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Certification body of BV CPS GmbH
Accredited according to EN 45011 -
ISO / IEC Guide 65

Certificate of conformity NS protection

Manufacturer / applicant: Kaco new energy GmbH
Carl-Zeiss-Straße 1
74172 Neckarsulm
Deutschland

Type of grid and plant protection:	Integrated NS protection
Assigned to generation unit type:	Powador 6.0TL3 – INT - A, Powador 7.8TL3 – INT - A, Powador 9.0TL3 – INT - A, Powador 10.0TL3 – INT - A, Powador 12.0TL3 – INT, Powador 14.0TL3 – INT, Powador 18.0TL3 – INT, Powador 20.0TL3 – INT

Firmware version: PKT: v2.15; ARM: v2.16 (2BED); CFG: v5.0442 (FD53); DSP-AC: v1.58 (5558); DSP-DC: v1.54 (814B)

Connection rule: **VDE-AR-N 4105:2011-08 – 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): 2012-07 – 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
- Active 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: 10TH0306

Certificate number: U13-0684

Date of issue: 2013-10-16

Valid until: 2016-10-15

Certification body

Dieter Zitzmann

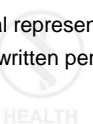


Deutsche
Akkreditierungsstelle
D-ZE-12024-01-01

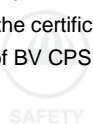
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QUALITY



HEALTH



SAFETY



ENVIRONMENT



SOCIAL
ACCOUNTABILITY



F.4 Requirements for the test report for the NS protection

Extract from test report for NS protection Nr. 10TH0306
 "Determination of electrical properties"

NS protection as integrated NS protection

Manufacturer / applicant:	Kaco new energy GmbH Carl-Zeiss-Straße 1 74172 Neckarsulm Deutschland
Type of grid and plant protection:	Integrated NS protection
Assigned to generation unit type:	Powador 6.0TL3 – INT - A, Powador 7.8TL3 – INT - A, Powador 9.0TL3 – INT - A, Powador 10.0TL3 – INT - A, Powador 12.0TL3 – INT, Powador 14.0TL3 – INT, Powador 18.0TL3 – INT, Powador 20.0TL3 – INT
Firmware version:	PKT: v2.15; ARM: v2.16 (2BED); CFG: v5.0442 (FD53); DSP-AC: v1.58 (5558); DSP-DC: v1.54 (814B)
Integrated interface switch:	Type of switching equipment 1: PCFN-112H2MG Type of switching equipment 2: PCFN-112H2MG
Measurement period:	2012-05-23 to 2013-07-12

Protection function	Setting value	Trip value	Disconnection time
Voltage drop protection U <	184V	184,8 V	199 ms
Rise-in-voltage protection U>	253 V	---	509,4 s ^a
Rise-in-voltage protection U>>	264 V	264,1 V	200 ms
Frequency decrease protection f<	47,50 Hz	47,50 Hz	168 ms
Frequency increase protection f>	51,5Hz	51,48 Hz	200 ms

^a longest disconnection of the rise-in-voltage protection as a moving 10-minute-average, tested according clause 5.4.5.3.3 measurement a) 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 active method (resonant circuit test).
 The above mentioned NS protection meets the requirements for synchronization.