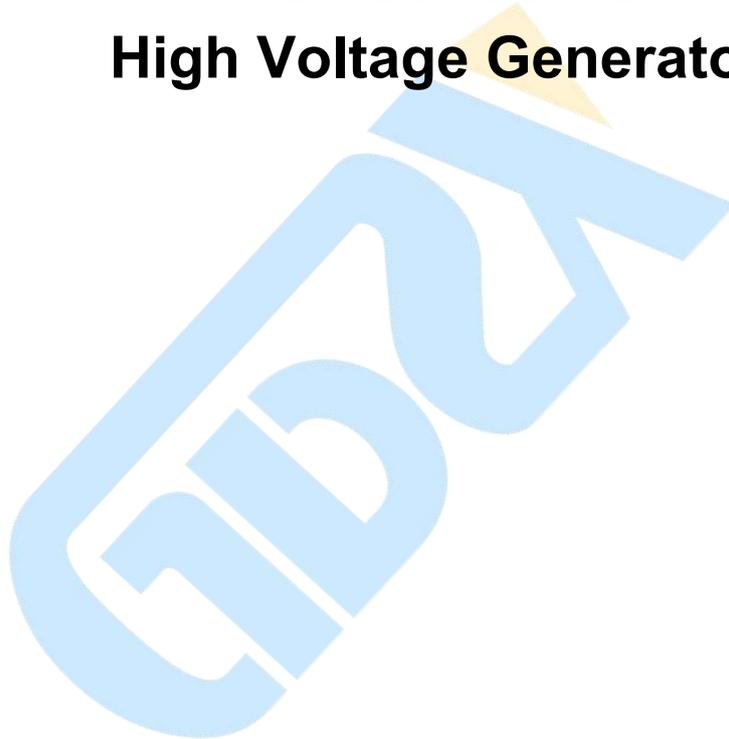


**ZGF Series DC
High Voltage Generator**



Contents

warning.....	- 2 -
I 、 Product Overview.....	- 3 -
II 、 Principle Of Operation.....	- 3 -
III、 Technical Character.....	- 3 -
IV、 Technical Parameters.....	- 4 -
V 、 Function Description.....	- 5 -
VI、 Operation Steps.....	- 7 -
VII、 Fault Resolve.....	- 9 -
VIII、 Complete Sets Of Products.....	- 10 -

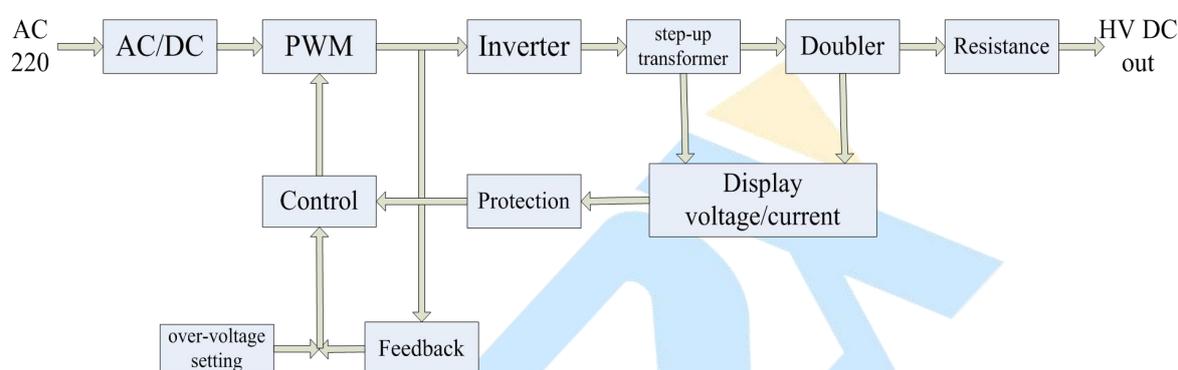
warning:

