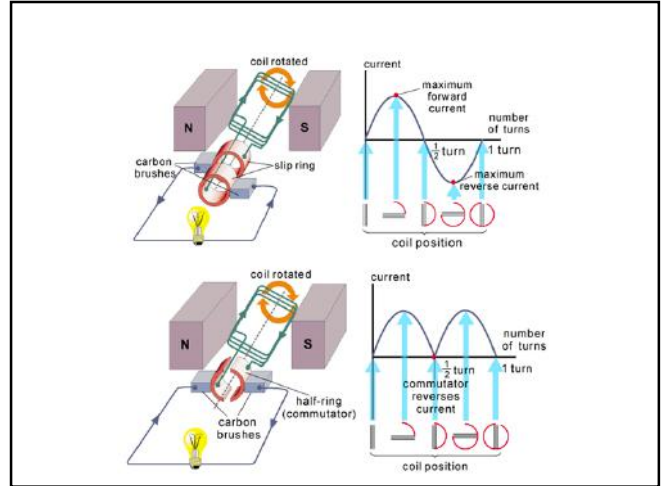
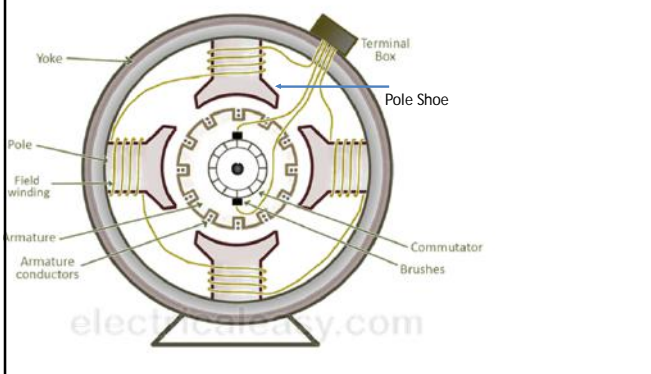


