

УДК 621.313.333

## THE STUDY OF START-UP MODES OF INDUCTION MOTORS

Д. Н. ШАМКО

Научный руководитель Б. Б. СКАРЫНО, канд. техн. наук, доц.

Консультант Г. И. СВИДИНСКАЯ

БЕЛОРУССКО-РОССИЙСКИЙ УНИВЕРСИТЕТ

The essence of the study is to identify the most effective method of start-up of the induction motor from the point of view of energy losses during the transition process. For the studies the most frequently used methods were selected, such as:

1) the direct start-up – this method consists of a direct connection of the motor to the source voltage.

2) the start-up with the step change of the supply voltage – the method consists in switching connection of the stator winding of the induction motor from the star to the triangle.

3) the start-up with a smooth change of the supply voltage – this method is implemented by using a thyristor voltage regulator, through which we can specify the law of variation of the voltages and obtain the desired character of transient processes.

4) the deterministic start-up – for the realization of the deterministic start-up you need to implement the alternating connection between the motor phases power supply.

5) the start-up with a smooth change of frequency of the supply voltage – management of the supply frequency by using the frequency converter, which allows you to obtain smooth and controlled start-up.

The study examines the impact on energy efficiency, not only of the chosen method of start-up, but also the influence of the parameters of the induction motor, of the laws of change of the supply voltage, etc. Therefore motors of various power were chosen for the research.

The whole study is performed by simulation modeling using software Matlab Simulink. This software allows us to obtain graphs of transient speed and torque, as well as a graph of energy losses.

The feasibility of this study is due to the global trends of reducing power consumption, improving production efficiency, reducing production prime costs. The future depends on the energy efficient technology.