



**BUREAU
VERITAS**

Type Certificate

Applicant: SMA Solar Technology AG
Address: Sonnenallee 1
34266 Niestetal
Germany

Type of power generating unit:	Grid connected photovoltaic inverter	Sunny Highpower PEAK3 (Inverter Family) (for details see <i>Supplement of Certificate</i> on p.2)
Technical data:	Max. apparent power:	150 kVA
	Nominal voltage:	304 V ... 690 V, (depending on type), 3~ + PE
	Nominal frequency:	50 Hz
Technical data determined by measurements:	Max. active power $P_{E_{max}}$ / Max. active power peak P_{600} :	(for details see <i>Supplement of Certificate</i> on p.2)
Firmware version:	(main processor / <i>Hauptprozessor</i>) 3.11.31.R or higher	
Validated type model:	Model file:	SMA_21-0234_0_TR4_SHP_1xx-20_V1.zip
	Identification number (MD5):	e8346942387e271c0cd08e0774c6c48c

Grid connection regulation: **VDE-AR-N 4110:2018-11** – Technical requirements for the connection and operation of customer installations to the medium voltage network (TCR medium voltage) [1]
VDE-AR-N 4120:2018-11 – Technical requirements for the connection and operation of customer installations to the high voltage network (TCR high voltage) [2]

Pertinent standards / Guidelines: Technical guidelines:
FGW TR 3 Rev. 25 [3], FGW TR 4 Rev. 09 [4], FGW TR 8 Rev. 09 [5]

The power generating units, stated in the certificate, were tested and certified according to the technical guidelines referenced to the grid connection regulation. The electrical characteristics fulfill the requirements of the grid connection regulation:

- Quasi-steady-state operation
- Dynamic network stability (reactive current characteristic according to TCR medium voltage)
- Active power output and network security management
- Active power adjustment as a function of the grid frequency
- Protection technology and protection settings on generating unit level
- Power quality

The manufacturer has provided proof of certification of the quality management system of his production facility in accordance with ISO 9001

Restrictions, deviations or notes on usage: see *Supplement of Certificate* on p.2.

The certificate includes the following information:

- technical data of the power generating unit, the auxiliary equipment used and the software version used;
- schematic structure of the power generating units;
- summarized information on the properties of the power generating unit.

The certificate is comprised of 100 pages (including Annex of 98 pages).

BV project number : 18TH0282
Certificate no. : 21-0234_0
Issued : 2021-03-11

Certification scheme : NSOP-0032-DEU-ZE-V01
Valid until : 2026-03-10

Certification body

Holger Schaffer



Certification body of Bureau Veritas Consumer Products Services Germany GmbH accredited according 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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Supplement of Certificate (21-0234_0)

Type of power generating unit:	Grid-tied photovoltaic inverter	Sunny Highpower PEAK3		
		SHP 100-20	SHP 150-20	
Technical data:	Rated active power:	76 kW	100 kW	150 kW
	Max. apparent power:	76 kVA	100 kVA	150 kVA
	Nominal voltage:	304 V, 3~ + PE	400 V, 3~ + PE	600 V, 3~ + PE
	Nominal frequency:	50 Hz		
Technical data determined by measurements:	Max. active power $P_{E_{max}}$ / Max. active power peak P_{600} ¹⁾ :	2)	2)	151,71 kW ³⁾
	Firmware version:	(main processor / Hauptprozessor) 3.11.31.R or higher		

Note:

- ¹⁾ The $P_{E_{max}}$ is the highest 10-min mean of the active power of a power generating unit defined according to VDE-AR-N 4110:2018 [1]. The P_{600} is the maximum active power peak of the overall system (averaging period 10 min) defined according to FGW TR 3 Rev. 25 [3].
- ²⁾ Due to spot testing the tests marked were not conducted.
- ³⁾ The stated measurement result was determined according to test 4.1.1, FGW TR 3 Rev. 25 [3].
The active power results of the SHP 150-20 @600V (tests were done on the variant with a line-to-line output voltage of 600 V), can be applied to the SHP 100-20 @304V and SHP 100-20 @400V scaled (by the factor $P_{n, \text{notmeasure}} / P_{n, \text{SHP 150-20 @600V}}$).

Restrictions, deviations or notes on usage:

- The PGUs in the series do not provide test terminals for on-site testing. For necessary on-site testing, a separate test terminal must be installed additionally. The PGUs in the series do not provide display for checking the protection setting. Settings of the integrated protection relay can only be checked and edited via Web-UI of the inverter. Authentic identification is ensured via the serial number of the device, which is displayed on the Web-UI.
- The implementation of the reactive power control functions on PGU level (Q(U) characteristic and Q(P)) may deviate to requirements according to VDE-AR-N 4110:2018-11. This needs to be considered for project planning. If needed, these have to be implemented on the plant level e.g. in the superimposed PGS controller.
- The reactive power with voltage limitation function implemented on PGU level was not tested. This needs to be considered for project planning. If needed, these have to be implemented on the plant level e.g. in the superimposed PGS controller.
- The default configuration of the units may not meet the reactive power requirement at the grid connection point. A permanent active power reduction may be needed (see p.42 to p.47). This needs to be considered for project planning.

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