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Certificate of compliance

Applicant: SMA Solar Technology AG
Sonnenallee 1
34266 Niestetal
Germany

Product: Photovoltaic (PV) inverter

Model: STP 50-40
STP 50-41

Inverter for three-phase parallel connection to a MV distribution network.

Applied rules and standards:

EN 50549-2:2019, I.S. EN 50549-2:2019

Requirements for generating plants to be connected in parallel with distribution networks - Part 2: Connection to a MV distribution network - Generating plants 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

TG3 Rev. 25:2018

Determination of the Electrical Characteristics of Power Generating Units and Systems, Storage Systems as well for their Components in Medium-, High- and Extra-High Voltage Grids

Commission Regulation (EU) 2016/631 of 14 April 2016

Establishing a network code on requirements for grid connection of generators (NC RFG).
Type approval for generation units to use in Type B and Type C plants.

Note:

This certificate proves the conformity of a generating unit based on NC RFG. However, some requirements, such as frequency sensitive mode (FSM), reactive power capacity etc. can be applicable on the generating plant level, which assessment can be out of the scope of this certificate. Consequently, it is possible that the conformity assessment of a generating unit does not cover all aspects of the above-mentioned standardization documents, typically when a requirement is rather evaluated on a plant level.

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: 17TH0199-EN50549-2_2
17TH0199-FRT_1
2220 / 0183 – E1 -TG3

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

Certificate number: U21-0626

Date of issue: 2021-07-05

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



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Annex to the EN 50549-2 certificate of compliance No. U21-0626

Appendix

Extract from test report according to EN 50549-2

Nr. 17TH0199-EN50549-2_2

Nr. 17TH0199-FRT_1

Nr. 2220 / 0183 – E1 -TG3

Type Approval and declaration of compliance with the requirements of EN 50549-2.

Manufacturer / applicant:	SMA Solar Technology AG Sonnenallee 1 34266 Niestetal Germany
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Micro-generator Type	Photovoltaic inverter
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	STP 50-40 STP 50-41
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MPP DC voltage range [V]	500 – 800
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Input DC voltage range [V]	max. 1000
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Input DC current [A]	6 x 20
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Output AC voltage [V]	400
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Output AC current [A]	72,5
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Output power [VA]	50000
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Firmware version	Beginning with V03.10.03.R
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Measurement period:	2019-12-27 to 2020-02-21
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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.



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Appendix

Extract from test report according to EN 50549-2

Nr. 17TH0199-EN50549-2_2

Nr. 17TH0199-FRT_1

Nr. 2220 / 0183 – E1 -TG3

Type Approval and declaration of compliance with the requirements of EN 50549-2 and Commission Regulation (EU) 2016/631 of 14 April 2016

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 50549-2:2019 Commission Regulation (EU) 2016/631 of 14 April 2016. 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.