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“Speed Control of Induction Motor”

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March,2018

start the motor setting the Jog switch in "H" position: the motor has to start with the set acceleration ramp and to settle to speed corresponding to the Jog value. We can reverse the direction of rotation of the motor set the "cw/ccw" to "ccw" position.

Different speed control methods of induction motor :

1. By Changing The Applied Voltage:

if supplied voltage is decreased, the developed torque decreases. Hence, for providing the same load torque, the slip increases with decrease in voltage, and consequently, the speed decreases.

2. By Changing The Applied Frequency

the synchronous speed changes with change in supply frequency. Actual speed of an induction motor is given as $N = N_s (1 - s)$. However, this method is not widely used. It may be used where, the induction motor is supplied by a dedicated generator (so that frequency can be easily varied by changing the speed of prime mover). Also, at lower frequency, the motor current may become too high due to decreased reactance. And if the frequency is increased beyond the rated value, the maximum torque developed falls while the speed rises.

3. Constant V/F Control Of Induction Motor

This is the most popular method for controlling the speed of an induction motor. As in above method, if the supply frequency is reduced keeping the rated supply voltage, the air gap flux will tend to saturate. This will cause excessive stator current and distortion of the stator flux wave. Therefore, the stator voltage should also be reduced in proportional to the frequency so as to maintain the air-gap flux constant. The magnitude of the stator flux is proportional to the ratio of the stator voltage and the frequency. Hence, if the ratio of voltage to frequency is kept constant, the flux remains constant. Also, by keeping V/F constant, the developed torque remains approximately constant. This method gives higher run-time efficiency. Therefore, majority of AC speed drives employ constant V/F method (or variable voltage, variable frequency method) for the speed control. Along with wide range of speed control, this method also offers 'soft start' capability.

We observed that as we change the local set point of frequency the speed is changed as well

We started the motor by setting the Jog switch to H: the motor started with ramp acceleration and then settled to speed corresponding to the Jog value.

the direction of rotation of the motor can be reversed by setting the either cw or ccw.