

#### 4. 光储一体机 160+95KW/200KWH 直流耦合+绿电直连 构网型 防逆流

DC coupling+Directly connected green electricity, grid-forming and prevent energy countercurrent system  
for solar power with energy storage

一体机型号(单机版) Model(stand-alone)		内置锂电池 初始容量 Biult-in lithium battery initial capacity	光伏 / 风电 最大直接输入功率 Solar/wind direct input maximum power	系统输出交流功率 额定 / 峰值 System AC output power rated/peak	
4	GSE-160-95-200KWH	200KWH	160 KW	95 / 145 KW @无电网时 (Off-grid) 160 / 200 KW @有电网时(Tied to grid)	
		整机重量 Weight =2600KG ±10% 宽*深*高 Width*Depth*Heigth =105*160*230 CM 最大并机扩展运行能力 maximum parallel number=220 台			

- ✓ **100%自主研发，全场景多种能源同时接入** Full independent R&D, full-scene, and the multiple energy can be accessed at the same time
 

光伏 /风电 /水电 /市电 /电池 /应急(燃油)发电机  
等同于：光伏逆变器 + 储能双向逆变器 +储能电池柜 +配电柜 +并离网切换柜  
Solar power /Wind power /Hydro power /AC grid /battery /Emergency fuel generator. Equivalent to: solar inverter + energy storage bi-inverter + battery cabinet + power distribution cabinet + on-grid and off-grid control and cabinet
- ✓ **真正的构网型光储系统** A real grid-forming system for solar power with energy storage
 

可快速形成区域微电网，减小对电网的依赖，也可高效支撑电网的稳定  
It can quickly form a regional micro-grid, reduce the dependence on pwer grid, and it can also effectively support the stability of the power grid.
- ✓ **直流耦合+绿电直连技术** DC coupling+Directly connected green electricity technology
 

代替隔墙售电，提高新能源电力远距离组网传输充的效率和效益本  
Instead of partition power sales, improving the efficiency and benefit of long-distance transmission of new energy power.
- ✓ **零毫秒切换电力电子技术（国内唯一）** Zero millisecond switching power electronics technology
 

特别适合用于半导体设备、IDC 数据中心、军事设备的等重要负载的电力供应  
Zero millisecond switching technology (The only technology in China), it is especially suitable for semiconductor equipment, internet data centre(IDC) and military equipment.



## **直流耦合技术 无需光伏(风电)逆变器 真正杜绝光伏逆流返送电网问题**

DC coupling technology, solar /wind /fuel generator /charging station /energy storage system (All in one)

The solar countercurrent and reverse transmission to grid problem can be truly eliminated

## **零毫秒切换电力电子技术 高效支撑半导体工厂、AI 算力中心电力供应安全**

Zero millisecond switching power electronics technology, it can quickly form a regional micro-grid, reduce the dependence on power grid, and it can also effectively support the stability of the semiconductor plant and AI computer center

## **真正的构网型设计 200KW~44MW 风光储混合逆变器模块技术**

### **高效支撑大型矿区、零碳园区电力供应安全**

200KW~44MW, A real hybrid and grid-forming inverter technology (solar power + wind power +energy storage)

It can effectively support the stability of the large mining area and zero carbon industrial park

## **0.9~1.5KV 高压直流 2~5 公里级 绿电直连 直流耦合能量调度与调配技术**

0.9K~1.5Vdc, 2~5km, directly connected green electricity and DC-coupling technology for energy scheduling and allocation

## **VPP 虚拟电网接入管理与控制 AI 自动决策功能**

Virtual power plant management and control, with AI automatic decision-making function

光储一体机，正面插拔式模块化设计技术，光储混合逆变器+电池模块  
Solar power system with energy storage, front plug modular design technology  
built-in hybrid invert and battery module



