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 the public grid. The network monitoring and disconnection device is an integral part of the above-mentioned model.

Applied rules and standards:

DANSK ENERGI:2019
Technical requirements for connection of power-generating plants to the low-voltage grid (≤1kV) Type A and Type B
Type A power plants above 50kW
Type B power generation plants above 125kW up to 3 MW

4.1 and 5.1 Immunity to of Frequency and voltage deviations
4.2 and 5.2 Start-up and reconnection of a power-generating plant
4.3 and 5.3 Active power control
5.4 and 5.4 Reactive power control
5.5 and 5.5 Protection
5.6 and 5.6 Power Quality
5.7 and 5.7 Exchange of information

DIN V VDE V 0126-1-1:2006-02 (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:	**17TH0199_DK1/DK2_Typ-B_0** **17TH0199_DK1/DK2_Typ-A_2**	**Certification Program:**	**NSOP-0032-DEU-ZE-V01**
Certificate number:	**U21-0237**	**Date of issue:**	**2021-03-11**

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

Type Verification Test Report	
Extract from test report according to DANSK ENERGI	**Nr. 17TH0199_DK1/DK2_Typ-B_0**
Extract from test report according to DANSK ENERGI	**Nr. 17TH0199_DK1/DK2_Typ-B_02**

Type Approval and declaration of compliance with the requirements of DANKS ENERGI	
Manufacturer / applicant	**SMA Solar Technology AG** **Sonnenallee 1** **34266 Niestetal** **Germany**
Micro-generator Type	Photovoltaic inverter
	STP 50-40 STP 50-41
MPP DC voltage range [V]	500 – 800
Input DC voltage range [V]	max. 1000
Input DC current [A]	6 x 20
Output AC voltage [V]	400
Output AC current [A]	72,5
Output power [VA]	50000
Firmware version	Beginning with V03.11.02.R
Measurement period	2019-10-29 to 2019-11-04, 2019-12-02, 2021-03-11

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.

Setting of the parameter values for DK1 and DK2:

	Settings for DK1	**Setting for DK2**
	LFSM-O	
Threshold frequency [Hz]	50,2	50,5
Droop [% of Pn]	5% (40% Pn/Hz)	4% (50% Pn/Hz)
Intentional Delay	500ms	500ms
	Reactive Power	
	Q fix	Q fix
Active/disabled [On/Off]	On	On
Q setpoint [VAr]	0	0
	cos φ fix	
Active/disabled [On/Off]	Off	Off
PF setpoint [PF]	1	1

Type Verification Test Report

Extract from test report according to DANSK ENERGI **Nr. 17TH0199_DK1/DK2_Typ-B_0**
Extract from test report according to DANSK ENERGI **Nr. 17TH0199_DK1/DK2_Typ-B_02**

	Settings for DK1	Setting for DK2
	cos φ (P)	
Active/disabled [On/Off]	Off	Off
cos φ (P) P1 [% of P_n]	0	0
cos φ (P) PF1 [PF]	1	1
cos φ (P) P2 [% of P_n]	50	50
cos φ (P) PF2 [PF]	1	1
cos φ (P) P3 [% of P_n]	100	100
cos φ (P) PF3 [PF]	0,9 inductive	0,9 inductive
cos φ (P) Lockin [% of U_n]	105	105
cos φ (P) Lockout [% of U_n]	100	100
	Connection and Reconnection	
Gradient [% of P_n/min]	20	20
Observation time [seconds]	180	180
U_{min} [% of U_n]	85	85
U_{max} [% of U_n]	110	110
f_{min} [Hz]	47,5	47,5
f_{max} [Hz]	50,2	50,5
	System Protection	
f> [s]	0,2	0,2
f> [Hz]	51,5	51,5
f< [s]	0,2	0,2
f< [Hz]	47,5	47,5
U> [s]	60	60
U> [% of U_n]	110	110
U>> [s]	0,2	0,2
U>> [% of U_n]	115	115
U< [s]	50	50
U< [% of U_n]	85	85
	Loss of Mains Detection	
ROCOF [s]	0,08	0,08
ROCOF [Hz/s]	2,5	2,5

Note.

The settings of the interface protection are password protected adjustable.

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.