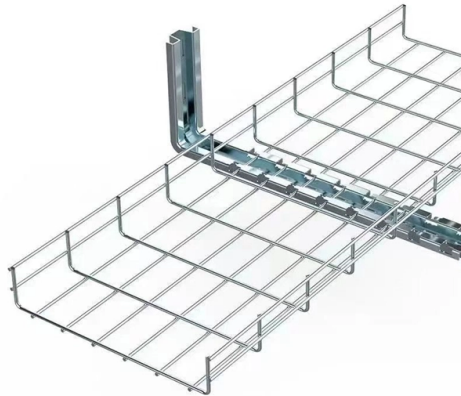


How to adjust the current in relay protection



Overview

How to Set Overcurrent Protection Relay Correctly: A Practical Guide Learn how to set overcurrent protection relays correctly with step-by-step calculation.

Key Takeaways

The current in relay protection is adjusted by setting the relay's pickup current using plug settings and coordinating it with the system's current transformer ratio and time settings. Understanding Pickup Current

The pickup current is the minimum current at which a relay begins to operate. It is determined by the deflecting force of the relay coil, which is proportional to the current and the number of active turns in the coil. By changing the number of active turns using taps and a plug bridge, you can adjust the pickup current. Increasing active turns reduces the required current, while decreasing turns increases it. The pickup current is usually expressed as a percentage of the CT's rated secondary current, for example, 125% of rated current for an overcurrent relay .

Using Plug Setting Multiplier (PSM)



The Plug Setting Multiplier (PSM) indicates how many times the actual current exceeds the relay's pickup current. It is a key factor in determining the relay's operating time according to inverse time characteristics. A higher PSM results in faster tripping. PSM is calculated as: $PSM = \text{Fault Current in Relay} / \text{Relay Pickup Current}$. For example, if a CT has a ratio of 200/1 A, the relay pickup is set at 150%, and the primary fault current is 1000 A, the secondary current in the relay is 5 A, which is used to determine the PSM.

Time Multiplier and Coordination

The Time Multiplier Setting (TMS or TSM) scales the relay's operating time based on its characteristic curve. Adjusting TMS ensures proper coordination between upstream and downstream relays, allowing the nearest relay to trip first while upstream relays provide backup. Lower TMS values result in faster tripping, while higher values delay operation to maintain selectivity.

Practical Steps to Adjust Relay Current

- Determine the system's rated current and CT ratio.
- Select the desired pickup current as a percentage of the CT secondary rating.
- Set the plug on the relay coil to achieve the required number of active turns corresponding to the pickup current.
- Calculate PSM using the expected fault current and relay pickup.
- Adjust TMS/TSM to coordinate with other relays in the system.
- Verify settings using relay characteristic curves or an overcurrent relay calculator to ensure proper operation and selectivity. By carefully adjusting the pickup current, PSM, and TMS, you ensure that the relay operates reliably during faults, protects equipment, and maintains system stability without unnecessary tripping.

Article Content

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Pick Up Current | Current Setting | Plug Setting ...

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Over Current Relay Setting Calculator

An Overcurrent Relay Setting Calculator is a online calculator tool that determines the proper relay settings to

Overload Relays Current Setting: Expert Guide for Electricians

Overload relays current settings are vital to protect motors from damage. Learn how to match current ratings and set

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Overload relay setting and calculation

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Relay Setting in Real Power System

Relay setting plays an important role in maintaining the reliability of a Power System. Read this blog to find out more

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The fundamentals of protection relay co-ordination and time/current ...

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The Basics Of Overcurrent Protection

The adjustment of definite-time and inverse-time relays can be carried out by determining two settings: time dial setting

Relays Part 4: The Protective Relay Basic Theory

The types of protective relays that exist are overcurrent, electromechanical, directional, distance, pilot, and differential

How to choose high-capacity relays for inrush current prevention ...

This guide provides detailed information on high-capacity relays that are perfect for inrush current protection and discharge circuits,

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Installing and Maintaining Protective Relay Systems

Ensuring that protection systems operate reliably is crucial, and a good preventive maintenance program ensures that protection and

How to Set Time-Current Curves for Relays

Learn how to set time-current curves for power system protection relays using steps and tools. Improve the reliability, safety, and

Overcurrent Protection Fundamentals

Relay protection against high current was the earliest relay protection mechanism to develop. From this basic method, the graded

Setting the generator protective relay functions

Protective relay functions and data This technical article will cover the gathering of information needed to calculate

Protective Relay Settings

Introduction Phase over-current protection is a common and widely used protection scheme that is implemented in high voltage and

Relay Protection Settings (PSM, TSM, EL, OL, MF)

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How to Test Protective Relays Correctly

You could calibrate and clean a relay to perfection today, and the electromagnetic and mechanical nature of the relay would cause

PSM and TMS Settings Calculation of a Relay: Protection

In the above figure, the over-current relay time characteristics are shown. By using these we can calculate The actual

RELAY SETTING CALCULATION

Maximum through fault current reflected in CT secondary $I_f = V_{S''} = I_{FS} * (R_{CT} + R_L)$
) Setting voltage Setting of the Pickup for the

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

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