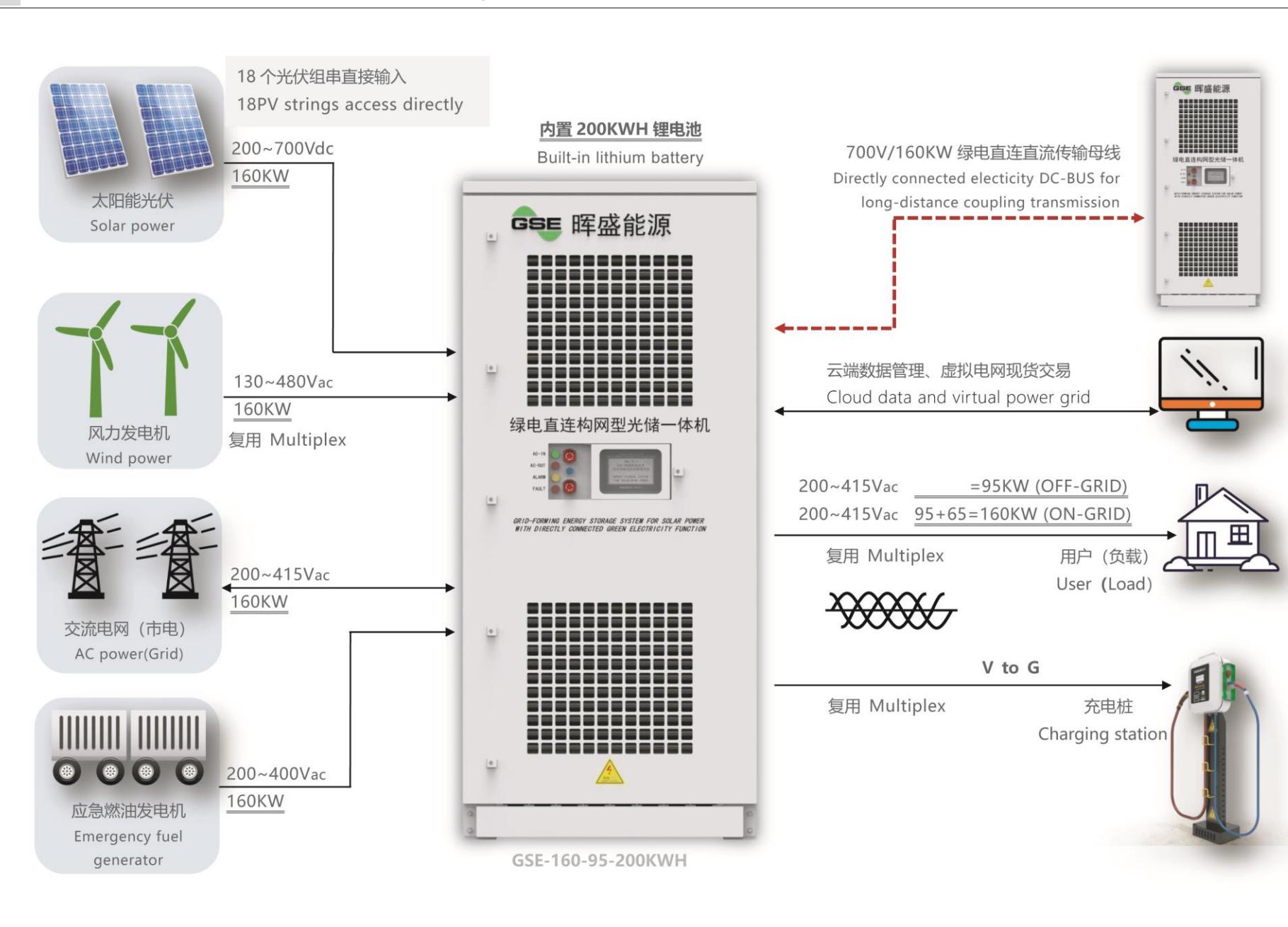
# 光储一体机，反面集成配电柜、汇流柜、计量柜

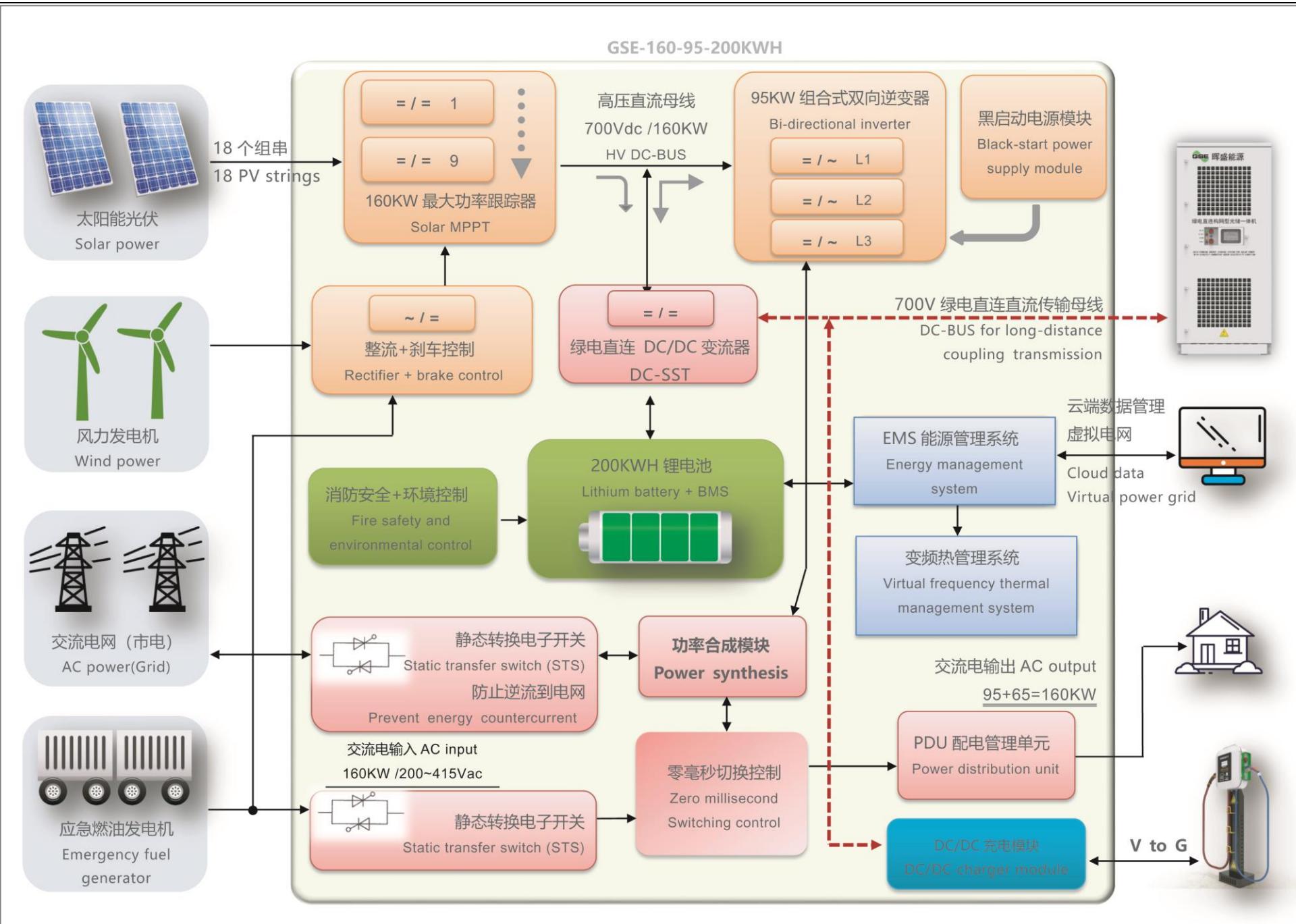
Solar power system with energy storage

reverse integrated distribution cabinet, busbar cabinet, metering cabinet

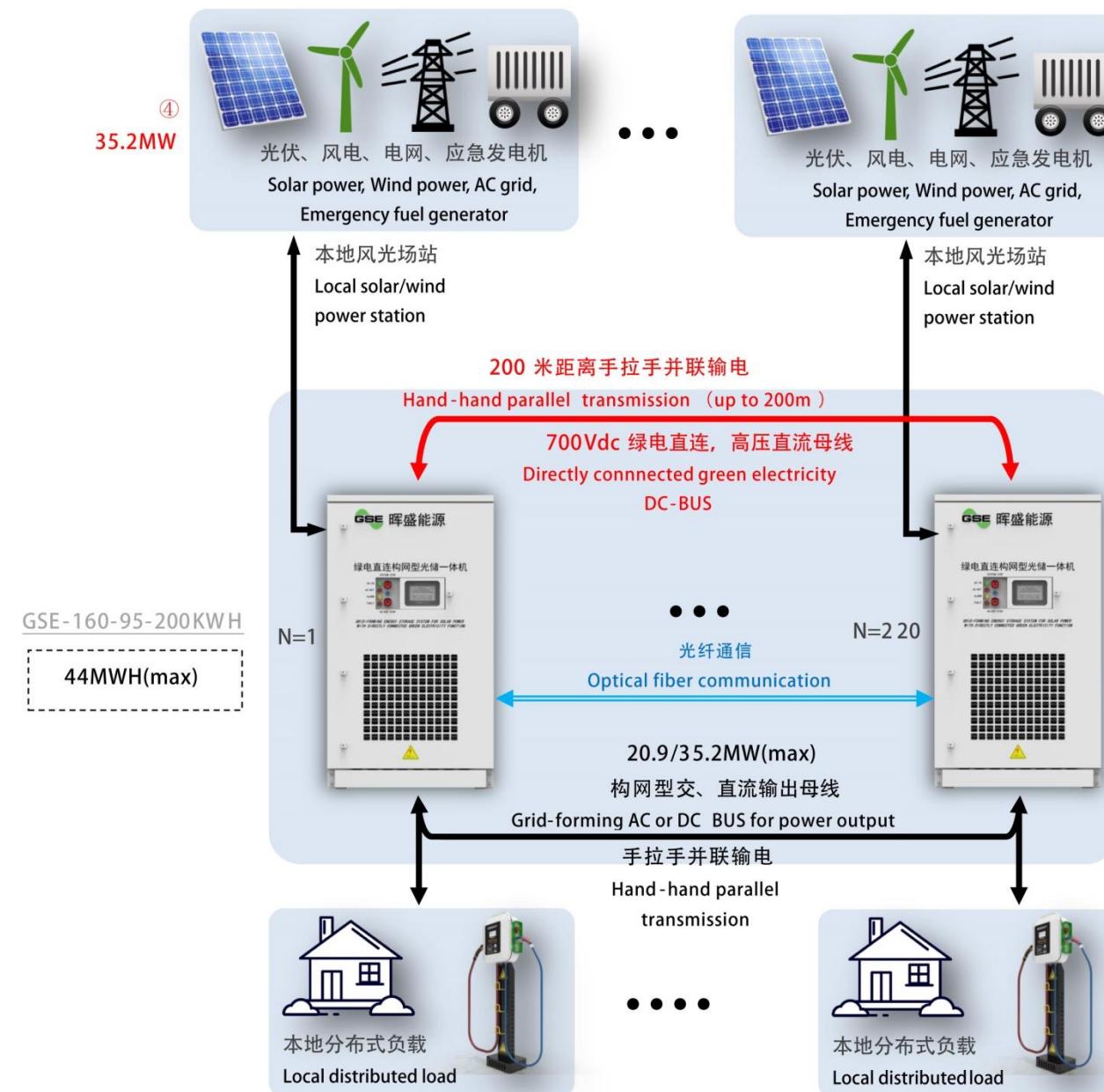


#### 4. 系统应用连接图 System application connection diagram





#### 4. 绿电直连技术 Directly connected green electricity technology



#### 4. 160+95KW/200KWH 绿电直连 构网型光储一体机 技术参数表 Technical parameters table about our All In One hybrid system

型号 MODEL	GSE-160-95-200KWH
<b>综合主要性能 Main comprehensive specifications</b>	
电池初始额定容量 Battery initial rated capacity	200kWh
高压直流耦合母线电压 High-voltage DC coupling BUS voltage	700V
逆变器交流输出额定/峰值功率 Inverter AC output rated/peak power	95 / 145KW @10S
系统交流输入输出额定/峰值功率 System AC input+output rated/peak power	160 / 200KW @10S
光伏输入最大功率 Solar input maximum power	160kW
宽*深*高 Width*Depth*Height	105*160*230CM
整机重量 Weight	2600KG ±15%
<b>光储混合双向逆变器参数 Hybrid bi- inverter</b>	
市电/油机最大输入功率 AC(grid,fuel generator) input maximum power	160kW
市电最大充电功率 AC(grid) charging maximum power	95kW
