

UNIVERSITY OF NORTH CAROLINA AT CHARLOTTE

Department of Electrical Engineering

Three-Phase Squirrel-Cage Induction Motor Characteristics

INTRODUCTION

The three-phase induction motor is basically a rotating transformer. By obtaining no-load data (open-circuit) and blocked-rotor data (short-circuit), an equivalent circuit of the motor can be obtained that will look similar to a power transformer equivalent circuit.

ASSIGNMENT

The student is to devise and run such tests as needed to obtain the properties and an equivalent circuit for a three-phase squirrel-cage induction motor.

REFERENCES

1. References on reserve in the library.
2. Textbooks on electromagnetic devices, or, specifically, electrical machinery.
3. Faculty with expertise in the area of electrical machinery and/or power distributions systems.

EXPECTED RESULTS (as a minimum)

1. Curves of line current and power input as a function of no-load voltage on the same graph with rated voltage noted..
2. Curves of voltage and power input as a function of blocked-rotor current on the same graph with rated current noted.
3. The equivalent circuit for the motor, assuming $X_S = X_R$.
4. Curves of efficiency, torque, input current, rotor speed (RPM), slip, and power factor versus horsepower output all on the same graph.
5. Curves of total input current, real current, and imaginary current versus torque all on the same graph.
6. Curves of torque and line current versus slip all on the same graph.
7. An explanation of the results..