1 Electric Machines-Standards and Definitions

1.1 Introduction and Standards

Electric machines produce in the operating point torque in a speed range determined on the one hand by the type of motor, and on the other hand by the load characteristic. Generally speaking, we must distinguish between direct-current - and alternating-current - or rotating field-machines; this type of distinction concerns the electrical power supply of the machine. Another type of distinction is based on the speed - torque characteristic. For example, here we distinguish between the series excitation characteristic, thus the speed increases clearly as the torque diminishes; the shunt excitation characteristic, thus the speed decrease slowly as the torque increases; or the synchronous characteristic, thus the speed is constant (not the angular position) with variable torque. Further distinctions are made based on the type of construction, the fields of application (classes of protection) or the control. Requirements and standards have been developed in order to unify the various additional conditions for electric motors, such as electrical connection, operating conditions, and types of constructions.

There are several normative references like:

- IEC 27: Letter symbols to be used in electrical technology
- IEC 27-1: 1992, Letter symbols to be used in electrical technology
- Part 1: General
- IEC 27-4: 1985, Part 4: Symbols for quantities to be used for rotating electrical machines
- IEC 34: Rotating electrical machines
- IEC 34-2: 1972, Rotating electrical machines - Part 2: Methods for determining losses and efficiency of rotating electrical machinery from tests (excluding machines for traction vehicles)
Indeed there are also national standards, which have to be considered.