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Certificate for the NS protection

Manufacturer / applicant: SolarEdge Technologies Ltd.
1 HaMada Street
Herzliya 4673335
Israel

Type of grid and plant protection:	Integrated NS protection
Assigned to generation unit type:	SE5K-RWB48 SE7K-RWB48 SE8K-RWB48 SE10K-RWB48

Firmware version: DSP 1: 1.20, DSP 2: 2.20

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):2020-06 – 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
- 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 and corresponding power generation types
- Setting values of the protection functions
- Trip values of the protection functions

Report number: 22TH0188-VDE-0124-100_0

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

Certificate number: U23-0361

Date of issue: 2023-04-28



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

Testing laboratory accredited according to DIN EN ISO/IEC 17025

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Annex to the Certificate for the NS-protection No. U23-0361

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

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

Nr. 22TH0188-VDE-0124-100_0

NS protection as integrated NS protection

Manufacturer / applicant:	SolarEdge Technologies Ltd. 1 HaMada Street Herzliya 4673335 Israel
Type of grid and plant protection:	integrated NS protection
Assigned to generation unit type:	SE5K-RWB48 SE7K-RWB48 SE8K-RWB48 SE10K-RWB48
Firmware version:	DSP 1: 1.20, DSP 2: 2.20
Integrated interface switch:	Type of switching equipment 1: Relay Type of switching equipment 2: Relay
Measurement period:	2022-05-01 – 2022-11-09

Inverter

Protection function	Setting value	Trip value	Disconnection time ^a
Voltage drop protection $U <$	184,0 V	183,3 V	3,076 s
Voltage drop protection $U <<$	103,5 V	102,7 V	0,376 s
Rise-in-voltage protection $U >$	253,0 V	--	486 s ^b
Rise-in-voltage protection $U >>$	287,5 V	287,1 V	0,163 s
Frequency decrease protection $f <$	47,50 Hz	47,50 Hz	0,186 s
Frequency increase protection $f >$	51,50 Hz	51,50 Hz	0,193 s

^a proper time of interface switch 10 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 active method (resonant circuit test).

The above-mentioned NS protection meet the requirements for synchronization.