# Relay protection coordination factor 6



## Overview

Protection Coordination Determining the fault clearance time and coordinating upstream electrical pro-tection equipment are two key elements of the study.

## Key Takeaways

A coordination factor of 6 in relay protection typically refers to a multiplying factor used to scale relay operating times or currents to achieve proper selectivity between upstream and downstream relays.

### Understanding Relay Coordination

Relay coordination ensures that only the protective device closest to a fault operates first, minimizing the impact on the rest of the network and protecting equipment from damage. This is achieved by adjusting relay settings such as: Plug Setting Multiplier (PSM): Indicates how many times the actual current exceeds the relay pickup current.

### Higher PS

M results in faster relay operation. Time Setting Multiplier (TSM): Scales the base operating time from the relay's characteristic curve.

### Lower TS

M results in faster tripping, while higher TSM provides backup coordination. Multiplying Factor (MF): Sometimes referred to as a scaling factor, MF adjusts the relay's operating time or current to maintain selectivity across multiple relays. A factor of 6 means the relay's operating time or current is multiplied by 6 relative to a base setting, ensuring upstream relays trip after downstream relays.

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Practical Implications of Factor 6Selectivity: Using a factor of 6 ensures that the downstream relay clears the fault first, while the upstream relay acts as a backup if the downstream relay fails. Fault Clearance: The factor affects the time-current characteristic, delaying upstream relay operation to prevent unnecessary tripping of the main feeder or substation breaker. System Protection: Properly applying this factor reduces equipment damage, limits outage areas, and improves overall system reliability.

### Example Application

In a radial distribution network, if a feeder relay has a base operating time of 0. 5 seconds, applying a coordination factor of 6 to the upstream relay would set its operating time to 3 seconds, allowing the downstream relay to clear the fault first. This ensures time-graded protection and prevents cascading outages.

### Summary

The coordination factor 6 is a critical parameter in relay protection studies, used to scale relay operating times or currents to achieve selective and reliable fault clearing. It works in conjunction with PSM and TSM to ensure that only the necessary protective device operates during a fault, protecting equipment and maintaining system stability.

## Article Content

Protection Coordination

Determining the fault clearance time and coordinating upstream electrical pro-tection equipment are two key elements of the study. Proper coordination and disruption clearing times can

FEEDER PROTECTION CALCULATIONS & SETTINGS

In OC relays the coordination is based on the relay time-current characteristics of instantaneous and/or time delay units. Instantaneous units should be set so they do not trip for fault levels equal or lower to

Relay Coordination & Protection Grading Tool

Free relay coordination and protection grading tool for power systems engineers. Visualize Time-Current Characteristic (TCC) curves on a log

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

• Achieves proper coordination between relays (upstream & downstream) • It''s the mechanism used to construct time grading across relays that make the downstream relay TSM small

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

Among the various possible methods used to achieve correct relay co-ordination are those using either time or overcurrent, or a combination of both. The common aim of all three

Relay Coordination Study: Selectivity Calculations | EEP

The scope of study involves calculating the settings for protective relays to achieve selectivity during faults ocurring in the electrical network for the 13.8 kV and 4.16 kV projects.

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)

A Step-by-Step Protection Coordination Study Example

Learn how to set and coordinate circuit breakers to meet AS/NZS 3000:2018, ensuring faults are isolated quickly and safely in electrical systems.

IEC Standard for Relay Coordination – Complete Guide to Protection

Learn the IEC standard for relay coordination in power systems. This detailed guide covers relay settings, coordination studies, IEC 60255 requirements, and best practices for

7 Core Concepts on Relay Coordination Basics: A Simple Guide to ...

The ''Whats'' and ''Whys'' of power system protection. An overview of power system protection with focus on relay coordination basics - principles and objectives.

D:OCR2TM-5811-14CHAP4.PDF

Indicate protective relay (3)This pick-up safety be de factor ranges. reased may Star ting with the largest ) testin (or g relays worst to case eliminate -load t the lowest level, voltage plot volv the es calibrating

Protective Relay Basics

Overview The objective of this presentation is to convey a basic understanding of protective relays to an audience of engineers already familiar with low voltage protective device coordination.

Overcurrent Protection & Coordination for Industrial Applications

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Partial differential schemes simplify the coordination of multiple source buses by ensuring the main relay for each bus always see the same current as the faulted feeder.

Achieving Relay Coordination and Selective Short Circuit Protection In ...

Relay Coordination & Selective Protection The selected protection principle affects the operating speed of the protection, which has a significant impact on the harm caused by short

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

Low Voltage Distribution Panel: Guide for LV

5.2 Standards and compliance 5.3 Coordination and protection Choosing and Specifying an LV Distribution Panel 6.1 Load and system

Protection Coordination Calculator Guide | PDF | Volt | Relay

The document discusses protection coordination in distribution systems, emphasizing the importance of selective fault isolation to minimize outages and equipment damage. It outlines advanced calculators

Relay Coordination Study: Selectivity Calculations | EEP

Relay Coordination Study: Calculation of the protective relays setting value to obtain selectivity Published on November 21st, 2025 Translate (Premium)

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