

10 Multiple and Relay Protection



Article Overview

10% multiple and relay protection involves configuring protective relays to detect faults near the generator neutral and coordinating multiple generators in parallel using settings like PSM, TSM, and earth fault relays.

10% Winding Fault Protection

In generator protection, a fault occurring 10% from the neutral refers to a short-circuit or ground fault located close to the neutral point of the generator winding. The fault current in this case is proportional to the distance from the neutral, meaning a fault at 10% of the winding produces a relatively low current. For example, with a 1000/5 CT, a 10% winding fault may result in only 0.5 A secondary current, requiring sensitive earth fault relays (51N) or differential relays (87G) to detect and isolate the fault effectively. This ensures that even small faults near the neutral are cleared before causing damage.

Multiple Generator Protection

When multiple generators operate in parallel, protection schemes must account for shared transformers and system grounding. Each generator may have its own overcurrent or differential relay, but coordination is essential to prevent unnecessary tripping. The transformer can serve as an earthing point, providing sufficient ground current (typically at least 50% of generator rated current) to cover most of the winding for earth fault detection. High-resistance grounding may be used to limit fault currents to 5–10 A, reducing the risk of iron damage while still allowing relays to operate....

Article Content

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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

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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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Practical handbook-for-relay-protection-engineers | PDF

The handbook for protection engineers includes guidelines on protective circuitry, protective relay principles, and testing procedures

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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

Aug 21, 2025

doi: 10.1007/978-3-319-20919-7_3

Verify by simulation that the relays operate as expected. Model malfunctioning of the protective equipment and verify operation of the

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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

May 15, 2026

Protection Basics

What is the function of power system protection? For what purpose is IEEE device 52 used? Why are seal-in and 52a contacts used

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Protection Basics

Protection System Elements Protective relays Circuit breakers CTs and VTs (instrument transformers) Communications channels

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Overcurrent Protection Fundamentals R

OVERCURRENT PROTECTION FUNDAMENTALS Relay protection against high current was the earliest relay protection

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Relay Setting Calculation For REF615/ REJ601 | PDF

This document outlines relay setting calculations for a 100 MW / 150 MWp solar power plant at Bhadla, Rajasthan, detailing

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Technical Explanation for Motor Protective Relay

Protecting the motor itself (burnout protection) Minimizing damage to the load connected to the motor (In this case, you must select a

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Generator Protection

GENERATOR PROTECTION Introduction This course covers generator protection concepts and theory. Protective devices that are

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Protection Relay Setting Interactive Calculator | FIRGELLI

📺 Video Walkthrough — How to Use This Calculator Protection Relay Setting Interactive Calculator Visualize how pickup

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Understanding Protective Relays in Power Systems

Protective relays are vital for safeguarding power systems, ensuring protection against faults and abnormalities. This

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Protection Basics

Ground fault protection for these systems is usually provided by residual protection, either calculated by relay or by

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PSM and TMS Settings Calculation of a Relay: Protection

PSM and TMS Settings are used to specify the tripping limits of a relay when a fault occurs. How to calculate the

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Distance Protection

Such protection relays are known as “distance protection relays” and only function in case of faults that occur between the location of

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

Plug Setting Multiplier (PSM) indicates how many times the determined relay secondary current (typically the CT

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Relay Settings Calculations

The relay (SEL-787) use the transformer MVA rating as a common reference point, TAP scaling converts all sec-ondary currents

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RELAY SETTING CALCULATION

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

Feb 25, 2026

Relay Settings Calculations

Protection selectivity is partly considered in this report, and could be also revaluated. Names of parameters in this calculation may

Jan 19, 2026

Plug Setting Multiplier (PSM): Formula, Calculation & Application ...

Learn What Plug Setting Multiplier (PSM) is, How to Calculate It, and its role in Overcurrent Relay Protection with

Apr 27, 2026

Over Current Relay Setting Calculator

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

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Generator Protection Relay Settings

The document provides recommended settings for various generator protection relays according to IEEE C37.102. It lists the

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Relay Pick Up Current and Settings

This document discusses key terms related to electrical protective relays and provides examples of calculating settings for

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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

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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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Distribution Automation Handbook

Time-graded protection is implemented using overcurrent relays with either definite time characteristic or inverse time characteristic.

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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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Protective Relay Basics

Multiple relays can use the same CT. The limit is defined by the electrical load (burden) of the relays in relation to the maximum

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Relay Protection

This is a prerequisite for accurate and reliable line differential protection and advanced monitoring applications.

Sep 03, 2025

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

Mar 04, 2026

Protective Relay Settings

As we are more familiar with settings based on how we set the electromechanical relays, this section describes the ways to set the

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Protective Relays: Overcurrent and Safety Relays | TE

TE offers types of protective relays from overcurrent relays to safety relays that trips a circuit breaker when

Aug 17, 2025

A Guide to Understanding Trip Curve for Overload Relays

Discover how to use trip curves to optimize motor protection. Explore relay trip classes and system characteristics for

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