- ❖ The staff of the use of the High Voltage DC Generator must be a professional personnel with "high pressure test certificate".
- ❖ Using this instrument, please users must according to the electrical safety, "the provisions of article 168 and power supply before entering the tester installed two obvious breaking point. When replace the trial product and the wiring should be the first two power off some obvious breaking.
- ❖ Please check the control box, cylinder pressure tester and test times the grounding wire is connected before test. Test circuit grounding line should be in accordance with the specifications shown in the ground.
- ❖ The discharge of large capacitor should be tested with 100 Ω discharge resistance. Discharge can not be discharging rod immediately contact product, should be the first discharge rod gradually close to the sample to a certain distance air gap began to hiss free discharge. When no sound is available when discharging rod discharge, finally direct ground discharge.
- ❖ In the test of capacitive load, the upper bound flow resistance must be connected.
- ❖ At 200kV and above, the DC high voltage, even though the test personnel wear insulated shoes and is in a safe distance, but because of the influence of high voltage DC ion space electric field distribution, will make a few of the human body with different DC potential. The test personnel do not shake hands or contact with the ground body, otherwise there will be a slight electric shock phenomenon, this phenomenon in dry areas and winter is more obvious, but because of the smaller the general will not cause damage.
- ❖ After testing the grounding wire must be linked to the high voltage output can be removed at the high voltage lead.

I 、 Product Overview

ZGF High Voltage DC Generator is a new generation of portable High Voltage DC Generator based on the new standard of the Chinese electric power industry DL/T848.1-2004. Mainly used in electric power sector, mining, metallurgy, steel and other enterprises of the power sector to the zinc oxide lightning arrester, power cable, transformer, generator and other high voltage electrical equipment for DC voltage test.

II 、 Principle Of Operation



III、 Technical Character

1. Case using aluminum alloy chassis.
2. PWM pulse width modulation technology and high power IGBT device are applied to the medium frequency power voltage circuit.
3. Using voltage feedback, output voltage stability, ripple coefficient is less than 3%.
4. Full range smooth regulator, voltage regulating fineness regulating precision is less than or equal to 0.5%, stability is less than or equal to 1%, voltage and current error of $\pm (1.5\% + 2 \text{ words})$, current error of plus or minus $(1.5\% + 2 \text{ words})$.
5. Boost potentiometer zero boost.
6. 0.75UDC1mA function button, easy to test the zinc oxide lightning arrester, the accuracy of $\pm (2\% + 2)$.
7. The over-voltage protection is set with the drawing code, and the error is 2%.
8. Double pressure using new material, lightweight, sturdy. Special insulation material, good electrical performance, good moisture resistance.



9. ZGF products comply with the requirements of DL/T848.1-2004 technology, and the power of the electrical equipment quality testing and testing center type test, strict implementation of corporate standards.

