The third generation
SVLF Series
Ultra-Low-Frequency High Voltage Generator

Sandi Electric Co.,Ltd

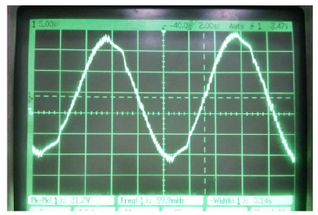
Product Brief

The high-voltage Withstand Test of the electrical equipment is one of the most important projects under The insulation preventive test. Withstand Test can be divided into the AC voltage test and DC voltage test. AC voltage test can use Power frequency, Frequency conversion and 0.1Hz ultra-low-frequency test, which the 0.1Hz ultra-low-frequency technology is the latest technology, the technology recommended by the International Electro technical Commission.

After years of independent research and development, our company's core products, the third generation of SVLF series ultra low frequency high-voltage generator was born. The third generation SVLF series ultra low frequency high-voltage generator will usher in a new era of domestic ultra low frequency high-voltage generator technology development, our company in the field of ultra low frequency 0.1Hz control technology has reached the international advanced level. Especially suitable for insulation equivalent capacitance larger electrical equipment (eg: power cables, power capacitors, medium and large generators and motors, etc.) pressure test.

Comparative analysis technology

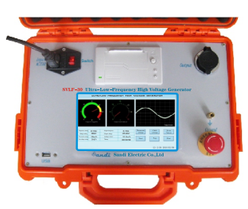
The first generation control box



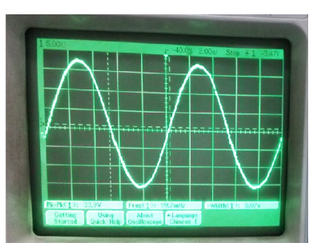
The first generation of ultra-low frequency high voltage generator high side output waveform (with an oscilloscope measurement)

The first generation of disadvantages:

1. Waveform distortion serious: The output waveform in the second, four-quadrant waveform distortion serious.
2. Poor load capacity: Load capacitance can`t meet the rated capacity(0.1Hz <1.1uF、0.05Hz <2.2uF、0.02Hz <5.5uF).
3. Large impulse current: Pulse current generated Cycloconverter big impact on the grid.
4. Poor EMI immunity: Frequent crashes during the test, the video, the need to repeatedly switch.
5. Complex operation: Too many menus, convenient button operation.



The third generation of the control box



The third generation of ultra-low frequency high voltage generator high side output waveform (with an oscilloscope measurement)

The third generation of advantages:

1. Waveform without distortion: Standard sine wave output.
2. Strong load capacity: load capacitance to meet the rated capacity(0.1Hz ⩾1.1uF、0.05Hz ⩾2.2uF、0.02Hz ⩾5.5uF).
3. Little impact pulse current: Cycloconverter pulse current generated little impact on the grid.
4. Strong EMI immunity: During the test controller is stable and reliable.
5. Simple operation: Capacitive screen operation, simple and convenient.

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Performance characteristics

Advanced inverter technology: Digital AC-AC inverter technology, advanced software closed-loop control, precise standard output without distortion sine wave, fully automated testing process.

Display: The 7 'capacitive touch screen, the screen displays real-time measurement data and the output waveform.

Comprehensive protection: high, low pressure side of the overvoltage and overcurrent protection, rapid response action (action time ⩽ 10ms).

Simple operation: simple wiring, fool type operation.

Safe and reliable: the controller and the high voltage generator connected to the low pressure, photoelectric control, safety and reliability.

The high and low voltage closed-loop negative feedback control circuit, the output can not rise effect.

Test range: 0.1Hz, 0.05Hz and 0.02Hz multi frequency selection, large measuring range.

Printer: print the test results.

Small size, light weight: very conducive to outdoor work.

Communication interface: USB2.0.

Software: Equipped with specialized SVLF ultra low frequency high-voltage generator software, can be tested by software, and the data query and print statements.

