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Product Service

Compliance Document

No. D 099567 0062 Rev. 01

Holder of Certificate: **AISWEI Technology Co., Ltd.**
Room 905B,757 Mengzi Road
Huangpu District
200023 Shanghai
PEOPLE'S REPUBLIC OF CHINA

Product: **PV inverter**
Grid-connected Hybrid Inverter

This Compliance document confirms the compliance with the listed standards on a voluntary basis. It refers only to the sample submitted for testing and certification and does not certify the quality or safety of the serial products. For details see: www.tuvsud.com/ps-cert

Test report no.: 704092228621-01

Date, 2023-04-04

(Zhengdong Ma)

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Model(s): **ASW3000H-S2, ASW3680H-S2, ASW4000H-S2, ASW5000H-S2, ASW6000H-S2**

Parameters:

Please see pages 3 to 8.

Tested according to: EN 50549-1:2019/AC:2019

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Model	ASW3000H-S2	ASW3680H-S2	ASW4000H-S2
PV input parameters:			
Max. input voltage	550 Vd.c.		
Max. input current	2*16 Ad.c.		
Isc PV (absolute maximum)	2*20 Ad.c.		
MPPT voltage range	40-530 Vd.c.		
Battery input parameters:			
Battery type	Li-ion		
Rated battery voltage	48 Vd.c.		
Battery voltage range	40-60 Vd.c.		
Max. battery charge/discharge current	100 Ad.c./100 Ad.c.		
Grid output parameters:			
Rated grid output active power	3000 W	3680 W	4000 W
Rated grid output apparent Power	3000 VA	3680 VA	4000 VA
Max. grid output apparent power	3000 VA	3680 VA	4000 VA
Rated grid voltage	230 Va.c.		
Rated grid frequency	50 Hz		
Max. grid output current	13.6 Aa.c.	16 Aa.c.	18.2 Aa.c.
Adjustable cos(φ)	0.8ind…0.8cap		

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Model	ASW5000H-S2	ASW6000H-S2
PV input parameters:		
Max. input voltage	550 Vd.c.	
Max. input current	2*16 Ad.c.	
Isc PV (absolute maximum)	2*20 Ad.c.	
MPPT voltage range	40-530 Vd.c.	
Battery input parameters:		
Battery type	Li-ion	
Rated battery voltage	48 Vd.c.	
Battery voltage range	40-60 Vd.c.	
Max. battery charge/discharge current	100 Ad.c./100 Ad.c.	
Grid output parameters:		
Rated grid output active power	5000 W	6000 W
Rated grid output apparent power	5000 VA	6000 VA
Max. grid output apparent power	5000 VA	6000 VA
Rated grid voltage	230 Va.c.	
Rated grid frequency	50 Hz	
Max. grid output current	22.7 Aa.c.	27.3 Aa.c.
Adjustable cos(φ)	0.8ind…0.8cap	

