SVLF

VERY LOW FREQUENCY AC HIGH VOLTAGE TEST INSTRUMENT (The third generation)

Operating Manual

Sandi Electric Co., Ltd

www.lgis.cc

Foreword

1. Thank you for using our products, you get our company comprehensive technical support and service.

2. This product specification for SVLF series VERY LOW FREQUENCY AC HIGH VOLTAGE TEST INSTRUMENT.

3. Before using this product, please read the operation manual carefully, and keep it for reference.

4. This product is a VERY LOW FREQUENCY AC HIGH VOLTAGE TEST INSTRUMENT, please use it according to the steps required in the manual, and strictly abide by the relevant provisions of the state. If used improperly, may damage the equipment and personal safety.

5. If there is doubt in the reading operation manual or using the instrument, can consult our company.

Description

Sandi VLF stands for Very Low Frequency. A Sandi VLF is an AC output high voltage instrument. Sandi VLF products provide sinusoidal AC voltage but at 0.1Hz - 0.02 Hz, compared to the 50/60Hz output of conventional AC test sets. It is still an AC voltage with sinusoidal polarity reversals every half cycle. The Sandi VLF instrument is used to provide a simple go/no-go, or pass/fail withstand test. Also, Sandi VLF instruments can be used as the voltage source for performing off-line Partial Discharge testing.

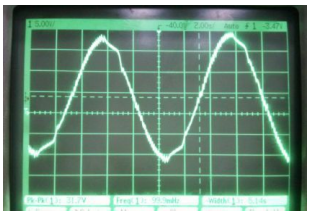
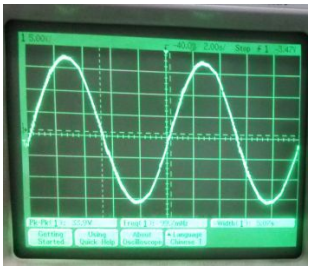
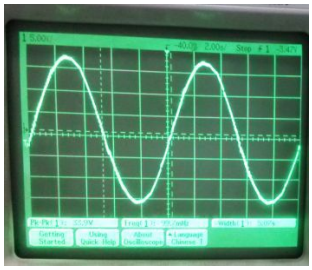
Application

Sandi VLF testing is used for any application requiring AC testing of high capacitance loads. The major application is for testing solid dielectric cable, followed by testing large rotating machinery, and occasionally for testing large insulators, arrestors, and the like.

Even if a utility doesn't adopt Sandi VLF for widespread cable testing, one of the best reasons to use VLF is to check installation quality and accessories, like splices. Many failures are due to damage during installation, improper workmanship, and/or insulation damage caused by excessive voltage fault locating - thumping. At the very least, every newly installed or repaired cable should be Sandi VLF tested before re-energizing.

The three generations of Sandi VLF technical performance comparison table

Sandi VLF	The first generation	The second generation	The third generation
Controller			

High voltage output waveform			
CPU	C51	ARM	ARM
Distortion	Serious distortion sine wave	Small distortion sine wave	Minimal distortion sine wave
Pulse current	big impact on power	Small impact on power	Smaller impact on power
EMC	Often crashes or Heaping	Strong anti-jamming capabilities	Stronger anti-interference capabilities
Display	Mono chrome LCD screen	7 “resistive Color LCD touch screen	7 “ capacitive Color LCD touch screen

Technical Data

No.	Description	Unit	Product Specs				
1	Main supply voltage.	V	220				
2	Current range.	A	4.8	6.4	8.0	9.6	12.7
3	Output voltage.	kV	30_{peak}	40_{peak}	50_{peak}	60_{peak}	80_{peak}
4	Output form		true sinusoidal, cosine rectangular				
5	Frequency ranges.	Hz	0.1、0.05、0.02				
6	Operating temperature.	C^o	0-50				
7	The accuracy of the instrument.	%	3				
8	Testable capacity at 30、40、50、60、80KV peak.	μF	0.1Hz,1.1μF; 0.05Hz,2.2μF; 0.02Hz,5.5μF				
9	Timer		The instrument contain a programmable test duration timer.				

No.	Description	Unit	Product Specs
10	Type of Protections: a) For instrument. b) For the user.		a&b
11	Maximum length of cable to be tested.	km	10
12	Sizes of the instrument components.	（L*W*H）mm	Controller: 357*243.5*131.8 The first-stage booster: 290*182*360 The second-stage booster: 355*190*470
13	Weights of the instrument components.	kg	Controller: 4Kg The first-stage booster: 25Kg The second-stage booster: 45Kg
14	Instrument capable		A. Testing capacitors, impregnated paper insulated power cables, bushings, insulators, transformers and switchgears. B. Measuring Leakage current during VLF and DC testing. C. Testing of sheath and Pin-Pointing of faults. D. Detecting of Breakdown. E. Internal discharge facility. F. Monitoring of earth loop (integrated safety system)
15	Print		An interconnect serial port for Laptop or PC available for print out of results.
16	View		there is a scoping for waveform view available.

