AMD GmbH, Mörkeweg 12, 26605 Aurich

AMD Dienstleistungs-GmbH
Mörkeweg 12
26605 Aurich

Tel.: +49 4941 – 97 34 60 0
Fax: +49 4941 – 97 34 60 15

office@amd-germany.com

Ihr Zeichen/Ihre Nachricht vom	Unser Zeichen/Unsere Nachricht vom	Bearbeiter, Durchwahl	Datum:
	AM/	AM	

Anlage zum Kaufvertrag

Item	Product Name	Model	SPEC	Qty	Unit
1	Solar Panel	SK9609MDGDC-405W	Double glass Dimenssion: 1722x1134x30mm 18pcs per system	7290	w
2	Inverter	MHT-6-25	Max recommended DC Power 7200w, Germany certificate	1	set
3	Battery+BMS	LFP 10KWH		1	set
4	Mounting Structure(Tile)	-	Structure to mount solar panel to tile roof	1	set
5	Mounting Structure(Cement)	-	Structure to mount solar panel to rooftop	1	set
6	DC Cable	-	Black 1*4mm2, Tinned copper 25m/system. To connect combination box to inverter.	25	meter
7	AC Cable	-	Black 2*6mm2, Thnned Copper 25m/system. To connect combination box to grid	25	meter
8	AC Cable	-	Black 3*6mm2, Tinned copper 52m/system. To connect inverter to combination box	25	meter
9	Earthing Cable	-	Green&yellow 1*6mm2, bare copper 25m/system. To connect the last module to th earth	25	meter

10	Earthing bonding	-	Green&Yellow 1*6mm2*30CM Length Tinned Copper, with terminal. To connect between module	18	pc
11	Plug Dispatch Tool	-	Steel	1	pc
12	Connector	-	MC4 compatible	1	pair
13	Combiner Box	Aswich	Includes 1*plastic Enclosure Box, 1*MCB stitch, 1* SPD, 1* MCB, 1*RCCB, 2*Cable Glands. CE certified	1	set

Freundliche Grüsse
AMD Dienstleistungs- GmbH

Alwin Müller
Geschäftsführer

Three Phase Hybrid Inverter

SUN- 5 / 6 / 8 / 10 / 12 K-SG04LP3-EU

- 100% unbalanced output, each phase; Max. output up to **50%** rated power
- DC couple and AC couple to retrofit existing solar system
- Max. 10 pcs parallel for on-grid and off-grid operation; Support multiple batteries parallel
- Max. charging/discharging current of 240A
- 48V low voltage battery, transformer isolation design
- 6 time periods for battery charging/discharging
- Support storing energy from diesel generator

Technical Data

Model	SUN-5K -SG04LP3-EU	SUN-6K -SG04LP3-EU	SUN-8K -SG04LP3-EU	SUN-10K -SG04LP3-EU	SUN-12K -SG04LP3-EU
Battery Input Data					
Battery Type	Lead-acid or Li-Ion				
Battery Voltage Range (V)			40~60		
Max. Charging Current (A)	120	150	190	210	240
Max. Discharging Current (A)	120	150	190	210	240
External Temperature Sensor	Yes				
Charging Curve	3 Stages / Equalization				
Charging Strategy for Li-Ion Battery	Self-adaption to BMS				
PV String Input Data					
Max. DC Input Power (W)	6500	7800	10400	13000	15600
Rated PV Input Voltage (V)	550 (160~800)				
Start-up Voltage (V)	160				
MPPT Voltage Range (V)	200-650				
Full Load DC Voltage Range (V)	350-650				
PV Input Current (A)	13+13			26+13	
Max. PV I_{SC} (A)	17+17			34+17	
No.of MPP Trackers	2				
No.of Strings per MPP Tracker	1			2	
AC Output Data					
Rated AC Output and UPS Power (W)	5000	6000	8000	10000	12000
Max. AC Output Power (W)	5500	6600	8800	11000	13200
AC Output Rated Current (A)	7.6/7.2	9.1/8.7	12.1/11.6	15.2/14.5	18.2/17.4
Max. AC Current (A)	11.4/10.9	13.6/13	18.2/17.4	22.7/21.7	27.3/26.1
Max. Continuous AC Passthrough (A)	45				
Peak Power (off grid)	2 time of rated power, 10 S				
Power Factor	0.8 leading to 0.8 lagging				
Output Frequency and Voltage	50/60Hz; 3L/N/PE 220/380, 230/400Vac				
Grid Type	Three Phase				
DC injection current (mA)	THD<3% (Linear load<1.5%)				
Efficiency					
Max. Efficiency	97.60%				
Euro Efficiency	97.00%				
MPPT Efficiency	99.90%				
Protection					
Integrated	PV Input Lightning Protection, Anti-islanding Protection, PV String Input Reverse Polarity Protection, Insulation Resistor Detection, Residual Current Monitoring Unit, Output Over Current Protection, Output Shorted Protection, Surge protection				
Output Over Voltage Protection	DC Type II/AC Type III				
Certifications and Standards					
Grid Regulation	CEI 0-21, VDE-AR-N 4105, NRS 097, IEC 62116, IEC 61727, G99, G98, VDE 0126-1-1, RD 1699, C10-11				
Safety EMC / Standard	IEC/EN 61000-6-1/2/3/4, IEC/EN 62109-1, IEC/EN 62109-2				
General Data					
Operating Temperature Range (℃)	-40~60℃, >45℃ derating				
Cooling	Smart cooling				
Noise (dB)	<45 dB				
Communication with BMS	RS485; CAN				
Weight (kg)	33.6				
Size (mm)	422W x 699.3H x279D				
Protection Degree	IP65				
Installation Style	Wall-mounted				
Warranty	5 years				

AKCOME

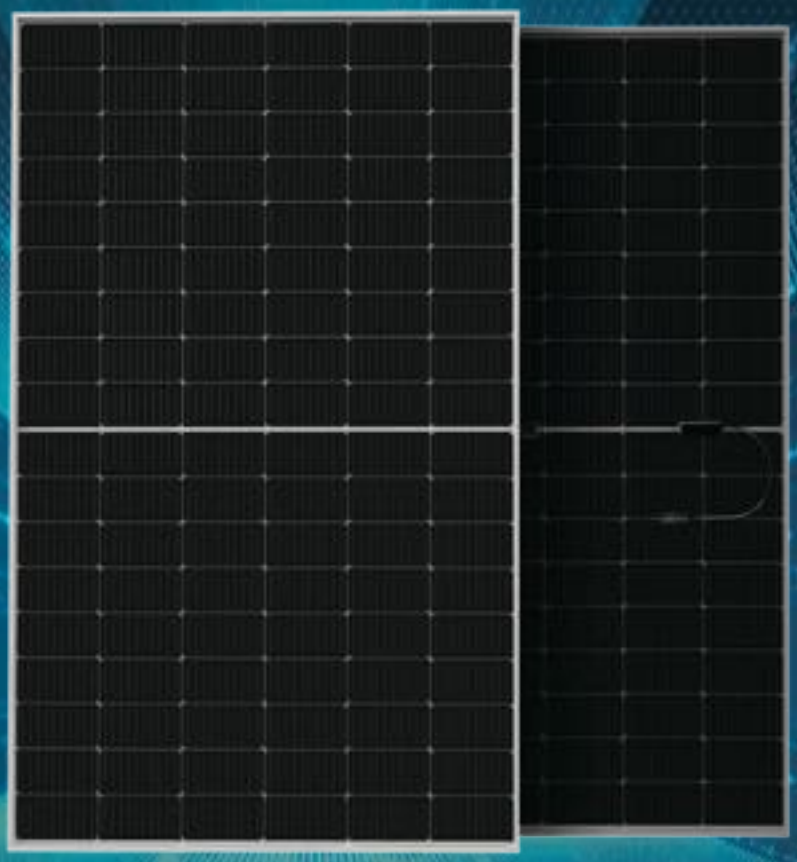
AK iChaser

PERC Module

390-410W

SK9609MDGDC

MONO 10BB Half-Cut Dual Glass Module



Fire class A, harsh environment adaptability

The back of the dual-glass module adopts high transparent glass, which can adapt to all kinds of harsh environment, and the fire rating can reach Class A.

30-year power warranty

The average life of dual-glass modules is 30 years, 5 years longer than that of single-glass modules.

Double-sided power generation, higher income

The dual-glass module has a double-sided ratio of up to 70% and a power generation gain of 5%-20% on the back side.

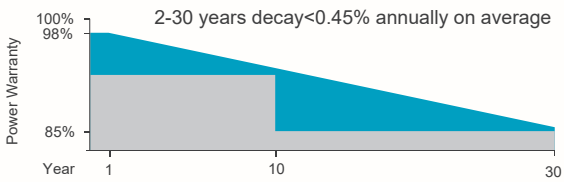
1500V system voltage

Due to the higher system voltage, the number of modules per string can be increased by 1/3, reducing the overall construction cost of the power station.

LINEAR PERFORMANCE WARRANTY

12 years — Product warranty on materials and workmanship

30 years — Linear power output warranty



CERTIFICATES

ISO 9001: 2015
Quality Management System

ISO 14001: 2015
Environmental Management System

IEC 61215 / IEC 61730

OHSAS 18001: 2007
Occupational Health & Safety Managemnet System

*Certification requirements vary in different markets, please consult with Akcome Optronics sales team for appropriate certification.

