CERTIFICATE OF CONFORMITY

Issued to:	Guangzhou Felicity Solar Technology Co., Ltd. (Airport Baiyun)No. 2, 4, 6, 8, 10 and 12 Donghua Huaye Road, Renhe Town, Baiyun District, Guangzhou, Guangdong, China
For the product:	Hybrid Inverter
Trade name:	Felicitysolar®
Type/Model:	IVGM10KLP3G1, IVGM12KLP3G1, IVGM14KLP3G1, IVGM15KLP3G1, IVGM16KLP3G1, IVGM18KLP3G1, IVGM20KLP3G1
Ratings:	See the annex
Manufactured by:	Guangzhou Felicity Solar Technology Co., Ltd. (Airport Baiyun)No. 2, 4, 6, 8, 10 and 12 Donghua Huaye Road, Renhe Town, Baiyun District, Guangzhou, Guangdong, China
Requirements:	VDE-AR-N 4105:2018-11 DIN VDE V 0124-100:2020-06

This Test Certificate is granted on account of an examination by DEKRA, the results of which are laid down in a confidential file no. 4947150.50.

The examination has been carried out on one single specimen of the product. The Attestation does not include an assessment of the manufacturer's production. Conformity of this production with the specimen tested by DEKRA is not the responsibility of DEKRA.

This Test Certificate expires at the latest on 12 January 2031 or expires upon withdrawal of one of the above-mentioned standards.

Shanghai, 12 January 2026 Number: 4947150.01COC

DEKRA Testing and Certification (Shanghai) Ltd.

Rosa Zhou
Certification Manager

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PCA-141

Annex to 4947150.01COC

Ratings of the PGU:

Model		**IVGM 10KLP3G1**	**IVGM 12KLP3G1**	**IVGM 14KLP3G1**	**IVGM 15KLP3G1**	**IVGM 16KLP3G1**
Battery	Battery type	Li-ion/Lead-acid				
	Battery Voltage Range [Vdc]	40 - 60				
	Rated Battery Voltage [Vdc]	50	50	50	50	50
	Max. charge/discharge current [Adc]	210	240	260	280	300
	Max. charge/discharge Power [kW]	10	12	14	15	16
PV input	Max. PV input Voltage [Vdc]	800				
	Rated PV input Voltage [Vdc]	550				
	MPPT Voltage Range [Vdc]	160 - 650				
	Max. PV input current [Adc]	26*2		36*2		
	Isc current [Adc]	39*2		54*2		
	Max. PV input power [kW]	15.0	18.0	22.4	24.0	25.6
AC terminal (On-grid)	Rated AC Voltage [Vac]	220/380, 230/400V, 3W+N+PE				
	Rated Frequency [Hz]	50/60				
	Max. AC input current [Aac]	16.7/16	20/19.2	23.4/22.4	25.0/24.0	26.7/25.6
	Max. AC input Power [kW]	11.0	13.2	15.4	16.5	17.6
	Rated AC output current [Aac]	15.2/14.5	18.2/17.4	21.3/20.3	22.8/21.8	24.3/23.2
	Max. AC output current [Aac]	16.7/16.0	20.0/19.2	23.4/22.4	25.0/24.0	26.7/25.6
	Rated AC output Power [kW]	10.0	12.0	14.0	15.0	16.0
	Max. AC output Apparent power [kVA]	11.0	13.2	15.4	16.5	17.6
	Power factor	0.8 leading to 0.8 lagging				
EPS output	Rated AC output Voltage [Vac]	220/380, 230/400V, 3W+N+PE				
	Rated Frequency [Hz]	50/60				
	Rated AC output current [Aac]	15.2/14.5	18.2/17.4	21.3/20.3	22.8/21.8	24.3/23.2

	Max. AC output current [Aac]	16.7/16.0	20.0/19.2	23.4/22.4	25.0/24.0	26.7/25.6
	Rated AC output Power [kW]	10.0	12.0	14.0	15.0	16.0
	Max. AC output Apparent power [kVA]	11.0	13.2	15.4	16.5	17.6
	Power factor	0.8 leading to 0.8 lagging				
General	Type of inverter	Non-isolated				
	Ingress Protection	IP65				
	Operating Temperature Range [ºC]	-40 to 60 (Derating above 45 ºC)				
	Net Weight [kg]	48.7				
	Size W×H×D [mm]	750*880*278				

