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## CABLE SELECTION METHODOLOGIES FOR THE POWER SUPPLY SYSTEM

**Аннотация:** выбор кабеля для системы электроснабжения – одна из важнейших частей электроснабжения. Правильный выбор кабелей для передачи электрической энергии обеспечивает снабжение потребителей качественной энергией, а правильно выбранный кабель также снижает общие затраты на потребление.

**Abstract:** the choice of cable for the power supply system is one of the very important parts of the supply of electricity. The correct choice of cables in the delivery of electrical energy ensures the supply of quality energy to consumers, while a properly selected cable also leads to a decrease in total spending.

**Ключевые слова:** изоляция, кабельный лоток, кабели, система электропитания.

**Keywords:** insulation, cable tray, cables, power supply system.

The power supply system is a system of electricity that provides electricity to industry, agriculture, urban economy, population, transport, etc. It includes power sources, voltage-raising and lowering power plants, supply distribution power grid, various auxiliary devices and structures. The bulk of the electricity generated is used for industrial needs [1]. When choosing a cable, it is necessary to rely on the type of Cable, the type of cable insulation material and its rating factors. Below I will introduce you to this information.

**Type of insulation:** most of today's cables are insulated with PVC or XLPE. Obviously, for the same conductor material, voltage level, type, insulation, cross-sectional area and installation method, the cost of the XLPE insulated cable for continuous current level, short-term current level and unit length is much higher. PVC insulated cable [1,2].

**Cable type:** armored or unarmed cables are used in closed structures and above-ground structures, such as cable trays, precast concrete cable trenches, etc., Armored cables are mandatory for the installation of any underground cable. The insulation of the cable must withstand the voltage that occurs under different operating conditions. The choice of cable insulation is based on the appropriate phase-phase voltage, and the overall system category is classified as 100%, 133% or 173% insulation levels.

**Armor** can be a wire or strip made of galvanized iron or aluminum. In most cases, this armor is connected to the plant grounding system, preferably at only one end, usually the sending end. **Continuous current rating:** the continuous current rating of aluminum / copper conductor cables is available in catalogs of various cable manufacturers. However, it should be noted that constant current ratings are given in these directories for certain standard conditions of laying. In practice, these standard conditions cannot be obtained or maintained.

Cables consist of resistance and reactance. And so the current flow, but such impedance leads to a decrease in voltage. This drop should not affect the loads connected through the cable.

The actual voltage drop in cables is given in V/km, in the cable manufacturer's catalogs, for different types of cables. It is also 1255 in the Indian Standard (Code of practice for the installation and maintenance of electrical cables up to 33 kV).



During the start of large loads, it is necessary to calculate not only the steady-state voltage drop, but also the voltage drop in the acceleration state.

And the steady state voltage drop in load terminals should not exceed 10% and the acceleration state voltage drop in load terminals should not exceed 15%. If the cable is buried in the ground this will require hard and resistant insulation from the cable while such insulation will be expensive. However, we can observe that if we pass the cable through the cable tray, the cost will decrease dramatically in this [3,4].

Protected power cables offer more protection than standard unprotected ones. In energy systems without a metal or shield coating, the electric field is partially in the insulation system and partially in the air. If the electric field is strong, as with medium and high voltage, surface discharge occurs and causes air particles to ionize. Shielding in electrical cables reduces the potential for serious safety threats and increases the reliability of cable chains.

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