Certificate of compliance

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

Product: **Photovoltaic (PV) inverter**

Model: **PLENTICORE plus 3.0 G2**
PLENTICORE plus 4.2 G2
PLENTICORE plus 5.5 G2
PLENTICORE plus 7.0 G2
PLENTICORE plus 8.5 G2
PLENTICORE plus 10.0 G2

Inverter for three-phase parallel connection to the public grid. The network monitoring and disconnection device is an integral part of the above-mentioned model.

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
4.13 Requirements regarding single fault tolerance of interface protection system and interface switch

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

Commission Regulation (EU) 2016/631 of 14 April 2016
Establishing a network code on requirements for grid connection of generators (NC RFG).
Type approval for generation units to use in Type A

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_Hybrid-G2_EN50549-1_0**	**Certification Program:**	**NSOP-0032-DEU-ZE-V01**
Certificate number:	**U22-0622**	**Date of issue:**	**2022-10-06**

Certification body

Alf Assenkamp

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

Certification body Bureau Veritas Consumer Products Services Germany GmbH accreditation to DIN EN ISO/IEC 17065

Testing laboratory accredited according to DIN EN ISO/IEC 17025

A partial representation of the certificate requires the written approval of Bureau Veritas Consumer Products Services Germany GmbH

Annex to the EN 50549-1 certificate of compliance No. U22-0622

Appendix

Extract from test report according to EN 50549-1 **No. 19TH0374_Hybrid-G2_EN50549-1_0**

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

Manufacturer / applicant	KOSTAL Industrie Elektrik GmbH Lange Eck 11 58099 Hagen Germany
Micro-generator Type	Photovoltaic inverter

	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
Rated AC current [A]	4,33	6,06	7,94	10,10
Max AC current [A]	4,81	6,74	8,82	11,23
Active Power [W]	3000	4200	5500	7000
Apparent power [VA]	3000	4200	5500	7000

	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	--	--
Rated AC current [A]	12,27	14,43	--	--
Max AC current [A]	13,63	16,04	--	--
Active Power [W]	8500	10000	--	--
Apparent 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 the inverter bridge and 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.

Note:

The settings of the interface protection are password protected adjustable.

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 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.

Appendix

Extract from test report according to EN 50549-1 **No. 19TH0374_Hybrid-G2_EN50549-1_0**

Setting of the interface protection EN 50438 default:

Parameter	Max. disconnection time	Min. operate time	Trip value
Over voltage (stage 1) [a]	3,0 s	-	230,0 V +10 % (253,0 V)
Over voltage (stage 2)	0,2 s	0,1 s	230,0 V +15 % (264,5 V)
Under voltage	1,5 s	1,2 s	230,0 V -15 % (195,5 V)
Over frequency	0,5 s	0,3 s	50 Hz +4 % (52 Hz)
Under frequency	0,5 s	0,3 s	50 Hz -5 % (47,5 Hz)
Reconnection settings for voltage	0,85 Un (195,5 V) ≤ U ≤ 1,10 Un (253,0 V)		
Reconnection settings for frequency	49,5 Hz ≤ f ≤ 50,1 Hz		
Reconnection time	≥ 60 s		
Active power gradient after reconnection	10 % P_{Emax} / per minute		
Permanent DC-injection	0,5 % of rated inverter output current or 20 mA		
Loss of mains according EN 62116 (LoM)	2,0 s		

Note:

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

Default interface setting according to EN 50438:2013 are used.

The settings of the interface protection are password protected adjustable.

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.