# **Sunplus Energy Storage System**



# **Sunplus ESS**

Utilizing smart technology and professional industry knowledge, Sunplus is committed to providing users with integrated, reliable household and commercial energy storage solutions, effectively ensuring users' green electricity consumption and avoiding the impact of rising electricity bills or power outages. We are working tirelessly to build a photovoltaic production, energy storage and charging ecosystem, and continue to develop green energy into an independent energy source that innumberable families can rely on.







10-year Warranty



Accessory kit

## **System Core Strength**



Systematic design,in-depth optimization and sealess connection on both sides.

Remotely fault diagnosis, upgrade and maintenance.





International brand devices, better stability.



Plug & Play for inverters connecting with batteries.

Localized design, the concept originated in Germany.





System full certificates:

Grid Standard, CE, CB, CEI0-21, UL, UN, ROSH, HSF, etc.

Comprehensive technical support and training to help quickly occupy the market.



### **System Parameter Overview**

#### **Inverter: AF-SLSeries**

| Rated Power Range(kW)            | 1-6                   |
|----------------------------------|-----------------------|
| Max.DC Input Voltage(V)          | 550                   |
| Max.DC Input Current(A)          | 18.5/String           |
| AC Output Power Range(kW)        | 1-6                   |
| Normal Grid Voltage(V)           | 220-230               |
| Normal Grid Frequency(Hz)        | 50/60                 |
| Charge/Discharge Power Range(kW) | 1-6                   |
| Max.Charge/Discharge Current(A)  | 80-120                |
| Battery Voltage Range(V)         | 40-60                 |
| Battery Type                     | Li-ion/Lead-acid etc. |
| Enclosure Protect Level          | IP65                  |

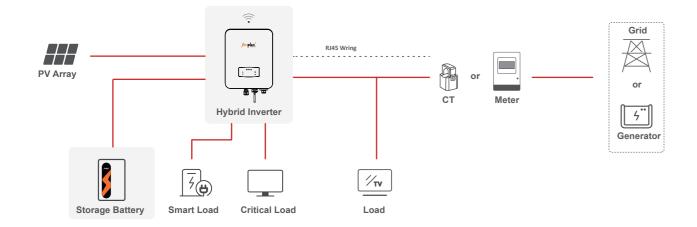
#### Battery: SP-LV5320-W

| Normal Capacity                            | 104Ah/5.32kWh |
|--|---------------|
| Normal Voltage(V)                          | 51.2          |
| Max.Continuous Charge/Discharge Current(A) | 50/100        |
| Communication                              | RS485/CAN     |
| Enclosure Protect Level                    | IP55          |

01 02

# **System Structure**

With a better understanding of the system, you will be able to respond faster when serving customers, and you can more accurately identify your customers' depth requirements.



# System Application Scenarios

# **Individual Battery Connection**

- · Simple, cost-effective
- Ideal for individuals
- Easy to maintain and operate

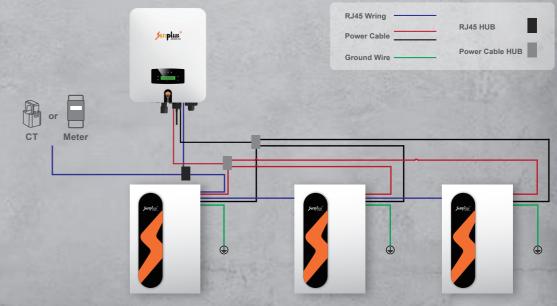


Grounded



# **Multiple Battery Connection**

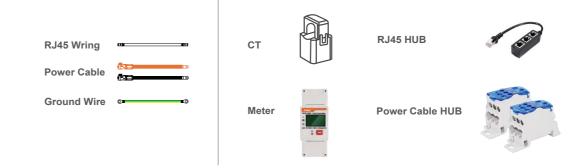
- · High capacity, highly scalable
- Ideal for high energy demands
- Provides more flexible energy management



Wall-Mounted

Whether on the floor or on the wall, Sunplus LV Batteries bring energy freedom to you.

# **Accessory Kit**



# **Single Phase Hybrid Inverter**



for Low Voltage Battery

The Afore AF low voltage Series storage Inverters are designed to increase energy independence for homeowners. The power range is from 1kW to 6kW, compatible with low voltage (40-60V) batteries.

Energy management is based on time-of-use and demand charge rate structures, significantly reduce the amount of energy purchased from the public grid.