Model		**IVGM 18KLP3G1**	**IVGM 20KLP3G1**
Battery	Battery type	Li-ion/Lead-acid	
	Battery Voltage Range [Vdc]	40 - 60	
	Rated Battery Voltage [Vdc]	50	50
	Max. charge/discharge current [Adc]	330	350
	Max. charge/discharge Power [kW]	18	20
PV input	Max. PV input Voltage [Vdc]	800	
	Rated PV input Voltage [Vdc]	550	
	MPPT Voltage Range [Vdc]	160 - 650	
	Max. PV input current [Adc]	36*2	
	Isc current [Adc]	54*2	
	Max. PV input power [kW]	28.8	32.0
AC terminal (On-grid)	Rated AC Voltage [Vac]	220/380, 230/400V, 3W+N+PE	
	Rated Frequency [Hz]	50/60	
	Max. AC input current [Aac]	30.0/28.7	33.4/31.9
	Max. AC input Power [kW]	19.8	22.0
	Rated AC output current [Aac]	27.3/26.1	30.4/29.0
	Max. AC output current [Aac]	30.0/28.7	33.4/31.9
	Rated AC output Power [kW]	18.0	20.0

	Max. AC output Apparent power [kVA]	19.8	22.0
	Power factor	0.8 leading to 0.8 lagging	
EPS output	Rated AC output Voltage [Vac]	220/380, 230/400V, 3W+N+PE	
	Rated Frequency [Hz]	50/60	
	Rated AC output current [Aac]	27.3/26.1	30.4/29.0
	Max. AC output current [Aac]	30.0/28.7	33.4/31.9
	Rated AC output Power [kW]	18.0	20.0
	Max. AC output Apparent power [kVA]	19.8	22.0
	Power factor	0.8 leading to 0.8 lagging	
General	Type of inverter	Non-isolated	
	Ingress Protection	IP65	
	Operating Temperature Range [ºC]	-40 to 60 (Derating above 45 ºC)	
	Net Weight [kg]	48.7	
	Size W×H×D [mm]	750*880*278	

E.4 Unit certificate

Unit certificate		
Manufacturer / Address:	Guangzhou Felicity Solar Technology Co., Ltd. (Airport Baiyun)No. 2, 4, 6, 8, 10 and 12 Donghua Huaye Road, Renhe Town, Baiyun District, Guangzhou, Guangdong, China	
Type of power generation unit:	Hybrid Inverter IVGM10KLP3G1, IVGM12KLP3G1, IVGM14KLP3G1, IVGM15KLP3G1, IVGM16KLP3G1, IVGM18KLP3G1, IVGM20KLP3G1	
☒ Inverter	☐ Asynchronous generator	☐ Synchronous generator
☐ Stirling generator	☐ Fuel cell	☐ Others
Assessment values	Max. active power P_{Emax}	20.0 kW (IVGM20KLP3G1)
	Max. apparent power S_{Emax}	22.0 kVA (IVGM20KLP3G1)
	Rated voltage	230/400 V (3W+N+PE)
	Rated current (AC) I_r	29 A (IVGM20KLP3G1)
Network connection rule	**VDE-AR-N 4105 "Generators connected to the low-voltage distribution network"** Technical minimum requirements for connection and parallel operation of power generation systems connected to the low-voltage network	
Test requirement	**DIN VDE V 0124-100 (VDE V 0124-100) "Network integration of power generation systems – Low voltage"** Test requirements for power generation units intended for connection to and parallel operation on the low-voltage network	
Test report	4947150.50 from (2026-01-09)	
The above designated power generation unit meets the requirements of VDE-AR-N 4105.		

