# Certificat de conformitate

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|---|---|
| **Solicitant:** | **Zhejiang Chisage New Energy Technology Co., Ltd.**<br>**No. 1828,Fuqing South Road, Panhuo Street, Yinzhou District, Ningbo City, Zhejiang Province, China 315000** |
| **Produs:** | **Invertor fotovoltaic şi baterie** (Photovoltaik- und Batteriewechselrichter) |
| **Model:** | **Ven-3G2-LE, Ven-3.6G2-LE, Ven-4G2-LE, Ven-5G2-LE, Ven-6G2-LE, Ven-6.6G2-LE** |

**Dispozitivul este conceput pentru a funcționa ca o unitate de generare de tip: A**

Invertor pentru conexiune paralelă monofazată la rețeaua publică. Dispozitivul de monitorizare și deconectare a rețelei face parte integrantă din modelul menționat mai sus.

**Documente aplicabile:**

Acte ale autoritătii nationale de reglementare in domeniul energiei: Ordin ANRE Nr. 79, Ordin ANRE Nr. 208 cu anexă “Norma tehnică privind cerinţele tehnice de racordare la reţelele electrice de interes public pentru module generatoare, centrale formate din module generatoare şi centrale formate din module generatoare offshore (situate în larg)”

Acte ale autoritătii nationale de reglementare in domeniul energiei: Ordin ANRE Nr. 79, Ordin ANRE Nr. 3 cu anexă “Normei tehnice privind cerințele tehnice de racordare la rețelele electrice de interes public pentru instalațiile de stocare a energiei electrice și procedura de notificare pentru racordarea instalațiilor de stocare a energiei electrice”

**Reguli şi standarde aplicabile:**

**EN 50549-1:2019/A1:2023, SR EN 50549-1:2019/A1:2023**
Prescripții pentru centrale electrice destinate a fi conectate în paralel cu rețele electrice de distribuție - Partea 1: Conectare la rețeaua electrică de distribuție de joasă tensiune - Centrale electrice de până la și inclusiv tip B

4.4 Domeniu de operare normal
4.5 Imunitate la tulburări
4.6 Răspuns activ la abaterea frecvenței
4.7 Răspunsul la putere la variațiile de tensiune și la modificările de tensiune
4.8 CEM și calitatea energiei electrice
4.9 Protecția interfeței
4.10 Conectarea și începerea generarii de energie electrică
4.11 Încetarea și reducerea puterii active la punctul de referință
4.13 Cerințe privind toleranța la o singură eroare a sistemului de protecție a interfeței și a comutatorului de interfață

**EN 50549-10:2022, SR EN 50549-10:2022**
Prescripții pentru centrale electrice destinate a fi conectate în paralel cu rețele electrice de distribuție. Partea 10: Încercări pentru evaluarea conformității unităților generatoare

**Conformitatea cu parametrii din anexa C la standard**
(a se vedea tabelul de parametri din anexă)

**Regulamentul (UE) 2016/631 Al Comisieu din 14 aprilie 2016**
De instituire a unui cod de rețea privind cerințele pentru racordarea la rețea a instalațiilor de generare (NC RFG).
Aprobarea de tip pentru unitățile de generație de utilizat în instalațiile de tip A

Conceptul de siguranţă al produsului reprezentativ susmenţionat corespunde, la momentul emiterii prezentului certificat, specificaţiilor valide privind siguranţa pentru utilizarea specificată în conformitate cu normele.

**Număr raport:** **CQDL-ESH-P25110986**
**Programul de certificare:** **NSOP-0032-DEU-ZE-ES-V10**
**Număr certificat:** **U26-0172**
**Data emiterii:** **2026-02-18**

**Institutia de certificare**

Domenik Koll
Head of Energy Systems Germany

**Acreditare**

DAkkS Deutsche Akkreditierungsstelle D-ZE-12024-01-00

Accredited certification body by Deutsche Akkreditierungsstelle GmbH (DAkkS) according to ISO/IEC 17065. The accreditation is valid only for the scope listed in the annex of the accreditation certificate D-ZE-12024-01-00. The Deutsche Akkreditierungsstelle GmbH (DAkkS) is signatory of the multilateral arrangements of EA, ILAC and IAF for mutual recognition.

