

Certificate of Conformity

No. ESY 105515 0080 Rev. 00

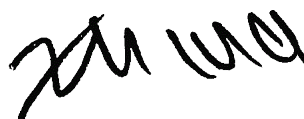
Holder of Certificate: **Suzhou Hypontech Co., Ltd.**
No.1508 Xiangjiang Road,
SND,
215010 Suzhou
PEOPLE'S REPUBLIC OF CHINA

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.: 5040922010517-00

Date, 2023-02-28



(Zhengdong Ma)



Product Service

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Model(s): HPT-30K, HPT-33K, HPT-36K, HPT-40K, HPT-50K

Parameters:
Please see pages 3 to 9.

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

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Model name	HPT-30K	HPT-33K	HPT-36K
PV input parameters			
Max. input voltage	d.c. 1100 V		
MPP voltage range	d.c. 3*30 A		
Max. input current	d.c. 3*45 A		
Isc PV(absolute maximum)	d.c. 150-1000 V		
AC output parameters			
Rated grid voltage	3/N/PE~, 230/400 V		
Rated grid frequency	50 Hz		
Rated AC output active power	30000 W	33000 W	36000 W
Max. AC output apparent power	33000 VA	36300 VA	39600 VA
Max. continuous output current	a.c. 50 A	a.c. 55 A	a.c. 60 A
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)		

Model name	HPT-40K	HPT-50K
PV input parameters		
Max. input voltage	1100 Vd.c.	
MPP voltage range	150 – 1000 Vd.c.	
Max. input current	4*30 Ad.c.	
Isc PV(absolute maximum)	4*45 Ad.c.	
AC output parameters		
Rated grid voltage	3/N/PE~, 230/400 V	
Rated grid frequency	50 Hz	
Rated AC output active power	40000 W	50000 W
Max. AC output apparent power	44000 VA	55000 VA
Max. continuous output current	a.c. 66.7 A	a.c. 80 A
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. 50.409.22.0105.17-00	
Manufacturer	Suzhou Hypontech Co., Ltd. No.1508 Xiangjiang Road, SND, 215010, Suzhou, PEOPLE'S REPUBLIC OF CHINA	
Power generation unit type	[Inverter]: HPT-30K, HPT-33K, HPT-36K, HPT-40K, HPT-50K, Remark: certified on representative model HPT-50K of family design products, results of the measurement of HPT-50K 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 $P_{E_{max}}$	55.53 kW
	Max. apparent power $S_{E_{max}}$	55.55 kVA
	Rated voltage	3/N/PE~, 230/400 V
Rated values	Rated current (AC) I_r	72.46A
Rated values	Max. current (AC) I_{max}	80 A
Rated values	Initial short-circuit current I_k "	80 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. <u>50.409.22.0105.17-00</u>
Generation unit manufacturer:	<u>Suzhou Hypontech Co., Ltd.</u> <u>No.1508 Xiangjiang Road, SND, 215010, Suzhou, PEOPLE'S REPUBLIC OF CHINA</u>	
Manufacturer indications:	Type of system	<u>Inverter for PV system</u>
	Max. active power $P_{E_{max}}$	<u>33 kW (HPT-30K)</u> <u>36.3 kW (HPT-33K)</u> <u>39.6 kW (HPT-36K)</u> <u>44 kW (HPT-40K)</u> <u>55 kW (HPT-50K)</u>
	Rated voltage	<u>3/N/PE~, 230/400 V</u>
	Period of measurement:	<u>From 2022-11-02 to 2023-01-15</u>

Flicker (EN 61000-3-11) (HPT-50K)					
Test condition	$d_{(t)} - 500ms$ [%]	d_c [%]	d_{max} [%]	P_{st}	P_{It}
Continuous operation	0/0/0	0.15/0.33/0.23	0.25/0.39/0.32	0.09/0.16/0.10	0.09/0.16/0.10
Start	0.00/0.00/0.00	0.17/0.32/0.20	0.32/0.36/0.57	-	-
Stop	0.00/0.00/0.00	0.16/0.31/0.13	0.41/0.40/0.21	-	-
Limit	3.3%	3.3%	4%	1.0	0.65

