

IT7800 high power programmable AC/DC source completes grid connection performance test of dynamic reactive power compensation device in wind farm

Keywords: IT7800, AC power, wind power, SVG

**【Abstract】**

The equipment capacity of wind farms has expanded dramatically as the scale of wind farm construction in China has increased, and the impact on the power grid has become increasingly serious. SVG dynamic reactive power compensation device plays an important role in meeting reactive power, harmonic control, improving power factor and power quality, reducing loss, adjusting voltage and so on.

**【Body】**

1. What is wind farm dynamic compensation device?

Wind farm dynamic reactive power compensation device: a device connected in parallel to a wind farm whose output capacitive or inductive reactive current can be continuously adjusted within a certain voltage range to realize reactive power compensation or voltage control at regulation points. Usually include static reactive power generator (SVG), static reactive power compensator and so on.

Static reactive power generator (SVG): A device consisting of voltage source converters connected in parallel to a system whose output reactive current is continuously adjustable within the system voltage range and is independent of the system voltage.

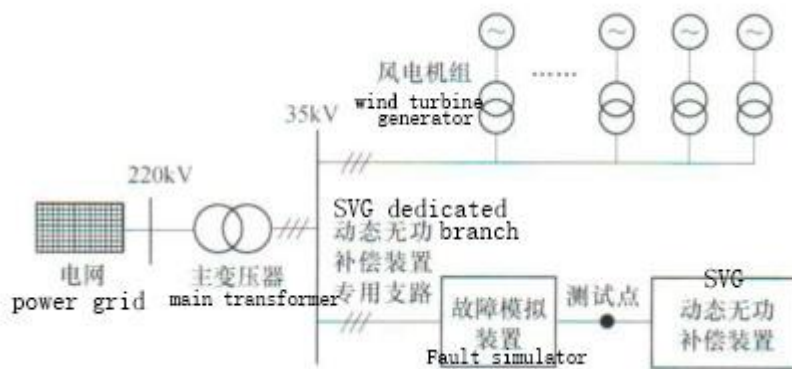
Static reactive power compensator (SVC): A parallel connected static reactive power compensation device that maintains or controls certain parameters (typically bus voltage) at its connection point to the grid by adjusting its inductive or capacitive current.

## 2. Test items and methods of wind farm dynamic compensation device

The test items of wind farm dynamic compensation device are divided into Control strategy simulation verification, steady-state characteristic field test, fault crossing capability field test and fault crossing capability evaluation.




One of the more critical test components is the fault ride-through capability test. The fault simulation device is connected in series with the dedicated branch of the dynamic reactive power compensation device, and the fault simulation device is used to induce voltage drop or rise at the test point while the wind farm is being monitored. When the voltage of the collector line and busbar is within the typical working range, test

the dynamic response characteristics of the dynamic reactive power compensation device (Figure 1 is a schematic diagram of the fault ride-through capability test of the dynamic reactive power compensation device)



SVG fault crossing ability test (Fig. 1)

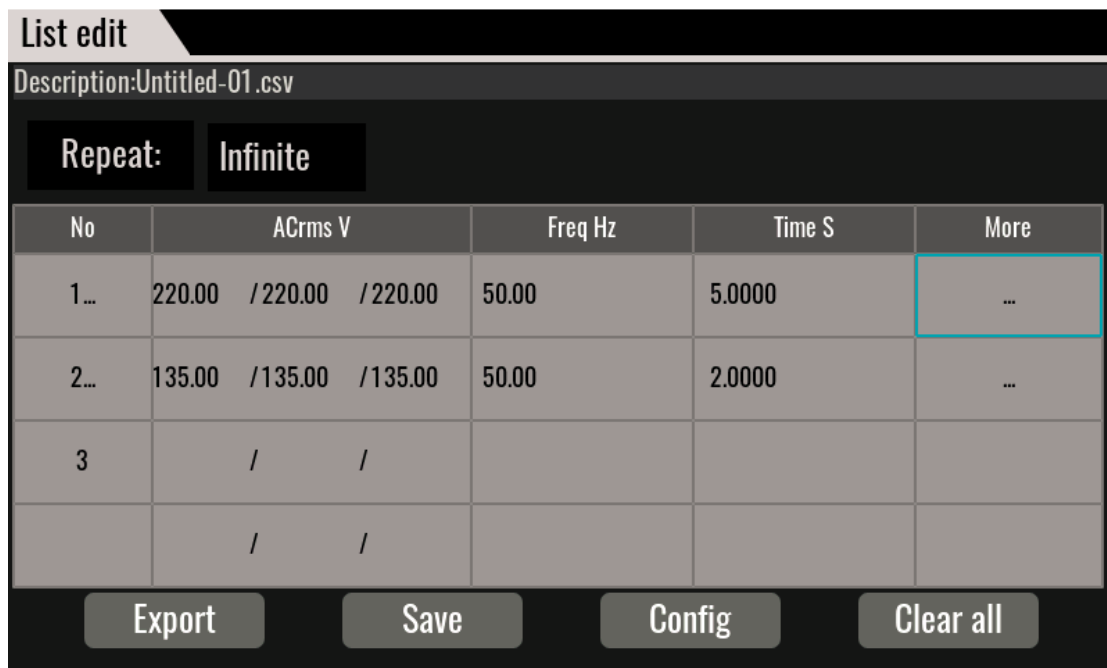
The following are the requirements for the fault crossing ability test: (taking voltage sag project as an example)

