



Compliance Document

No. D 091566 0089 Rev. 00

Holder of Certificate: **SINENG ELECTRIC CO.,LTD.**
No.6 Hehui Road, Huishan District
214174 Wuxi City
PEOPLE'S REPUBLIC OF CHINA

Product: **Converter**
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.: 704092407517-00

Date, 2024-05-13

(Zhengdong Ma)



Compliance Document

No. D 091566 0089 Rev. 00

Model(s): SN5.0HT, SN6.0HT, SN8.0HT, SN10HT,
SN10HT-X, SN12HT, SN15HT

Parameters:
Please see pages 3 to 7.

Tested according to: EN 50549-1:2019

Compliance Document

No. D 091566 0089 Rev. 00

Model	SN5.0HT	SN6.0HT	SN8.0HT
PV Input Parameters:			
Max. Input Voltage	DC 1000 V		
Max. Input Current	DC 18/18 A		
Isc PV (Absolute Max.)	DC 25/25 A		
MPPT Voltage Range	DC 160, ..., 950 V		
AC Output Parameters:			
Nominal Output Power	5 kW	6 kW	8 kW
Rated Apparent Output Power	5 kVA	6 kVA	8 kVA
Max. Apparent Output Power	5.5 kVA	6.6 kVA	8.8 kVA
Nominal Voltage	3/N/PE AC 230/400 V		
Nominal Frequency	50 Hz		
Rated Output Current	AC 7.3 A	AC 8.7 A	AC 11.6 A
Max. Output Current	AC 8.0 A	AC 9.6 A	AC 12.8 A
Power Factor	0.8(leading), ..., 0.8(lagging)		
Battery			
Voltage Range	DC 160, ..., 600 V		
Rated(Max.) Charge/Discharge Current	DC 25/25 A		
Battery Type	Li-ion		

Model	SN10HT
PV Input Parameters:	
Max. Input Voltage	DC 1000 V
Max. Input Current	DC 18/18 A
Isc PV (Absolute Max.)	DC 25/25 A
MPPT Voltage Range	DC 160, ..., 950 V
AC Output Parameters:	
Nominal Output Power	10 kW
Rated Apparent Output Power	10 kVA
Max. Apparent Output Power	11 kVA
Nominal Voltage	3/N/PE AC 230/400 V
Nominal Frequency	50 Hz
Rated Output Current	AC 14.5 A
Max. Output Current	AC 16.0 A
Power Factor	0.8(leading), ..., 0.8(lagging)
Battery	
Voltage Range	DC 160, ..., 600 V
Rated(Max.) Charge/Discharge Current	DC 25/25 A
Battery Type	Li-ion

Compliance Document

No. D 091566 0089 Rev. 00

Model	SN10HT-X	SN12HT	SN15HT
PV Input Parameters:			
Max. Input Voltage	DC 1000 V		
Max. Input Current	DC 32/18 A		
Isc PV (Absolute Max.)	DC 40/25 A		
MPPT Voltage Range	DC 160, ..., 950 V		
AC Output Parameters:			
Nominal Output Power	10 kW	12 kW	15 kW
Rated Apparent Output Power	10 kVA	12 kVA	15 kVA
Max. Apparent Output Power	11 kVA	13.2 kVA	16.5 kVA
Nominal Voltage	3/N/PE AC 230/400 V		
Nominal Frequency	50 Hz		
Rated Output Current	AC 14.5 A	AC 17.4 A	AC 21.8 A
Max. Output Current	AC 16.0 A	AC 19.2 A	AC 24 A
Power Factor	0.8(leading), ..., 0.8(lagging)		
Battery			
Voltage Range	DC 160, ..., 600 V		
Rated(Max.) Charge/Discharge Current	DC 30/30 A		
Battery Type	Li-ion		