E.6 Certificate of the network and system protection

Certificate of NS protection		
Manufacturer	Guangzhou Felicity Solar Technology Co., Ltd. (Airport Baiyun)No. 2, 4, 6, 8, 10 and 12 Donghua Huaye Road, Renhe Town, Baiyun District, Guangzhou, Guangdong, China	
Type of NS protection	Integrated NS protection	
Central NS protection	☐	
Integrated NS protection	☒	Assigned to power generation unit of type: IVGM10KLP3G1, IVGM12KLP3G1, IVGM14KLP3G1, IVGM15KLP3G1, IVGM16KLP3G1, IVGM18KLP3G1, IVGM20KLP3G1
Network connection rule	**VDE-AR-N 4105 "Generators connected to the low-voltage distribution network"** Technical minimum requirements for connection and parallel operation of power generation systems connected to the low-voltage network	
Test requirement	**DIN VDE V 0124-100 (VDE V 0124-100) "Network integration of power generation systems – Low voltage"** Test requirements for power generation units intended for connection to and parallel operation on the low-voltage network	
Test report	4947150.50 from (2026-01-09)	
The network and system protection designated above meets the requirements of VDE-AR-N 4105.		

E.7 Requirements for the test report for the NS protection

Extract from test report for NS protection "Determination of electrical properties"		Report No.: 4947150.50
Test report NS protection		
Type of NS protection:	Integrated NS protection	**Other Manufacturer indications**
Software version:	100	N/A
Manufacturer:	Guangzhou Felicity Solar Technology Co., Ltd. (Airport Baiyun)No. 2, 4, 6, 8, 10 and 12 Donghua Huaye Road, Renhe Town, Baiyun District, Guangzhou, Guangdong, China	
Measuring period:	From 2025-11-11 to 2026-01-05	

	Inverter		
Protection function	**Setting value**	**Tripping value**	**Tripping time NS protection***
Rise-in-voltage protection *U* >>	1.25 * U_n	L1-N&L2-N&L3-N: 287.6 V L1-N: 287.5 V L2-N: 287.5 V L3-N: 287.5 V	L1-N&L2-N&L3-N: 139 ms L1-N: 138 ms L2-N: 137 ms L3-N: 136 ms
Rise-in-voltage protection *U* >	1.10 * U_n	1.10 * U_n, ≤ 100 ms**	
Voltage drop protection *U* <	0.8 * U_n	L1-N&L2-N&L3-N: 184.0 V L1-N: 184.0 V L2-N: 184.0 V L3-N: 184.0 V	L1-N&L2-N&L3-N: 3.018 s L1-N: 3.039 s L2-N: 3.022 s L3-N: 3.039 s
Voltage drop protection *U* <<	0.45 * U_n	L1-N&L2-N&L3-N: 103.8 V L1-N: 103.3 V L2-N: 103.4 V L3-N: 103.4 V	L1-N&L2-N&L3-N: 316 ms L1-N: 340 ms L2-N: 318 ms L3-N: 328 ms
Frequency decrease protection *f* <	47.5 Hz	47.50 Hz	131 ms
Frequency increase protection *f* >	51.5 Hz	51.48 Hz	174 ms

*: The tripping time includes the period from the limit value violation U/f until the tripping signal to the interface switch.

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.

The disconnection time (sum of tripping time of the NS protection plus response time of the interface switch) shall not exceed 200 ms.

**: Verification disconnection time of moving 10-min-average value. Disconnecting time as below:

(496.00/501.00/509.00) s (L1-N/L2-N/L3-N from 600 s @ 100% Un to 112% Un)

Continuous operation (L1-N/L2-N/L3-N from 600 s @ 100% Un to 108% Un)

(300.52/305.00/311.00) s (L1-N/L2-N/L3-N from 600 s @ 106% Un to 114% Un)

☒ **For integrated NS protection**

Assigned to power generation unit type	IVGM10KLP3G1, IVGM12KLP3G1, IVGM14KLP3G1, IVGM15KLP3G1, IVGM16KLP3G1, IVGM18KLP3G1, IVGM20KLP3G1
Integrated interface switch type	Series-connected relays for all phase conductors each Relay type: CHAR-112A90C
Response time of interface switch for integrated NS protection	Release time: max. 10 ms
Verification of the entire functional chain "integrated NS protection – interface switch" has resulted in successful disconnection.	☒

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