Multifunctional Grid Simulator

500kVA~1MVA | 5MVA~20MVA | 50MVA~150MVA

HOPEWIND

Mobile Test Platform-
multifunctional Grid Simulator

Hopewind's independently developed multifunctional power grid simulator supports the following functions:Precisely simulate various steady-state deviations and dynamic disturbances of power systems at different voltages and frequencies. Launch comprehensive grid adaptability test for different equipment under test such as wind, photovoltaic, and energy storage systems, covering voltage deviation, frequency deviation, three-phase voltage unbalance, voltage flicker, grid harmonics, interharmonics, etc.Accurately simulate characteristics of the grid such as low-voltage, high-voltage, and continuous fault conditions, including symmetrical and asymmetrical three-phase faults, to efficiently evaluate the transient support capability of equipment under test during grid fault ride through events. Simulate grid frequency fluctuation and voltage fluctuation curves to assess the dynamic support performance of the equipment under test when integrated into the grid. Inject disturbance voltages at a series of frequency points to automatically determine the broadband impedance characteristics of the equipment. Simulate phase angle jumps, weak grid conditions, and source/load interactions to meet the latest testing requirements for grid-forming equipment.

(Operation interface)

Diverse Functions

Grid Adapta Bility Tests

1 Voltage Deviation
2 Frequency Deviation
3 Three-phase Voltage Imbalance
4 Voltage Flicker
5 Harmonic
6 Interharmonic

Grid Voltage Fault Ride Through Tests

1 LVRT
2 HVRT
3 Continuous Ride-throughs

Grid Support Tests

1 Primary Frequency Modulation
2 Inertia Response
3 Frequency Domain Impedance Characteristic
4 Weak Grid Simulation
5 Phase Angle Jump
6 Damping Control
7 Load Simulation

Product

■ Low Voltage & Small Capacity

- 500kVA / 1MVA

■ Medium and High Voltage & Large Capacity

- 5MVA/6MVA/10MVA/ 11MVA/15MVA/20MVA
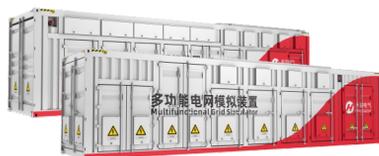
■ High Voltage & Ultra-large Capacity

- 50MVA/60MVA/90MVA/ 100MVA/150MVA

Product Features

- Supports customization for various voltage levels and testing functions
- Integrated isolation shock resistance, suitable for testing in weak grid environments
- Widely applied in wind power, PV, energy storage, hydrogen energy, and SVG testing scenarios
- Equipped with comprehensive power grid access protection devices, featuring robust fault protection capabilities
- The 32-bit DSP real-time intelligent control system ensures high accuracy in voltage waveform and rate of change control
- Supports parallel connection for capacity expansion

Technical Parameters

Power Lever / Parameter	500kVA~1MVA	5MVA~20MVA	50MVA~150MVA
Input Voltage	AC 400V±10%	AC 35kV±10% AC 10kV±10%	AC 35kV±10%
Input Frequency	50Hz±5%		
Steady State Output Voltage Range	80~110%		
Steady State Voltage Accuracy	0.2% under rated voltage		
High Voltage Output Range	110~140%		
Low Voltage Output Range	0~90%		
Output Frequency Range	45~66Hz		
Output Frequency Accuracy	0.008Hz		
Output Waveform Distortion Rate	≤1%		
Three-phase Voltage Unbalance Output Range	1~10%		
Output Flicker-pst	1~10		
Output Harmonics/ Interharmonics	1~2000Hz		
Overall Machine Efficiency	≥95%		
Noise	≤70dB	≤90dB	
Storage Temperature	-40~+70℃	-30~+55℃	
Operating Temperature	-30~+40℃	-25~+40℃	
Altitude	≤2000m		
Cooling	Liquid cooling	Air cooling	Liquid cooling / Air cooling

Note: Some functional parameters can be customized according to customer needs.

Application Cases

90MVA Grid Simulator

Scenario: national offshore wind energy testing platform

Functional Applications: grid adaptability test, LVRT test, HVRT test, continuous ride-throughs test

6MVA Grid Simulator

Scenario: grid-forming PV station

Functional Applications: grid adaptability test, LVRT and HVRT test, frequency domain impedance characteristic test, phase angle jump test

10MVA Grid Simulator

Scenario: offshore wind farm

Functional Applications: grid adaptability test, LVRT test, HVRT test, continuous ride-throughs test

10MVA Grid Simulator

Scenario: energy storage station

Functional Applications: grid adaptability test, LVRT test, HVRT test, continuous ride-throughs test

# Test Platform Applications

• WTGS Test Platform Application

Power Grid · Transformer · Inverter · Prime Motor · Tested WTGS (Generator · Wind Power Converter) · Grid Simulator

