



TIANJIN GREWIN TECHNOLOGY CO.,LTD.
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Operation Manual

DCHV-1200 High Voltage DC Generator





Warning

People who use of this product must have a "high-voltage test certificate".

Please read the 168 regulation of "electric power regulatory" when you use this product, and install two apparently disconnected point between power and the tester, when replacing the tester or Connecting line, you should break the two disconnect point of power supply.

Check tester control box, the high-voltage cylinder and the grounding wire is connected together before testing. The grounding wire should be connected rightly to the earth.

The large capacitor loader must discharged through the resistor of $100\Omega/V$. Don't contact the rod resistor with the loader immediately, you should put the rod resistor close to the sample gradually, keep a certain distance, and then discharge with hiss. When there is no sound, we can use rod resistor finally discharge by connecting to earth.

If the loader is a capacitive loader, before test you must connect with resistor.

When the voltage is more than 200kV, although the test personnel wear insulated shoes and at a safe distance from the outside area, but because of the effects of high voltage DC ion distribution of space electric field, it can lead to different DC potential of standing people nearby. Don't handshake each other or touch any grounding body, otherwise there will be a mild electric shock phenomenon, this phenomenon happens in dry areas and winter commonly, but it generates little energy, so it can do no harm to people.

After finishing the test, you must connect the grounding wire to the end of high voltage output, and then you can remove the lead wire off.



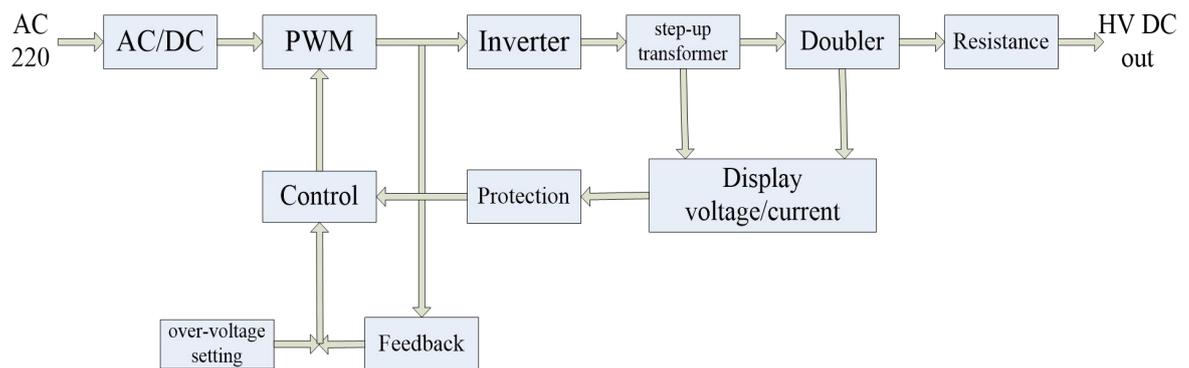
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Introduction

The high voltage DC generator is a new product designed according to the new China electric power industry standard DL / T848.1-2004 "DC high voltage generator general technical conditions". This product is mainly used for DC endure experiment to high voltage device such as Electric Power Cooperation, Metallurgy, Iron and Steel enterprises.

Principle of operation



Technical parameter

1. Technical character

- The control box is used of aluminum alloy structure.
- It uses the new technology such as PWM pulse-wide modulation, middle frequency high voltage and high power IGBT device.
- It uses voltage feedback; output stability is less than 3%.
- Full range of voltage output, voltage regulating accuracy is less than 1%,



the stability of voltage error is less than 1.5%, the voltage error $\pm (1.5\% \pm 2$ words), the current error $\pm (1.5\% \pm 2$ words).