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| **Type Approval and declaration of compliance with the requirements of EN 50549-1 and Commission Regulation (EU) 2016/631 of 14 April 2016** | | | | |
|---|---|---|---|---|
| **Manufacturer** | Zhejiang Chisage New Energy Technology Co., Ltd.<br>No. 1828,Fuqing South Road, Panhuo Street, Yinzhou District, Ningbo City, Zhejiang Province, China 315000 | | | |
| | | | | |
| **Product type** | Battery inverter with PV input | | | |
| | | | | |
| **Inverter model** | **Ven-3G2-LE** | **Ven-3.6G2-LE** | **Ven-4G2-LE** | **Ven-5G2-LE** |
| **Input DC (photovoltaic)** | | | | |
| MPP voltage range [V] | 150-425 | 150-425 | 150-425 | 150-425 |
| Max. input voltage [V] | 500 | 500 | 500 | 500 |
| Max. input current per MPP tracker [A] | 18+18 | 18+18 | 18+18 | 18+18 |
| **Input DC (battery)** | | | | |
| DC voltage range [V] | 40-60 | 40-60 | 40-60 | 40-60 |
| Max. DC voltage [V] | 60 | 60 | 60 | 60 |
| Max. DC current per DC input [A] | 60 | 75 | 85 | 110 |
| **AC connection** | | | | |
| Nominal AC voltage [V] | L/N/PE,230V, 50Hz | L/N/PE,230V, 50Hz | L/N/PE,230V, 50Hz | L/N/PE,230V, 50Hz |
| Nominal output current [A] | 13,0 | 15,7 | 17,4 | 21,7 |
| Max. output current [A] | 14,3 | 17,2 | 19,1 | 23,9 |
| Nominal output power inverter [kW] | 3,0 | 3,6 | 4,0 | 5,0 |
| Max. apparent output power inverter [kVA] | 3,3 | 3,96 | 4,4 | 5,5 |
| | | | | |
| **Inverter model** | **Ven-6G2-LE** | **Ven-6.6G2-LE** | -- | -- |
| **Input DC (photovoltaic)** | | | | |
| MPP voltage range [V] | 150-425 | 150-425 | -- | -- |
| Max. input voltage [V] | 500 | 500 | -- | -- |
| Max. input current per MPP tracker [A] | 18+18 | 18+18 | -- | -- |
| **Input DC (battery)** | | | | |
| DC voltage range [V] | 40-60 | 40-60 | -- | -- |
| Max. DC voltage [V] | 60 | 60 | -- | -- |
| Max. DC current per DC input [A] | 135 | 150 | -- | -- |
| **AC connection** | | | | |
| Nominal AC voltage [V] | L/N/PE,230V, 50Hz | L/N/PE,230V, 50Hz | -- | -- |
| Nominal output current [A] | 26,1 | 28,7 | -- | -- |
| Max. output current [A] | 28,7 | 31,6 | -- | -- |
| Nominal output power inverter [kW] | 6,0 | 6,6 | -- | -- |
| Max. apparent output power inverter [kVA] | 6,6 | 7,26 | -- | -- |

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| **Interface protection system and interface switch (Network and system protection "NS-protection")** | |
| **Type of protection** | integrated NS-protection |
| **Assigned to generation unit type** | Ven-3G2-LE, Ven-3.6G2-LE, Ven-4G2-LE, Ven-5G2-LE, Ven-6G2-LE, Ven-6.6G2-LE |
| **Integrated interface switch** | Type of switching equipment 1: Relay (Model HF161F-40W)<br>Type of switching equipment 2: Relay (Model HF161F-40W) |
| | Note: The output is switched off by the inverter bridge and two relay in series in each line and neutral. |
| | |
| **Firmware version** | INV: 0.3.0.0.1.B<br>DCDC: 0.0.0.1.0.6<br>DISP: 0.2.1.0.0.C |
| | |

**Note**

The settings of the generation unit are password protected adjustable.

In case the generators are used with an external protection device, the protection settings of the inverters are to be adjusted according to the manufacturer's declaration.

The above stated generators are tested according to the requirements in the EN 50549-1 and Commission Regulation (EU) 2016/631 of 14 April 2016. Any modification that affects the stated tests must be named by the manufacturer/supplier of the product to ensure that the product meets all requirements.