TÜV NORD CE Tier 1 Bloomberg

390-410W

MONO 10BB Half-Cut Dual Glass Module

AK iChaser

ELECTRICAL PARAMETERS @ STC

Max. Power Output Pmax (W)	390	395	400	405	410
Power Tolerance	0~+3%	0~+3%	0~+3%	0~+3%	0~+3%
Max. Power Voltage Vmp (V)	31.23	31.30	31.38	31.45	31.52
Max. Power Current Imp (A)	12.49	12.62	12.75	12.88	13.01
Open Circuit Voltage Voc (V)	36.96	37.04	37.13	37.21	37.29
Short Circuit Current Isc (A)	13.34	13.47	13.60	13.73	13.86
Module Efficiency (%)	19.98	20.23	20.49	20.74	21.00

*STC (Standard Test Condition): Irradiance 1000W/m^2 , Cell Temperature 25°C, Air Mass 1.5
*Measurement Tolerance (±3.0%)

Inegrated Power @ STC (Reference to 405W front)

Power Gains	5%	10%	15%	20%	25%
Max. Power Output Pmax (W)	427	447	466	486	506
Max. Power Voltage Vmp (V)	31.55	31.55	31.45	31.45	31.45
Max. Power Current Imp (A)	13.52	14.17	14.81	15.46	16.10
Open Circuit Voltage Voc (V)	37.21	37.21	37.31	37.31	37.31
Short Circuit Current Isc (A)	14.42	15.10	15.79	16.48	17.16

TEMPERATURE COEFFICIENTS

Temperature Coefficients of Pmp	-0.35%/ °C
Temperature Coefficients of Voc	-0.29%/ °C
Temperature Coefficients of Isc	+0.048%/ °C

MECHANICAL PARAMETERS

Cell Type	Mono 182x91mm
Number of Cells	108pcs(6x18)
Dimensions (L*W*H)	1722x1134x30mm
Weight	24.5kg
Frame	Anodised Aluminum
Junction Box	IP68, 3 bypass diodes
Cable, Length	4.0mm^2 , 300mm

OPERATING CONDITION

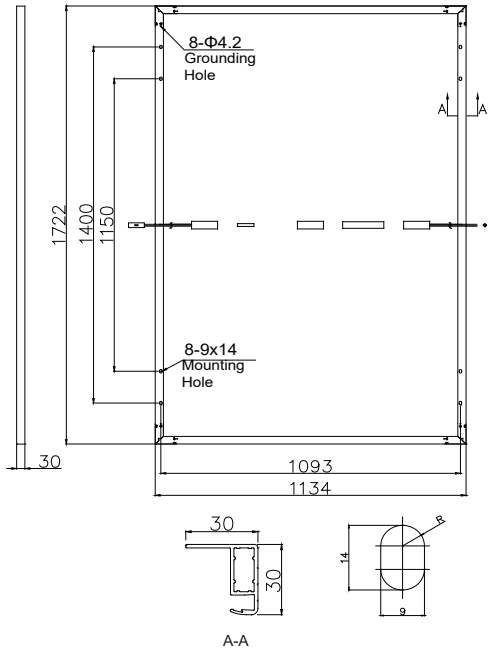
Maximum System Voltage(V)	1500(DC)
Operating Temperature(℃)	-40~+85
Max. Wind Load / Snow Load(pa)	2400/5400
Max. Series Fuse Rating(A)	30
Fire Rating	Class A
Bifaciality	70±5%

PACKAGE INFORMATION

Container 40'HQ	910pcs
Quantity / Pallet	35pcs
Package size: 1750×1100×1254mm;	Net weight: 857.5kg; Gross weight: 899.5kg

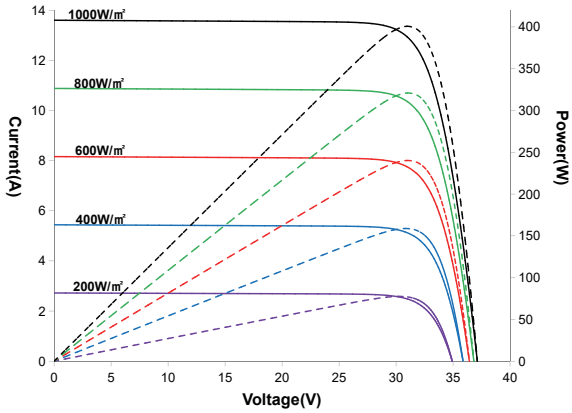
Ver: 20220816

ASSEMBLY DRAWING (Unit:mm)

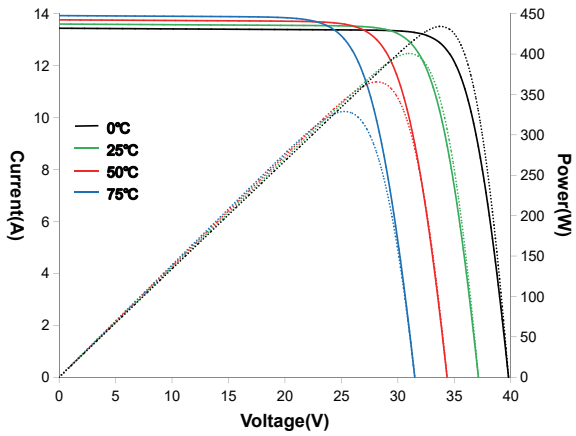


I-V CURVES

Test temperature 25℃



Irradiance: AM1.5, 1000W/m²



AKCOME

Tel: 400-101-7000 Email: modulesales@akcome.com www.akcome.com

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Uhome

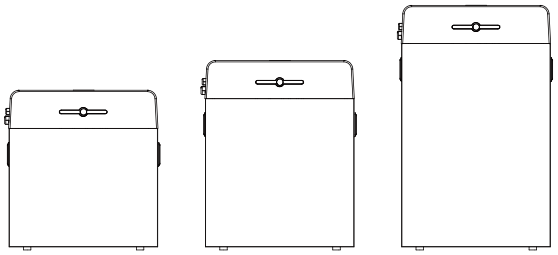
ENERGY STORAGE BATTERY

Uhome-LFP 5/5.8/10 kWh/LV Lithium Battery Storage

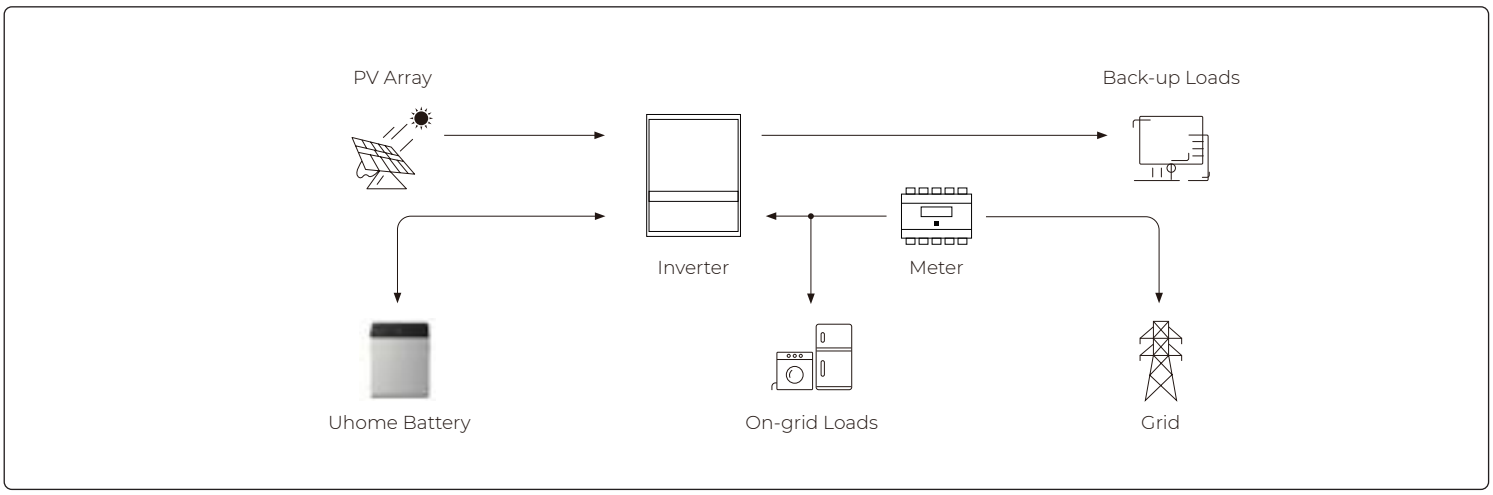
Uhome Smart Energy(Wuxi)Co.,Ltd.

Tel: +86-510-85366880
Address: No.1 Qianluo Rd, Qianqiao St, Huishan District, Wuxi City
U.S.A Warehouse：3605 Carmel Hills Dr.,Denton, Texas 76208

APPLICATIONS



Uhome-LFP 5kWh/LV | Uhome-LFP 5.8kWh/LV | Uhome-LFP 10kWh/LV



FEATURES

- Reliable LFP Cells
- Easy Installation& After Sales Service
- High Inverter Compatibility
- Digital monitoring system APP
- Intelligent Build in BMS
- Safety Protection and Easy Move
- >6,000 Cycles at 90% DOD
- Scalable up to 20-40kW(4 Parallel)

Uhome

Technical Specifications

Model		Uhome-LFP 5kWh/LV	Uhome-LFP 5.8kWh/LV	Uhome-LFP 10kWh/LV
Total Energy*		5kWh	5.8kWh	10kWh
Usable Energy(DC)*		4.6kWh	5.3kWh	9.2kWh
Nominal Dis-/Charge Power		3.0kW	2.75kW	4.6kW
Peak Power(Only Discharge)		7kW for 3s	7kW for 3s	10kW for 3s
Constant Current(Only Discharge)		100A	100A	120A
Voltage		48~56Vd.c	42~54Vd.c	48~56Vd.c
Nominal Voltage		51.2Vd.c	48Vd.c	51.2Vd.c
Nominal Current		60A	58A	90A
Max. Charge Voltage		57.6Vd.c	54.0Vd.c	57.6Vd.c
Weight		55kg	66kg	96kg
Dimension(mm)		525*635*238mm	525*635*238mm	525*820*238mm
Max.recommended DOD		90%		
Operating Condition		Indoor or outdoor		
Operating Temperature	Charge	From 0~45℃		
	Discharge	From -10~50℃		
WIFI Frequency Range		2400MHz~2483MHz		
Humidity		4~100%(No condensed water)		
Pollution Degree		3		
Over Voltage Category		II		
Cooling Type		Natural cooling		
Case Material		Metal + Plastic		
Color		Black+Silver grey or White		
Installation		Free standing		
IP rating		IP 65		
Protective Class		I		
Max. Number of Parallel or Series		4		
Warranty		10 years		
Life Span		>15 years		
Communication		CAN/ RS485		
Protection Mode		Triple hardware protection		
Battery Protection		Over-current/Over-voltage/Short circuit/ Under-voltage/Over temperature		
Safety		Cell UL 1973	Cell UL 1973	Cell UL 1973
		CE	Pack TUV/CE	CE
Hazardous Material Classification		9		
Transportation		UN 38.3		

Testing conditions based on temperature 25℃ at the beginning of life.
***Total Energy/Usable Energy measured under specific conditions from Uhome 0.2C CC-CV**