No.	Description	Unit	Product Specs
17	Percentage of voltage waveform distortion.	%	5
18	Conditions of use		indoor/outdoor
19	Zero Start		A Zero Start Interlock is available.
20	Display		Color LCD

Benefits of Sandi VLF

- ✧ Portable and affordable.
- ✧ All models feature is true sine wave output.
- ✧ Waveform is independent of load capacitance between 0.01mF and maximum load.
- ✧ Highest load ratings available.
- ✧ Highest voltage models available.
- ✧ Simple and easy operation.
- ✧ AC testing does not degrade good cable insulation.
- ✧ Harmful space charges are not injected into the cable insulation.
- ✧ No traveling waves are generated during testing.
- ✧ Rugged and reliable design less prone to failure from transients.
- ✧ No polarization effects as with DC.
- ✧ Breakdown detection.
- ✧ Reporting
- ✧ 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 over-current protection, rapid response action (action time 10ms).
- ✧ Small size, light weight: very conducive to outdoor work.
- ✧ Communication interface: USB2.0.

Instrument components

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

Figure 1 Sandi VLF Controller board schematic

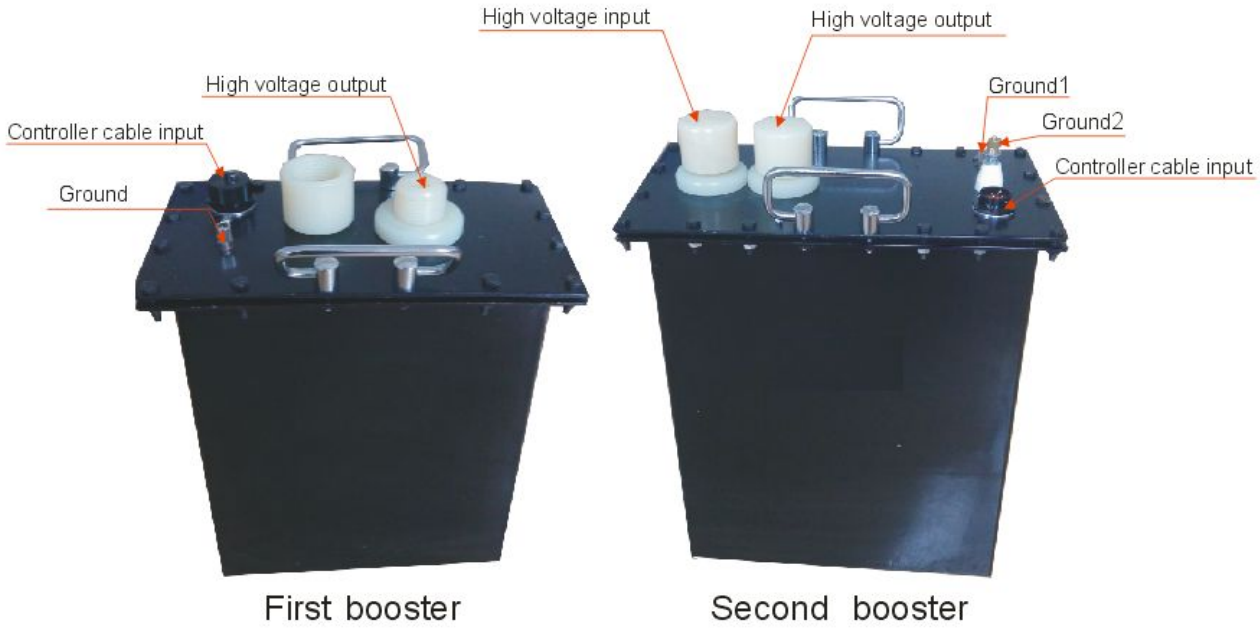
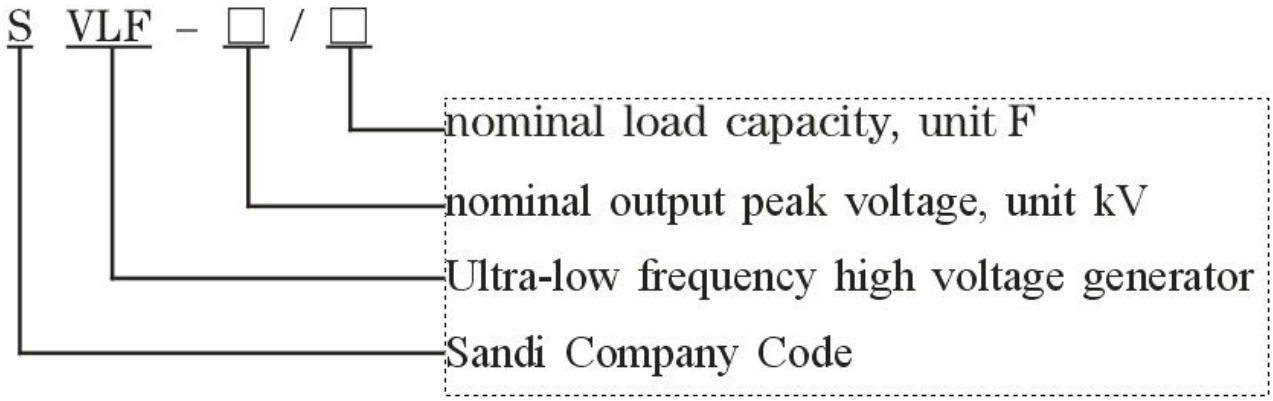


