SNS COLLEGE OF TECHNOLOGY

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Coimbatore-641035

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

19EET301 / POWER ELECTRONICS AND DRIVES

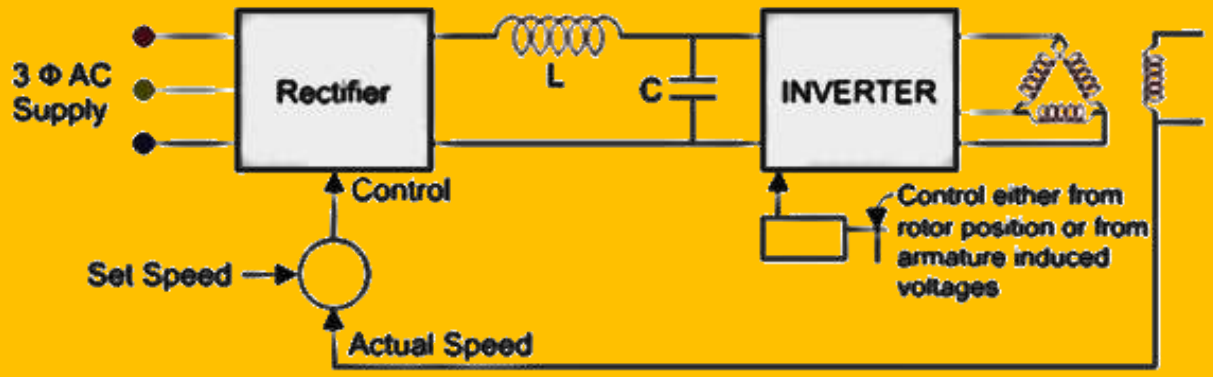
III YEAR / V SEMESTER

UNIT – V : AC DRIVES

SYNCHRONOUS MOTOR DRIVE – Self Control Mode

2.SELF CONTROL MODE

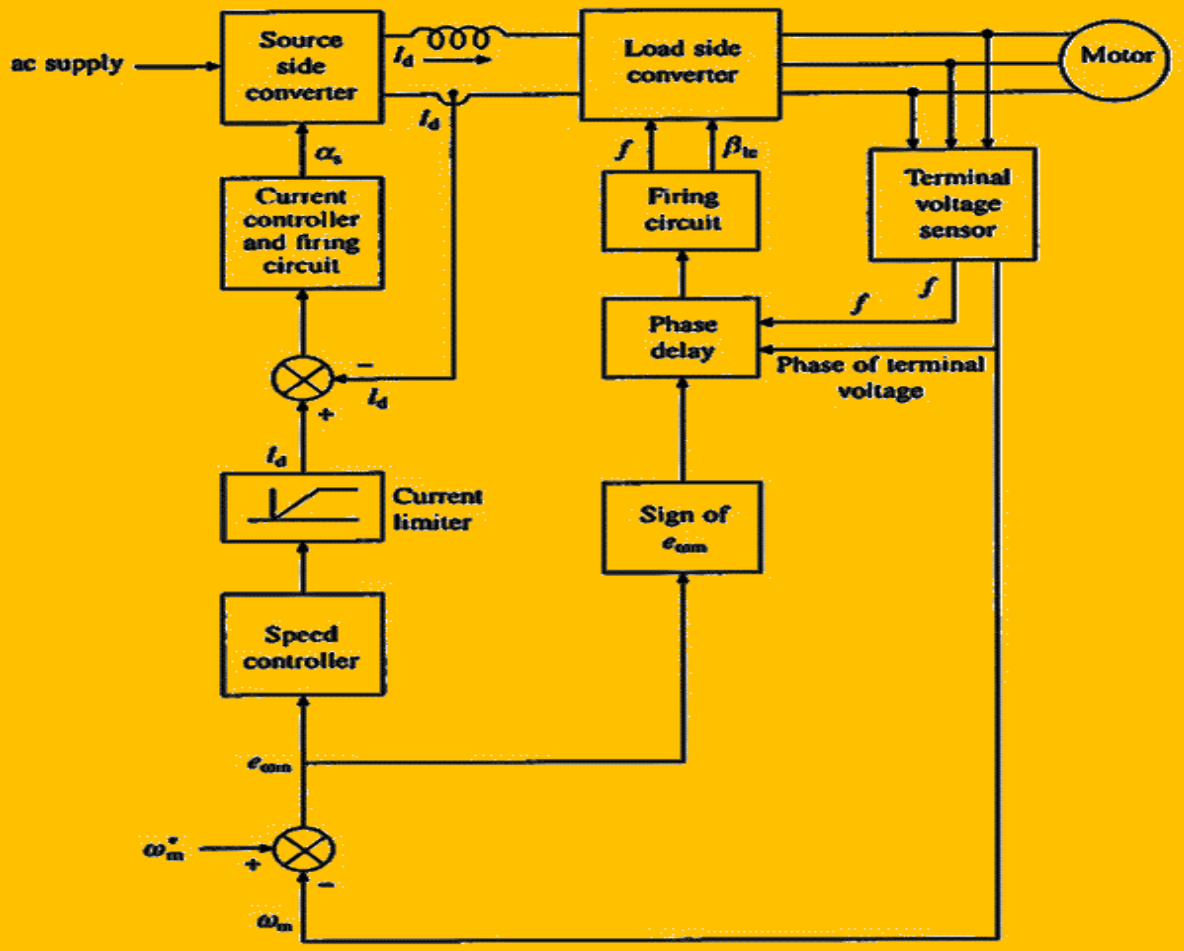
- The supply frequency is changed so that the synchronous speed is same as that of the rotor speed.
- Hence, rotor cannot pull-out of slip and hunting oscillations are eliminated.
- For such a mode of operation the motor does not require a damper winding.



VSI fed SM drive (SCM)

SELF CONTROL MODE

Block diagram of self control mode of SM drive



SELF CONTROL MODE

- The stator winding is fed by an inverter that generates a variable frequency variable voltage sinusoidal supply.
- Unlike, separate control mode where the controlling of the inverter frequency is from an independent oscillator
- The frequency and phase of the output wave are controlled by an absolute position sensor mounted on machine shaft, giving it self-control characteristics.
- Here the pulse train from position sensor may be delayed by the external command

CONTROL OF PMSM

- Block diagram employs sinusoidal PMSM motor fed from current regulated VSI
- VSI is operated to supply motor three phase currents of the magnitude and phase commanded by reference currents iα, iβ and iγ which are generated by a reference current generator .
- Actual motor speed is compared with reference speed
- The speed error is processed through the speed controller
- The speed controller sets a reference for the amplitude and polarity of the stator current Isd.
- The stator current templates for the three phase are generated by the rotor position sensors in such a way that …
- When the speed error is positive value the machine will work as a motor and the drive will accelerated to reference speed .
- If the speed error is negative value braking will decelerate the motor to reference speed to ωm.

RECAP

Summarize….

Thank You.