**Type Approval and declaration of compliance with the requirements of EN 50549-1 and Commission Regulation (EU) 2016/631 of 14 April 2016**

**Parameter Table**

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|---|---|
| **Name of parameter set** | EN50549-1&EN50549-10 |
| **Specific technical requirement** | EN50549-10 |

| **Clause of EN 50549-1** | **Parameter** | **Remarks / additional information** | **setting range** | **default settings used** | |
|---|---|---|---|---|---|
| 4.3.2 Interface switch | Single fault tolerance for interface switch | | yes \| no | yes | |
| 4.4.2 Operating frequency range | 47,0 – 47,5 Hz Duration | | 0 s – 20 s | 0s | |
| | 47,5 – 48,5 Hz Duration | | 30 – 90 min | 30 min | |
| | 48,5 – 49,0 Hz Duration | | 30 – 90 min | 30 min | |
| | 49,0 – 51,0 Hz Duration | | not configurable | unlimited | |
| | 51,0 – 51,5 Hz Duration | | 30 – 90 min | 30 min | |
| | 51, 5 – 52 Hz Duration | | 0 – 15 min | 0 s | |
| 4.4.3 Minimal requirement for active power delivery at under frequency | Reduction threshold | | not configurable | | |
| | Maximum reduction rate | | 49,0 Hz – 49,5 Hz | Electronic inverter, no power reduction take place | |
| 4.4.4 Continuous operating voltage range | Upper limit | | not configurable<br>1,0 $U_n$ – 2,0 $U_n$ | 1,15 $U_n$<br>1,10 $U_n$ | |
| | Lower limit | | not configurable<br>0,9 $U_n$ – 1,0 $U_n$ | 0,85 $U_n$, 0,90 $U_c$ | |
| 4.5.2 Rate of change of frequency (ROCOF) immunity | ROCOF withstand capability (defined with a sliding measurement window of 500 ms)<br>non-synchronous generating technology (inverter):<br>synchronous generating technology: | Note: The generator module must remain connected of frequency vaition of 2 Hz / s for a time interval of 500 ms, 1.5 Hz / s for a time interval of 1000 ms, and of 1.25 Hz / s for a time interval of 2000 ms | not configurable<br>0 – 10 Hz/s<br>yes<br>no | 2 Hz/s | |
| 4.5.3.2 Generating plant with non-synchronous generating technology (FRT) | Maximum power resumption time | | not defined | ≤1 s | |
| | Voltage-Time-Diagram | | see Figure 6 of EN 50549-1:2019 | Time [s] | U [p.u.] |
| | | | | 0,00 | 0,20 |
| | | | | 0,15 | 0,20 |
| | | | | 1,50 | 0,85 |
| | | | | 180 | 0,85 |
| | | | | 180 | 0,90 |
| 4.5.4 Over-voltage ride through (OVRT) | Voltage-Time-Diagram | | not configurable see Figure 8 of EN 50549-1:2019 | 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 |
| 4.5.5 Phase jump immunity | Phase jump immunity | | not configurable | 20° | |
| 4.6.1 Power response to over frequency (LFSM-O) | Threshold frequency $f_1$ | | 50,2 Hz – 52,0 Hz | 50,2 Hz | |
| | Droop | | 2% – 12% | 5% | |
| | Power reference | | $P_M$ \| $P_{max}$ | $P_M$ for other nonsynchronous Generating technology | |
| | Intentional delay | | 0 s – 2 s | 0 s | |
| | Deactivation threshold fstop | | 50,0 Hz – $f_1$ | deactivated | |
| | Deactivation time $t_{stop}$ | | 0 s – 600 s | - | |
| | Acceptance of staged disconnection | | yes \| no | yes | |
| 4.6.2 Power response to under frequency (LFSM-U) | Threshold frequency $f_1$ | | 49,8 Hz – 46,0 Hz | 49,8 Hz | |
| | Droop | | 2 % – 12% | 5% | |
| | Power reference | | $P_M$ \| $P_{max}$ | $P_{max}$ | |
| | Intentional delay | | 0 s – 2 s | 0 s | |
| 4.7.2.2 Capabilities | Active factor range overexcited | | 0,90 – 1 / 48% $P_d$ - 0<br>0,95 – 1 / 33% $P_d$ - 0 | 0,95 – 1 / 33% $P_d$ - 0 | |
| | Active factor range underexcited | | 0,90 – 1 / 48% Pd - 0<br>0,95 – 1 / 33% Pd - 0 | 0,95 – 1 / 33% Pd - 0 | |
| 4.7.2.3 Control modes | Enabled control mode | | Q setp.<br>Q(U)<br>Q(P)<br>cos φ setp.<br>cos φ (P) | activated<br>deactivated<br>deactivated<br>deactivated<br>deactivated | |
| 4.7.2.3.2 Set point control modes | Q setpoint and excitation | | 0 – 48 % $P_{D,}$<br>0 – 33 % $P_D$ | 0 | |
| | cos φ setpoint and excitation | | 1 – 0,9 | 1 | |
| 4.7.2.3.3 Voltage related control modes | Characteristic curve | | cos φ (P) | | |
| | Time constant | | Q(P) | indicate default characteristic | |
| | Min cos φ | | 3 s – 60 s | 10 s | |
| | Lock in power | | 0,0 – 1 | 0,9 | |
| | Lock out power | | 0% – 20% | deactivated | |
| 4.7.2.3.4 Power related control mode | Characteristic curve | | 0% – 20% | deactivated | |
| 4.7.4.2.2 Zero current mode for converter connected generating technology | Enabling | | enable \| disable | disabled | |
| | Static voltage range overvoltage | | 100 % $U_n$ – 120 % $U_n$ | 120 % $U_n$ | |
| | Static voltage range undervoltage | | 20 % $U_n$ – 100 % $U_n$ | 50 % $U_n$ | |