Figure 2 Sandi VLF booster schematic

Model defined



Instrument wiring methods

1. Cable test terminal voltage method as shown below:

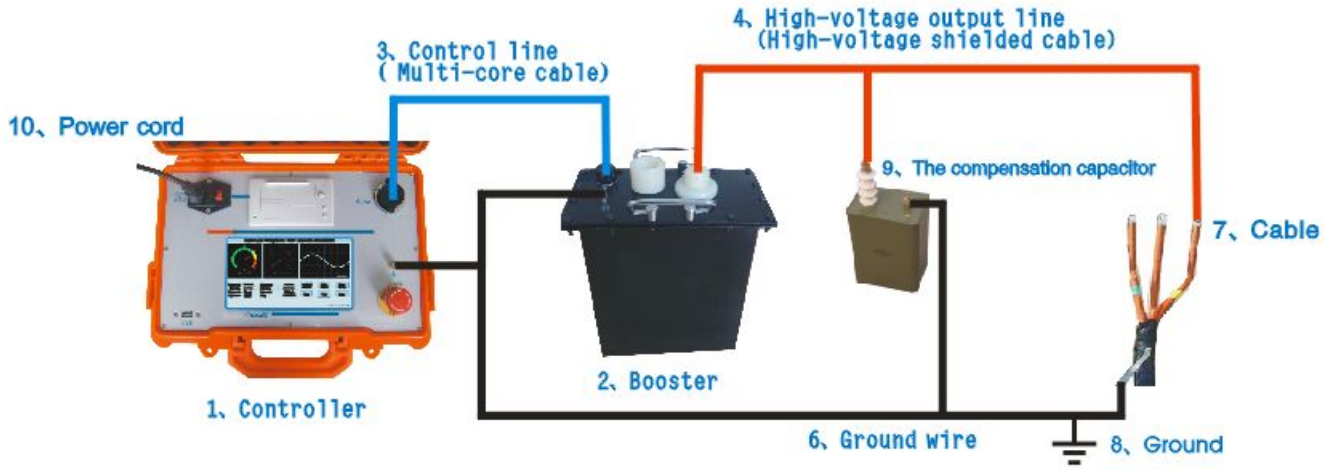


Figure 3Schematic diagram of cable test terminal

Instrument instructions for use

(1) The boot set test parameters

According to instrument wiring method even after all the lines, you can turn on the power switch. Instrument in microcomputer power on or after a reset, automatic access such as the interface shown in figure 4. Test parameters were the first set. According to the test set test time, test the output frequency, voltage, high voltage side over current protection, overvoltage protection values in Figure 4 screen, and Click "Save" button save the parameters. Click "Return" button appears Figure 5.

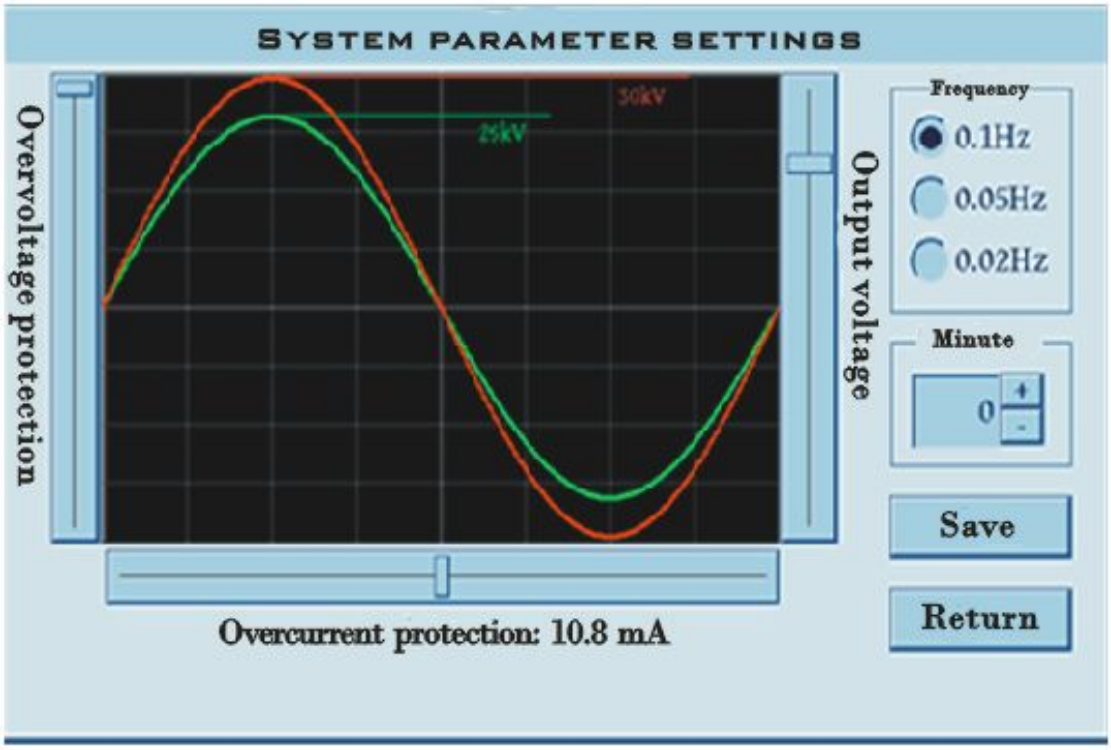


Figure 4 set test parameters

Parameter settings as follows:

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

Automatically after power up or reset of the instrument on the microprocessor, the interface shown in Figure 5. 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.

