

Research on the Portable 10kV Arrester Test Holder

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Abstract. This paper mainly explores problems in the test of surge arrester. In the test, because of the restriction of the field condition, the lightning arrester can not be fixed, and the requirement of the test condition is not satisfied. Can not guarantee the operation safety, the work efficiency is low, the power supply time is easy to delay, there is the risk of damage test equipment. In this paper, the portable arrester test trestle, with the space of the compression equipment, easy to carry, easy handling, reliable monitoring, test quality can be guaranteed, test wiring is safe and reliable, etc.. In handling, can shrink into a "box", convenient and flexible selection of test sites, the test is not easy to appear errors.

Introduction

Surge arrester is the most basic over-voltage protection device. The surge arrester can be understood as a kind of voltage limiting device, which is parallel to the protective equipment. When the over voltage on the line is greater than the discharge voltage of the surge arrester, the arrester begins to discharge, and the electric charge in the over voltage wave is introduced into the earth, which limits the development of the over voltage, and avoids the damage to the electrical equipment, and the insulation damage of the electrical equipment is not occurred[1, 2].

The long withstand voltage of the surge arrester, and the influence of the bad environment, will inevitably damage. Lightning arrester damage mainly in the following aspects:

MOA does not exist in series gap, in the power grid voltage; there will be leakage current through zinc oxide valve. The active component of the current will cause the valve plate heat, causing the change of the MOA volt ampere characteristic. This is a positive feedback process, the long-term role will lead to the decline in the performance of ZnO valve, more serious will appear thermal breakdown phenomenon[3].

In the impact of the voltage, the MOA is aging; zinc oxide valve will also be aging, performance degradation.

MOA internal moisture or, the insulation performance of the MOA internal insulation, which makes the power frequency current value increases, power consumption increased, easily lead to internal discharge[4].

MOA will be affected by rain, snow, frost and dust pollution, so that the potential value of the MOA internal oxidation of zinc valve and external porcelain sets, resulting in a greater potential difference, there may be a radial discharge phenomenon, serious damage to the lightning arrester[5].

When the MOA generates a fault, the arrester body will damage or even explode. The electrical equipment in the range of the lightning arrester will lose the protection of the over voltage, which affects the safe operation of the power system. Most of the damage process of the lightning arrester is gradually changing, the preventive test can be used to judge the performance of the arrester is good, whether the valve sheet is damp, and the performance of the surge arrester meets the requirements. At the same time, it can also predict the service life of the surge arrester and its protective performance. Therefore, it is very important to carry out arrester test.

The existing problems in the field test

Arrester test wiring diagram is shown in Figure 1.

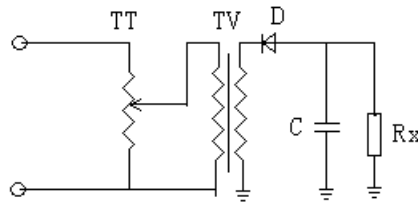
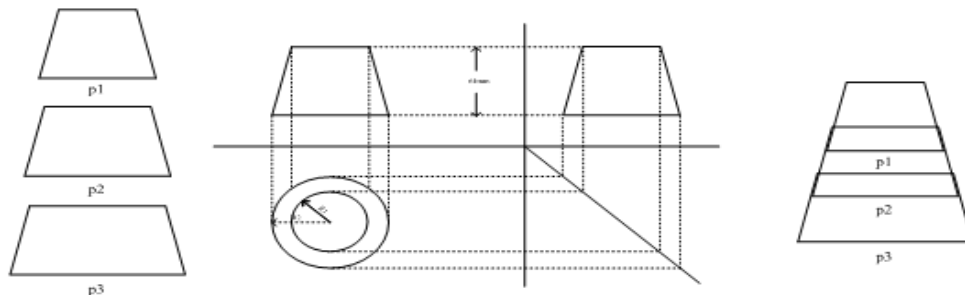


Fig. 1 DC voltage test principle diagram

According to the statistics, there are thousands of 10kV surge arrester for the handover and the pilot test. In the test site, lightning arrester needs to put the safety and stability. But there is no equipment for the installation of the device, which can not reach the stability of the arrester, which affects the accuracy of the test data. The safety of the test can not be guaranteed. It can reduce the work efficiency. Therefore, we need to develop a lightning arrester test bracket to fix the arrester.

The process of the production

Portable 10kV arrester test stand with 3 rotating mechanical arm, are conformed the actual needs. With special grounding wire and balanced support device, each of the machine arm is equipped with 3 auxiliary support units, each unit can be fixed a lightning arrester. It can be flexible and stable to a fixed arrester, to ensure that the arrester test in any field conditions. Figure 2 is as a combination of support units and mechanical drawings.



P1、 P2、 P3 Universal mechanical drawing P1、 P2、 P3 Combined schematic diagram

Fig. 2 the combination of the supporting unit and the mechanical drawing

P1:R1=46mm、 R2=66mm P2: R1=63mm、 R2=86mm P3:R1=80mm、 R2=103mm

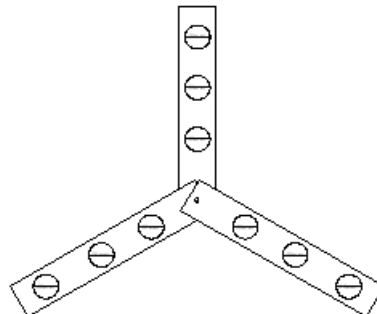


Fig. 3 Assembly drawing of mechanical arm

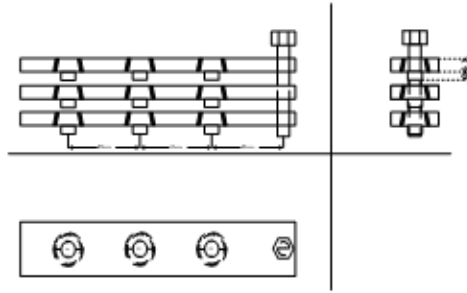


Fig.4 Plane expansion diagram

The advantages of portable 10kV arrester test stand: the use of retractable auxiliary support unit, saving space and stable surge arrester. Application of rotating machinery arm, the space of further compression equipment, are easy to carry and easy to select test site. Facilitate safety monitoring, ensure the quality of testing. Test connection is safe and reliable, and is not easy to be wrong.

Application on cite

From June 8th, the actual application of portable 10kV arrester testing stand could meet the actual needs. In the test, we can save time on carrying and fastening arresters. And we can test 9 arresters at the same time. The process of the lightning arrester is reduced. In contrast with the previous test, the whole process saves 0.5 hours. Throughout 2011, Fushun Power Supply Company testing area has finished 480 arresters leakage current test work. By using portable 10kV arrester test frame have saved 240 hours and more than 1 million RMB. The use of the holder are shown in Figure 5 and Figure 6.



Fig.5 The expanded holder



Fig.6 The fixed arrester

Summary

After one year practical application, arrester testing stand solved the problem of the conditions of testing place. The bracket can be carried out in a lightning arrester test, and nine lightning arresters can be placed at the same time. In the lightning arrester test, the lightning arrester can be placed stable and firm, so it is convenient to connect testing lines, test personnel safety is also guaranteed. Test personnel's are very satisfied with it. Arrester test stand has a wide range of

promotion value and application prospects. Now Fushun Company has produced five sets of lightning arresters test stand.

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