- Raise voltage from zero voltage potentiometer.
- The 0.75UDC/1mA function button is convenient for zinc oxide arrester test, and the accuracy is $\pm (2\% \pm 2$ words) .
- Over voltage protection uses dialing number set, and the error is $\pm 2\%$.
- High voltage cylinder is used of new materials, lightweight and sturdy. It's coated with special insulating materials, electrical performance and moisture-proof ability is good.
- The product conforms to DL / T848.1-2004 technology requirements, and passed the center test of electrical equipment quality inspection, strictly according to the enterprise standard.

2. Technical parameters

Specification Technical Parameter	6 0/ 5	120/5	100/1 0	160/2	180/ 2	200/2	250/2	100/200 3/2	200/300 3/2	Others
Output voltage (kV)	6 0	120	100	160	180	200	250	100/200	200/300	600 ~ 800kV Produce according to the contract
Output current (mA)	5	5	10	2	2	2	2	3/2	3/2	
Output power (W)	3 0 0	600	1000	320	360	400	500	400	600	
Charging current (mA)	5. 0	5.0	12.0	3.0	3.0	3.0	3.0	4.5/3.0	4.5/3.0	
Case weight (kg)	4. 5	7	5.3	4.3	4.3	4.4	4.5	4.5	8.1	
Dimension of multivoltage tube (mm)	Φ 8 0 × 5 0 0	Φ80 ×770	Φ80 ×770	Φ80 ×770	Φ110 ×770	Φ110 ×770	Φ110 ×820	Φ110 ×800	Φ110 ×1350	
Height of multivoltage tube (kg)	7. 3	9	7.5	7.2	7.2	7.2	7.6	7.5	12.6	

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HV polarity	Polarity of negative volt, zero voltage start, continuous adjustable
Work power	AC 220V±10%;50Hz
Voltage measuring accuracy	1.0% (full scale) ±1character, max resolution 0.1%kV
Current measuring accuracy	1.0% (full scale) ±1character, max resolution 0.1%uA
Over voltage rectify accuracy	≤1.0%
0.75 switch over accuracy	≤0.5%
Ripple factor	≤1.0%
Voltage stability	Random fluctuation, when voltage change of power supply±10% ≤0.5%
Work manner	Intermittent service; 30min of rated load;1.1 times of rated voltage use:10min
Temperature	-15℃~50℃
Relative humidity	When at 25℃, no more than 90%(no condensation)
Altitude	Below 2500m

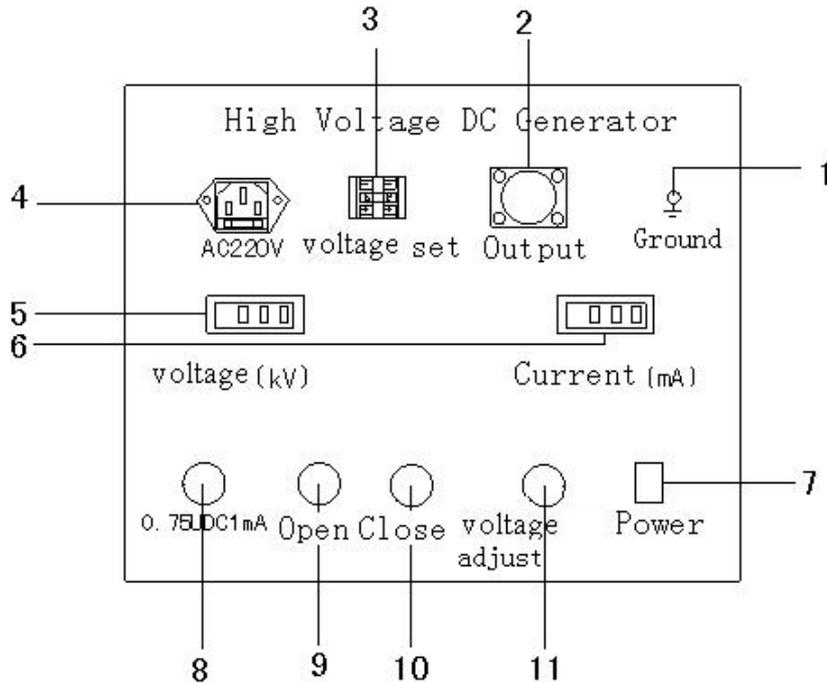
Note: As the product update, we don't notice any more, according to the sample, the company reserves the right of interpretation.

