

Certificate of Conformity

No. ESY 105515 0075 Rev. 00

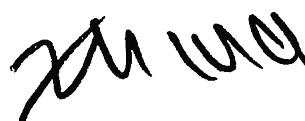
Holder of Certificate: **Suzhou Hypontech Co., Ltd.**
No.1508 Xiangjiang Road,
SND,
215010 Suzhou
PEOPLE'S REPUBLIC OF CHINA

Product: **PV inverter**
Solar inverter

This Certificate of Conformity 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.: 5040922010516-00

Date, 2022-11-09



(Zhengdong Ma)



Product Service

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Model(s): HPT-3000, HPT-4000, HPT-5000,
HPT-6000, HPT-8000, HPT-10000,
HPT-11000.

Parameters:
Please see pages 3 to 10.

Applicable standards: VDE-AR-N 4105:2018
DIN VDE V 0124-100 (VDE V 0124-100):2020

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Model name	HPT-3000	HPT-4000	HPT-5000	HPT-6000
PV input parameters				
Max. input voltage	1000 Vd.c.			
MPP voltage range	180 – 850 Vd.c.			
Max. input current	2*12.5 Ad.c.			
Isc PV(absolute maximum)	2*15.6 Ad.c.			
AC output parameters				
Rated grid voltage	3/N/PE~, 230/400 V			
Rated grid frequency	50 Hz			
Rated AC output active power	3000 W	4000 W	5000 W	6000 W
Max. AC output apparent power	3300 VA	4400 VA	5500 VA	6000 VA
Max. continuous output current	5 Aa.c.	6.5 Aa.c.	8.5 Aa.c.	9 Aa.c.
Adjustable cos(φ)	0.8ind...0.8cap			
Others				
Inverter topology	Non-isolated			
Operating temperature range	-25...+60°C			
Ingress protection	IP65			
Protective class	I			
Overtoltage category	II(PV), III(MAINS)			

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Model name	HPT-8000	HPT-10000	HPT-11000
PV input parameters			
Max. input voltage	1000 Vd.c.		
MPP voltage range	180 – 850 Vd.c.		
Max. input current	2*12.5 Ad.c.		
Isc PV(absolute maximum)	2*15.6 Ad.c.		
AC output parameters			
Rated grid voltage	3/N/PE~, 230/400 V		
Rated grid frequency	50 Hz		
Rated AC output active power	8000 W	10000 W	10500 W
Max. AC output apparent power	8800 VA	10000 VA	10500 VA
Max. continuous output current	13 Aa.c.	15.2 Aa.c.	16 Aa.c.
Adjustable cos(φ)	0.8ind...0.8cap		
Others			
Inverter topology	Non-isolated		
Operating temperature range	-25...+60°C		
Ingress protection	IP65		
Protective class	I		
Overvoltage category	II(PV), III(MAINS)		

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E.4 Unit certificate

Unit certificate	No. 50.409.22.0105.16-00	
Manufacturer	Suzhou Hypontech Co., Ltd. No.1508 Xiangjiang Road, SND, 215010, Suzhou, PEOPLE'S REPUBLIC OF CHINA	
Power generation unit type	[Inverter]: HPT-3000, HPT-4000, HPT-5000, HPT-6000, HPT-8000, HPT-10000, HPT-11000 Remark: certified on representative model HPT-8000 of family design products, results of the measurement of HPT-8000 can be transferred to the other models based on transferability rule of measurements in DIN VDE V 0124-100 (VDE V 0124-100):2020.	
<input checked="" type="checkbox"/> Inverter	<input type="checkbox"/> Asynchronous generator	<input type="checkbox"/> Synchronous generator
<input type="checkbox"/> Stirling generator	<input type="checkbox"/> Fuel cell	<input type="checkbox"/> others
Assessment values	Max. active power $P_{E_{max}}$	8916 W (HPT-8000)
	Max. apparent power $S_{E_{max}}$	8926 VA (HPT-8000)
	Rated voltage	3/N/PE~, 230/400 V
Rated values	Rated current (AC) I_r	11.6 A (HPT-8000)
Rated values	Max. current (AC) I_{max}	13 A (HPT-8000)
Rated values	Initial short-circuit current I_k''	13 A
Network connection rules	VDE-AR-N 4105:2018-11/Corrigendum 1:2020-10 Generators connected to the low-voltage distribution network - Technical requirements for the connection to and parallel operation with low-voltage distribution networks.	
Test requirement	DIN VDE V 0124-100 (VDE V 0124-100):2020-06 "Network integration of power generation system – Low voltage" Test requirements for power generation units intended for connection to and parallel operation on the low-voltage network.	
The above mentioned power generation unit meets the requirements of VDE-AR-N 4105.		