交流输出功率因数 AC output power factor	0.1~1 (超前或滞后 leading or lagging)
交流输出谐波 AC output harmonic distortion	< 3%
交流输入输出类型 AC input/output type	三相 5 线制 3W + N + PE
交流输出电压/频率 AC output voltage/frequency	200/210/220V, 380/400/415V 50/60HZ
MPPT 输入电压范围 MPPT input voltage	200~700V
MPPT 满载输入电压 MPPT input voltage in full load	550~600V
MPPT 给电池最大充电功率 MPPT charging maximum power	160kW
MPPT 适配光伏组件 Matching PV panel	390~720W
MPPT 每个组串最大输入功率 MPPT input maximum power per PV string	10kW
MPPT 最大跟踪效率 MPPT maximum tracking efficiency	99%
MPPT 最大转换效率 MPPT maximum conversion efficiency	99.4%
逆变器模块选配输入 Optional input for inverter	风力、水力、应急发电机 Wind power, hydro power, emergency fuel generator
风力、水力、应急发电机输入交流电压 Wind power, hydro power, emergency fuel generator input AC voltage	130~480Vac
<b>切换时间 Conversion speed</b>	
太阳能供电转换到电池后备供电切换时间 Response time from solar power supply to battery backup	0ms
交流输出转换到市电(电网)旁路切换时间 Response time when from inverter AC_out convert to grid bypass mode	0ms
市电充电转向正常逆变模式切换时间 Response time from AC→DC charging mode to normal DC→AC conversion Mode	0ms
