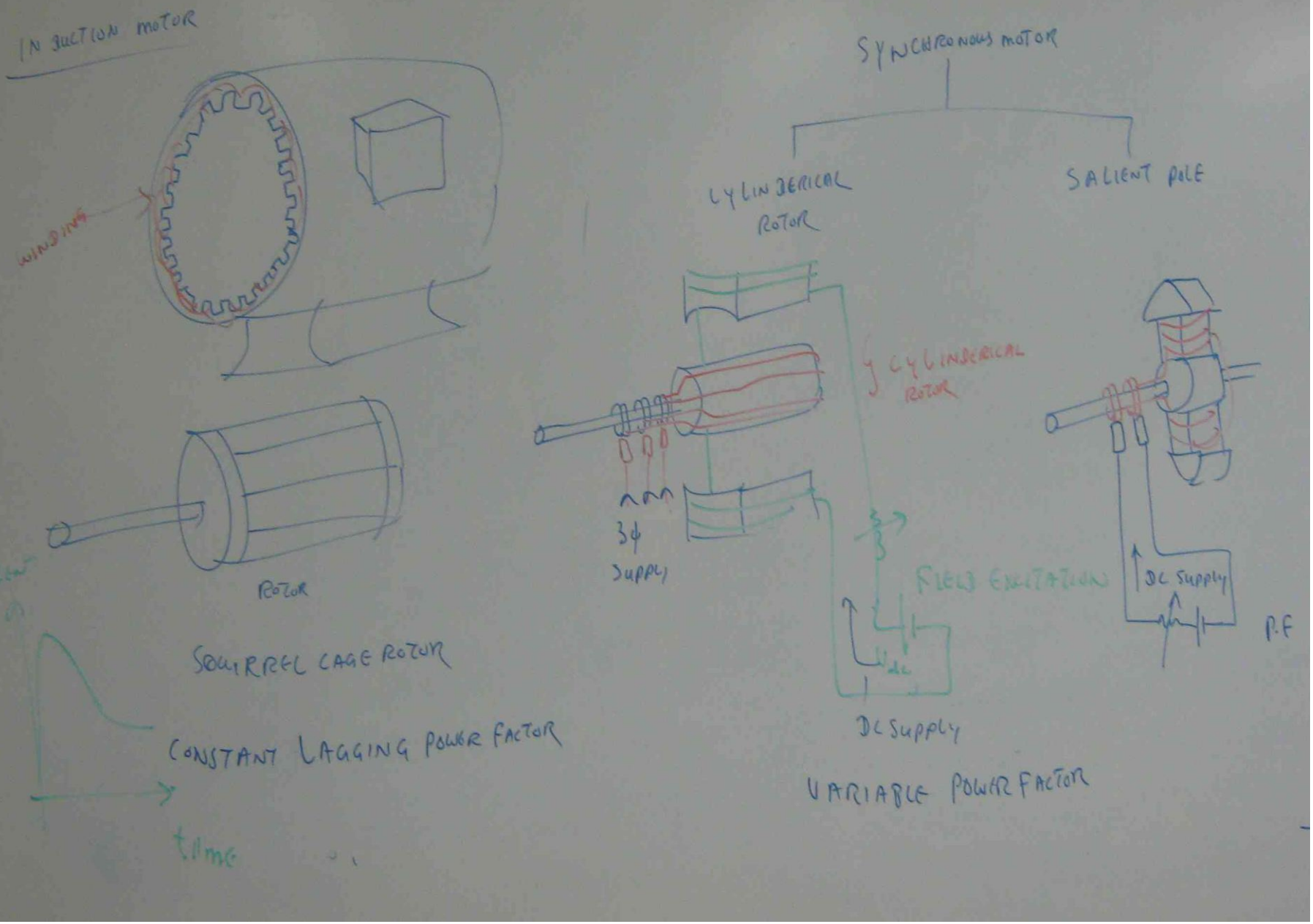

INDUCTION MOTOR
WINDING
ROTOR
SQUIRREL CAGE ROTOR
CONSTANT LAGGING POWER FACTOR
time
SYNCHRONOUS MOTOR
CYLINDERICAL ROTOR
SALIENT POLE
CYLINDERICAL ROTOR
3ϕ SUPPLY
FIELD EXCITATION
DC SUPPLY
DC SUPPLY
P.F
VARIABLE POWER FACTOR

