

Certificate of The Network and System Protection

Zertifikat für den Netz- und Anlagenschutz



Certificate holder / Inhaber des Zertifikats : EcoFlow Inc.
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Guangdong, China

Date of Original Issue / Datum der ursprünglichen Ausgabe : 2024-11-14

Date of Last Revision / Datum der letzten Überarbeitung : 2024-12-05

Date of Expiry / Verfallsdatum : 2027-11-13

Certificate number / Zertifikatsnummer : PCS-24-1165/M1

Brand / Trademark / Warenzeichen :  **or** 
ECO FLOW



It is certified that the product / Es ist zertifiziert, dass das Produkt

Models / Modelle : EF HD-P3-29K9-S1, EF HD-P3-25K0-S1,
EF HD-P3-20K0-S1, EF HD-P3-15K0-S1

Type of generator / Generatortyp : EcoFlow PowerOcean Plus Hybrid Inverter

Technical Data / Technische Daten : See page 4

Test Laboratory / Testlabor : SGS-CSTC Standards Technical Services Co., Ltd. Suzhou Branch

Test Report (s) / Testbericht(e) : SUEE241000011051-AM1

Test Standard(s) / Prüfnorm(en) : VDE-AR-N 4105:2018-11 + Correction 1:2020

In compliance with the Network connection rule / In Übereinstimmung mit der Anwendungsregel:

VDE-AR-N-4105:2018-11 + Correction 1:2020-10 "Generators connected to the low-voltage distribution network / Erzeugungsanlagen am Niederspannungsnetz". Technical minimum requirements for connection and parallel operation of power generation systems connected to the low-voltage network / Technische Mindestanforderungen für Anschluss und Parallelbetrieb von Erzeugungsanlagen am Niederspannungsnetz.

Based on tests requirements defined in / Basierend auf Tests Anforderungen definiert in:

VDE V 0124-100: 2020-06 "Network integration of power generation systems – Low voltage / Netzintegration von Erzeugungsanlagen"

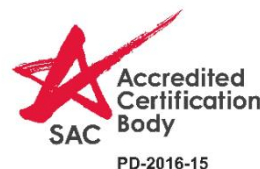
Test requirements for power generation units intended for connection to and parallel operation on the low-voltage network / Niederspannung – Prüfanforderungen an Erzeugungseinheiten, vorgesehen zum Anschluss und Parallelbetrieb am Niederspannungsnetz.

This is to certify that the product has been tested and was found to comply with the requirements of the standard(s). / Hiermit wird bescheinigt, dass das Produkt getestet wurde und den Anforderungen der Norm(en) entspricht.

The above-mentioned product is certified according to the requirements of ISO/IEC 17065:2012. / Das oben genannte Produkt ist gemäß den Anforderungen der ISO/IEC 17065:2012 zertifiziert.

This certificate superseded the certificate number PCS-24-1165 dated 2024-11-14 due to add the tests of clause 4.1.3 / Dieses Zertifikat ersetzt das Zertifikat mit der Nummer PCS-24-1165 vom 14.11.2024, da die Prüfungen gemäß Klausel 4.1.3 hinzugefügt wurden.

Christopher Hee
Certification Officer
SGS Testing & Control Services Singapore Pte Ltd
30 Boon Lay Way #03-01 Singapore 609957



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APPENDIX(ANHANG)



Certificate number / Zertifikatsnummer: PCS-24-1165/M1

E.7 Requirements for the test report for the NS protection <i>E.7 Anforderungen an den Prüfbericht zum NA-Schutz</i>						
Extract from test report for unit certificate "Determination of electrical properties" <i>Auszug aus dem Prüfbericht für Erzeugungseinheiten</i> <i>„Bestimmung der elektrischen Eigenschaften“</i>					N° SUEE241000011051-AM1	
Test report NS protection <i>Prüfbericht NA-Schutz</i>						
Type of NS protection <i>Typ NA-Schutz</i>	Integrated NS protection					
Software Version <i>Software-Version</i>	3.0.4.5					
Manufacturer <i>Hersteller</i>	EcoFlow Inc.					
Measuring Period <i>Messzeitraum</i>	2024-08-21 to 2024-10-23					
	Stirling generators, fuel cells <i>Stirlinggeneratoren, Brennstoffzellen</i>			Inverter(s) <i>Umrichter</i>		
	Synchronous and asynchronous generators with P_n ≤ 50 kW coupled directly or via inverters <i>direkt oder über Umrichter gekoppelte Synchron- und Asynchrongeneratoren mit P_n ≤ 50 kW</i>			Directly coupled synchronous and asynchronous generators with P_n > 50 kW <i>direkt gekoppelte Synchron- und Asynchrongeneratoren mit P_n > 50 kW</i>		
Protective function <i>Schutzfunktion</i>	Set value <i>Einstellwert</i>	Tripping value <i>Auslösewert</i>	Tripping time NS protection ⁽¹⁾ <i>Auslösezeit NA-Schutz</i>	Set value <i>Einstellwert</i>	Tripping value <i>Auslösewert</i>	Tripping time NS protection ⁽¹⁾ <i>Auslösezeit NA-Schutz</i>
Rise-in voltage protection U>> <i>Spannungssteigerungsschutz U >></i>	--	--	--	1.250*Un	1.248*Un	75 ms
Rise-in voltage protection U> <i>Spannungssteigerungsschutz U ></i>	--	--	--	1.100*Un	--	541.0 s
Voltage drop protection U< <i>Spannungsrückgangsschutz U <</i>	--	--	--	0.800*Un	0.796*Un	3.066 s
Voltage drop protection U<< <i>Spannungsrückgangsschutz U <<</i>	--	--	--	0.450*Un	0.449*Un	383 ms
Frequency decrease protection f< <i>Frequenzrückgangsschutz f <</i>	--	--	--	47.50 Hz	47.50 Hz	41 ms
Frequency increase protection f> <i>Frequenzsteigerungsschutz f ></i>	--	--	--	51.50 Hz	51.52 Hz	48 ms
⁽¹⁾ The tripping time includes the period from the limit violation U/f until the tripping signal to the interface switch. <i>Die Auslösezeit umfasst den Zeitraum von der Grenzwertverletzung U/f bis zum Auslösesignal an den Kuppelschalter.</i>						
When planning the power generation system, the response time of the interface switch shall be added to the maximum time value obtained as indicated above. <i>Bei der Planung der Erzeugungsanlage ist die Eigenzeit des Kuppelschalters zum höchsten oben er-mittelten Zeitwert zu addieren.</i>						
The disconnection time (sum of tripping time of the NS protection plus response time of the interface switch) shall not exceed 200 ms. <i>Die Abschaltzeit (Summe der Auslösezeit NA-Schutz zzgl. Eigenzeit des Kuppelschalters) darf 200 ms nicht überschreiten.</i>						



