

1.7 Selection of Motor for Electrical Drives

Choice of an electric drive depends on a number of factors. Some of the important factors are.

✓ Steady State Operating conditions requirements:

Nature of speed torque characteristics, speed regulation, speed range, efficiency, duty cycle, quadrants of operation, speed fluctuations if any, ratings etc

✓ Transient operation requirements:

Values of acceleration and deceleration, starting, braking and reversing performance.

✓ Requirements related to the source:

Types of source and its capacity, magnitude of voltage, voltage fluctuations, power factor, harmonics and their effect on other loads, ability to accept regenerative power

✓ Capital and running cost, maintenance needs life.

✓ Space and weight restriction if any.

✓ Environment and location.

✓ Reliability.

Group Electric Drive

This drive consists of a single motor, which drives one or more line shafts supported on bearings. The line shaft may be fitted with either pulleys and belts or gears, by means of which a group of machines or mechanisms may be operated. It is also sometimes called as SHAFT DRIVES.

Advantages

A single large motor can be used instead of number of small motors

Disadvantages

There is no flexibility. If the single motor used develops fault, the whole process will be stopped.

Individual Electric Drive

In this drive each individual machine is driven by a separate motor. This motor also imparts motion to various parts of the machine.

In this drive system, there are several drives, each of which serves to actuate one of the working parts of the drive mechanisms.

E.g. Complicated metal cutting machine tools

Paper making industries, rolling machines etc.

Classification of Electrical Drives

Another main classification of electric drive is

- ✓ DC drive
- ✓ AC drive

Applications

- ✓ Paper mills
- ✓ Cement Mills
- ✓ Textile mills
- ✓ Sugar Mills
- ✓ Steel Mills
- ✓ Electric Traction
- ✓ Petrochemical Industries
- ✓ Electrical Vehicles

