

# Certificate of Conformity

No. ESY 083373 0093 Rev. 00

**Holder of Certificate:** **GoodWe Technologies Co., Ltd.**

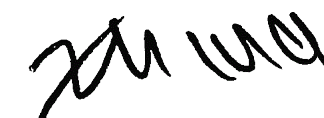
No. 90 Zijin Road  
New District  
215011 Suzhou  
PEOPLE'S REPUBLIC OF CHINA

**Product:** **PV inverter**  
**Micro 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](http://www.tuvsud.com/ps-cert)

**Test report no.:** 50409220013155-00

**Date,** 2024-02-05



( Zhengdong Ma )

# Certificate of Conformity

No. ESY 083373 0093 Rev. 00

**Model(s):**

GW1600-MIS, GW1800-MIS, GW2000-MIS

**Parameters:**

Please see pages 3 to 7

**Applicable standards:**

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

# Certificate of Conformity

No. ESY 083373 0093 Rev. 00

Model Name	GW1600-MIS	GW1800-MIS	GW2000-MIS
PV Input			
Max. DC Voltage	65 Vd.c.		
MPPT Voltage Range	16...60 Vd.c.		
Max. Input Current	16/16/16/16 Ad.c.		
Isc PV	25/25/25/25 Ad.c.		
AC Output			
Rated Output Power	1600 W	1800 W	2000 W
Rated Apparent Power	1600 VA	1800 VA	2000 VA
Max. Apparent Power	1600 VA	1800 VA	2000 VA
Max. Output Current	6.96 Aa.c.	7.83 Aa.c.	8.7 Aa.c.
Rated Voltage	1/N/PE~230 Va.c.		
Rated Frequency	50 Hz		
Power Factor	1, 0.8cap...0.8ind		

## E.4 Unit certificate

Unit certificate	No. 50409220013155-00	
Manufacturer	GoodWe Technologies Co., Ltd. No. 90 Zijin Road, New District, 215011 Suzhou, PEOPLE'S REPUBLIC OF CHINA	
Power generation unit type	GW1600-MIS GW1800-MIS GW2000-MIS Remark: certified on representative model GW2000-MIS of family design products, results of the measurement of GW2000-MIS can be transferred to 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 $P_{E_{max}}$	2021 W (GW2000-MIS)
	Max. apparent power $S_{E_{max}}$	2025 VA (GW2000-MIS)
	Rated voltage	L/N/PE AC 230 V
Rated values	Max. current (AC) $I_{max}$	8.7 A (GW2000-MIS)
Network connection rules	<b>VDE-AR-N 4105:2018-11/Corrigendum 1:2020-10</b> Generators connected to the low-voltage distribution network - Technical requirements for the connection to and parallel operation with low-voltage distribution networks.	
Test requirement	<b>DIN VDE V 0124-100 (VDE V 0124-100):2020-06 “Network integration of power generation system – Low voltage”</b> 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.		

# Certificate of Conformity

No. ESY 083373 0093 Rev. 00

## 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. 50409220013155-00
Generation unit manufacturer:	GoodWe Technologies Co., Ltd. No. 90 Zijin Road, New District, 215011 Suzhou, PEOPLE'S REPUBLIC OF CHINA	
Manufacturer indications:	Type of system	Micro Inverter for PV system
	Max. active power $P_{E_{max}}$	1600 W (GW1600-MIS) 1800 W (GW1800-MIS) 2000 W (GW2000-MIS)
	Rated voltage	L/N/PE AC 230 V
Period of measurement:	2023-09-11 to 2023-12-29	

Flicker-DIN EN 61000-3-3 (VDE 0838-3):2014-03 ( $\leq 16$ A) (GW2000-MIS)					
Test items	$d_{(t)} - 500ms$ [%]	$d_c$ [%]	$d_{max}$ [%]	$P_{st}$	$P_{it}$
Limit	3.30	3.30	4.00	1.00	0.65
L-N	0.000	0.001	0.500	0.019	0.019
Flicker-DIN EN 61000-3-3 (VDE 0838-3):2014-03 ( $\leq 16$ A) (GW2000-MIS)					
	$d(t) - 500ms$ [%]	$d_c$ [%]	$d_{max}$ [%]		
Start	L-N	0.000	0.001	0.490	
Stop	L-N	0.000	0.001	0.500	
Limit		3.3%	3.3%	4%	

