Dear Client,

Thank you for Purchasing our HTFZ-HI Arrester Discharge Counter Calibrator. Please read the manual in detail prior to first use, which will help you operate the equipment skillfully.

Our aim is to continually improve and perfect the company's products, so there may be slight differences between your purchase equipment and its instruction manual. You can find the changes in the appendix. Sorry for the inconvenience. If you have further questions, welcome to contact with our service department.

The input/output terminals and the test column may bring voltage, when you plug in/pull out test line or power outlet, they will cause electric spark. PLEASE CAUTION RISK OF ELECTRIC SHOCK! To avoid risk of electric shock, be sure to follow the operating instructions!

Company Address:

- **T4， No. 1, High-tech 2 Road，East Lake High-tech Development Zone，Wuhan**
- Sales Hotline: 86-27- 87452243
- After Service Hotline**:** 13871482510
- Fax: 86-27- 87803129
- E-mail: whhuatian@163.com
- Website: www.whhuatian.com

◆ SERIOUS COMMITMENT

All products of our company carry one year limited warranty from the date of shipment. If any such product proves defective during this warranty period we will maintain it for free. Meanwhile we implement lifetime service. Except otherwise agreed by contract.

◆ SAFETY REQUIREMENTS

Please read the following safety precautions carefully to avoid personal injury and to prevent the product or any other attached products being damaged. In order to avoid possible danger, this product can only be used within the scope of the provision.

Only qualified technician can carry out maintenance or repair work.

--**To avoid fire hazard or personal injury**:

Use Proper Power Cord

Only use the power wire supplied by the product or meet the specifications of this product.

Connect and Disconnect Correctly

When the test wire is connected to the charged terminal, please do not connect or disconnect the test wire at will.

Grounding

The product is grounded through the power cord; besides, the ground pole of the shell must be grounded. To prevent electric

shock, the grounding conductor must be connected to earth ground. Before making connections to the input or output terminals of the product, please do check that the product is properly grounded.

Pay Attention to the Ratings of All Terminals

To prevent the fire hazard or electric shock, please be care of all ratings and labels/marks of this product. Before connecting, please read the instruction manual to acquire information about the ratings.

Do Not Operate without Covers

Do not operate this product when covers or panels removed.

Use Proper Fuse

Only use the fuse with type and rating specified for the product.

Avoid Touching Bare Wire and Charged Conductor

Do not touch the bare connection points and parts of energized equipment.

Do Not Operate with Suspicious Faults

If you encounter operating faults/suspect there is damage to this product, do not continue. Please contact with our maintenance staff.

Do Not Operate in Wet/Damp Conditions.

Do Not Operate in Explosive Atmospheres.

Ensure Product Surfaces Clean and Dry.

—Security Terms

Warning: indicates that death or severe personal injury may result if proper precautions are not taken

Caution: indicates that property damage may result if proper precautions are not taken.

Contents

I .Principle

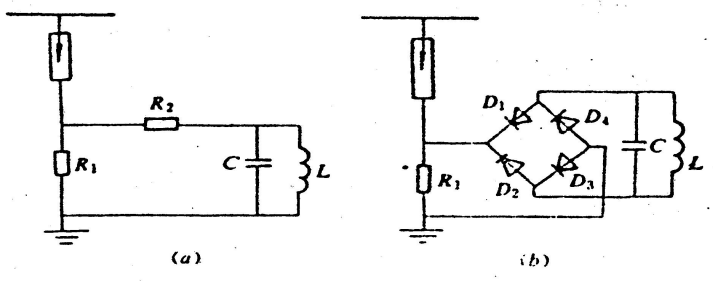

Fig 1 Circuit diagram for JS-type operating cycles counter

(a) JS-type (b) JS-8 type

R1, R2-nonlinear resistance C-Energy-storage capacitor

L-Counter coil D1-4 A silicon diode

Figure 1 is circuit diagram of JS-type operating cycles counter. Figure 1 (a) shows circuit diagram of JS-type operating cycles counter, also called dual-valve plate structure. When the arrester operating, the discharge current drop voltage through the valve R1, and charge capacitor C through the valve R2, then C discharge to the inductance coil L of magnetic counter, let it rotate a division and record one time. Changing the resistance values of R1 and R2, the counter will have different sensitivity. Generally the minimum action current is 100A (8/20μs) impact current. Because there is some voltage drop on R1, and these will increase residual voltage of arrester, the instrument is mainly used for HV arresters above 40kV.

