

Article Overview

Relay protection circuits are numbered using the ANSI/IEEE C37.2 standard, where each number identifies a specific protective function, often with suffixes to indicate application details.

Overview of ANSI/IEEE Device Numbering

In electrical power systems, protective relays and devices are assigned standard numbers according to the ANSI/IEEE C37.2 standard. This system allows engineers to quickly identify the function of a relay or device in diagrams, schematics, and control panels. Each number corresponds to a specific protective function, such as overcurrent, undervoltage, or differential protection. For example:

- o 50 - Instantaneous overcurrent relay
- o 51 - Time overcurrent relay
- o 27 - Undervoltage relay
- o 59 - Overvoltage relay
- o 87 - Differential relay

Use of Suffixes

Suffix letters or numbers are added to clarify the application or connection of the device:

- o G - Ground (e.g., 51G for time overcurrent ground relay) or Generator (e.g., 87G for generator differential relay)
- o T - Transformer (e.g., 87T for transformer differential relay)
- o N - Neutral connection (e.g., 59N for neutral overvoltage)
- o X, Y, Z - Auxiliary devices or specific functions These suffixes help distinguish between similar functions applied to different equipment or system points.

Multifunction Relays

Modern microprocessor-based relays can perform multiple protective functions in a single device. In such cases, the relay may be represented by a combination of device numbers, such as:

- o 27/59 - Combined undervoltage/overvoltage relay
- o 50/51 - Instantaneous and time overcurrent in one relay Even when multiple functions are integrated, each function retains its ANSI device number for clarity in documentation and single-line diagrams.

Practical Application

Relay numbering is widely used in:

- o Single-line diagrams - to indicate which protective functions are present
 - o Control schematics - to identify relay contacts and trip circuits
 - o Maintenance and troubleshooting - to quickly locate and understand relay functions
- By following the ANSI/IEEE numbering system, engineers ensure consistent communication and documentation across power systems, regardless of manufacturer or relay type .

Key Takeaway

Relay protection circuit numbering standardizes the identification of protective devices, making it easier to design, operate, and maintain electrical power systems. Numbers indicate the function, while suffixes specify the application, and multifunction relays combine multiple numbers to represent all functions performed by a single device.

Most commonly used Device Numbers, Suffixes, & Acronyms in Advanced Power Technologies (APT) Power Distribution Protection

In electric power systems and industrial automation, ANSI Device Numbers can be used to identify equipment and devices in a

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

This handbook covers the code of practice in protection circuitry including standard lead and device numbers, mode of

The widely used United States standard ANSI/IEEE C37.2 "Electrical Power System Device Function Numbers,

ANSI/IEC Relay Symbols Comparison This document provides a comparison of relay protection function indicators using the ANSI

In the design of electrical power systems, the ANSI Standard Device Numbers denote what features a protective

55. power factor relay is a relay that operates when the power factor in an ac circuit rises above or falls below a predetermined value.

This document lists standard electrical power system device function numbers from ANSI C37.2. It includes 99 device functions

This publication contains new and updated information as indicated in the following table. The protection and control devices in

This document provides a comparison of relay protection function symbols used in the ANSI and IEC standards. It lists common relay

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

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

Numerical relay Protective relay In utility and industrial electric power transmission and distribution systems, a numerical relay is a

Relaying and protection can be confusing-REALLY CONFUSING. Elaborate new ways to protect power systems are

Protective relay functions are typically represented in single-line electrical diagrams as circles, with the ANSI/IEEE number code

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