检 测 报 告
Test Report

№: UNWT(2021)06014

产品名称 Sample Name	Uhome-LFP 10kWh/LV		
样品标示商标 Sample Mark	AOBOET	样品型号 Sample Model	Uhome-LFP 10kWh/LV
额定容量 Rated Capacity	200Ah	标称电压 Normal Voltage	51.2V
额定能量 Rated Energy	10240 Wh	锂金属含量 Metal Content	不适用 N/A
执行标准 Executive Standard	/	样品等级 Sample Grade	/
委托单位名称/ 地址及电话 Name, Add. and Tel. of Client	奥波环境新能源（无锡）有限公司/无锡市惠山区钱桥街道/86-13771878232 AOBO Environmental New Energy (Wuxi) Co. , Ltd./ Qianjiang Street, Huishan District, Wuxi City/86-13771878232		
标示生产单位名称/地址及电话 Name, Add. and Tel. of Manufacture	奥波环境新能源（无锡）有限公司/无锡市惠山区钱桥街道/86-13771878232 AOBO Environmental New Energy (Wuxi) Co. , Ltd./ Qianjiang Street, Huishan District, Wuxi City/86-13771878232		
到样日期 Accepted Date	2021.06.11	测试日期 Test Date	2021.06.11-2021.06.27
样品状态 Sample Status	灰色+黑色方形 Grey+Black Cube	送样人员 Sample Carrier	秦光辉 Qin Guanghui
样品数量 Quantity of Sample	System: 1pcs Battery: 4pcs Cell: 30pcs		
检测依据 Test method and criterion	联合国《关于危险货物运输的建议书-试验和标准手册》 第 6 修订版修正 1，38.3 UN “Recommendations on the Transport of Dangerous Goods”, Manual of Tests and Criteria ST/SG/AC.10/11/Rev.6/Amend1, 38.3		
检测项目 Test items	高度模拟、温度试验、振动、冲击、外部短路、挤压、强制放电、过度充电保护功能验证、短路保护功能验证、电池组之间过度放电保护功能验证 Altitude simulation, Thermal test, Vibration, Shock, External Short-circuit, Crush, Forced Discharge, Verified the protection of overcharge, Verified the protection of short-circuit, Verified the protection of over discharge between the batteries.		
检测结论 Conclusion	经测试，送检样品符合联合国《关于危险品货物运输的建议书-试验和标准手册》第 6 修订版修正 1 第 38.3 节的测试要求。 The sample meets the requirement of UNITED NATIONS Recommendations on the Transport of Dangerous Goods, Manual of Test and Criteria ST/SG/AC.10/11/Rev.6/Amend1, Section 38.3. （检测检测专用章）(Stamp) 签发日期(Issue date)：		
备注 Comments	委托送样检测，检测结果仅对来样负责。 It is a entrusted sample test, the test results are only responsible for the samples.		

批准：
Approver:

审核：
Checker:

主检：
Tester:

检 测 报 告
Test Report

序号 No.	检测项目 Name of test	检测方法/标准要求 Test method and Standard requirement	子样编号 Sample number	检测结果 Test result	单项结论 Test conclusion
1	高度模拟 Altitude simulation	联合国《关于危险货物运输的建议书 试验和标准手册》试验 T.1 UN Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria ST/SG/AC.10/11/Rev.6/Amend1, 38.3, Test T.1	B01-B04	见附表 1 See Appendix 1	合格 Pass
2	温度试验 Thermal test	联合国《关于危险货物运输的建议书 试验和标准手册》试验 T.2 UN Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria ST/SG/AC.10/11/Rev.6/Amend1, 38.3, Test T.2	B01-B04	见附表 2 See Appendix 2	合格 Pass
3	振动 Vibration	联合国《关于危险货物运输的建议书 试验和标准手册》试验 T.3 UN Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria ST/SG/AC.10/11/Rev.6/Amend1, 38.3, Test T.3	B01-B04	见附表 3 See Appendix 3	合格 Pass
4	冲击 Shock	联合国《关于危险货物运输的建议书 试验和标准手册》试验 T.4 UN Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria ST/SG/AC.10/11/Rev.6/Amend1, 38.3, Test T.4	B01-B04	见附表 4 See Appendix 4	合格 Pass
5	外部短路 External Short-circuit	联合国《关于危险货物运输的建议书 试验和标准手册》试验 T.5 UN Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria ST/SG/AC.10/11/Rev.6/Amend1, 38.3, Test T.5	B01-B04	见附表 5 See Appendix 5	合格 Pass
6	挤压 Crush	联合国《关于危险货物运输的建议书 试验和标准手册》试验 T.6 UN Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria ST/SG/AC.10/11/Rev.6/Amend1, 38.3, Test T.6	C01-C10	见附表 6 See Appendix 6	合格 Pass
7	强制放电 Forced discharge	联合国《关于危险货物运输的建议书 试验和标准手册》试验 T.8 UN Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria ST/SG/AC.10/11/Rev.6/Amend1, 38.3, Test T.8	C11-C30	见附表 7 See Appendix 7	合格 Pass

转下页
See next page

检 测 报 告
Test Report

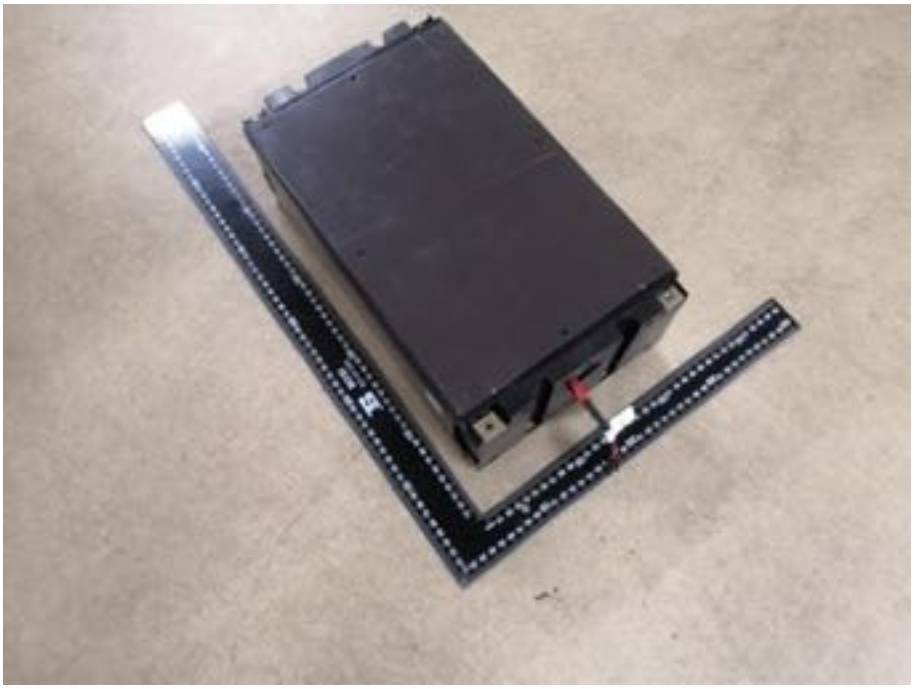
序号 No.	检测项目 Name of test	检测方法/标准要求 Test method and Standard requirement	子样编号 Sample No.	检测结果 Test result	单项结论 Test conclusion
8	过度充电保护功能验证 Verified the protection of overcharge	联合国《关于危险货物运输的建议书 试验和标准手册》表 38.3.3c UN Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria ST/SG/AC.10/11/Rev.6/Amend1, 38.3, Table 38.3.3c	S01	经验证，过度充电保护功能正常。The protection of over charge is Effectively.	合格 Pass
9	短路保护功能验证 Verified the protection of short-circuit		S01	经验证，短路保护功能正常。The protection of short-circuit is Effectively.	合格 Pass
10	电池组之间过度放电保护功能验证 Verified the protection of over discharge between the batteries		S01	经验证，电池组之间过度放电保护功能正常。The protection of discharge between the batteries is effectively.	合格 Pass
以下空白 Blank following					