Figure 1 (b) shows circuit diagram of JS-8 type operating cycles counter, it is rectifier type structure. When the arrester operating, voltage drop on the valve R1 charge capacitor C through full-wave rectifier, then C discharge to L of electromagnetic counter and let it count. For this counter, the resistance value of valve R1 is small (when at 10kA, the voltage drop is 1.1kV), current capacity is larger (1200A square wave), the minimum action current is 100A (8 / 20 μ s) impact current. JS-8 counter is suitable for 6.0 ~ 330kV arrester, JS-8A counter can be used for 500kV arrester.

II .Inspection method for action and principle of counter

As bad seal, may there are moisture and water will enter operating cycles counter during operating, which will make internal components corrode, further counter cannot work properly, so the "regulations" require that this device should be checked one a year. The two methods of on-site inspection counter action are: capacitor release current method (DC&AC) and standard impulse current method. Research indicates that standard impulse current method is more reliable; the principle circuit diagram is shown in Figure 2.

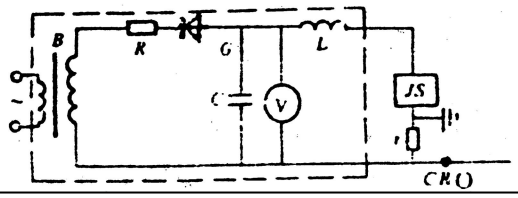

Fig. 2 the principle circuit diagram for standard impulse current method
(Impulse current generator in the dashed box)

C---charging capacitor R---charging resistance L--- damped inductance

D---Silicon rectifier diode r---Current divider B---Test transformer

V---Electrostatic voltmeter CRO---high-voltage oscilloscope

Let 8/20 μ s, 100A impulse current waves generated by impulse current generator act on operating cycles counter, if counter is functioning normally, which indicating the instrument is well, otherwise it should be repaired. For example, a power administration uses this method to test 27 counters, three of them cannot act, the technician finds that the internal components are affected with damp and damaged.

"Regulation" provides that continuously test for 3 to 5 times, each action should be normal, each time interval should be not less than 30s. After test logger should be set to zero.

Voltage accuracy of this instrument: class 2

III .Instructions

1. Let the output terminal of instrument connect to the two ends of arrester counter (the connecting lead should be as short as possible), red terminal connect to upper end, black terminal connect to earth terminal.

2. Well connect power cord (use DC power, need not connect power), then check whether the equipment and wiring are correct, confirm all is ok, you can start test.

3. Close power switch (power light glows), wait the voltage exceeds 600V, you can start test (Rated voltage of instrument is 1600V; higher voltage can also be customized according to user's requirements).

4. Press "Test" key, output voltage will immediately drop, at this time you can observe the action of counter.

5. For multiple tests, please wait output voltage exceeds 600V, then press "Test" key and observe the action of counter.

6. After test, please immediately turn off power supply; remove the wiring after output voltage has completely come back to zero.

7. If you pressing “Test” key, output voltage do not drop, you should turn off power supply, wait voltage come back to zero, then check whether there is a breakpoint on the circuit or the type of discharge counter is not suitable for the specified technical specification type.

IV .Notes

1. Removing wiring, if the input voltage has not returned to zero, the operator can not touch the non-insulated part of test leads to avoid injury.

2. The tested target cannot bring voltage.

3. If DC power has run down, please charge up the battery in time.

4. Under DC test, if the voltage cannot reach specified scale, please stop using DC power and use AC power instead for test.

5. If the instrument not use for a long time, please charge up the battery every two months, generally charging time is about 14 hours, until the "full" indicator lights up.