



**BUREAU
VERITAS**

Certificate of compliance

Applicant: SMA Solar Technology AG
Sonnentallee 1
34266 Niestetal
Germany

Product: Photovoltaic (PV) inverter and Battery Inverter

Model: SHP 75-10 STPS60-10

Use in accordance with regulations:

Automatic disconnection device with three-phase mains surveillance in accordance with EN50549-1:2019 for photovoltaic systems with a three-phase parallel coupling via an inverter in the public mains supply. The automatic disconnection device is an integral part of the aforementioned inverter.

Applied rules and standards:

EN 50549-1:2019, I.S. EN 50549-1:2019

Requirements for parallel connection of installations with distribution networks - Part 1: Connection to an LV distribution network - Production of installations up to and including Type B

- 4.4 Normal operating range
- 4.5 Immunity to disturbances
- 4.6 Active response to frequency deviation
- 4.7 Power response to voltage variations and voltage changes
- 4.8 EMC and power quality
- 4.9 Interface protection
- 4.10 Connection and starting to generate electrical power
- 4.11 Ceasing and reduction of active power on set point
- 4.13 Requirements regarding single fault tolerance of interface protection system and interface switch

EN 50438:2013, I.S. EN 50438:2013

Requirements for micro-generating plants to be connected in parallel with public low-voltage distribution networks

DIN V VDE V 0126-1-1:2006 (4.1 Functional safety)

Automatic disconnection device between a generator and the public low-voltage grid

At the time of issue of this certificate the safety concept of an aforementioned representative product corresponds to the valid safety specifications for the specified use in accordance with regulations.

Report number: 14TH0075-EN50549-1_2 **Certification Program:** NSOP-0032-DEU-ZE-V01
Certificate number: U21-0619 **Date of issue:** 2021-07-02

Certification body

Thomas Lammel



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

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



Appendix

Extract from test report according to EN 50549-1 Nr. 14TH0075-EN50549-1_2

Type Approval and declaration of compliance with the requirements of EN 50549-1.

| | |
|----------------------------------|---|
| Manufacturer / applicant: | SMA Solar Technology AG Sonnentallee 1 34266 Niestetal Germany |
|----------------------------------|---|

| Micro-generator Type | Photovoltaic inverter | Battery inverter |
|-----------------------------------|-----------------------|------------------|
| | SHP 75-10 | STPS60-10 |
| MPP DC voltage range [V] | 570 - 800 | -- |
| Input DC voltage range [V] | 565 - 1000 | -- |
| Input DC current [A] | 140 | -- |
| Output AC voltage [V] | 400 (3P + PE) | 400 (3P + PE) |
| Output AC current [A] | 109 | 109 |
| Output power [VA] | 75000 | 75000 |
| Max. DC Charging power [W] | N/A | 60000 |
| DC voltage range [V] | N/A | 575 – 1000 |
| Max. DC current [A] | N/A | 140 |

| | |
|-------------------------|-------------------------|
| Firmware version | Beginning with 2.02.008 |
|-------------------------|-------------------------|

| | |
|----------------------------|--|
| Measurement period: | 2021-04-14 to 2021-06-15 2020-07-27 to 2020-07-31 2019-11-12 2019-09-25 to 2019-09-27 2018-08-03 to 2018-08-05 2018-05-14 to 2018-05-22 2018-03-09 to 2018-03-14 |
|----------------------------|--|

Description of the structure of the power generation unit:
 The power generation unit is equipped with a PV and line-side EMC filter. The power generation unit has no galvanic isolation between DC input and AC output. Output switch-off is performed with single-fault tolerance based on two series-connected relays in each line and neutral. This enables a safe disconnection of the power generation unit from the network in case of error.



Appendix

Extract from test report according to EN 50549-1

Nr. 14TH0075-EN50549-1_2

Setting of the interface protection:

| Parameter | Min. disconnection time | Max. disconnection time | Min. operate value | Max. operate value | Standard set value |
|---|--|-------------------------|--------------------|--------------------|---|
| Over voltage (stage 1) ^a | 0,1s | 100s | 1,0V _n | 1,2V _n | 0,5s/253,0V |
| Over voltage (stage 2) | 0,1s | 5s | 1,0V _n | 1,3V _n | N/A |
| Under voltage (stage 1) | 0,1s | 100s | 0,2V _n | 1,0V _n | 0,5s/207,0V |
| Under voltage (stage 2) | 0,1s | 5s | 0,2V _n | 1,0V _n | N/A |
| Over frequency | 0,1s | 100s | 1,0f _n | 1,04f _n | 0,5s/50,5Hz |
| Over frequency (stage 1) | 0,1s | 5s | 1,0f _n | 1,04f _n | N/A |
| Under frequency | 0,1s | 100s | 0,94f _n | 1,04f _n | 0,5s/48,0Hz |
| Under frequency (stage 2) | 0,1s | 5s | 0,94f _n | 1,04f _n | N/A |
| Reconnection settings for voltage (normal operational startup) | Ajustement range: min: 0-1V _n , max: 1-2V _n | | | | 0,85V _n (195,5V) ≤ V ≤ 1,10V _n (253V) |
| Reconnection settings for frequency (normal operational startup) | Adjustment range: min: 44-60Hz, max: 50-66Hz | | | | 49,8Hz ≤ f ≤ 50,2Hz |
| Reconnection time (normal operational startup) | Adjustment range: 0-6000s | | | | ≥ 300s |
| Reconnection settings for voltage (automatic reconnection after tripping) | Ajustement range: min: 0-1V _n , max: 1-2V _n | | | | 0,85V _n (195,5V) ≤ V ≤ 1,10V _n (253V) |
| Reconnection settings for frequency (automatic reconnection after tripping) | Adjustment range: min: 44-60Hz, max: 50-66Hz | | | | 49,8Hz ≤ f ≤ 50,2Hz |
| Reconnection time (automatic reconnection after tripping) | Adjustment range: 0-6000s | | | | ≥ 300s |
| Active power gradient after reconnection | Adjustment range: 1-10000% | | | | 10% P _E max / per minute |
| Active power delivery at under frequency | electronic inverter, no active power reduction | | | | |
| Power response to over frequency (frequency / droop s) | Adjustment range: 44-60Hz / 1-10000% | | | | 50,2Hz / 4% |
| Permanent DC-injection | ≤ 0,5% of rated inverter output current or ≤ 20mA | | | | |
| Rate of change of frequency (ROCOF) | Adjustment range: 0,01-100Hz/s | | | | 1Hz/s |
| Loss of mains according EN 62116 (LoM) | Adjustment range: 0-6000s | | | | 0,5s |

Note:^a Over voltage – stage1: 10 min-mean-value corresponding to EN 50160.

The settings of the interface protection are password protected adjustable in the stated range above.

In case the above stated generators are used with an external protection device, the protection settings of the inverters are to be adjusted according to the manufacturer's declaration.

The above stated generators are tested according to the requirements in the EN 50549-1:2019. Any modification that affects the stated tests must be named by the manufacturer/supplier of the product to ensure that the product meets all requirements of the EN 50549-1:2019.