

# All-In-One micro-grid solution with seamless energy source switch

## Outdoor Standing Plug & Play

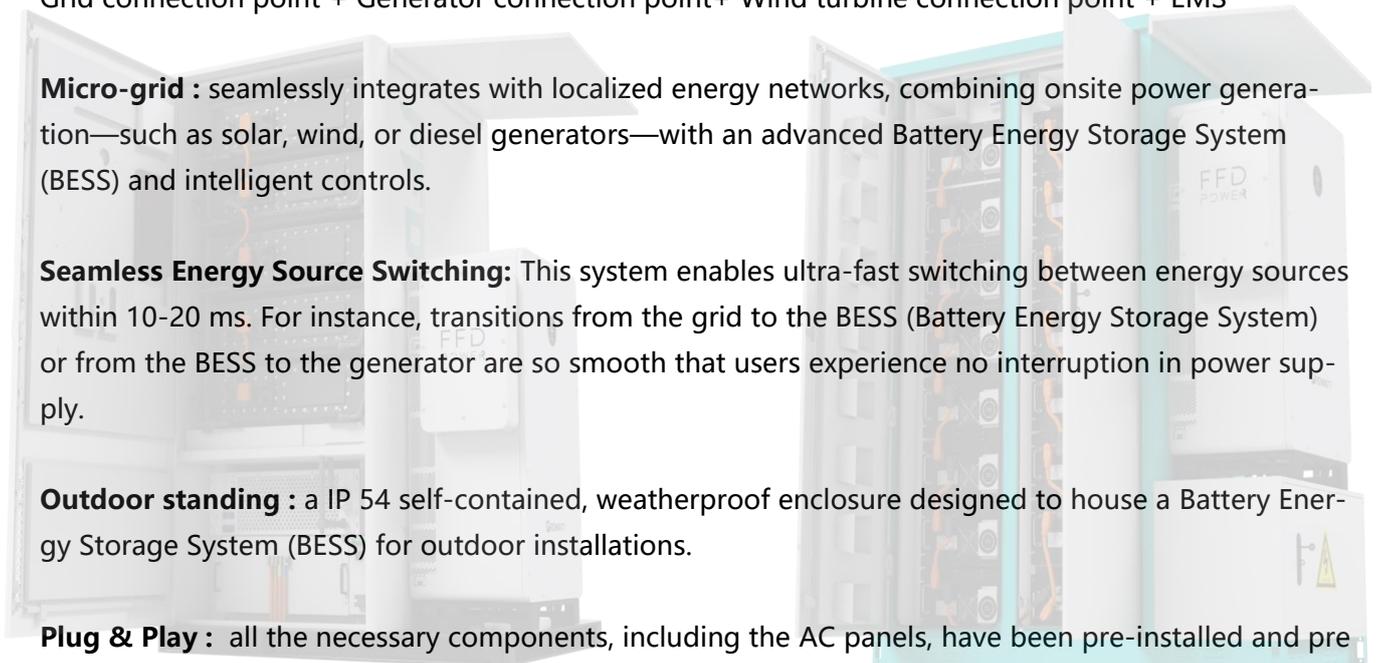
**All-In-One :** Lithium battery + Power converting system + PV inverter + AC panel  
Grid connection point + Generator connection point+ Wind turbine connection point + EMS

**Micro-grid :** seamlessly integrates with localized energy networks, combining onsite power generation—such as solar, wind, or diesel generators—with an advanced Battery Energy Storage System (BESS) and intelligent controls.

**Seamless Energy Source Switching:** This system enables ultra-fast switching between energy sources within 10-20 ms. For instance, transitions from the grid to the BESS (Battery Energy Storage System) or from the BESS to the generator are so smooth that users experience no interruption in power supply.

**Outdoor standing :** a IP 54 self-contained, weatherproof enclosure designed to house a Battery Energy Storage System (BESS) for outdoor installations.

**Plug & Play :** all the necessary components, including the AC panels, have been pre-installed and pre-configured. Installers only need to connect the system to the energy sources (e.g., solar panels, grid, or generators) and perform simple settings or configurations to make the system operational.