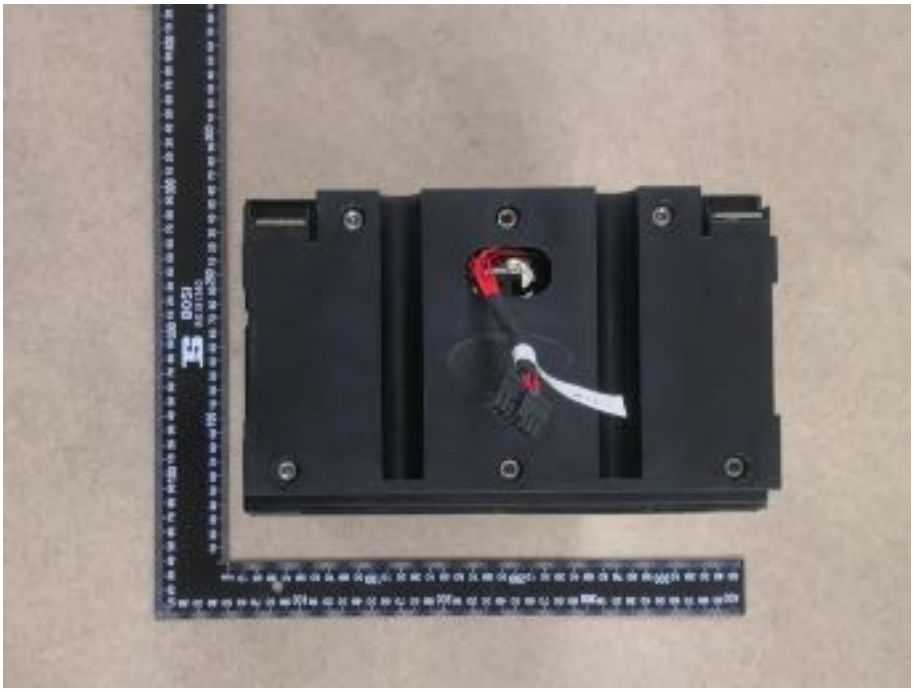
检 测 报 告
Test Report

样品及标识照片
Photos of samples and markings

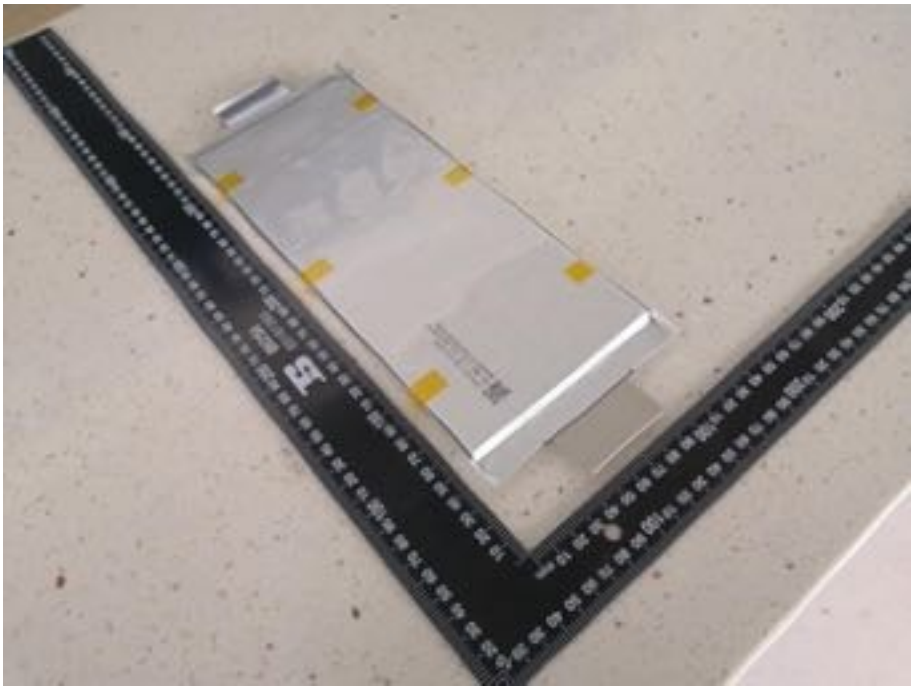
Photos of System

Photos of Battery





Photos of Cell



附表 1
Appendix 1

测试项目 Test Items	高度模拟 Altitude simulation
1.1	测试步骤 Test procedure
	试验电池和电池组在环境温度(20±5℃)下，储存在小于等于 11.6kPa 的压力下至少六小时。 Test cells and batteries shall be stored at a pressure of 11.6kPa or less for at least six hours at ambient temperature (20±5℃).
1.2	样品状态 Sample status
	B01-B02：第 1 个循环完全充电状态。 B01-B02: first cycle, fully charged state.
	B03-B04：25 个循环后完全充电状态。 B03-B04: 25th cycle, fully charged state.
1.3	测试结果 Result

样品编号 Sample No.	测试前/Before		测试后/After		质量损失 Mass Loss (%)	剩余电压 Residual OCV (%)	测试结果 Test Result
	质量/Mass (kg)	开路电压/OCV (V)	质量/Mass (kg)	开路电压/OCV (V)			
B01	17.759	13.206	17.756	13.204	0.017%	99.985%	O
B02	17.757	13.205	17.756	13.203	0.006%	99.985%	O
B03	17.758	13.207	17.756	13.205	0.011%	99.985%	O
B04	17.756	13.208	17.755	13.204	0.006%	99.970%	O

注：L-泄漏；V-排气；D-解体；R-破裂；F-起火；O-无泄漏、无排气、无解体、无破裂、无起火。
Note: L-Leakage, V-Venting, D -Disassembly, R -Rupture, F-Fire, O-No leakage, no venting, no disassembly, no rupture & no fire.

附表 2
Appendix 2

测试项目 Test Items	温度试验 Thermal test
1.1	测试步骤 Test procedure
	将测试电池和电池组在温度为 72±2℃的条件下贮存不少于 6 个小时，然后在温度-40±2℃条件下贮存不少于 6 个小时，两个温度间的间隔最长为 30min。重复操作上述步骤 10 次，然后将测试电池和电池组在环境温度为 20±5℃的条件下放置 24 个小时。 Test cells and batteries are to be stored for at least six hours at a test temperature equal to 72±2℃, followed by storage for at least six hours at a test temperature equal to -40±2℃. The maximum time interval between test temperature extremes in 30 minutes. This procedure is to be repeated until 10 total cycles are complete, after which all test cells and batteries are to be stored for 24 hours at ambient temperature (20±5℃).
1.2	样品状态 Sample status
	B01-B02：第 1 个循环完全充电状态。 B01-B02: first cycle, fully charged state.
	B03-B04：25 个循环后完全充电状态。 B03-B04: 25th cycle, fully charged state.
1.3	测试结果 Result

样品编号 Sample No.	测试前/Before		测试后/After		质量损失 Mass Loss (%)	剩余电压 Residual OCV (%)	测试结果 Test Result
	质量/Mass (kg)	开路电压 /OCV (V)	质量/Mass (kg)	开路电压 /OCV (V)			
B01	17.758	13.205	17.753	13.196	0.028%	99.932%	O
B02	17.757	13.206	17.755	13.202	0.011%	99.970%	O
B03	17.756	13.204	17.752	13.197	0.023%	99.947%	O
B04	17.755	13.207	17.751	13.205	0.023%	99.985%	O

注：L-泄漏；V-排气；D-解体；R-破裂；F-起火；O-无泄漏、无排气、无解体、无破裂、无起火。
Note: L-Leakage, V-Venting, D -Disassembly, R -Rupture, F-Fire, O-No leakage, no venting, no disassembly, no rupture & no fire.

附表 3
Appendix 3

测试项目 Test Items	振动 Vibration
1.1	测试步骤 Test procedure
	将电池和电池组牢固地安装在振动台的台面上，同时确保电芯和电池没有变形，以此保证振动有效地传播。振动为正弦波形式，频率从 7Hz 增加至 200Hz，然后再回到 7Hz，持续 15 分钟，此为一个循环。每个电池和电池组需在三个互相垂直的安装方向上循环 12 次振动，且其中一个振动方向必须与端面垂直，整个测试共 3 个小时。 Cells and batteries are firmly secured to the platform of the vibration machine without distorting the cells in such a manner as to faithfully transmit the vibration. The vibration shall be a sinusoidal waveform with a logarithmic sweep between 7 Hz and 200 Hz and back to 7 Hz traversed in 15 minutes. This cycle shall be repeated 12 times for a total of 3 hours for each of three mutually perpendicular mounting positions of the cell. One of the directions of vibration must be perpendicular to the terminal face.
1.2	样品状态 Sample status
	B01-B02：第 1 个循环完全充电状态。 B01-B02: first cycle, fully charged state.
	B03-B04：25 个循环后完全充电状态。 B03-B04: 25th cycle, fully charged state.
1.3	测试结果 Result

样品编号 Sample No.	测试前/Before		测试后/After		质量损失 Mass Loss (%)	剩余电压 Residual OCV (%)	测试结果 Test Result
	质量/Mass (kg)	开路电压 /OCV (V)	质量/Mass (kg)	开路电压 /OCV (V)			
B01	17.757	13.206	17.754	13.202	0.017%	99.970%	O
B02	17.756	13.205	17.752	13.204	0.023%	99.992%	O
B03	17.758	13.208	17.756	13.204	0.011%	99.970%	O
B04	17.756	13.207	17.755	13.205	0.006%	99.985%	O

注：L-泄漏；V-排气；D-解体；R-破裂；F-起火；O-无泄漏、无排气、无解体、无破裂、无起火。
Note: L-Leakage, V-Venting, D -Disassembly, R -Rupture, F-Fire, O-No leakage, no venting, no disassembly, no rupture & no fire.

附表 4
Appendix 4

测试项目 Test Items	冲击 Shock
1.1	测试步骤 Test procedure
	将测试电池和电池组用坚硬支架紧固在试验装置上，支架支撑着每个试验样品的所有安装面。每个测试电池和电池组须经受最大加速度 150g_n和脉冲持续时间 6 毫秒的半正弦波冲击。每个电池和电池组需在三个互相垂直的正方向经受三次冲击，然后在反方向经受三次冲击，总共 18 次。 Test cells and batteries shall be secured to the testing machine by means of a rigid mount which will support all mounting surfaces of each test battery. Each cell shall be subjected to a half-sine shock of peak acceleration of 150 g_n and pulse duration of 6 milliseconds. Each cell or battery shall be subjected to three shocks in the positive direction and to three shocks in the negative direction in each of three mutually perpendicular mounting positions of the cell or battery for a total of 18 shocks.
1.2	样品状态 Sample status
	B01-B02：第 1 个循环完全充电状态。 B01-B02: first cycle, fully charged state.
	B03-B04：25 个循环后完全充电状态。 B03-B04: 25th cycle, fully charged state.
1.3	测试结果 Result

样品编号 Sample No.	测试前/Before		测试后/After		质量损失 Mass Loss (%)	剩余电压 Residual OCV (%)	测试结果 Test Result
	质量/Mass (kg)	开路电压 /OCV (V)	质量/Mass (kg)	开路电压 /OCV (V)			
B01	17.757	13.206	17.755	13.202	0.011%	99.970%	O
B02	17.756	13.207	17.754	13.204	0.011%	99.977%	O
B03	17.759	13.208	17.755	13.206	0.023%	99.985%	O
B04	17.758	13.205	17.753	13.202	0.028%	99.977%	O

注：L-泄漏；V-排气；D-解体；R-破裂；F-起火；O-无泄漏、无排气、无解体、无破裂、无起火。
Note: L-Leakage, V-Venting, D -Disassembly, R -Rupture, F-Fire, O-No leakage, no venting, no disassembly, no rupture & no fire.

附表 5
Appendix 5

测试项目 Test Items	外部短路 External short circuit		
1.1	测试步骤 Test procedure		
	测试电池和电池组应加热一段必要的时间，使得其外壳温度达到均匀稳定的 57±4℃。这段加热时间的长短取决于电池和电池组的设计尺寸大小，同时这段加热时间应加以评估和记录。若无法评估加热时间，则小型电池和电池组需暴露至少 6 小时。然后，电池或电池组应在 57±4℃条件下经受总外电阻小于 0.1 欧姆的外短路。当小型电池和电池组的外壳温度降到 57±4℃后应继续维持外短路状态至少 1 个小时。短路和降温阶段的温度应至少相当于环境温度。 The cell or battery to be tested shall be heated for a period of time necessary to reach a homogeneous stabilized temperature of 57±4℃, measured on the external case. This period of time depends on the size and design of the cell or battery and should be assessed and documented. If this assessment is not feasible, the exposure time shall be at least 6 hours for small cells and small batteries. Then the cell or battery at 57±4℃ shall be subjected to one short circuit condition with a total external resistance of less than 0.1 ohm. This short circuit condition is continued for at least one hour after the cell or battery external case temperature has returned to 57±4℃. The short circuit and cooling down phase shall be conducted at least at ambient temperature.		
1.2	样品状态 Sample status		
	B01-B02：第 1 个循环完全充电状态。 B01-B02: first cycle, fully charged state.		
	B03-B04：25 个循环后完全充电状态。 B03-B04: 25th cycle, fully charged state.		
1.3	测试结果 Result		
样品编号 Sample No.	外电路总阻值（mΩ） Total External Resistance	样品表面最高温度(℃) Max. External Temperature	测试结果 Test Result
B01	87.45	58.72	O
B02	88.67	60.34	O
B03	85.47	59.27	O
B04	87.84	59.66	O
注： D- 解体；R- 破裂；F - 起火；O- 无泄漏、无排气、无解体、无破裂、无起火。 Note: D -Disassembly, R -Rupture, F-Fire, O-No leakage, no venting, no disassembly, no rupture & no fire.			

