

# Sensitivity requirements in relay protection



## Article Overview

Relay sensitivity ensures that protective relays detect the minimum fault current within the protected zone without compromising system stability or causing false trips.

### Definition and Importance

Sensitivity in relay protection refers to the ability of a relay to detect the smallest fault current that can occur in the protected section of a power system while avoiding operation for external faults or normal load conditions . Proper sensitivity is critical to ensure that all faults, even those with high resistance or low magnitude, are reliably detected and isolated, preventing equipment damage and maintaining system stability .

### Key Considerations

- **Minimum Fault Detection:** Relays must be set to operate at currents slightly above the maximum load current but below the minimum fault current expected in the protected zone. This ensures that all internal faults are detected while avoiding unnecessary tripping for normal operation .
- **Coordination with System Components:** Sensitivity settings must consider the characteristics of current transformers (CTs), circuit breakers, and other relays in the system. The relay must operate reliably under actual conditions, including transient power swings, without being influenced by external faults .
- **Selectivity and Security:** High sensitivity should not compromise selectivity. The r...

## Article Content

Aug 26, 2025

General Requirements of Protection Relay in Power System

3.2, the sensitivity coefficient: refers to the power system in the minimum mode of operation, in the entire protection of

Jun 13, 2026

Practical handbook for relay protection engineers | EEP

The relaying equipment must be sufficiently sensitive so that it operates reliably when required under the actual

Jun 16, 2026

Basics of Protective Relaying and Design Principles

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

Dec 08, 2025

Distribution Automation Handbook

On the other hand, the sensitivity of the relay for internal faults may be decreased in the same time, particularly in the transformer

Mar 27, 2026

Protective Relays and Monitoring Relays Selection Guide: Types ...

Both protective relays and monitoring relays may be sensitive to voltages, power or phase, current, or frequency. Protective relays

Mar 07, 2026

IEEE Power Systems Relays Standards Collection: VuSpec™

IEEE Power Systems Relays Standards Collection: VuSpec™ This VuSpec includes 47 active IEEE standards, guides,

Jun 28, 2026

Lecture 4 | PDF

This document discusses the desirable attributes of power system protection, including dependability, security, sensitivity, selectivity,

May 24, 2026

## Fundamentals of Modern Protective Relaying

A primary motor protective element of the motor protection relay is the thermal overload element and this is accomplished through

Apr 13, 2026

## Requirements of Protection Systems

Sensitivity refers to the characteristic of a protective relay that it operates reliably, when required, in response to a

Oct 12, 2025

## Assessing the Sensitivity of Relay Protection

Based on simple examples of the generator-transformer unit protection from symmetrical short circuits, it was shown

Sep 04, 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

May 04, 2026

## Maximizing line protection reliability, speed, and sensitivity

The relay protection sensitivity is one of the determined factors in the power system, however, it is often overlooked in

Feb 06, 2026

## (PDF) Prioritising the Protection Philosophy Elements of Speed ...

The protection philosophy is defined by sensitivity, selectivity, speed, dependability and security. This philosophy is

Aug 30, 2025

## Relay protection sensitivity integrated optimal placement and capacity ...

To address this challenge, a new optimization model integrated with the relay protection sensitivity to maximize the

May 04, 2026

## Module 1 : Fundamentals of Power System Protection

4.1 Dependability A relay is said to be dependable if it trips only when it is expected to trip. This happens either when the fault is in

May 05, 2026

## Protection Function Testing Procedure

Protection Function Testing Procedure: Step-by-step guide for stability, sensitivity & differential relay tests ensuring

Sep 21, 2025

## ASSESSING THE SENSITIVITY OF RELAY PROTECTION

One of the main requirements to relay protection is the sensitivity requirement, which implies consistent tripping during the short

Jun 21, 2026

## Basic protection relay knowledge

ABB Protection relay and solution Objective Protection purpose and requirements Key terminology Selectivity Sensitivity Stability

Jul 31, 2025

## Essential Qualities of Protective Relays

The document outlines the fundamental requirements of protective relaying, which include reliability, selectivity, speed, sensitivity,

Jun 16, 2026

## Maximizing Line Protection Reliability, Speed, and Sensitivity

Originally presented at the 42nd Annual Western Protective Relay Conference, October 2015, under the title "Maximizing Line

Apr 14, 2026

## Selectivity and sensitivity of overcurrent relay protections

The paper discusses the conditions for setting the overcurrent protection and how they determine the sensitivity and selectivity of

Jun 06, 2026

## Selectivity and sensitivity of overcurrent relay protections

The issues related to the fulfillment of the requirements for selectivity and sensitivity of the overcurrent protections are still relevant

Aug 31, 2025

## Protective Relay Basics

Traditionally, protective relays were electromechanical devices utilizing induction disk, coils, contacts, and solenoid elements to

Jun 06, 2026

Basic protection relay knowledge

A fast and selective arc fault mitigation for air-insulated LV & MV switchgear and Relion protection and control relays and sensor

Sep 22, 2025

What is a Protective Relay? Principle, Advantages, Applications

A protective relay is an electrical component that is designed to trip a circuit breaker when a fault is encountered or

Dec 14, 2025

Distribution Automation Handbook

The use of intermediate current transformers is not recommended as this increases the requirements set on the main current

Aug 14, 2025

Assessing the Sensitivity of Relay Protection

An assessment of sensitivity of the measuring elements of relay protection was performed. Based on simple examples

## Contact Us

For more information, pricing, or custom solutions, please contact us:

Website: <https://greatpremiersolutions.co.za>

Email: [sales@greatpremiersolutions.co.za](mailto:sales@greatpremiersolutions.co.za)

Phone: +27 82 914 3675

Address: Unit 5, Silicon Heights, 22 Electron Avenue, Cape Town, 8001, South Africa

This document is for informational purposes only. Specifications subject to change without notice.