IV、 Technical Parameters

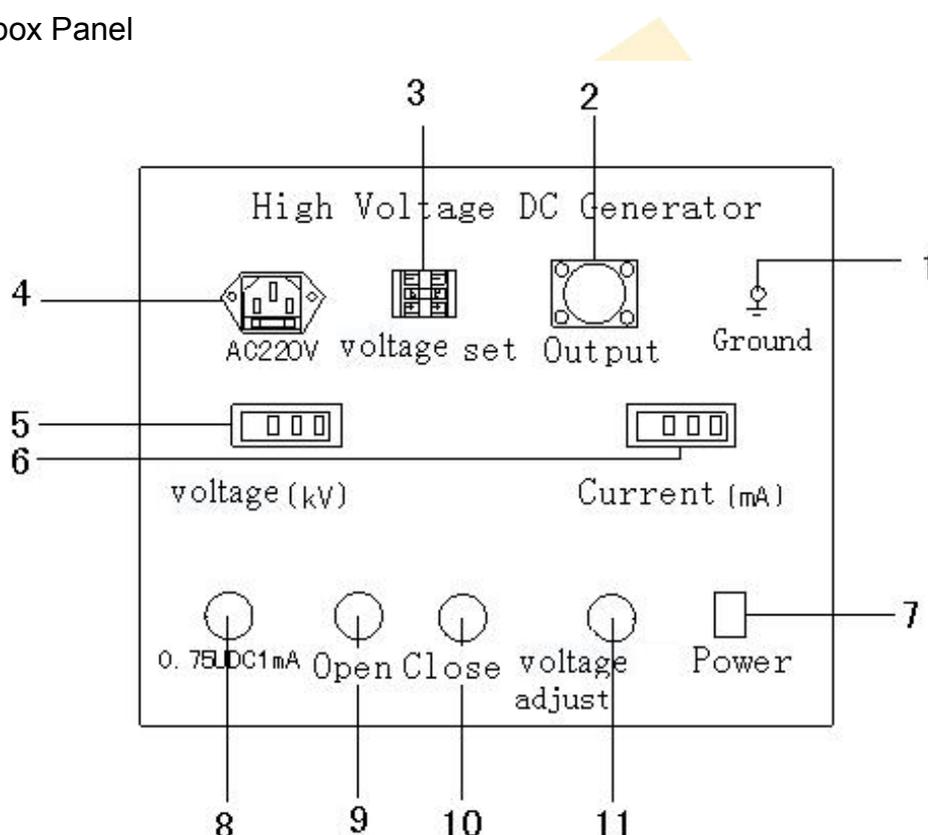
Specifications Parameter	60/2	60/3	60/5	120/2	120/3	120/5	120/10
Rated voltage (kV)	60	60	60	120	120	120	120
Rated current (mA)	2	3	5	2	3	5	10
Rated power (W)	120	180	300	240	360	600	1200
Chassis weight (kg)	8	8	8	2	3	5	9
Double weight (kg)	4	4	5	6	6	8	9
Double height (mm)	440	440	440	535	535	535	750
Voltage measurement accuracy	Digital display table (1.5% + 2)						
Current measurement accuracy	Digital display table (1.5% + 2)						
Ripple coefficient	≤3%						
Voltage stability	Random fluctuations, power supply voltage change 10%≤1%						
Overload capacity	No-load voltage can exceed the rated voltage of 10% to 10 minutes Maximum charge current of 1.25 times the rated current						
Power supply	Single phase AC 220V 50HZ 10%						
Working style	Discontinuous use						
	One time, the longest time is 10 minutes						
Working environment	Temperature: 0~40						
	Relative humidity: room temperature to 25 DEG C is not greater than 85% (without dew)						
	Altitude: 1500 m below						
Structure characteristic	Epoxy glass fiber reinforced plastic electric insulation						
	Air insulation, no leakage						

Operating box features	High precision 0.75UDC1mA single touch button (accuracy = 2%)
	Most suitable for zinc oxide arrester test
	Over voltage protection, at a glance
The case of double pressure placed in an aluminum alloy box, the machine can be put on a hand	

Note: the company reserves the right of interpretation as the product is constantly updated without notice.