SYNCHRONOUS MOTOR

CYLINDERICAL ROTOR

SALIENT POLE

3 CYLINDERICAL ROTOR

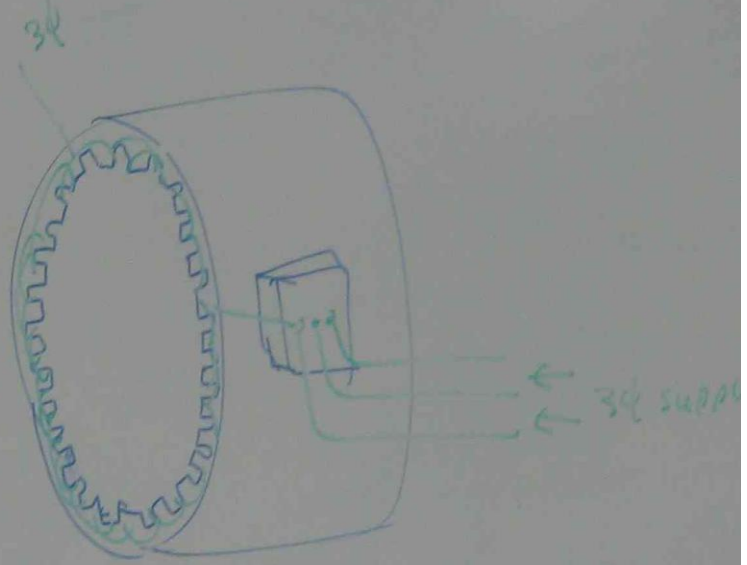
3φ Supply

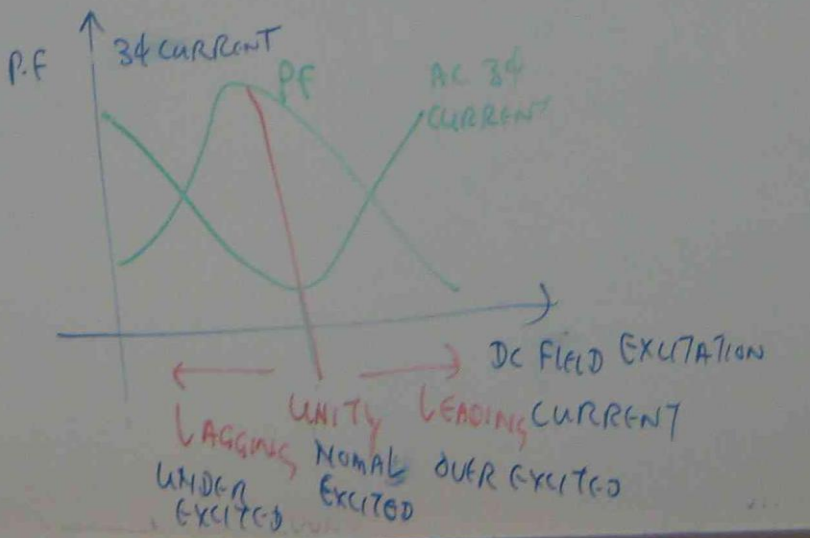
FIELD EXCITATION

DC Supply

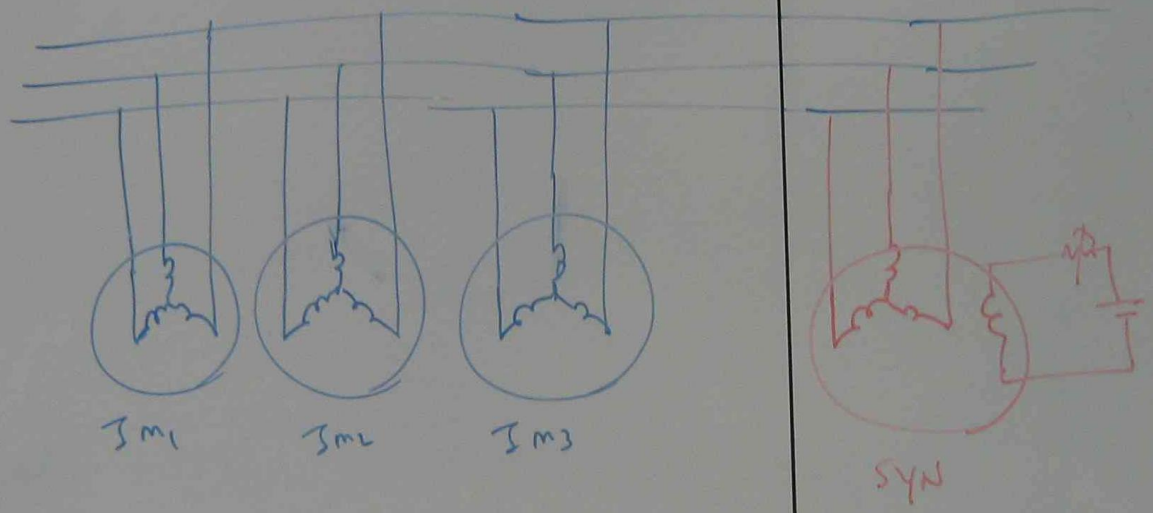
DC Supply

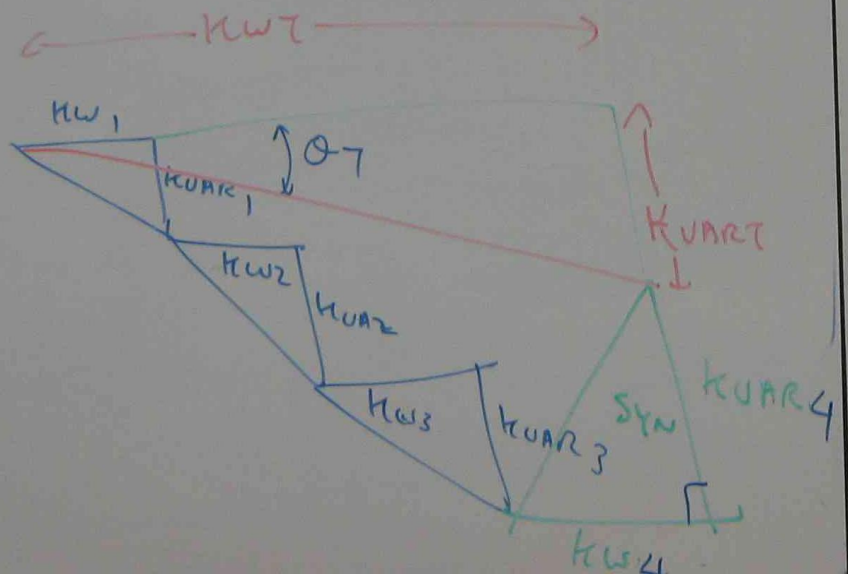
VARIABLE POWER FACTOR





SUB STATIONS P.f IMPROVEMENTS





$KW_T = KW_1 + KW_2 + KW_3 + KW_4$

$KUAR_T = KUAR_1 + KUAR_2 + KUAR_3 - KUAR_4$

