

Article Overview

Set the overload relay to 115-125% of the motor's full-load amperes (FLA), adjusted for service factor and operating conditions, to protect against sustained overcurrent while allowing normal startup currents.

Understanding Overload Relays

An overload relay protects motors from overheating and winding damage by monitoring current flow and disconnecting power if excessive current persists for a prolonged period. It allows brief inrush currents during motor startup without tripping, but trips if the motor draws too much current for an extended time, signaling the contactor to cut off power . Key components include:

- o Current Limit Adjuster: Sets the maximum current before tripping, usually based on the motor's FLA .
- o Auxiliary Contacts (95-96 NC, 97-98 NO): Provide status signals when an overload occurs .
- o Overload Signal Light: Indicates when the relay has tripped .

Calculating the Overload Setting

- o Obtain Motor Data: Record the motor's FLA, service factor (SF), and other nameplate data such as voltage, power, and insulation class .
- o Determine Base Setting:
 - o For motors with $SF \geq 1.15$, set the relay to 125% of FLA.
 - o For motors with $SF < 1.15$, set to 115% of FLA .
- o Adjust for Startup Conditions: If the motor frequently starts under load, some standards allow increasing the setting up to 140% of FLA for short durations to prevent nuisance trips .
- o Consider Trip Class: Thermal overload relays have trip classes (Class 10, 20, 30) indicating the time to trip at six times rated current. Choose a class suitable for the motor's duty cycle .
- o Environmental Adjustments: Reduce the setting slightly for high ambient temperatures or altitude to enhance protection .

Example

For a motor with FLA = 100 A and SF = 1.15:

- o Correct pickup = $125\% \times 100 \text{ A} = 125 \text{ A}$
- o Incorrectly using SF current as base could result in 132 A, allowing dangerous overloading .

Setting Procedure

- o Turn the current limit dial on the overload relay to the calculated amperage.

Relay protection overload setting value

- o Verify the relay type (thermal or electronic) and ensure it matches the motor's characteristics.
- o Test the system under controlled conditions to confirm the relay trips appropriately without nuisance trips.
- o Perform routine maintenance to ensure reliable operation over time .

Best Practices

- o Always use motor nameplate FLA for calculations, not measured operating current .
- o Match the trip class to the motor's starting and load conditions.
- o Adjust for ambient temperature and load variations.
- o Document all settings and verify against manufacturer recommendations and local safety standards. By following these steps, the overload relay will provide effective protection against sustained overcurrent while allowing normal motor operation and startup transients.

Calculate IEC-compliant overload relay settings quickly and accurately with our easy-to-use Overload Relay Calculator. Ensure

Calculate thermal overload, overcurrent, ground fault, and differential relay settings with step-by-step examples.

Since the relay should ideally be matched to the protected motor and be capable of close sustained overload

Authoritative guidance on setting motor overload relays to 125% of nameplate FLA,

An overload relay may look like a small component, but it plays a massive role in protecting your expensive 3-phase

The document provides guidelines for setting overcurrent protection devices for motors to meet objectives of life safety, equipment

To control their activation threshold, overload protection relays have adjustable current setting ranges. They can

Properly setting the overload relay is essential for ensuring both motor protection and smooth operation. To avoid frequent trips and

Calculate motor overload relay setting instantly using motor FLC and service factor. Supports thermal & electronic relays per NEC

Over current relays provide protection against overcurrent in power systems. They sense overcurrent and

Relay protection overload setting value

trigger circuit breakers to

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

I for Star values: $3.30 + (2.90 - 3.30) \times 0.6 = 3.06 = 3.10 \text{ A}$ The values for the full-load

Correct overload relay settings are important for protecting motors from overheating, phase failure, and prolonged

On the contrary, overcurrent relay protection is completely directed to the clearance of short circuits, even though with the settings

Overload Setting is a thermal/long-term overcurrent element (I²t-based). It guards against sustained overcurrent which

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

Web: <https://morwarreconst.co.za>