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Harmonics (EN 61000-3-12) (HPT-50K)												
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	0.047	0.048	0.046	0.054	0.044	0.056	0.059	0.064	0.079	0.064	0.053	8.0
3	0.084	0.079	0.085	0.090	0.094	0.098	0.113	0.132	0.133	0.125	0.058	-
4	0.047	0.046	0.052	0.048	0.056	0.053	0.058	0.061	0.058	0.064	0.069	4.0
5	0.226	0.147	0.259	0.357	0.402	0.456	0.502	0.549	0.608	0.698	0.844	10.7
6	0.038	0.037	0.041	0.041	0.042	0.043	0.046	0.047	0.049	0.052	0.058	2.67
7	0.110	0.249	0.125	0.175	0.215	0.217	0.237	0.247	0.244	0.228	0.264	7.2
8	0.007	0.010	0.010	0.012	0.012	0.012	0.013	0.016	0.017	0.016	0.027	2.0
9	0.018	0.018	0.023	0.021	0.019	0.021	0.023	0.028	0.027	0.024	0.028	-
10	0.013	0.013	0.014	0.015	0.014	0.015	0.016	0.017	0.017	0.019	0.030	1.6
11	0.076	0.054	0.095	0.089	0.100	0.118	0.122	0.122	0.121	0.113	0.157	3.1
12	0.017	0.018	0.018	0.019	0.019	0.020	0.021	0.022	0.022	0.025	0.031	1.33
13	0.047	0.061	0.090	0.049	0.076	0.078	0.095	0.092	0.092	0.100	0.096	2.0
14	0.014	0.014	0.016	0.017	0.017	0.018	0.020	0.020	0.020	0.022	0.029	-
15	0.008	0.008	0.012	0.017	0.011	0.028	0.023	0.017	0.016	0.017	0.024	-
16	0.008	0.009	0.009	0.013	0.011	0.029	0.099	0.050	0.025	0.023	0.024	-
17	0.043	0.051	0.047	0.042	0.030	0.062	0.061	0.087	0.090	0.066	0.103	-
18	0.009	0.010	0.012	0.013	0.014	0.032	0.122	0.059	0.040	0.221	0.026	-
19	0.036	0.027	0.030	0.038	0.017	0.040	0.049	0.076	0.082	0.080	0.076	-
20	0.011	0.013	0.013	0.013	0.014	0.014	0.017	0.018	0.032	0.275	0.031	-
21	0.007	0.012	0.010	0.009	0.010	0.010	0.013	0.013	0.016	0.048	0.030	-
22	0.011	0.009	0.012	0.012	0.012	0.012	0.014	0.015	0.018	0.033	0.034	-
23	0.031	0.042	0.016	0.036	0.022	0.016	0.036	0.041	0.044	0.050	0.137	-
24	0.007	0.008	0.010	0.010	0.011	0.011	0.013	0.014	0.017	0.027	0.036	-
25	0.029	0.012	0.018	0.031	0.013	0.027	0.026	0.041	0.038	0.045	0.101	-
26	0.009	0.008	0.011	0.010	0.010	0.012	0.013	0.017	0.017	0.021	0.047	-
27	0.007	0.008	0.009	0.010	0.010	0.011	0.013	0.016	0.017	0.019	0.048	-
28	0.010	0.010	0.009	0.010	0.011	0.011	0.013	0.014	0.017	0.019	0.049	-
29	0.018	0.011	0.022	0.028	0.015	0.020	0.026	0.030	0.038	0.039	0.105	-
30	0.008	0.008	0.009	0.009	0.011	0.009	0.011	0.013	0.014	0.016	0.049	-
31	0.018	0.020	0.021	0.022	0.021	0.011	0.031	0.030	0.038	0.039	0.171	-
32	0.008	0.009	0.010	0.009	0.011	0.011	0.013	0.013	0.013	0.016	0.047	-
33	0.007	0.009	0.008	0.008	0.008	0.008	0.010	0.011	0.012	0.012	0.044	-
34	0.008	0.006	0.009	0.010	0.010	0.009	0.011	0.012	0.012	0.013	0.043	-
35	0.008	0.012	0.010	0.016	0.009	0.011	0.021	0.028	0.032	0.034	0.132	-
36	0.007	0.006	0.006	0.006	0.006	0.007	0.008	0.009	0.009	0.009	0.035	-
37	0.006	0.026	0.006	0.009	0.014	0.009	0.015	0.028	0.032	0.034	0.073	-
38	0.008	0.009	0.009	0.009	0.010	0.010	0.011	0.010	0.012	0.011	0.036	-
39	0.006	0.009	0.007	0.007	0.007	0.007	0.008	0.008	0.009	0.010	0.042	-
40	0.007	0.007	0.009	0.009	0.010	0.010	0.011	0.011	0.012	0.012	0.032	-
THC/Iref	0.303	0.334	0.348	0.440	0.495	0.553	0.627	0.667	0.717	0.862	0.985	13
PWHC/Iref	0.397	0.435	0.387	0.462	0.350	0.486	0.854	0.784	0.810	1.748	1.951	22