市电充电下电网突然掉电，强制转向电池后备模式的切换时间 When AC-grid is failure, Response time from AC→DC charger mode to emergency DC→AC battery backup conversion mode	0ms

<b>电池模块参数 Battery module</b>	
电池电芯类型 Battery cell	磷酸铁锂 LiFePO4 3.2V/314AH (326~329AH)
电池模块电量 Battery module capacity	50kWh
系统电池模块数量 Number of battery module in one cabinet	4
电池模块相互连接方式 Battery module interconnection mode	串联 in series
电池组总电压 Total battery pack voltage	614.4V (537~700V)
电池循环寿命 Battery cycle life	≥8000( EOL 70%), 25°C, 0.5C
<b>最大系统效率 System maximum efficiency</b>	
电池逆变模式 Battery input → Inverter → AC output	99% (max)
电网充电模式 Grid AC input → Inverter → DC charging for battery	98% (max)
光伏充电模式 Solar input → MPPT → DC BUS → Battery → DC charging for battery	98% (max)
光伏逆变模式 Solar input → MPPT → DC BUS → Inverter → AC output	95% (max)
光储一体化逆变模式 Solar input → MPPT → DC BUS → Battery → Inverter → AC output	90% (max)
<b>系统综合特性 System comprehensive specifications</b>	
工作噪音 Acoustic level	<50dB
工作/推荐环境温度 Operating /Recommend operating temperature	-20°C ~ 50°C / -10°C ~ 40°C