Thanks for the UPS function (switch time < 10ms), enables the crucial loads power on during outages. Additionally, under the backup operation mode, the inverter provides you up to 150% peak output overloading.

The AF low voltage Series storage inverters integrated with Arc Fault Circuit Interrupter (AFCI) and Rapid Shutdown.







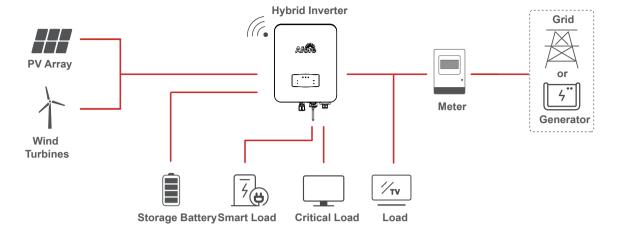






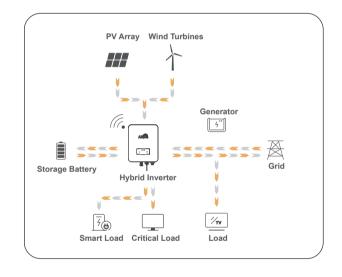
- Support for Time-of-use Optimization
- Configurable Operation Modes
- Arc Fault Circuit Interrupter (AFCI)
- Build in Anti-feed-in Function
- Compact Size and Easy Installation
- Smart Monitoring & Remote Firmware Upgrade

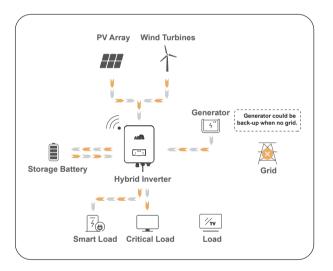
#### For New Storage System:



#### **Optimizing Self-Consumption (on-grid)**

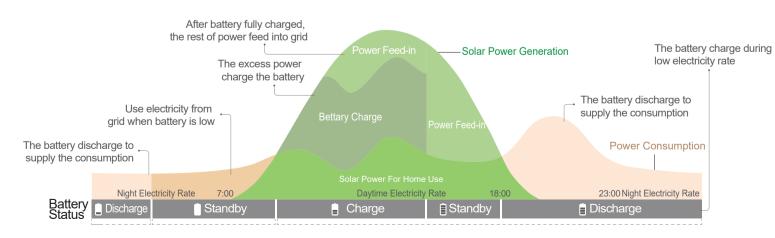
#### Emergency Power Supply(off-grid)





#### **Optimizing Self-Consumption Mode**

With home energy storage installed, home owners may also be able to change from a flat rate electricity tariff to a time-of-use tariff. For the areas and regions, where peak shaving can be applied.



