



**BUREAU
VERITAS**

Certificate of compliance

Applicant: KOSTAL Solar Electric GmbH
Hanferstraße 6
79108 Freiburg im Breisgau
Germany

Product: Grid-tied photovoltaic (PV) inverter

Model: PLENTICORE 3.0 G2
PLENTICORE 4.2 G2
PLENTICORE 5.5 G2
PLENTICORE 7.0 G2
PLENTICORE 8.5 G2
PLENTICORE 10 G2

Use in accordance with regulations:

Automatic disconnection device with three-phase mains surveillance in accordance with DANSK ENERGI:2021 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:

ENERGIENET TECHNICAL REGULATION 3.3.1:2019-12-18 DK1/DK2

TECHNICAL REGULATI ON 3.3.1 For Electrical Energy storage facilities up to 125 kW Type A

- 4.1 Tolerance of Frequency and voltage deviations
- 4.2 Start-up and reconnection of a power-generating plant
- 4.3 Active power control
- 4.4 Reactive power control
- 4.5 Protection
- 4.6 Power Quality

DIN V VDE V 0126-1-1:2006-02 (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 representative product listed above corresponds to the stated rules and standards.

Report number: 19TH0374-Hybrid-G2_TR 3.3.1 DK1/DK2_0 **Certification Program:** NSOP-0032-DEU-ZE-V01

Certificate number: U22-0627 **Date of issue:** 2022-10-06

Certification body



Alf Assenkamp



Zertifizierungsstelle der Bureau Veritas Consumer Products Services Germany GmbH akkreditiert nach DIN EN ISO/IEC 17065

Prüflabor akkreditiert nach DIN EN ISO/IEC 17025

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Type Verification Test Report

Extract from test report according to ENERGIENET TECHNICAL REGULATION 3.3.1

Nr. 19TH0374-Hybrid-G2_TR 3.3.1 DK1/DK2_0

Type Approval and declaration of compliance with the requirements of ENERGIENET TECHNICAL REGULATION 3.3.1

Manufacturer / applicant:	KOSTAL Industrie Elektrik GmbH Lange Eck 11 58099 Hagen Germany			
Micro-generator Type	Grid-tied photovoltaic inverter			
Rated values	PLENTICORE plus 3.0 G2	PLENTICORE plus 4.2 G2	PLENTICORE plus 5.5 G2	PLENTICORE plus 7.0 G2
MPP DC voltage range [V]	180 - 720	180 - 720	225 - 720	290 - 720
Input DC voltage range [V]	120 - 1000	120 - 1000	120 - 1000	120 - 1000
Input DC current [A]	3x 13,0	3x 13,0	3x 13,0	3x 13,0
Output AC voltage [V]	3N~, 400V, 50Hz	3N~, 400V, 50Hz	3N~, 400V, 50Hz	3N~, 400V, 50Hz
Output AC current [A]	4,81	6,74	8,82	11,23
Output power [VA]	3000	4200	5500	7000
Rated values	PLENTICORE plus 8.5 G2	PLENTICORE plus 10 G2	--	--
MPP DC voltage range [V]	345 - 720	405 - 720	--	--
Input DC voltage range [V]	120 - 1000	120 - 1000	--	--
Input DC current [A]	3x 13,0	3x 13,0	--	--
Output AC voltage [V]	3N~, 400V, 50Hz	3N~, 400V, 50Hz	--	--
Output AC current [A]	13,63	16,04	--	--
Output power [VA]	8500	10000	--	--
Firmware version	02.04			

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

Setting of the parameter values for DK1 and DK2:

	Settings for DK1	Setting for DK2
	LFSM-O	
Threshold frequency [Hz]	50,2	50,5
Drop [% of P _n]	5 % (40 % P _n / Hz)	4 % (50 % P _n / Hz)
Intentional Delay	500 ms	500 ms
	Reactive Power	
	Q fix	Q fix
Active/disabled [On/Off]	On	On
Q setpoint [VAR]	0	0
	cos φ fix	
Active/disabled [On/Off]	Off	Off
PF setpoint [PF]	1	1

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Nr. 19TH0374-Hybrid-G2_TR 3.3.1 DK1/DK2_0

	Settings for DK1	Setting for DK2
	cos ϕ (P)	
Active/disabled [On / Off]	Off	Off
cos ϕ (P) P1 [% of P _n]	0	0
cos ϕ (P) PF1 [PF]	1	1
cos ϕ (P) P2 [% of P _n]	50	50
cos ϕ (P) PF2 [PF]	1	1
cos ϕ (P) P3 [% of P _n]	100	100
cos ϕ (P) PF3 [PF]	0,9 inductive	0,9 inductive
cos ϕ (P) Lock _{in} [% of U _n]	105	105
cos ϕ (P) Lock _{out} [% of U _n]	100	100
	Connection and Reconnection	
Gradient [% of P _n / min]	20	20
Observation time [s]	180	180
U _{min} [% of U _n]	85	85
U _{max} [% of U _n]	110	110
f _{min} [Hz]	47,5	47,5
f _{max} [Hz]	50,2	50,5
	System Protection	
f > [s]	0,2	0,2
f > [Hz]	51,5	51,5
f < [s]	0,2	0,2
f < [Hz]	47,5	47,5
U > [s]	60	60
U > [% of U _n]	110	110
U >> [s]	0,2	0,2
U >> [% of U _n]	115	115
U < [s]	50	50
U < [% of U _n]	85	85
	Loss of Mains Detection	
U << [s]*	0,2	0,2
U << [% of U _n]*	80	80

Note:

Loss of Mains Detection: Under voltage stage 2 used for the Loss of Mains Detection

B1.2.8.5 Harmonics:

Unit PLENTICORE 5.5 G2 passed the criteria for a Connection Point with a SCR \geq 120

Unit PLENTICORE 10 G2 passed the criteria for a Connection Point with a SCR \geq 120