Certificate number: U22-0354

Certificate of Compliance

Submitter:	**AISWEI Technology (Shanghai) Co., Ltd.** **Room 905B, 757 Mengzi Road, Huangpu District,** **200023 Shanghai** **P.R. China**
Product:Photovoltaic (PV)	**inverter**
Model:	**ASW3K-LT-G2 Pro, ASW4K-LT-G2 Pro, ASW5K-LT-G2 Pro** **ASW6K-LT-G2 Pro, ASW8K-LT-G2 Pro, ASW10K-LT-G2 Pro** **ASW12K-LT-G2 Pro, ASW13K-LT-G2 Pro, ASW15K-LT-G2 Pro** **ASW17K-LT-G2 Pro, ASW20K-LT-G2 Pro**
Software version:	**Main: V610-03043-01, Slave: V610-60009-00.**

Regulations and standards applied:

EN 50549-1:2019, PN-EN 50549-1:2019
Requirements for generating installations intended for parallel connection to public distribution networks -- Part 1: Connection to the LV distribution network -- Generating installations up to and including type B

4.4 Normal operating range
4.5 Resistance to interference
4.6 Active response to frequency deviation
4.7 Power response to voltage change
4.8 EMC and power quality
4.9 Protection of the connection
4.10 Connect and start generating electricity
4.11 Cessation and reduction of active power in the setting
4.13 Requirements for tolerance of individual disturbances, for the protection system of the connection and the connection coupler

- **Commission Regulation** (EU) 2016/631 of April 14, 2016 establishing a network code on requirements for connection of generating units to the grid (OJ EU L 112/1, 27.4.2016), requirements for type A generation modules (NC RFG 2016-04-27)

- **General Application Requirements** under **Commission Regulation** (EU) 2016/631 of April 14, 2016 establishing a network code concerning requirements for connection of generating units to the grid (NC RfG) - approved by Decision of the President of the Energy Regulatory Authority DRE.WOSE.7128.550.2.2018.ZJ of January 2, 2019 (PSE 2018- 12-18).

IRiESD:2021 (Instruction for the Operation and Maintenance of the Distribution Network)
9.1.2 Requirements for equipping microinstallations with active power regulation
9.1.3 Requirements for equipping the microinstallation with a protection system

Certification in accordance with the certification program NSOP-0032-DEU-ZE-V01 through the implementation of the requirements arising from the provisions arising from Commission Regulation (EU) 2016/631 of April 14, 2016 establishing a network code on requirements for connection of power generation units to the grid (NC RfG). Certification program in accordance with the document Conditions and procedures for the use of certificates in the process of connecting power generation modules to the electricity grid. Conditions and procedures for the use of NC RfG certificates - version 1.2 (PTPiREE 2021-04-28).

Report number: **PVPL2203WDG0348-1** **Certification Program:** **NSOP-0032-DEU-ZE-V01**

Issue date: **2022-06-03** **Operiod of validity:** **2022-06-03 to 2027-06-02**

Certification Institute

Hamburg, 2022-06-03, Thomas Lammel

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

Certification institute Bureau Veritas Consumer Products Services Germany GmbH accredited in accordance with DIN EN ISO/IEC 17065 The Bureau Veritas testing unit is accredited in accordance with EN ISO/IEC 17025

Partial representation of the certificate requires written approval from Bureau Veritas Consumer Products Services Germany GmbH