| PV Input   | AF1K-SL-1       | AF1.5K-SL-1      | AF2K-SL-1           | AF2.5K-SL-1         | AF3K-SL-1    | AF3.6K-SL-  |
|--|-----------------|------------------|---------------------|---------------------|--------------|-------------|
| Max. Input Power (kW)  | 1.5             | 2.3              | 3.0                 | 3.8                 | 4.5          | 5.4         |
| Max. PV Voltage (V)  |                 |                  | 55                  | 50                  |              |             |
| MPPT Range (V)   |                 |                  | 80 -                | 500                 |              |             |
| Full MPPT Range (V)  | 80 - 500        | 90 - 500         | 120 - 500           | 150 - 500           | 170 - 500    | 210 - 500   |
| Normal Voltage (V)   |                 |                  | 36                  | 80                  |              |             |
| Startup Voltage (V)  |                 |                  | 10                  | 00                  |              |             |
| Max. Input Current (A)   |                 |                  | 18.5                | 5 x 1               |              |             |
| Max. Short Current (A)   |                 |                  | 26                  | x 1                 |              |             |
| No. of MPP Tracker / No. of PV String  |                 |                  | 1 /                 | <b>'</b> 1          |              |             |
| Battery Port   |                 |                  |                     |                     |              |             |
| Max. Charge/Discharge Power (kW)   | 1.0             | 1.5              | 2.0                 | 2.5                 | 3.0          | 3.6         |
| Max. Charge/Discharge Current (A)  | 25              | 40               | 50                  | 63                  | 80           | 80          |
| Battery Normal Voltage (V)   |                 |                  | 51                  |                     |              |             |
| Battery Voltage Range (V)  |                 |                  | 40 -                |                     |              |             |
| Battery Type   |                 |                  | Li-ion / Lea        |                     |              |             |
| AC Grid  |                 |                  | LI-IUII / Lea       | u-aciu eic.         |              |             |
| Max Continuous Current (A)   | 5.0             | 7.0              | 10.0                | 12.0                | 14.0         | 17.0        |
| ` ,  |                 |                  |                     |                     |              |             |
| Max Continuous Power (kVA)   | 1.0             | 1.5              | 2.0                 | 2.5                 | 3.0          | 3.6         |
| Nominal Grid Current(A)  | 4.6 / 4.4       | 6.9 / 6.6        | 9.1 / 8.7           | 11.4 / 10.9         | 13.7 / 13.1  | 16.4 / 15.7 |
| Nominal Grid Voltage (V)   |                 | 1:               | 98 to 242 @ 220 /   |                     | 30           |             |
| Nominal Grid Frequency (Hz)  |                 |                  | 50 /                |                     |              |             |
| Power Factor   |                 | 0.999 (Adju      | stable from 0.8 ove | erexcited to 0.8 ur | nderexcited) |             |
| Current THD (%)  |                 |                  | <                   |                     |              |             |
| AC Load Output   | AF1K-SL-1       | AF1.5K-SL-1      | AF2K-SL-1           | AF2.5K-SL-1         | AF3K-SL-1    | AF3.6K-SL-  |
| Max Continuous Current (A)   | 5.0             | 7.0              | 10.0                | 12.0                | 14.0         | 17.0        |
| Max Continuous Power (kVA)   | 1.0             | 1.5              | 2.0                 | 2.5                 | 3.0          | 3.6         |
| Max Peak Current (A) (10min)   | 6.9 / 6.6       | 10.5 / 10.0      | 13.7 / 13.1         | 17.3 / 16.6         | 20.5 / 19.6  | 24.6 / 23.5 |
| Max Peak Power (kVA) (10min)   | 1.5             | 2.3              | 3.0                 | 3.8                 | 4.5          | 5.4         |
| Nominal AC Current (A)   | 4.6 / 4.4       | 6.9 / 6.6        | 9.1 / 8.7           | 11.4 / 10.9         | 13.7 / 13.1  | 16.4 / 15.7 |
| Nominal AC Voltage L-N (V)   |                 |                  | 220 /               | 230                 |              |             |
| Nominal AC Frequency (Hz)  | 50 / 60         |                  |                     |                     |              |             |
| Switching Time (s)   |                 |                  | Seam                | nless               |              |             |
| Voltage THD (%)  |                 |                  | <                   | 3                   |              |             |
| Efficiency   |                 |                  |                     |                     |              |             |
| CEC Efficiency (%)   |                 |                  | 97                  | .0                  |              |             |
| Max. Efficiency (%)  |                 |                  | 97                  | .6                  |              |             |
| PV to Bat. Efficiency (%)  | 97.6<br>98.1    |                  |                     |                     |              |             |
| Bat. between AC Efficiency (%)   |                 |                  | 96                  |                     |              |             |
| Protection   | VETR'SI'T       | AE1 5K_SL_1      | AF2K-SL-1           |                     | VE3K-SI-1    | VE3 CK-CI   |
| PV Reverse Polarity Protection   | AI IN-SE-I      | AI I.SK-SE-I     | Ye                  |                     | AI SIX-SE-I  | AI 3.0K-3L- |
| Over Current/Voltage Protection  |                 |                  |                     |                     |              |             |
| , and the second | Yes<br>Yes      |                  |                     |                     |              |             |
| Anti-Islanding Protection  |                 |                  |                     |                     |              |             |
| AC Short Circuit Protection  | Yes             |                  |                     |                     |              |             |
| Residual Current Detection   | Yes             |                  |                     |                     |              |             |
| Ground Fault Monitoring  | Yes             |                  |                     |                     |              |             |
| Insulation Resister Detection  | Yes             |                  |                     |                     |              |             |
| PV Arc Detection   | Yes             |                  |                     |                     |              |             |
| Enclosure Protect Level  | A E 414 OL -    | A E 4 E 14 OL -1 | IP65 / N            |                     | A FOLGOL of  | A E O OLGO  |
| General Data   | AF1K-SL-1       | AF1.5K-SL-1      |                     |                     | AF3K-SL-1    | AF3.6K-SL-  |
| Dimensions (L x W x H, mm)   |                 |                  | 513 x 37            |                     |              |             |
| Weight (kg)  |                 |                  | 1                   | 7                   |              |             |
| Topology   |                 |                  | Transfor            |                     |              |             |
| Cooling  | Intelligent Fan |                  |                     |                     |              |             |
| Relatively Humidity  | 0 - 100 %       |                  |                     |                     |              |             |
| Operating Temperature Range (°C)   | - 25 to 60      |                  |                     |                     |              |             |
| Operating Altitude (m)   | < 4000          |                  |                     |                     |              |             |
| Noise Emission (dB)  | < 25            |                  |                     |                     |              |             |
| Standby Consumption (W)  | < 10            |                  |                     |                     |              |             |
| Mounting   | Wall Bracket    |                  |                     |                     |              |             |
| Communication with RSD   | SUNSPEC         |                  |                     |                     |              |             |
|  |                 |                  |                     |                     |              |             |
| Display & Communication Interfaces   |                 | L C              | D, LLD. NO400. (7   |                     |              |             |

