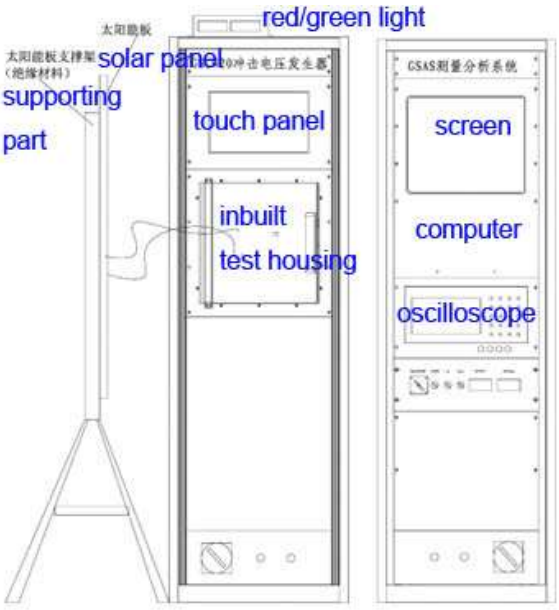
Technical Specification of
SXCW-30 Impulse Voltage Generator

1. General

Impulse voltage generator can be used to generate impulse of exponential shapes to perform high energy surge tests. The system can output 1.2/50 μ s up to 30kV.



The supporting part and solar panel will not be provided by HVGRAND.

The left cabinet (called control cabinet) consists of green& red light, touch panel, testing housing, PLC controlled, control software, wave resistors, charging unit, discharge unit, automatic earthing system and impulse capacitors.

The right cabinet (called measurement cabinet) consists of Dell computer screen with impulse analysis software, Advantech industrial computer and American Tektronix oscilloscope.

2. Delivery List

The impulse voltage generator includes the below items:

a) Control Cabinet

1) Dimension of control cabinet: 600(D)*800(W)*1800mm (H), approximately 280kgs;

2) Control system with Mitsubishi PLC (Japan brand) and touch panel;

3) Charging unit with rectifier

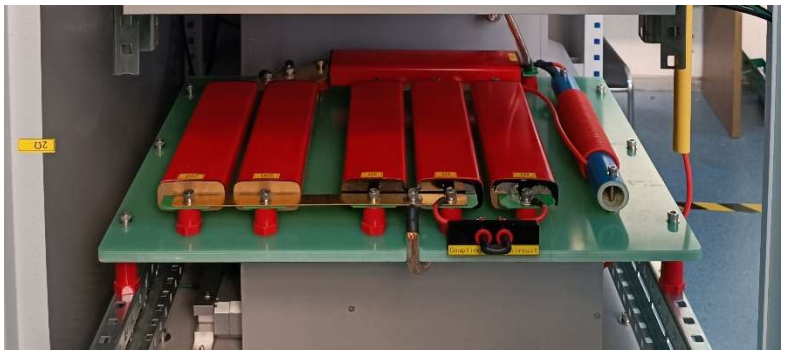
4) Capacitor bank: 1pc 3 μF/35kV impulse capacitor ;

5) Discharge unit;

6) Automatic polarity change: positive and negative

7) Automatic earthing and safety interlock;

8) 7 groups impulse module (wave front and wave tail resistors);



9) Red and green lamp for indication;

10) Emergency stop button;

11) Test cabinet: L*D*H=400*400*300mm;

b) Measurement cabinet

1) Dimension of measurement cabinet: 600(D)*800(W)*1800mm (H), approximately 200kgs;

2) Industrial computer with Impulse analysis software;

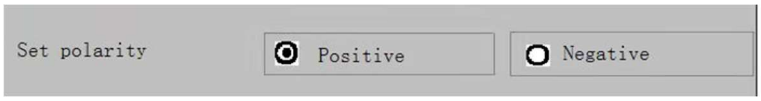
3) US brand Tektronix oscilloscope TBS2102 (100 MHz analog bandwidth, 2 analog Channels, sample rate up to 1 GS/s, 20k sample record length, 8 bit vertical resolution);

4) Measuring cable;

5) 2-30kV voltage divider with BNC connector for 1.2/50 μ s to reduce the voltage signal to a value that the measurement system can receive.

