

Influence of Parameter Changes on The Operation Characteristics of Circuit Breaker with Oil Dashpot at Low Temperature

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Abstract

The iron core in the circuit breaker of oil dashpot is mainly affected by the electromagnetic force, spring force and oil damping force, which can play the function of anti-time protection when overload current is excited. At low temperature, the viscosity of the methyl silicone oil damping fluid will change, and the parameters of spring and iron core will also change with temperature. The change of this parameters will lead to the change of the resultant force on the iron core, which will affect the operation time. To analyze this problem, a correlation model is established. Through the measurement of parameters at low temperature, numerical calculation, electromagnetic analysis, simulation analysis and compared with the experimental results. The study found that the viscosity of the damping fluid increases, the iron core is deformed, and the spring stiffness increases at low temperature. The influence of a single factor on the operation characteristics of the tripper is not enough to reflect its overall characteristics, and the comprehensive effect of each factor needs to be considered. After comprehensively considering all factors, the results are closer to the experimental results. The results provide a theoretical basis for the optimization design of the circuit breaker.

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