| PV Input   | AF3K-SL      | AF3.6K-SL         | AF4K-SL         | AF4.6K-SL                    | AF5K-SL         | AF5.5K-SL        | AF6K-SL       |
|--|--------------|-------------------|-----------------|------------------------------|-----------------|------------------|---------------|
| Max. Input Power (kW)                                    | 4.5          | 5.4               | 6.0             | 6.9                          | 7.5             | 8.3              | 9.0           |
| Max. PV Voltage (V)                                      |              |                   |                 | 550                          |                 |                  |               |
| MPPT Range (V)   |              |                   |                 | 80 - 500                     |                 |                  |               |
| Full MPPT Range (V)                                      | 90 - 500     | 110 - 500         | 120 - 500       | 130 - 500                    | 150 - 500       | 160 - 500        | 170 - 500     |
| Normal Voltage (V)                                       |              |                   |                 | 360                          |                 |                  |               |
| Startup Voltage (V)                                      |              |                   |                 | 100                          |                 |                  |               |
| Max. Input Current (A)                                   |              |                   |                 | 18.5 x 2                     |                 |                  |               |
| Max. Short Current (A)                                   |              |                   |                 | 26 x 2                       |                 |                  |               |
| No. of MPP Tracker / No. of PV Strin                     | a            |                   |                 | 2/2                          |                 |                  |               |
| Battery Port   | 9            |                   |                 | 272                          |                 |                  |               |
| Max. Charge/Discharge Power (kW)                         | 3.0          | 3.6               | 4.0             | 4.6                          | 4.8             | 4.8              | 4.8           |
| Max. Charge/Discharge Current (A)                        |              |                   |                 | 80                           |                 |                  |               |
| Battery Normal Voltage (V)                               |              |                   |                 | 51.2                         |                 |                  |               |
| Battery Voltage Range (V)                                |              |                   |                 | 40 - 60                      |                 |                  |               |
| Battery Type   |              |                   | li i            | on / Lead-acid e             | to              |                  |               |
| AC Grid  |              |                   | LI-I            | on / Leau-aciu e             | ic.             |                  |               |
| Max Continuous Current (A)                               | 14.0         | 17.0              | 19.0            | 22.0                         | 23.0            | 26.0             | 28.0          |
| Max Continuous Power (kVA)                               | 3.0          | 3.6               | 4.0             | 4.6                          | 5.0             | 5.5              | 6.0           |
| Nominal Grid Current(A)                                  | 13.7 / 13.1  | 16.4 / 15.7       | 18.2 / 17.4     | 21.0 / 20.0                  | 22.8 / 21.8     | 25.0 / 24.0      | 27.3 / 26.1   |
| Nominal Grid Voltage (V)                                 | 10.7 / 10.1  | 10.4 / 10.7       |                 |                              |                 | 20.0 / 24.0      | 21.3720.1     |
| Nominal Grid Frequency (Hz)                              |              |                   | 190 (0 242      | @ 220 / 207 to 50 / 60       | 200 (1) 200     |                  |               |
| Power Factor   |              | 0.000             | Adjustable from | n 0.8 overexcited            | to 0 0 undo-    | avoited)         |               |
| Current THD (%)  |              | 0.999 (           | Aujustable Iror | n u.8 overexcited<br>< 3     | i to o.o undere | excited)         |               |
| AC Load Output   | AF3K-SL      | AF3.6K-SL         | AF4K-SL         | AF4.6K-SL                    | AF5K-SL         | AF5.5K-SL        | AF6K-SL       |
| Max Continuous Current (A)                               | 14.0         | 17.0              | 19.0            | 22.0                         | 23.0            | 26.0             | 28.0          |
| Max Continuous Power (kVA)                               |              |                   |                 |                              |                 |                  |               |
| ` '  | 3.0          | 3.6               | 4.0             | 4.6                          | 5.0             | 5.5              | 6.0           |
| Max Peak Current (A) (10min)                             | 20.5 / 19.6  | 24.6 / 23.5       | 27.3 / 26.1     | 31.4 / 30                    | 34.1 / 32.7     | 37.8 / 36.1      | 41.0 / 39.2   |
| Max Peak Power (kVA) (10min)                             | 4.5          | 5.4               | 6.0             | 6.9                          | 7.5             | 8.3              | 9.0           |
| Nominal AC Current (A)                                   | 13.7 / 13.1  | 16.4 / 15.7       | 18.2 / 17.4     | 21.0 / 20.0                  | 22.8 / 21.8     | 25.0 / 24.0      | 27.3 / 26.1   |
| Nominal AC Voltage L-N (V)                               |              |                   |                 | 220 / 230                    |                 |                  |               |