Appendix				
Excerpt from the test report in accordance with EN 50549-1				**No. PVPL2203WDG0348-1**
Technical data of the generating unit				
Manufacturer/applicant	AISWEI Technology (Shanghai) Co., Ltd Room 905B, 757 Mengzi Road, Huangpu District, 200023 Shanghai P.R. China			
Generator type	Photovoltaic (PV) inverter			
	ASW3K-LT-G2 Pro	ASW4K-LT-G2 Pro	ASW5K-LT-G2 Pro	ASW6K-LT-G2 Pro
MPP DC voltage range [V].	150-1000	150-1000	150-1000	150-1000
Max. DC input voltage [V] (photovoltaic)	1100	1100	1100	1100
DC input current [A] (photovoltaic)	16,0 / 16,0	16,0 / 16,0	16,0 / 16,0	16,0 / 16,0
AC output voltage [V].	3/N/PE ~ 230/400, 50Hz	3/N/PE ~ 230/400, 50Hz	3/N/PE ~ 230/400, 50Hz	3/N/PE ~ 230/400, 50Hz
Max. AC output current [A].	4,8	6,4	8,0	9,6
AC active power [kW].	3,0	4,0	5,0	6,0
Max. apparent AC power [VA].	3,0	4,0	5,0	6,0
	ASW8K-LT-G2 Pro	ASW10K-LT-G2 Pro	ASW12K-LT-G2 Pro	ASW13K-LT-G2 Pro
MPP DC voltage range [V].	150-1000	150-1000	150-1000	150-1000
Max. DC input voltage [V] (photovoltaic)	1100	1100	1100	1100
DC input current [A] (photovoltaic)	20,0 / 16,0	20,0 / 16,0	32,0 / 20,0	32,0 / 20,0
AC output voltage [V].	3/N/PE ~ 230/400, 50Hz	3/N/PE ~ 230/400, 50Hz	3/N/PE ~ 230/400, 50Hz	3/N/PE ~ 230/400, 50Hz
Max. AC output current [A].	12,8	16,0	19,0	20,7
AC active power [kW].	8,0	10,0	12,0	13,0
Max. apparent AC power [VA].	8,0	10,0	12,0	13,0

Appendix				
Excerpt from the test report in accordance with EN 50549-1				**No. PVPL2203WDG0348-1**
	ASW15K-LT-G2 Pro	ASW17K-LT-G2 Pro	ASW20K-LT-G2 Pro	–
MPP DC voltage range [V].	150-1000	150-1000	150-1000	--
Max. DC input voltage [V] (photovoltaic)	1100	1100	1100	–
DC input current [A] (photovoltaic)	32,0 / 20,0	32,0 / 32,0	32,0 / 32,0	–
AC output voltage [V].	3/N/PE ~ 230/400, 50Hz	3/N/PE ~ 230/400, 50Hz	3/N/PE ~ 230/400, 50Hz	–
Max. AC output current [A].	24,0	27,1	31,9	–
AC active power [kW].	15,0	17,0	20,0	–
Max. apparent AC power [VA].	15,0	17,0	20,0	–
Software version	Main: V610-03043-01, Slave: V610-60009-00			
Description of the structure of the generating unit: The power generation unit is equipped with an EMC filter on the DC and AC line sides. The power generation unit has no galvanic isolation between the DC input and AC output. Output shutdown is done with a single fault tolerance based on two series-connected relays in each phase and neutral line. This allows the generating unit to be safely disconnected from the grid in the event of an error.				

Appendix

Excerpt from the test report in accordance with EN 50549-1 **No. PVPL2203WDG0348-1**

Scope of evaluation and results

The following functionalities from the following list have been evaluated based on the rules for the use of equipment certificates for power park modules (PPMs) according to Type A, as specified in Chapter 7 and 9 of PTPiREE 2021-04-28.

Attention:

NC RFG = Commission Regulation (EU) 2016/631 of April 14, 2016 (NC RFG 2016-04-27)

PSE = Commission Regulation (EU) 2016/631 of April 14, 2016, approved by decision of the President of the Energy Regulatory Authority DRE.WOSE.7128.550. 2.2018.ZJ of January 2, 2019. (PSE 2018-12-18)