附表 6
Appendix 6

测试项目 Test Items	挤压 Crush
1.1	测试步骤 Test procedure
	将未进行其他检测试验的电芯或组成电池的电芯放在两个平面之间挤压，挤压力度逐渐加大，在第一个接触点上的速度大约为 1.5cm/s。挤压持续进行，直到出现以下三种情况之一： （1）挤压力达到 13 kN±0.78 kN； （2）电池电压下降了至少 100mV； （3）电池厚度和最初比较，变形 50%或以上。 对棱柱或袋形电池，应对最宽面进行挤压；对钮扣电池应对平面进行挤压；对圆柱形电池，应在纵轴的垂直方向进行挤压。试验结束后应继续观察 6h。 A cell or component cell is to be crushed between two flat surfaces. The crushing is to be gradual with a speed of approximately 1.5 cm/s at the first point of contact. The crushing is to be continued until the first of the three options below is reached. (a) The applied force reaches 13 kN ± 0.78 kN; (b) The voltage of the cell drops by at least 100 mV; or (c) The cell is deformed by 50% or more of its original thickness. A prismatic or pouch cell shall be crushed by applying the force to the widest side. A button/coin cell shall be crushed by applying the force on its flat surfaces. For cylindrical cells, the crush force shall be applied perpendicular to the longitudinal axis. The test sample shall be observed for a further 6h.
1.2	样品状态 Sample status
	C01-C05：第 1 个循环后 50%的额定容量。 C01-C05: first cycle, 50% charged state.
	C06-C10：25 个循环后 50%的额定容量。 C06-C10: 25th cycle, 50% charged state.
1.3	测试结果 Result

样品编号 Sample No.	样品表面最高温度(℃) Max. External Temperature	测试结果 Test Result	样品编号 Sample No.	样品表面最高温度(℃) Max. External Temperature	测试结果 Test Result
C01	26.30	O	C06	25.60	O
C02	26.00	O	C07	25.80	O
C03	25.90	O	C08	26.40	O
C04	26.40	O	C09	25.80	O
C05	25.50	O	C10	25.70	O

注： D- 解体；R- 破裂；F - 起火；O- 无泄漏、无排气、无解体、无破裂、无起火。
Note: D -Disassembly, R -Rupture, F-Fire, O-No leakage, no venting, no disassembly, no rupture & no fire.

附表 7
Appendix 7

<table>
<tr><td>测试项目
Test Items</td><td colspan="3">强制放电
Forced discharge</td></tr>
<tr><td rowspan="2">1.1</td><td colspan="3">测试步骤
Test procedure</td></tr>
<tr><td colspan="3">在 20±5℃的环境温度下，将单个电池连接在 12V 的直流电源上进行强制放电，此直流电源提供每个电池初始电流为制造厂指定的最大放电电流，放电时间（h）为额定容量除以初始电流（A）。
Each cell shall be forced discharged at ambient temperature by connecting it in series with a 12V D. C, power supply at an initial current equal to the maximum discharge current specified the manufacturer . The specified discharge current is to be obtained by connecting a resistive load of the appropriate size and rating in series with the test cell. Each cell shall be forced discharged for a time interval(in hours) equal to its rated capacity divided by the initial test current(in ampere).</td></tr>
<tr><td rowspan="3">1.2</td><td colspan="3">样品状态
Sample status</td></tr>
<tr><td colspan="3">C11-C20：第 1 个循环完全放电状态。
C11-C20: first cycle, fully discharged state.</td></tr>
<tr><td colspan="3">C21-C30：25 个循环后完全放电状态。
C21-C30: 25th cycle, fully discharged state.</td></tr>
<tr><td>1.3</td><td colspan="3">测试结果
Result</td></tr>
<tr><td>样品编号
Sample No.</td><td>测试结果
Test Result</td><td>样品编号
Sample No.</td><td>测试结果
Test Result</td></tr>
<tr><td>C11</td><td>O</td><td>C21</td><td>O</td></tr>
<tr><td>C12</td><td>O</td><td>C22</td><td>O</td></tr>
<tr><td>C13</td><td>O</td><td>C23</td><td>O</td></tr>
<tr><td>C14</td><td>O</td><td>C24</td><td>O</td></tr>
<tr><td>C15</td><td>O</td><td>C25</td><td>O</td></tr>
<tr><td>C16</td><td>O</td><td>C26</td><td>O</td></tr>
<tr><td>C17</td><td>O</td><td>C27</td><td>O</td></tr>
<tr><td>C18</td><td>O</td><td>C28</td><td>O</td></tr>
<tr><td>C19</td><td>O</td><td>C29</td><td>O</td></tr>
<tr><td>C20</td><td>O</td><td>C30</td><td>O</td></tr>
<tr><td colspan="4">注：D-解体；F -起火；O-无解体、无起火。
Note: D -Disassembly, F-Fire, O-No disassembly, no fire.</td></tr>
</table>

测试摘要
TEST SUMMARY

电池生产商信息/Manufacturer information			
电池生产商 Manufacturer	安徽利维能动力电池有限公司 EVPS Anhui Power Battery Co., Ltd.		
生产商地址 Address	安徽省滁州市南谯区元山路 60 号 NO. 60, Yuanshan Road, Chuzhou, Anhui.		
联系电话 Tell	86-13771878232	电子邮箱 E-mail	/
网站地址 Website	/		
电池信息/Battery information			
电池类型 Type	锂电池 Lithium Battery	型号 Model	Uhome-LFP 10kWh/LV
额定容量 Rate Capacity	200Ah	电池质量 Mass	/
物理形状说明 Physical description	灰色+黑色方形 Grey+Black Cube		
测试机构信息/Test laboratory information			
测试机构 test laboratory	山东高质新能源检测有限公司 Shandong High Quality New Energy Testing Co., Ltd.		
机构地址 Address	山东省枣庄高新区复元三路 Fuyuan 3rd Road, High-tech District, Zaozhuang, Shandong, P. R. China.		
联系电话 Telephone	86-0632-8637868	电子邮箱 E-mail	gjldzjzx@163.com
网站地址 Website	www.guojialidianjiance.com		
测试报告信息/Test report information			
报告编号/Test report ID	**UNWT(2021)06014**		
接样日期 Receiving date	2021.06.11	测试日期 Test date	2021.06.11-2021.06.27
测试人员 Tester	王威、杨尚官 Wang Wei/ Yang Shangguan	批准人员 Approver	鞠群 Ju Qun

测试项目及结论/Test item and result			
T1.高度模拟 Altitude simulation	通过/Pass	T2.温度试验 Thermal test	通过/Pass
T3.振动 Vibration	通过/Pass	T4.冲击 Shock	通过/Pass
T5.外部短路 External short circuit	通过/Pass	T6.挤压 Crush	通过/Pass
T8.强制放电 Forced discharge	通过/Pass	过度充电保护功能验证 Verified the protection of overcharge	通过/Pass
短路保护功能验证 Verified the protection of	通过/Pass	电池组之间过度放电保护功能验证 Verified the protection of over discharge	通过/Pass

结论/Result：

样品满足联合国《关于危险货物运输的建议书—试验与标准手册》第 6 修订版修正 1 第 38.3 节的测试要求。

The sample meets the requirement of UNITED NATION Recommendation on the Transport of Dangerous Goods，Manual of Test and Criteria AT/SG/AC.10/11/Rev.6, amend1, section 38.3.

—报告结束(End of Report)—

ZERTIFIKAT ◆ CERTIFICATE ◆ 認證證書 ◆ СЕРТИФИКАТ ◆ CERTIFICADO ◆ CERTIFICAT

Product Service

Attestation of Conformity

No. T8A 102470 0008 Rev. 00

Holder of Certificate: **AOBO ENVIRONMENTAL NEW ENERGY (WUXI) CO., LTD.**
(INDUSTRIAL CONCENTRATION ZONE)
SUMIAO VILLAGE, QIANQIAO STREET, HUISHAN DISTRICT
214151 WUXI CITY, JIANGSU PROVINCE
PEOPLE'S REPUBLIC OF CHINA

Product: **Batteries (Battery System)**

This Attestation of Conformity is issued on a voluntary basis in support of the Conformity Assessment Module A of Radio Equipment Directive 2014/53/EU. On the basis of the referenced test reports, the samples of the listed product were found to comply with the essential requirements of the above mentioned directive as implemented in the standards used valid at the time the tests were carried out. For the requirements of the Article(s) 3(2) and 3(3) only harmonized standards valid at the moment of issuing where used. The used standards completely cover all essential requirements of the Radio Equipment Directive applicable to this product. The manufacturer must ensure compliance of the manufactured products with the technical documentation and other requirements of the Radio Equipment Directive that apply to them. National legal requirements have to be considered before bringing the product to the market. See also notes overleaf.

Test report no.: 64771193062801

Date, 2020-01-15 (Tony Liu)

After preparation of the necessary documentation and establishing compliance to requirements of all applicable directives the manufacturer may sign a Declaration of Conformity and apply the CE-marking.

Attestation of Conformity

No. T8A 102470 0008 Rev. 00

Model(s): 5.8kWh/LV

Parameters:

Norminal voltage: 48Vd.c.
Rated capacity: 120Ah
Norminal current: 57A
Protective class: I
Test report No.:
64.771.19.30628.01R
(EN 300 328 V2.1.1:2016, EN 62311:2008)
64.771.19.30628.01E
(Draft EN 301 489-1 V2.2.0:2017,
Draft EN 301 489-17 V3.2.0:2017,
EN 61000-6-3:2007/A1:2011, EN IEC 61000-6-1:2019)
64.290.19.30626.01 (IEC 62040-1:2017, IEC 62619:2017)

Tested according to:

EN 300 328 V2.1.1:2016
EN 62311:2008
Draft EN 301 489-1 V2.2.0:2017
Draft EN 301 489-17 V3.2.0:2017
EN 61000-6-3:2007/A1:2011
EN IEC 61000-6-1:2019
IEC 62040-1:2017
IEC 62619:2017

After preparation of the necessary documentation and establishing compliance to requirements of all applicable directives the manufacturer may sign a Declaration of Conformity and apply the CE-marking.