| Nominal AC Frequency (Hz)                                |              |                   |                 | 50 / 60                      |                 |                  |               |
| Switching Time (s)                                       |              |                   |                 | Seamless                     |                 |                  |               |
| Voltage THD (%)  |              |                   |                 | < 3                          |                 |                  |               |
| Efficiency   |              |                   |                 | 07.0                         |                 |                  |               |
| CEC Efficiency (%)                                       |              |                   |                 | 97.0<br>97.6                 |                 |                  |               |
| Max. Efficiency (%)                                      |              |                   |                 | 98.1                         |                 |                  |               |
| PV to Bat. Efficiency (%)                                |              |                   |                 |                              |                 |                  |               |
| Bat. between AC Efficiency (%)                           | A FOIC OI    | A EQ CK CL        | A E AIX OL      | 96.8                         | AFEK OL         | A ECK OL         | A FOX OL      |
| Protection   | AF3K-SL      | AF3.6K-SL         | AF4K-SL         | AF4.6K-SL                    | AF5K-SL         | AF6K-SL          | AF6K-SL       |
| PV Reverse Polarity Protection                           |              |                   |                 | Yes                          |                 |                  |               |
| Over Current/Voltage Protection                          |              |                   |                 | Yes                          |                 |                  |               |
| Anti-Islanding Protection                                |              |                   |                 | Yes                          |                 |                  |               |
| AC Short Circuit Protection                              |              |                   |                 | Yes                          |                 |                  |               |
| Residual Current Detection                               |              |                   |                 | Yes                          |                 |                  |               |
| Ground Fault Monitoring                                  |              |                   |                 | Yes                          |                 |                  |               |
| Insulation Resister Detection                            |              |                   |                 | Yes                          |                 |                  |               |
| PV Arc Detection Enclosure Protect Level                 |              |                   |                 | Yes<br>IP65 / NEMA4X         |                 |                  |               |
|  | AF3K-SL      | AF3.6K-SL         |                 | AF4.6K-SL                    | AF5K-SL         | AF6K-SL          | AF6K-SL       |
| General Data Dimensions (L x W x H, mm)                  | AF3K-SL      | AF3.6K-SL         |                 | AF4.6K-SL<br>513 x 370 x 192 | AF5K-SL         | AF6K-SL          | AF6K-SL       |
| Weight (kg)  |              |                   |                 | 17                           |                 |                  |               |
| Topology   |              |                   |                 | Transformerless              |                 |                  |               |
| Cooling  |              |                   |                 | Intelligent Fan              |                 |                  |               |
| Relatively Humidity                                      |              |                   |                 | 0 - 100 %                    |                 |                  |               |
| Operating Temperature Range (°C)                         |              |                   |                 | - 25 to 60                   |                 |                  |               |
| Operating Periperature Range (C)  Operating Altitude (m) |              |                   |                 | - 25 to 60<br>< 4000         |                 |                  |               |
| Noise Emission (dB)                                      |              |                   |                 | < 25                         |                 |                  |               |
| Standby Consumption (W)                                  |              |                   |                 | < 10                         |                 |                  |               |
| Mounting   |              |                   |                 | < 10<br>Wall Bracket         |                 |                  |               |
| Communication with RSD                                   |              |                   |                 |                              |                 |                  |               |
| Display & Communication Interfaces                       |              |                   | LCD LED D       | SUNSPEC                      | CDDS 40         |                  |               |
| Certification & Approvals                                | NIDCOZ COCIO | 200 ENECE40 4 4   |                 | S485, CAN, Wi-F              |                 | 62040 15000460   | 1 IEC62400 0  |
| EMC  | NEO91, G98/0 | ສສ, ⊑INDUD49-1, ( |                 | 7, VDE-AR-N4105              |                 | 02040, IEC62109- | 1, 15002109-2 |
| Livio  |              |                   | ⊏INO10          | 000-6-2, EN6100              | 0-0-3           |                  |               |

