# Certificate of compliance

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|---|---|
| **Applicant:** | **RCT Power GmbH**<br>Line Eid Str. 1<br>78467 Konstanz<br>**Germany** |
| **Product:** | **Photovoltaic (PV) inverter / Battery Inverter** |
| **Model:** | **Power storage DC 8.0; Power storage DC 10.0** |

**Use in accordance with regulations:**

Automatic disconnection device with three-phase mains surveillance in accordance with EN 50549-1:2019 for photovoltaic systems with a three-phase parallel coupling via an inverter in the public mains supply. The automatic disconnection device is an integral part of the aforementioned inverter.

**Applied rules and standards:**

**EN 50549-1:2019**
Requirements for parallel connection of installations with distribution networks - Part 1: Connection to an LV distribution network - Production of installations up to and including Type B

4.4 Normal operating range
4.5 Immunity to disturbances
4.6 Active response to frequency deviation
4.7 Power response to voltage variations and voltage changes
4.8 EMC and power quality
4.9 Interface protection
4.10 Connection and starting to generate electrical power
4.11 Ceasing and reduction of active power on set point
4.12 Remote information exchange
4.13 Requirements regarding single fault tolerance of interface protection system and interface switch

**EN 50438:2013**
Requirements for micro-generating plants to be connected in parallel with public low-voltage distribution networks

**DIN V VDE V 0126-1-1:2006 (4.1 Functional safety)**
Automatic disconnection device between a generator and the public low-voltage grid

At the time of issue of this certificate the safety concept of an aforementioned representative product corresponds to the valid safety specifications for the specified use in accordance with regulations.

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|---|---|---|---|
| **Report number:** | **19TH0431-DC 10.0-EN50549-1_0** | **Certification Program:** | **NSOP-0032-DEU-ZE-V01** |
| **Certificate number:** | **U21-0087** | **Date of issue:** | **2021-02-01** |

**Certification body**

Thomas Lammel

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

*Certification body Bureau Veritas Consumer Products Services Germany GmbH accreditation to DIN EN ISO/IEC 17065*
*A partial representation of the certificate requires the written approval of Bureau Veritas Consumer Products Services Germany GmbH*

## Appendix

**Extract from test report according to EN 50549-1** **Nr. 19TH0431-DC 10.0-EN50549-1_0**

| **Type Approval and declaration of compliance with the requirements of EN 50549-1.** | | | | |
|---|---|---|---|---|
| **Manufacturer / applicant:** | RCT Power GmbH<br>Line Eid Str. 1<br>78467 Konstanz<br>Germany | | | |
| | | | | |
| **Micro-generator Type** | Photovoltaic inverter / Battery Inverter | | | |
| | Power storage DC 8.0 | Power storage DC 10.0 | - | - |
| **MPP DC voltage range [V]** | 380 – 800 | | - | - |
| **Input DC voltage range [V]** | Max 1000 | | - | - |
| **Input DC current [A]** | 2 x 14 | | - | - |
| **Output AC voltage [V]** | 230 / 50Hz | | - | - |
| **Output AC current [A]** | max 15,2 | | - | - |
| **Output power [W]** | 8000 | 9900 | - | - |
| **Output power [VA]** | 10500 | 10500 | - | - |
| | | | | |
| **Firmware version** | V2.3 and higher | | | |
| | | | | |
| **Measurement period:** | 2020-06-03 to 2021-01-29 | | | |
| | | | | |
| **Description of the structure of the power generation unit:**<br>The power generation unit is equipped with a PV and line-side EMC filter. The power generation unit has no galvanic isolation between DC input and AC output. Output switch-off is performed with single-fault tolerance thanks to the inverter bridge and two series-connected relays. This enables a safe disconnection of the power generation unit from the network in case of error. | | | | |
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## Appendix

**Extract from test report according to EN 50549-1** **Nr. 19TH0431-DC 10.0-EN50549-1_0**

**Setting of the interface protection:**

| Parameter | Min. disconnection time | Max. disconnection time | Min. operate value | Max. operate value | Standard set value |
|---|---|---|---|---|---|
| Over voltage (stage 1) a | 0,04s | 3600 s | 1,0Vn | 1,30Vn | 600s/1,1Vn |
| Over voltage (stage 2) | 0,04s | 3600 s | 1,0Vn | 1,30Vn | 5,0s/1,15Vn |
| Over voltage (stage 3) | 0,04s | 3600 s | 1,0Vn | 1,30Vn | 0,2s/1,20Vn |
| Under voltage (stage 1) | 0,04s | 3600 s | 0,08Vn | 1,0Vn | 0,04s/0,087Vn |
| Under voltage (stage 2) | 0,04s | 3600 s | 0,08Vn | 1,0Vn | 1,5s/0,85Vn |
| Under voltage (stage 3) | -- | -- | -- | -- | -- |
| Over frequency | 0,04s | 3600 s | 50Hz | 65Hz | 0,5s/1,04fn |
| Over frequency (stage 1) | 0,04s | 3600 s | 50Hz | 65Hz | 0,5s/1,04fn |
| Under frequency | 0,04s | 3600 s | 45Hz | 50Hz | 0,5s/0,95fn |
| Under frequency (stage 2) | 0,04s | 3600 s | 45Hz | 50Hz | 0,5s/0,95fn |
| Reconnection settings for voltage (normal operational startup) | Adjustment range: min: 0-1Vn, max: 1,3Vn min: 0-230Vac, max: 230-300Vac | | | | 0,95Vn ≤ V ≤ 1,02Vn 220V≤V≤ 235V |
| Reconnection settings for frequency (normal operational startup) | Adjustment range: min: 46-60Hz, max: 50-64Hz | | | | 46,0Hz ≤ f ≤ 53,0Hz |
| Reconnection time (normal operational startup) | Adjustment range: 0-3600s | | | | 60s |
| Reconnection settings for voltage (automatic reconnection after tripping) | Adjustment range: min: 0-1Vn, max: 1,3Vn min: 0-230Vac, max: 230-300Vac | | | | 0,95Vn ≤ V ≤ 1,02Vn 220V≤V ≤235V |
| Reconnection settings for frequency (automatic reconnection after tripping) | Adjustment range: min: 46-60Hz, max: 50-64Hz | | | | 46,0Hz ≤ f ≤ 53,0Hz |
| Reconnection time (automatic reconnection after tripping) | Adjustment range: 0-3600s | | | | 60s |
| Active power gradient after reconnection | Adjustment range: 3-6000% | | | | 10%/min |
| Active power delivery at under frequency | electronic inverter, no active power reduction | | | | |
| Power response to over frequency (frequency / droop s) | Adjustment range: 45 - 65Hz / 200%Pn/Hz – 16,7 %/Hz ( 1 – 12 % ) | | | | 50,2Hz / 5% bzw. 40%Pn/Hz |
| Permanent DC-injection | ≤ 0,5% of rated inverter output current or ≤ 20mA | | | | |
| Rate of change of frequency (ROCOF) | 3 Hz/s fix | | | | 3 Hz/s |
| Loss of mains according EN 62116 (LoM) | 5 s fix | | | | 5 s |

**Note:**

[a] Over voltage – stage1: 10 min-mean-value corresponding to EN 50160.

The settings of the interface protection are password protected adjustable in the stated range above.

In case the above stated 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 50549-1:2019. 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 of the EN 50549-1:2019.