

Relay protection is divided into electromagnetic type



Overview

Electromagnetic Relay
Electromagnetic Relay Working Attraction Armature Type
Relay Induction Cup Type Relay
Balanced Beam Relay
Moving Coil Type
Relay
Electromagnetic relays are operated by electromagnetic action. Although modern electrical protection relays often use microprocessor-based relays, electromagnetic relays remain prevalent. Their complete replacement by microprocessor-based static relays will take considerable time.

Key Takeaways

Electromagnetic relays are protective devices that operate using magnetic forces to detect abnormal electrical conditions and actuate circuit breakers.
Overview of Electromagnetic Relays

Electromagnetic relays are a category of protective relays that use electromagnetic action to open or close contacts in response to abnormal electrical conditions such as overcurrent, overvoltage, or phase displacement . They are widely used in power systems for feeders, transformers, buses, motors, generators, and transmission lines to ensure system stability and equipment protection .

Types of Electromagnetic Relays

Electromagnetic relays can be classified based on their operating principle and construction:



- Electromagnetic Attraction Type
- Attracted Armature Relay: Operates when an armature is pulled by the magnetic field generated by current through the relay coil. Commonly used as overcurrent or auxiliary relays .
- Solenoid Type Relay: Uses a plunger that moves along the solenoid axis under magnetic force to actuate contacts .
- Electromagnetic Induction Type
- Induction Disc Relay: A metallic disc rotates due to the interaction of induced currents and alternating magnetic fields. Often used for overcurrent protection with time delay .
- Induction Cylinder Relay: Similar principle as the disc relay but uses a cylindrical rotor.
- Electrodynamic Type
- Uses a moving coil in an electromagnetic field. The coil rotates proportionally to the current or voltage, suitable for measuring and protective applications .
- Moving Coil Type
- A coil rotates in the air gap of a permanent magnet. These relays are precise and often used for voltage or current measurement .
- Electro-Thermal Type
- Operates based on the heat generated by current through a bimetallic strip, causing mechanical movement to actuate contacts .
- Physicoelectric Type
- Example: Buchholz relay, which operates based on gas accumulation or oil movement in transformers .

Working Principle

Electromagnetic relays operate by converting electrical energy into mechanical motion. When the actuating quantity (current or voltage) exceeds a preset threshold, the magnetic field generated in the relay coil produces a force that moves the relay mechanism, closing or opening contacts to trip a circuit breaker . Induction-type relays, for example, produce torque on a disc proportional to the input current, with the disc rotation eventually closing the relay contacts .

Applications

- Overcurrent and undercurrent protection
- Overvoltage and undervoltage protection
- Impedance and directional protection

- Auxiliary and control functions in power systems Electromagnetic relays remain prevalent due to their reliability, long lifespan, and simplicity, even though modern systems increasingly use static or digital relays . Understanding their types and operation is essential for designing and maintaining effective electrical protection schemes.

Article Content

Types of Electrical Protection Relays or Protective Relays

Types of protection relays are mainly based on their characteristic, logic, on actuating parameter and operation

Electromagnetic Relay Working | Types of Electromagnetic Relays

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Protective relay - Wikipedia

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Power source

Electromechanical relays can be classified into several different types as follows:
"Armature"-type relays have a pivoted lever supported on a hinge or knife-edge pivot, which carries a moving contact. These relays may work on either alternating or direct current, but for alternating current, a shading coil on the pole is used to maintain contact force throughout the alternating current cycle. Because the air gap between t

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Electromagnetic relays are those relays which are operated by electromagnetic action. Modern electrical protection relays are mainly

Classification or Types of Protective Relays

Most of the relays used are electromechanical type which work on the principles of electromagnetic attraction and

Protective Relays: Types, Working Principle & Uses

Protective relays are power system protection devices that monitor current, voltage, frequency, impedance, or

Types of Electromagnetic Relays

Analyze how an admittance relay (mho relay) distinguishes itself from an impedance relay in terms of operation and application. An

Types of Protective Relays

Electromagnetic attraction relays operate by virtue of an armature being attracted to the poles of an electromagnet or a plunger being

Different Types of Relays

The electrical protective relay can be broad, classified into two categories (i) Electromagnetic Relay and (ii) Static Relay.

Relay Classification and Functions | PDF | Relay | Electrodynamics

A protection relay senses changes in current or voltage signals and operates to initiate actions like tripping a circuit breaker if the

Introduction to Protective Relaying | Electric Power

Electronic Protection Relays Later protective relay designs used electronic circuits rather than

Power System Protective Relays: Principles & Practices

This presentation reviews the established principles and the advanced aspects of the selection and application of protective relays in

Different Types of Protective Relays

These relays have elements like temperature sensors and control elements. Thermal relays are often used in motor

Relays Part 4: The Protective Relay Basic Theory

The electromagnetic attraction protective relays are applicable in both AC and DC power and attract their poles

Protective Relay Basics

Electromechanical Type Relay This is an example of typical utility upstream transformer and feeder protection coordinated with a low

Understanding Relay Types: From Electromagnetic to Time and Speed Relays

This article explores the diverse classification of relays—from electromagnetic, thermal, and photoelectric types to time and speed

Types Of Protection Relays

What are Protection Relays? Protection relays are crucial components in electrical systems, safeguarding equipment and ensuring

Protective Relaying Principles and Applications

The article provides an overview of protective relaying principles and their applications for high-voltage power system components. It

Electromagnetic Relays | How it works, Application

Electromagnetic relays come with a host of advantages: Isolation: One of the key

Know About Different Types of Relays.cdr

The Watt-hour structure type relay works as an electromagnetic induction type of watt-hour – a meter so named, after it. It consists of

UNIT 1 PROTECTIVE RELAYS

PROTECTIVE RELAYS PROTECTIVE RELAYING Requirement of Protective Relaying Zones of protection, primary and backup

Classification of Relays

In power system protective relaying, the most widely applied are electrical type relays. Generally speaking the classification of relays

Relay Types: Electromagnetic, Reed, and Solid State

Explore electromagnetic, reed, and solid-state relays, their differences, advantages, disadvantages, and applications. Learn how

Choosing the Right Protection Relay

Protection relays can be divided into two main categories: digital relays and electromechanical relays. Digital protection relays Digital

Protective Relay: Working, Types, and Applications

Learn about protective relays, their working principle, types, and applications in power systems. Discover how relays

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Figure 1 (above) illustrates an electromagnetic relay. Protective Relay Definition: A protective relay is an automatic device that

What is Electromagnetic Relay?

Definition: Electromagnetic relays are those relay which operates on the principle of electromagnetic attraction. It is a type of a

Types of Relays in Electrical Power Systems | New Topic

Here we have listed different types of protection relays in the electrical system, or electrical substations. If you are

Different Types of Relays and Their Working Principles

Depending on the operating principle and structural features relays are of different types such as electromagnetic relays, thermal

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A primary motor protective element of the motor protection relay is the thermal overload element and this is accomplished through

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Types of Electrical Relays: Guide to EMR, SSR, Reed & Protective Relays

A simple explanation of electrical relay types. We cover how electromechanical, solid-state, and protective relays work

Protective Relay : Working, Types, Circuit & Its Applications

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

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