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# EXPERT SYSTEMS AND SOLUTIONS

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## Energy conservation in industrial A.C drives

### ABSTRACT

The induction motors can be considered the larger users of electrical energy. They are used both in industrial and commercial sectors in a wide range of applications, such as: fans, compressors, pumps, conveyor, winders, mills, transports, elevators, home appliances and office equipments. In India, the electric motors used in the industrial field consume typically the 60 to 70% of the total adsorbed electrical energy. In the commercial sector, this percentage is up to 35%.

With reference to industrial sector, a general purpose electrical motor consumes about an annual quantity of electrical energy equal to 5 times its purchase costs and the motor life *can* be evaluated around 10 to 12 years. On the base of these considerations, it is possible to obtain consistent energy saving if higher efficiency motors are used in the final applications.

World-wide, there exist several standards for testing electric machinery. For induction motors, the four most important are:

IEEE Standard 112-1996

IEC 34-2 and IEC 34-2A

JEC 37

IS 325

Several national standards are harmonized with regard to one of the three general standards above. The NEMA MG-1- 1993 standard and the Canadian standard C390 correspond to the IEEE standard, while in most of the European countries; the standards are harmonized to IEC 34-2. JEC stands for the Japanese standard. The efficiency value obtained from the considered testing standards can differ by several percent, as will be shown in the measurement results. Moreover, one standard can contain different methods that do not necessarily lead to one firmly determined value.

In this project, international standards are used to evaluate the efficiency of 3.7 KW, 4 pole three-phase induction motor and a logic based energy optimizer is developed using the numerical values obtained from the above standards.

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