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E.5 Test report "Network interactions" for generating units with an input current > 75 A

Extract from test report for unit certificate "Determination of electrical properties"		No. 50.409.22.0105.16-00
Generation unit manufacturer:	Suzhou Hypontech Co., Ltd. No.1508 Xiangjiang Road, SND, 215010, Suzhou, PEOPLE'S REPUBLIC OF CHINA	
Manufacturer indications:	Type of system	Inverter for PV system
	Max. active power $P_{E_{max}}$	3300 W (HPT-3000) 4400 W (HPT-4000) 5500 W (HPT-5000) 6000 W (HPT-6000) 8800 W (HPT-8000) 10000 W (HPT-10000) 10500 W (HPT-11000)
	Rated voltage	3/N/PE~, 230/400 V
Period of measurement:	From 2022-08-31 to 2022-10-15	

Flicker (EN 61000-3-3) (HPT-8000)					
Test condition	$d_{(t) - 500ms}$ [%]	d_c [%]	d_{max} [%]	P_{st}	P_{it}
Continuous operation	0/0/0	0.14/0.17/0.17	0.42/0.37/0.48	0.14/0.13/0.15	0.13/0.13/0.15
Start	0/0/0	0.11/0.09/0	0.28/0.36/0	-	-
Stop	0/0/0	0.25/0.19/0.16	0.26/0.21/0.21	-	-
Limit	3.3%	3.3%	4%	1.0	0.65

