



**BUREAU
VERITAS**

Certificate for the NS protection

Manufacturer / applicant: SMA Solar Technology AG
Sonnallee 1
34266 Niestetal
Germany

Type of grid and plant protection:	Integrated NS protection	
Assigned to generation unit type:	STP3.0-3AV-40 STP4.0-3AV-40 STP5.0-3AV-40	STP6.0-3AV-40 STP8.0-3AV-40 STP10.0-3AV-40

Firmware version: beginning with V03.10.10.R

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):2019-09 – 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
- Technical requirements of the switching device
- Integrated interface switch that can also be used in conjunction with a central interface protection relay (VDE-AR-N 4105:2018-11 §6.4.1)
- Active detection of unintended islanding
- Single-fault tolerance

The certificate contains the following information:

- Technical specifications of the NS protection
- Setting values of the protection functions
- Trip values of the protection functions

BV project number: 18TH0325-VDE-0124-100_0

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

Certificate number: U20-0459

Date of issue: 2020-06-17

Certification body



Thomas Lammel



Deutsche
Akkreditierungsstelle
D-ZE-12024-01-00

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

A partial representation of the certificate requires the written permission of Bureau Veritas Consumer Products Services Germany GmbH

E.6 and E.7 Requirements for the test report for the NS protection

Extract from test report for NS protection Nr. 18TH0325-VDE-0124-100_0
 “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:	STP3.0-3AV-40 STP4.0-3AV-40 STP5.0-3AV-40	STP6.0-3AV-40 STP8.0-3AV-40 STP10.0-3AV-40	
Firmware version:	beginning with V03.10.10.R		
Integrated interface switch:	Type of switching equipment 1: Relay Type of switching equipment 2: Relay		
Measurement period:	2020-03-03 to 2020-06-08		

Inverter STP6.0-3AV-40			
Protection function	Setting value	Trip value	Disconnection time a
Voltage drop protection U <	184,0 V	184,0 V	3037 ms
Voltage drop protection U <<	103,5 V	103,4 V	337 ms
Rise-in-voltage protection U >	253,0 V	--	515 s ^b
Rise-in-voltage protection U >>	287,5 V	289,1 V	137 ms
Frequency decrease protection f <	47,50 Hz	47,50 Hz	165 ms
Frequency increase protection f >	51,50 Hz	51,50 Hz	171 ms

Inverter STP10.0-3AV-40			
Protection function	Setting value	Trip value	Disconnection time a
Voltage drop protection U <	184,0 V	183,5 V	3036 ms
Voltage drop protection U <<	103,5 V	102,7 V	336 ms
Rise-in-voltage protection U >	253,0 V	--	502 s ^b
Rise-in-voltage protection U >>	287,5 V	288,1 V	136 ms
Frequency decrease protection f <	47,50 Hz	47,50 Hz	165 ms
Frequency increase protection f >	51,50 Hz	51,50 Hz	171 ms

^a proper time of interface switch 5 ms(STP6.0-3AV-40)
^a proper time of interface switch 10 ms (STP10.0-3AV-40)
^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 active method (resonant circuit test).
 The above mentioned NS protection meets the requirements for synchronization.