DC Machines

Babu Thomas



DC Machine



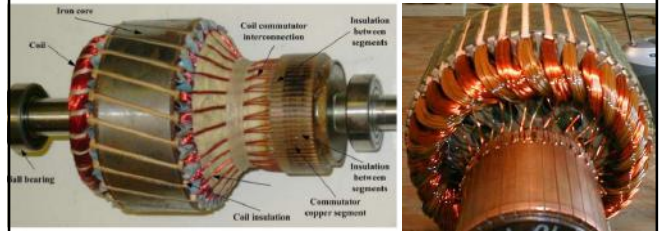
Field System



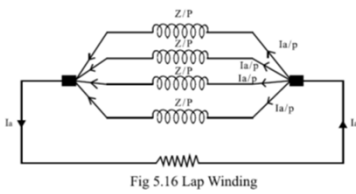
Armature



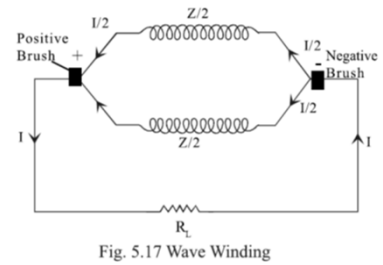
Armature Winding



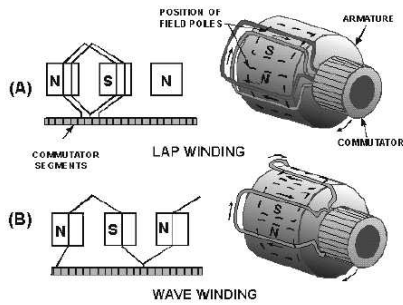
Lap Winding



Wave Winding



Armature Winding



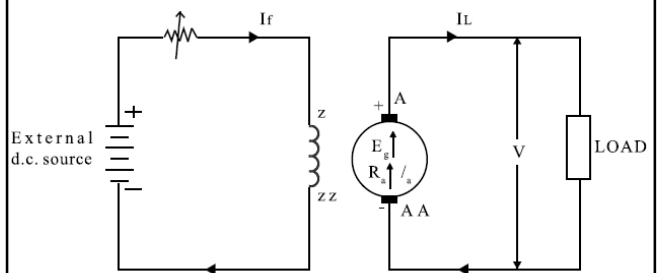
EMF Equation of Generator

$$\begin{aligned}
 \text{Flux cut by one conductor in one revolution} &= d\phi \\
 &= P \times \phi \\
 \text{No: of revolutions in 1sec} &= \frac{N}{60} \\
 \text{Time for one revolution} &= \frac{60}{N} \\
 \text{EMF generated per conductor} &= e = \frac{d\phi}{dt} \\
 &= \frac{\phi P}{60/N} = \frac{N\phi P}{60}
 \end{aligned}$$

EMF Equation of Generator

$$\begin{aligned}
 \text{No: of conductors connected in series in each parallel path} &= \frac{Z}{A} \\
 \text{Total emf generated across each parallel path} &= \frac{N\phi P Z}{60 A} \\
 &= \frac{N\phi Z P}{60 A} \\
 \text{For Lap wound } A &= P \\
 \text{For Wave wound } A &= 2
 \end{aligned}$$

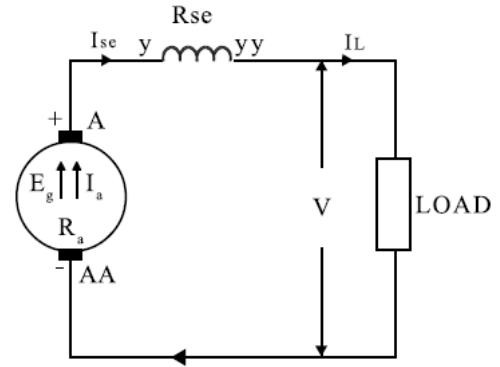
Separately Excited DC Generator



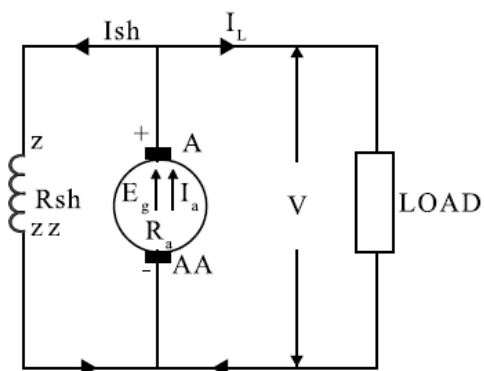
Self Excited DC Generator

- DC Series
- DC Shunt
- DC Compound
 - Short Shunt
 - Long Shunt

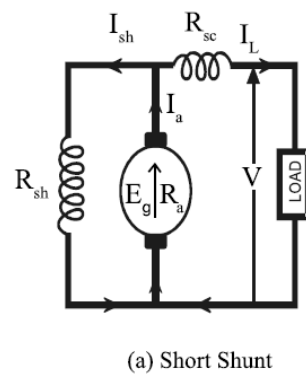
DC Series Generator



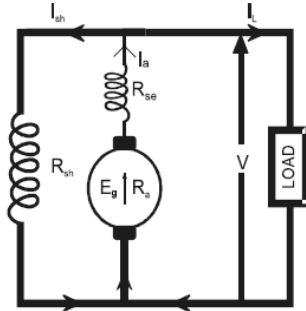
DC Shunt Generator



Compound Generator

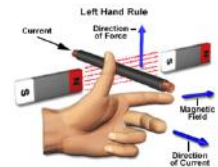
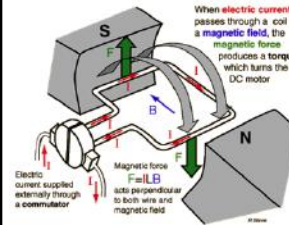


