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Certificate of compliance

Applicant: Kostal Solar Electric
Hanferstrasse 6
79108 Freiburg
Germany

Product: Battery Inverter

Model: PLENTICORE BI 5.5/26 PLENTICORE BI 10/26

Use in accordance with regulations:

Automatic disconnection device with three-phase mains surveillance in accordance with EN 50549-1:2019 for Battery 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: 19TH0374-BI-EN50549-1_0 **Certification Program:** NSOP-0032-DEU-ZE-V01
Certificate number: U20-0981 **Date of issue:** 2020-12-10

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



Appendix

Extract from test report according to EN 50549-1 Nr. 19TH0374-BI-EN50549-1_0

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

Manufacturer / applicant:	Kostal Industrie Elektrik GmbH Lange Eck 11 58099 Hagen Germany			
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Micro-generator Type

Micro-generator Type	Battery Inverter			
	PLENTICORE BI 5.5/26	PLENTICORE BI 10/26	--	--
In-/Output DC voltage range [V]	120 – 650	120 – 650	--	--
In-/Output Input DC current [A]	26	26	--	--
Output AC voltage [V]	3N~, 400V, 50Hz	3N~, 400V, 50Hz	--	--
Output AC current [A]	7,94	16,04	--	--
Output power [VA]	5500	10000	--	--

Firmware version

Firmware version	Beginning with FW = 01.46 / PAR = 03.19			
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Measurement period:

Measurement period:	2019-08-02 - 2019-11-07, 2020-04-06 – 2020-05-29, 2020-11-10 – 2020-11-30			
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Description of the structure of the power generation unit:

The power generation unit is equipped with a DC 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 based on two series-connected relays in each line and neutral. This enables a safe disconnection of the power generation unit from the network in case of error.

Appendix

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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	---	---	1,0V _n	1,35V _n	1,1V _n
Over voltage (stage 2)	0,05s	24h	1,0V _n	1,35V _n	0,2s / 1,15V _n
Under voltage (stage 1)	0,05s	24h	0V	1,0V _n	1,5s / 0,85V _n
Under voltage (stage 2)	0,05s	24h	0V	1,0V _n	---
Over frequency	0,05s	24h	50,01Hz	53,1Hz	0,5s / 52Hz
Over frequency (stage 1)	0,05s	24h	50,01Hz	53,1Hz	---
Under frequency	0,05s	24h	46,9Hz	49,99Hz	0,5s / 47,5Hz
Under frequency (stage 2)	0,05s	24h	46,9Hz	49,99Hz	---
Reconnection settings for voltage (normal operational startup)	Ajustement range: min: 0-1V _n , max: 1-2V _n				0,85V _n ≤ V ≤ 1,10V _n
Reconnection settings for frequency (normal operational startup)	Adjustment range: min: 44-60Hz, max: 50-66Hz				49,5Hz ≤ f ≤ 50,1Hz
Reconnection time (normal operational startup)	Adjustment range: 0-6000s				≥ 60s
Reconnection settings for voltage (automatic reconnection after tripping)	Ajustement range: min: 0-1V _n , max: 1-2V _n				0,85V _n ≤ V ≤ 1,10V _n
Reconnection settings for frequency (automatic reconnection after tripping)	Adjustment range: min: 44-60Hz, max: 50-66Hz				49,5Hz ≤ f ≤ 50,2Hz
Reconnection time (automatic reconnection after tripping)	Adjustment range: 0-6000s				≥ 60s
Active power gradient after reconnection	Adjustment range: 1-10000%				10% P _E max / per minute
Active power delivery at under frequency	electronic inverter, no active power reduction				
Active power delivery at under frequency: threshold frequency f1: Droop: Intentional delay: Power reference: Deactivation time tstop:	Adjustment range: 44-60Hz 1-10000% 0-2s PM Pmax 0-600s				--
Active power delivery at over frequency: threshold frequency f1: Droop: Intentional delay: Power reference: Deactivation time tstop:	Adjustment range: 44-60Hz 1-10000% 0-2s PM Pmax 0-600s				50,2Hz 5% 0s Pmax 0s
Permanent DC-injection	≤ 0,5% of rated inverter output current or ≤ 20mA				
Rate of change of frequency (ROCOF)	Adjustment range: 0,01-100Hz/s				--
Loss of mains according EN 62116 (LoM)	Adjustment range: 0-6000s				<1s



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Annex to the EN 50549-1 certificate of compliance No. U20-0981

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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.