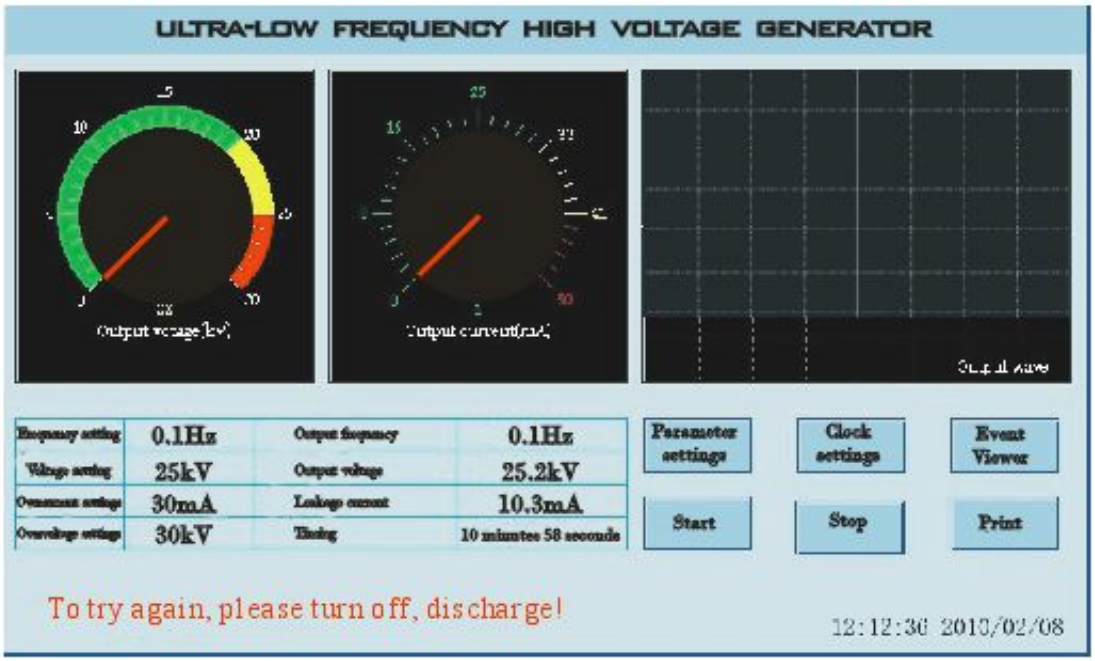


Figure 5 the main interface

(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 6 in the status bar message: "Load unconnected".

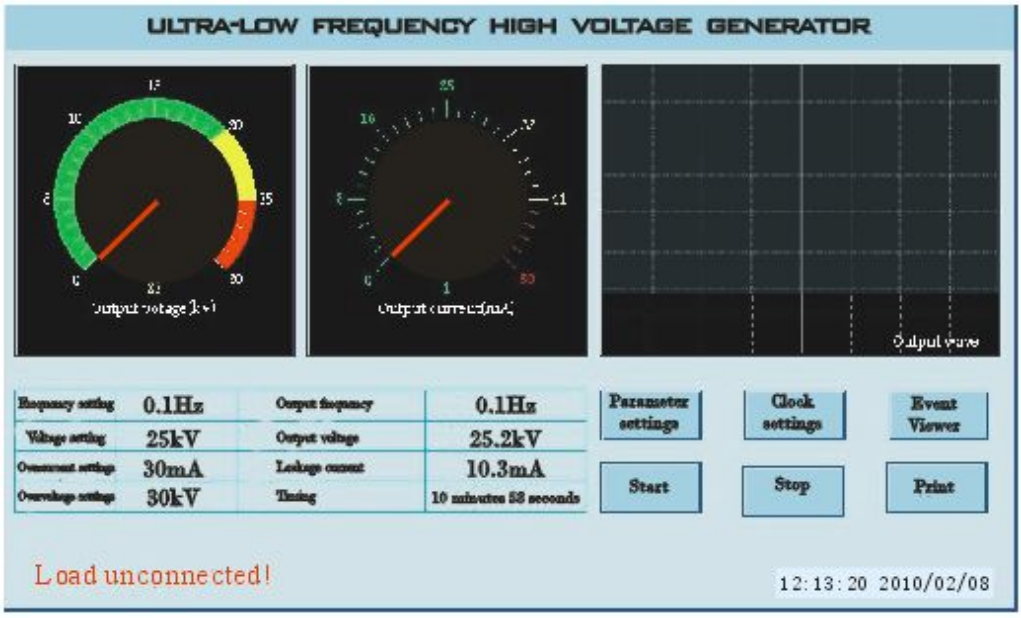


Figure 6

2. Boost

After the self-test is successful, the instrument automatically boost, as shown in Figure 7 in the status bar message: "In boosting". At the same time, the timer starts.