Features

1) Automatic polarity switching, the polarity can be changed from positive to negative or negative to positive automatically just by pressing the button on the control software.



2) Easy operation and maintenance
3) Liquid insulation in the impulse capacitors offers optimal environmental compatibility (no PCBs). The impulse capacitors have very low inductance, high quality and long service life.
4) Considerate safety measures

- Door safety interlock
- The whole cabinet is grounded to earth.
- Emergency stop button is equipped with magnetic materials and is removable on both sides according to the height of the operators.

- Manual earthing rod-- when the operator opens the back door of the cabinet to change the impulse module or do some maintenance work, the manual earthing rod should be hanged in the place to discharge the energy of HV terminal to ensure the safety of the operator.

Manual earthing rod

- Automatic earthing system--the machine will automatically discharge the energy through the earthing stick after each impulse.
- Green/Red warning lamp indication on top of the machine, which is easy to be watched. It is red when the test is going; It is green color when the test is finished.

3. Color

Insulating parts gray-white RAL1035 (Gray) and impulse capacitors blue RAL 5002 (Blue).

4. Ambient Conditions for the Surge Test System

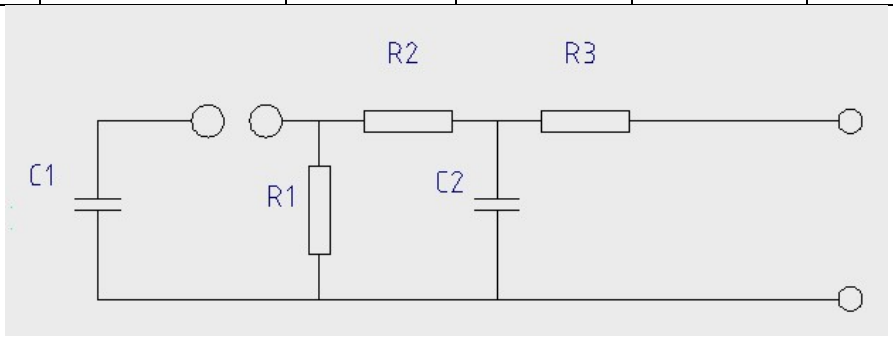
Height above sea level <1000m (For higher altitudes special design will be required);
Relative humidity without condensation: <90%
Temperature average over 24h for high voltage parts: min. -5°C, max. +30 °C Extreme temperatures for high voltage min. -5 °C, max. +40 °C Temperature for electronic controls and measuring equipment to operate with the specified measuring errors min. +15 °C, max. +25 °C
The room where the test system is located must be clean and dust-free.
Earth resistance must be less than 0.5 Ω, with an independent earthing system;

5. Technical Data

1) Input voltage: phase to neutral, AC 220~230V;
2) Frequency: 50Hz;
3) Input power: 2kVA;
4) Maximum DC charging voltage: DC32kV; maximum charging current:0.2A; Charging time: reach @ 32kV within 40~60s (adjustable);
5) Output Waveforms as the below table

No	Output waveform	Output range	Load capacity	Wave Front time T1	Time to half value T2

				(μs)	(μs)
1	Open circuit voltage 1.2/50μs	3~32kV	≤0.12μF	1.2 ± 30%	50 ± 20%



6) Tolerance of peak voltage: ≤±3%;

7) Measuring accuracy: ≤±3%;

8) With wheels at the bottom for easy movement.

6. Touch panel and Control software

We use touch panel with the software as the control system.

The functions of control software are as below:

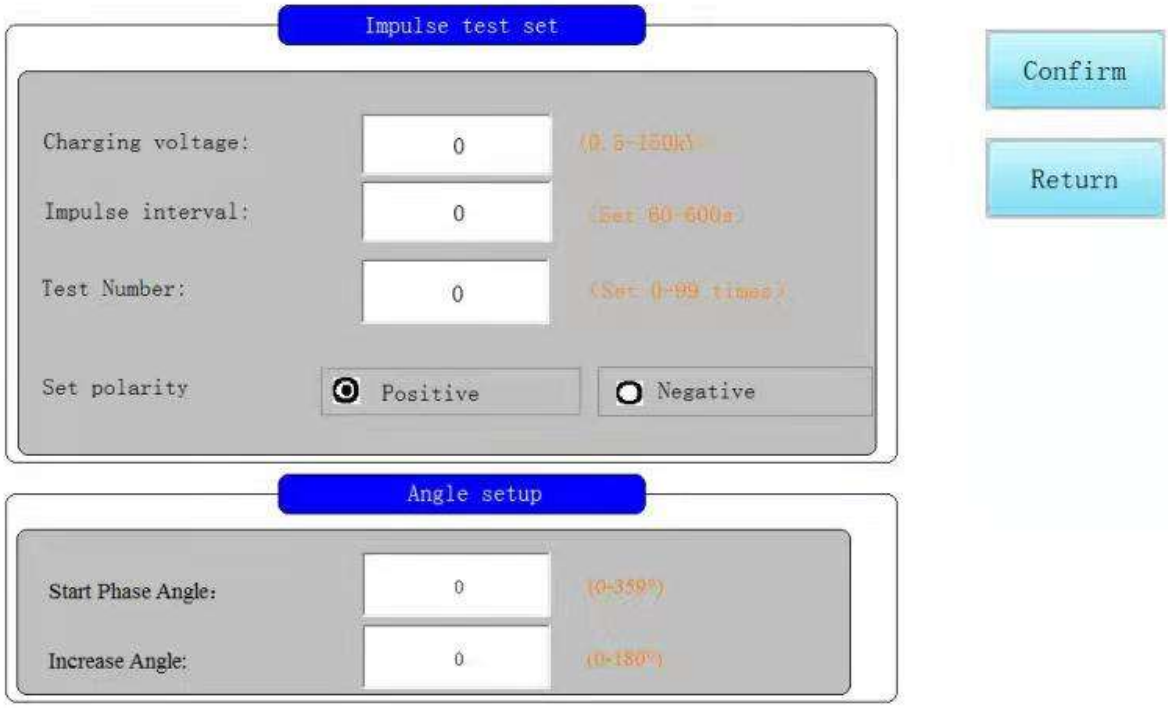
1) Set the charging voltage, interval time, number of test (can be from 1 till 99);

2) Safety: The system has set the maximum charging voltage for 8/20 μ s and combination wave respectively. In case the operator sets the charging voltage above this value, the machine will not charge at all. It will give the error tips.

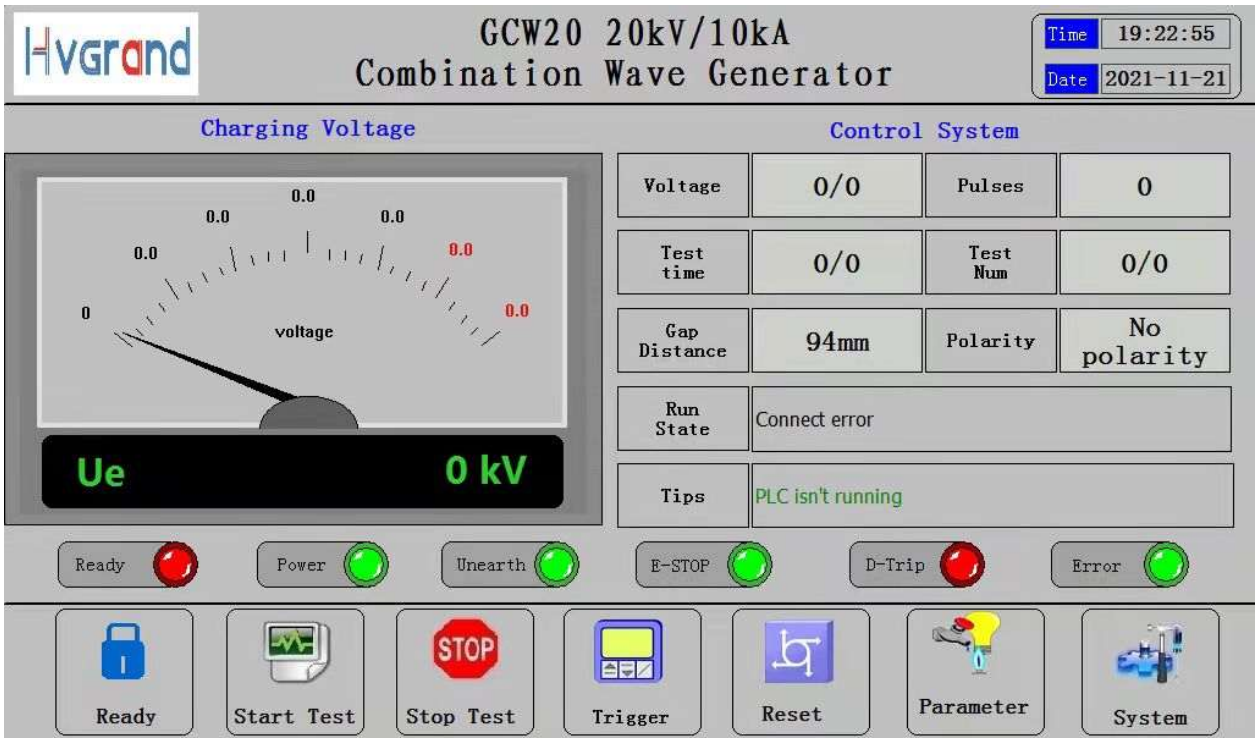
3) Select the positive polarity or negative polarity, the machine will change the polarity automatically;