# SP-LV5320-W Series / 5.32kWh

**Residential Low Voltage Lithium Battery** 



CE10-21 LK CE CB & ...



Over Current Protection



Cell Balance Function



Over Charge Protection







Over Discharge Protection

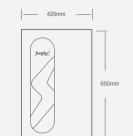


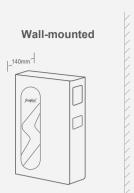
Temperature Protection

- Long Design Life
- Multiple Protection
- Modular Design
- Dekra Certification
- Scalable & Flexible
- Remote management & maintenance
- 10 Years Warranty

#### **Two Installation Methods:**

## Floor-mounted





#### Specification

| Specification                            |   |  |  |  |  |  |
|--|---|--|--|--|--|--|
| Product Name                             | Rechargeable Lithium Iron Phosphate Battery |  |  |  |  |  |
| Module Model                             | SP-LV5320-W 1                               |  |  |  |  |  |
| Battery Type                             | LFP 1P16S                                   |  |  |  |  |  |
| Nominal Capacity                         | 104Ah / 5.32kWh                             |  |  |  |  |  |
| Rated Capacity*2                         | 5.05kWh                                     |  |  |  |  |  |
| Nominal Voltage                          | 51.2V                                       |  |  |  |  |  |
| Working Voltage                          | 43.2~57.6V                                  |  |  |  |  |  |
| Charging Voltage                         | 57.6  |  |  |  |  |  |
| Max. Continuous Charge Co                | ge Current*3 50A                            |  |  |  |  |  |
| Max. Continuous Discharge Current*4 100A |   |  |  |  |  |  |
| Communication                            | RS485,CAN,WIFI(Optional)                    |  |  |  |  |  |
| Storage Temperature                      | ure 0°C~45°C (Recommended)                  |  |  |  |  |  |
| Storage Humidity                         | ≤85% (RH)                                   |  |  |  |  |  |
| Working Temperature                      | Charging: -10°C~50°C、                       |  |  |  |  |  |
|  | Discharging: -20°C ~50°C                    |  |  |  |  |  |
| Working Humidity                         | ≤95% (RH) No Condensation                   |  |  |  |  |  |
| Working Altitude                         | ≤2000m                                      |  |  |  |  |  |
| Ingress Protection                       | IP65  |  |  |  |  |  |
| Protective Class                         | I   |  |  |  |  |  |
| Weight                                   | 51kg  |  |  |  |  |  |
| Dimension(WxDxH, mm)                     | 420 x 140 x 650                             |  |  |  |  |  |
| Design Life                              | 15Years (25°C)                              |  |  |  |  |  |
| Cycle Life                               | >6000 (25°C)                                |  |  |  |  |  |
| Scalability Reco                         | ommended ≤3, (Max. 8 in parallel)           |  |  |  |  |  |
| Certification CEI0-21                    | ,CE, IEC62619, IEC/EN 61000-6-1/3, UN38.3   |  |  |  |  |  |

#### $^{*1}$ Test conditions:cell voltage 2.0~3.65V,25±2 $^{\circ}\mathrm{C}$ , 0.5C charge and 1C discharge.

#### **Matching List**











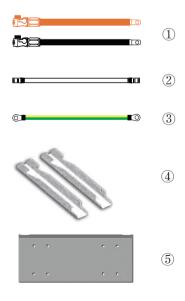








#### **Accessories**



① Inverter to Battery Positive & Negative Power Cables

<sup>&</sup>lt;sup>12</sup> Test conditions:95% depth of cell discharge,25±2°C, 0.5°C charge and 1°C discharge.

<sup>\*3. \*4</sup> Affected by temperature and SOC state.

② RJ45 Communication Cable

③ Grounding Cable

④ Square Tube Support
(Fixed On The Back Of The Battery Pack)