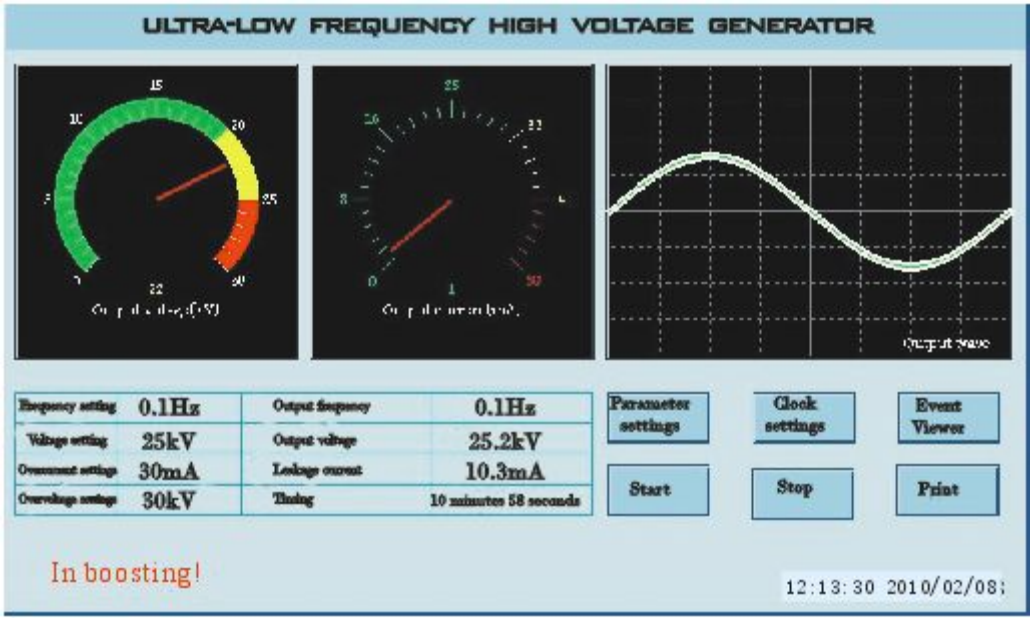


Figure 7

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 8 in the status bar message: "Equal amplitude output!".

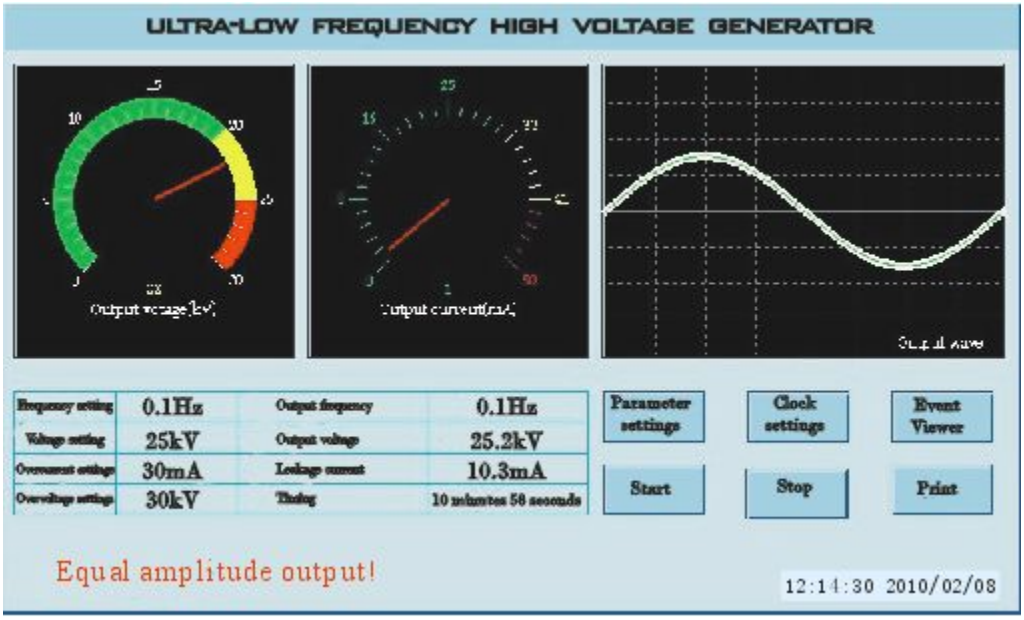


Figure 8

4. Stop

When the timer reaches the set time, the instrument is automatically shut down, as shown in Figure 9 in the status bar message: "Stop the high voltage output!".