• PV Test Platform Application

Power Grid · Transformer · Grid Simulator · Three-phase AC Loads · Tested PV Inverter · PV Simulation Source
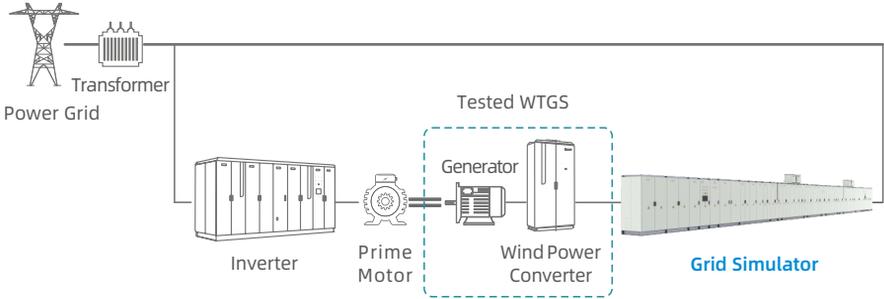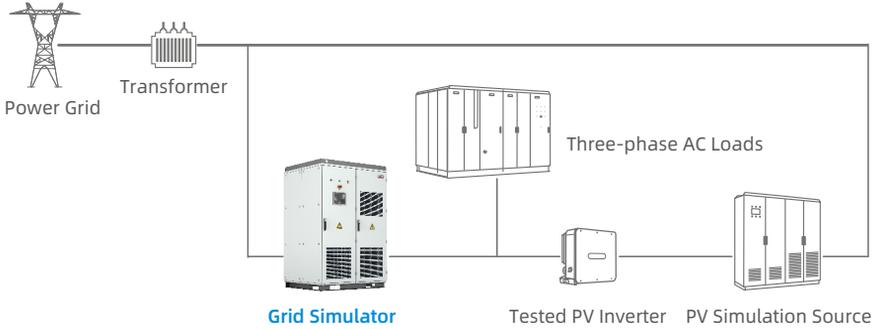
• Energy Storage Test Platform Application

Power Grid · Transformer · Grid Simulator · Three-phase AC Loads · Tested PCS · Battery Simulator
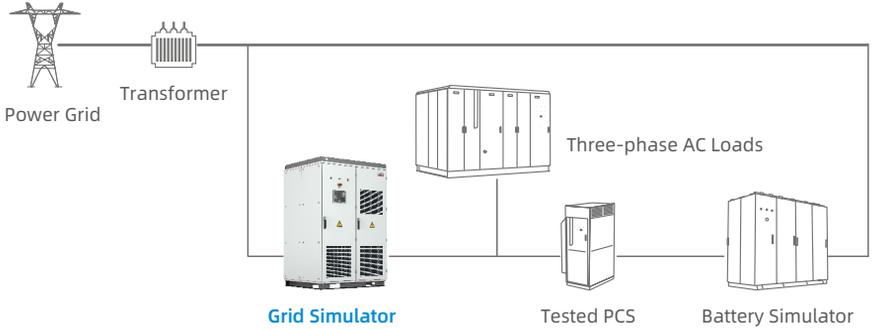
Industry Application

• Wind Turbine Test

Grid   Multifunctional Grid Simulator   Box Transformer   Wind Turbine
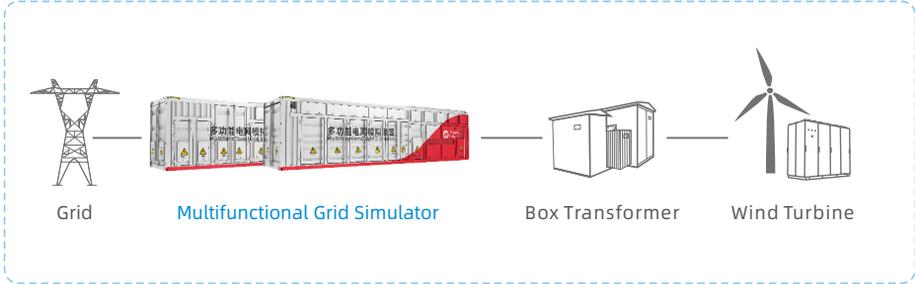
• PV Power Generation Unit test

Grid   Multifunctional Grid Simulator   Box Transformer   PV Inverter   PV Array

• Energy Storage System Test

Grid   Multifunctional Grid Simulator   Box Transformer   PCS   Battery & BMS
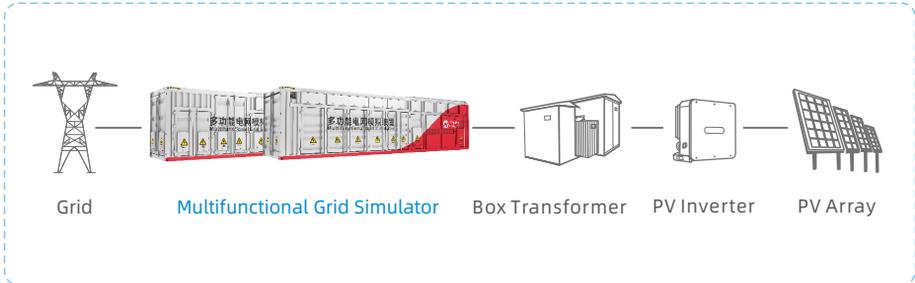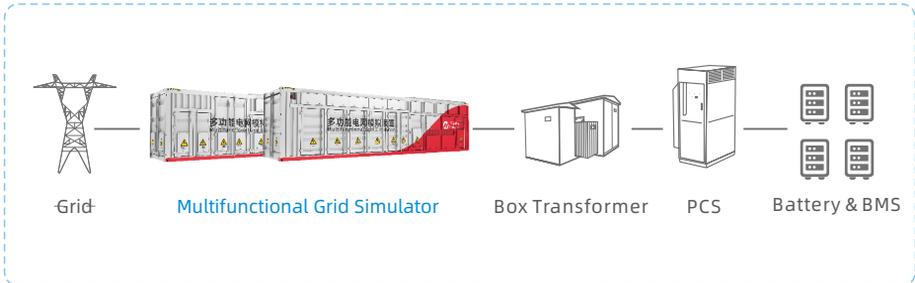
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