V、Function Description

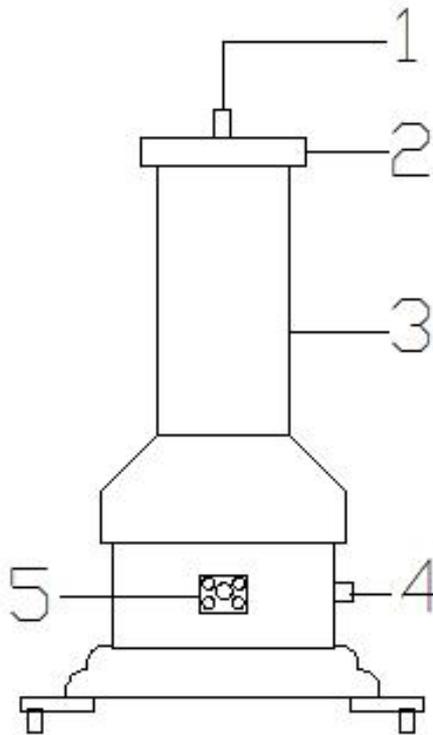
1. Control box Panel



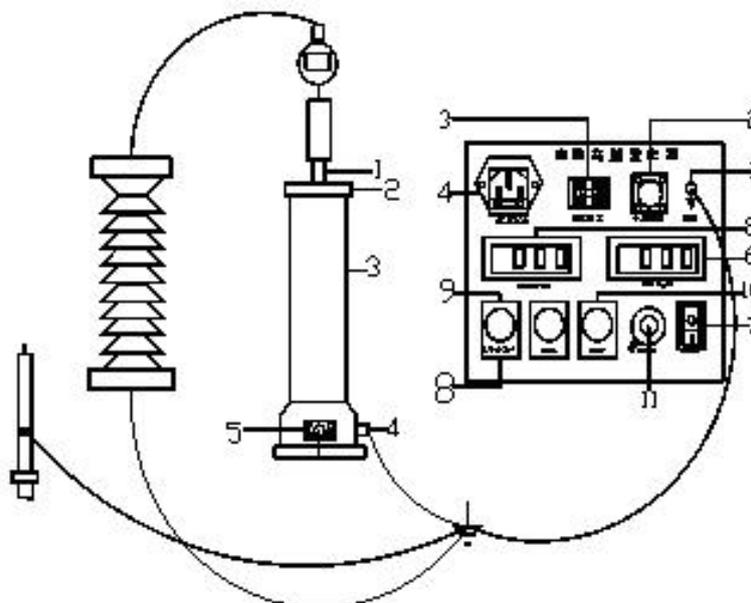
- 1) Ground terminal: When testing, the grounding terminal of control box and high-voltage cylinder should be connected together, and then connected with the earth.
- 2) Output port is used for the connection of the control box and high-voltage cylinder. We only rotate the cable pressing plug clockwise in place when connecting, only rotate the cable plug anti-clockwise when broking.
- 3) Voltage setting switch: Used for setting the over-voltage protection value. The display unit of dial switch is kV, set values is 1.1 times of the test voltage.
- 4) Power input socket: A random configuration of power line and the power input socket. (AC voltage $220V \pm 10\%$, socket with fuse.)
- 5) Digital voltage meter: Digital display high voltage DC output voltage.
- 6) Digital current meter: Digital display high voltage DC output current.

- 7) Power switch: Forward press, the power is on, the red lights, conversely to shutdown.
- 8) Yellow light button: This function is designed for zinc oxide arrester for measurement of 0.75UDc1mA. It's effective when the green lights. After pressing the button, output voltage reduce to the original 0.75%, and keeps this state. Press the red button, red light and green light all out, high pressure cuts off and exits 0.75 times state.
- 9) The green button: High-voltage output button, high voltage indicator lamps. In red light state, press the green button, the green light and red light out, this means high voltage circuit is switched on, then we can raise voltage. It's Effective that this button must be on voltage regulating potentiometer zero state. If press the green button, the green light is bright red, at the same time the red light is brighter, but release the green button, green light out and red light, it means Internal protection circuit has been working.
- 10) Red button: the red light shows that the power is switched on and the high voltage is cut off .In the green state ,press the red button, red light is bright, high voltage is cut off.
- 11) Voltage adjusting potentiometer: The potentiometer is a multi-turn potentiometer. Rotate clockwise to boost, and conversely to Step-down. The potentiometer has the function of controlling electronic zero protection, so must firstly return to zero before boosting.

2. High-voltage cylinder



- 1) High voltage terminals (connect Microampere meter and water resistance or current-limiting resistor)
 - 2) The cover of High-voltage cylinder
 - 3) High-voltage cylinder
 - 4) Grounding terminal
 - 5) Intermediate frequency output terminal
- ### 3. Testing connection



VI、 Operation Steps

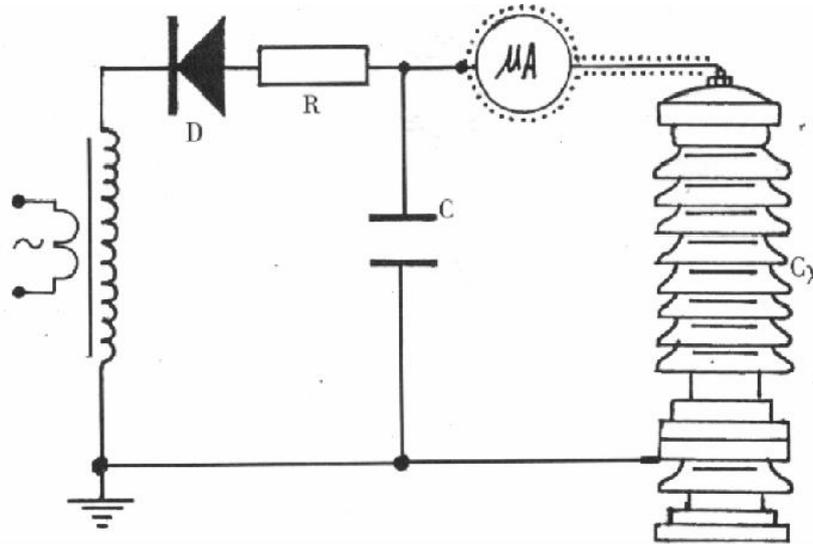
(If capacitive load, should access the current-limiting resistor)

