Self-powered relay protection device



Overview

ABB Relion REJ603 is a self-powered protection relay for the protection of utility substations and industrial power distribution systems in secondary distribution.

Key Takeaways

Self-powered relay protection devices operate without external auxiliary power, drawing energy directly from the line they protect, ensuring reliable and maintenance-free operation.

Overview and Principle

A self-powered relay is an electronic protection relay designed for medium voltage (MV) systems that derives its operating energy directly from the current transformers (CTs) of the protected line, eliminating the need for external batteries or auxiliary power supplies. This design significantly reduces maintenance requirements in substations and distribution networks, as there is no need to monitor or replace batteries, chargers, or other external power elements. Key AdvantagesMaintenance-Free Operation: No auxiliary power or batteries are required, reducing operational costs and simplifying substation management.

Reliable Fault Detection: Capable of detecting both high and low current faults, unlike traditional fuses that only interrupt high currents. Protection Selectivity: Allows precise coordination between MV and LV protection, improving system selectivity. Inrush Current Handling: Can distinguish transformer energizing inrush currents from fault currents, preventing unnecessary trips.

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Temperature Resilience: Operates reliably across a wide temperature range, avoiding undesired trips at high or low temperatures. Operating MechanismsSelf-powered relays typically use low-energy tripping mechanisms due to the limited energy available from the line. Two common mechanisms include: Striker Mechanism: A bistable device with a spring and electromagnet that requires minimal energy (~100 millijoules) to trip the breaker.

Low Power Coil (LPC): A bistable tripping coil designed to operate efficiently with the relay's energy output, often used in RMU applications. If a coil-based breaker is used, an external energy accumulator like the TCM adapter can store energy to trip the coil when needed, providing autonomy for several days. ApplicationsSelf-powered relays are widely used in: Ring Main Units (RMUs) for distribution networks.

Medium Voltage Substations to protect transformers, feeders, and generators. Compact or space-constrained switchboards, where their small size and integrated functionality simplify installation.

Features and Examples

Modern self-powered relays often include: Event and fault recording with timestamps for post-fault analysis. Communication interfaces such as RS-485 Modbus, USB ports, and SCADA integration for remote monitoring. Flexible energization options, allowing operation from CTs, auxiliary AC/DC supply, or internal batteries during commissioning.

Examples of commercially available devices include: Fanox Self-Powered Relays: No internal batteries, energy sourced from CTs, striker-based tripping.

C&

S Electric CSDPR-V2-500: Multi-powered feeder protection relay for RMUs with USB and Modbus interfaces.

ZIV IRS Self-

Powered Relay: Uses a bistable low-power coil, supports AC/DC auxiliary voltage, and provides event recording. ConclusionSelf-powered relay protection devices provide reliable, maintenance-free protection for medium voltage systems by utilizing the energy from the line itself. Their ability to handle low and high current faults, coordinate protection, and integrate with modern communication systems makes them ideal for RMUs, substations, and compact switchboards, offering both operational efficiency and cost savings.

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Article Content

Self-powered protection relay

Find your self-powered protection relay easily amongst the 5 products from the leading brands (SIEMENS, FANOX, ...) on DirectIndustry, the industry specialist

Self-powered protection relays, overcoming challenges

The concept “Self-Power” defines the supplying mode of electronic protection relays for medium voltage, meaning that there is no need for auxiliary

Self-powered Protection Relay

Simple but safe wiring, high electromagnetic interference immunity, uncomplicated adjustment and the ability to scale to different power quantities of the switchboard, helping the switchgear manufacturer

Relion REJ603 | ABB

ABB Relion REJ603 is a self-powered protection relay for the protection of utility substations and industrial power distribution systems in secondary distribution. It is a current-transformer-powered

What Are Self-Powered Relays and Why Are They Growing in Popularity

High-voltage protection systems are too complex and expensive for smaller neighborhood grids. Because of this, self-powered relays are becoming the go-to choice for modern,

Self Power Protection Relay (RMU) – C&S Electric Limited

C&S Electric Self Power Protection Relay (RMUs) product range includes Innovative Self Power Protection Relay for RMUs with Horizontal & Vertical Mounting.

Self-powered protection relays, overcoming challenges and providing ...

What is a self-powered protection relay and how does it operate? Protection relays are special types of electrical devices that are used to protect an electrical system from the improper operation and

Relays Part 4: The Protective Relay Basic Theory

The types of protective relays that exist are overcurrent, electromechanical, directional, distance, pilot, and differential relays. The circuit diagram of the protective relay is made up of current

Self-powered relay testing challenges

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When testing self-powered relays, many technicians ask why a current of 1 A injected by the relay test set is not registered as 1 A by the relay. Stefan Larson, Power Protection Product

Slim Innovative Self Power Protection Relay – C&S Electric

In the Protection relay, CSPR is numeric multi powered Over—current relay specially designed for ring main units & feeder protection.

Self-Powered RMU Protection Relay CSDPR-V2-500

C&S Electric CSDPR-V2-500 self-powered relay delivers advanced RMU protection with O/C, E/F and multi-setting groups for reliable feeder safety. Contact us today.

Self-powered feeder protection REJ603

Self-powered feeder protection for utility distribution and industrial applications REJ603 is intended to be used for the selective short circuit and earth fault protection of feeders in secondary distribution

Self Powered Relay Manufacturers in India

Leading Indian manufacturer of advanced self-powered relays, providing innovative power protection solutions committed to safety, reliability, and efficiency.

HighPROTEC Line

The HighPROTEC product range from SEG Electronics GmbH is an outstanding solution for reliable protection in the areas of power generation and power distribution. The user-friendly protection

Protection relays

Scope Modern protection relays Multifunctional protection Product benefits Provide continuity of power to consuments Protection of network assets Protection against life-threatening electrical incidents

Types of Electrical Protection Relays or Protective Relays

□□ Key learnings: Protective Relay Definition: A protective relay is an automatic device that senses abnormal conditions in electrical circuits and triggers actions to isolate faults. Types of

Adaptive electronic relay for smart grid based on self-healing ...

The third section introduces an adaptive electronic relay for the smart protection system, detailing the control model designed to achieve the self-healing aims of the smart grid system. The

What Are Self-Powered Relays and Why Are They Growing in Popularity

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What Are Self-Powered Relays and Why Are They Growing in Popularity Discover why testing self-powered protection relays can be tricky. Learn how non-linear loads and pre-fault

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