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## MICRO-GRID APPLICATION SCENARIOS

1. **Power supply for remote areas and islands** : In remote areas or islands far away from the grid, off-grid energy storage systems can provide stable power supply to support residents' lives and infrastructure operations.
2. **Rural and agricultural electricity** : Rural areas or agricultural facilities may have difficulty connecting to the power grid due to their remote location. Off-grid energy storage systems can provide reliable power to support agricultural production and residents' lives.
3. **Outdoor and temporary facilities** : Such as field operations, temporary construction sites, etc., off-grid energy storage systems can provide necessary power support without relying on the power grid.
4. **Emergency backup power supply** : In the event of a natural disaster or power grid failure, the off-grid energy storage system can be used as an emergency backup power supply to ensure the power supply of key facilities (such as hospitals, fire stations, etc.).
5. **Homes and Residences** : In areas with high electricity bills or for households looking to become energy self-sufficient, off-grid energy storage systems can be combined with solar photovoltaic panels to provide power to the home.
6. **Microgrid system** : In microgrids, off-grid energy storage systems can serve as energy buffers to improve the stability and reliability of the entire microgrid.
7. **Remote communities and schools** : In remote communities and schools, off-grid energy storage systems can provide lighting, communications and basic power services, improving education and quality of life.
8. **Commercial and industrial applications** : Small commercial facilities, factories, data centers, etc., can reduce dependence on the grid and improve energy efficiency and reliability through off-grid energy storage systems.
9. **Disaster recovery and reconstruction** : During the reconstruction process after a natural disaster, off-grid energy storage systems can quickly provide power to support temporary facilities and rescue efforts.



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## LIQUID COOLING SYSTEM



① 233 kWh Lithium Iron Phosphate (LiFePO<sub>4</sub>) battery, composed of 5 liquid-cooled battery packs. Each pack is a 1P52S 280Ah module, and all packs are connected in series to generate a high-voltage DC output. This configuration allows the battery to be charged from multiple energy sources, including solar panels, generators, wind turbines, and the grid, ensuring versatile and reliable energy storage

② Featuring seamless switching, the system supports PV inverter inputs up to 109/156 kW and can output a rated power of 50KW/100KW, making it compatible with large solar arrays. It can operate in both grid-connected and off-grid modes, ensuring flexibility and reliability for a variety of energy applications.

③ The use of Envi-cool's high-efficiency liquid cooling system ensures that the battery cell temperature difference is within 3°C, maximizing the battery life.

④ The AC panel features integrated connection points for the grid, wind turbine, and gas/diesel generator, all equipped with electronic switches managed by the EMS (Energy Management System) for intelligent control. This design ensures seamless switching between energy sources, optimized energy flow, and enhanced system reliability.

⑤ The high-voltage box has a DC power extraction function to further ensure the stability of the system. It adopts an active balanced BMS architecture to maximize the service life of the battery cell.

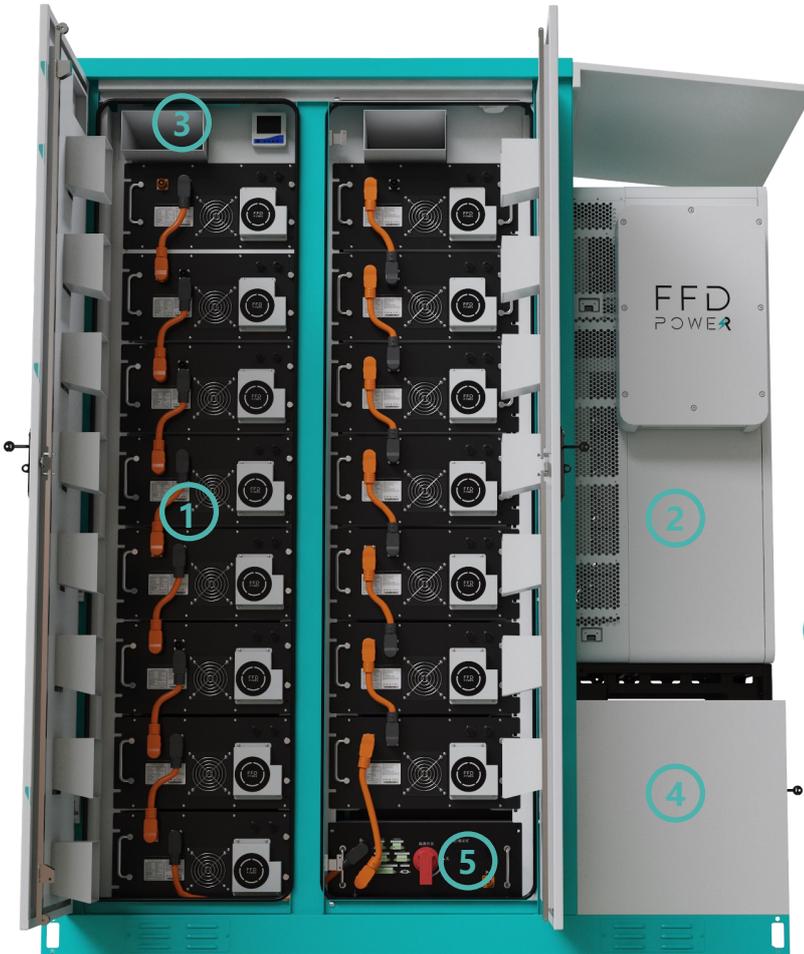
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## AIR COOLING SYSTEM



