

Constant Torque Operation

Constant Power Operation

A variable speed drive is called Constant Torque Drive if the drive's Maximum torque capability does not change with a change in speed setting.

A variable speed drive is called Constant Power Drive if the drive's Maximum power capability does not change with a change in speed setting.

A DC motor with a constant field voltage increases its speed when the voltage across its armature circuit increases, and vice versa.

A DC Motor With a Constant Armature Voltage and reduced field current increase the speed keeping Power Constant.

The equation of torque is given by $T = K_a \Phi I_a$.

The equation of Power is given by $P = \frac{2\pi NT}{60}$

For the motor speed from zero to base speed is known as Constant Torque Region.

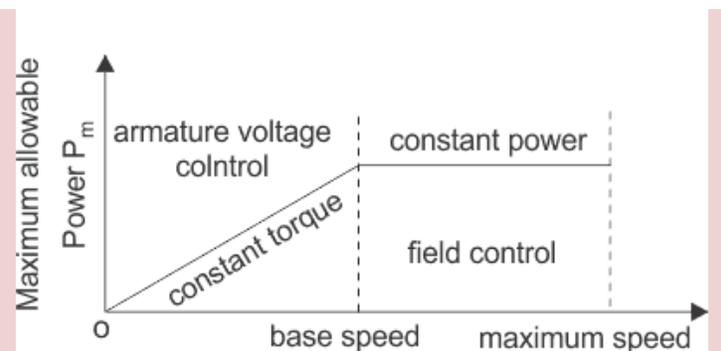
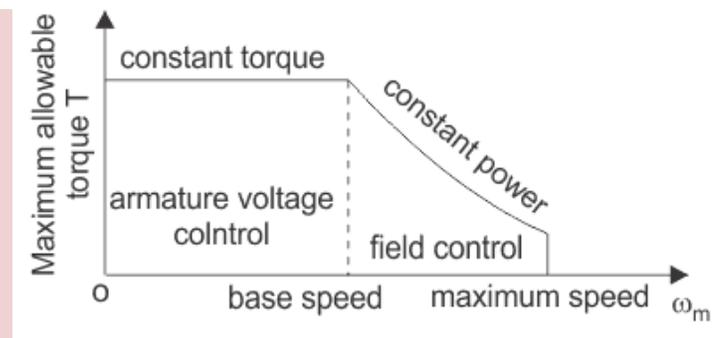
For the motor speed above the rated speed is known as Constant Power Region.

Generally Armature Control Speed control technique is used in this region

Generally Field Control Speed Control Technique is employed in this region.

In this region Power is constantly varies with speed

In this region Torque is constantly varies with speed.



Because constant field current as the Armature Voltage Control Change the required speed and thus speed regulation should be kept in consideration while changing the armature voltage.

Because motor speed increases as the field current decreases, safeguards must be put in place to prevent motor "run-away" in the event that power is lost in the field circuit.

It must be noted that Constant Torque refers to

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maximum torque capability of the drive and not to actual output torque which may be vary from zero speed to full speed.

maximum power capability of the drive and not to actual power output which may be vary from varying the speed.

Conveyors and Hoist are the example of Constant Load Torque.

Mixer and Compressor are the examples of load proportional speed means Constant Power Operation.