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|---|---|---|---|---|
| 4.9.3 Requirements on voltage and frequency protection | Threshold for protection as dedicated device [in A or kW, kVA] | | 43 A<br>Note: Rated current of internal safety device! | Internal safety device |
| | Undervoltage threshold stage 1 | | 0,2 $U_n$ – 1 $U_n$ | 0,85 $U_n$ |
| | Undervoltage operate time stage 1 | | 0,1 s – 100 s | 1,2 – 1,5 s |
| | Undervoltage threshold stage 2 | | 0,2 $U_n$ – 1 $U_n$ | N/A |
| | Undervoltage operate time stage 2 | | 0,1 s – 5 s | N/A |
| | Overvoltage threshold stage 1 | | 1,0 $U_n$ – 1,2 $U_n$ | 1,15 $U_n$ |
| | Overvoltage operate time stage 1 | | 0,1 s – 100 s | 0,1 – 0,2 s |
| | Overvoltage threshold stage 2 | | 1,0 $U_n$ – 1,3 $U_n$ | 1,25 $U_n$ (N/A) |
| | Overvoltage operate time stage 2 | | 0,1 s – 5 s | 0,1 s (N/A) |
| | Overvoltage threshold 10 min mean protection[a] | | 1,0 $U_n$ – 1,15 $U_n$ | 1,10 $U_n$ |
| | Overvoltage operate time 10 min mean protection[a] | | 0,04 s – 10,00 s | 10 min (update every 3s) |
| | Underfrequency threshold stage 1 | | 47,0 Hz – 50,0 Hz | 47,5 Hz |
| | Underfrequency operate time stage 1 | | 0,1 s – 100 s | 0,3 s – 0,5 s |
| | Underfrequency threshold stage 2 | | 47,0 Hz – 50,0 Hz | N/A |
| | Underfrequency operate time stage 2 | | 0,1 s – 5 s | N/A |
| | Overfrequency threshold stage 1 | | 50,0 Hz – 52,0 Hz | 52,0 Hz |
| | Overfrequency operate time stage 1 | | 0,1 s – 100 s | 0,3 s – 0,5 s |
| | Overfrequency threshold stage 2 | | 50,0 Hz – 52,0 Hz | N/A |
| | Overfrequency operate time stage 2 | | 0,1 s – 5,0 s | N/A |
| | Loss of mains according EN 62116 (LoM) | | 0 s – 6000 s | ROCOF 2,5 Hz/s (0,5 s)<br>active 2 s (5 s) |
| 4.10.2 Automatic reconnection after tripping<br>Ordin ANRE Nr. 3 type A Article 10. | Lower frequency | | 47,0 Hz – 50,0 Hz | 49,5 Hz |
| | Upper frequency | | 50,0 Hz – 52,0 Hz | 50,2 Hz |
| | Lower voltage | | 50% $U_n$ – 100 % $U_n$ | 85% $U_n$, 90% $U_c$ |
| | Upper voltage | | 100% $U_n$ – 120% $U_n$ | 110% $U_n$ |
| | Observation time | | 10 s – 600 s | 60 s |

| | | | | |
|---|---|---|---|---|
| | Active power increase gradient | | 6% – 3000% / min | 10% / min |
| 4.10.3 Starting to generate electrical power | Lower frequency | | 47,0 Hz – 50,0 Hz | 49,5 Hz |
| | Upper frequency | | 50,0 Hz – 52,0 Hz | 50,1 Hz |
| | Lower voltage | | 50% – 100% $U_n$ | 85% $U_n$, 90% $U_c$ |
| | Upper voltage | | 100% – 120% $U_n$ | 110% $U_n$ |
| | Observation time | | 10 s – 600 s | 60 s |
| | Active power increase gradient | | 6% – 3000% / min | disabled |
| 4.11.1 Ceasing active power | Remote operation of the logic interface | | RS485 | |
| 4.11.2 Reduction of active power on set point | Remote operation<br>NOTE: If yes further definition is provided by the DSO | | RS485 | |