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DAkkS Deutsche Akkreditierungsstelle D-ZE-11321-01-00

Certificate

No. ESY 091566 0163 Rev. 00

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

Product: **Hybrid Energy Storage System**
HTC Energy storage system

Model(s): **SN5.0HTC-6.4,SN5.0HTC-12.8,SN5.0HTC-19.2,SN5.0HTC-25.7,**
SN6.0HTC-6.4,SN6.0HTC-12.8,SN6.0HTC-19.2,SN6.0HTC-25.7,
SN8.0HTC-6.4,SN8.0HTC-12.8,SN8.0HTC-19.2,SN8.0HTC-25.7,
SN10HTC-6.4,SN10HTC-12.8,SN10HTC-19.2,
SN10HTC-25.7,SN12HTC-6.4,SN12HTC-12.8,
SN12HTC-19.2,SN12HTC-25.7,SN15HTC-6.4,
SN15HTC-12.8,SN15HTC-19.2,SN15HTC-25.7

Parameters: See next pages.

Applicable standards: TOR Stromerzeugungsanlagen Typ A Version 1.3:2024
OVE-Richtlinie R 25:2020

This Certificate confirms the compliance with the above listed standards on a voluntary basis. It refers only to the sample submitted to TÜV SÜD Product Service GmbH and does not certify the quality or safety of the serial products. It was issued according to TÜV SÜD Product Service certification program Photovoltaics and Grid Integration. For details see: www.tuvsud.com/ps-cert

Test report no.: 704092602518-00

Date, 2026-05-28

(Zhengdong Ma)

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Certificate

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Parameters:

Model	SN5.0HTC- 6.4	SN5.0HTC-12.8	SN5.0HTC-19.2	SN5.0HTC-25.7
PV [DC]:				
Max. Input Voltage	1000 V d.c.			
MPPT Volatge Range	160, …, 950 V d.c.			
Max. Input Current	18/18 A d.c.			
Isc PV	25/25 A d.c.			
BAT parameters:				
Nominal Voltage	412.8 V d.c.			
Rated(max.) Discharge/Charge Current	7.9 A d.c.	13.4 A d.c.		
GRID [AC output]:				
Nominal Voltage	3/N/PE ~ 230/400 V			
Nominal Frequency	50 Hz			
Nominal Active Power	5 kW			
Nominal Apparent Output Power	5 kVA			
Rated (Max.) Apparent Output Power	5.5 kVA			
Nominal Output Current	7.3 A a.c.			
Rated (Max.) Output Current	8.0 A a.c.			
PF	0.8overexcited, …, 1, …, 0.8underexcited			

Model	SN6.0HTC- 6.4	SN6.0HTC-12.8	SN6.0HTC-19.2	SN6.0HTC-25.7
PV [DC]:				
Max. Input Voltage	1000 V d.c.			
MPPT Volatge Range	160, …, 950 V d.c.			
Max. Input Current	18/18 A d.c.			
Isc PV	25/25 A d.c.			
BAT parameters:				
Nominal Voltage	412.8 V d.c.			
Rated(max.) Discharge/Charge Current	7.9 A d.c.	13.9 A d.c.		
GRID [AC output]:				
Nominal Voltage	3/N/PE ~ 230/400 V			
Nominal Frequency	50 Hz			
Nominal Active Power	6 kW			
Nominal Apparent Output Power	6 kVA			
Rated (Max.) Apparent Output Power	6.6 kVA			
Nominal Output Current	8.7 A a.c.			
Rated (Max.) Output Current	9.6 A a.c.			
PF	0.8overexcited, …, 1, …, 0.8underexcited			

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DAkkS Deutsche Akkreditierungsstelle D-ZE-11321-01-00

TÜV SÜD

Certificate

No. ESY 091566 0163 Rev. 00

Model	SN8.0HTC- 6.4	SN8.0HTC-12.8	SN8.0HTC-19.2	SN8.0HTC-25.7
PV [DC]:				
Max. Input Voltage	1000 V d.c.			
MPPT Volatge Range	160, …, 950 V d.c.			
Max. Input Current	18/18/18 A d.c.			
Isc PV	25/25/25 A d.c.			
BAT parameters:				
Nominal Voltage	412.8 V d.c.			
Rated(max.) Discharge/Charge Current	7.9 A d.c.	15.8 A d.c.	22.3 A d.c.	
GRID [AC output]:				
Nominal Voltage	3/N/PE ~ 230/400 V			
Nominal Frequency	50 Hz			
Nominal Active Power	8 kW			
Nominal Apparent Output Power	8 kVA			
Rated (Max.) Apparent Output Power	8.8 kVA			
Nominal Output Current	11.6 A a.c.			
Rated (Max.) Output Current	12.8 A a.c.			
PF	0.8overexcited, …, 1, …, 0.8underexcited			

Model	SN10HTC- 6.4	SN10HTC-12.8	SN10HTC-19.2	SN10HTC-25.7
PV [DC]:				
Max. Input Voltage	1000 V d.c.			
MPPT Volatge Range	160, …, 950 V d.c.			
Max. Input Current	18/18/18 A d.c.			
Isc PV	25/25/25 A d.c.			
BAT parameters:				
Nominal Voltage	412.8 V d.c.			
Rated(max.) Discharge/Charge Current	7.9 A d.c.	15.8 A d.c.	23.7 A d.c.	28.0 A d.c.
GRID [AC output]:				
Nominal Voltage	3/N/PE ~ 230/400 V			
Nominal Frequency	50 Hz			
Nominal Active Power	10 kW			
Nominal Apparent Output Power	10 kVA			
Rated (Max.) Apparent Output Power	11 kVA			
Nominal Output Current	14.5 A a.c.			
Rated (Max.) Output Current	16.0 A a.c.			
PF	0.8overexcited, …, 1, …, 0.8underexcited			

