	0,191	N/A	N/A
18th	0,005	0,011	0,023	0,048	N/A	N/A
19th	0,076	0,159	0,268	0,560	N/A	N/A
20th	0,017	0,035	0,060	0,125	N/A	N/A
21th	0,013	0,028	0,022	0,045	N/A	N/A
22th	0,010	0,022	0,063	0,131	N/A	N/A
23th	0,071	0,148	0,116	0,243	N/A	N/A
24th	0,006	0,012	0,025	0,052	N/A	N/A
25th	0,091	0,191	0,203	0,425	N/A	N/A
26th	0,014	0,030	0,058	0,122	N/A	N/A
27th	0,004	0,008	0,025	0,051	N/A	N/A
28th	0,017	0,036	0,063	0,133	N/A	N/A
29th	0,076	0,160	0,118	0,246	N/A	N/A
30th	0,005	0,011	0,039	0,082	N/A	N/A
31th	0,090	0,188	0,312	0,653	N/A	N/A
32th	0,014	0,030	0,067	0,141	N/A	N/A
33th	0,007	0,016	0,031	0,064	N/A	N/A
34th	0,020	0,041	0,038	0,080	N/A	N/A
35th	0,050	0,106	0,116	0,243	N/A	N/A
36th	0,006	0,012	0,038	0,079	N/A	N/A
37th	0,047	0,097	0,268	0,560	N/A	N/A
38th	0,011	0,022	0,079	0,165	N/A	N/A
39th	0,008	0,017	0,031	0,065	N/A	N/A
40th	0,011	0,022	0,098	0,204	N/A	N/A
THD ₄₀ [%]	--	1,070	--	1,972	23%	13%
PWHD [%]	--	2,565	--	8,100	23%	22%

Power Quality. Power factor.

Output power	216,2V	230V	253V	Measured at three voltage levels and at full output. Voltage to be maintained within $\pm 1,5\%$ of the stated level during the test.
20%	0,998	0,998	0,993	
50%	1,000	0,999	0,999	
75%	1,000	1,000	0,999	
100%	1,000	1,000	0,999	
Limit	>0,95	>0,95	>0,95	

Power Quality. Voltage fluctuation and Flicker.

		Starting			Stopping			Running	
		dmax	dc	d(t)	dmax	dc	d(t)	Pst	Plt 2 hours
Measured values at test impedance	L1	0,920	0,171	0,000	0,920	0,171	0,000	0,342	0,310
Measured values at standard impedance	L1	0,920	0,171	0,000	0,920	0,171	0,000	0,342	0,310
Values for maximum impedance	L1	0,920	0,171	0,000	0,920	0,171	0,000	0,342	0,310
Measured values at test impedance	L2	0,616	0,142	0,000	0,616	0,142	0,000	0,257	0,254
Measured values at standard impedance	L2	0,616	0,142	0,000	0,616	0,142	0,000	0,257	0,254
Values for maximum impedance	L2	0,616	0,142	0,000	0,616	0,142	0,000	0,257	0,254
Measured values at test impedance	L3	0,617	0,127	0,000	0,617	0,127	0,000	0,252	0,251
Measured values at standard impedance	L3	0,617	0,127	0,000	0,617	0,127	0,000	0,252	0,251
Values for maximum impedance	L3	0,617	0,127	0,000	0,617	0,127	0,000	0,252	0,251
Limits set under BS EN 61000-3-11		4%	3,3%	3,3% 500ms	4%	3,3%	3,3% 500ms	1,0	0,65
Test impedance		R	0,240	Ω		XI	0,150	Ω	
		Z	0,283	Ω					
Standard impedance		R	0,240	Ω		XI	0,150	Ω	
		Z	0,283	Ω					
Maximum impedance		R	0,240	Ω		XI	0,150	Ω	
		Zmax	0,283	Ω					