4) Once the charging voltage is set, the gap distance will be adjusted automatically to the desirable value.

5) There are information tips on the touch panel to show the error information or running condition.



Set charging voltage, interval time and test numbers

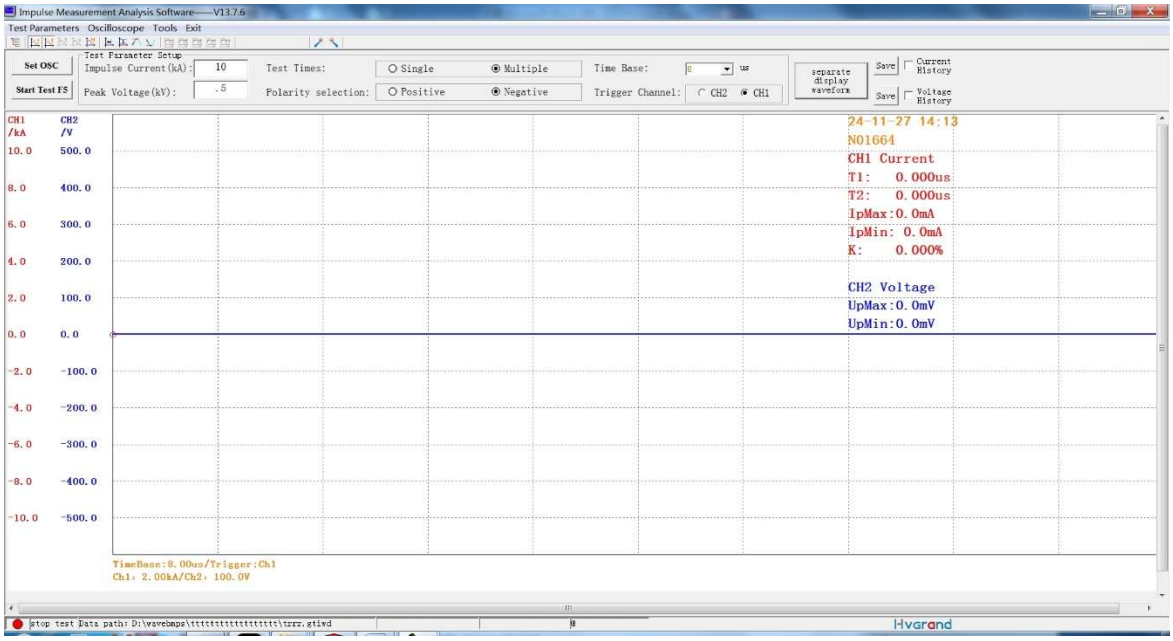


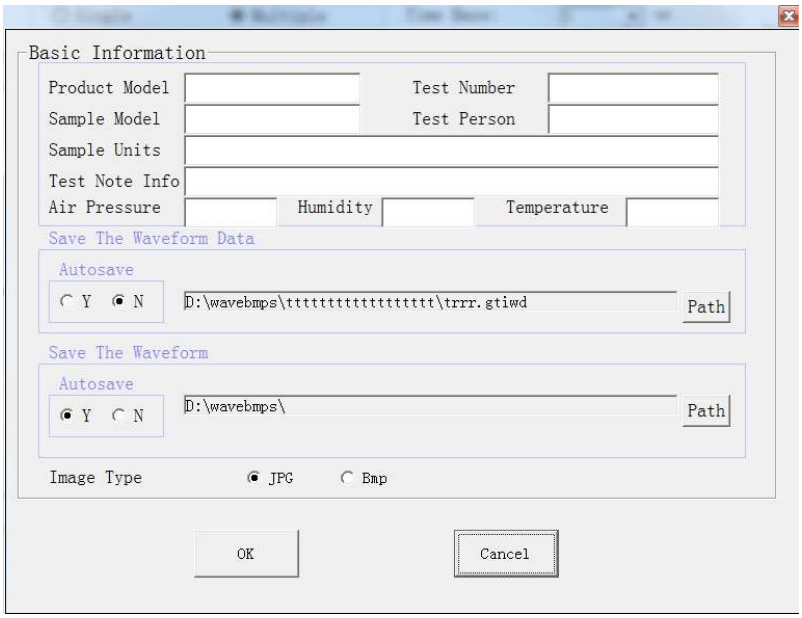
Main control software

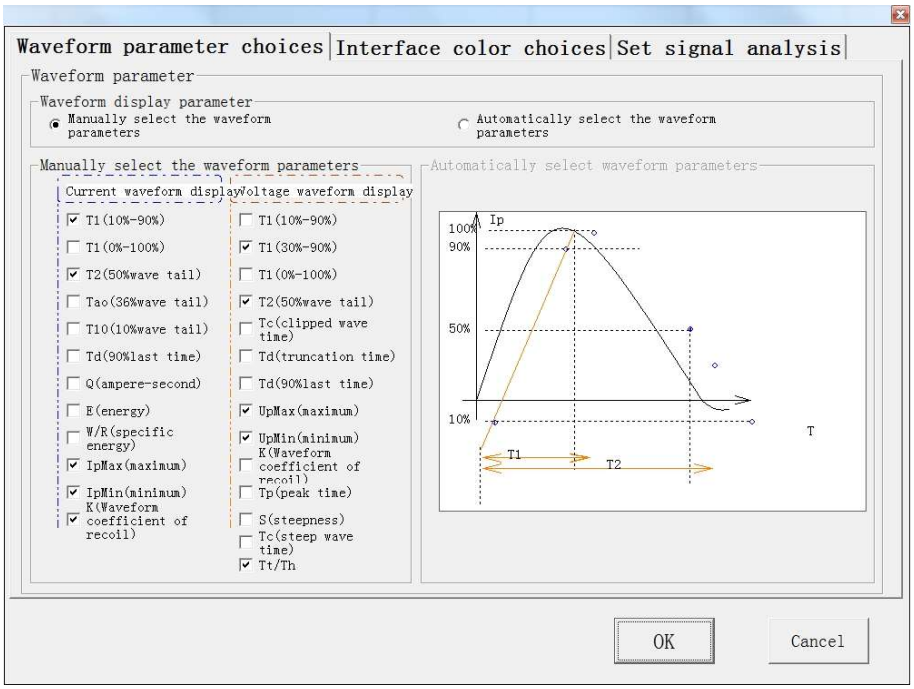
7. Impulse analysis software (measurement software)