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Certificate

No. ESY 091566 0163 Rev. 00

Model	SN12HTC- 6.4	SN12HTC-12.8	SN12HTC-19.2	SN12HTC-25.7
PV [DC]:				
Max. Input Voltage	1000 V d.c.			
MPPT Volatge Range	160, …, 950 V d.c.			
Max. Input Current	18/18/18 A d.c.			
Isc PV	25/25/25 A d.c.			
BAT parameters:				
Nominal Voltage	412.8 V d.c.			
Rated(max.) Discharge/Charge Current	7.9 A d.c.	15.8 A d.c.	23.7 A d.c.	31.6 A d.c.
GRID [AC output]:				
Nominal Voltage	3/N/PE ~ 230/400 V			
Nominal Frequency	50 Hz			
Nominal Active Power	12 kW			
Nominal Apparent Output Power	12 kVA			
Rated (Max.) Apparent Output Power	13.2 kVA			
Nominal Output Current	17.4 A a.c.			
Rated (Max.) Output Current	19.2 A a.c.			
PF	0.8overexcited, …, 1, …, 0.8underexcited			

Model	SN15HTC-6.4	SN15HTC-12.8	SN15HTC-19.2	SN15HTC-25.7
PV [DC]:				
Max. Input Voltage	1000 V d.c.			
MPPT Volatge Range	160, …, 950 V d.c.			
Max. Input Current	18/18/18 A d.c.			
Isc PV	25/25/25 A d.c.			
BAT parameters:				
Nominal Voltage	412.8 V d.c.			
Rated(max.) Discharge/Charge Current	7.9 A d.c.	15.8 A d.c.	23.7 A d.c.	31.6 A d.c.
GRID [AC output]:				
Nominal Voltage	3/N/PE ~ 230/400 V			
Nominal Frequency	50 Hz			
Nominal Active Power	15 kW			
Nominal Apparent Output Power	15 kVA			
Rated (Max.) Apparent Output Power	16.5 kVA			
Nominal Output Current	21.8 A a.c.			
Rated (Max.) Output Current	24.0 A a.c.			
PF	0.8overexcited, …, 1, …, 0.8underexcited			

Requirements for power generator	Value default			
1. Reactive power of inverter				
1a. Fixed displacement factor cos φ_{fixed}	1			
1b. Displacement factor/active power characteristic cos φ (P)	setpoint	cos φ	P/PEmax	
	a	1	0	
	b	1	0.5	
	c	$0.9_{underexcited}$	1	
1c. Reactive power voltage/voltage characteristic Q (U)	setpoint	U/Un	Q/P_{max}	
	a	0.92 Un	0.436	cos φ = 0.9
	b	0.96 Un	0	cos φ = 1

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TÜV SÜD

Certificate

No. ESY 091566 0163 Rev. 00

	c	1.05 Un	0	cos φ = 1
	d	1.08 Un	-0.436	cos φ = 0.9
	Time constant of a first-order filter (PT1 behaviour)		5 s	
	Intentional delay time		0 s	
1d. Fixed reactive power Q_{fixed}	Q = 0			
1e. Fixed Power factor cos φ_{fixed}	cos φ=0.4			
2. Standard settings for active power control				
2a-1. Default settings for electrical energy storage-LFSM OC mode	Start of power reduction from		Droop S_2	
	50.2 Hz		5 % (40%P_M/Hz)	
	Intentional delay time		0 s	
2a-2. Default settings for electrical energy storage-LFSM UC mode	Start of power reduction from		Droop S_2	
	49.8 Hz		1 % (200%P_M/Hz)	
	Intentional delay time		0 s	
2b. Voltage related active power control P(U)	standard values apply for setting the interpolation points of the characteristic curve:		U/Un	P/Pn
	Setpoint a		110% Un	100%
	Setpoint b		112% Un	0%
	Time constant of a first-order filter (PT1 behaviour)		5 s	
	Intentional delay time		0 s	
3. Default settings for FRT capability				
FRT capability for undervoltage setpoint	0.8 Un			
4. Default settings for the connection conditions				
Setting values for connection conditions	Voltage		0.85 p.u. ≤ U ≤ 1.09 p.u.	
	Frequency		47.5 Hz < f < 50.10 Hz	
Settings for the minimum waiting time for connection to the grid	For automatic or operation-related connection		60 s	
	In case of reconnection after interface protection:		300 s	
Maximum gradient of the increase in active power after interface protection	10 % P_{max}/min			
5. Default settings for interface protection				
Default settings for the grid decoupling protection	Function	Setting values for protection relays		
	Overvoltage protection U_{eff}>>	1.15 Un	0.1 s	
	Overvoltage protection U_{eff}> 10-min average value	1.11 Un	0.1 s	
	Undervoltage protection U_{eff}<	0.80 Un	1.5 s	
	Undervoltage protection U_{eff}<<	0.25 Un	0.5 s	
	Overfrequency f>	51.5 Hz	0.1 s	
	Underfrequency f<	47.5 Hz	0.1 s	
	Grid failure		≤5.0 s	
Password protection for settings: Password protection used for unauthorized change by user and not disclosed to the user.				

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