

damage.

\* The sensing unit will give the necessary control signal to the control unit.

### (v) control unit:

The control unit will control the power modulator depending upon the control signal received from sensing unit and input command.

\* For this control semiconductor converters, its firing circuit, transistors and a microprocessors are used.

### (vi) Load:

\* Normally loads are employed for accomplishing the given task.

\* For eg. Fans, pumps, robots, washine machine.

## ⇒ Types of Electric Drives:

The electric drives used in industry may be divided into three types.

(a) Group drive

(b) Individual drive

(c) Multi motor drive.

### (a) Group drive

Here a single motor drives several machines. This motor is mechanically connected to a long shaft, it's also called lineshaft drive.

- \* The line shaft is fitted with multi-stepped pulleys and belts.
- \* The driven machines are connected to these pulleys and belts for their required speed.
- \* In a group drive a large motor capable of taking the load of all machines simultaneously has to be installed.
- \* At times it happens that only a few machines are working and the power of motor is not completely utilised.

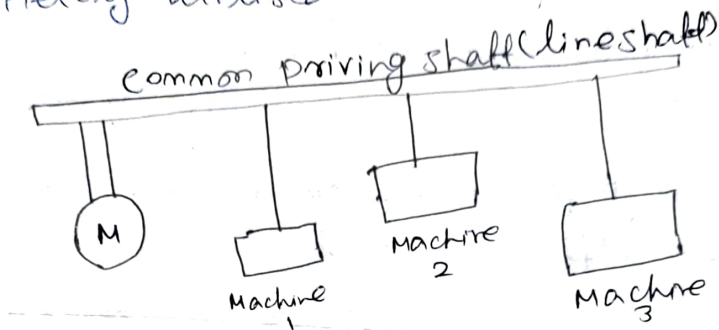


Fig: group drive

#### Advantages:

- \* The Installation cost and cost of one large motor will be much less than a number of smaller motors totalling the capacity.
- \* Efficiency and power factor of a large group drive motor will be higher (operated by it's full load).
- \* All the operations can be stopped simultaneously.
- \* only less space is required compare to Individual drive.
- \* It requires less maintenance compared to Individual drive.

#### Disadvantages:

- \* Breakdown of a motor causes all the operations to be stopped.
- \* If most of the machines are idle then, the main motor will operate on load with less  $\eta$ .

- \* Noise level at the work place.
- \* Not possible to install any machine at a distant place.
- \* In existing industry installation of additional machines are difficult.
- \* speed control of individual machines is not possible.

### (b) Individual Drive:

Here there is a separate driving motor for each machine. Such a drive is very common in most of the industries.

- \* It's ~~very~~ necessary for heavy machinery such as for lifts, cranes etc.

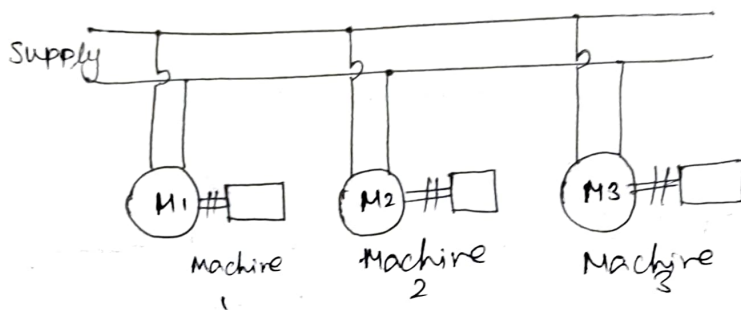


Fig: Individual Drive

### advantages:

- \* The machines can be installed at any desired position.
- \* If there is a fault in one motor other machines will not be affected.
- \* Each operator has complete control of his machine. He can vary the speed and ~~can~~ stop that's necessary.
- \* No-load losses can be eliminated.
- \* Efficiency of the system is high.

\* Good power factor

(19)

\* Absence of belts and line shafts greatly reduces the risk of accidents to operator.

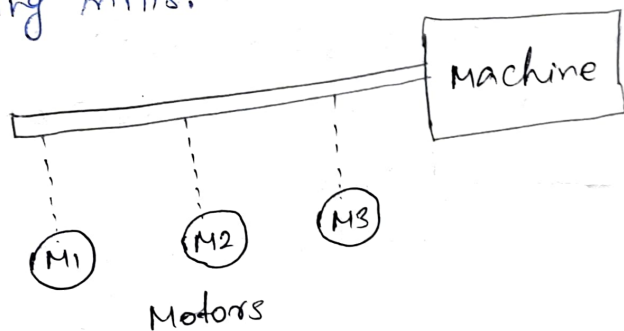
disadvantages:

\* Initial cost is high.

ce) Multi Motor Drive:

Here a separate motors are used for operating different parts of the same mechanism. e.g. in case of an overhead crane, different motors are used for hoisting, long travel motion and cross travel motion.

\* It's also essential in complicated metal cutting machine tools, paper making machines, rolling mills.



Motors

Fig: Multimotor Drive

⇒ Factors influencing the choice of drive:

choice of Motors-

- \* In various designs the electric motors are available for the different application.
- \* If a reliable and efficiency motor is to be chosen the conditions of service must be exactly known.