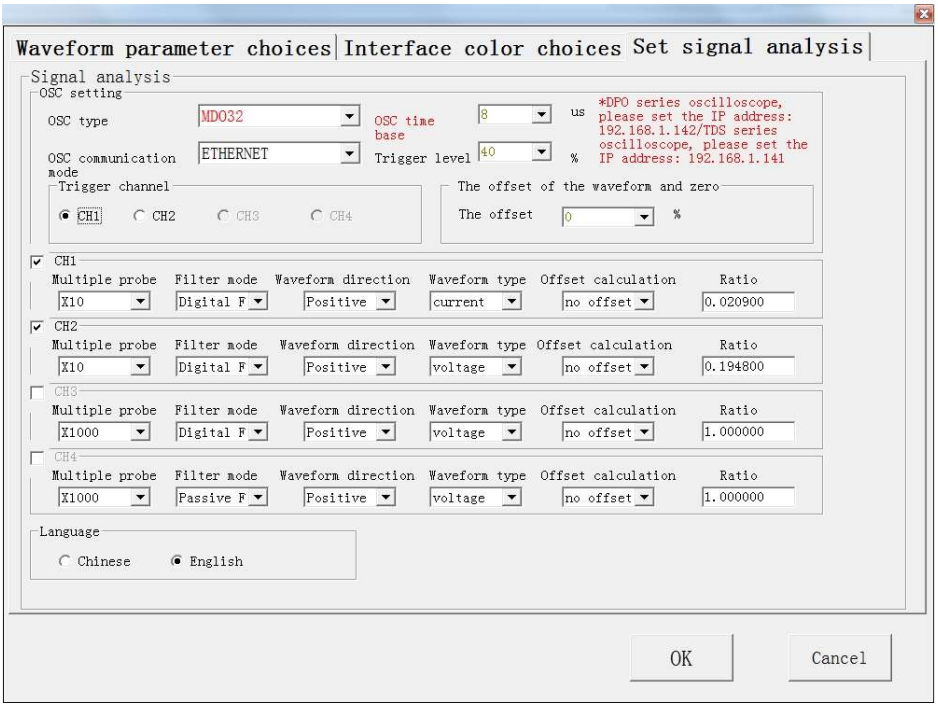
The functions of the impulse analyzing software are as below:

1) Can input the name of the test person, name of the test object, model no of the test object;
2) The waveform can be stored in jpg or bmp format according to the customer's requirement. The measurement software will automatically save the waveform after each discharge.
3) Some important remarks can be written on the output waveform.
4) The impulse waveforms can be displayed on the computer, showing wave front time T1, wave tail time T2, peak current and peak voltage.
5) The excel file test report can be achieved for convenient edit.
6) The waveforms can be copied to USB disk.
7) The color of the output waveforms can be changed according to the operator's requirement.









8. Check and Routine Test on the Test System

In Works Tests

The tests must be carried out with test objects delivered by the customer to our works. They remain the property of the customer and shall be taken back after the tests.

All transportation costs shall be on customer's account.

We bear no liability should any test object be damaged during the tests. A sufficient number of test objects shall be made available at least 2 weeks before the acceptance test date.

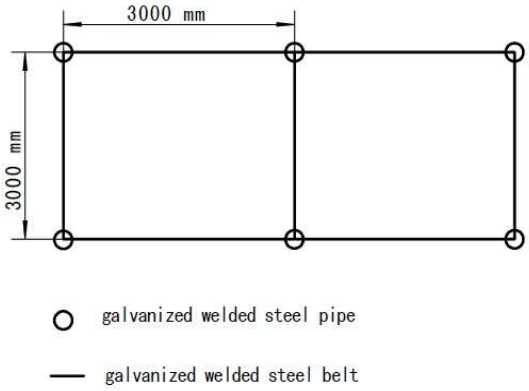
9. Quality guarantee

12 months quality guarantee after successful delivery in the customer's side

10. Documents (English)

Test reports
Circuit diagram
Operation and maintenance manuals

11. Technical requirement of Earthing system (See the below drawing)



Technical Requirements of Earthing System

1) galvanized steel pipe with 50mm diameter, length=2500 mm
2) The pipe is as long as enough to reach the water/wet-earth
3) Connect the pipes with galvanized steel belt, 5mmx40mm with welded connection
4) Lead the earthing system to lab with copper belt,
5) The earthing resistance is less than 0.5 Ohm

A good test field has a separate grounding. This ensures that no disturbances from surrounding machines enter the test field and - in case of a failure - the earth potential of the surrounding does not rise, causing damage to electrical equipment. It is necessary for the test field to have a lower grounding resistance than the surrounding building.