

Principle of 330kV Relay Protection Anti-pumping Circuit



Article Overview

The anti-pumping relay ensures that a 330kV circuit breaker closes only once per close command, preventing repeated closing during faults or continuous close signals.

Overview

In high-voltage systems like 330kV substations, circuit breakers are critical for isolating faults and protecting equipment. During a fault, repeated closing attempts can damage the breaker mechanism, trip coils, or other equipment. The anti-pumping relay (also called Y-relay or ANSI 94 Trip-Free Relay) is an auxiliary protective device that prevents such repeated operations by allowing only one close operation per close command .

Working Principle

- **Initial Condition:** When the circuit breaker (CB) is open and the spring is fully charged, the auxiliary contacts are positioned such that the closing circuit is complete. The normally closed (NC) contact of the anti-pumping relay allows the closing coil to be energized when a close command is issued .
- **Closing Operation:** When the operator presses the Remote Close switch or the Local TNC switch, current flows through the closing coil, energizing it and closing the breaker. This action changes the state of the auxiliary contacts (e.g., 52a closes, 52b opens), which in turn energizes the anti-pumping coil .
- **Anti-Pumping Activation:** Once energized, the anti-pumping relay opens its NC co...

Article Content

Dec 29, 2025

Power System Protective Relays: Principles & Practices

Abstract: Protective relays and devices have been developed over 100 years ago to provide “last line” of defense for the electrical

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Principle of 330kV Relay Protection Anti-pumping Circuit

Circuit Breaker Anti-Pumping Relay Working Principle Learn the working principle of the circuit breaker anti-pumping relay, its

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Anti pumping relay in Circuit Breaker –Diagram, Working principle

Anti pumping relay is used in the circuit breakers to prevent unwanted closing of the breaker after immediate tripping.

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Anti Pumping Relay: Working Principle, Circuit Diagram & Testing ...

An anti-pumping relay is a specialized electrical protection device integrated into the closing circuit of circuit breaker

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Anti-Pumping Relay in Circuit Breakers | PDF

This document discusses anti-pumping relays used in circuit breakers. It explains that anti-pumping relays prevent continuous

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Anti-Pumping Relay in Circuit Breakers | PDF | Relay | Switch

The document discusses an anti-pumping relay, which is a device that prevents multiple closures of circuit breakers. Multiple

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Anti Pumping Relay in Circuit Breaker

In this way the continuous Circuit Breaker opening and closing will take place which may damage Circuit Breaker

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Circuit Breaker Anti-Pumping Relay Working Principle

Learn the working principle of the circuit breaker anti-pumping relay, its function, advantages, common issues, and

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Anti Pumping and Lockout Relay Overview

The document discusses anti-pumping and lockout relays. It defines them as follows:

- Anti-pumping relays are classified as auxiliary

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Anti-Pumping Scheme in Circuit Breakers – A Complete Guide

To prevent this situation, the anti-pumping scheme comes into play. The anti-pumping mechanism ensures that the

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Anti-Pumping Relay Diagram & Working Function Explained

This article describes the anti-pumping relay, its definition, function, and circuit diagram. In a circuit breaker it is

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What is an Anti-Pumping Relay?

Working Principle of Anti-Pumping Relay: Typically, a DC contactor serves as the anti-pumping relay in a circuit

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Anti-Pumping Coil: Essential Protection in Circuit Breakers

The anti-pumping mechanism ensures that once a circuit breaker trips due to a fault, it will not automatically reclose

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Understanding the Antipumping Relay in Switchgears: Ensuring Safe

The antipumping relay is a vital component in switchgears, providing essential protection against repeated and

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Design and Testing of Anti-Pumping Circuit for High-Voltage Circuit ...

High-voltage circuit breakers play a critical role in the power system, and their anti-pumping circuit is an important protective

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Anti-Pumping relay diagram and Working Function Explanation

Anti-Pumping relay diagram and Working Function Explanation Anti-Pumping relay diagram and Working Function Explanation

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Anti Pumping And Lockout Relays

The function of anti pumping relay is to cut off the supply to closing coil in case of TNC switch spring failure and prevent

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Anti Pumping Relay: Working Principle, Circuit Diagram & Testing ...

In this technical guide we will discuss what is an Anti Pumping Relay, how does Anti Pumping Relay works, circuit

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Anti pumping relay

An anti-pumping relay satisfies the electrical trip-free requirement. For full trip-free protection, some engineers also

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Anti-Pumping relay diagram and Working Function Explanation

Anti-pumping-relay is used to protect the circuit breaker from multiple closing command. Once the breaker closed means, if we give

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