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Harmonics (EN 61000-3-2) (HPT-8000)												
P/Pn [%]	0	10	20	30	40	50	60	70	80	90	100	Limit
Ordinal number	A	A	A	A	A	A	A	A	A	A	A	[A]
2	0.019	0.034	0.028	0.030	0.032	0.031	0.031	0.028	0.028	0.029	0.030	1.080
3	0.007	0.013	0.021	0.021	0.019	0.020	0.020	0.018	0.019	0.021	0.029	2.300
4	0.010	0.037	0.028	0.021	0.028	0.021	0.017	0.016	0.014	0.014	0.015	0.430
5	0.019	0.057	0.073	0.063	0.047	0.031	0.025	0.022	0.026	0.030	0.036	1.140
6	0.003	0.012	0.011	0.008	0.008	0.006	0.004	0.004	0.004	0.004	0.005	0.300
7	0.021	0.013	0.009	0.006	0.011	0.022	0.025	0.027	0.028	0.029	0.030	0.770
8	0.007	0.030	0.027	0.021	0.017	0.016	0.013	0.012	0.011	0.012	0.011	0.230
9	0.005	0.008	0.007	0.009	0.010	0.009	0.009	0.007	0.006	0.006	0.005	0.400
10	0.006	0.015	0.016	0.017	0.015	0.010	0.009	0.008	0.008	0.011	0.012	0.184
11	0.034	0.088	0.044	0.053	0.081	0.034	0.015	0.052	0.077	0.099	0.113	0.330
12	0.001	0.011	0.009	0.008	0.008	0.005	0.004	0.003	0.003	0.003	0.003	0.153
13	0.037	0.041	0.063	0.099	0.055	0.065	0.077	0.080	0.077	0.066	0.051	0.210
14	0.004	0.011	0.010	0.013	0.016	0.013	0.009	0.007	0.006	0.006	0.006	0.131
15	0.004	0.007	0.009	0.004	0.006	0.006	0.005	0.005	0.005	0.005	0.004	0.150
16	0.004	0.006	0.018	0.014	0.015	0.015	0.015	0.012	0.012	0.012	0.011	0.115
17	0.022	0.041	0.024	0.026	0.013	0.012	0.035	0.053	0.057	0.051	0.043	0.132
18	0.003	0.004	0.008	0.007	0.007	0.004	0.003	0.003	0.004	0.003	0.004	0.102
19	0.022	0.044	0.037	0.016	0.037	0.016	0.032	0.027	0.018	0.029	0.045	0.118
20	0.004	0.007	0.010	0.012	0.010	0.006	0.007	0.010	0.010	0.011	0.012	0.092
21	0.002	0.004	0.009	0.007	0.006	0.007	0.005	0.003	0.004	0.004	0.004	0.107
22	0.004	0.005	0.008	0.012	0.016	0.013	0.010	0.007	0.006	0.005	0.005	0.084
23	0.012	0.017	0.011	0.016	0.025	0.026	0.030	0.040	0.039	0.030	0.021	0.098
24	0.001	0.003	0.006	0.006	0.005	0.004	0.003	0.003	0.003	0.003	0.003	0.077
25	0.016	0.036	0.023	0.019	0.011	0.033	0.043	0.034	0.025	0.031	0.038	0.090
26	0.003	0.004	0.009	0.013	0.006	0.008	0.010	0.010	0.008	0.007	0.006	0.071
27	0.002	0.003	0.006	0.007	0.004	0.005	0.003	0.004	0.004	0.003	0.004	0.083
28	0.003	0.003	0.012	0.014	0.012	0.010	0.009	0.008	0.009	0.009	0.010	0.066
29	0.009	0.018	0.029	0.016	0.015	0.021	0.006	0.009	0.004	0.017	0.028	0.078
30	0.001	0.004	0.006	0.006	0.005	0.004	0.003	0.003	0.003	0.003	0.003	0.061
31	0.013	0.019	0.024	0.031	0.029	0.019	0.013	0.011	0.016	0.019	0.016	0.073
32	0.003	0.004	0.005	0.008	0.008	0.006	0.005	0.004	0.006	0.008	0.009	0.058
33	0.003	0.003	0.005	0.005	0.003	0.005	0.003	0.003	0.003	0.003	0.004	0.068
34	0.003	0.003	0.005	0.012	0.007	0.009	0.007	0.006	0.005	0.006	0.006	0.054
35	0.012	0.016	0.012	0.021	0.008	0.012	0.015	0.018	0.020	0.029	0.033	0.064
36	0.001	0.002	0.003	0.004	0.004	0.004	0.003	0.003	0.003	0.003	0.003	0.051
37	0.011	0.010	0.028	0.023	0.018	0.015	0.018	0.025	0.032	0.029	0.023	0.061
38	0.003	0.005	0.005	0.008	0.006	0.003	0.006	0.007	0.009	0.007	0.006	0.048
39	0.002	0.003	0.005	0.005	0.004	0.005	0.004	0.006	0.004	0.004	0.004	0.058
40	0.003	0.005	0.005	0.008	0.006	0.007	0.006	0.007	0.007	0.006	0.006	0.046

Max. value of three phase are recorded for harmonics.

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E.6 Certificate of the network and system protection

Certificate of NS protection	<u>No. 50.409.22.0105.16-00</u>		
Manufacturer	Suzhou Hypontech Co., Ltd. No.1508 Xiangjiang Road, SND, 215010, Suzhou, PEOPLE'S REPUBLIC OF CHINA		
Type of NS protection			
Central NS protection	<input type="checkbox"/>		
Integrated NS protection	<input checked="" type="checkbox"/>	Assigned to power generation unit type	HPT-3000, HPT-4000, HPT-5000, HPT-6000, HPT-8000, HPT-10000, HPT-11000.
Network connection rules	VDE-AR-N 4105:2018-11/Corrigendum 1:2020-10 Generators connected to the low-voltage distribution network - Technical requirements for the connection to and parallel operation with low-voltage distribution networks.		
Test requirement	DIN VDE V 0124-100 (VDE V 0124-100):2020-06 “Network integration of power generation system – Low voltage” Test requirements for power generation units intended for connection to and parallel operation on the low-voltage network.		
The network and system protection mentioned above meets the requirements of VDE-AR-N 4105.			

