

Thermal relay protection device setting value



Article Overview

Thermal relay protection devices are typically set based on motor full-load current and service factor, with pickup values around 115–125% of FLA to ensure proper overload protection.

Key Setting Parameters

1. Pickup Current (Overload Setting): The pickup current is the threshold at which the thermal relay begins to operate. It is usually set as a percentage of the motor's full-load amps (FLA). For motors with a service factor of 1.0, the pickup is typically 115% of FLA, while for motors with a service factor of 1.15 or higher, it is 125% of FLA . Setting the pickup too high may fail to protect the motor from moderate overloads, while too low a setting can cause nuisance trips . 2. Time Setting (Thermal Time Constant): Thermal relays operate based on the I^2t principle, where the tripping time depends on the square of the current over time. The relay's thermal time constant defines how long it takes to trip at a given multiple of the rated current. Modern microprocessor relays calculate accumulated heat and trip before the motor reaches its hot stall limit . 3. Plug Setting Multiplier (PSM) and Time Setting Multiplier (TSM): For IDMT (Inverse Definite Minimum Time) relays, PSM indicates how many times the actual current exceeds the relay pickup, affecting the operating speed, while TSM scales the base operating time to coordinate upstream and downstream relays . Higher PSM results in faster tripping, and lower TSM reduces trip delay.

Practical Adjustment Guidelines...

Article Content

Jun 14, 2026

THERMAL OVERLOAD CALCULATION

SIEMENS RELAY THERMAL OVERLOAD CALCULATION THERMAL OVERLOAD The thermal overload protection is

Oct 05, 2025

IEEE Guide for Protective Relay Applications to Power Transformers

Types of transformer failures This guide deals primarily with the application of electrical relays and over-current protective devices to

Dec 12, 2025

Relay Settings Calculations

These settings may be revaluated during the commissioning, according to actual and/or measured values. Protection selectivity is

Jul 24, 2026

SIPROTEC Protection Relays | Siemens

High-performance protection Future-proof your power supply with protection relays and control for digital

May 06, 2026

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

Nov 12, 2025

Keep on Running—Select Motor Relay Settings to Balance Protection

Thermal protection settings of electric motors can often be challenging to set in a way that maximizes motor availability while

Dec 19, 2025

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

Jan 20, 2026

Relay Protection Simulation and Testing of Online Setting Value ...

Analyzing the feasibility of modifying setting values on the condition of the running line without exiting the protection function is of

Mar 31, 2026

Thermal overload protection and automated protection relay setting ...

Potential motor disturbances are detected at the earliest possible stage by protection relays, which are used to prevent possible

Sep 18, 2025

Line protection calculations and setting guidelines for relays ...

Protection Settings The documents presented should serve as a model to various utilities in preparing similar

Mar 12, 2026

Overload relay setting and calculation

An overload relay is a crucial device for motor control, designed to prevent motors from overheating or suffering winding damage due

Jul 09, 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),

Dec 08, 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

Apr 17, 2026

Thermal Protection Relay Function: Role, Settings and Motor

Discover the thermal protection relay function: operating principle, types, tripping classes and selection criteria to

Jun 01, 2026

Thermal relay: operating principle, types, connection diagram ...

The current setting of the protective device can be adjusted in the range of 0.75-1.25x from the values of the rated current of the

Jan 08, 2026

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

The maximum and minimum values of short circuit currents that are expected to flow through each protection device.

Dec 03, 2025

Using the Engine Thermal Wizard for Accurate Setting and

In the simplest protection relays the thermal replica is built based on the nominal current, the pick-up setting, the trip class, and the

Apr 28, 2026

Motor Overload Setting Calculator | NEC 430.32 Sizing

Determine the correct thermal overload relay setting for electric motors to protect windings from overheating. Calculate NEC

Feb 09, 2026

Technical Explanation for Motor Protective Relay

The problem is that you have to anticipate that drop when setting the overcurrent must-operate value for the Motor Protective Relay.

May 04, 2026

REM610settool_opmanENb.fm

The settings for the relay thermal overload protection are calculated in the dialog shown in the figure above. The first value calculated

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Overcurrent Protection Fundamentals R

From this basic method, the graded overcurrent relay protection system, a discriminative short circuit protection, has been

Dec 25, 2025

Protection Basics

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

Feb 09, 2026

Protective Relay Basics Part 2

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

Jul 12, 2026

AC Motor Protection

A protection relay setting of 30% of this value can be used to give protection without the risk of a trip due to healthy system

May 24, 2026

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

Sep 11, 2025

Motor Protection Calculation Tool for SPAM 150 C

General The SPAM 150C setting program has been designed as an aid for defining the setting values for the SPAM 150 C motor

Contact Us

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