ZX-JS02 Lightning
Arrester Discharge Counter Tester

Contents

I. Overview

This instrument is used to judge the operation reliability of various surge arrester counters. The reliability of the counter operation is very important to the power system. The counter should correctly record the number of lightning strokes during its normal running, it is a key parameter for inspecting the arresters.

II. Product principle

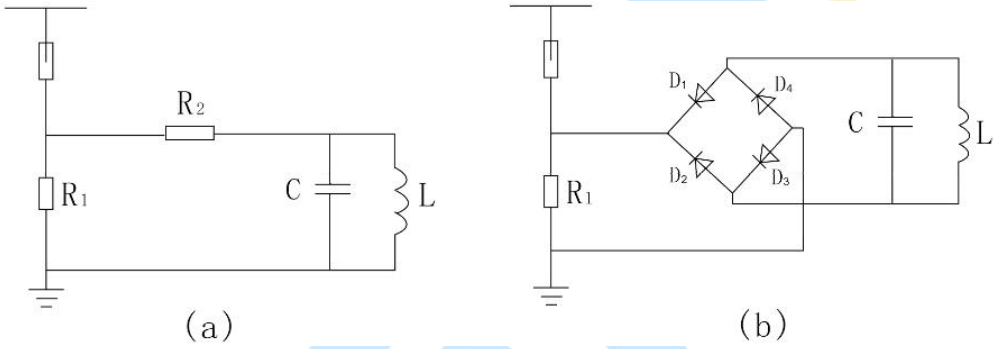

Figure 1 JS type Discharge counter wiring diagram

（a）JS（b）JS-8

R1, R2 - nonlinear resistance　　C - enery storage capacitor

L - counter coil　　D1~D4 - silicon diode

Figure 1 shows the schematic wiring diagram of the JS type action counter. Figure 1 (a) is the basic structure of the JS type action counter, the so called double valve tandem structure. When arrester operates, the discharge current flows through the valve plate R1, the voltage drop on the R1 charge via valve piece R2 to the capacitor C, and then C will discharge to the inductance coil L of the electromagnetic counter, the hand will move on the clcok, counted 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 μs) impulse current. Because there is a certain voltage drop on R1, it will increase the residual voltage of the arrester, so it is mainly used for high voltage arresters above 40kV.

Figure 1 (b) represents the structure of the JS 8 type action counter and is a rectifying structure. When the arrester operates, the voltage drop on the high temperature valve R1 charge by full wave rectifier to the capacitor C, and C discharge to the L to make it counts a number. The resistance of the valve plate R1 of the counter is small (step-down at 10kA is 1.1kV), the flow capacity is large (1200A squre wave), and the minimum operation current is 100A (8 / 20 s) surge. JS 8 type counter can be used in arresters of 6 ~ 330kV system.

III. **Technique Parameters**

1) Output voltage: DC1600V±3%
2) Interval：≥30s
3) Power supply：DC12V / AC220V±10% 50Hz±2%
4) Surge current：≥100A（8/20μs）
5) Volum：380×250×180mm
6) Net weight：3kg

IV. **Inspection method and counter tester work principle**

Because of the bad seal, the moisture or water might enter into the counter during the counter working, that the internal components are rusted and the counter can not operate normally, so there is regulation that to have to heck every one year. On site testing method include capacitor discharge method, AC method, standard surge current method. Research shows that the

standard impulse current method is the most reliable one, wiring principle shown in Figure 2.

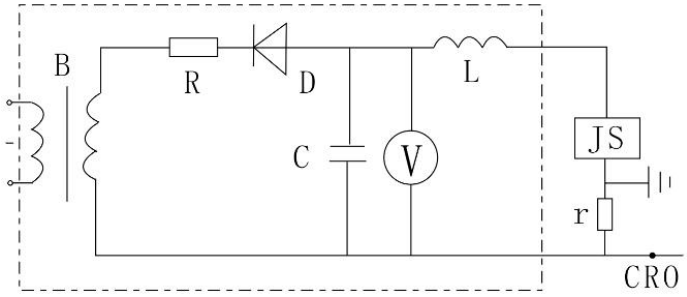

Figure 2

（the dotted line frame represents the surge current generator）

C - Charging capacitor R - charge resistor L - damped inductance

D - silicon rectifier diode r - current divider B - testing transformer

V - electrostatic voltmeter CRO—high-voltage oscilloscope

Apply generated 8 / 20 μs 100A surge current on the counter. If the counter works well, it means the counter is good, otherwise it should be disassembled and overhauled. For example, one user adopted this method to detect 27 pcs of counters and 3 of them did not make the action, after disassembled the 3 pcs were found moistured and damaged.

According to the regulations, a countinuous test of 3 to 5 times measurements should be done, and every time there should be an action. Test interval should not be less than 30s. After test the counter should be dialed to 0.

Ⅴ. Operation method

1) Connect the output terminal of the instrument to two ends of the counter (as short as possible), black end to the ground, red end to the upper end

2) Plug in power cord, check the instrument and wiring before start the test.
3) Turn on power switch (power light is on), wait till voltage up to about 600V
4) Press the test button, the output voltage immediately step down. At this time, abserve the action of the counter.
5) When multiple tests needed, press the test button and observe only after the output voltage reach a stable value.
6) After the test is completed, turn off the power immediately, wait till the voltage is back to zero, then plug out the wires.
7) if the output voltage does not drop when press test button, turn off power immediately. After the voltage indicates zero, check whether the circuit has breaking point, or the discharge counter is not suitable for the model.

VI. **Attention**

1) The operator should not touch the non-insulated part when voltage is not back to zero.
2) The test objected should not be energized during the test.
3) Charge the battery every 2 months when there is no use for a long time, charge time about 10 hours till the light turns to green.
4) When voltage can't reach 1600 under battery power, use AC power supply.

VII. **Packing list**

1.	Tester	1 PCS
2.	Power cord	1 PCS
3.	Test wires	2 PCS
4.	Fuse	2 PCS
5.	Manual	1 PCS

6. Warranty card 1 PCS

7. Inspection report 1 PCS