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E.7 Requirement for the test report for the NS protection

Extract from test report for NS protection "Determination of electrical properties"		No. 50.409.22.0105.16-00	
NS protection test report			
Type of NS system:	Integrated NS protection	Other Manufacturer indications	
Software version:	V1.0.0.00		
Manufacturer:	Suzhou Hypontech Co., Ltd. No.1508 Xiangjiang Road, SND, 215010, Suzhou, PEOPLE'S REPUBLIC OF CHINA		
Measuring period:	From 2022-08-31 to 2022-10-15		
	Inverter		
Protection function	Setting value	Tripping value	Break time NS protection *
Rise-in-voltage protection $U >>$	$1,25 \cdot U_n$	L1-N/L2-N/L3-N: 289 V, 288.8 V, 289 V, L1-N: 287 V, L2-N: 287 V, L3-N: 288 V,	L1-N/L2-N/L3-N: 174 ms, L1-N: 182 ms, L2-N: 181 ms, L3-N: 178 ms,
Rise-in-voltage protection $U >$	$1,10 \cdot U_n$	$1,10 \cdot U_n$	ms**
Voltage drop protection $U <$	$0,8 \cdot U_n$	L1-N/L2-N/L3-N: 185.5 V, 185.5 V, 185.5 V, L1-N: 184 V, L2-N: 184 V, L3-N: 184 V,	L1-N/L2-N/L3-N: 3013 ms, L1-N: 3005 ms, L2-N: 3020 ms, L3-N: 3028 ms,
Voltage drop protection $U <<$	$0,45 \cdot U_n$	L1-N/L2-N/L3-N: 103.5 V, 103.7 V, 103.8 V, L1-N: 103 V, L2-N: 103 V, L3-N: 103 V,	L1-N/L2-N/L3-N: 334 ms, L1-N: 332 ms, L2-N: 340 ms, L3-N: 324 ms,
Frequency decrease protection $f <$	47,5 Hz	47,49 Hz	168 ms
Frequency increase protection $f >$	51,5 Hz	51,52 Hz	186 ms
<p>*: The tripping time includes the period from the limit value violation U/f until the tripping signal to the interface switch. When planning the power generation system, the response time of the interface switch shall be added to the maximum time value obtained as indicated above. The disconnection time (sum of tripping time of the NS protection plus response time of the interface switch) shall not exceed 200 ms.</p> <p>** : Verification disconnection time of moving 10-min-average value.</p> <p>Disconnecting time as below:</p> <ol style="list-style-type: none"> 492 s (L1-N) / 528 s (L2-N) / 536 s (L3-N) (from 600s@U_n to 112%U_n) Continuous operation (L1-N/L2-N/L3-N) (from 600s@U_n to 108%U_n) 303 s (L1-N) / 272 s (L2-N) / 273 s (L3-N) (from 600s@106%U_n to 114%U_n) 			

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<input checked="" type="checkbox"/> as integrated NS protection	
Assigned to power generation unit type	HPT-3000, HPT-4000, HPT-5000, HPT-6000, HPT-8000, HPT-10000, HPT-11000.
Integrated interface switch type	Series-connected relays for both line and neutral conductors Relay type: HF161F-W/12-HT
Response time of interface switch for integrated NS protection	Operate time: Max. 20 ms Release time: Max. 10 ms
Verification of the entire functional chain "integrated NS protection – interface switch" has resulted in successful disconnection.	<input checked="" type="checkbox"/>