



**BUREAU
VERITAS**

Verklaring van geen bezwaar

Aanvrager: KOSTAL Solar Electric GmbH
Hanferstraße 6
79108 Freiburg i. Br.
Duitsland

Product: Fotovoltaïsche omvormers en batterij-omvormers

Model: PIKO MP plus 1.5-1, PIKO MP plus 2.0-1, PIKO MP plus 2.5-1, PIKO MP plus 3.0-1, PIKO MP plus 3.0-2, PIKO MP plus 3.6-1, PIKO MP plus 3.6-2, PIKO MP plus 4.6-2; PIKO MP plus 5.0-2

À utiliser conformément aux réglementations:

Automatisch schakelstation met enkelfasige netwerkbewaking conform C10/11 – 01.09-2019 voor fotovoltaïsche installaties met een enkelfasige parallelvoeding door middel van gelijkstroom-wisselstroommutator in het net van de openbare voorziening. Het automatische schakelstation vormt een integraal bestanddeel van de hoger vermelde gelijkstroom-wisselstroommutators.

Controlebasis:

EN 50549-1:2019-02

Exigences relatives aux centrales électriques destinées à être raccordées en parallèle à des réseaux de distribution - Partie 1: Raccordement à un réseau de distribution BT - Centrales électriques jusqu'au Type B inclus

- 4.4 Normaal werkbereik
- 4.5 Immuniteit voor storingen
- 4.6 Actieve reactie op frequentieafwijking
- 4.7 Vermogensreactie op spanningsvariaties en spanningsveranderingen
- 4.8 EMC en vermogenskwaliteit
- 4.9 Interfacebescherming
- 4.10 Aansluiting en starten met het opwekken van elektrische stroom
- 4.11 Stoppen en verminderen van actief vermogen op instelpunt
- 4.12 Informatie-uitwisseling op afstand
- 4.13 Vereisten met betrekking tot tolerantie voor één fout van interfacebeveiligingssysteem en interfaceschakelaar

C10/11:2019-09

Specifieke technische voorschriften voor elektriciteitsproductie-installaties die parallel werken met het distributienet

Een representatief testpatroon van het hoger vermelde product voldoet aan de op het moment van de uitreiking van dit attest geldende veiligheid technische eisen van de vermelde controlegrondbeginselen voor een reglementair voorgeschreven gebruik.

Rapportnummer: 18TH0316-PIKO-Hybrid-
EN50549-1_1 **Certificatie-programma:** NSOP-0032-DEU-ZE-V01

Certificaatnummer: U20-0391 **Datum:** 2020-06-08

Certificatie-instelling

Thomas Lammel

Certificatie-instelling Bureau Veritas Consumer Products Services Germany GmbH geaccrediteerd volgens DIN EN ISO/IEC 17065

Een gedeeltelijke weergave van het certificaat vereist de schriftelijke goedkeuring van Bureau Veritas Consumer Products Services Germany GmbH

Appendix

Extract from test report according to EN 50549-1 / C10/11

Nr. 18TH0316-PIKO-Hybrid-EN50549-1_1

Type Approval and declaration of compliance with the requirements of EN 50549-1 / C10/11.

| | | | | |
|----------------------------------|--|--|--|--|
| Manufacturer / applicant: | KOSTAL Solar Electric GmbH Hanferstraße 6 79108 Freiburg i. Br. Duitsland | | | |
|----------------------------------|--|--|--|--|

| | | | | |
|-----------------------------------|---------------------------------|--------------------|--------------------|--------------------|
| Micro-generator Type | Grid-tied photovoltaic inverter | | | |
| | PIKO MP plus 1.5-1 | PIKO MP plus 2.0-1 | PIKO MP plus 2.5-1 | PIKO MP plus 3.0-1 |
| MPP DC voltage range [V] | 75-360 | 75-360 | 75-360 | 125-600 |
| Input DC voltage range [V] | Max 450 | Max 450 | Max 450 | Max 750 |
| Input DC current [A] | 13 | 13 | 13 | 13 |
| Output AC voltage [V] | 230; N; PE | | | |
| Output AC current [A] | 12 | 12 | 14 | 14 |
| Output power [VA] | 1500 | 2000 | 2500 | 3000 |