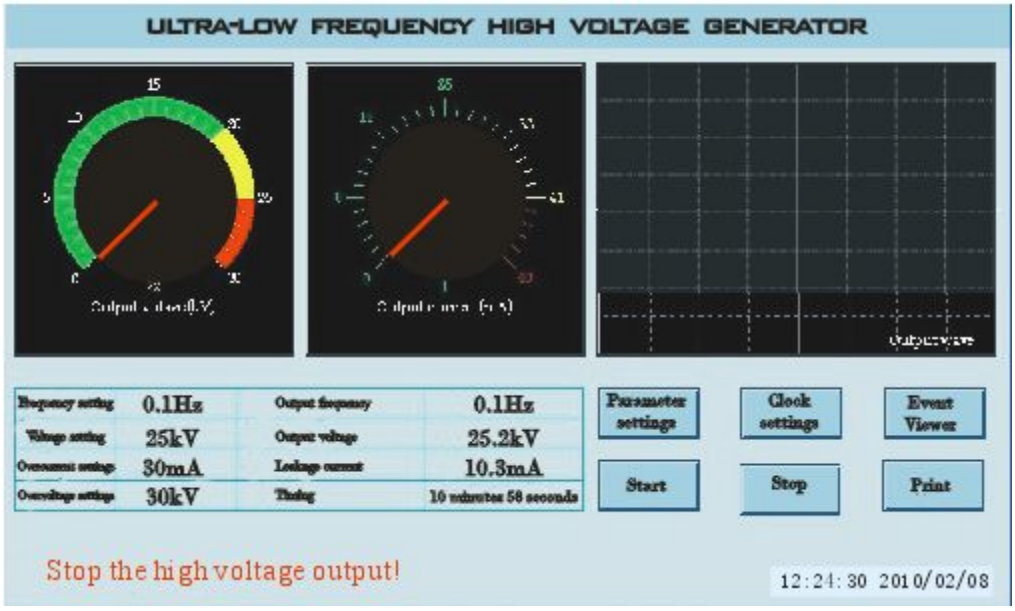


Figure 9

After the Instrument stop and discharge, there is shown in Figure 10 status bar message: "Test passed!

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.

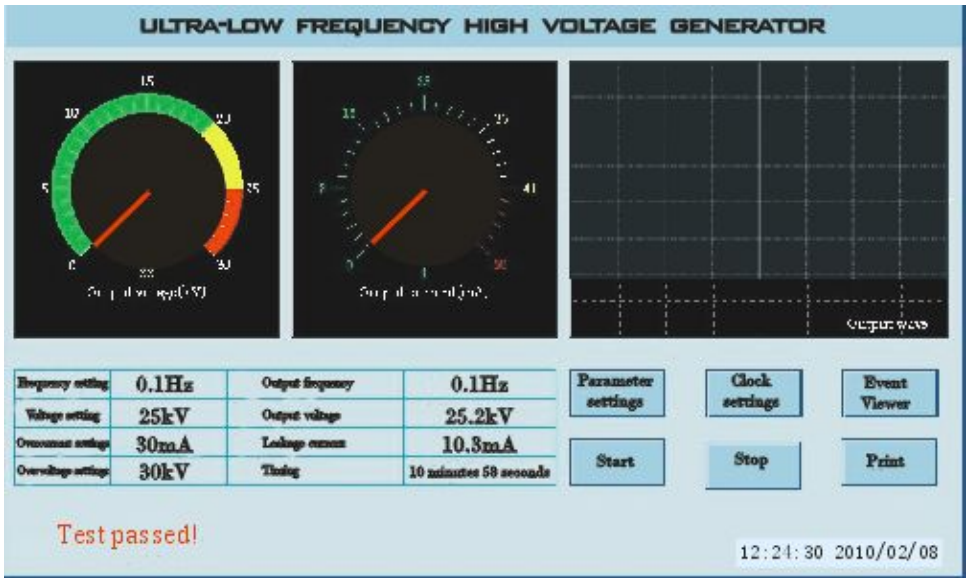


Figure 10

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.

a. 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 11 in the status bar after the shutdown message: "Over voltage protection!" and perform the test data is saved.