The main technical parameters

Table 3

Model	Output peak voltage	Measuring range	Weight	Applications
SVLF-30	30kV	0.1Hz:⩾1.1 μ F 0.05Hz:⩾2.2 μ F 0.02Hz:⩾5.5 μ F	Controler:4kg Booster:25kg	10kV and below voltage cables, generators
SVLF-50	50kV	0.1Hz:⩾1.1 μ F 0.05Hz:⩾2.2 μ F 0.02Hz:⩾5.5 μ F	Controler:4kg Booster:45kg	15kV and below voltage cables, generators
SVLF-60	60kV	0.1Hz:⩾1.1 μ F 0.05Hz:⩾2.2 μ F 0.02Hz:⩾5.5 μ F	Controler:4kg First Booster:25kg Second Booster:45kg	20kV and below voltage cables, generators
SVLF-80	80kV	0.1Hz:⩾1.1 μ F 0.05Hz:⩾2.2 μ F 0.02Hz:⩾5.5 μ F	Controler:4kg First Booster:25kg Second Booster:45kg	35kV and below voltage cables, generators

Power supply:
AC220V ± 10%, 50Hz ± 5%
Note: If you use a portable generator power to require the generator output voltage and frequency stability (generally require power greater than 3kW, frequency 50Hz, voltage 220V ± 5%, and preferably with a 1kW load), or to use some auxiliary measures to stabilize the generator output .

Output voltage accuracy:
Output voltage peak instability: < 1%
Output voltage and frequency instability: < 3%
Output voltage waveform distortion: <5%

- Description of the test range:

1. The capacitance of a test sample shall not exceed the instrument maximum rated capacity, the magnitude of the numerical values shown in Table 3;

2 . When used, the test shall not exceed the capacity of the instrument rated capacity. Test capacity is too small, it will affect the output waveform. If less than 0.05μF, the instrument will not work output, then you can parallel 0.05 μF capacitor (supplied by the Company) auxiliary output.

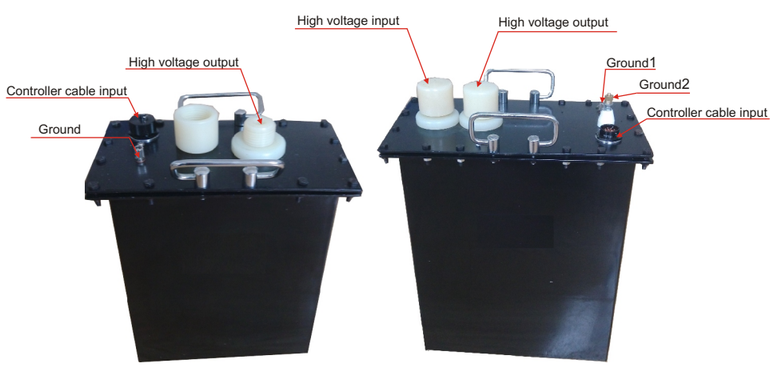
Work environment

- Altitude: not exceed 2000m;
- Ambient temperature: -10℃~ +40℃;
- Air humidity: daily average not more than 85 percent, the monthly average not more than 80% (25 ℃);

Instrument components

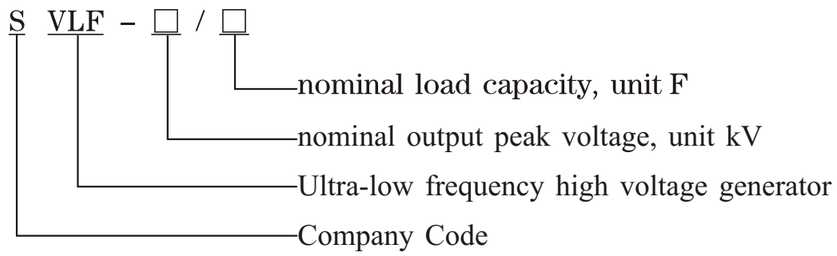
The instrument consists of two parts: the controller and the booster, two-part structure diagram is as follows:

SVLF Controller board schematic



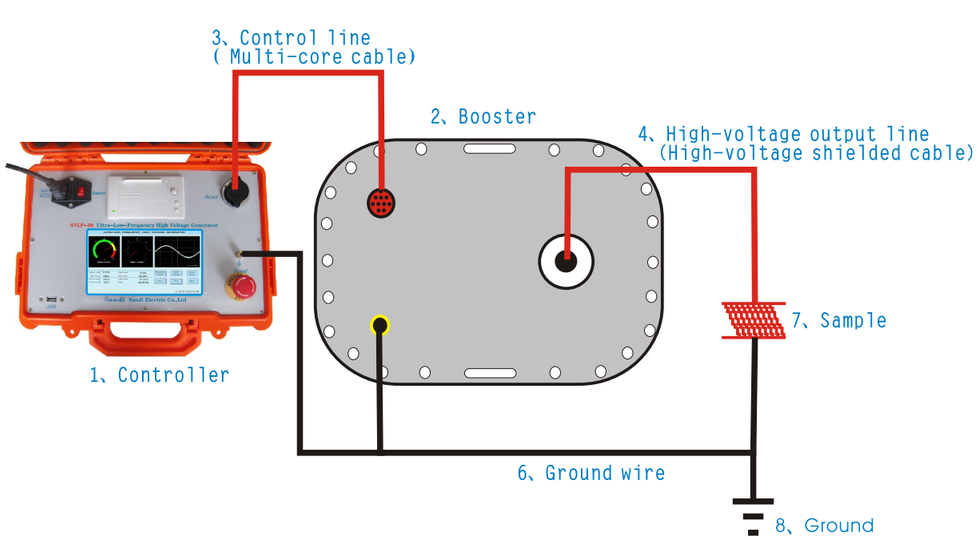
First booster Second booster

Model defined



Instrument wiring methods

Instrument wiring method as shown below:



Wiring instructions:

1. A method according to the above diagram, with this instrument were equipped with two dedicated lines and ground wire connections.
2. The power outlet connected to 220V/50Hz AC power line.

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Instrument instructions for use

(1) Boot

In accordance with the instrument wiring methods with all lines, you can Turn the power switch. Automatically after power up or reset of the instrument on the microprocessor, the interface shown in *Figure 1*. Connect, disconnect, or temporarily use instruments should turn off the power. Equipped with a fuse in the power outlet. If the boot screen does not display, you should first check the fuse is blown.

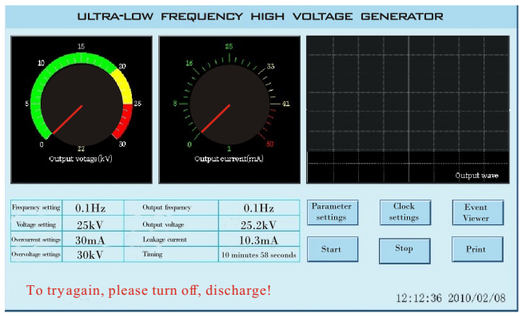

Figure 1

(2) Set the test parameters

First set of test parameters. Figure 1 screen, click the "Settings" button will appear shown in *Figure 2* set the parameters of the interface in *Figure 2* to set the output frequency according to the needs of the test, test time, test voltage, High side of the Over current protection value, the over-voltage protection value, and save the parameters.

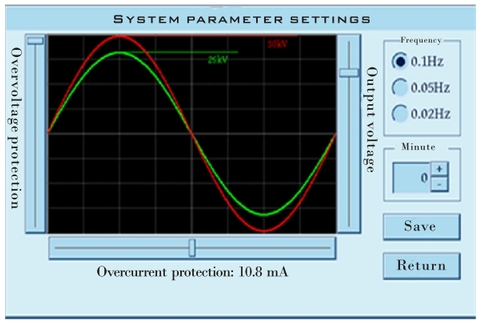

Figure 2

Parameter settings as follows:

Frequency: There are three to choose 0.1Hz,0.05Hz,0.02 Hz.

Minutes: Set the Withstand Test time, the range of 0 to 200 minutes.