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Interface protection system default settings and power controls in inverter					
Clause(s) /subclause(s) of this EN	Ref	Parameter	Typical value range	Value default	
4.3.2 Interface switch	n.a.	Single fault tolerance for interface switch required	yes | no	yes	
4.4.2 Operating frequency range	A,B	47.0 – 47.5 Hz Duration	0 – 20 s	0.4s	
	A,B	47.5 – 48.5 Hz Duration	30 – 90 min	Unlimited	
	A,B	48.5 – 49.0 Hz Duration	30 – 90 min	Unlimited	
	A,B	49.0 – 51.0 Hz Duration	not configurable	Unlimited	
	A,B	51.0 – 51.5 Hz Duration	30 – 90 min	Unlimited	
	A,B	51.5 – 52 Hz Duration	0 – 15 min	0.4s	
4.4.3 Minimal requirement for active power delivery at underfrequency	A,B	Reduction threshold	49 Hz – 49.5 Hz	N/A	
	A,B	Maximum reduction rate	2 – 10 % P_M/Hz	N/A	
4.4.4 Continuous operating voltage range	n.a.	Upper limit	not configurable	115%Un	
	n.a.	Lower limit	not configurable	85%Un	
4.5.2 Rate of change of frequency (ROCOF) immunity	A,B	ROCOF withstand capability (defined with a sliding measurement window of 500 ms)	not defined	2Hz/s	
		non-synchronous generating technology:		2Hz/s	
		synchronous generating technology:		N/A	
4.5.3.2 Generating plant with non-synchronous generating technology	B	Maximum power resumption time	not defined	1 s	
	B	Voltage-Time-Diagram	see Figure 6	Time [s]	U [p.u.]
				0.00	0.05
				0.25	0.05
				3.00	0.85
4.5.3.3 Generating plant with synchronous generating technology	B	Maximum power resumption time	not defined	N/A	
	B	Voltage-Time-Diagram	see Figure 7 (N/A)	Time [s]	U [p.u.]
				-	-
				-	-
				-	-
				-	-
				-	-
4.5.4 Over-voltage ride through (OVRT)	n.a.	Voltage-Time-Diagram	not configurable	Time [s]	U [p.u.]
				0.12	1.30
				0.12	1.25
				0.12	1.20
				5.2	1.20
				5.2	1.15
				60.5	1.15
				60.5	1.10
4.6.1 Power response to overfrequency	A,B	Threshold frequency f_1	50.2 Hz – 52 Hz	50.2 Hz	
	A,B	Droop	2 % – 12 %	5 %	
	A,B	Power reference	P_M | P_{max}	P_{max}	
	n.a.	Intentional delay	0 – 2 s	0s	
	n.a.	Deactivation threshold f_{stop}	50,0 Hz – f_1	deactivated	
	n.a.	Deactivation time t_{stop}	0 – 600 s	-	
	A	Acceptance of staged	yes | no	yes	

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		disconnection		
4.6.2 Power response to underfrequency	n.a.	Threshold frequency f_1	49.8 Hz – 46 Hz	49.8 Hz
	n.a.	Droop	2 – 12 %	2 %
	n.a.	Power reference	P_M | P_{max}	P_{max}
	n.a.	Intentional delay	0 – 2 s	0 s
4.7.2.2 Capabilities	B	Active factor range overexcited	0.9 – 1	0.8
	B	Active factor range underexcited	0.9 – 1	0.8
4.7.2.3 Control modes	n.a.	Enabled control mode	Q setp. Q(U) cos φ setp. cos φ (P)	Q setpoint
4.7.2.3.2 Setpoint control modes	n.a.	Q setpoint and excitation	0 – 60 % S_{max}	0
	n.a.	cos φ setpoint and excitation	1 – 0.9	1
4.7.2.3.3 Voltage related control modes	n.a.	Characteristic curve	-	-
	n.a.	Time constant	3 s – 60 s	-
	n.a.	Min cos φ	0.0 – 1	-
	n.a.	Lock in power	0 % – 20 %	-
	n.a.	Lock out power	0 % – 20 %	-
4.7.2.3.4 Power related control mode	n.a.	Characteristic curve	-	Yes
4.7.4.2.2 Zero current mode for converter connected generating technology	n.a.	Enabling	enable | disable	disabled
	n.a	Static voltage range overvoltage	100 % U_n – 120 % U_n	115%Un
	n.a	Static voltage range undervoltage	20 % U_n – 100 % U_n	85%Un
4.9.2 Requirements on voltage and frequency protection	n.a	Threshold for protection as dedicated device [in A or kW, kVA]	16 A – 250 kVA	Interface protection integrated
	B	Undervoltage threshold stage 1	0.2 U_n – 1 U_n	195.5 V
	B	Undervoltage operate time stage 1	0.1 s – 100 s	1.40 s
	B	Undervoltage threshold stage 2	0.2 U_n – 1 U_n	115 V
	B	Undervoltage operate time stage 2	0.1 s – 5 s	0.30 s
	B	Overvoltage threshold stage 1	1.0 U_n – 1.2 U_n	264.5 V
	B	Overvoltage operate time stage 1	0.1 s – 100 s	0.30 s
	B	Overvoltage threshold stage 2	1.0 U_n – 1.3 U_n	287.5 V
	B	Overvoltage operate time stage 2	0.1 s – 5 s	0.10s