| | | | | |
|-----------------------------------|--------------------|--------------------|--------------------|--------------------|
| | PIKO MP plus 3.0-2 | PIKO MP plus 3.6-1 | PIKO MP plus 3.6-2 | PIKO MP plus 4.6-2 |
| MPP DC voltage range [V] | 125-600 | 125-600 | 150-600 | 150-600 |
| Input DC voltage range [V] | Max 750 | | | |
| Input DC current [A] | 13 | 13 | 13 | 13 |
| Output AC voltage [V] | 230; N; PE | | | |
| Output AC current [A] | 14 | 16 | 16 | 20 |
| Output power [VA] | 3000 | 3680 | 3680 | 4600 |

| | | | | |
|-----------------------------------|--------------------|--|--|--|
| | PIKO MP plus 5.0-2 | | | |
| MPP DC voltage range [V] | 150-600 | | | |
| Input DC voltage range [V] | Max 750 | | | |
| Input DC current [A] | 13 | | | |
| Output AC voltage [V] | 230; N; PE | | | |
| Output AC current [A] | 22 | | | |
| Output power [VA] | 5000 | | | |

| | |
|-------------------------|---------------------------------------|
| Firmware version | PU_APP_3.7.0 and PAR_23.0.2 or higher |
|-------------------------|---------------------------------------|

| | |
|----------------------------|--------------------------|
| Measurement period: | 2019-11-11 to 2020-05-18 |
|----------------------------|--------------------------|

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 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 / C10/11

Nr. 18TH0316-PIKO-Hybrid-EN50549-1_1

| Setting of the interface protection: | | | |
|---|--|-------------------|--------------------|
| Parameter | Max. disconnection time | Min. operate time | Trip value |
| Over voltage (stage 1) ^a | 0,2s | - | 230V +10% (253V) |
| Over voltage (stage 2) | 0,2s | 0,1s | 230V +15% (264,5V) |
| Under voltage | 0,2s | 0,1s | 230V -20% (184V) |
| Over frequency | 0,2s | 0,1s | 50Hz +3% (51,5Hz) |
| Under frequency | 0,2s | 0,1s | 50Hz -5% (47,5Hz) |
| Reconnection settings for voltage (normal operational startup) | $0,85V_n (195,5V) \leq V \leq 1,10V_n (253V)$ | | |
| Reconnection settings for frequency (normal operational startup) | $49,9Hz \leq f \leq 50,1Hz$ | | |
| Reconnection time (normal operational startup) | $\geq 60s$ | | |
| Active power gradient (normal operational startup) | 20% $P_{E_{max}}$ / per minute | | |
| Reconnection settings for voltage (automatic reconnection after tripping) | $0,85V_n (195,5V) \leq V \leq 1,10V_n (253V)$ | | |
| Reconnection settings for frequency (automatic reconnection after tripping) | $49,9Hz \leq f \leq 50,1Hz$ | | |
| Reconnection time (automatic reconnection after tripping) | $\geq 60s$ | | |
| Active power gradient after reconnection | 10% $P_{E_{max}}$ / per minute | | |
| Active power delivery at under frequency | electronic inverter, no active power reduction | | |
| Power response to over frequency (frequency / droop s) | 50,2Hz / 5% | | |
| Permanent DC-injection | 0,5% of rated inverter output current or 20mA | | |
| Rate of change of frequency (ROCOF) | 2Hz/s | | |
| Loss of mains according EN 62116 (LoM) | 2,0s | | |

Note:

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

Default interface setting according to C10/11:2019-09 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 and C10/11:2019. 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 and C10/11:2019.