Compliance Document

No. D 091566 0089 Rev. 00

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	20 s
	A,B	47.5 – 48.5 Hz Duration	30 – 90 min	90 min
	A,B	48.5 – 49.0 Hz Duration	30 – 90 min	90 min
	A,B	49.0 – 51.0 Hz Duration	not configurable	unlimited
	A,B	51.0 – 51.5 Hz Duration	30 – 90 min	90 min
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 % U _n
	n.a.	Lower limit	not configurable	80 % U _n
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	2 Hz/s
		non-synchronous generating technology:		N/A
		synchronous generating technology:		N/A
4.5.3.2 Generating plant with non-synchronous generating technology	B	Maximum power resumption time	not defined	1s
		Voltage-Time-Diagram		see Figure 6
	B	Maximum power resumption time	not defined	N/A
		Voltage-Time-Diagram		see Figure 7 (N/A)
4.5.4 Over-voltage ride through (OVRT)	n.a.	Voltage-Time-Diagram	not configurable	Time [s] U [p.u.] 0.0 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	0 s
	n.a.	Deactivation threshold f _{stop}	50,0 Hz – f ₁	50.1
	n.a.	Deactivation time t _{stop}	0 – 600 s	30 s
	A	Acceptance of staged disconnection	yes no	yes

Compliance Document

No. D 091566 0089 Rev. 00

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	1
	B	Active factor range underexcited	0.9 – 1	1
4.7.2.3 Control modes	n.a.	Enabled control mode	Q setp. Q(U) cos φ setp. cos φ (P)	cos φ (P)
4.7.2.3.2 Setpoint control modes	n.a.	Q setpoint and excitation	0 – 43.6 % P_n	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 (3 τ)
	n.a.	Min cos φ	0.0 – 1	1
	n.a.	Lock in power	0 % – 20 %	20 %
	n.a.	Lock out power	0 % – 20 %	5 %
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	110 % U_n
	n.a.	Static voltage range undervoltage	20 % U_n – 100 % U_n	90 % U_n
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	0.85 U_n
	B	Undervoltage operate time stage 1	0.1 s – 100 s	3 s
	B	Undervoltage threshold stage 2	0.2 U_n – 1 U_n	0.4 U_n
	B	Undervoltage operate time stage 2	0.1 s – 5 s	1.5 s
	B	Overvoltage threshold stage 1	1.0 U_n – 1.2 U_n	1.16 U_n
	B	Overvoltage operate time stage 1	0.1 s – 100 s	10 s
	B	Overvoltage threshold stage 2	1.0 U_n – 1.3 U_n	1.25 U_n
	B	Overvoltage operate time stage 2	0.1 s – 5 s	0.1 s
	B	Overvoltage threshold 10 min mean protection	1.0 U_n – 1.15 U_n	1.10 U_n
	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	5 s
	B	Underfrequency threshold stage 2	47.0 Hz – 50.0 Hz	47.0 Hz
	B	Underfrequency operate time stage 2	0.1 s – 5 s	0.1 s
	B	Overfrequency threshold stage 1	50.0 Hz – 52.0 Hz	51.5 Hz
	B	Overfrequency operate time stage 1	0.1 s – 100 s	5 s
	B	Overfrequency threshold	50.0 Hz – 52.0 Hz	52.0 Hz

Compliance Document

No. D 091566 0089 Rev. 00

		stage 2		
	B	Overfrequency operate time stage 2	0.1 s – 5 s	0.1 s
4.10.2 Automatic reconnection after tripping	B	Lower frequency	47.0 Hz – 50.0 Hz	49.5 Hz
	B	Upper frequency	50.0 Hz – 52.0 Hz	50.2 Hz
	B	Lower voltage	50 % U_n – 100 % U_n	85% U_n
	B	Upper voltage	100 % U_n – 120 % U_n	110 % U_n
	B	Observation time	10 s – 600 s	70 s
	B	Active power increase gradient	6 % – 3000 %/min	9 % P_n /min
4.10.3 Starting to generate electrical power	A,B	Lower frequency	47.0 Hz – 50.0 Hz	49.5 Hz
	A,B	Upper frequency	50.0 Hz – 52.0 Hz	50.2 Hz
	A,B	Lower voltage	50 % – 100 % U_n	85 % U_n
	A,B	Upper voltage	100 % – 120 % U_n	110 % U_n
	A,B	Observation time	10 s – 600 s	70 s
	A,B	Active power increase gradient	6 % – 3000 %/min	9 % P_n /min
4.11.1 Ceasing active power	A,B	Remote operation of the logic interface	yes no	Can be achieved by EESS. (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 EESS. (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	N/A

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 introduced into EN 50549-1 for local DSO network management reasons and is not considered as cross border issues.

Unauthorised 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.