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IEC 60038 Standard Voltages: What You Need to Know

IEC 60038 is an international standard that defines a set of standard voltages for use in low voltage and high voltage AC and DC electricity supply systems. It is published by the International Electrotechnical Commission (IEC), a global organization that develops and publishes standards for electrical, electronic and related technologies.

The purpose of IEC 60038 is to harmonize the voltages used in different countries and regions, and to facilitate the interconnection of equipment and systems. It also helps to ensure the safety and compatibility of electrical products and services.

In this article, we will explain the main features of IEC 60038, such as the nominal voltage ranges, the tolerances, and the frequency. We will also provide a link to download the PDF version of the standard for your reference.

Nominal Voltage Ranges

IEC 60038 defines three categories of nominal voltage ranges: low voltage (LV), medium voltage (MV), and high voltage (HV). Each category has a number of sub-ranges, as shown in the table below.

| Category | Sub-range | Nominal voltages (kV) | |----------|-----------|-----------------------| | LV | A | 0.1; 0.23 | | LV | B | 0.4; 0.69 | | LV | C | 1; 1.5 | | MV | A | 3; 6; 10; 15; 20; 30 | | MV | B | 4.16; 6.6; 11; 13.2; 13.8; 22; 33; 34.5 | | HV | A | 35; 66; 110; 132; 150; 220; 275; 330; 400; 500; 765 | | HV | B | 45; 66; 69;115;138;161;230;345;500 |

Note that some nominal voltages may belong to more than one sub-range, depending on the region or application. For example, 66 kV can be either MV or HV.

Tolerances

IEC 60038 also specifies the tolerances for each nominal voltage range, which are the permissible variations from the nominal value. The tolerances are expressed as percentages of the nominal

voltage, and they depend on the category and sub-range.

The table below summarizes the tolerances for each category and sub-range.

| Category | Sub-range | Tolerance (%) | |----------|-----------|---------------| | LV | A | Â±10 | | LV | B | +6/-10 | | LV | C | +10/-10 | | MV | A | +6/-10 | | MV | B | +10/-15 | | HV | A | +10/-10 | | HV | B | +10/-15 |

For example, if the nominal voltage is 400 kV (HV-A), then the actual voltage can vary from 360 kV to 440 kV.

Frequency

IEC 60038 also defines two standard frequencies for AC systems: 50 Hz and 60 Hz. These frequencies are widely used around the world, although some regions may have other frequencies for historical or technical reasons.

The standard frequency for a given nominal voltage range is determined by the region or application. For example, most European countries use 50 Hz for all voltage ranges, while most American countries use 60 Hz for all voltage ranges.

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The PDF file contains the full text of the standard, including definitions, symbols, tables, figures, annexes, and references. It also includes amendments

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