

# **HZJS-3 HV Surge Counter Tester**



**Huazheng Electric Manufacturing (Baoding) Co., Ltd**

Dear user:

Thank you for choosing HZJS-3 HV Surge Counter Tester.

We hope that this instrument can make your work easier and more enjoyable, so that you can get the feeling of office automation in the test and analysis work.

Before using the instrument, please read this manual, and operate and maintain the instrument according to the manual to prolong its service life. "Just a light press, the test will be completed automatically" is the operating characteristics of this instrument.

If you are satisfied with this instrument, please tell your colleagues; if you are not satisfied with this instrument, please call (0312) 6775656 to tell you to serve you at all times-Baoding Huazheng Electric Manufacturing Co., Ltd., our company will definitely make you satisfied !

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## I. Overview

Lightning arrester is an important electrical equipment in power network to protect power equipment from over-voltage. Normally, the action of the arrester and leakage current are monitored through the arrester monitor. Due to poor sealing, the monitor may enter water or moisture during operation, causing internal element corrosion, or other reasons, the monitor counter cannot operate normally, and the leakage current indication is not accurate. Therefore, according to 《The Regulations》, the arrester monitor should be checked once a year.

The reliability of counter operation is very important for power system. It is an important parameter to record the number of lightning strikes received by the arrester in normal operation. It can provide an important basis for the power system workers to inspect the arresters.

## II. Principle

Figure 1 shows the principle wiring diagram of HZJS action counter. Figure 1 (a) is the basic structure of hzjs-type action register, namely the dual-disc structure.

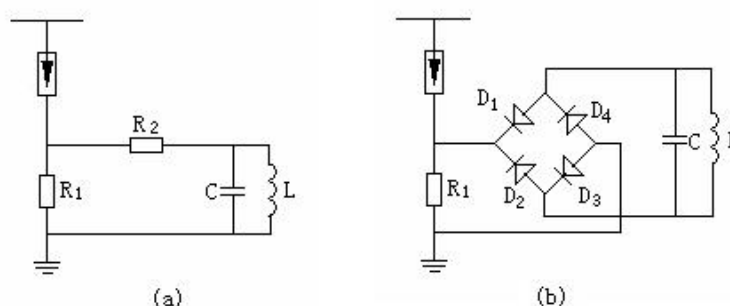


Figure 1. Schematic wiring of hzjs-type action register

(a)HZJS Type; (b)HZJS-3 Type

$R_1$ 、 $R_2$ -Non-linear resistance; C-Energy storage capacitor

L-Register coil;  $D_1 \sim D_4$  Silicon diode

When the arrester operates, the discharge current flows through the valve sheet  $R_1$ , the voltage drop on the valve sheet  $R_2$  charges the capacitor C, and then C discharges

the inductance coil L of the electromagnetic counter, making it rotate one grid and record one time. Changing the resistance of R1 and R2 can make the recorder have different sensitivity. The general minimum action current is 100A (8/20 s) impulse current. Because there is a certain pressure drop on R1, it will increase the residual voltage of arrester, so it is mainly used for high voltage arrester over 40 kV.

Fig. 1 (b) represents the structure of the type of motion recorder, which is a rectifying structure. When the arrester operates, the voltage drop on the high temperature valve sheet R1 is charged to capacitor C by full wave rectification, and then C discharges L of the electromagnetic counter to make it count. The resistance value of the valve piece R1 of the counter is small (the pressure drop at 10 kA is 1.1 kV), the flow capacity is large (1200 A square wave), and the minimum operating current is 100 A (8/20s) impulse current.

### **III. Technical Parameter**

- 1、Output voltage: DC1600V  $\pm 5\%$
- 2、Interval time:  $\geq 30s$
- 3、Power supply: AC200V $\pm 10\%$  50Hz $\pm 2\%$
- 4、Shock current:  $\geq 100A$  (8/20 $\mu s$ )
- 5、Dimension: 380 $\times$ 250 $\times$ 180mm
- 6、Weight: 3kg

### **IV. Inspection Methods And Principles**

Due to poor sealing, the action counter may enter moisture or moisture in operation, which causes the internal components to rust, leading to the normal operation of the counter. Therefore, the "Regulations" stipulate that the meter should be checked once a year. There are direct current method, alternating current method and standard impulse current method. The research shows that the standard impulse current method is the most reliable and its principle wiring is shown in Figure 2.

