Certificate of compliance

Applicant:

SMA Solar Technology AG
Sonnenallee 1
34266 Niestetal
Germany

Product: **Grid-tied photovoltaic (PV) inverter**

Model:

SB3.0-1AV-41
SB3.6-1AV-41
SB4.0-1AV-41
SB5.0-1AV-41
SB6.0-1AV-41

Use in accordance with regulations:

Automatic disconnection device with single-phase mains surveillance in accordance with EN50549-1:2019 for photovoltaic systems with a single-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
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

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:	**16TH0348-EN50549-1_0**	**Certification Program:**	**NSOP-0032-DEU-ZE-V01**
Certificate number:	**U20-0311**	**Date of issue:**	**2020-04-28**

Certification body

Thomas Lammel

DAkkS Deutsche Akkreditierungsstelle D-ZE-12024-01-00

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. 16TH0348-EN50549-1_0**

Type Approval and declaration of compliance with the requirements of EN 50549-1.				
Manufacturer / applicant:	**SMA Solar Technology AG** Sonnenallee 1 34266 Niestetal **Germany**			
Micro-generator Type	Grid-tied photovoltaic inverter			
	SB3.0-1AV-41	**SB3.6-1AV-41**	**SB4.0-1AV-41**	**SB5.0-1AV-41**
MPP DC voltage range [V]	110 - 500	130 - 500	140 - 500	175 - 500
Input DC voltage range [V]	max. 600			
Input DC current [A]	2 x 15			
Output AC voltage [V]	220 / 230 / 240; 50/60 Hz			
Output AC current [A]	13	16	18	22
Output power [VA]	3000	3680	4000	5000

	SB6.0-1AV-41			
MPP DC voltage range [V]	210 - 500			
Input DC voltage range [V]	max. 600			
Input DC current [A]	2 x 15			
Output AC voltage [V]	220 / 230 / 240; 50/60 Hz			
Output AC current [A]	26,1			
Output power [VA]	6000			

Firmware version	Beginning with 03.10.16.R
Measurement period:	2020-03-27 to 2020-04-27

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. 16TH0348-EN50549-1_0**

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	$1,0V_n$	$1,2V_n$	$0,2s/1,2V_n$
Over voltage (stage 2)	0,1s	5s	$1,0V_n$	$1,3V_n$	$0,1s/1,25V_n$
Under voltage (stage 1)	0,1s	100s	$0,2V_n$	$1,0V_n$	$10s/0,2V_n$
Under voltage (stage 2)	0,1s	5s	$0,2V_n$	$1,0V_n$	$3s/0,8V_n$
Over frequency	0,1s	100s	$1,0f_n$	$1,04f_n$	$0,1s/1,03f_n$
Over frequency (stage 1)	0,1s	5s	$1,0f_n$	$1,04f_n$	$0,1s/1,03f_n$
Under frequency	0,1s	100s	$0,94f_n$	$1,04f_n$	$0,1s/0,95f_n$
Under frequency (stage 2)	0,1s	5s	$0,94f_n$	$1,04f_n$	$0,1s/0,95f_n$
Reconnection settings for voltage (normal operational startup)	Ajustement range: min: $0\text{-}1V_n$, max:$1\text{-}2V_n$				$0,85V_n$ (195,5V) ≤ V ≤ $1,10V_n$ (253V)
Reconnection settings for frequency (normal operational startup)	Adjustment range: min: 44-60Hz, max: 50-66Hz				49,5Hz ≤ f ≤ 50,1Hz
Reconnection time (normal operational startup)	Adjustment range: 0-6000s				≥ 60s
Reconnection settings for voltage (automatic reconnection after tripping)	Ajustement range: min: $0\text{-}1V_n$, max:$1\text{-}2V_n$				$0,85V_n$ (195,5V) ≤ V ≤ $1,10V_n$ (253V)
Reconnection settings for frequency (automatic reconnection after tripping)	Adjustment range: min: 44-60Hz, max: 50-66Hz				49,5Hz ≤ f ≤ 50,1Hz
Reconnection time (automatic reconnection after tripping)	Adjustment range: 0-6000s				≥ 60s
Active power gradient after reconnection	Adjustment range: 1-10000%				10% P_{Emax} / 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 / 5%
Permanent DC-injection	≤ 0,5% of rated inverter output current or ≤ 20mA				
Rate of change of frequency (ROCOF)	Adjustment range: 0,01-100Hz/s				2,5Hz/s
Loss of mains according EN 62116 (LoM)	Adjustment range: 0-6000s				2s

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.