

# Switching quantities in relay protection



## Article Overview

Switching quantities in relay protection are the electrical parameters, primarily current and voltage, that determine when a protective relay operates to isolate a faulted section of a power system.

### Key Concepts

1. **Pickup Current:** This is the minimum current at which a relay begins to operate, overcoming the controlling force of the relay mechanism. It is a critical parameter for ensuring that the relay responds only to fault conditions and not to normal load currents ( ).
2. **Current Setting:** The relay's pickup current can be adjusted by changing the coil turns or using a percentage of the current transformer (CT) rated secondary current. This allows the relay to be tuned to the expected operating conditions of the protected circuit ( ).
3. **Plug Setting Multiplier (PSM):** PSM is the ratio of the fault current to the relay's pickup current. It is used to determine the operating time of the relay, as higher fault currents generally cause faster relay operation ( ).
4. **Time Setting Multiplier (TSM):** This adjusts the relay's operating time, allowing coordination with other relays in the system. The TSM ensures that relays closer to the fault operate first, maintaining selectivity and minimizing unnecessary outages ( ).....

## Article Content

Distribution Automation Handbook

Time-graded protection is implemented using overcurrent relays with either definite time characteristic or inverse time characteristic.

Pick Up Current | Current Setting | Plug Setting Multiplier and Time ...

When studying electrical protective relays, we often use specific terms. To understand how different protective relays

SEL-751 Feeder Protection Relay | Schweitzer Engineering Laboratories

The SEL-751 Feeder Protection Relay is ideal for directional overcurrent, fault location, arc-flash detection, and high-impedance fault

Practical Setting Considerations for Protective Relays That Use ...

The paper reviews a number of typical settings found in incremental quantity- and traveling-wave-based protection elements and

Protective Relaying

Typical Relay and Circuit Breaker Connections Protective relays using electrical quantities are connected to the power

Practical Setting Considerations for Protective Relays That Use ...

Practical Setting Considerations for Protective Relays That Use Incremental Quantities and Traveling Waves Bogdan Kasztenny,

POWER SYSTEM PROTECTION

Switchgear and protection are essential components of electrical power systems, ensuring the safe and reliable operation of

Principle of Operation of Protective System | Economic ...

Basic Principle of Operation of Protective System: Basic Principle of Operation of Protective System – Each relay in a protection

Protective Relaying Terminologies Definition

Phase Fault Protective System Unit Protection Reach Protective Relay This is a master mind control of an electrical relay, which

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

Power System Protective Relays: Principles & Practices

A generic term covering those forms of protective relays in which the response to the input quantities is primarily a function of the

Types of Protective Relays

This article covers various types of protective relays, such as overcurrent, directional, and differential relays, highlighting their

Practical handbook for relay protection engineers | EEP

Relay protection circuitry This handbook covers the code of practice in protection circuitry

Basic protection relay knowledge

Definite time delay means that the protection operate time dose not change or depend on the fault type or the fault current

Power System Protective Relays: Principles & Practices

correct relaying-system performance The satisfactory operation of all equipment associated with the protective-relaying function in a

Fundamentals of Modern Protective Relaying

Instrument Transformers • Supply accurately scaled current and voltage quantities for measurement while insulating the relay from

Basics of Protective Relaying and Design Principles

Rules for protecting a network using overcurrent relays. Requirements for instrumentation (number and locations of instrument

Protective Relay : Working, Types, Circuit & Its Applications

Protective Relay : Working, Types, Circuit & Its Applications An electrically operated switch like a relay plays a key role in controlling

SCHEMATIC REPRESENTATION OF POWER SYSTEM RELAYING

Prepared by Working Group I5 Working Group Assignment presentation of protection and control relaying. The report

Practical Setting Considerations for Protective Relays That Use ...

New ultra-high-speed line protective relays that use incremental quantities and traveling waves are emerging. These

Pick Up Current | Current Setting | Plug Setting Multiplier and Time ...

Plug Setting Multiplier (PSM): The ratio of the fault current to the relay's pickup current, critical for relay operation.

Practical handbook for relay protection engineers | EEP

The relay must be able to discriminate (select) between those conditions for which prompt operation is required and

Numerical relay

The digital protective relay is a protective relay that uses a microprocessor to analyze power system voltages, currents or other

How Is the Switching Capacity of a Relay Defined and What ...

One of the specifications on switches and relays is the switching capacity. What does this mean and how is it

Fundamentals of Distance Protection

Distance protection is a very extensive aspect of power system protection. This article offers the reader a simple overview of distance

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