What is the function of dual-sided relay protection

Article Overview

Dual-powered relay protection ensures reliable fault detection and system protection by operating from both line-derived power and an auxiliary supply, providing redundancy and continuous protection even under abnormal conditions.

Core Function

Dual-powered relays are designed to detect electrical faults such as overcurrent or earth faults and initiate circuit breaker operation to isolate the faulted section of the network quickly, minimizing equipment damage and maintaining system stability . The "dual-powered" aspect means the relay can operate using power from current transformers (CTs) when the line is live or from an auxiliary battery or external supply if the line is de-energized or the primary power source fails . This ensures that protection is available under all operating conditions, including during line switching or in remote substations without reliable local power.

Advantages of Dual-Powered Relays
o Redundancy and Reliability: By having two independent power sources, the relay can continue to function even if one source fails, enhancing system reliability .
o Rapid Fault Response: The relay can quickly detect faults and send trip signals to circuit breakers, reducing the risk of equipment damage and limiting the faulted area .
o Flexibility in Remote Locations: In substations without permanent power, the relay can operate directly from CTs, ensuring protection is active even in isolated or temporary setups .
o Continuous Monitoring: Dual-powered relays maintain monitoring and recording of electrical parameters, fault events, and oscillography, which is critical for post-fault analysis and system maintenance .

Practical Applications

Dual-powered relays are commonly used in medium-voltage distribution transformer stations, ring main units, and industrial grids where reliable protection is essential . They are particularly valuable in remote or secondary substations, where auxiliary power may be intermittent or unavailable. These relays often include digital interfaces, USB ports, and programmable settings to facilitate configuration, fault record retrieval, and integration with supervisory control systems .

Summary

The primary function of dual-powered relay protection is to ensure uninterrupted, reliable fault detection and isolation by leveraging two independent power sources. This design enhances system safety, operational reliability, and flexibility, making it a critical component in modern power system protection schemes .

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Relays are generally available in different types like reed, protective, thermal, electromagnetism, reed, Buchholz relay,

There are different types of relays available and each type is used based on the requirement. So this article discusses an overview of

Selectivity Selectivity is a mandatory requirement for all protection, but the importance of it depends on the application. For example,

Dual CT Applications-- Apply the SEL-421 with ring-bus, breaker-and-a-half, or other two-breaker schemes. Combine currents within

Fundamental Requirements of Protective Relay: The principal function of Protective Relay is to cause the prompt removal from

A fast and selective arc fault mitigation for air-insulated LV & MV switchgear and Relion protection and control relays and sensor

Relay protection The objective of relay protection is to quickly isolate a faulty section from both ends so that the rest of

A differential relay is a protective device that detects imbalances in incoming and outgoing currents, safeguarding

Essential protection principles The aim of this technical article is to cover the most important principles of four

Protective relays play a vital role in safeguarding electrical systems, ensuring safety, and preventing costly equipment

Explore our insights about protection relay, learn about 4 key types of protection relay and their functions in different

Protective relays and devices have been developed over 100 years ago to provide "last line" of defense for the electrical systems.

On the other hand, unselective protection operation in the extra high voltage network - i.e. at the national grid

level- may endanger

Due to their often remote location, secondary substations do not always have a battery to provide power to electronic

Ground fault protection for these systems is usually provided by residual protection, either calculated by relay or by

Protective relay coordination is the process of setting relays so the device closest to the fault operates first, while

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