

How to adjust the size of the relay protection switch



Overview

Protection relays employ a wide range of configurable parameters to identify defects & trip the breaker in a controlled & selected manner.

Key Takeaways

Adjusting a relay protection switch involves configuring key parameters such as the Plug Setting Multiplier (PSM) and Time Setting Multiplier (TSM) to ensure proper current and time coordination for fault protection. Key Parameters for Adjustment1. Plug Setting Multiplier (PSM) PSM determines how many times the actual current exceeds the relay's pickup current.

It is crucial for overcurrent relays, especially IDMT (Inverse Definite Minimum Time) types, as it directly affects the relay's operating speed. A higher PSM results in faster tripping, while a lower PSM delays operation.

PS

M settings must comply with IEC 60255-151 standards to ensure reliable operation under fault conditions and proper coordination with other relays. 2. Time Setting Multiplier (TSM) TSM scales the base operating time derived from the relay's characteristic curve.

It allows coordination between upstream and downstream relays, ensuring that the downstream relay trips first while the upstream relay provides backup.



Lower TS

M values result in faster tripping, and higher values increase delay.

TS

M selection should follow IEC 60255-3 guidelines for inverse, very inverse, and extremely inverse characteristics. 3. Overload (OL) and Earth Leakage (EL) Settings OL (Overload Setting): Adjusts the thermal overload protection to prevent damage from sustained overcurrent.

E

L (Earth Leakage / Earth Fault Setting): Sets the pickup current for detecting ground faults. Proper adjustment ensures selective tripping without nuisance operations. 4.

Multiplying Factor (MF) MF is used for scaling metering or CT secondary currents to match the relay's input.

Correct M

F ensures accurate relay response and coordination with system measurements.

Practical Steps for Adjustment

Determine System Parameters: Identify the maximum load current, fault current levels, and feeder ampacity. Select Relay Type and Characteristic: Choose the appropriate relay (IDMT, instantaneous, directional, etc.) based on system requirements.

Set PS

M: Calculate the pickup current based on CT ratios and desired fault sensitivity.

Adjust PS

M to achieve the required operating speed.

Set TS

M: Apply time grading to coordinate with upstream and downstream relays, ensuring backup protection.

Adjust OL and E

L: Configure overload and earth fault settings according to equipment ratings and protection requirements. Verify Coordination: Plot the relay curves on a Time-Current Characteristic (TCC) diagram to ensure proper coordination with other protective devices. Test and Commission: Perform secondary injection tests or use relay testing software to validate settings before energizing the system.

Safety Considerations

Always de-energize circuits before adjusting relay settings. Follow manufacturer manuals and IEC standards for safe handling and configuration. Avoid touching internal components of electronic relays to prevent electrostatic damage.

By carefully adjusting these parameters, the relay protection switch can be sized and configured to operate reliably, discriminate between faults, and protect the electrical system effectively.

Article Content

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

Protection relays employ a wide range of configurable parameters to identify defects & trip the breaker in a controlled & selected manner. Understanding each setting facilitates proper relay

MSB Calibration and Relay Setting Guide | PDF | Relay | Switch

This document provides a work method statement for calibrating and setting protection relays for a main switchboard. It outlines responsibilities of those involved including the construction manager, testing

Relay Protection in HV/MV Substations: Calculations, Settings ...

Effective relay protection in HV/MV substations requires a thorough approach encompassing calculations, precise settings, meticulous coordination, informed relay selection, and

Protection Relay Setting Interactive Calculator | FIRGELLI

Use this Protection Relay Setting Calculator to calculate pickup current, time multiplier settings (TMS), operating time, coordination time interval (CTI), and plug setting multiplier (PSM)

Relay Setting Calculation Overview | PDF | Volt | Relay

The calculations are performed to determine appropriate relay settings that ensure protection and coordination within the power system network.

Protection Relay Installation Manual

The type of mounting brackets to be used depends on whether the IED is installed into the frame on its own or with a test switch. Mount the case into the 19" equipment frame.

Power Engineering Course: Relay Control and Protection For

Learn how to analyze and set relay control and protection for low- medium- and high-voltage switchgear and substations from beginner to expert level. 20 sections and 129 lectures in 17h 11m total course

Adjusting Relay Settings: A Comprehensive Guide

It is typically set above the maximum fault current seen by downstream relays to provide fast clearing for close-in faults. The setting should be coordinated with the withstand capability of protected equipment.

Relay Settings Calculations – Electrical Engineering

This technical report refers to the electrical protection of all 132kV switchgear. These settings may be re-evaluated during the commissioning, according to actual and measured values.

Relay Settings Calculations – Electrical Engineering

Protection Settings Calculations for Lines SEL-311C Distance Protection Settings
Distance Zone Non-Homogeneous Correction Angle Load Impedance and Load
Encroachment Power Swing Detection/

Relay Settings Calculations

Stabilization during inrush condition via 2nd harmonic content in differential current is also detected by relay which just initiates blocking of the tripping. 2nd harmonic content can be measured roughly

Advice & How-To's

Welcome to the AutoZone DIY Auto Repair Blog, where you can access an extensive collection of automotive repair and maintenance information. Whether you're a seasoned mechanic or a novice

Industrial Relay Selection Guide: How to Choose the Right Part

In this industrial relay selection guide, find the right relay by considering important factors like type, voltage, durability, and application needs.

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 about relay setting and how it is achieved in real power systems.

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

Plug setting multiplier of relay is referred as ratio of fault current in the relay to its pick up current. Suppose we have connected on protection CT of ratio 200/1 A and current setting is 150%.

What to Know About Protective Relays | EC&M

Protective relays are arguably the least understood component of medium voltage (MV) circuit protection. In fact, some believe that MV circuit breakers operate by themselves, without direct

Relay Technical Information

When switching inductive loads with a DC relay such as relay sequence circuits, DC motors, DC clutches, and DC solenoids, it is always important to absorb surges (e.g. with a diode) to protect the

Overload relay setting and calculation

How to Set Overload Relay Protection An overload relay is a crucial device for motor control, designed to prevent motors from overheating or suffering winding damage due to excessive current. Properly

Related Video Reference

This video was associated with the source search result. Verify technical details against current product documentation and project requirements.

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Technical inquiry: <https://ensaa.es/contact.html>

This document is for preliminary research. Verify specifications against current standards, product documentation and project requirements.