1. Check integrity before using the tester, make sure that there is no circuit breaker or short circuit in connecting cable, and equipment without rupture damage.
2. Put the control box and High-voltage cylinder in place, then respectively connect power line, control cable and grounding line ,protect all grounding wire separately connecting to the sample point (one point tie to the earth).Forbids the grounding wire connected in series. For this purpose, you should use the DHV special grounding wire.
3. Keep power switch off and check voltage potentiometer at zero. Over voltage protection setting value is generally 1.1 times of the testing voltage.
4. No load ,step-up to verify the sensitivity of over voltage protection setting.
5. Put power on, the red light, it means power on.
6. Press the green button, then the green light, it means high voltage is outputting
7. Regulate pressure regulating potentiometer clockwise direction smoothly, output end is raised from zero to a desired voltage, according to the prescribed time recording current meter readings, and check the control box and high voltage output line has no abnormal phenomenon or sound.
8. Reduce voltage , regulate pressure regulating potentiometer to zero, then press the red button, cut off the high voltage and then turn the power switch off.
9. To test for leakage and DC voltage endurance, check test confirmation tester without exception, you can start test for leakage and DC voltage endurance test. Connect the test items and grounding wire, and then can open power s before there is no mistake.
10. Raise to the required voltage or current. The suitable raising speed is 3 - 5kV test voltage per second. For large capacitance, we need to monitor of ammeter charging current not exceed the maximum charging current tester while raising voltage. For small capacitive products such as zinc oxide arrester, lightning arrester, we firstly raise to a desired voltage (current) at 95%, then slowly raise to a desired voltage (current).From the digital display meter, we can read out voltage (current) value. For

zinc oxide arrester 0.75UDC - 1mA measurement, we firstly rise to UDC1mA voltage value, and then press the yellow button, when the voltage is reduced to the original 75%, and remains in this state. At this time, current value can be read. After the measurement, regulate pressure regulating potentiometer anticlockwise to zero, press the green button. Press red button when you need raising voltage again

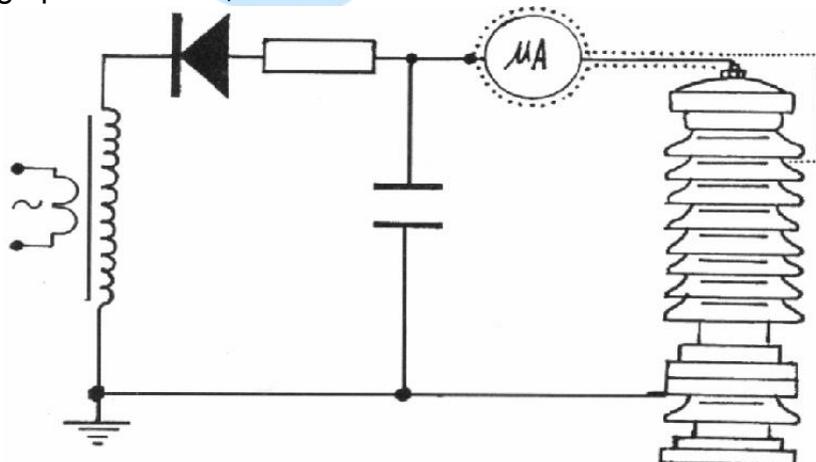
You can use external High Voltmeter to measure the output voltage if necessary.