Clause of EN 50549-1	From n.	Parameter	Microgenerator setting range	Default setting used for Poland
4.3.2 Connector connector	n.a.	Resistance of the connection panel to a single failure	yes | no	yes
4.4.2 Operating frequency range "PSE Article. 13.1(a)(i)" Type A "NC RFG Article 13.1(a)" Type A."	A,B	47.0 - 47.5 Hz duration	0 - 5 min	0s
	A,B	47.5 - 48.5 Hz duration	30 - 90 min	≥30 min
	A,B	48.5 - 49.0 Hz duration	30 - 90 min	≥30 min
	A,B	49.0 - 51.0 Hz duration	non-configurable	unbound
	A,B	51.0 - 51.5 Hz duration	30 - 90 min	≥30 min
	A,B	51, 5 - 52 Hz duration	0 - 5 min	0 s
4.4.3 Minimum requirement for delivery of active power at reduced frequency "PSE Article 13.4" Type A "NC RFG Article. 13.4" Type A	A,B	Restriction threshold	non-configurable	Electronic inverter, power limitation is not present
	A,B	Maximum degree of restriction	≤ 2 %PN/Hz	≤ 2 %
4.4.4 Continuous range of operating voltage	n.a.	Upper limit	100 - 120 %	1.15 U_n
	n.a.	Lower limit	80 - 100 %	0.85 U_n
4.5.2 Resistance to rate of change of frequency (ROCOF). "PSE Article 13.1(b)" Type A "NC RFG Article 13.1(b)". Type A	A,B	ROCOF endurance capacity (defined by a moving measurement window of 500 ms) non-synchronous manufacturing technology: synchronous manufacturing technology	0.5 - 10 Hz/sec.	≥2.5 Hz/sec.
4.6.1 Power response to increased frequency "PSE Article. 13.2(a)(b)(f)" Type A "NC RFG Article. 13.2" Type A	A,B	Threshold frequency f1	50.2 Hz - 52 Hz	50.2 Hz
	A,B	Statism	2 % - 12 %	5 %
	A,B	Power reference	P_M | Pmax	Pmax
	n.a.	Deliberate delay	0 - 2 s	0 s
	n.a.	Fstop shutdown threshold	50.0 Hz - f1	deactivated
	n.a.	Shutdown time tstop	0 - 600 s	not applicable
	A	Acceptance of staged disconnection	yes | no	not
4.6.2 Power response to reduced frequency	n.a.	Threshold frequency f1	49.8 Hz - 46 Hz	not applicable
	n.a.	Statism	2 - 12 %	not applicable
	n.a.	Power reference	P_M | Pmax	not applicable
	n.a.	Deliberate delay	0 - 2 s	not applicable

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4.7.2.2 Capabilities	B	Active power range at overdrive	0,8 - 1	0,8
	B	Range of active power at underboosting	0,8 - 1	0,8
4.7.2.3 Control modes	n.a.	Control mode enabled	Q setp. Q(U) cos φ setp. cos φ (P)	Ability to set all parameters!
4.7.2.3.2 Setting the control modes	n.a.	Q and excitation setting	0 - 60% $_{PD}$	0
	n.a.	cos φ set and excitation	1 - 0,8	1
4.7.2.3.3 Modes voltage-related controls	n.a.	Characteristic curve	Q(U) P(U)	Q(U) (three-phase inverter) 0.0...-0.6 0,92...-0,6 0,94...0,0 1,06...0,0 1,08...0,6 1,2...0,6 off P(U)
	n.a.	Time constant	3 s - 60 s	10 s
	n.a.	min cos φ	0,0 - 1	0,8
	n.a.	Connecting power	0 % - 20 %	20%
	n.a.	Disconnecting power	0 % - 20 %	5%
4.7.2.3.4 Mode power-related controls	n.a.	Characteristic curve	cos φ (P)	disabled
4.7.4.2.2 Zero current mode for generation technology connected to the converter	n.a.	Shutdown	on | off	disabled
	n.a	Static voltage range surge	1.0 $_{Un}$ - 1.20 $_{Un}$	not applicable
	n.a	Static voltage range too low	0.1 $_{Un}$ - 0.9 $_{Un}$	not applicable
4.9.2 Voltage protection requirements and frequencies "IRiESD (Instruction for the Operation and Maintenance of the Distribution Network, 9.1.3 Requirements for equipping the micro-installation with a security system)"	n.a	Protection threshold as a dedicated device [in A or kW, kVA].	16 A - 250 kVA	not applicable
	B	Threshold of too low voltage - stage 1	0.2 $_{Un}$ - 1 $_{Un}$	0.85 Un
	B	Operating time of too low voltage - stage 1	0.0 s - 300 s	1,3 s
	B	Threshold of too low voltage - stage 2	0.2 $_{Un}$ - 1 $_{Un}$	not applicable
	B	Operating time of too low voltage - stage 2	0.0 s - 300 s	not applicable
	B	Overvoltage threshold stage 1	1.0 $_{Un}$ - 1.3 $_{Un}$	1.15 Un
	B	Surge operating time - stage 1	0.0 s - 300 s	0,1 s
	B	Overvoltage threshold step 2	1.0 $_{Un}$ - 1.3 $_{Un}$	not applicable
	B	Surge operating time - stage 2	0.0 s - 300 s	not applicable
	B	Overvoltage threshold: 10 minutes protection on average	1.0 $_{Un}$ - 1.3 $_{Un}$	1.1 Un
	B	Surge operating time: 10 min. protection on average	0.0 s - 10 s	10 min (update every 3 s)
	B	Threshold of too low frequency - stage 1	45.0 Hz - 50.0 Hz	47.5 Hz
	B	Operating time too low frequency - stage 1	0.0 s - 300 s	0,4 s
	B	Threshold of too low frequency - step 2	45.0 Hz - 50.0 Hz	not applicable

