



Bureau Veritas
Consumer Products Services
Germany GmbH
Businesspark A96
86842 Türkheim
Germany
+ 49 (0) 4074041-0
cps-tuerkheim@de.bureauveritas.com

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

Certificate of conformity NS protection

Manufacturer / applicant: Delta Energy Systems (Germany) GmbH
Tscheulinstr. 21
79331 Teningen
Germany

Type of grid and plant protection:	Integrated NS protection	
Assigned to generation unit type:	SOL10.0-1TR3-E4	SOL11.0-1TR3-E4

Firmware version: SYS 1.2.27, DC 2.2.20, AC 2.2.20

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
- 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: 11TH0120

Certificate number: U13-0180

Date of issue: 2013-03-26

Valid until: 2016-03-25

Certification body

Dieter Zitzmann

(A partial representation of the certificate requires
the written permission of BV CPS GmbH)





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

Extract from test report for NS protection Nr. 11TH0120
 “Determination of electrical properties”

NS protection as integrated NS protection

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Type of grid and plant protection:	Integrated NS protection		
Assigned to generation unit type:	SOL10.0-1TR3-E4	SOL11.0-1TR3-E4	
Firmware version:	SYS 1.2.27, DC 2.2.20, AC 2.2.20		
Integrated interface switch:	Type of switching equipment 1: Transformer Type of switching equipment 2: Relay		
Measurement period:	2011-11-21 til 2013-03-14		

Protection function	Setting value	Trip value	Disconnection time ^a
Voltage drop protection U <	184 V	183,6 V	171 ms
Rise-in-voltage protection U>	253 V	---	143,6 s ^a
Rise-in-voltage protection U>>	264 V	264,4 V	171 ms
Frequency decrease protection f<	47,50 Hz	47,51 Hz	193 ms
Frequency increase protection f>	51,50 Hz	51,50 Hz	176 ms

^a longest disconnection of the rise-in-voltage protection as a moving 10-minute-average

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).