Compound Generator

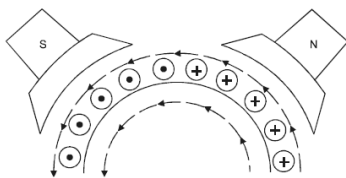


(b) Long Shunt

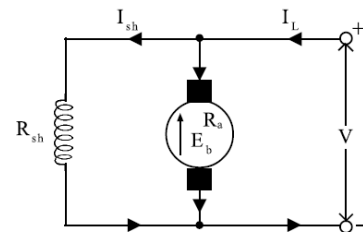
DC Motor



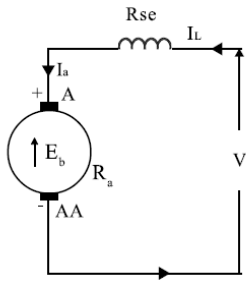
DC Motor



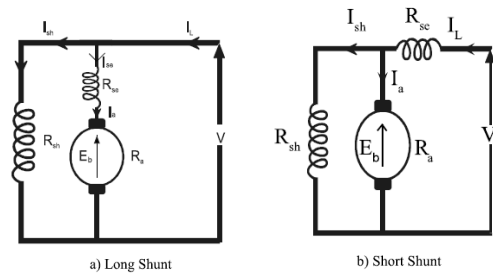
DC Shunt Motor



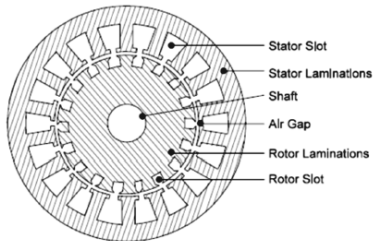
DC Series Motor



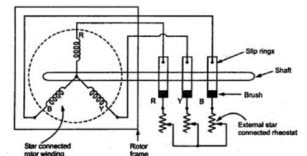
DC Compound Motor



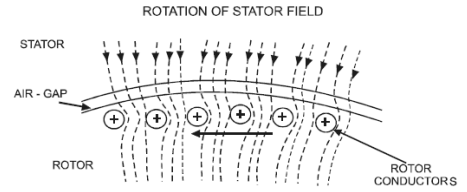
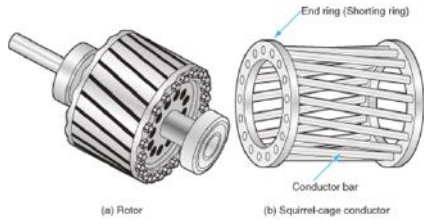
Induction Motor



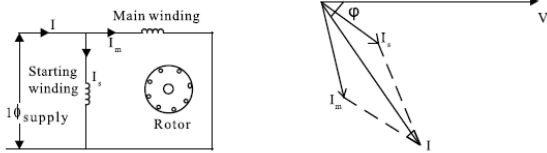
Slip Ring Induction Motor/ Wound Rotor Type



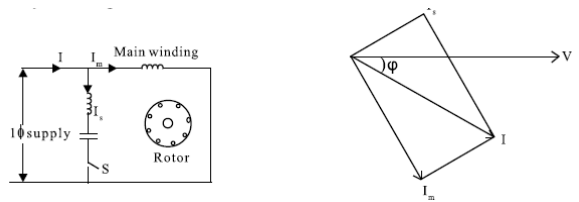
Squirrel Cage Rotor



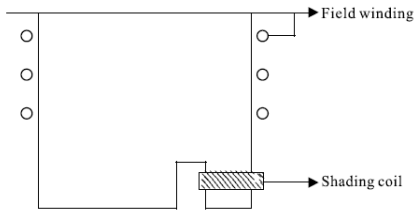
Split Phase



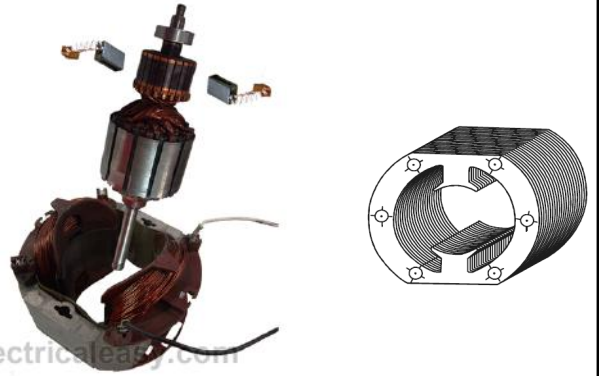
Capacitor Start



Shaded Pole



Universal Motor



Operating Principle

