



**BUREAU
VERITAS**

Verklaring van geen bezwaar

Aanvrager: Kostal Solar Electric
Hanferstrasse 6
79108 Freiburg
Duitsland

Product: Batterij-omvormer

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

Reglementair voorgeschreven gebruik:

Automatisch schakelstation met driefasige netwerkbewaking conform EN 50549-1:2019 voor fotovoltaïsche installaties met een driefasige parallelvoeding door middel van gelijkstroom-wisselstroommutator in het net van de openbare voorziening. Het automatische schakelstation vormt een integraal bestanddeel van hoger vermelde gelijkstroom-wisselstroommutator.

Controlebasis:

EN 50549-1:2019, NEN-EN 50549-1:2019

Vereisten voor het parallel schakelen van installaties met distributienetwerken - Deel 1: Aansluiting op een LV-distributienetwerk - Productie van installaties tot en met Type B

- 4.4 Normaal werkbereik
- 4.5 Immuniteit voor storingen
- 4.6 Actieve reactie op frequentieafwijking
- 4.7 Krachtreactie op spanningsvariëaties 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

BWBR0037940 Netcode elektriciteit 25-05-2019

DIN V VDE V 0126-1-1:2006-02 (4.1 Functionele Veiligheid)

Automatisch schakelstation tussen een netparallele zelfopwekinstallatie en het openbare laagspanningsnet

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

Rapportnummer: 19TH0374-BI-EN50549-1_0 **Certificatie-programma:** NSOP-0032-DEU-ZE-V01
Certificaatnummer: U20-0983 **Datum:** 2020-12-10

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

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	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	Beginning with FW = 01.46 / PAR = 03.19
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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

Extract from test report according to EN 50549-1

Nr. 19TH0374-BI-EN50549-1_0

Setting of the interface protection: (Option 1 "Settings nach EN 50438 geprüft")

Parameter	Time	Setting
Over voltage	2,0 s	230V +10% (253V)
Under voltage	2,0 s	230V -20% (184V)
Over frequency	2,0 s	50Hz +2% (51Hz)
Under frequency	2,0 s	50Hz -4% (48Hz)
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)	$49,5Hz \leq f \leq 50,1Hz$	
Reconnection time (normal operational startup)	$\geq 60s$	
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)	$49,5Hz \leq f \leq 50,1Hz$	
Reconnection time (automatic reconnection after tripping)	$\geq 60s$	
Active power gradient after reconnection	10% P_{Emax} / 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:

Default interface setting according to EN 50438:2013, NEN-EN 50438:2013/IS 01:2015 of Annex A for Netherlands 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 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.

Appendix

Extract from test report according to EN 50549-1

Nr. 19TH0374-BI-EN50549-1_0

Setting of the interface protection: for power generation module with a maximum output up to 11 kW

Parameter	Min. disconnection time	Max. disconnection time	Min. operate value	Max. operate value	Standard set value
Over voltage (stage 1)	0,05s	24h	1,0V _n	1,35V _n	2,0s / 1,1V _n
Under voltage (stage 1)	0,05s	24h	0V	1,0V _n	2,0s / 0,80V _n
Over frequency	0,05s	24h	50,01Hz	53,1Hz	2,0s / 51,0Hz
Under frequency	0,05s	24h	46,9Hz	49,99Hz	2,0s / 48,0Hz
Reconnection settings for voltage (normal operational startup)	Ajustement range: min: 0-1V _n , max:1-1,35V _n				0,90V _n ≤ V ≤ 1,10V _n
Reconnection settings for frequency (normal operational startup)	Adjustment range: min: 46,9-49,99Hz, max: 50,01-53,1Hz				49,90Hz ≤ f ≤ 50,10Hz
Reconnection time (normal operational startup)	Adjustment range: 1s – 24h				≥ 60s
Reconnection settings for voltage (automatic reconnection after tripping)	Ajustement range: min: 0-1V _n , max:1-1,35V _n				0,9V _n ≤ V ≤ 1,10V _n
Reconnection settings for frequency (automatic reconnection after tripping)	Adjustment range: min: 46,9-49,99Hz, max: 50,01-53,1Hz				49,90Hz ≤ f ≤ 50,10Hz
Reconnection time (automatic reconnection after tripping)	Adjustment range: 1s – 24h				≥ 60s
Active power gradient after reconnection	Adjustment range: 6,6 %/min – 100%/s				20% P _E max / min
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: 0,01-5Hz/s				---
Loss of mains according EN 62116 (LoM)	Adjustment range: not field-adjustable				<1s

Note:

Default interface setting according to BWBR0037940 Netcode elektriciteit 25-05-2019 with deviation Netherlands for power generation module with a maximum output up to 11 kW 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 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.

Appendix

Extract from test report according to EN 50549-1

Nr. 19TH0374-BI-EN50549-1_0

Setting of the interface protection: for power generation module with a maximum output of more than 11 kW

Parameter	Min. disconnection time	Max. disconnection time	Min. operate value	Max. operate value	Standard set value
Over voltage (stage 1)	0,05s	24h	1,0V _n	1,35V _n	2,0s / 1,1V _n
Under voltage (stage 1)	0,05s	24h	0V	1,0V _n	2,0s / 0,80V _n
Under voltage (stage 2)	0,05s	24h	0V	1,0V _n	0,2s / 0,70V _n
Over frequency	0,05s	24h	50,01Hz	53,1Hz	0,5s / 51,5Hz
Under frequency	0,05s	24h	46,9Hz	49,99Hz	0,5s / 47,5Hz
Reconnection settings for voltage (normal operational startup)	Ajustement range: min: 0-1V _n , max:1-1,35V _n				0,90V _n ≤ V ≤ 1,10V _n
Reconnection settings for frequency (normal operational startup)	Adjustment range: min: 46,9-49,99Hz, max: 50,01-53,1Hz				49,90Hz ≤ f ≤ 50,10Hz
Reconnection time (normal operational startup)	Adjustment range: 1s – 24h				≥ 60s
Reconnection settings for voltage (automatic reconnection after tripping)	Ajustement range: min: 0-1V _n , max:1-1,35V _n				0,9V _n ≤ V ≤ 1,10V _n
Reconnection settings for frequency (automatic reconnection after tripping)	Adjustment range: min: 46,9-49,99Hz, max: 50,01-53,1Hz				49,90Hz ≤ f ≤ 50,10Hz
Reconnection time (automatic reconnection after tripping)	Adjustment range: 1s – 24h				≥ 60s
Active power gradient after reconnection	Adjustment range: 6,6 %/min – 100%/s				20% P _E max / min
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: 0,01-5Hz/s				---
Loss of mains according EN 62116 (LoM)	Adjustment range: not field-adjustable				<1s

Note:

Default interface setting according to BWBR0037940 Netcode elektriciteit 25-05-2019 with deviation Netherlands for power generation module with a maximum output of more than 11 kW 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 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.