11. Reduce voltage and turn off the power after finish testing.
12. Several methods for measuring
 - 1) Normal, when the wires are connected, suspend wires of tester, rising to the testing voltage with no load ,Read stray current I'first, and then try to read the total current I 1 with load , sample leakage current: $I_0 = I_1 - I'$
 - 2) When we need an accurate measurement of sample leakage current, we should connect the high voltage micro ammeter to the high side (see below).



Microammeter access high side test CX wiring diagram

Microampere meter must have a metal shielding; shielding line should be connected with test. The shielding of High voltage lead should be closely connected with end shielding. If the sample surface is dirty, we should exclude effect of sample surface leakage current. In samples of high potential end, several times around with bare metal cords (see below).



Exclude effect of sample Cx surface leakage current.

- 3) For sample such as zinc oxide, magnetic blow-out arrester, the grounding end can be breaked up; also can measure by connecting ammeter to the bottom (ground potential

side) of test items. when we exclude effect of sample surface leakage current, we can use soft of bare copper wire in the sample to end the last laps around the shield ,and connect shielding line (see below)

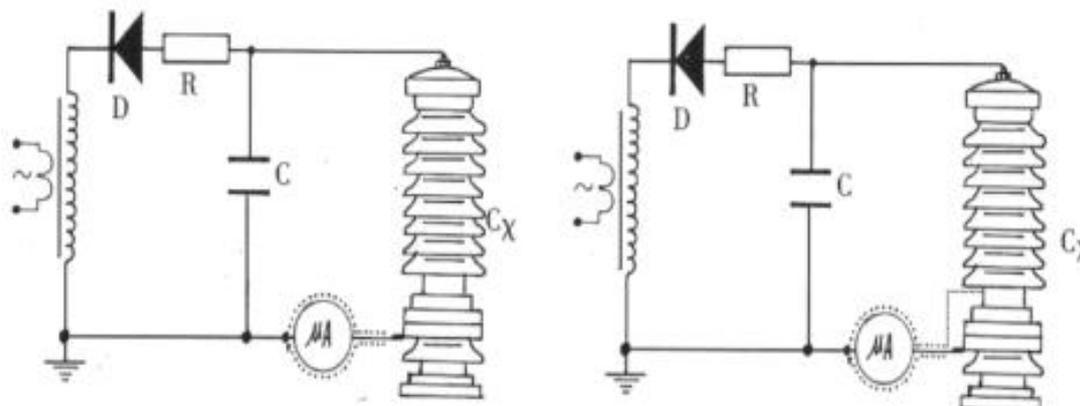


Figure 8a microampere wiring chart at the bottom of the access test CX

Figure 8b exclude the impact of the test surface wiring diagram CX

13. For small capacitive products ,such as zinc oxide and lightning arrester ,it discharges quickly through pressure resistance. For large capacitive products such as cable, while test voltage self discharging to the test voltage is below 20%, then it can discharge by supporting the discharging rod. Keep connect the grounding wire to the capacitive products before voltage discharging completely, and then we can remove high voltage lead and other wire.
14. If green light is off, red light is bright, voltage is dropping, which is related protection to the product .You should turn off the power switch, panel lights are not bright. Turn the pressure regulating potentiometer to zero position, while low voltage capacitor discharging completely, then open the power switch a minute later. If you start a no loading test again, you can begin raising voltage test before checking all situations.

VII、 Fault Resolve

	Fault	Reason	Resolve
1	The power is on, but green lights are off and the fan doesn't working.	1 Power line is broke. 2 Power fuse is broke...	1 Change power line 2 Change fuse.
2	Press the green button, the light doesn't light.	Thregulating potentiometer doesn't return to zero.	Pressure regulating potentiometer returns to zero.
3	Press the green button , when raising voltage, ,the red light is off	The high voltage output connect to the round	Check output cable and the tester.
4	During raising voltage, the red light is off	Tester discharge or breakdown, overvoltage or	Check tester. Reset setting protects



		over current	value.
--	--	--------------	--------

VIII、 Complete Sets Of Products

Numbering	name	Quantity
1	control box	1
2	High-voltage cylinder	1
3	fuses	2
4	Power cable	1
5	Special grounding wire	1
6	Discharging rod	1
7	Current limiting resistor	1
8	Microampere ammeter	1
9	Instructions	1
10	Test Report	1
11	Certification / warranty card	1