Output voltage: Set the controller to control the test voltage of the booster, range from 0 to rated value. The unit is kV. Booster rose to the set voltage limiter value, will no longer boost, and to maintain equal amplitude sine wave output in this peak.

Over voltage protection: to set the boost output voltage of the upper limit of the test product, range from 0 to rated value. The unit is kV. When the booster output voltage exceeds the set value, the instrument automatically cut off the High voltage output.

Over current protection: Set the boost output by the current upper limit of the test product, range from 0 to rating. The unit is mA. When the booster output current exceeds the set value, the instrument automatically cut off the High voltage output.

Note: The above voltage, current, and the instrument displays the measurement data are the peak.

(3) Automatically boost

After set the test parameters, you can start the automatic boost. Click "Start" button on Figure 1 screen, automatic boost controller in the microprocessor program control, the following process:

Self-test → Boost → Equal amplitude output → Stop

① Self-test

Controller starts the step-up program. First load detection, if the instrument is not detected load is shown in *Figure* 3 in the status bar message: "Load unconnected"

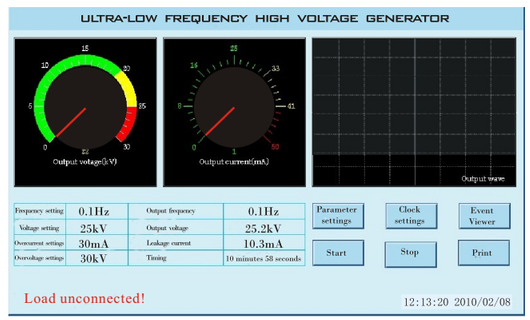

Figure 3

② Boost

After the self-test is successful, the instrument automatically boost, as shown in *Figure 4* in the status bar message: "In boosting". At the same time, the timer starts.

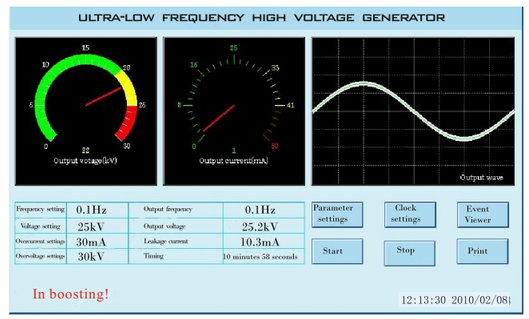

Figure 4

③ Equal amplitude output

The booster output voltage rises in the number of cycles within the time set value when the high side voltage reaches the set value, the equal amplitude output, is shown in *Figure 5* in the status bar message: "Equal amplitude output!".

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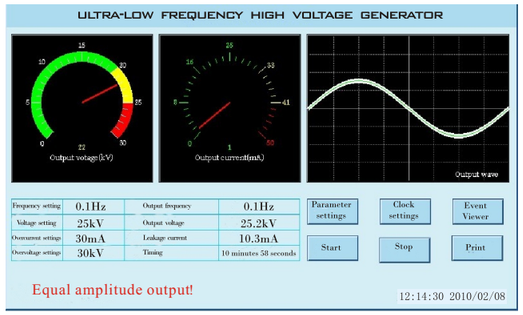

Figure 5

④ Stop

When the timer reaches the set time, the instrument is automatically shut down, as shown in Figure 6 in the status bar message: "Stop the high voltage output!.

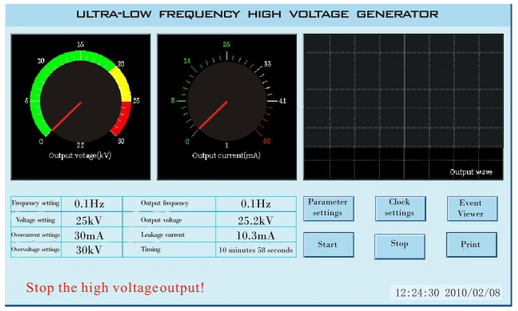

Figure 6

Stop the High output of the booster, the instrument and the test product for automatic discharge, as shown in *Figure 7* in the status bar message: "Is discharging".