**1** 215 kWh Lithium Iron Phosphate (LiFePO<sub>4</sub>) battery, composed of 15 air-cooled battery packs. Each pack is a 1P16S 280Ah module, and all packs are connected in series to generate a high-voltage DC output. This configuration allows the battery to be charged from multiple energy sources, including solar panels, generators, wind turbines, and the grid, ensuring versatile and reliable energy storage

**2** Featuring seamless switching, the system supports PV inverter inputs up to 109/156 kW and can output a rated power of 50KW/100KW, making it compatible with large solar arrays. It can operate in both grid-connected and off-grid modes, ensuring flexibility and reliability for a variety of energy applications.

**3** The use of Envi-cool's high-efficiency air cooling system ensures that the battery cell temperature difference is within 8°C, maximizing the battery life.

**4** The AC panel features integrated connection points for the grid, wind turbine, and gas/diesel generator, all equipped with electronic switches managed by the EMS (Energy Management System) for intelligent control. This design ensures seamless switching between energy sources, optimized energy flow, and enhanced system reliability.

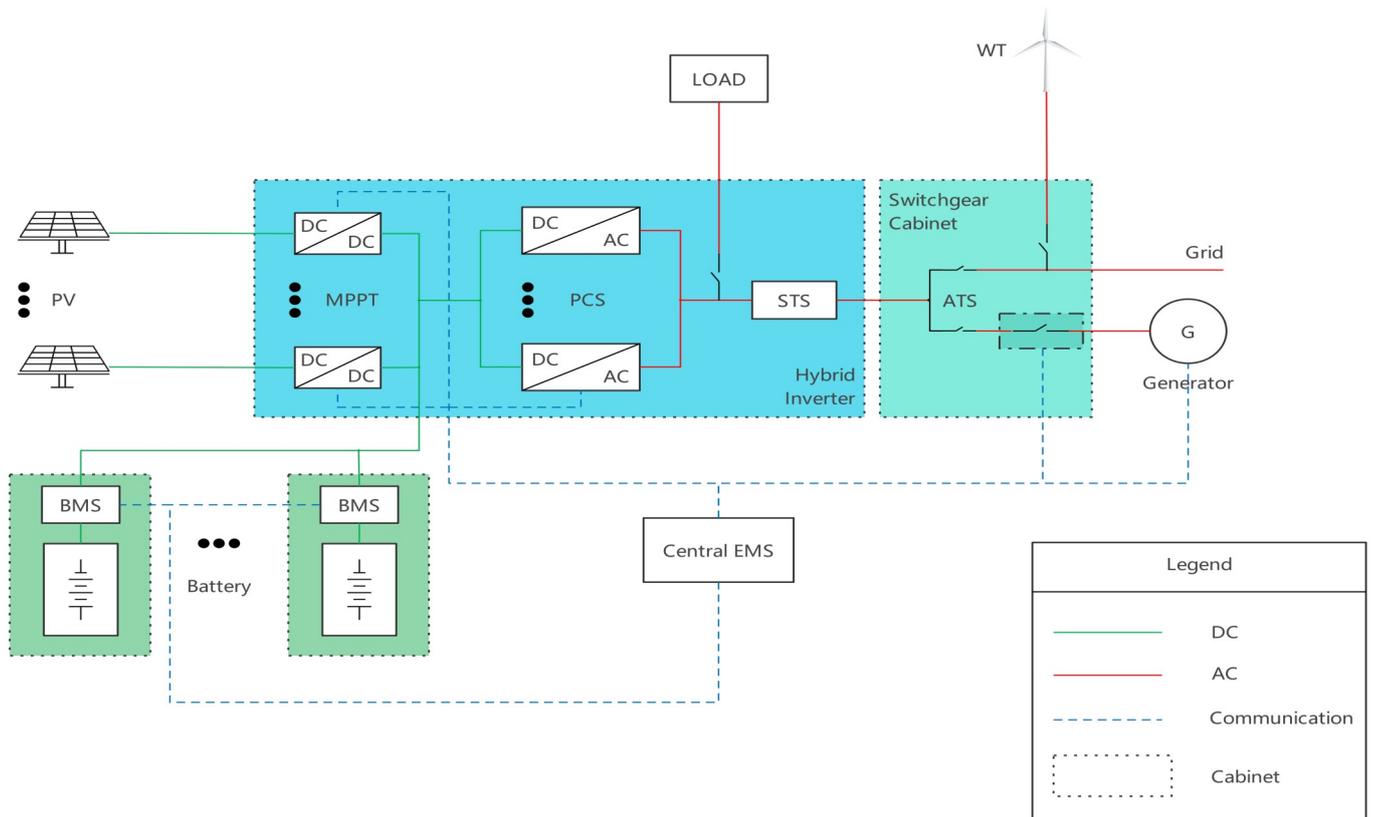
**5** The high-voltage box has a DC power extraction function to further ensure the stability of the system. The BMS secondary protection architecture ensures system security to the greatest extent.