θ_T = P.f ANGLE TOTAL

$$\tan\theta_T = \frac{KUART}{KW_T}$$

$$PF_{TOTAL} = \cos\theta_T$$

STARTING CURRENT AND TORQUE OF SYNCHRONOUS MOTOR

SALIENT POLE

$T_{max\ (st)} = 100\% \rightarrow 125\%\ T_{FL}$

$I_{st} = 525 \rightarrow 625\%\ I_{FL}$

0.8 PF LEADING MACHINE

$I_{st} = 425 \rightarrow 500\%\ I_{FL}$

$T_{pull\ out} = 150\% \rightarrow 200\%\ T_{FL}$

CYLINDERICAL ROTOR

$T_{max\ (st)} = 200 \rightarrow 250\%\ T_{FL}$

$I_{st} = 150 \rightarrow 200\%\ I_{FL}$

$T_{pull\ out} = 150\% \rightarrow 250\%\ T_{FL}$

MOTOR PROTECTION

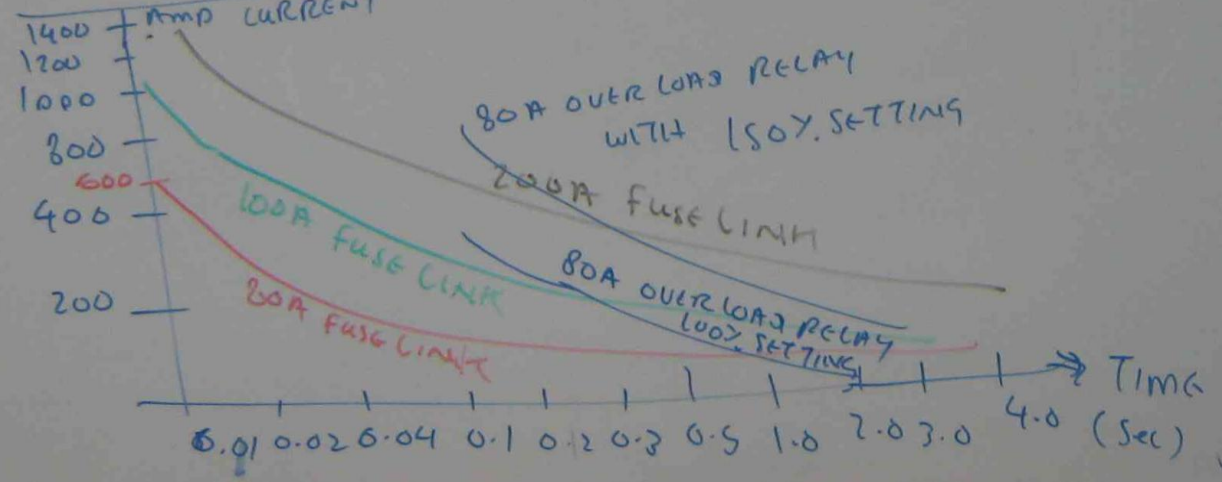
PROTECTIVE DEVICES

- CURRENT SENSING DEVICES
- TEMPERATURE SENSING DEVICES
  - THERMOSTATS
  - THERMO COUPLES
  - THERMISTORS

→ OVER LOAD RELAY

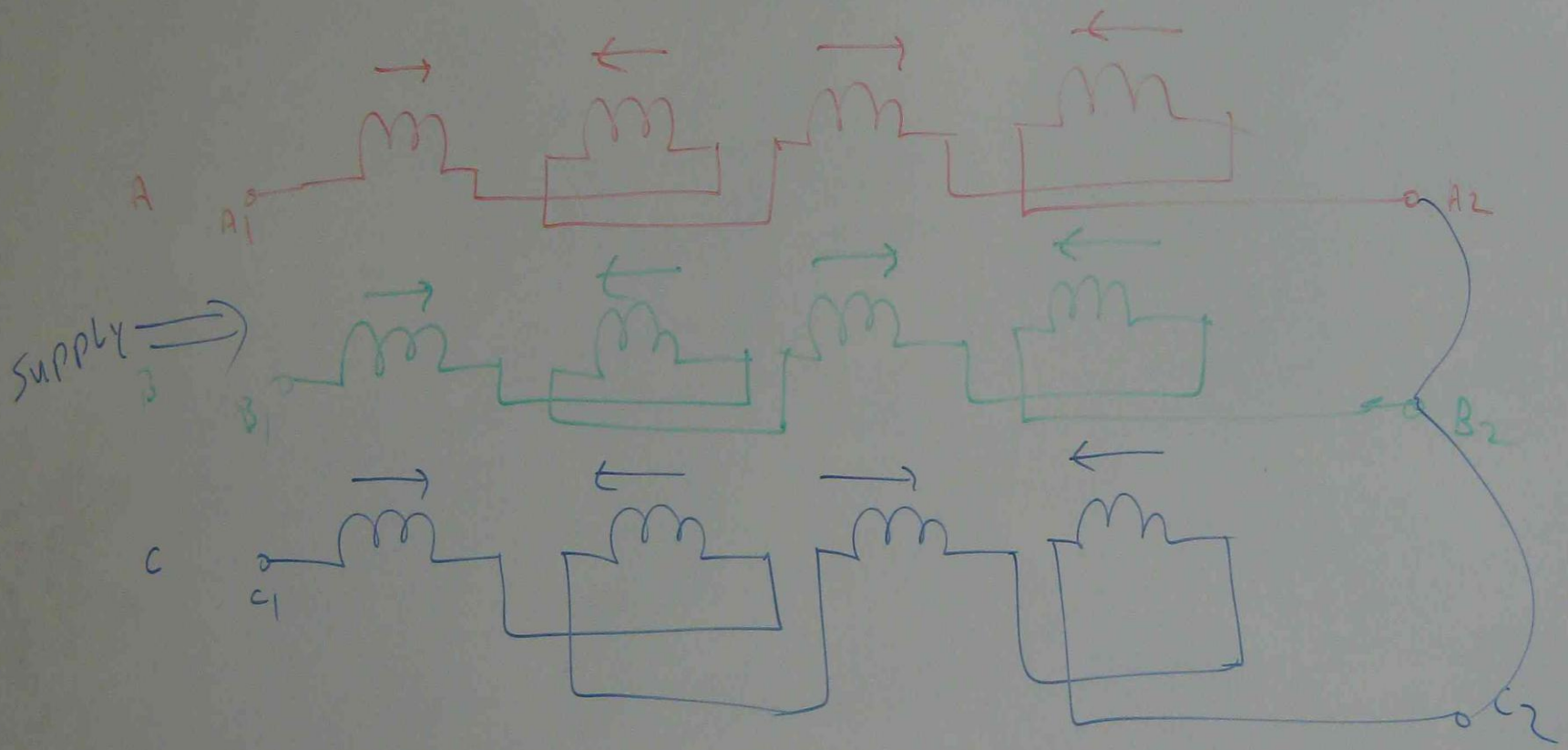
- THERMAL OVER LOAD RELAY
- MAGNETIC TYPE WITH DASH POT
- THERMAL OPERATION USING BIMETALLIC PRINCIPLE

