# STUDY OF THE MAIN QUANTITIES CHARACTERIZING ELECTRICAL LOAD GRAPHS

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***Annotation.*** *In this article, the quantities characterizing the electric load graphs were studied, through which the electrical quantities were analyzed using the demand coefficient, utilization coefficient, maximum coefficient and shape coefficient of industrial enterprises.*

***Key words:*** *demand coefficient, utilization coefficient, maximum coefficient.*

In the calculation and research of loads, the coefficients of load graphs describing the working mode of consumers in terms of power and time are used. Such coefficients are determined for private and group graphs and are denoted by lowercase k and capital K, respectively.

The demand coefficient refers to the group of consumers, and it is determined by the ratio of the accounting load to the nominal value of consumers [1]:

$$K_{T.a} = \frac{P_x}{P_{nom}}$$

Usage and maximum of coefficients expressions account if we take [2]:

$$K_{T.a} = \frac{P_{o'rt.}}{P_{nom}} \cdot \frac{P_x}{P_{o'rt.}} = K_{ish.a} \cdot K_{M.a}$$

also

$$K_{T.r} = K_{ish.r} \cdot K_{M.r}$$

The values of the demand coefficients are determined by this expression based on experience in operating conditions for various groups of consumers in industrial enterprises:

$$K_{T.a} = \frac{P_q}{P_{nom}}$$

Here, $P_q$ is the asset power received by the consumer group. Values of the demand coefficient for different groups of consumers and enterprises are given in references [3].

The utilization factor means the ratio of the average active power to the nominal power, and its amount is determined for the shift with the highest load:

$$k_{ish.a} = \frac{p_{o'rt.}}{p_n}; \qquad K_{ish.a} = \frac{P_{o'rt.}}{P_n} = \frac{\sum_1^n k_{ish.a} \cdot p_n}{\sum_1^n p_n}$$

Here, $p_n$, $P_n$ are nominal active capacities of one or a group of consumers, respectively. The amount of $P_n$ is taken from the passports of consumers who work repeatedly for a short period of time [4].

$P_s$, $P_s$ – respectively, the average active power of certain groups of consumers is determined according to the indicator of energy meters:

$$p_{o'rt.} = \frac{э_a}{t_s}; \qquad P_{o'rt.} = \frac{Э_A}{t_s}$$

$e_a$, $E_A$ - active electricity received by one or a group of consumers.

$T_s$ – the time interval for the cycle.

The above relations can also be written for reactive power [5]:

$$k_{ish.r} = \frac{q_{o'rt.}}{q_n}; \qquad k_{ish.r} = \frac{Q_{o'rt.}}{Q_n} = \frac{\sum_1^n k_{ish.r} \cdot q_n}{\sum_1^n q_n};$$

$$q_{o'rt.} = \frac{э_r}{t_s}; \qquad Q_{o'rt.} = \frac{Э_r}{t_s}.$$

The average value of utilization coefficients for electricity consumers operating in different modes is presented in the data [6].

Determining the maximum and shape coefficients from the coefficients of the load graphs describing the operating mode in terms of power and time [7].

Maximum coefficient graph filling to the coefficient reverse has been quantity, which is [8]:

$$K_{m.a} = \frac{1}{K_{T.a}} = \frac{P_m}{P_{o'rt.}}; \qquad K_{m.r} = \frac{1}{K_{T.r}} = \frac{Q_m}{Q_{o'rt.}}$$

of this coefficient value t is loaded shift for is determined and group to consumers belongs to will be If the max power when you say accounting power acceptance to be done attention removable if [ 9,10],

$$K_{M.a} = \frac{P_x}{P_{o'rt.}}$$

So , the maximum coefficient y enti from the graph defined two the most main Amounts are calculated and average downloads between relationship determines $K_m$ coefficient y enti accounting power average to power relatively how much size shows . His quantity together equal to or big to be can Immutable consumer goods (fans , pumps and tu .) for $K_m$=1, i.e $P_x = P_{o'rt}$.

Uniform coefficient don't download effective value his o ' average to the value of ratio with is determined. This pointer some iste ' mulchi or group consumers for known time in the interval found:

$$k_{f.a} = \frac{p_{o'rt.kv.}}{p_{o'rt.}}; \qquad K_{F.A} = \frac{P_{o'rt.kv.}}{P_{o'rt.}}$$

$$k_{f.r} = \frac{q_{o'rt.kv.}}{q_{o'rt.}}; \qquad K_{F.R} = \frac{Q_{o'rt.kv.}}{Q_{o'rt.}}$$

Form factor upload of the graph time according to unevenness shows. His the most small value, time according to variable in download, together equal to will be Average square upload the following expression through defined as [11]:

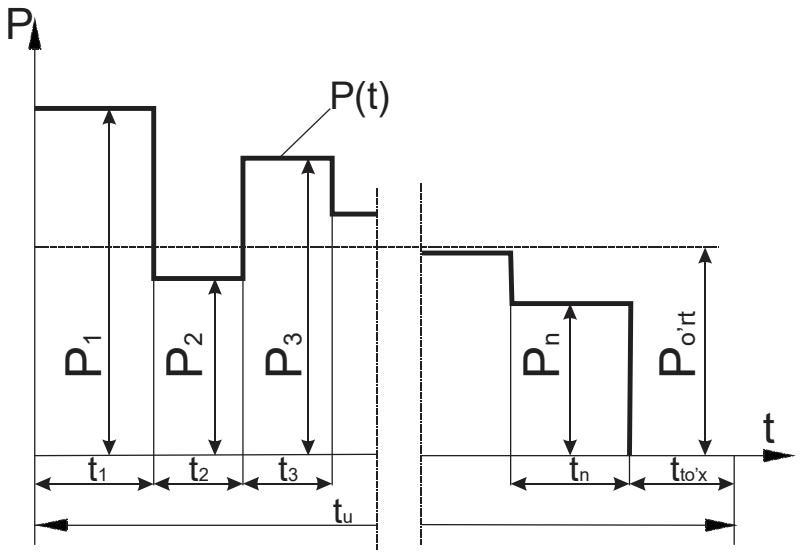


Figure 1. Download of the graph time according to unevenness.

$$P_{o'rt.kv.} = \sqrt{\frac{\sum_{1}^{n} P_i^2 \cdot t_i}{T}} = \sqrt{\frac{\sum_{1}^{n} P_i^2}{n}} \qquad Q_{o'rt.kv.} = \sqrt{\frac{\sum_{1}^{n} Q_i^2 \cdot t_i}{T}} = \sqrt{\frac{\sum_{1}^{n} Q_i^2}{n}}$$

Download $n = \frac{T}{t_i}$ here T time of the graph between equal to pieces the number Form factor $K_{fa}$ of quantity work release process in the ceremony has been in enterprises between 1.05 and 1.15 will be

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