工作湿度 Operating humidity	10% ~ 90% 不结露不结冰 non condensation and Ice-free
最大海拔高度 Maximum altitude	3000m (max)
系统冷却方式 System cooling mode	变频风冷 Variable frequency air cooling
最大并机运行数量 Maximum number of parallel together	220
系统防护等级 Degree of system protection	IP65 (可在室外恶劣环境下直接安装使用 Adapt to various harsh working environment for outdoor installation)
<b>EMS 功能配置 Function configuration</b>	
EMS 显示屏 LCD(HMI)	7/10 英寸触摸屏 7/10 inch high performance TFT touch screen
EMS 数据存储能力 Data storage capability	64GB
EMS 可配置通信接口 Configurable communication interface	光纤(Optical fiber) / RS485 / CAN-BUS / Ethernet / GPRS / WIFI / LoRa / NB-IOT
EMS 通信协议 Communication protocol	Modbus RTU / Modbus TCP / IEC 61850 / DNP3
EMS 虚拟电网接入控制响应时间 Response time for virtual power grid	0.5ms
系统绝缘与电池漏液检测 System insulation and battery leakage detect	YES
系统消防保护 System fire protection	YES
系统动力与环境管理 System power and environmental management	YES
PDU 配电管理 Power distribution unit	YES
电网与用户负载功率预测 Power grid and user load power prediction	YES