CO-ORDINATION OF PROTECTION



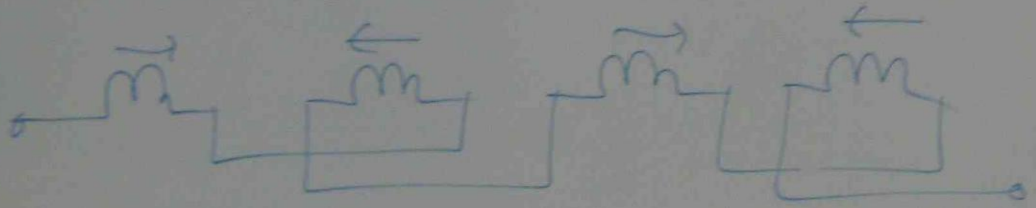
CONNECTION OF 3ϕ INDUCTION MOTOR

3ϕ 4 POLES 5 HP INDUCTION MOTOR

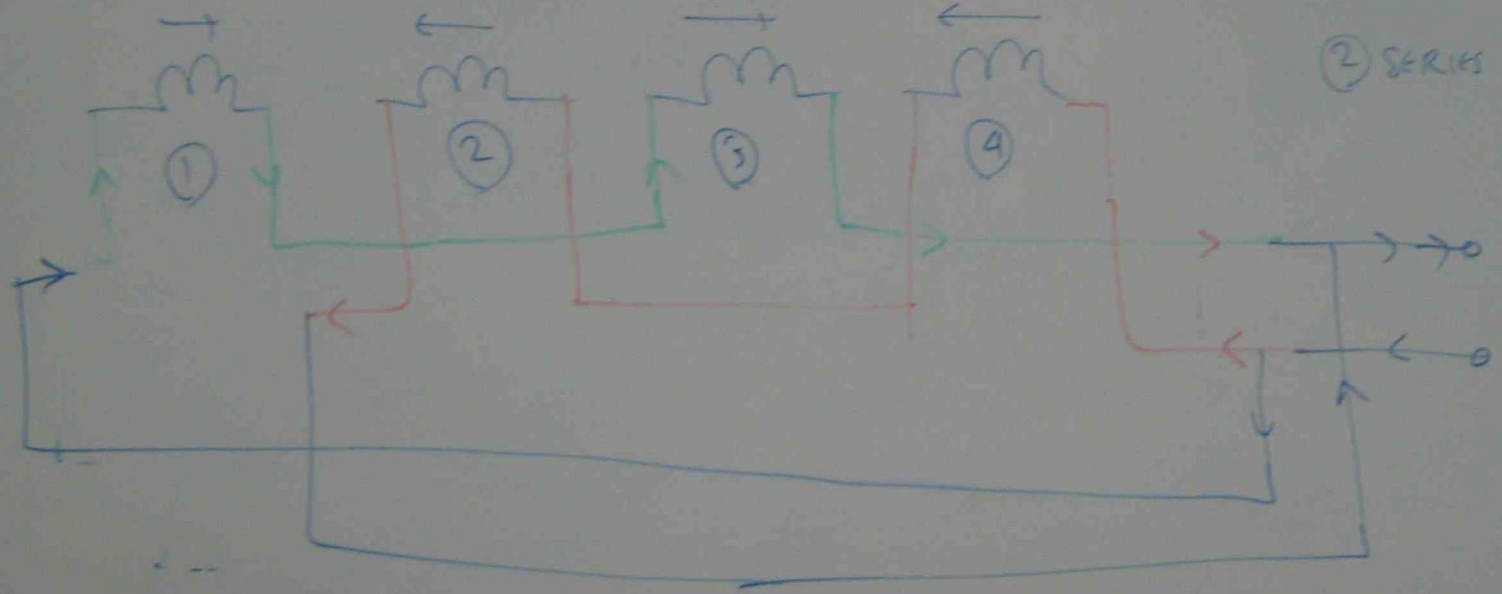


BIG MACHINE 50HP ⟶ 200 HP

SERIES PARALLEL (OR) ALL PARALLEL CONNECTIONS



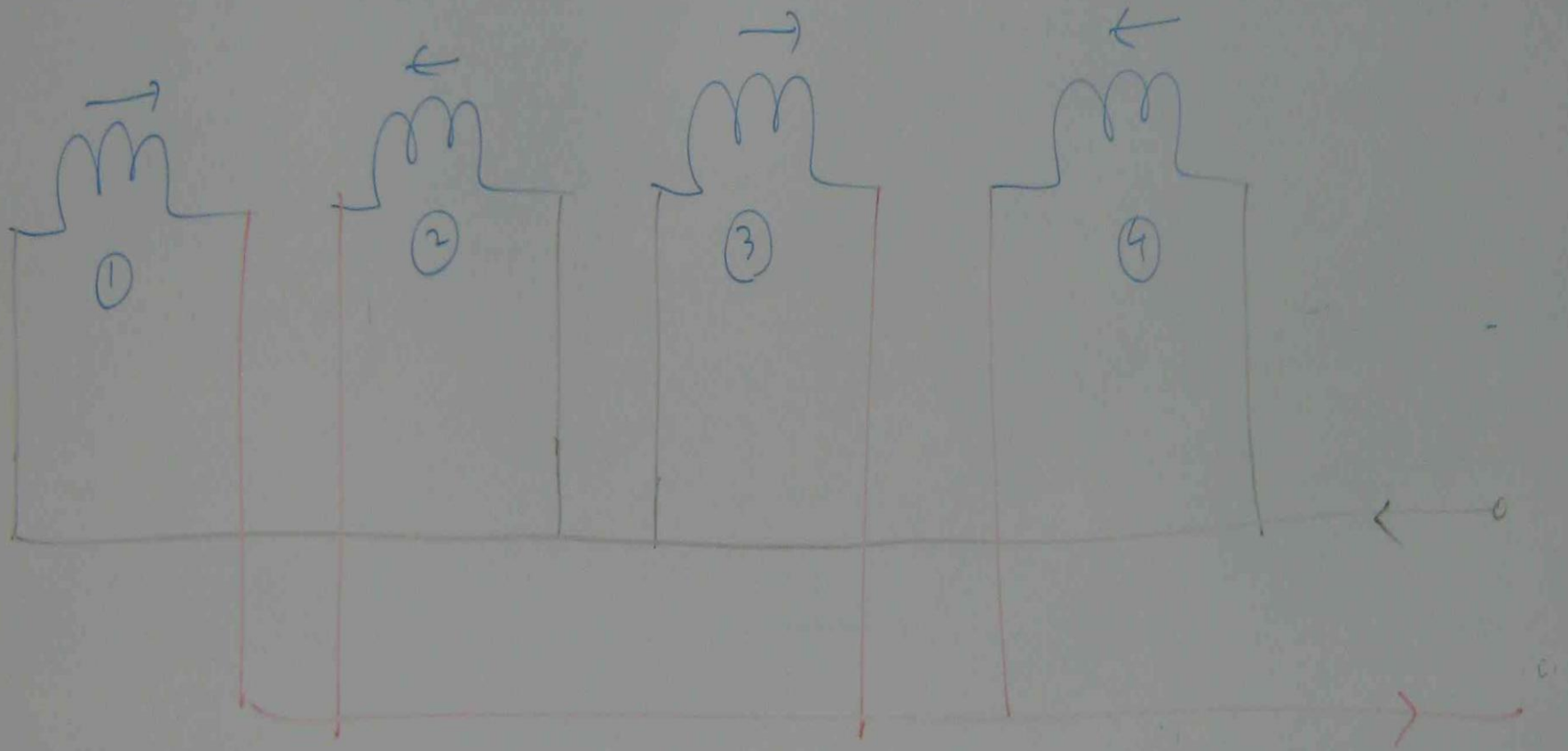
