ATTESTATION ◆ ATTESTATO ◆ ATTESTACIÓN ◆ BESCHEINIGUNG ◆ ATTESTATION

Product Service

Compliance Document

No. D 125489 0006 Rev. 00

Holder of Certificate:	**Chint PVSTAR Energy Solution B.V.** Transformatorweg 38 1014AK Amsterdam THE NETHERLANDS
Product:	**PV inverter** **Grid-connected Hybrid Inverter**
Model(s):	**PVS-AS3k-G2, PVS-AS3.68k-G2, PVS-AS4k-G2, PVS-AS5k-G2, PVS-AS6k-G2**
Parameters:	See next pages.
Tested according to:	EN 50549-1:2019

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.: 704092441802-00

Date, 2024-10-21

(Zhengdong Ma)

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Model	PVS-AS3k-G2	PVS-AS3.68k-G2	PVS-AS4k-G2
PV input parameters:			
Max. input voltage	DC 550 V		
Max. input current	DC 2*16 A		
Isc PV (absolute maximum)	DC 2*20 A		
MPPT Voltage range	DC 40 V, …, 530 V		
Battery port parameters:			
Battery type	Li-ion		
Rated battery voltage	DC 48 V		
Battery voltage rang	DC 40 V, …, 60 V		
Max. Charge/discharge current	DC 100 A/DC 100 A		
AC output parameters (Grid side):			
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 output voltage	1/N/PE AC 230 V		
Rated output frequency	50 Hz		
Max output current	AC 13.6 A	AC 16 A	AC 18.2 A
General power factor	-0.8, …, 1, …, +0.8		

Model	PVS-AS5k-G2	PVS-AS6k-G2
PV input parameters:		
Max. input voltage	DC 550 V	
Max. input current	DC 2*16 A	
Isc PV (absolute maximum)	DC 2*20 A	
MPPT Voltage range	DC 40 V, …, 530 V	
Battery port parameters:		
Battery type	Li-ion	
Rated battery voltage	DC 48 V	
Battery voltage rang	DC 40 V, …, 60 V	
Max. Charge/discharge current	DC 100 A/DC 100 A	
AC output parameters (Grid side):		
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 output voltage	1/N/PE AC 230 V	
Rated output frequency	50 Hz	
Max output current	AC 22.7 A	AC 27.3 A
General power factor	-0.8, …, 1, …, +0.8	

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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	110%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	1.25
				0.1	1.25
				0.1	1.20
				5.0	1.20
				5.0	1.15
				60.0	1.15
				60.0	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	0.8 – 1	0.9
	B	Active factor range underexcited	0.8 – 1	0.9
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	10 s
	n.a.	Min cos φ	0.0 – 1	0.9
	n.a.	Lock in power	0 % – 20 %	deactivated
	n.a.	Lock out power	0 % – 20 %	deactivated
4.7.2.3.4 Power related control mode	n.a.	Characteristic curve	-	-
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	120%Un
	n.a	Static voltage range undervoltage	20 % U_n – 100 % U_n	50%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	10%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	10%Pn/min
4.11.1 Ceasing active power	A.B	Remote operation of the logic interface	yes | no	Can be achieved by PGU. (Logic interface shall be specified by DNO)
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	Can be achieved by PGU. (Definition shall be specified by DNO)
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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