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Analysis on Interruption Performance of Molded Case Circuit Braeker according to External Magnetic Field

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The interruption performance of the Molded Case Circuit Breaker (MCCB) is important because this circuit breaker is closest protection device to consumer at the power distribution system. Basically, the interruption process of the MCCB is follows: when the fault current inflows, the trip unit detects it and operates stator to separate fixed electrode and moving electrode. Next, the arc stretches with bending toward the splitter plate after the arc discharge occurs between electrodes. finally, the arc is extinguished between plates by cooling, dividing and stretching when it reaches the splitter plate. In whole process of interruption, the factors that the arc stretches with bend toward the splitter plate are the Lorentz force, the arc runner and the gas pressure generated by hot-gas. Therefore, by improving these factors, the arc extinguishment at the splitter plate can be more fast and it leads to advance an interruption performance of the MCCB.
In this paper, to improve the Lorentz force, an external magnetic field is applied to both side of electrodes. The experiment circuit to make the over-current for activating the interruption performance of the MCCB is implemented and the experiments applied an external magnetic field are done by using ready-made product. As a result, the time between contact separation and splitter plate reach is shorter and the interruption process is faster. It is expected that these results help an optimization of design and improvement of performance.

Author: CHO, Young-Maan (Hanyang Univ.)

Co-authors: KIM, SEHOON (Hanyang University); Mr LEE, Chang-Jin (Hanyang University); Prof. KO, Kwang-Cheol (Hanyang University)

Presenter: CHO, Young-Maan (Hanyang Univ.)

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