



BUREAU
VERITAS

Type Certificate

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

Type of power generating unit:

Technical data:

Technical data determined by measurements:

Firmware version:

Validated type model:

Alternative type model:

Grid connected photovoltaic inverter	Sunny Highpower PEAK3 (Inverter Family) (for details see <i>Supplement of Certificate</i> on p.2)
Max. apparent power:	180 kVA
Nominal AC voltage:	400 V ... 690 V, (depending on type), 3~ + PE
AC voltage range:	177 V ... 793 V, (depending on type), 3~ + PE
Nominal frequency:	50 Hz
Max. active power $P_{E_{max}}$ / Max. active power peak P_{600} :	(for details see <i>Supplement of Certificate</i> on p.2)
(main processor / Hauptprozessor)	3.00.04.R / 3.00.08.R / 3.00.10.R / 3.10.02.R / 3.11.31.R, 3.16.xx.R, 3.17.xx.R
"xx" can be any number, changes on this position indicate no certification relevant modifications	
Model file:	SMA_SHP_Template_V0112.zip ¹⁾
Identification number (MD5):	7ab2ee5aeab23a7ea58b772a2c5b9b46
Model file:	SMA_21-0234_0_TR4_SHP_1xx-20_V1.zip ¹⁾
Identification number (MD5):	e8346942387e271c0cd08e0774c6c48c

Grid connection regulation: **VDE-AR-N 4110:2023-09** – 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 fulfil 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.3.

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 141 pages (including Annex of 148 pages).

BV project number : 18TH0282

Certificate no. : 21-0234_3

Issued : 2026-03-10

Certification scheme : NSOP-0032-DEU-ZE-ES-V10

Valid until : 2031-03-09

Certification body

Georg Loritz
Lab Supervisor Energy Systems



Accredited certification body by Deutsche Akkreditierungsstelle GmbH (DAkkS) according to ISO/IEC 17065. The accreditation is valid only for the scope listed in the annex of the accreditation certificate D-ZE-12024-01-00. The Deutsche Akkreditierungsstelle GmbH (DAkkS) is signatory of the multilateral arrangements of EA, ILAC and IAF for mutual recognition.

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Certificate number 21-0234_3

ZERT-0168-DEU-ZE-ES-V01/TEMP-0048-DEU-ZE-ES-V01

1/141

Supplement of Certificate (21-0234_3)

Type of power generating unit:

Technical data:

Technical data determined by measurements:

Firmware version:

Type of power generating unit:

Technical data:

Technical data determined by measurements:

Firmware version:

Grid-tied photovoltaic inverter	Sunny Highpower PEAK3			
	SHP 100-20	SHP 150-20	SHP 172-21	SHP 180-21
Rated active power:	100 kW ⁵⁾	150 kW	172 kW	180 kW
Max. apparent power:	100 kVA ⁵⁾	150 kVA	172 kVA	180 kVA
Nominal AC voltage:	400 V, 3~ + PE	600 V, 3~ + PE	660 V, 3~ + PE	690 V, 3~ + PE
AC voltage range:	304V - 477 V ⁵⁾	480 V – 690 V ⁵⁾	528 V – 759 V ⁵⁾	552 V– 793 V ⁵⁾
Nominal frequency:	50 Hz			
Max. active power $P_{E_{max}}$ / Max. active power peak P_{600} ²⁾ :	3)	151,71 kW ⁴⁾	3)	3)
Firmware version:	(main processor / Hauptprozessor) 3.00.04.R / 3.00.08.R / 3.00.10.R / 3.10.02.R / 3.11.31.R, 3.16.xx.R, 3.17.xx.R "xx" can be any number, changes on this position indicate no certification relevant modifications			
Grid-tied photovoltaic inverter	Sunny Highpower PEAK3			
	SHP 100-21	SHP 150-21	SHP 172-21	SHP 180-21
Rated active power:	100 kW ⁵⁾	150 kW	172 kW	180 kW
Max. apparent power:	100 kVA ⁵⁾	150 kVA	172 kVA	180 kVA
Nominal AC voltage:	400 V, 3~ + PE	600 V, 3~ + PE	660 V, 3~ + PE	690 V, 3~ + PE
AC voltage range:	177 V – 477 V ⁵⁾	480 V – 690 V ⁵⁾	528 V – 759 V ⁵⁾	552 V– 793 V ⁵⁾
Nominal frequency:	50 Hz			
Max. active power $P_{E_{max}}$ / Max. active power peak P_{600} ¹⁾ :	3)	3)	3)	3)
Firmware version:	(main processor / Hauptprozessor) 3.00.04.R / 3.00.08.R / 3.00.10.R / 3.10.02.R / 3.11.31.R, 3.16.xx.R, 3.17.xx.R "xx" can be any number, changes on this position indicate no certification relevant modifications			

Note:

- ¹⁾ The SMA_SHP_Template_V0112.zip package includes a new DLL-based model to enhance control behaviour. The previous model file SMA_21-0234_0_TR4_SHP_1xx-20_V1.zip that includes different PFD model files remains valid and can be used for simulation purposes.
- ²⁾ 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 4110:2023 [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].
- ³⁾ Due to spot testing the tests marked were not conducted.
- ⁴⁾ 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 with the configuration with a line-to-line output voltage of 600 V), can be applied to the SHP 100-20, SHP 100-21, SHP 150-21, SHP 172-21 and SHP 180-21 scaled (by the factor $P_{n, notmeasure} / P_{n, SHP 150-20 @600V}$).
- ⁵⁾ Generally, the value of the nominal voltages of each device can be adjusted (parameterized) within the given range. For example, SHP 100-21 can be set to a nominal voltage of 360V. Active and apparent power of the PGU scale linearly with the AC voltage if the value is below the origin nominal AC voltage.

Supplement of Certificate (21-0234_3)

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 4110:2023-09. 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.95 to p.109). This needs to be considered for project planning.

Description of the revisions of certificate 21-0234_3

Rev. 0	First issue
Rev. 1	- Added types SHP 100-21, SHP 150-21, SHP 172-21, SHP 180-21 - Updated references of TG3 and TG4 report
Rev. 2	- Information about the default nominal voltage for Sunny Highpower PEAK3 inverter family is updated - Transferability notes of test results for 304V and 400V for type SHP 100-20 are updated - Updated references of TG3, TG4 and TG8 report - Updated Annex 3 – Extract from the test report - Updated Annex 4 – Validated simulation model - Updated Annex 5 – Certification-relevant parameters
Rev. 3	- Added New Template - Updated references of TG8 - New FW-version added on page 1 & 2 - Added references [24],[25] and [26]