Secondary load of relay protection CT

Article Overview

The secondary load of a relay protection CT is the total impedance (burden) connected to the CT secondary, which directly affects accuracy, saturation, and reliable relay operation.

Understanding Secondary Load

The secondary load of a current transformer (CT) refers to the total impedance connected across its secondary winding, including the protective relay input, connecting cables, and any auxiliary devices. This load is typically expressed in volt-amperes (VA) and is critical because it determines the excitation voltage the CT must provide to maintain accurate secondary current proportional to the primary current .

Impact on Relay Protection

o Accuracy and Saturation: If the secondary load exceeds the CT's rated burden, the CT may saturate during high fault currents, causing the secondary current to deviate from the primary current. This can lead to delayed or failed relay operation, compromising protection reliability .

o Relay Sensitivity: Protective relays rely on accurate secondary currents to detect faults. Excessive burden increases the required excitation voltage, which can reduce the relay's sensitivity and accuracy limit factor (ALF), potentially causing misoperation .

o Voltage Drop in Cables: Long secondary cables add resistance and inductance, increasing the effective burden. Proper sizing of cable cross-section and length is essential to minimize voltage drop and maintain CT performance .

Sizing and Selection Guidelines

o Rated Burden: Choose a CT with a secondary burden rating higher than the total connected load to avoid saturation. For example, a 5 A CT with a 50 VA burden rating can safely drive a relay and associated wiring without significant error .

o Relay Manual Reference: Always follow the protective relay manufacturer's recommendations for CT sizing, as different relays have varying input impedances and sensitivity requirements .

o Consider Fault Conditions: Ensure the CT can handle the maximum expected fault current without saturating. This may involve selecting a CT with a higher VA rating or using multiple CTs in parallel for high-current applications .

Practical Tips

o Avoid oversizing the CT excessively, as it may reduce resolution for low currents.

o Use dedicated protection CTs rather than metering CTs to ensure proper saturation characteristics and accuracy under fault conditions .

o For long cable runs, consider using a higher-rated CT or increasing cable size to reduce secondary voltage drop . In summary, the secondary load of a relay protection CT is a key factor in ensuring accurate current measurement and reliable relay operation. Proper calculation of the total burden, careful CT selection, and consideration of cable and relay characteristics are essential to prevent saturation and maintain protection system integrity.

This signal level is typically 5A nominal. Primary side is the line current and secondary side is connected to the relay. Multiple relays

Proper CT secondary wiring and burden calculation are essential for accurate metering and reliable protection. The

This article focuses on the calculation of CT sizing specifically for dual power overcurrent

An overcurrent relay analyses and processes the secondary currents from a set of current transformers (CTs) and if

#3 "Re: Use of Single CT Secondary Output for Both Differential and Overcurrent Protection" by raghun on

Because external current transformers are typically used on motor loads greater than 200 A, this example uses a 400 A motor load

This is possible in line protection applications since large load currents result in the use of high ratio CTs, and fault currents are

Calculate CT burden in VA from secondary current, lead resistance, and device load.

Comprehensive CT guide covering ratio selection, accuracy classes (ANSI/IEC), burden calculation,

Transformer Protection Application Guide This guide focuses primarily on application of protective relays for the protection of power

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

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

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We use CT models verified using high-current tests on a physical CT. Then using these models, we determine CT sizing guidelines

CT burden in measuring and protection systems explained in detail. Learn how CT burden affects metering accuracy,

Wow. for newer relays 100VA, unpossible 10P20, take 5P30, don"t increase burden, its not good solution, change

Calculate CT burden in VA from secondary current, lead resistance, and device load. Includes step-by-step metric

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