备注：本手册技术参数仅做参考，如有变动，恕不提前通知，请以实际发货的产品手册为准，实际发货的技术参数不低于表中的各项参数。

#### 4. 160+95KW/200KWH 绿电直连 光储一体机 MPPT 连接外部光伏组件配置表

##### Configuration table for solar panels

光伏输入有效电压范围=200~700V, 最佳功率点下光伏输入电压=550~600V, 系统直流母线电压=700V

Solar effective input voltage =200~700V, MPPT (for maximum power) input voltage=550~600V, System DC-BUS voltage=700V

类型 1: 54 片串联电池片, 395~470W Type1: Photovoltaic cell chip unit=54	每个光伏组串=12~17 片太阳能板串联(200 ~675V) Per PV string=12~17 solar panels in series	每个光伏组串 MPPT 输入电压=574V Per PV string MPPT input voltage=574V	每个光伏组串最大功率= 7.99KW Per PV string=7.99KW (max)
系统光伏最大输入 =2x9=18 个光伏组串 =143KW System solar power maximum input =2x9=18 PV strings =143KW			

类型 2: 60 片串联电池片, 490~650W Type2: Photovoltaic cell chip unit=60	每个光伏组串=12~15 片太阳能板串联(200 ~662V) Per PV string=12~15 solar panels in series	每个光伏组串 MPPT 输入电压=553V Per PV string MPPT input voltage=553V	每个光伏组串最大功率= 9.75KW Per PV string=9.75KW (max)
系统光伏最大输入 =2x9=18 个光伏组串 =175KW System solar power maximum input =2x9=18 PV strings =175KW			

类型 3: 66 片串联电池片, 600~720W Type3: Photovoltaic cell chip unit=66	每个光伏组串=9~14 片太阳能板串联(200 ~679V) Per PV string=9~14 solar panels in series	每个光伏组串 MPPT 输入电压=568V Per PV string MPPT input voltage=568V	每个光伏组串最大功率= 10.08KW Per PV string=10.08KW (max)
系统光伏最大输入 =2x8=16 个光伏组串 =161KW System solar power maximum input =2x8=16 PV strings =161KW			