TÜV SÜD Product Service GmbH • Certification Body • Ridlerstraße 65 • 80339 Munich • Germany

ZERTIFIKAT ◆ CERTIFICATE ◆ 認證證書 ◆ СЕРТИФИКАТ ◆ CERTIFICADO ◆ CERTIFICAT
A4 / 07.17

ZERTIFIKAT ◆ CERTIFICATE ◆ 認證證書 ◆ СЕРТИФИКАТ ◆ CERTIFICADO ◆ CERTIFICAT

Product Service

CERTIFICATE

No. B 102470 0007 Rev. 00

Holder of Certificate: **AOBO ENVIRONMENTAL NEW ENERGY (WUXI) CO., LTD.**
(INDUSTRIAL CONCENTRATION ZONE)
SUMIAO VILLAGE, QIANQIAO STREET, HUISHAN DISTRICT
214151 WUXI CITY, JIANGSU PROVINCE
PEOPLE'S REPUBLIC OF CHINA

Production Facility(ies): 102470

Certification Mark:

Product: **Batteries (Battery System)**

Model(s): **5.8kWh/LV**

Parameters:

Nominal voltage:	48Vd.c.
Rated capacity:	120Ah
Nominal current:	57A
Operation temperature range:	0°C to 45°C
Protective class:	I
Ingress class:	IP65

Tested according to: IEC 62040-1:2017
IEC 62619:2017

The product was tested on a voluntary basis and complies with the essential requirements. The certification mark shown above can be affixed on the product. It is not permitted to alter the certification mark in any way. In addition the certification holder must not transfer the certificate to third parties. See also notes overleaf.

Test report no.: 64290193062601
Valid until: 2024-12-09

Date, 2019-12-10 (Billy Qiu)

TÜV SÜD Product Service GmbH • Certification Body • Ridlerstraße 65 • 80339 Munich • Germany

A4 / 07.17

CERTIFICATE

TÜV NORD CERT GmbH
herewith declares that

Suzhou Akcome Optronics Science & Technology Co., Ltd.
Jintang Rd, Zhangjiagang Economic Development Zone
Zhangjiagang City, Jiangsu Province, 215618
P.R. China

is authorized to provide the product mentioned below with the mark as illustrated:

Description of product (details see Annex 2):

Crystalline Silicon Terrestrial Photovoltaic (PV) Modules

Valid from: 2022-11-04
Valid until: 2026-07-26

Certification program:	P12-VA-01 Rev. 17 09.20
Certification fundamental(s):	IEC / EN 61215-1:2016; IEC / EN 61215-1-1:2016; IEC 61215-2:2016 / EN 61215-2:2017 + AC:2017 + AC:2018; IEC 61730-1:2016 / EN IEC 61730-1:2018 + AC:2018; IEC 61730-2:2016 / EN IEC 61730-2:2018 + AC:2018.
Registered No.:	44 780 21 406749 - 091R8A2M14
Manufacturer:	see Annex 1
Test Report No.:	492011690.015_R2
File No.:	PVP03021/22P-02

TÜV NORD CERT GmbH
Certification Body
Consumer Products

Essen, 2022-11-04

Please also pay attention to the information stated overleaf.

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Manufacturer:

Manufacturer 1:	**Suzhou Akcome Optronics Science & Technology Co., Ltd.** Jintang Rd, Zhangjiagang Economic Development Zone Zhangjiagang City, Jiangsu Province, 215618, P.R. China
Factory inspection report no.:	862010243.009
Manufacturer 2:	**Zhejiang Akcome Optronics Science&Technology Co., Ltd.** Zheneng Science and Technology Industrial Park, Meishan Town Changxing, Huzhou City, Zhejiang, P.R.China
Factory inspection report no.:	862010481.004
Manufacturer 3:	**Ganzhou Akcome Optronics Science & Technology Co., Ltd.** Jingba Industrial Zone, Jingba Town, Nankang District Ganzhou City, Jiangxi Province, 341408, P.R. China
Factory inspection report no.:	862010369.004
Manufacturer 4:	**Zhejiang Runhai New Energy Co., Ltd.** High-tech Industrial Park, Dinghai District, Zhoushan City, Zhejiang, P.R.China
Factory inspection report no.:	862010654.001

Remark:
Factory inspection is mandatory to be performed annually. Please refer to factory inspection report for detailed information.

TÜV NORD CERT GmbH
Certification Body
Consumer Products

Description of product(s):

Module types:	**Double glass PV Modules with half-cut 6" Bifacial Mono Solar Cells:** 144 cells: SK6612MDGDC-xxx (xxx = 400-425, in increment of 5) 120 cells: SK6610MDGDC-xxx (xxx = 340-350, in increment of 5) 144 cells: SK8612MDGDC-xxx (xxx = 425-475, in increment of 5) 120 cells: SK8610MDGDC-xxx (xxx = 355-395, in increment of 5)
Maximum system voltage:	1500V
Fuse rating:	20A
Electrical protection class:	Class II
Pollution degree:	1
Material group:	I
Design load (positive / negative):	3600Pa / 1600Pa or 1600Pa / 1600Pa
Safety factors:	1.5
Fire safety class:	Class A according to ANSI/UL 1703-2018 (as per ANSI/UL 790-2018)

Module types:	**Double glass PV Modules with half-cut 7" Bifacial Mono Solar Cells:** 144 cells: SK9612MDGDC-xxx (xxx = 520-560, in increment of 5) 132 cells: SK9611MDGDC-xxx (xxx = 475-510, in increment of 5) 120 cells: SK9610MDGDC-xxx (xxx = 435-465, in increment of 5) 108 cells: SK9609MDGDC-xxx (xxx = 390-420, in increment of 5)
Maximum system voltage:	1500V
Fuse rating:	30A
Electrical protection class:	Class II
Pollution degree:	1
Material group:	I
Design load (positive / negative):	3600Pa / 1600Pa
Safety factors:	1.5
Fire safety class:	Class A or C according to ANSI/UL 1703-2018 (as per ANSI/UL 790-2018)

TÜV NORD CERT GmbH
Certification Body
Consumer Products

Module types:	**Double glass PV Modules with half-cut 8" Bifacial Mono Solar Cells:** 132 cells: SKA611MDGDC-xxx (xxx = 635-675, in increment of 5) 120 cells: SKA610MDGDC-xxx (xxx = 580-610, in increment of 5) 110 cells: SKA511MDGDC-xxx (xxx = 525-560, in increment of 5)
Maximum system voltage:	1500V
Fuse rating:	30A
Electrical protection class:	Class II
Pollution degree:	1
Material group:	I
Design load (positive / negative):	3600Pa / 1600Pa
Safety factors:	1.5
Fire safety class:	Class A or C according to ANSI/UL 1703-2018 (as per ANSI/UL 790-2018)

Module types:	**Double glass PV Modules with half-cut 6" n-type heterojunction Bifacial Mono Solar Cells:** 144 cells: SK6612HDGDC-xxx (xxx = 415-440, in increment of 5) 132 cells: SK6611HDGDC-xxx (xxx = 380-400, in increment of 5) 120 cells: SK6610HDGDC-xxx (xxx = 350-365, in increment of 5) 144 cells: SK8612HDGDC-xxx (xxx = 450-490, in increment of 5) 132 cells: SK8611HDGDC-xxx (xxx = 410-450, in increment of 5) 120 cells: SK8610HDGDC-xxx (xxx = 375-405, in increment of 5)
Maximum system voltage:	1500V
Fuse rating:	20A
Electrical protection class:	Class II
Pollution degree:	1
Material group:	I
Design load (positive / negative):	3600Pa / 1600Pa or 1600Pa / 1600Pa
Safety factors:	1.5
Fire safety class:	Class A according to ANSI/UL 1703-2018 (as per ANSI/UL 790-2018)

TÜV NORD CERT GmbH
Certification Body
Consumer Products

Module types:	**Double glass PV Modules with half-cut 8" n-type heterojunction Bifacial Mono Solar Cells:** 132 cells: SKA611HDGDC-xxx (xxx = 625-700, in increment of 5) 120 cells: SKA610HDGDC-xxx (xxx = 585-635, in increment of 5) 110 cells: SKA511HDGDC-xxx (xxx = 540-580, in increment of 5) 100 cells: SKA510HDGDC-xxx (xxx = 490-530, in increment of 5) 80 cells: SKA508HDGDC-xxx (xxx = 390-425, in increment of 5)
Maximum system voltage:	1500V
Fuse rating:	35A
Electrical protection class:	Class II
Pollution degree:	1
Material group:	I
Design load (positive / negative):	3600Pa / 1600Pa
Safety factors:	1.5
Fire safety class:	Class A or C according to ANSI/UL 1703-2018 (as per ANSI/UL 790-2018)

Module types:	**Double glass PV Modules with 1/6-cut Shingled 6" n-type heterojunction Bifacial Mono Solar Cells:** 468 cells: SK6678HDGDS-xxx (xxx =380-395, in increment of 5) 396 cells: SK6666HDGDS-xxx (xxx =320-335, in increment of 5)
Maximum system voltage:	1500V
Fuse rating:	20A
Electrical protection class:	Class II
Pollution degree:	1
Material group:	I
Design load (positive / negative):	3600Pa / 1600Pa
Safety factors:	1.5
Fire safety class:	Class A according to ANSI/UL 1703-2018 (as per ANSI/UL 790-2018)

Remark:
For detailed product information, please refer to CDF (Constructional Data Form) in Annex 1 of test report.

TÜV NORD CERT GmbH
Certification Body
Consumer Products

Verklaring van geen bezwaar

Aanvrager:	**NingBo Deye Inverter Technology Co., Ltd.** No. 26 South YongJiang Road, Daqi, Beilun, NingBo, **China**
Product:	**Fotovoltaïsche en batterij-omvormer**
Model:	**SUN-5K-SG04LP3-EU** **SUN-6K-SG04LP3-EU** **SUN-8K-SG04LP3-EU** **SUN-10K-SG04LP3-EU** **SUN-12K-SG04LP3-EU**

Omvormer voor driefasige parallelle aansluiting op het openbare net. Het netbewakings- en scheidingsapparaat maakt integraal deel uit van bovengenoemd model.

Toepasselijke documenten:

Besluit van de Autoriteit Consument en Markt van 21 april 2016, kenmerk ACM/DE/2016/202151, houdende de vaststelling van de voorwaarden als bedoeld in artikel 31 van de Elektriciteitswet 1998 (Netcode elektriciteit)

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 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
4.13 Vereisten met betrekking tot tolerantie voor één fout van interfacebeveiligingssysteem en interfaceschakelaar

DIN V VDE V 0126-1-1:2006-02 (4.1 Functionele Veiligheid)
Automatisch schakelstation tussen een netparallelle zelfopwekinstallatie en het openbare laagspanningsnet

Verordening (EU) 2016/631 Van De Commissie van 14 april 2016
Tot vaststelling van een netcode betreffende eisen voor de aansluiting van elektriciteitsproducenten op het net.
Typegoedkeuring voor productie-eenheden voor gebruik in installaties van type A en type B.