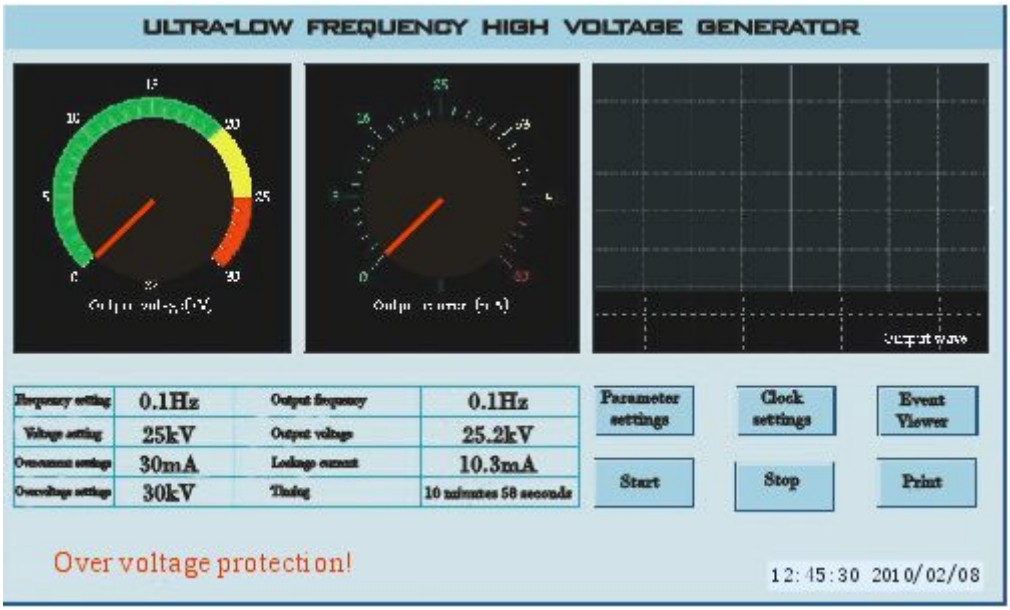


Figure 11

b. 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 12 status bar after the shutdown message: "Over current protection" and perform the test data is saved.

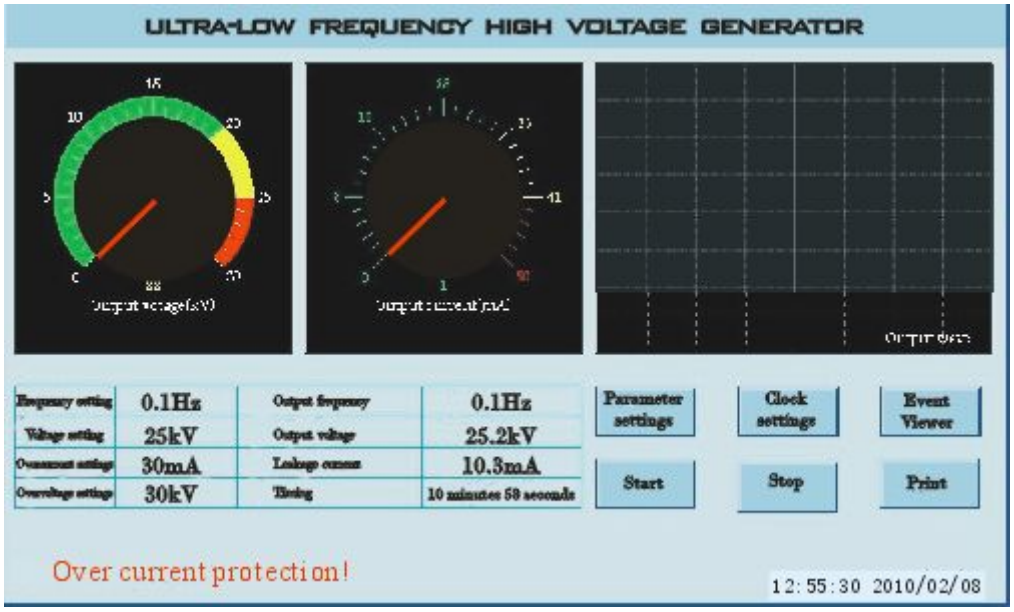


Figure 12

(4) Print

In Figure 5 Click "Print" button, you can print the test data into the test report.

(5) Event Viewer

Click on the "Event Viewer" button in figure 5, and enter the interface shown in figure 13.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 13 test historical data, click on "Print" button, historical data that can print the current historical data into the test report.

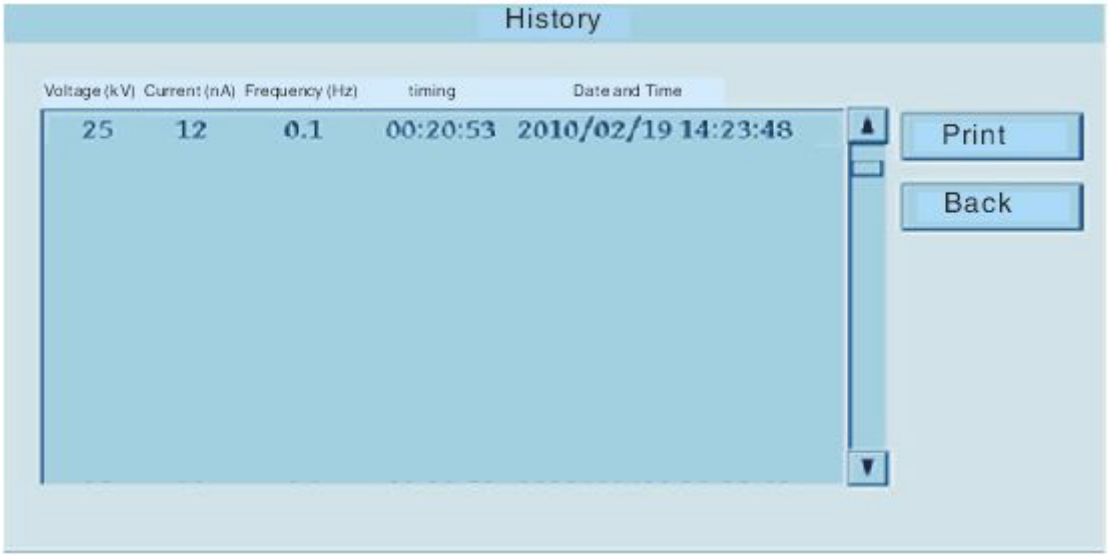


Figure 13

(6) Clock settings

Click on the Clock settings button in Figure 5, and enter the settings interface shown in Figure 14, you can set the date and time of the instrument.

