TECHNOLOGY LICENCING OPPORTUNITY

DC Circuit Breaker with Mechanical and Auxiliary Relay System

Technology Details

The direct current (DC) circuit breaker described integrates both a mechanical relay and an auxiliary relay assembly to enhance the reliability and responsiveness of power interruption in DC circuits. This system is designed to provide a seamless transition from the mechanical relay to the auxiliary relay path during transient conditions, ensuring the safe and controlled interruption of electrical current.

Applications

1. Improved Fault Response: The integration of a mechanical relay with an auxiliary power-semiconductor relay enables faster response to fault conditions, particularly for DC circuits, where switching speed and precision are critical.
2. Bidirectional Current Blocking: The power-semiconductor circuit provides the capability for bidirectional current blocking, which is crucial for preventing unwanted power flow in either direction during transient faults, thus ensuring the safety of the system.
3. Enhanced System Protection: The method of using an auxiliary relay path in parallel with the mechanical relay ensures that power transfer is interrupted without delay. This enhances the reliability and safety of the electrical system by ensuring that current is swiftly redirected or blocked during fault conditions, reducing the risk of damage or fire.
4. Zero Voltage Condition for Safe Deactivation: By providing a zero-voltage condition under which the mechanical relay is deactivated, the system minimizes the chances of arcing or contact wear in the mechanical relay, thereby extending its lifespan and enhancing system reliability.
5. Efficient Power Transfer Termination: The ability to transition smoothly from mechanical to semiconductor-based current conduction ensures seamless power interruption without significant delays, improving overall system performance during faults or transient events.

Technology Benefits

This direct current circuit breaker system, incorporating both a mechanical relay and an auxiliary power-semiconductor relay, offers a highly responsive and reliable method of interrupting power flow during fault conditions. The controller manages the coordination between the relays, ensuring safe, efficient, and fast power interruption, minimizing system downtime, and protecting critical equipment from electrical damage

Development Stage

Investment in the further development and commercialization of this technology will accelerate the transition to a more sustainable and resilient energy future. Stakeholders in the energy sector, including utility companies, renewable energy developers, and technology investors, are encouraged to explore partnerships and collaborations to bring this innovative solution to market.

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