# Certificate of Conformity

No. ESY 083373 0093 Rev. 00

Harmonics-DIN EN 61000-3-2 (VDE 0838-2): 2019-12 (≤16 A) (GW2000-MIS)												
Active power P/Pn[%]	4	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	0.000	0.000	0.001	0.001	0.001	0.002	0.002	0.002	0.002	0.003	0.004	1.080
3	0.009	0.027	0.038	0.032	0.021	0.025	0.035	0.054	0.074	0.089	0.090	2.300
4	0.000	0.000	0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.002	0.002	0.430
5	0.005	0.010	0.023	0.034	0.036	0.034	0.042	0.033	0.027	0.020	0.034	1.140
6	0.000	0.000	0.000	0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.002	0.300
7	0.002	0.003	0.003	0.006	0.012	0.015	0.014	0.021	0.020	0.022	0.022	0.770
8	0.000	0.000	0.000	0.001	0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.230
9	0.001	0.003	0.006	0.008	0.010	0.014	0.017	0.020	0.021	0.023	0.023	0.400
10	0.000	0.000	0.000	0.001	0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.184
11	0.001	0.004	0.007	0.008	0.016	0.014	0.019	0.030	0.033	0.041	0.047	0.330
12	0.000	0.000	0.000	0.001	0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.153
13	0.004	0.006	0.008	0.008	0.014	0.026	0.023	0.027	0.035	0.040	0.050	0.210
14	0.000	0.000	0.000	0.001	0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.131
15	0.005	0.010	0.011	0.009	0.010	0.020	0.029	0.028	0.033	0.037	0.041	0.150
16	0.000	0.000	0.000	0.001	0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.115
17	0.004	0.008	0.012	0.011	0.012	0.016	0.024	0.031	0.032	0.038	0.038	0.132
18	0.000	0.000	0.000	0.001	0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.102
19	0.003	0.006	0.013	0.015	0.017	0.020	0.018	0.027	0.033	0.039	0.044	0.118
20	0.000	0.000	0.000	0.001	0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.092
21	0.005	0.010	0.016	0.019	0.019	0.024	0.026	0.027	0.029	0.034	0.044	0.107
22	0.000	0.000	0.000	0.001	0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.084
23	0.004	0.010	0.014	0.016	0.018	0.027	0.033	0.030	0.030	0.032	0.037	0.098
24	0.000	0.000	0.000	0.001	0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.077
25	0.003	0.004	0.010	0.013	0.018	0.024	0.030	0.032	0.035	0.036	0.033	0.090
26	0.000	0.000	0.000	0.001	0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.071
27	0.003	0.003	0.012	0.017	0.018	0.022	0.025	0.030	0.035	0.039	0.040	0.083
28	0.000	0.000	0.000	0.001	0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.066
29	0.003	0.004	0.012	0.019	0.019	0.017	0.024	0.028	0.029	0.035	0.043	0.078
30	0.000	0.000	0.000	0.001	0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.061
31	0.001	0.003	0.007	0.015	0.018	0.020	0.022	0.028	0.026	0.030	0.036	0.073
32	0.000	0.000	0.000	0.001	0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.058
33	0.001	0.001	0.005	0.012	0.017	0.021	0.020	0.021	0.027	0.026	0.027	0.068
34	0.000	0.000	0.000	0.001	0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.054
35	0.001	0.001	0.006	0.012	0.015	0.018	0.021	0.018	0.023	0.024	0.025	0.064
36	0.000	0.000	0.000	0.001	0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.051
37	0.001	0.001	0.005	0.010	0.013	0.015	0.019	0.019	0.018	0.020	0.024	0.061
38	0.000	0.000	0.000	0.001	0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.048
39	0.002	0.001	0.003	0.007	0.011	0.011	0.015	0.019	0.017	0.016	0.017	0.058
40	0.000	0.000	0.000	0.001	0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.046

# Certificate of Conformity

No. ESY 083373 0093 Rev. 00

## E.6 Certificate of the network and system protection

Certificate of NS protection	No. 50409220013155-00		
Manufacturer	GoodWe Technologies Co., Ltd. No. 90 Zijin Road, New District, 215011 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	GW1600-MIS GW1800-MIS GW2000-MIS
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.			

# Certificate of Conformity

No. ESY 083373 0093 Rev. 00

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

Extract from test report for NS protection "Determination of electrical properties"		No. 50409220013155-00	
NS protection test report			
Type of NS system:	Integrated NS protection	Other Manufacturer indications	
Software version:	V1.00.00		
Manufacturer:	GoodWe Technologies Co., Ltd. No. 90 Zijin Road, New District, 215011 Suzhou, PEOPLE'S REPUBLIC OF CHINA		
Measuring period:	2023-09-11 to 2023-12-29		
	Inverter directly coupled synchronous and asynchronous generators with P <sub>n</sub> > 50 kW		
Protection function	Setting value	Tripping value	Break time NS protection
Rise-in-voltage protection $U >>$	1.25 * Un	L-N: 288.91 V;	L-N: 141.80 ms;
Rise-in-voltage protection $U >$	1.10 * Un	1.10 * Un	ms**
Voltage drop protection $U <$	0.8 * Un	L-N: 183.96 V;	L-N: 3030 ms;
Voltage drop protection $U <<$	0.45 * Un	L-N: 102.99 V;	L-N: 317.53 ms;
Frequency decrease protection $f <$	47.5 Hz	47.47 Hz	150.27 ms
Frequency increase protection $f >$	51.5 Hz	51.49 Hz	165.90 ms
<p>*: The tripping time includes the period from the limit value violation <math>U/f</math> 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"><li>468 s (L-N from 600s@Un to 112%Un);</li><li>Continuous operation (L-N from 600s@Un to 108%Un);</li><li>280 s (L-N from 600s@106%Un to 114%Un);</li></ol>			
<input checked="" type="checkbox"/> as integrated NS protection			
Assigned to power generation unit type	Micro Inverter for PV system: GW1600-MIS GW1800-MIS GW2000-MIS		
Integrated interface switch type	Series-connected relays for both line and neutral conductors Relay type: HF175F/12-2HTF		
Response time of interface switch for integrated NS protection	HF175F/12-2HTF Release time: Max. 5 ms		
Verification of the entire functional chain "integrated NS protection – interface switch" has resulted in successful disconnection.	<input checked="" type="checkbox"/>		