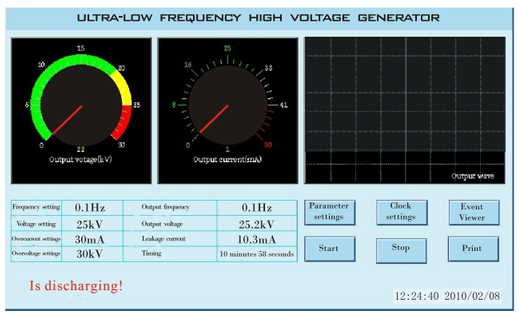

Figure 7

After the Instrument stop and discharge, there is shown in *Figure 8* status bar message: "Test passed! and perform the test data is saved.

Note: During the test, if the voltage does not appear over-voltage protection exceptions, the test product does not discharge phenomena or appear Over current protection, you can determine by the withstand voltage test.

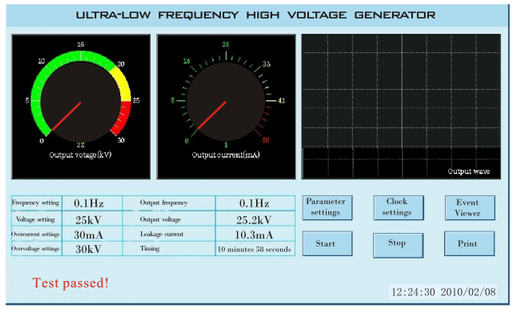

Figure 8

The instrument provides two Stop modes:

Timing stop: When the timer reaches the set time, the instrument is automatic stop.

Manually stop: in boosting process, you can click on the "stop" button to stop.

There are also two non-normal stop: over-voltage protection stop, Over current stop.

Over voltage protection stop:

In the process of testing, when the high voltage output of the booster exceeds a set limit, the instrument immediately issues a stop command, automatically cut off the high voltage output. *Figure 9* in the status bar after the shutdown message: "Over voltage protection!" and perform the test data is saved.

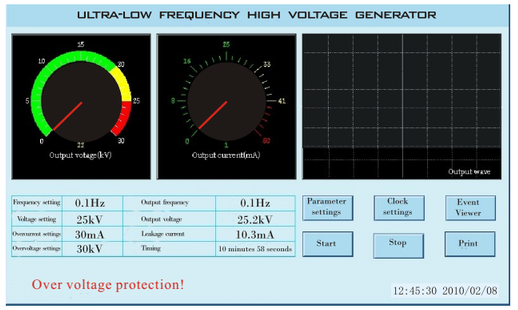

Figure 9

Over current protection stop

In the process of testing, when the booster high voltage side of the output current exceeds the set limits, the instrument immediately issue a stop command, automatically cut off the high voltage output. *Figure 10* status bar after the shutdown message: "Over current protection" and perform the test data is saved.

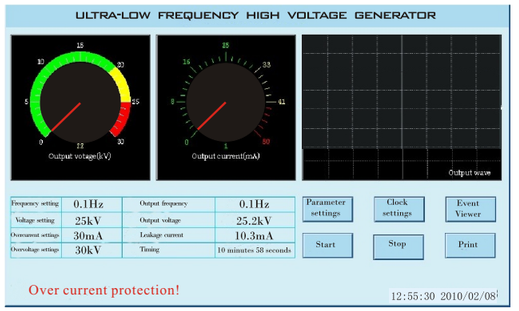

Figure 10

(4) Print

In *Figure 1* Click "Print" button, you can print the test data into the test report.

(5) Event Viewer

Click on the Event Viewer" button in *Figure 1*, and enter the interface shown in *Figure 11*. The instrument can store up to 64 test data; retained the last 64 historical records, before the 64 historical records will be automatically deleted. For example, in *Figure 11* test historical data, click on "Print" button, historical data that can print the current historical data into the test report.

