

How to adjust relay protection parameters



Article Overview

Adjusting relay protection parameters involves setting current, time, and thermal thresholds based on system characteristics, motor data, and coordination requirements to ensure safe and selective operation.

Key Parameters and Their Adjustment

1. Plug Setting Multiplier (PSM) PSM determines how many times the actual current exceeds the relay's pickup current. It is crucial for IDMT (inverse definite minimum time) relays to calculate operating time.

- Formula: $PSM = \text{Fault Current} / \text{Pickup Current}$
 - Example: For a CT 400/5 A, relay current setting 120%, and fault current 10 A (secondary), $\text{Pickup} = 1.2 \times 5 = 6 \text{ A}$, $PSM = 10 / 6 = 1.67$
 - Adjustment: Set PSM according to expected fault currents and IEC 60255-151 standards to ensure proper trip speed .
2. Time Setting Multiplier (TSM) TSM scales the base operating time from the relay's characteristic curve.
- Adjustment: Multiply the base time by TSM to coordinate with upstream and downstream protection. Follow IEC 60255-3 for inverse, very inverse, or extremely inverse curves .
3. Overload (OL) / Thermal Protection Thermal overload settings protect motors and transformers from long-duration overcurrent.
- Typical Settings: Motor protection: 90–110% of FLA; Transformer: 110–130% of rated current
 - Adjustment: Use the motor's service factor and full-load amps (FLA) to calculate p...

Article Content

Mar 03, 2026

Relay Settings Calculations

To avoid relay mal-operation, set Slope 2 as high as possible. Normally, a high Slope 2 setting causes slow tripping for evolving

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Basics and Setting of Parameters for Protection of Transmission Line

Before getting started with setting parameters, first of all required data needs to be gathered and accessed, calculated

Dec 15, 2025

Overcurrent Protection Relay Settings: Best Guide

Learn how to set overcurrent protection relay settings with a clear, step-by-step guide. Understand pickup settings,

Jul 08, 2026

How to Set Motor Protection Relay Parameters Correctly

Learn about how to set motor protection relay parameters correctly. Expert guide covering key concepts, selection

Apr 14, 2026

Adaptive Protective Relay Settings – A Vision to the Future

Adaptive relaying utilizes the continuously changing status of the power system as the basis for online adjustment of the power

Jan 22, 2026

Distance Protection Relay Settings Guide

Zone settings in distance protection are critical for determining the relay's reach and selectivity in fault detection. Zones are

Nov 22, 2025

CALCULATION AND SETTING OF RELAYS IN TRANSMISSION

Abstract. This article deals with the issue of protective relays in terms of protecting high voltage lines. At the beginning of the article it

Jun 25, 2026

RELAY SETTING CALCULATION

To determine stability voltage for through fault V_s'' Voltage across the relay at IFS (VS) CT Resistance (RCT)

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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

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Relay Setting in Real Power System

To configure protective devices such as making a relay setting, having all the consideration of the fault severity and

Dec 19, 2025

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

Mar 24, 2026

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

Effective relay protection in HV/MV substations requires a thorough approach encompassing calculations, precise

Jun 12, 2026

Protection Relay Setting Interactive Calculator | FIRGELLI

With this Protection Relay Setting Calculator, you'll be able to work out pickup current, time multiplier settings (TMS),

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How to Test Protective Relays Correctly

How to Test Protective Relays Correctly Usually I try to keep my posts as simple and practical as possible.

Oct 01, 2025

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

Jan 09, 2026

Basics of Protective Relaying and Design Principles

Perform power system simulations of selected faults and observe how a given protection principle (overcurrent, impedance, and

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Overcurrent Protection Basics | How to Set Overcurrent ...

Overcurrent Protection Basics | How to Set Overcurrent Elements in Protection Relays

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How to Calculate Motor Protection Relay Settings Step

Calculate thermal overload, overcurrent, ground fault, and differential relay settings with

Feb 14, 2026

Protective Relay Basics Part 2

Part 1: Protective relay compared to low voltage circuit breaker. Review fundamental concepts, components, and terminology using

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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

Sep 12, 2025

Over Current Relay Setting Calculator

Our Overcurrent Relay Setting Calculator will accurately calculate your overcurrent relay settings. Enter rated current,

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A Guide for Calculating Step Distance Relay Settings

The relay setting development process should include a series of steps that guides the settings engineer to achieve reliable and

Feb 07, 2026

Generator Protection Relay Setting Calculations

Generator Protection – Setting Calculations Field Ground Protection (64F) Injection
Frequency adjustment Decade Box Initial

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PARAMETERIZATION OF PROTECTION RELAYS IN POWER

The teaching text describes complex procedures for parameterization of overcurrent, differential, and distance protection relays from

Apr 19, 2026

Practical handbook for relay protection engineers | EEP

Relay protection circuitry This handbook covers the code of practice in protection circuitry including standard lead and

Nov 18, 2025

Operation, maintenance, and field test procedures for protective relays

Plant protection system functional testing Protective circuit functional testing, including lockout relay testing, must take

Contact Us

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