Power Quality. DC injection.			
blueplanet 25.0 NX3 M3 WM OD IIG0			
Phase 1			
Test level power [%]	10	55	100
Recorded value [mA]	80,614	74,685	88,751
Recorded value [%]	0,22	0,21	0,24
Limit [%]	0,25	0,25	0,25
Phase 2			
Test level power [%]	10	55	100
Recorded value [mA]	81,031	79,676	86,451
Recorded value [%]	0,22	0,22	0,24
Limit [%]	0,25	0,25	0,25
Phase 3			
Test level power [%]	10	55	100
Recorded value [mA]	79,262	79,916	84,864
Recorded value [%]	0,22	0,22	0,23
Limit [%]	0,25	0,25	0,25
Note. Informative measurement of DC-injection of each phase of the inverter and a limit of 0,25% per phase of the rated current per phase as pass criteria.			
Sum of all Phases Tests are carried out at three defined power levels $\pm 5\%$. At 230 V a 25,0 kW three phase Inverter has a current output of 108,696 A so DC limit is 271,740 mA. These tests is undertaken in accordance with Annex A.7.1.4.4. The % DC injection ("as % of rated AC current" below) is calculated as follows: $\% \text{ DC injection} = \text{Recorded DC value in Amps} / \text{Base current where the base current is the Registered Capacity (W) / V phase.}$ The % DC injection should not be greater than 0,25%.			
Sum of all Phases			
Test level power [%]	10	55	100
Recorded value [mA]	240,908	234,276	260,066
Recorded value [%]	0,22	0,22	0,24
Limit [%]	0,25	0,25	0,25

Power Quality. DC injection.			
blueplanet 33.0 NX3 M3 WM OD IIG0			
Phase 1			
Test level power [%]	10	55	100
Recorded value [mA]	99,710	110,425	113,303
Recorded value [%]	0,21	0,23	0,24
Limit [%]	0,25	0,25	0,25
Phase 2			
Test level power [%]	10	55	100
Recorded value [mA]	86,276	112,324	108,128
Recorded value [%]	0,18	0,23	0,23
Limit [%]	0,25	0,25	0,25
Phase 3			
Test level power [%]	10	55	100
Recorded value [mA]	107,772	112,539	107,113
Recorded value [%]	0,23	0,24	0,22
Limit [%]	0,25	0,25	0,25
Note. Informative measurement of DC-injection of each phase of the inverter and a limit of 0,25% per phase of the rated current per phase as pass criteria.			
Sum of all Phases Tests are carried out at three defined power levels $\pm 5\%$. At 230 V a 33 kW three phase Inverter has a current output of 143,478 A so DC limit is 358,696 mA. These tests is undertaken in accordance with Annex A.7.1.4.4. The % DC injection ("as % of rated AC current" below) is calculated as follows: $\% \text{ DC injection} = \text{Recorded DC value in Amps} / \text{Base current where the base current is the Registered Capacity (W) / V phase.}$ The % DC injection should not be greater than 0,25%.			
Sum of all Phases			
Test level power [%]	10	55	100
Recorded value [mA]	293,758	335,288	328,544
Recorded value [%]	0,20	0,23	0,23
Limit [%]	0,25	0,25	0,25

Fault level Contribution.

Phase 1

For a directly coupled SSEG			For a Inverter SSEG		
Parameter	Symbol	Value	Time after fault	Volts [V]	Amps [A]
Peak Short Circuit current	I_p	N/A	20ms	10,91	4,58
Initial Value of aperiodic current	A	N/A	100ms	11,85	-0,07
Initial symmetrical short-circuit current*	I_k	N/A	250ms	-12,83	-0,17
Decaying (aperiodic) component of short circuit current*	i_{DC}	N/A	500ms	11,42	-0,12
Reactance/Resistance Ratio of source*	X/R	N/A	Time to Trip [s]	0,082	

Phase 2

Parameter	Symbol	Value	Time after fault	Volts [V]	Amps [A]
Peak Short Circuit current	I_p	N/A	20ms	-12,35	-0,06
Initial Value of aperiodic current	A	N/A	100ms	-12,69	-0,07
Initial symmetrical short-circuit current*	I_k	N/A	250ms	11,51	-0,11
Decaying (aperiodic) component of short circuit current*	i_{DC}	N/A	500ms	-12,56	-0,06
Reactance/Resistance Ratio of source*	X/R	N/A	Time to Trip [s]	0,082	

Phase 3

Parameter	Symbol	Value	Time after fault	Volts [V]	Amps [A]
Peak Short Circuit current	I_p	N/A	20ms	1,59	-4,92
Initial Value of aperiodic current	A	N/A	100ms	1,10	-0,01
Initial symmetrical short-circuit current*	I_k	N/A	250ms	1,25	-0,11
Decaying (aperiodic) component of short circuit current*	i_{DC}	N/A	500ms	1,29	-0,17
Reactance/Resistance Ratio of source*	X/R	N/A	Time to Trip [s]	0,082	

For rotating machines and linear piston machines the test should produce a 0s – 2s plot of the short circuit current as seen at the Generating Unit terminals.

* Values for these parameters should be provided where the short circuit duration is sufficiently long to enable interpolation of the plot.

