Power supply designation for relay protection devices

Overview

In electric power systems and industrial automation, ANSI Device Numbers can be used to identify equipment and devices in a system such as relays, circuit breakers, or instruments. The device numbers are enumerated in ANSI/IEEE Standard C37.2 Standard for Electrical Power System Device Function Numbers, Acronyms, and Contact Designations.

Key Takeaways

Relay protection devices are typically powered by standard DC or AC auxiliary supplies, and their designation is indicated using ANSI/IEEE device numbers with specific suffixes for auxiliary or control functions.

Overview of Relay Power Supply Designation

Protective relays require a dedicated power supply to operate independently of the main system voltage. These supplies are usually 24V, 48V, 125V, or 250V DC, or 110V/220V AC, depending on the relay type and system requirements. The power supply ensures that the relay can detect faults and operate circuit breakers reliably, even during abnormal system conditions.

ANSI/IEEE Device Numbering and SuffixesANSI/IEEE C37. 2 standard assigns device numbers to protective relays based on their function. While the main number identifies the protective function (e.g., 50 for instantaneous overcurrent, 51 for time overcurrent), suffix letters or numbers can indicate special applications or auxiliary connections: X, Y, Z: Used for auxiliary devices or contacts.

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G: Denotes ground-related functions (e.g., 51G for ground overcurrent). N: Indicates connection to a neutral wire (e.g., 59N for neutral overvoltage protection). For power supply designation, relays often include auxiliary device numbers or are documented in the relay legend to indicate the type of supply required.

For example, a relay may be labeled as 11X if it is a multifunction device (device 11) with an auxiliary DC supply.

Multifunction and Numerical Relays

Modern microprocessor-based relays can perform multiple protective functions in a single device. These multifunction relays are designated as device 11 under ANSI standards, and their power supply requirements are specified in the relay documentation or schematic legend. The relay's power supply type (AC or DC, voltage rating) is critical for proper operation and is often listed alongside the device number in single-line diagrams or relay setting records.

Practical Considerations

Ensure the relay's auxiliary supply voltage matches the system design. Use suffixes in documentation to clarify auxiliary or control connections. For multifunction relays, clearly define all functions and their power supply requirements in the relay legend.

Verify that the power supply has sufficient capacity to operate all relays and associated auxiliary devices reliably during faults. In summary, while ANSI/IEEE device numbers primarily indicate relay functions, power supply designation is communicated through auxiliary device suffixes, relay legends, and documentation, ensuring that protective relays operate correctly under all system conditions.

Article Content

ANSI device numbers

In electric power systems and industrial automation, ANSI Device Numbers can be used to identify equipment and devices in a system such as relays, circuit breakers, or instruments. The device numbers are enumerated in ANSI/IEEE Standard C37.2 Standard for Electrical Power System Device Function Numbers, Acronyms, and Contact Designations. Many of these devices protect electrical systems and individual system components from damage whe

Power System Protective Relays: Principles & Practices

Protective relays and devices have been developed over 100 years ago to provide “last line” of defense for the electrical systems. They are intended to quickly identify a fault and isolate it so the balance of

Protection Relay

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In the design of electrical power systems, the ANSI Standard Device Numbers denote what features a protective device supports (such as a relay or circuit breaker).

Protection and Control Device Numbers and Functions

The protection and control devices in electrical equipment can be referred to by numbers, with appropriate suffix letters when necessary, according to the functions they perform.

Table of ANSI IEEE Standard Device Numbers

This table details ANSI IEEE Standard Device Numbers as used for protective relaying in North America. Suffixes for numbers are also suggested.

ANSI Codes – Device Designation Numbers

In the design of electrical power systems, the ANSI Standard Device Numbers (ANSI /IEEE Standard C37.2) denote what features a protective device supports (such as a relay or circuit

ANSI (IEEE) Protective Device Numbering

Protective relays are commonly referred to by standard device numbers. For example, a time overcurrent relay is designated a 51 device, while an instantaneous overcurrent is a 50 device.

ANSI/IEEE Relay Device Numbers List

This document lists standard device numbers for protective relays used in North America according to ANSI/IEEE Standard C37.2-2008. The numbers are used to refer to different types of relays with

ANSI codes and IEC Relay Symbols – Electrical Engineering

To assist the Protection Engineer in converting from one system to the other, a select list of ANSI device numbers and their IEC equivalents are given in the following figure.

To: [Customer Name]

ANSI/IEEE Standard Device Numbers In North America protective relays are generally referred to by standard device numbers. Letters are sometimes added to specify the application (IEEE Standard

IEC Relay Symbols and Functions Guide | PDF | Relay | Switch

This document provides symbols and designations for relay protection devices based on IEC 617 standards. It includes: 1) Block symbols and qualifying symbols for general protection relays,

Relay symbols and device numbers; selection from IEC 617-, IEEE

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Definition and function Master element is the initiating device, such as a control switch, voltage relay, float switch etc., that serves either directly, or through such permissive devices as protective and

ANSI (IEEE) Protective Device Numbering

The widely used United Sates standard ANSI/IEEE C37.2 ''Electrical Power System Device Function Numbers, Acronyms, and Contact Designations'' deals with protective device

ANSI codes and IEC Relay Symbols – Electrical Engineering

There are two methods for indicating protection relay functions in common use. One is given in ANSI Standard and uses a numbering system for various functions. The functions are supplemented by

1MRK590006-BEN: Guide to Relay Symbols & Device Numbers

Page 1 Symbols and designations Symbols and designations, based on the IEC 617-series, IEC 617-7 (1983) and others Block symbols and qualifying symbols General block symbols Protection relay The

Collection_vuSpec

This powerful collection contains over 184 IEEE Standards, Guides, and Recommended Practices, including Errata & Interpretations on Power Switchgear, Circuit Breaker, Fuse, Substation, and

Intro to Relays #2

Protective Relays are an advanced area of electrical engineering and contracting that can be intimidating, but they don''t have to be! This series of 3 articles will introduce basic relaying to the

Introduction to Protective Relaying | Electric Power Measurement and ...

Introduction to Protective Relaying What are Protective Relays, or Protection Relays? Protective relays are used in industrial power generation and supply systems to open and isolate branch circuits in the

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