Op het ogenblik dat dit certificaat wordt afgegeven, beantwoordt het hierboven vermelde representatieve product aan de vermelde regels en normen.

Rapportnummer:	**ASUE-ESH-P22010034**	**Certificatie-programma:**	**NSOP-0032-DEU-ZE-V01**
Certificaatnummer:	**U22-0168**	**Datum:**	**2022-03-30**

Certificatie-instelling

Thomas Lammel

DAkkS Deutsche Akkreditierungsstelle D-ZE-12024-01-00

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

Testlaboratorium geaccrediteerd volgens DIN EN ISO/IEC 17025

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

Annex to the EN 50549-1 certificate of compliance No. U22-0168

Appendix

Extract from test report according to EN 50549-1 **Nr. ASUE-ESH-P22010034**

Type Approval and declaration of compliance with the requirements of EN 50549-1, Commission Regulation (EU) 2016/631 of 14 April 2016 and "Netcode elektriciteit" for Netherlands

Manufacturer / applicant:	NingBo Deye Inverter Technology Co., Ltd. No. 26 South YongJiang Road, Daqi, Beilun, NingBo, China

Micro-generator Type	Photovoltaic and battery inverter			
	SUN-5K-SG04LP3-EU	SUN-6K-SG04LP3-EU	SUN-8K-SG04LP3-EU	SUN-10K-SG04LP3-EU
MPP DC voltage range [V]	200-650	200-650	200-650	200-650
Input DC voltage range [V]	160-800	160-800	160-800	160-800
Input DC current [A]	13+13	13+13	13+13	26+13
Output AC voltage [V]	3L/N/PE 400, 50Hz/60Hz	3L/N/PE 400, 50Hz/60Hz	3L/N/PE 400, 50Hz/60Hz	3L/N/PE 400, 50Hz/60Hz
Output AC current [A]	7,6	9,1	12,1	15,2
Output power [W]	5000	6000	8000	10000
Battery DC voltage range [V]	40-60	40-60	40-60	40-60
Battery charge current [A]	120	150	190	210
Battery discharge current [A]	120	150	190	210

	SUN-12K-SG04LP3-EU	--	--	--
MPP DC voltage range [V]	200-650	--	--	--
Input DC voltage range [V]	160-800	--	--	--
Input DC current [A]	26+13	--	--	--
Output AC voltage [V]	3L/N/PE 400, 50Hz/60Hz	--	--	--
Output AC current [A]	18,2	--	--	--
Output power [W]	12000	--	--	--
Battery DC voltage range [V]	40-60	--	--	--
Battery charge current [A]	240	--	--	--
Battery discharge current [A]	240	--	--	--

Firmware version	Beginning with V1090

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 the inverter bridge and 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.

Note:

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 Commission Regulation (EU) 2016/631 of 14 April 2016. 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.

CE Declaration of Conformity

Manufacturer: Suzhou Akcome Optronics Science & Technology Co., Ltd.

Address: No.110, West Jintang Rd., Economic Development Zone, Zhangjiagang, Jiangsu Province, 215600, P.R. China

Product: Photovoltaic (PV) Module

Brand: AKCOME

Model(s):

SK6612MDGDC-xxx (xxx = 400-425, in increment of 5)

SK6610MDGDC-xxx (xxx = 340-350, in increment of 5)

SK8612MDGDC-xxx (xxx = 425-475, in increment of 5)

SK8610MDGDC-xxx (xxx = 355-395, in increment of 5)

SK9612MDGDC-xxx (xxx = 520-560, in increment of 5)

SK9611MDGDC-xxx (xxx = 475-510, in increment of 5)

SK9610MDGDC-xxx (xxx = 435-465, in increment of 5)

SK9609MDGDC-xxx (xxx = 390-420, in increment of 5)

SKA611MDGDC-xxx (xxx = 635-675, in increment of 5)

SKA610MDGDC-xxx (xxx = 580-610, in increment of 5)

SKA511MDGDC-xxx (xxx = 525-560, in increment of 5)

SK6612HDGDC-xxx (xxx = 415-440, in increment of 5)

SK6611HDGDC-xxx (xxx = 380-400, in increment of 5)

SK6610HDGDC-xxx (xxx = 350-365, in increment of 5)

SK8612HDGDC-xxx (xxx = 450-490, in increment of 5)

SK8611HDGDC-xxx (xxx = 410-450, in increment of 5)

SK8610HDGDC-xxx (xxx = 375-405, in increment of 5)

SKA611HDGDC-xxx (xxx = 645-700, in increment of 5)

SKA610HDGDC-xxx (xxx = 585-635, in increment of 5)

SKA511HDGDC-xxx (xxx = 540-580, in increment of 5)

SKA510HDGDC-xxx (xxx = 490-530, in increment of 5)

SKA508HDGDC-xxx (xxx = 390-425, in increment of 5)

SK6678HDGDS-xxx (xxx =380-395, in increment of 5)

SK6666HDGDS-xxx (xxx =320-335, in increment of 5)

Suzhou Akcome Optronics Science & Technology Co., Ltd. herewith confirms that it's PV modules comply with the requirements set out in the European Union Directive 2014/35/EU (Low Voltage Directive – LVD) for the electrical equipment used in certain voltage limits and 2014/30/EU (Electromagnetic Imission – EMI). For the evaluation of the conformance with these Directives, the following IEC standards were applied:

AKCOME 爱康光电

EN IEC 61730-2:2018; EN IEC 61730-2:2018/AC:2018-06

based on: report 492011690.010_R2 issued by TÜV NORD

Responsible for making this declaration is the manufacturer and/or it's authorized representative within the European Union (Suzhou Akcome Optronics Science & Technology Co., Ltd.).

Signing place: Zhangjiagang, China

Signing Date：Sep 21st 2022

General manager: Tony Hu（胡伟钱）

Seal and signature:

Declaración de conformidad CE

Fabricante: Suzhou Akcome Optronics Science & Technology Co., Ltd.

Dirección: No 110, West Jintang Rd., Economic Development Zone, Zhangjiagang, Jiangsu Province, 215600, P.R. China

Producto: Módulo fotovoltaico (PV)

Marca: AKCOME

Modelo (s):

SK6612MDGDC-xxx (xxx = 400-425, en el paso de 5)

SK6610MDGDC-xxx (xxx = 340-350, en el paso de 5)

SK8612MDGDC-xxx (xxx = 425-475, en el paso de 5)

SK8610MDGDC-xxx (xxx = 355-395, en el paso de 5)

SK9612MDGDC-xxx (xxx = 520-560, en el paso de 5)

SK9611MDGDC-xxx (xxx = 475-510, en el paso de 5)

SK9610MDGDC-xxx (xxx = 435-465, en el paso de 5)

SK9609MDGDC-xxx (xxx = 390-420, en el paso de 5)

SKA611MDGDC-xxx (xxx = 635-675, en el paso de 5)

SKA610MDGDC-xxx (xxx = 580-610, en el paso de 5)

SKA511MDGDC-xxx (xxx = 525-560, en el paso de 5)

SK6612HDGDC-xxx (xxx = 415-440, en el paso de 5)

SK6611HDGDC-xxx (xxx = 380-400, en el paso de 5)

SK6610HDGDC-xxx (xxx = 350-365, en el paso de 5)

SK8612HDGDC-xxx (xxx = 450-490, en el paso de 5)

SK8611HDGDC-xxx (xxx = 410-450, en el paso de 5)

SK8610HDGDC-xxx (xxx = 375-405, en el paso de 5)

SKA611HDGDC-xxx (xxx = 645-700, en el paso de 5)

SKA610HDGDC-xxx (xxx = 585-635, en el paso de 5)

SKA511HDGDC-xxx (xxx = 540-580, en el paso de 5)

SKA510HDGDC-xxx (xxx = 490-530, en el paso de 5)

SKA508HDGDC-xxx (xxx = 390-425, en el paso de 5)

SK6678HDGDS-xxx (xxx =380-395, en el paso de 5)

SK6666HDGDS-xxx (xxx =320-335, en el paso de 5)

Suzhou Akcome Optronics Science & Technology Co., Ltd.confirma por la presente que sus módulos fotovoltaicos cumplen con los requisitos establecidos en la Directiva de la Unión Europea 2014/35 / UE (Directiva de bajo voltaje - LVD) para los equipos eléctricos utilizados en ciertos límites de voltaje y 2014/30 / UE (emisión electromagnética - EMI). Para la evaluación de la conformidad con estas Directivas, se aplicaron las siguientes normas IEC:

EN IEC 61730-1:2018; EN IEC 61730-1:2018/AC:2018-06

EN IEC 61730-2:2018; EN IEC 61730-2:2018/AC:2018-06

basado en: informe 492011690.010_R2 emitido por TÜV NORD

El responsable de hacer esta declaración es el fabricante y / o su representante autorizado dentro de la Unión Europea (Suzhou Akcome Optronics Science & Technology Co., Ltd.)

Lugar de firma: Zhangjiagang, China

Fecha de firma : Sep 21st 2022

Gerente general: Tony Hu（胡伟钱）

Sello y firma :

CE Konformitätserklärung

Hersteller: Suzhou Akcome Optronics Science & Technology Co., Ltd.