Self Monitoring – Solid state switching.	N/A
It has been verified that in the event of the solid state switching device failing to disconnect the Power Park Module, the voltage on the output side of the switching device is reduced to a value below 50 volts within 0,5 seconds.	N/A
Note. Unit do not provide solid state switching relays. In case the semiconductor bridge is switched off, then the voltage on the output drops to 0. In this case the relays on the output will also open (Functional safety of the internal automatic disconnection device according to VDE 0124-100).	

Cyber security	P
Confirm that the Manufacturer or Installer of the Micro-generator has provided a statement describing how the Micro-generator has been designed to comply with cyber security requirements, as detailed in 9.7.	Yes



CERTIFICAT D'EXAMEN UE DE TYPE
EU TYPE EXAMINATION CERTIFICATE



N°: RED_1020

Etabli selon l'article 17 (Annexe III) de la directive RED 2014/53/UE du 16 avril 2014
Established under Article 17 Annex III of Directive RED 2014/53/UE of 16 April 2014.

Numéro de l'organisme / Notified Body Identification Number: 0081
Règles de certification : Référentiel de certification RED / Certification program : RED Certification Rules

Titulaire / Applicant	KACO new energy GmbH Werner-von-Siemens-Allee 1, 74172 NECKARSULM Germany
Fabricant / Manufacturer	KACO new energy GmbH Werner-von-Siemens-Allee 1, 74172 NECKARSULM Germany
Equipement / Equipment	Onduleur / Inverter Grid-connected PV inverter
Produit / Product	
Marque commerciale / Trade Mark	KACO new energy
Modèle / Model	Voir annexe / See annex Version: Cyber Security Baseline 1.00.000
Composition du (of) document	3 pages
Document émis le / issued on	12/06/2025

Signature sous la responsabilité de l'organisme :

Signature on behalf of Notified Body by

Gilles DEMONNIER

Responsable Certification / Certification Officer

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FRANCE

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Annexe / Annex

Product Family Series

The list of products below implements the same identical RF module and IoT solution as the tested model. The only difference is the lighting type controlled by the RF module.

Modèle / Model
blueplanet 50.0 NX3 M5 WM OD IIG0
blueplanet 60.0 NX3 M5 WM OD IIG0
blueplanet 25.0 NX3 M3 WM OD IIG0
blueplanet 30.0 NX3 M3 WM OD IIG0
blueplanet 33.0 NX3 M3 WM OD IIG0
blueplanet hybrid 6.0 NH3 M2 B1 WM OD IIG0
blueplanet hybrid 8.0 NH3 M2 B1 WM OD IIG0
blueplanet hybrid 10.0 NH3 M2 B1 WM OD IIG0
blueplanet hybrid 12.0 NH3 M2 B1 WM OD IIG0
blueplanet hybrid 8.0 NH3 M3 B1 WM OD IIG0
blueplanet hybrid 10.0 NH3 M3 B1 WM OD IIG0
blueplanet hybrid 12.0 NH3 M3 B1 WM OD IIG0
KACO blueplanet 3.0 NX3 M2 WM OD IIG0
KACO blueplanet 5.0 NX3 M2 WM OD IIG0
KACO blueplanet 8.0 NX3 M2 WM OD IIG0
KACO blueplanet 10.0 NX3 M2 WM OD IIG0
KACO blueplanet 15.0 NX3 M2 WM OD IIG0
KACO blueplanet 20.0 NX3 M2 WM OD IIG0

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Note:

Different levels of access, all are password protected, only certain parameters can be changed on maintenance level.

Logic Interface (input port) Required by paragraph 11.1.3.1	P
Confirm that an input port is provided and can be used to reduce the Active Power output to zero	Yes
Note. Manufacturer information provided.	
Provide high level description of logic interface, e.g. details in 11.1.3.1 such as AC or DC signal	Yes
<p>Logic Interface is implemented by pin 7 and pin 8 of COM port (Figure 4).</p> <p>Pin 7 and pin 8 are connected to the switch or contactor. Pin 8 is defined as GND, and pin 7 is defined as Remote off.</p> <p>When the switch is closed, the generating module can work normally.</p> <p>When the switch is opened, the logical port has a DC voltage of 3V, and the power module reduces the active power to zero within 5 seconds.</p> <p>Open the corresponding APP for these devices.</p> <ol style="list-style-type: none"> 1. Select <Select inverter> in the < Communication unit> menu and view the <External input signal> via the <Settings for> menu. 2. Enable the <External input signal> function. <p>» NS Protection operation is enabled.</p>	
	