

Lab 9: Three Phase Induction Motor
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Abstract

In this experiment, the basic principals of operation of an induction motor were studied. These studies included the characteristics of a wound-rotor induction motor analyzed at two different supply voltages. The characteristics such as motor speed, output torque, and line current were recorded while varying load torque.

Results

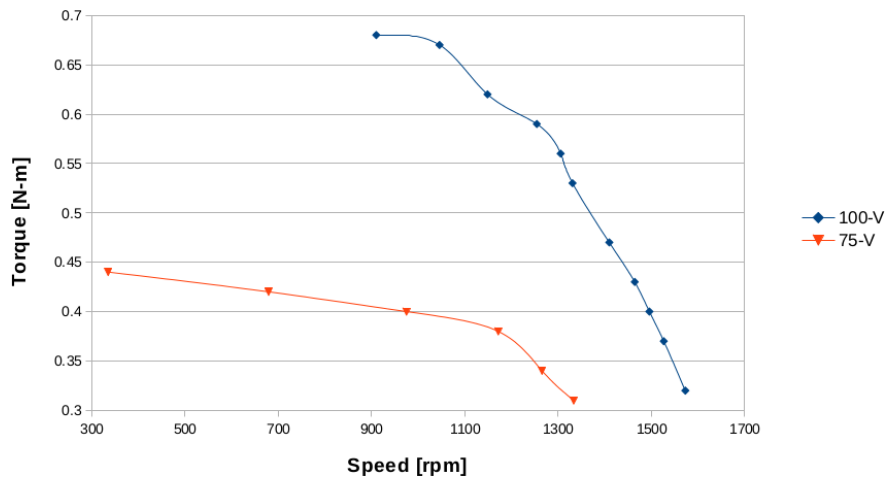


Figure 1: Comparison of Output Torque vs. Speed for Different Supply Voltages

Conclusions

In a typical torque speed curve, the plot rises sharply from the starting torque to the breakdown (peak) torque, and then decreases linearly to the no-load mark. This linear section, from no-load to breakdown, is the motor's operating region.

However, the data obtained in the experiment is represented in the figure above. The plot is not characteristic of a typical induction motor torque-speed curve as described. This is because of a high unknown rotor resistance. Both supply voltages of 100-V and 75-V have the starting torques and breakdown torques to be at the same mark. The motor with a starting voltage of 100-V has a starting torque of 0.68-Nm and a no-load speed of 1565-rpm. The motor with a starting torque of 75-V had a starting torque of 0.44-Nm and a no-load speed of 1343-rpm. Thus a wound-rotor induction motor needs to have a higher supply voltage to be start heavy loads.