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For integrated NS protection <i>Bei integriertem NA-Schutz</i>	
Assigned to power generation unit of type <i>zugeordnet zu Erzeugungseinheit Typ</i>	EF HD-P3-29K9-S1 / EF HD-P3-25K0-S1 / EF HD-P3-20K0-S1 / EF HD-P3-15K0-S1
Type integrated interface switch <i>Typ integrierter Kuppelschalter</i>	Main Relay / HF176F
Response time of interface switch for integrated NS protection <i>Eigenzeit des Kuppelschalters bei integriertem NA-Schutz</i>	≤30 ms
Verification of the entire functional chain "integrated NS protection – interface switch" has resulted in successful disconnection <i>Die Überprüfung der Gesamtwirkungskette „integrierter NA-Schutz – Kuppelschalter“ führte zu einer erfolgreichen Abschaltung.</i>	<input checked="" type="checkbox"/>



APPENDIX(ANHANG)



Certificate number / Zertifikatsnummer: PCS-24-1165/M1

Full list of product references and nominal characteristics / Vollständige Liste der Produktreferenzen und nominalen Merkmale:

Rating specifications of EcoFlow PowerOcean Plus Hybrid Inverter				
Model	EF HD-P3-29K9-S1	EF HD-P3-25K0-S1	EF HD-P3-20K0-S1	EF HD-P3-15K0-S1
Input:				
Vmax PV (Vdc)	1000			
Start-up Voltage (Vdc)	160			
MPPT Voltage Range (Vdc)	200-850			
Isc PV (absolute Max.) (A)	PV1 19/19, PV2/3 24/24			
Number of MPP trackers	3			
Max. PV input current (A)	PV1 16/16, PV2/3 16/16			
Battery (charge / discharge):				
Battery Nominal Voltage (V)	800			
Max Battery Voltage (V)	960			
Max. Current (A)	40.0	33.3	26.6	20.0
AC Input (Grid Side):				
Normal AC Voltage (Vac)	400/230, 3L/N/PE			
Frequency (Hz)	50			
Max. input current (A)	63.0			
Power factor(adjustable)	-0.8 ~ +0.8			
AC Output (Grid Side)				
Normal AC Voltage (Vac)	400/230, 3L/N/PE			
Frequency (Hz)	50			
Rated output Current (A)	43.3	36.2	29.0	21.7
Rated apparent output Power (VA)	29900	25000	20000	15000
Max. apparent output Power (VA)	29900	25000	20000	15000
Power factor(adjustable)	-0.8 ~ +0.8			
AC Output (Back-up):				
Normal Voltage (Vac)	3L/N/PE 400/230			
Frequency (Hz)	50			
Rated output Current (A)	43.3	36.2	29.0	21.7
Max. output Current (Off-Grid) (A)	52.0@1s	43.4@1s	34.8@1s	26.0@1s
Normal apparent output Power (VA)	29900	25000	20000	15000
Max. apparent output Power (VA)	35880@1s	30000@1s	24000@1s	18000@1s
Others:				
Ingress protection (IP)	IP65			
Protective class	Class I			
Temperature (°C)	-20°C to +50°C			
Cooling Method	Intelligent air cooling			
Inverter Isolation	Non-isolated			
Overvoltage category	II (PV), III (Mains)			
Dimensions (W*D*H)	636*235*498mm (without trim cover)			
Weight	41.0 kg			
Altitude	3000m			
Topology	Transformerless			



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