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## All-In-One Microgrid with Hybrid Inverter

Our integrated Hybrid Inverter System is a compact, all-in-one solution designed for seamless integration with renewable energy sources, including photovoltaic (PV) systems, wind turbines, and energy storage batteries. The system can function as a standalone microgrid in off-grid environments while also supporting full grid integration or automatic switching between on-grid and off-grid modes.

### Key Features

#### Seamless Automatic Switching

Provides uninterrupted power supply with an ultra-fast on-grid to off-grid transition within 20ms, ensuring continuous operation for critical loads.

#### Flexible Power Options

The system is able to operate solely on solar power when the load is relatively small compared to battery capacity, eliminating reliance on the utility grid or diesel/gas generators.

The system is able to operate in multi power sources with fast and smart switch between the utility grid/ diesel generator backup and battery system to deliver uninterrupted power supply for the loads.

#### Advanced Energy Management System (EMS)

Equipped with a real-time monitoring and control platform, the EMS collects data from batteries, inverters, and sensors, displaying insights via a cloud-based interface and local screen. This enables users to monitor performance, analyze trends, and optimize energy usage efficiently.

### Inverter Configuration Options

50kW / 100kW -- 215kWh Air-Cooled all-in-one Microgrid unit, max 3 units in parallel;

50kW / 100kW -- 233kWh Liquid-Cooled all-in-one Microgrid unit, max 3 units in parallel.

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## PARAMETERS OF THE ENERGY STORAGE SYSTEM—INVERTER

MODEL	WIT 50K-HU	WIT 100K-HU
<b>PV INPUT PARAMETERS</b>		
Max. Input Power (KW)	109.2KW	156KW
Max. Input Voltage (Vdc)	1100V	
MPPT Operation Voltage Range (Vdc)	180V-800V	
Start-up Voltage	195V	
Rated Input Voltage	550V	
MPPT Operation Voltage Range at Rated Power (Vdc)	520V~800V	
Max. Input Current (Adc)	32A	
Max. Short-circuit Current (Adc)	40A	
Number of MPPT Channels and Strings	7/2	10/2
<b>BATTERY PORT</b>		
Max Input/Output Power( KW )	56.7KW	113.5KW
Operating Voltage Range ( Vdc )	600-1000V (3P3W)/680V-1000V(3P4W)	
Rated Battery Voltage	768V	
Max. Continuous Current	83.3A	167A
BMS Communication	RS 485/CAN	
<b>GRID-CONNECTED PARAMETERS ( AC )</b>		
Rated Power Input/Output (KW)	100KW/50KW	200KW/100KW
Max. Apparent Power Input/Output( KVA )	100KVA/55KVA	200KVA/110KVA
Rated Voltage (Vac)	380V/400V/415V	
Voltage Range	-15%~+10%	
Rated Power Frequency (Hz)	50/60Hz	
Voltage Frequency Range	45~55Hz/55Hz~65Hz	
Rated Output Current	151A/75.6A@220V 144.9A/72.5A@230V	
Max. Output Current	151A/83.3A@220V 144.9A/79.7A@230V	
Power Factor ( cos φ)	> 0.99	
Adjustable Power Factor Range	(1 lead...1 lag)	
THDI	< 3%	
Wiring Method	3P+PE/3P+N+PE	