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Function

(1) Control box Panel



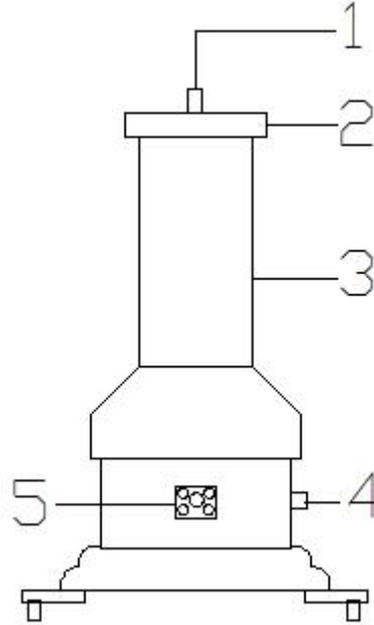
- 1、 Ground terminal: When testing, the grounding terminal of control box and high-voltage cylinder should be connected together, and then connected with the earth.
- 2、 Output port is used for the connection of the control box and high-voltage cylinder . We only rotate the cable pressing plug clockwise 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.

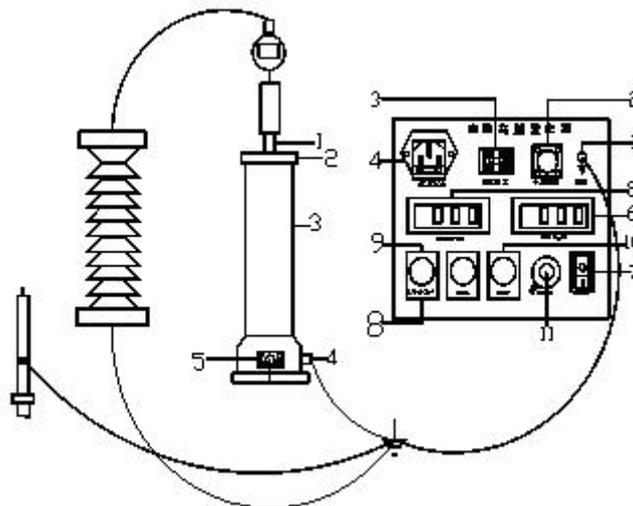


(2) High-voltage cylinder



- 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





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 -

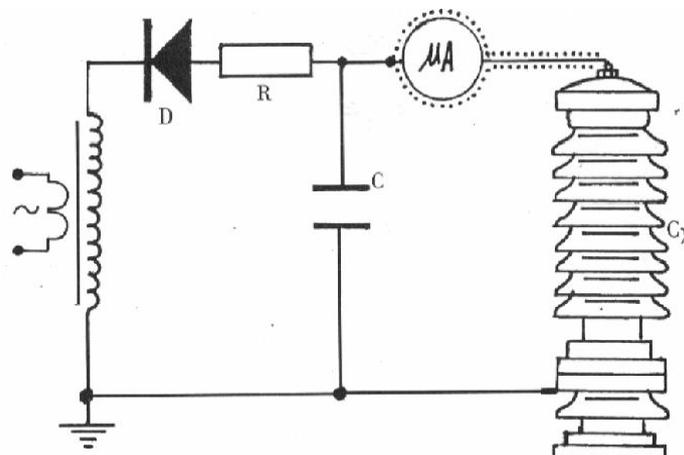
5kV test voltage per second. For large capacitance, we need to monitor of ammeter charging current not exceed the maximum charging current tester while raising voltage. For small capacitive products such as zinc oxide arrester, lightning arrester, we firstly raise to a desired voltage (current) at 95%, 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.