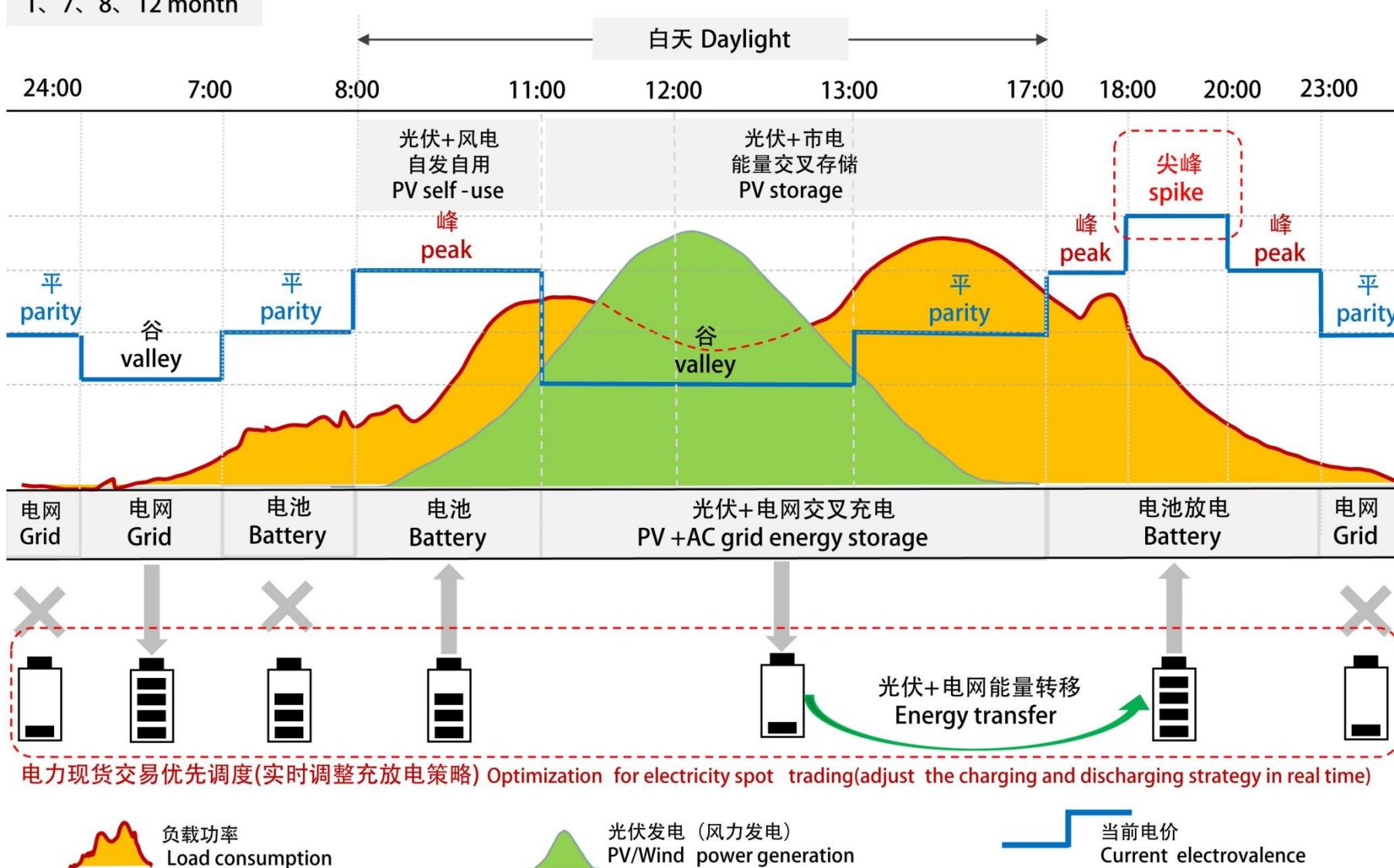
类型 4: 72 片串联电池片, 525~630W Type4: Photovoltaic cell chip unit=72	每个光伏组串=10~13 片太阳能板串联(200 ~689V) Per PV string=10~13 solar panels in series	每个光伏组串 MPPT 输入电压=587V Per PV string MPPT input voltage=587V	每个光伏组串最大功率= 8.19KW Per PV string=8.19KW (max)
系统光伏最大输入 =2x9=18 个光伏组串 =147KW System solar power maximum input =2x9=18 PV strings =147KW			

类型 5: 78 片串联电池片, 615~640W Type5: Photovoltaic cell chip unit=78	每个光伏组串=9~12 片太阳能板串联(200 ~684V) Per PV string=9~12 solar panels in series	每个光伏组串 MPPT 输入电压=562V Per PV string MPPT input voltage=562V	每个光伏组串最大功率= 7.68KW Per PV string=7.68KW (max)
系统光伏最大输入 =2x9=18 个光伏组串 =138KW System solar power maximum input =2x9=18 PV strings =138KW			

## 晖盛能源技术（上海）有限公司 Green-shine energy (Shanghai) Co., Limited

山西省 举例  
Shanxi (2024)  
1、7、8、12月份  
1、7、8、12 month

绿电直连 构网型光储一体机 虚拟电网中能量调度自动控制软件算法  
Energy dispatch control algorithm for virtual power grid (VPP system for solar power with energy storage)