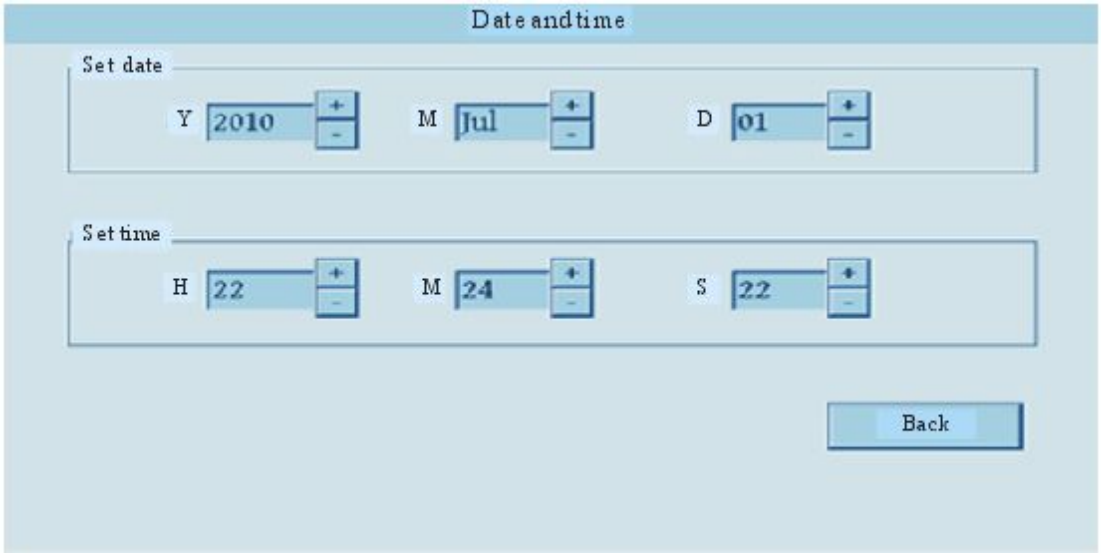


Figure 14

Operating Software

The instrument is equipped with SVLF software; the main interface shown in Figure 15, 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 Sandi VLF software.

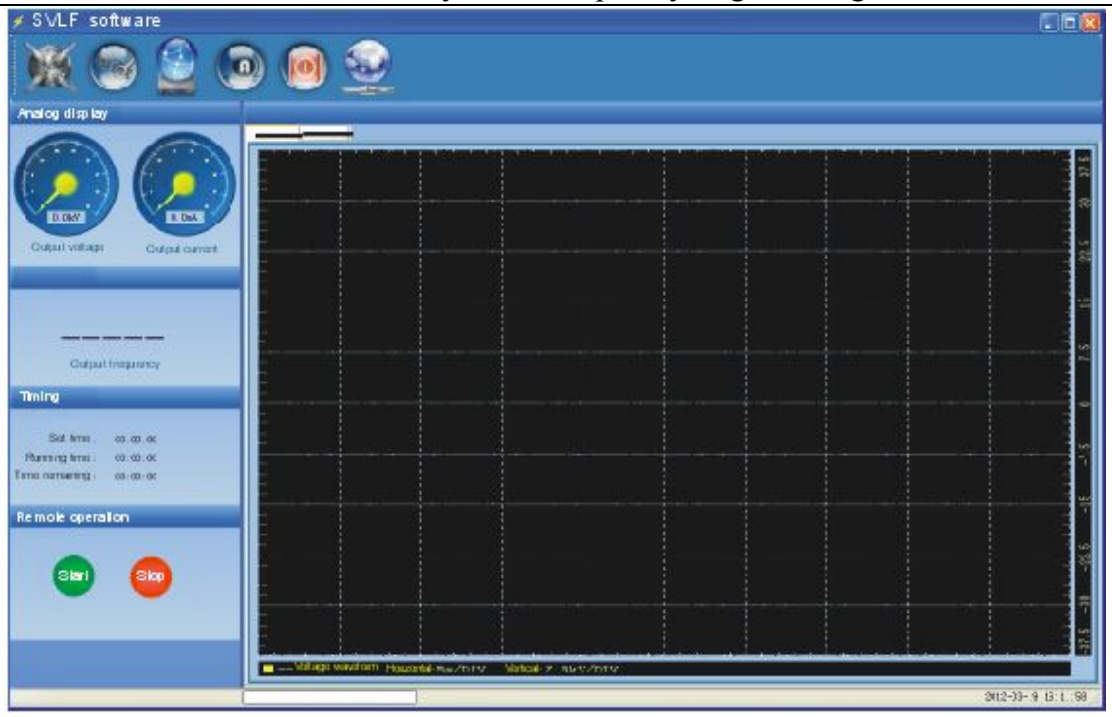


Figure 15

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℃ to +60℃, 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.