Adresse: No.110, West Jintang Rd., Economic Development Zone, Zhangjiagang, Jiangsu Province, 215600, P.R. China

Produkt: Photovoltaik (PV) Module

Marke: AKCOME

Modell(e):

SK6612MDGDC-xxx (xxx = 400-425, in Schritten von 5)

SK6610MDGDC-xxx (xxx = 340-350, in Schritten von 5)

SK8612MDGDC-xxx (xxx = 425-475, in Schritten von 5)

SK8610MDGDC-xxx (xxx = 355-395, in Schritten von 5)

SK9612MDGDC-xxx (xxx = 520-560, in Schritten von 5)

SK9611MDGDC-xxx (xxx = 475-510, in Schritten von 5)

SK9610MDGDC-xxx (xxx = 435-465, in Schritten von 5)

SK9609MDGDC-xxx (xxx = 390-420, in Schritten von 5)

SKA611MDGDC-xxx (xxx = 635-675, in Schritten von 5)

SKA610MDGDC-xxx (xxx = 580-610, in Schritten von 5)

SKA511MDGDC-xxx (xxx = 525-560, in Schritten von 5)

SK6612HDGDC-xxx (xxx = 415-440, in Schritten von 5)

SK6611HDGDC-xxx (xxx = 380-400, in Schritten von 5)

SK6610HDGDC-xxx (xxx = 350-365, in Schritten von 5)

SK8612HDGDC-xxx (xxx = 450-490, in Schritten von 5)

SK8611HDGDC-xxx (xxx = 410-450, in Schritten von 5)

SK8610HDGDC-xxx (xxx = 375-405, in Schritten von 5)

SKA611HDGDC-xxx (xxx = 645-700, in Schritten von 5)

SKA610HDGDC-xxx (xxx = 585-635, in Schritten von 5)

SKA511HDGDC-xxx (xxx = 540-580, in Schritten von 5)

SKA510HDGDC-xxx (xxx = 490-530, in Schritten von 5)

SKA508HDGDC-xxx (xxx = 390-425, in Schritten von 5)

SK6678HDGDS-xxx (xxx =380-395, in Schritten von 5)

SK6666HDGDS-xxx (xxx =320-335, in Schritten von 5)

Suzhou Akcome Optronics Science & Technology Co., Ltd. bestätigt hiermit, daß die PV Module den Anforderungen gemäß Direktiven der Europäischen Union 2014/35/EU (Niederspannungsrichtlinie) f ü r elektrische Geräte innerhalb bestimmter Spannungsgrenzen und 2014/30/EU (Elektromagnetische Verträglichkeit) entsprechen. F ür die Evaluierung der Übereinstimmung mit diesen Direktiven wurden die folgenden IEC Standards angewandt:

EN IEC 61730-1:2018; EN IEC 61730-1:2018/AC:2018-06

EN IEC 61730-2:2018; EN IEC 61730-2:2018/AC:2018-06

basiert auf: Bericht 492011690.010_R2 von TÜV Süd NORD

Verantwortlich für die Erklärung ist der Hersteller und/oder die autorisierte Niederlassung innerhalb der Europäischen Union (Suzhou Akcome Optronics Science & Technology Co., Ltd.).

Unterzeichnungsort: Zhangjiagang, China

Unterzeichnungsdatum : Sep 21st 2022

General manager: Tony Hu (胡伟华)

Siegel und Unterschrift:

Deklaracja zgodności CE

Producent: Suzhou Akcome Optronics Science & Technology Co., Ltd.

Adres: No.110, West Jintang Rd., Economic Development Zone, Zhangjiagang, Jiangsu Province, 215600, P.R. China

Produkt: Moduł fotowoltaiczny (PV)

Marka: AKCOME

Model(-e):

SK6612MDGDC-xxx (xxx = 400-425, w krokach po 5)

SK6610MDGDC-xxx (xxx = 340-350, w krokach po 5)

SK8612MDGDC-xxx (xxx = 425-475, w krokach po 5)

SK8610MDGDC-xxx (xxx = 355-395, w krokach po 5)

SK9612MDGDC-xxx (xxx = 520-560, w krokach po 5)

SK9611MDGDC-xxx (xxx = 475-510, w krokach po 5)

SK9610MDGDC-xxx (xxx = 435-465, w krokach po 5)

SK9609MDGDC-xxx (xxx = 390-420, w krokach po 5)

SKA611MDGDC-xxx (xxx = 635-675, w krokach po 5)

SKA610MDGDC-xxx (xxx = 580-610, w krokach po 5)

SKA511MDGDC-xxx (xxx = 525-560, w krokach po 5)

SK6612HDGDC-xxx (xxx = 415-440, w krokach po 5)

SK6611HDGDC-xxx (xxx = 380-400, w krokach po 5)

SK6610HDGDC-xxx (xxx = 350-365, w krokach po 5)

SK8612HDGDC-xxx (xxx = 450-490, w krokach po 5)

SK8611HDGDC-xxx (xxx = 410-450, w krokach po 5)

SK8610HDGDC-xxx (xxx = 375-405, w krokach po 5)

SKA611HDGDC-xxx (xxx = 645-700, w krokach po 5)

SKA610HDGDC-xxx (xxx = 585-635, w krokach po 5)

SKA511HDGDC-xxx (xxx = 540-580, w krokach po 5)

SKA510HDGDC-xxx (xxx = 490-530, w krokach po 5)

SKA508HDGDC-xxx (xxx = 390-425, w krokach po 5)

SK6678HDGDS-xxx (xxx =380-395, w krokach po 5)

SK6666HDGDS-xxx (xxx =320-335, w krokach po 5)

Firma Suzhou Akcome Optronics Science & Technology Co., Ltd. niniejszym potwierdza, że jej moduły fotowoltaiczne spełniają wymagania określone w dyrektywie Unii Europejskiej 2014/35/UE (dyrektywa niskonapięciowa - LVD) dla urządzeń elektrycznych stosowanych w określonych granicach napięcia oraz 2014/30/EU (emisja elektromagnetyczna - EMI). Do oceny zgodności z tymi dyrektywami zastosowano następujące normy IEC:

EN IEC 61730-1:2018; EN IEC 61730-1:2018/AC:2018-06

EN IEC 61730-2:2018; EN IEC 61730-2:2018/AC:2018-06

Na podstawie: Raport 492011690.010_R2 wydany przez TÜV NORD

Za sporządzenie niniejszej deklaracji odpowiedzialny jest producent i/lub jego upoważ niony przedstawiciel w Unii Europejskiej (Suzhou Akcome Optronics Science & Technology Co., Ltd.).

Miejsce podpisywania: Zhangjiagang, China

Data podpisania : Września 21 2022

Główny menadżer: Tony Hu (胡伟伟)

Pieczęć i podpis:

TÜV NORD

Certificate
of conformity with the following European Directives

Registered No.:
44 799 22 406749 - 047

Low-Voltage Directive 2014/35/EU

Date of application	File reference	Test report No.	Date of issue	Place of issue
2022-04-01	PVPM0321022PJ01	4520116992.010_R2	2022-05-10	Essen

This is to certify that the following products comply to the essential requirements of the above mentioned European Directive and the following standards, taking into account the German national deviations:

Product: Crystalline Silicon Terrestrial Photovoltaic (PV) Modules

Type designation: See Annex 1

Applicant: **Suzhou Akcome Optronics Science & Technology Co., Ltd.**
Jintang Rd, Zhangjiagang Economic Development Zone
Zhangjiagang City, Jiangsu Province, 215618, P.R. China

Standard(s): EN IEC 61730-1:2018; EN IEC 61730-1:2018/AC:2018-05
EN IEC 61730-2:2018; EN IEC 61730-2:2018/AC:2018-06

This Certificate of conformity is based on the evaluation of samples of the product. It does not imply an assessment of the production and it does not permit the use of a mark of conformity or of a safety mark of the TÜV NORD CERT GmbH. The holder of this certificate may use this Certificate together with his EC-Declaration of Conformity.

Digitally signed by Roger Maas
Date: 2022.05.10 15:04:11 +08'00'

Certification Body
Specialist Manager Consumer Products

TÜV NORD CERT GmbH
Am TÜV 1
D-45307 Essen
P.O.Box 10 32 61
D-45032 Essen
Fon: +49 (0)201 825-0120
Fax: +49 (0)201 825-5259
Email: product@tuev-nord.de

CE The CE marking may be affixed on the product if all relevant and effective Directives are complied with. CE

TÜV NORD

Anlage 1 zum Zertifikat Nr.: / Annex 1 to Certificate No. 44 780 22 436740 - 047

Seite / Page 1 von / of 2

Aktenzeichen: / File reference: PVPD4021/22P-01

2022-05-10

Description of product(s):

Module types:

Double glass PV Modules with half-cut 6" Bifacial Mono Solar Cells:
144 cells: SK6612MDGDC-xxx (xxx = 400-425, in increment of 5)
120 cells: SK6610MDGDC-xxx (xxx = 340-350, in increment of 5)
144 cells: SK6612MDGDC-xxx (xxx = 425-475, in increment of 5)
120 cells: SK6610MDGDC-xxx (xxx = 355-395, in increment of 5)

Module types:

Double glass PV Modules with half-cut 7" Bifacial Mono Solar Cells:
144 cells: SK9612MDGDC-xxx (xxx = 520-560, in increment of 5)
132 cells: SK9611MDGDC-xxx (xxx = 475-510, in increment of 5)
120 cells: SK9610MDGDC-xxx (xxx = 435-465, in increment of 5)
108 cells: SK9609MDGDC-xxx (xxx = 390-420, in increment of 5)

Module types:

Double glass PV Modules with half-cut 8" Bifacial Mono Solar Cells:
132 cells: SKA611MDGDC-xxx (xxx = 635-675, in increment of 5)
120 cells: SKA610MDGDC-xxx (xxx = 580-610, in increment of 5)
110 cells: SKA511MDGDC-xxx (xxx = 525-560, in increment of 5)

Module types:

Double glass PV Modules with half-cut 6" n-type heterojunction Bifacial Mono Solar Cells:
144 cells: SK6612HDGDC-xxx (xxx = 415-440, in increment of 5)
132 cells: SK6611HDGDC-xxx (xxx = 380-400, in increment of 5)
120 cells: SK6610HDGDC-xxx (xxx = 350-355, in increment of 5)
144 cells: SK6612HDGDC-xxx (xxx = 450-490, in increment of 5)
132 cells: SK6611HDGDC-xxx (xxx = 410-450, in increment of 5)
120 cells: SK6610HDGDC-xxx (xxx = 375-405, in increment of 5)

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TÜV NORD CERT GmbH
Certification Body
Consumer Products

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Anlage 1 zum Zertifikat Nr.: / Annex to Certificate no.: 44 759 22 486769 - 047 Seite / Page 2 von / of 2

Aktenzeichen: / File reference: PVP04821/22P-01 2022-05-10

Module types:	**Double glass PV Modules with half-cut 8" n-type heterojunction Bifacial Mono Solar Cells:** 132 cells: SKA611HDGDC-xxx (xxx = 645-700, in increment of 5) 120 cells: SKA610HDGDC-xxx (xxx = 585-635, in increment of 5) 110 cells: SKA511HDGDC-xxx (xxx = 540-580, in increment of 5) 100 cells: SKA510HDGDC-xxx (xxx = 490-530, in increment of 5) 80 cells: SKA508HDGDC-xxx (xxx = 390-425, in increment of 5)
Module types:	**Double glass PV Modules with 1/6-cut Shingled 6" n-type heterojunction Bifacial Mono Solar Cells:** 468 cells: SK5678HDGDS-xxx (xxx =380-395, in increment of 5) 396 cells: SK5668HDGDS-xxx (xxx =320-335, in increment of 5)

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