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	B	Overvoltage threshold 10 min mean protection	1.0 U_n – 1.15 U_n	253 V
	B	Underfrequency threshold stage 1	47.0 Hz– 50.0 Hz	47.5 Hz
	B	Underfrequency operate time stage 1	0.1 s – 100 s	0.40 s
	B	Underfrequency threshold stage 2	47.0 Hz – 50.0 Hz	47.00 Hz
	B	Underfrequency operate time stage 2	0.1 s – 5 s	0.20 s
	B	Overfrequency threshold stage 1	50.0 Hz – 52.0 Hz	51.50 Hz
	B	Overfrequency operate time stage 1	0.1 s – 100 s	0.40 s
	B	Overfrequency threshold stage 2	50.0 Hz – 52.0 Hz	52.00 Hz
	B	Overfrequency operate time stage 2	0.1 s – 5 s	0.20 s
4.10.2 Automatic reconnection after tripping	B	Lower frequency	47.0 Hz – 50.0 Hz	49.5Hz
	B	Upper frequency	50.0 Hz – 52.0 Hz	50.2Hz
	B	Lower voltage	50 % U_n – 100 % U_n	85%Un
	B	Upper voltage	100 % U_n – 120 % U_n	110%Un
	B	Observation time	10 s – 600 s	60s
	B	Active power increase gradient	6 % – 3000 %/min	8%Pn/min
4.10.3 Starting to generate electrical power	A,B	Lower frequency	47.0 Hz – 50.0 Hz	49.5Hz
	A,B	Upper frequency	50.0 Hz – 52.0 Hz	50.1Hz
	A,B	Lower voltage	50 % – 100 % U_n	85%Un
	A,B	Upper voltage	100 % – 120 % U_n	110%Un
	A,B	Observation time	10 s – 600 s	60s
	A,B	Active power increase gradient	6 % – 3000 %/min	8%Pn/min
4.11.1 Ceasing active power	A.B	Remote operation of the logic interface	yes | no	Digital input
4.11.2 Reduction of active power on set point	B	Remote operation NOTE: If yes further definition is provided by the DSO	yes | no	Digital input
4.12 Remote information exchange	B	Remote information exchange required NOTE: If yes further definition is provided by the DSO	yes | no	No

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The Column Ref specifies if a parameter is relevant for COMMISSION REGULATION 2016/631 and for what type of generating module the parameter is relevant. If n.a. is set, this parameter is: not applicable for 2016/631, but is introduce into EN50549-1 for local DSO network management reasons and is not considered as cross border issues.

Unauthorized access to factory safety parameters setting and software should be prohibited.

A reset to the factory safety parameters requires retesting and verification in conjunction with the end-use system.

Based on manufacturer's request, below national deviation for Netherland according to EN 50438:2013 is considered and tested in addition.

4.9.2 Requirements on voltage and frequency protection	B	Undervoltage threshold stage 1(Netherland deviation)	230 V - 20 %	184 V
	B	Undervoltage operate time stage 1(Netherland deviation)	2 s	2 s
	B	Overvoltage threshold stage 1 (Netherland deviation)	230 V + 10 %	253
	B	Overvoltage operate time stage 1 (Netherland deviation)	2 s	2 s
	B	Underfrequency threshold stage 1 (Netherland deviation)	50,0 Hz – 4 %	48.00 Hz
	B	Underfrequency operate time stage 1(Netherland deviation)	2 s	2 s
	B	Overfrequency threshold stage 1 (Netherland deviation)	50,0 Hz + 2 %	51.00 Hz
	B	Overfrequency operate time stage 1 (Netherland deviation)	2 s	2 s

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