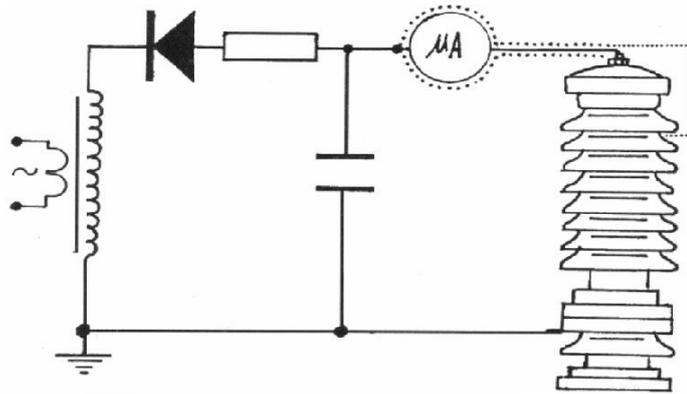
11、 Reduce voltage and turn off the power after finish testing.

12、 Several methods for measuring

- a. 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 I₁ with load , sample leakage current: $I_0 = I_1 - I'$
- b. When we need an accurate measurement of sample leakage current, we should connect the high voltage micro ammeter to the high side (see below).

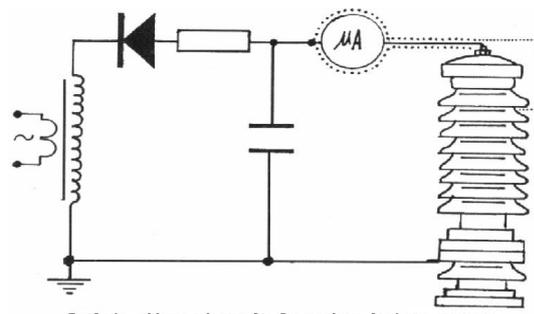
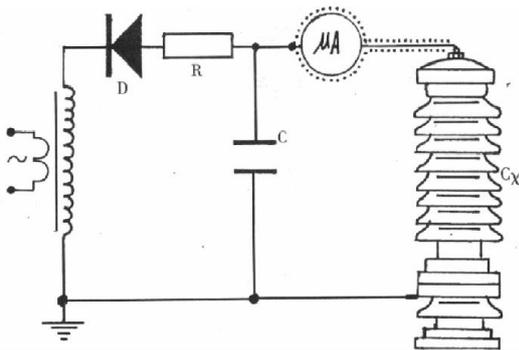


Microampere meter must have a metal shielding; shielding line should be connected with test. The shielding of High voltage lead should be closely connected with end shielding. If the sample surface is dirty, we should exclude effect of sample surface leakage current. In samples of high potential end,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



Exclude effect of sample Cx surface leakage current.

c. For sample such as zinc oxide, magnetic blow-out arrester, the grounding end can be broken 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)



Exclude effect of sample Cx surface leakage current.

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.

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.	1Change 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 over current	Check tester. Reset setting protects value.

Complete sets of products

- 1.Control box 1
- 2. High-voltage cylinder 1



3. Use's manual book	1
4. Certificate of inspection	1
5. Fuse	2
6. Power cable	1
7. Special grounding wire	1
8. Discharging rod	1
9.Current limiting resistor	1
10. Microampere ammeter	1

Quality assurance

1. The equipment made by the company can meet the requirements of the buyer, and provide free pre-sale technical services.
2. Products of the company have effective inspection and control, strictly product according to ISO9001 quality system of production service.
3. The quality of our products is according to the standards of our company and relevant national standards.

Service Promise

The product's warrant time is one year, the implementation of "Three Guarantees", life-long repairing, all of the equipment of the company quality problem, we can provide free repair in the warranty period. Improper operation due to the user or accidental damage, we can provide preferential services. We'll be looking forward to your valuable opinions to our products.