

Certificate of Conformity

No. ESY 083373 0089 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

Test report no.: 704092215906-00

Date, 2023-09-20



(Zhengdong Ma)

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Model(s): GW1600-MIS, GW1800-MIS, GW2000-MIS

Parameters:
Please see pages 3 to 5.

Applicable standards: EN 50549-1:2019

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| Models | 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 |
| Rated 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 | 0.8cap...0.8ind | | |

| 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 | 5 s |
| | A,B | 47,5 – 48,5 Hz Duration | 30 – 90 min | unlimited |
| | A,B | 48,5 – 49,0 Hz Duration | 30 – 90 min | unlimited |
| | A,B | 49,0 – 51,0 Hz Duration | not configurable | unlimited |
| | A,B | 51,0 – 51,5 Hz Duration | 30 – 90 min | unlimited |
| | A,B | 51, 5 – 52 Hz Duration | 0 – 15 min | 5 s |
| 4.4.3 Minimal requirement for active power delivery at underfrequency | A,B | Reduction threshold | 49 Hz – 49,5 Hz | No threshold |
| | A,B | Maximum reduction rate | 2 – 10 % PM/Hz | No power reduce |
| 4.4.4 Continuous operating voltage range | n.a. | Upper limit | not configurable | 110% Un |
| | n.a. | Lower limit | not configurable | 85% Un |
| 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: | | |
| | | synchronous generating technology: | | N/A |
| 4.5.3.2 Generating plant with non-synchronous generating technology | B | Maximum power resumption time | not defined | 1s |
| | B | Voltage-Time-Diagram | see Figure 6 | Time [s] U [p.u.] |
| | | | | 0,0 0,15 |
| | | | | 0,2 0,15 |
| 4.5.3.3 Generating plant with synchronous generating technology | B | Voltage-Time-Diagram | see Figure 7 (N/A) | 1,5 0,85 |
| | | | | Time [s] U [p.u.] |
| | | | | - - |
| | | | | - - |

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| | | | | - | - |
| | | | | - | - |
| 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 | 1,15 |
| | | | | 60 | 1,10 |
| 4.6.1 Power response to overfrequency | A,B | Threshold frequency f1 | 50,2 Hz – 52 Hz | 50,2Hz | |
| | A,B | Droop | 2 % – 12 % | 5% | |
| | A,B | Power reference | PM Pmax | P _M | |
| | n.a. | Intentional delay | 0 – 2 s | 0s | |
| | n.a. | Deactivation threshold fstop | 50,0 Hz – f1 | deactivated | |
| | n.a. | Deactivation time tstop | 0 – 600 s | - | |
| | A | Acceptance of staged disconnection | yes no | yes | |
| 4.6.2 Power response to underfrequency | n.a. | Threshold frequency f1 | 49,8 Hz – 46 Hz | 49,8 Hz | |
| | n.a. | Droop | 2 – 12 % | 5% | |
| | n.a. | Power reference | PM Pmax | P _{max} | |
| | n.a. | Intentional delay | 0 – 2 s | 0s | |
| 4.7.2.2 Capabilities | B | Active factor range overexcited | 0,9 – 1 | 0,9 | |
| | B | Active factor range underexcited | 0,9 – 1 | 0,9 | |
| 4.7.2.3 Control modes | n.a. | Enabled control mode | Q setp Q(U) cos φ setp cos φ (P) | Q setpoint | |
| 4.7.2.3.2 Setpoint control modes | n.a. | Q setpoint and excitation | 0 – 60 % S _{max} | ±43,6 % S _{max} | |
| | n.a. | cos φ setpoint and excitation | 1 – 0,9 | ±0,9 | |
| 4.7.2.3.3 Voltage related control modes | n.a. | Characteristic curve | - | - | |
| | n.a. | Time constant | 3 s – 60 s | 10s | |
| | n.a. | Min cos φ | 0,0 – 1 | 0,9 | |
| | 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 | - | - | |
| 4.7.4.2.2 Zero current mode for converter connected generating technology | n.a. | Enabling | enable disable | disable | |
| | n.a. | Static voltage range overvoltage | 100 % Un – 120 % Un | 120%Un | |
| | n.a. | Static voltage range undervoltage | 20 % Un – 100 % Un | 50%Un | |
| 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 Un – 1 Un | 0,85Un | |
| | B | Undervoltage operate time stage 1 | 0,1 s – 100 s | 3s | |
| | B | Undervoltage threshold stage 2 | 0,2 Un – 1 Un | 0,4Un | |
| | B | Undervoltage operate time stage 2 | 0,1 s – 5 s | 1,5s | |
| | B | Overvoltage threshold stage 1 | 1,0 Un – 1,2 Un | 1,2Un | |
| | B | Overvoltage operate time stage 1 | 0,1 s – 100 s | 6s | |
| | B | Overvoltage threshold stage 2 | 1,0 Un – 1,3 Un | 1,25Un | |
| | B | Overvoltage operate time stage 2 | 0,1 s – 5 s | 0,2s | |

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| | | stage 2 | | |
| | B | Overvoltage threshold 10 min mean protection | 1,0 Un – 1,15 Un | 1,1Un |
| | B | Underfrequency threshold stage 1 | 47,0 Hz – 50,0 Hz | 47,5Hz |
| | B | Underfrequency operate time stage 1 | 0,1 s – 100 s | 5s |
| | B | Underfrequency threshold stage 2 | 47,0 Hz – 50,0 Hz | 47Hz |
| | B | Underfrequency operate time stage 2 | 0,1 s – 5 s | 0,1s |
| | B | Overfrequency threshold stage 1 | 50,0 Hz – 52,0 Hz | 51,5Hz |
| | B | Overfrequency operate time stage 1 | 0,1 s – 100 s | 5s |
| | B | Overfrequency threshold stage 2 | 50,0 Hz – 52,0 Hz | 52Hz |
| | B | Overfrequency operate time stage 2 | 0,1 s – 5 s | 0,1s |
| 4.10.2 Automatic reconnection after tripping | B | Lower frequency | 47,0 Hz – 50,0 Hz | 49,5Hz |
| | B | Upper frequency | 50,0 Hz – 52,0 Hz | 50,2Hz |
| | B | Lower voltage | 50 % Un – 100 % Un | 85%Un |
| | B | Upper voltage | 100 % Un – 120 % Un | 110%Un |
| | B | Observation time | 10 s – 600 s | 60s |
| | B | Active power increase gradient | 6 % – 3000 %/min | ≤10%/min |
| 4.10.3 Starting to generate electrical power | A,B | Lower frequency | 47,0 Hz – 50,0 Hz | 49,5Hz |
| | A,B | Upper frequency | 50,0 Hz – 52,0 Hz | 50,1Hz |
| | A,B | Lower voltage | 50 % – 100 % Un | 85%Un |
| | A,B | Upper voltage | 100 % – 120 % Un | 110%Un |
| | A,B | Observation time | 10 s – 600 s | 60s |
| | A,B | Active power increase gradient | 6 % – 3000 %/min | disable |
| 4.11.1 Ceasing active power | A,B | Remote operation of the logic interface | yes no | yes |
| 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 | no |
| 4.12 Remote information exchange | B | Remote information exchange required NOTE: If yes further definition is provided by the DSO | yes no | no |

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 EN50549-1 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.