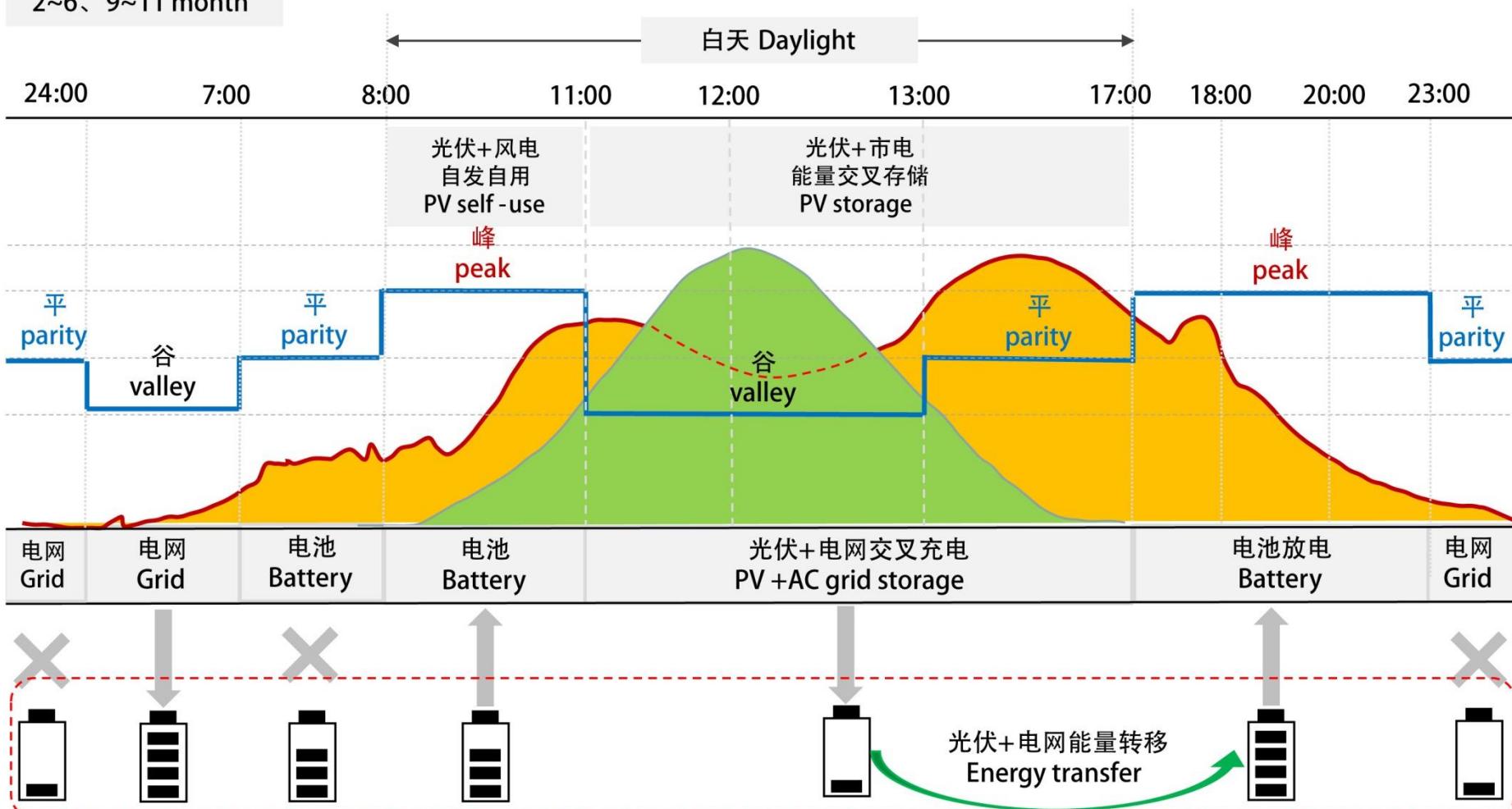


## 晖盛能源技术（上海）有限公司 Green-shine energy (Shanghai) Co., Limited

山西省 举例  
Shanxi (2024)  
2~6、9~11 月份  
2~6、9~11 month

### 绿电直连 构网型光储一体机 虚拟电网中能量调度自动控制软件算法

Energy dispatch control algorithm for virtual power grid (VPP system for solar power with energy storage)



负载功率 (电网负荷)  
Load or grid consumption

光伏发电 (风力发电)  
PV/Wind power generation

当前电价  
Current electrovalence