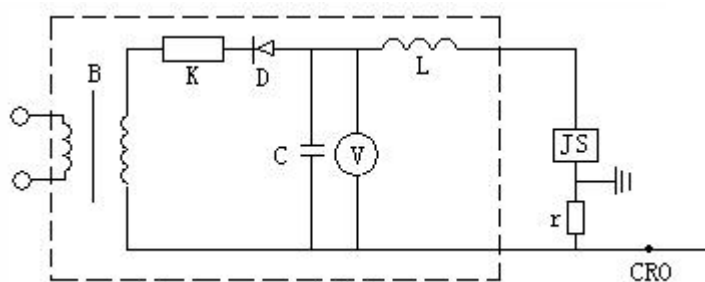


Fig. 2 principle wiring of standard impulse current detection method

(The part of the dotted box is an impulse current generator)

C-Charge capacitance; R-Charging resistance; L-Damped inductor

D-Silicon diode rectifier; r-Shunt; B-Testing transformer

V-Electrostatic voltmeter; CRO-High voltage oscilloscope

If the impulse current wave of 8/20s and 100A produced by the impulse current generator acts on the action recorder, if the action of the recorder is normal, the instrument is good, otherwise it should be dismantled and repaired. For example, a power bureau has used this method to detect 27 counting devices, of which 3 are not moving, and the internal components are found damped and damaged after disintegration.

The Regulations stipulate that continuous testing should be carried out 3 to 5 times, each time should be normal, and each time interval should be no less than 30 seconds. After testing, the recorder should be adjusted to 0.

## V.Operation Method

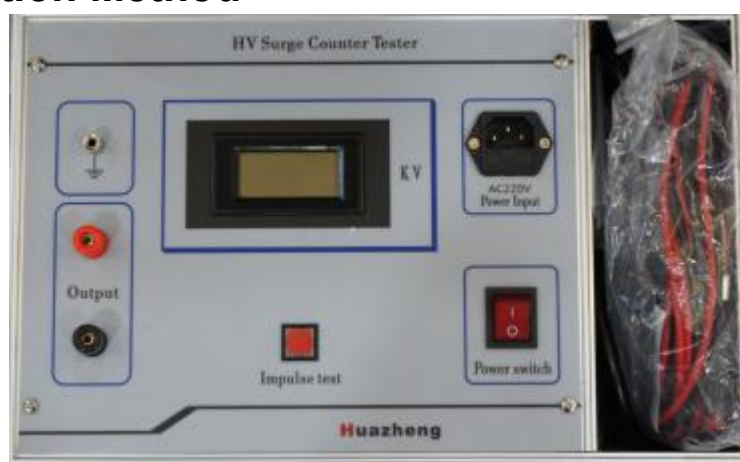


Fig. 3 Schematic diagram of detector panel

1. Connect the output end of the instrument with both ends of the arrester counter

(the connecting line should be as short as possible), connect the red end to the upper end and the black end to the ground end.

2. After the power cord is connected, check whether the instrument and wiring are correct, and then start the test.

3. Start the power switch, and the voltage will rise. Generally, the counter can start checking when it is around 600V.

4. Press the check key and the current voltage is output. At this time, the action of the counter can be observed.

5. If multiple tests are needed, press the check key when the output voltage reaches the required value and observe the operation of the counter.

6. Turn off the power immediately after the inspection, and remove the connection only when the output voltage returns to zero.

7. If the output voltage does not decline after pressing the check key, the power should be turned off. After the voltage indicator returns to zero, check whether there is a break point in the loop or whether the discharge counter is not suitable for the model specified in the technical index.

## **VI.Matters Needing Attention**

1.When dismantling the connection, if the output voltage does not return to zero, the operator shall not touch the non-insulated part of the test line to avoid personal accident.

2. The tested product is not allowed to be charged.

## **VII.Packing List**

<b>No.</b>	<b>Item</b>	<b>Qty</b>
<b>1</b>	Main engine	1
<b>2</b>	Power line	1
<b>3</b>	Fuse pipe	2
<b>4</b>	Red test line	1
<b>5</b>	Black test line	1