Certificate of compliance

Applicant:	**Kostal Industrie Elektrik GmbH** Lange Eck 11 58099 Hagen **Germany**
Product:	**Grid-tied photovoltaic (PV) inverter**
Model:	**PIKO 10** **PIKO 12** **PIKO 15** **PIKO 17** **PIKO 20**

Use in accordance with regulations:

Automatic disconnection device with three-phase mains surveillance in accordance with EN50549-1:2019 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

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:	**19TH0373-EN50549-1_1**	**Certification Program:**	**NSOP-0032-DEU-ZE-V01**
Certificate number:	**U19-0624**	**Date of issue:**	**2019-11-26**

Certification body

Holger Schaffer

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. 19TH0373-EN50549-1_1**

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			
Micro-generator Type	Grid-tied photovoltaic inverter			
	PIKO 10	PIKO 12	PIKO 15	PIKO 17
MPP DC voltage range [V]	290 – 800	345 - 800	260 - 800	290 - 800
Input DC voltage range [V]	290 – 1000	345 - 1000	260 - 1000	290 - 1000
Input DC current [A]	20			
Output AC voltage [V]	3N~, 400V, 50Hz			
Output AC current [A]	16,2	19,3	24,2	27,4
Output power [VA]	10000	12000	15000	17000
	PIKO 20			
MPP DC voltage range [V]	345 - 800			
Input DC voltage range [V]	345 - 1000			
Input DC current [A]	20			
Output AC voltage [V]	3N~, 400V, 50Hz			
Output AC current [A]	32,2			
Output power [VA]	20000			
Firmware version	FW = 06.10 PAR = 03.20			
Measurement period:	2019-08-02 to 2019-10-07, 2019-11-14			

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 (HF/LF transformer). 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

Extract from test report according to EN 50549-1 **Nr. 19TH0373-EN50549-1_1**

Setting of the interface protection EN 50438 default:

Parameter	Max. disconnection time	Min. operate time	Trip value
Over voltage (stage 1) [a]	3s	-	230V +10% (253V)
Over voltage (stage 2)	0,2s	0,1s	230V +15% (264,5V)
Under voltage	1,5 s	1,2 s	230V -15% (195,5V)
Over frequency	0,5 s	0,3 s	50Hz +4% (52 Hz)
Under frequency	0,5 s	0,3 s	50Hz -5% (47,5 Hz)
Reconnection settings for voltage	0,85Un (195,5V) ≤ U ≤ 1,10Un (253V)		
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 20mA		
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.