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	B	Operating time too low frequency - stage 2	0.0 s - 300 s	not applicable
	B	Threshold of too high frequency - stage 1	50.0 Hz - 55.0 Hz	52.0 Hz
	B	Operating time too high frequency - stage 1	0.0 s - 300 s	0,4 s
	B	Threshold of too high frequency - step 2	50.0 Hz - 55.0 Hz	not applicable
	B	Operating time too high frequency - stage 2	0.0 s - 300 s	not applicable
	B	Voltage drop in accordance with EN 62116 (LoM)	non-configurable	2s
4.10.2 Automatic reclosing after triggering "PSE Article 13.7" Type A "NC RFG Article 13.7" Type A	B	Lower frequency	47.0 Hz - 50.0 Hz	49.00 Hz
	B	Upper frequency	50.0 Hz - 52.0 Hz	50.05 Hz
	B	Lower voltage	0.5 U_n - 1.0 U_n	0.85 U_n
	B	Upper voltage	1.0 U_n - 1.2 U_n	1.10 U_n
	B	Observation time	60 s - 600 s	60 s
	B	Active power growth factor	5% - 3000 %/min	9 %/min
4.10.3 Start of electricity generation "PSE Article 13.7" Type A "NC RFG Article. 13.7" Type A	A,B	Lower frequency	47.0 Hz - 50.0 Hz	49.00 Hz
	A,B	Upper frequency	50.0 Hz - 52.0 Hz	50.05 Hz
	A,B	Lower voltage	0.5 U_n - 1.0 U_n	0.85 U_n
	A,B	Upper voltage	1.0 U_n - 1.2 U_n	1.10 U_n
	A,B	Observation time	60 s - 600 s	60 s
	A,B	Active power growth factor	5% - 3000 %/min	9 %/min
4.11.1 Discontinuation of active power generation "PSE Article 13.6, Type A "NC RFG Article. 13.6" Type A "IRiESD (Instruction for the Operation and Maintenance of the Distribution Network, 9.1.2 Requirements for equipping microinstallations with active power regulation)"	A,B	Remote operation of the logical interface	yes | no	yes The Modbus signal via RS485 can be used to change or stop active power output.

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Excerpt from the test report in accordance with EN 50549-1 **No. PVPL2203WDG0348-1**

4.11.2 Reduction in active power setting "PSE Article 13.6 Type A "NC RFG Article. 13.6" Type A "IRiESD (Instruction for the Operation and Maintenance of the Distribution Network, 9.1.2 Requirements for equipping micro-installations with active power regulation)."	B	Remote work NOTE: If so, the definition is provided by the DSO.	yes | no	yes The Modbus signal via RS485 can be used to change or stop active power output.
4.12 Remote information exchange	B	Remote data exchange required NOTE: If so, the definition is provided by the DSO.	yes | no	not

Attention:

[a] Overvoltage stage - 1: 10 min- average value corresponds to EN 50160.

Default interface settings according to the TNC (Distribution Grid Operation and Maintenance Manual) are used. EN

50549-1:2019, EN 50549-1 based on the

- **Commission Regulation** (EU) 2016/631 of April 14, 2016 establishing a network code on requirements for connection of generating units to the grid (OJ EU L 112/1, 27.4.2016), requirements for type A generation modules (NC RFG 2016-04-27)

- **General Application Requirements** under **Commission Regulation** (EU) 2016/631 of April 14, 2016 establishing a network code concerning requirements for connection of generating units to the grid (NC RfG) - approved by Decision of the President of the Energy Regulatory Authority DRE.WOSE.7128.550.2.2018.ZJ of January 2, 2019 (PSE 2018- 12-18).

The interface protection settings are password-protected and can be adjusted within the range given above.

If the above-mentioned generating units are used with an external protection device, the inverter protection settings must be adjusted according to the manufacturer's declaration.

Any modifications that affect testing must be indicated by the product manufacturer/supplier to ensure that the product meets all requirements.