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	No. 50.409.22.0105.17-00		
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	33 kW (HPT-30K) 36.3 kW (HPT-33K) 39.6 kW (HPT-36K) 44 kW (HPT-40K) 55 kW (HPT-50K)
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. <u>50.409.22.0105.17-00</u>	
NS protection test report			
Type of NS system:	Integrated NS protection	Other Manufacturer indications	
Software version:	V1.00		
Manufacturer:	<u>Suzhou Hypontech Co., Ltd.</u> <u>No.1508 Xiangjiang Road, SND,</u> <u>215010, Suzhou, PEOPLE'S</u> <u>REPUBLIC OF CHINA</u>		
Measuring period:	From 2022-11-02 to 2023-01-15		
	Inverter		
	directly coupled synchronous and asynchronous generators with Pn > 30 kW		
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: 288 V, 288 V, 288 V, L1-N: 288 V, L2-N: 288 V, L3-N: 288 V, L1-L2: 498 V, L2-L3: 498 V, L3-L1: 498 V,	L1-N/L2-N/L3-N: 116 ms, L1-N: 126 ms, L2-N: 114 ms, L3-N: 114 ms, L1-L2: 198 ms, L2-L3: 178 ms, L3-L1: 184 ms,
Rise-in-voltage protection $U >$	$1.10 \cdot U_n$	$1.0 \cdot U_n$	ms**
Voltage drop protection $U <$	$0.8 \cdot U_n$	L1-N/L2-N/L3-N: 184 V, 184 V, 184 V, L1-N: 184 V, L2-N: 184 V, L3-N: 184 V, L1-L2: 319 V, L2-L3: 319 V, L3-L1: 319 V,	L1-N/L2-N/L3-N: 3008 ms, L1-N: 3025 ms, L2-N: 3020 ms, L3-N: 3005 ms, L1-L2: 3010 ms, L2-L3: 3003 ms, L3-L1: 3028 ms,
Voltage drop protection $U <<$	$0.45 \cdot U_n$	L1-N/L2-N/L3-N: 103 V, 103 V, 103 V, L1-N: 103 V, L2-N: 103 V, L3-N: 103 V, L1-L2: 179 V, L2-L3: 179 V, L3-L1: 179 V,	L1-N/L2-N/L3-N: 314 ms, L1-N: 318 ms, L2-N: 321 ms, L3-N: 307 ms, L1-L2: 312 ms, L2-L3: 308 ms, L3-L1: 314 ms,
Frequency decrease protection $f <$	47.5 Hz	47.49 Hz	125 ms
Frequency increase protection $f >$	51.5 Hz	51.50 Hz	129 ms

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<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"> 1. 497 s (L1-N) / 498 s (L2-N) / 503 s (L3-N) (from 600s@U_n to 112%U_n) 2. Continuous operation (L1-N/L2-N/L3-N) (from 600s@U_n to 108%U_n) 3. 318 s (L1-N) / 305 s (L2-N) / 320 s (L3-N) (from 600s@106%U_n to 114%U_n) 	
<p><input checked="" type="checkbox"/> as integrated NS protection</p>	
Assigned to power generation unit type	HPT-30K HPT-33K HPT-36K HPT-40K HPT-50K
Integrated interface switch type	Series-connected relays for both line and neutral conductors Relay type: HONGFA_HF167F/12-htf
Response time of interface switch for integrated NS protection	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"/>