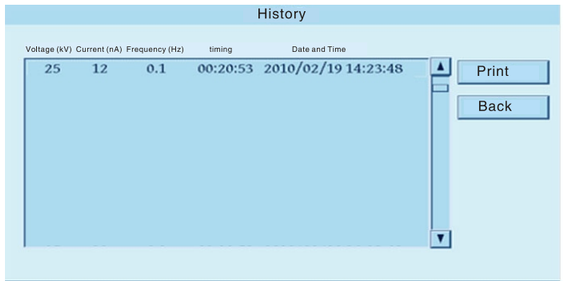

Figure 11

(6) Clock settings

Click on the Clock settings button in *Figure 1*, and enter the settings interface shown in *Figure 12*, you can set the date and time of the instrument.

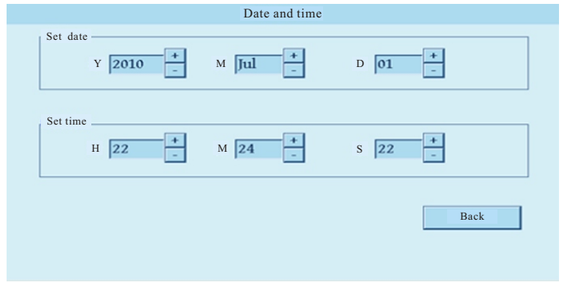

Figure 12

SVLF Ultra-low Frequency High voltage Generator Operating software

The instrument is equipped with SVLF ultra-low frequency high voltage generator Operating software; the main interface shown in Figure 13, the software supports Windows XP \ 2000 \ 2007 operating system. The software can be installed on a desktop or notebook, with the instrument via the USB cable to connect. All the operating functions of the instrument can set the parameters; start the booster test, view, save, print the test of historical data and other functions in SVLF ultra-low frequency high voltage generator Operating software.

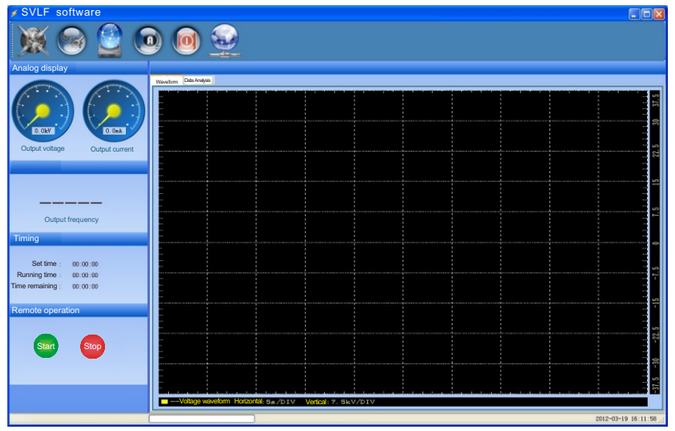

Figure 13

Note

1. When the pilot strict compliance with the security specifications of the high voltage test by professionals to operate;
2. If the instrument is faulty, do not attempt to disassemble, repair, should immediately contact me;
3. After the shutdown, with the discharge stick of the test product to fully discharge, convinced that after the discharge, and then stitches!

Supplied Accessories

1. A dedicated high voltage-voltage connecting cable;
2. A dedicated low-voltage connecting cable;
3. A power line;
4. Ten power fuse;
5. A discharge stick;
6. An instruction manual.

Transport and preservation

(1) Transport

The instrument must be transported in packaging, the box can be used cardboard boxes or wooden box, and the box should be a foam shock layer. Packaged product, should be able to by road, rail, air transport. During transport shall not be placed in open carriages. The warehouse should be noted that rain, dust, mechanical damage.

(2) Storage

The instrument when not in use, should be stored in ambient humidity -20 C to +60 C, relative humidity of not more than 85%, ventilation, indoor non-corrosive gases. Storage should not be close to the ground and walls.

(3) Moisture

In humid areas or wet season, instruments such as long-term not require Power-up time (approximately two hours) a month to make the moisture distribution and protection components.

(4) Anti-exposure

Instrument when used outdoors as much as possible to avoid or reduce direct sunlight. Instrument when used outdoors as much as possible to avoid or reduce direct sunlight.