

Eighteen Relay Protection Items



AI Overview

The 18 relay protection items correspond to standard ANSI/IEEE device numbers used to protect electrical systems from faults and abnormal conditions. Overview of Relay Protection Items In power systems, protective relays are assigned ANSI device numbers to identify their specific functions. These relays safeguard equipment such as transformers, generators, motors, and transmission lines by detecting abnormal conditions and initiating circuit breaker operations. The 18 common relay protection items include:

- 50 – Instantaneous Overcurrent Relay: Trips immediately on high current faults.
- 51 – Time Overcurrent Relay: Trips after a time delay proportional to current magnitude.
- 46 – Negative Sequence Overcurrent Relay: Protects against unbalanced currents in three-phase systems.
- 47 – Phase Sequence Relay: Detects incorrect phase rotation.
- 27 – Undervoltage Relay: Trips when voltage drops below a set threshold.
- 59 – Overvoltage Relay: Trips when voltage exceeds a set threshold.
- 81 – Frequency Relay: Monitors system frequency deviations.
- 32 – Directional Power Relay: Detects power flow direction for selective tripping.
- 37 – Undercurrent Relay: Trips when current falls below a set value.
- 21 – Distance Relay: Protects transmission lines based on impedance measurement.
- 50/51N – Ground Overcurrent Relay: Detects ground faults with instantaneous or time-delayed action.
- 51G – Time Overcurrent Ground Relay: Protects against ground faults with time delay.
- 64 – Ground Fault Relay: Detects leakage currents to ground.
- 49 – Thermal Overload Relay: Protects equipment from overheating.
- 78 – Out-of-Step Relay: Detects generator or system instability.
- 50BF – Breaker Failure Relay: Trips backup breakers if the primary breaker fails.
- 46 – Negative Sequence Relay: Protects motors from unbalanced currents.
- 50/51 – Multifunction Overcurrent Relay: Combines multiple overcurrent functions in one device.

Applications These relays are used in medium- and high-voltage systems, including substations, industrial plants, and power distribution networks. Modern mi...

Article Content

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 systems. They are intended to quickly identify a fault and isolate it so the

Cybersecurity Issues in Electrical Protection Relays: A

The increasing digitalization of power systems has revolutionized the functionality and efficiency of electrical protection relays. These digital relays

Different Types of Protective Relays | 360training

Protective relays play a vital role in safeguarding electrical systems, ensuring safety, and preventing costly equipment damage. These devices are

Motor Protection Overload Relays

Motor Protection Overload Relays Thermal overload relays are essential components of electric motors. They protect motors from excessive current,

Practical handbook for relay protection engineers | EEP

Also principles of various protective relays and schemes including special protection schemes like differential, restricted, directional and distance

Types of Protection Relays and Testing procedures

Regular testing and maintenance of protection relays are essential to verify their proper operation, detect faults, and mitigate risks. By conducting

Safety Precautions of General Purpose Relays Cautions

Precautions for Correct Use 1. Selecting Relays 1-1 Mounting Structure and Type of Protection 1-1-1 Type of Protection If a Relay is selected that does not have the

Introduction to Protective Relaying | Electric Power

Introduction to Protective Relaying What are Protective Relays, or Protection Relays? Protective relays are used in industrial power generation and supply

ANSI Codes – Device Designation Numbers

In the design of electrical power systems, the ANSI Standard Device Numbers (ANSI /IEEE Standard C37.2) denote what features a protective device supports (such as a relay or circuit

Protective Relay : Working, Types, Circuit & Its

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

Electromechanical relays

ABB electromechanical relays have protected the power system for more than 100 years, and with the proper inspection, maintenance, and testing techniques,

To: [Customer Name]

ANSI/IEEE Standard Device Numbers In North America protective relays are generally referred to by standard device numbers. Letters are sometimes added to specify the application (IEEE Standard

Protective Relay Basics

Traditionally, protective relays were electromechanical devices utilizing induction disk, coils, contacts, and solenoid elements to determine protective characteristics.

Protective Relay | Fundamental Requirements of

A Protective Relay is a device that detects the fault and initiates the operation of the circuit breaker to isolate the defective element from the rest of the system.

Basic protection relay knowledge

A fast and selective arc fault mitigation for air-insulated LV & MV switchgear and Relion protection and control relays and sensor technology protect staff and plant facilities for many years.

Protection Relay:Types, wiring diagram and working principle.

Protection relay is an electromechanical monitoring safety device which senses fault and provide trip signal to the breaker as per set value in LT and HT panel. The Protection devices is over current

Protection Basics

Name two protective devices For what purpose is IEEE device 52 is used? Why are seal-in and 52a contacts used in the dc control scheme? In a typical feeder OC protection scheme, what

Circuit Protection, Fuses, Power Control & Sensing

Circuit Protection, Fuses, Power Control & Sensing Solutions - Littelfuse

Relays, Fuses, and Circuit Breakers | Protection

Comprehensive guide to electrical protection devices including relays, fuses, and circuit breakers, with specifications, selection criteria, and applications

Protection relays

Protection relays Numerical relays are based on the use of microprocessors. The first numerical relays were released in 1985. A big difference between

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

Protection relays — ABB Group

ABB's smart protection technology ensures smooth and safe everyday life without blackouts. ABB released its first programmable relays based on the use of microprocessors in 1985. ABB's Relion®

Protective Relays: Types, Working Principle & Uses

Learn how protective relays detect faults, trip breakers, coordinate protection zones, and protect feeders, transformers, motors, generators, and lines.

Protective Relay: Working, Types, and Applications

Learn about protective relays, their working principle, types, and applications in power systems. Discover how relays protect transformers, generators, and transmission lines from faults.

Table of ANSI IEEE Standard Device Numbers

This table details ANSI IEEE Standard Device Numbers as used for protective relaying in North America. Suffixes for numbers are also suggested.

Contact Us

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