



**BUREAU
VERITAS**

Certificate for the NS protection

Manufacturer / applicant: KACO new energy GmbH
Carl-Zeiss-Straße 1
74172 Neckarsulm
Germany

Type of grid and plant protection:	Integrated NS protection
Assigned to generation unit type:	blueplanet hybrid BSS 10.0
Info:	The battery storage system consists of the inverter blueplanet gs 10.0TL3 M2B1 WM ID IIGS, the accessory blueplanet 1.0 EMAS and the referenced battery models described on page 3 of this certificate

Firmware version: Controller: 4.7; Com: 4.1

Connection rule: VDE-AR-N 4105:2018-11 – Power generation systems connected to the low-voltage distribution network

Technical minimum requirements for the connection to and parallel operation with low-voltage distribution networks.

Applicable standards / directives: DIN VDE V 0124-100 (VDE V 0124-100):2019-11 – Grid integration of power generation systems – low voltage

Test requirements for power generation units to be connected and operated parallel with the low-voltage distribution networks

The above mentioned grid and plant protection has been tested and certified according to the test guideline VDE 0124-100. The electrical properties required in the connection rule are satisfied.

- Setting values and disconnect times
- Properly functioning functional chain "NS protection – interface switch"
- Technical requirements of the switching device
- Passive detection of stand-alone power systems
- Single-fault tolerance

The certificate contains the following information:

- Technical specifications of the NS protection and corresponding power generation types
- Setting values of the protection functions
- Trip values of the protection functions

BV project number: 19TH0305-ARN4105-2018_1

Certification program: NSOP-0032-DEU-ZE-V01

Certificate number: U20-0294

Date of issue: 2020-04-23

Certification body



Holger Schaffer

Certification body of Bureau Veritas Consumer Products Services Germany GmbH Accredited according to DIN EN ISO/IEC 17065

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Deutsche
Akkreditierungsstelle
D-ZE-12024-01-00

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

Extract from test report for NS protection
"Determination of electrical properties"

Nr. 19TH0305-ARN4105-2018_1

NS protection as integrated NS protection

Manufacturer / applicant:	KACO new energy GmbH Werner-von-Siemens-Allee 1 74172 Neckarsulm Germany
Type of grid and plant protection:	Integrated NS protection
Assigned to generation unit type:	blueplanet hybrid BSS 10.0
Firmware version:	Controller: 4.7; Com: 4.1
Integrated interface switch:	Type of switching equipment 1: Relay Type of switching equipment 2: Relay
Measurement period:	2019-05-15 to 2019-11-06

Inverter / direct coupled synchrone and asynchrone generators with $P_n > 50kW$

Protection function	Setting value	Trip value	Disconnection time ^a
Voltage drop protection U <	184,0 V	182,7 V	3000 ms
Voltage drop protection U <<	103,5 V	102,6 V	325 ms
Rise-in-voltage protection U >	253,0 V	--	524 s ^b
Rise-in-voltage protection U >>	287,5 V	285,6 V	199 ms
Frequency decrease protection f <	47,50 Hz	47,50 Hz	142 ms
Frequency increase protection f >	51,50 Hz	51,50 Hz	142 ms

^a proper time of interface switch 2 ms

^b longest disconnection of the rise-in-voltage protection as a moving 10-minute-average, tested according clause 5.5.7 Protection devices and protection settings of VDE 0124-100

The disconnect time (sum of trip time of grid and plant protection and delay time of interface switch) must not exceed 200 ms.

A check of the overall functional chain "NS protection – interface switch" resulted in a successful disconnection.

The above mentioned grid and plant protection with the assigned power generation units has met the requirements for islanding detection with the help of the passive method (three-phase voltage monitoring).

The above mentioned NS protection meets the requirements for synchronization.

The inverter listed above may be installed with the following batteries:		
Manufacturer:	Energy Depot	BYD
Accumulator Model / Battery Model:	DOMUS 2.5 / DOMUS 3.6 / DOMUS 4.1	Battery-Box H 5.1 / H 6.4 / H 7.7 / H 9.0 / H 10.2
Capacity of each battery module (kWh):	5,0 – 20,0 / 7,2 – 28,4 / 8,2 – 32,8	5,12 / 6,40 / 7,68 / 8,96 / 10,24
Number(s) of battery modules recommended by the manufacturer:	2 – 8	4 / 5 / 6 / 7 / 8
<p>Note: The batteries are not integrated into the inverter and must be installed according to the local regulations.</p>		
The inverter listed above may be installed with the following accessories:		
Manufacturer:	KACO new energy GmbH	
Type:	blueplanet 1.0 EMAS	