



**BUREAU
VERITAS**

Certificate of compliance

Applicant: RCT Power GmbH
Line Eid Str. 1
78467 Konstanz
Germany

Product: Photovoltaic (PV) inverter / Battery Inverter

Model: Power Inverter 6.0; Power Inverter 5.0; Power Inverter 4.0
Power storage DC 6.0; Power storage DC 5.0; Power storage DC 4.0
Power storage AC 6.0; Power storage AC 4.0

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.

Report number: 19TH0431-EN50549-1_0 **Certification Program:** NSOP-0032-DEU-ZE-V01
Certificate number: U21-0058 **Date of issue:** 2021-01-27

Certification body



Thomas Lammel



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

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Annex to the EN 50549-1 certificate of compliance No. U21-0058

Appendix

Extract from test report according to EN 50549-1

Nr. 19TH0431-EN50549-1_0

Type Approval and declaration of compliance with the requirements of EN 50549-1.

Manufacturer / applicant:	RCT Power GmbH Line Eid Str. 1 78467 Konstanz Germany
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Micro-generator Type	Photovoltaic inverter / Battery Inverter			
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	Power Inverter 6.0	Power Inverter 5.0	Power Inverter 4.0	-
MPP DC voltage range [V]	200 – 800	200 – 800	200 – 800	-
Input DC voltage range [V]	1000	1000	1000	-
Input DC current [A]	2 x 12	2 x 12	2 x 12	-
Output AC voltage [V]	230 / 50Hz	230 / 50Hz	230 / 50Hz	-
Output AC current [A]	Max 9,1	Max 9,1	Max 9,1	-
Output power [VA]	6000	5000	4000	-

	Power storage DC 6.0	Power storage DC 5.0	Power storage DC 4.0	-
MPP DC voltage range [V]	200 – 800	200 – 800	200 – 800	-
Input DC voltage range [V]	Max 1000	Max 1000	Max 1000	-
UDC min/max bat [V]	150 - 600	150 - 600	150 - 600	-
IDC bat max [A]	20	20	20	-
Output AC voltage [V]	230 / 50Hz	230 / 50Hz	230 / 50Hz	-
Output AC current [A]	Max 9,1	Max 9,1	Max 9,1	-
Output power [VA]	6000	5000	4000	-

	Power storage AC 6.0	Power storage AC 4.0	-	-
MPP DC voltage range [V]	200 – 800	200 – 800	-	-
Input DC voltage range [V]	Max 1000	Max 1000	-	-
UDC min/max bat [V]	150 - 600	150 - 600	-	-
IDC bat max [A]	20	20	-	-
Output AC voltage [V]	230 / 50Hz	230 / 50Hz	-	-
Output AC current [A]	Max 9,1	Max 9,1	-	-
Output power [VA]	6000	4000	-	-

Firmware version	V2.3 and higher
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Measurement period:	2020-06-03 to 2021-01-18
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Description of the structure of the power generation unit:

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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Annex to the EN 50549-1 certificate of compliance No. U21-0058

Appendix

Extract from test report according to EN 50549-1

Nr. 19TH0431-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				$0,95Vn \leq V \leq 1,02Vn$ $220V \leq V \leq 235V$
Reconnection settings for frequency (normal operational startup)	Adjustment range: min: 46-60Hz, max: 50-64Hz				$46,0Hz \leq f \leq 53,0Hz$
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				$0,95Vn \leq V \leq 1,02Vn$ $220V \leq V \leq 235V$
Reconnection settings for frequency (automatic reconnection after tripping)	Adjustment range: min: 46-60Hz, max: 50-64Hz				$46,0Hz \leq f \leq 53,0Hz$
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	$\leq 0,5\%$ of rated inverter output current or $\leq 20mA$				
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.