Voltage sag amplitude	Duration of voltage sag ms	Voltage drop waveform
0.90-0.05	2 000±20	
0.50±0.05	1 214±20	
0.20±0.05	625±20	

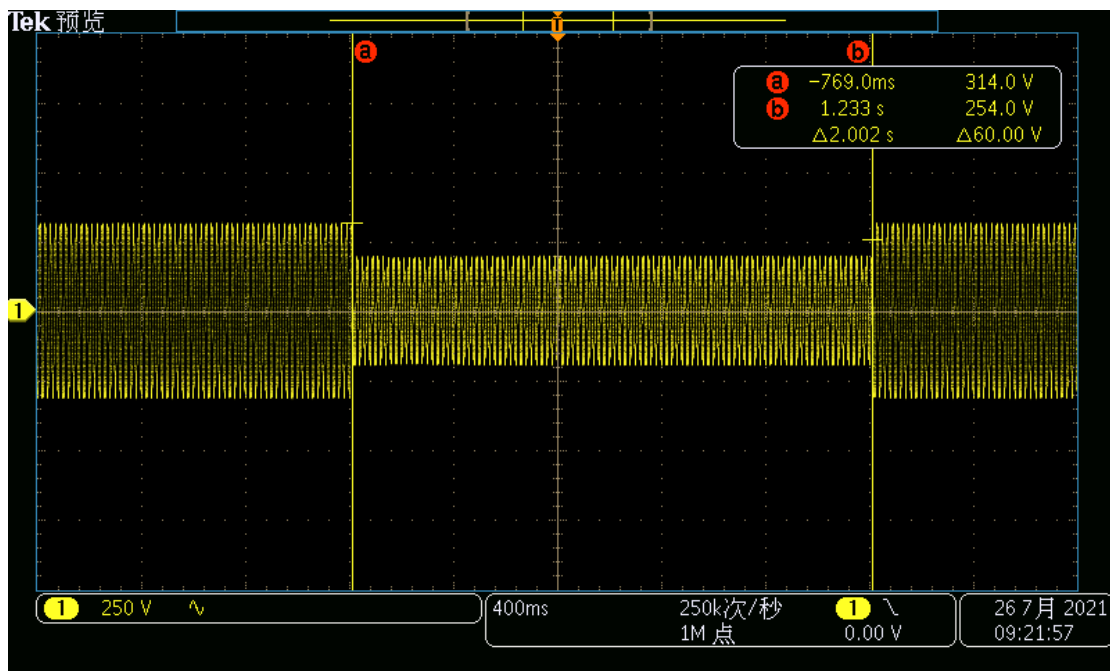
Fault crossing voltage drop test (Fig. 2)

3. ITECH IT7800 series high power programmable AC/DC source test solution

IT7800 series high-power programmable AC/DC power supplies are a new generation of high-power programmable AC/DC power supplies with robust programming functions, a new touch interface, and extensive data waveform analysis capabilities. Adopting high power density design, 3U up to 15kVA. Users are able to increase output power up to 960kVA by configuring master-slave parallel. IT7800 AC power source provides a compact and efficient solution for high power test of wind farm dynamic compensation device.



IT7800 LIST editing interface (Fig. 3)



IT7800 simulated fault crossing voltage drop test waveform (Fig. 4)

IT7800 can easily edit single-phase/three-phase AC output voltage amplitude and frequency by using LIST function to complete voltage sag simulation. For different test projects of SVG, IT7800 series provides different test modes of STEP, LIST and PULSE to realize gradual or continuous change of output parameters. The amplitude, frequency, phase, waveform and other parameters of the output voltage can also be controlled by the internal trigger or external trigger in the instrument to output, which can simulate the characteristics of all kinds of power supply, sudden power, slow rise and so on. Also, built-in 50 harmonic simulation and harmonic analysis functions, to help users understand the harmonic data in the circuit in time when using AC power supply.



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IT7800 series AC power source can be widely used in new energy, rail transit, semiconductor and scientific research institutions and other fields. More information please visit ITECH website <https://www.itechate.com>