

INFLUENCE OF VARYING GAPS BETWEEN TMF CONTACTS ON HIGH CURRENT VACUUM ARC MODES

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Abstract: The behavior of high current arcs in vacuum circuit breaker (VCB) is highly interesting for research and industrial development purpose which lead to further products. To improve the breaking capability of VCB two approaches to control the arc have prevailed. One of the common approaches is applying transversal magnetic fields (TMF) on the arc, which is in industrial use for VCB in medium voltage ranges. For greater gap distances the arc depended behavior is less examined.

In this paper, the appearance of metal vapor arcs drawn by common TMF contacts in a vacuum-test-interrupter is investigated. The test setup includes a capacitor bank for a high current (50 Hz) and optical system to observe the arc from two directions under a 90° angle with a high-speed camera as well as electrical measurements of current and arc voltage. An adapted drive mechanism enables the possibility to switch a fixed current with varying gaps from 5 to 25 mm and a constant opening time. With rising gaps a changed arc appearance can be observed. The goal of this work is a deeper understanding of the behavior of vacuum arcs under TMF in dependence of the contact gap.