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## PARAMETERS OF THE ENERGY STORAGE SYSTEM—INVERTER

MODEL	WIT 50K-HU	WIT 100K-HU
<b>OFF-GRID PARAMETERS ( AC )</b>		
Rated Power (KW)	50KW	100KW
Max. Apparent Power ( KVA )	60KVA	120KVA
Max. Output Voltage	220V/230V/240V/380V/400V/415V	
Rated Power Frequency ( Hz)	50/60Hz	
Max. Output Current	90.0A@220V 87A@230V	181.8A@220V 173.9A@230V
Voltage Accuracy	1%	
Frequency Accuracy	0.1Hz	
Output Harmonics	3% @ linear full load	
Unbalanced Load	Allows 100% unbalance of single phase	
Overload Capacity	≤110%, continuous; ≤120%, 10min >120%, 200ms	
Grid-connected to Off-grid Switching Time	< 20ms	
Off-Grid to Grid-Connected Switching Time	0ms	
<b>EFFICIENCY</b>		
Max. Efficiency	98%	
Max. Charge/Discharge Efficiency	98%	
MPPT Efficiency	99.90%	
<b>PROTECTION</b>		
Input Reverse Connection Protection	Support	
PV Input DC Switch	Support	
DC Surge Protection	Support ( Class II)	
Insulation Impedance Testing	Support	
RCD Testing	Support	
AC Output Short Circuit Protection	Support	
AC Surge Protection	Support ( Class II)	
Ground Fault Detection	Support	
Grid Monitoring	Support	
String Monitoring	Support	
Anti-PID Function	Optional	
Arc Fault Detection (AFCI)	Optional	

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## PARAMETERS OF THE ENERGY STORAGE SYSTEM—INVERTER

MODEL	WIT 50K-HU	WIT 100K-HU
<b>DISPLAY AND COMMUNICATION</b>		
Display	OLED+LED/WIFI+APP	
USB	Support	
RS485	Support	
4G/WIFI	Optional	
<b>GENERAL PARAMETERS</b>		
Dimensions (W*H*L)	820*1350*510mm	
Weight	153kg	160kg
Operating Temperature Range	-30°C—+60°C (> 50°C decrease)	
Noise	≤53dB (A)	≤65dB (A)
Relative Humidity	0~100%	
Max. Altitude	4000m	
Power Consumption at Night	20W	
Standby Power	250W	
Topological Structure	Non-Isolation Transformer	
Cooling Method	GROWATT Intelligent Forced Air Cooling	
Protection Level	IP66	
Warranty	5 years (10 years optional)	
<b>CERTIFICATION</b>		
Safety Regulations	IEC/EN 62109-1、IEC/EN 62109-2、IEC/EN62477-1	
EMC	IEC/EN 61000-1、IEC/EN 61000-3	
Grid Connection Standards	EN50549-1、NRS 097-2-1、G99:2020、UKCA、VDE 4105、VDE4110、CEI0-21:2019+V1:2020、CEI 0-16:2019+V1:2020、TOR Type A、VDE 0126、NC RFG、PSE-2018、PTPIREE-2021、C10/C11:2021、UNE 217001-2020、UNE 217002-2020、RD647:2020、NTS Type B	

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## LIQUID-COOLING BATTERY CABINET

<b>MODEL: Galaxy 215/233L Liquid-cooling Energy Storage Cabinet</b>		
MODEL	GALAXY 215L	GALAXY 233L
Cell Type	LFP	
Capacity	280Ah	
System Battery Configuration	1P48S*5	1P52S*5
Battery Capacity (BOL) at DC Side	215.04 kWh	232.96 kWh
System Output Voltage Range	600V~876V	650V~949V
Dimensions of Battery Unit (W *H * D)	1150mm*2230mm*1335mm	
Weight of Battery Unit*	≈2650kg	≈2750kg
Battery Pack Degree of Protection	IP67	
Battery Cabinet Degree of Protection	IP54	
Corrosion Protection Level	C 3	
Relative Humidity	0 ~ 85 % (non-condensing)	
Operating Temperature Range	-20°C ~ 60°C (> 45°C derating)	
Max. working Altitude	3000 m	
Cooling Concept of Battery Cabinet	Smart liquid cooling	
Fire Safety Equipment	Combustible gas detection and ventilation systems, aerosol fire suppression	



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## AIR-COOLING BATTERY CABINET

<b>MODEL: Galaxy 215 Air-cooling Energy Storage Cabinet</b>	
MODEL	GALAXY 215
Cell Type	LFP
Capacity	280Ah
System Battery Configuration	1P16S*15
Battery Capacity (BOL) at DC Side	215.04 kWh
System Output Voltage Range	600V~876V
Dimensions of Battery Unit (W *H * D)	1900mm*2450mm*1000mm
Weight of Battery Unit*	≈2850kg
Battery Cabinet Degree of Protection	IP54
Corrosion Protection Level	C 3
Relative Humidity	0 ~ 85 % (non-condensing)
Operating Temperature Range	-20°C ~ 60°C (> 45°C derating)
Max. working Altitude	3000 m
Cooling Concept of Battery Chamber	Smart Air-cooling
Fire Safety Equipment	Combustible gas detection and ventilation systems, aerosol fire suppression



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