— ORDINARY SERIES

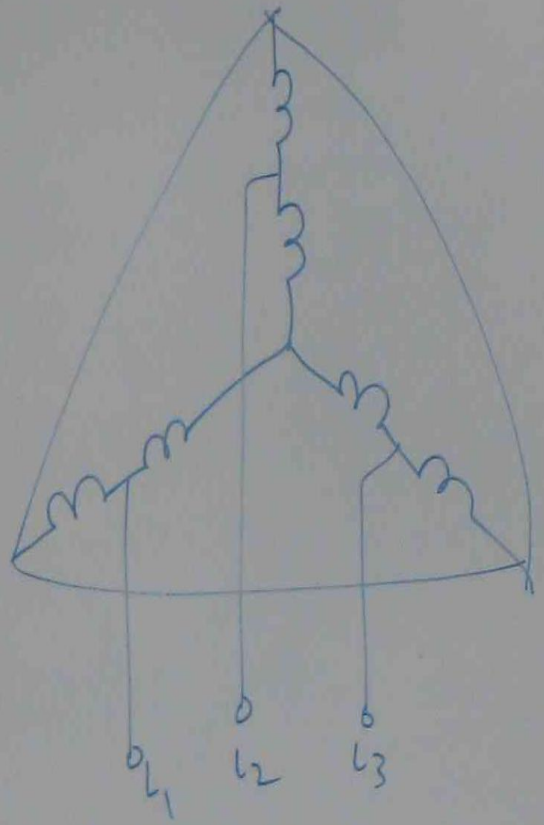


① SERIES ③
② SERIES ④
} II R

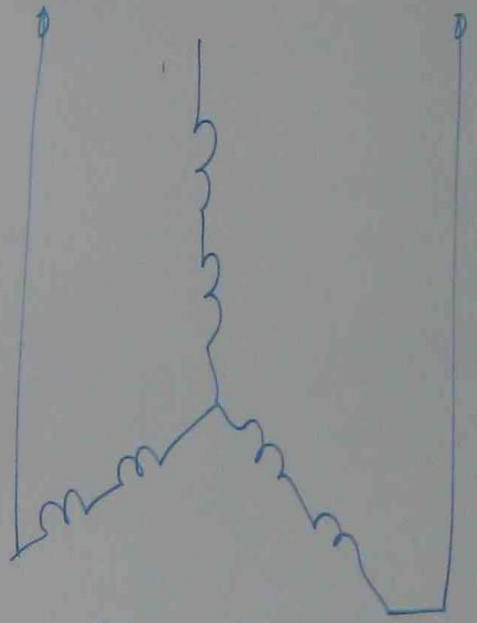
motor

ALL PARALLEL

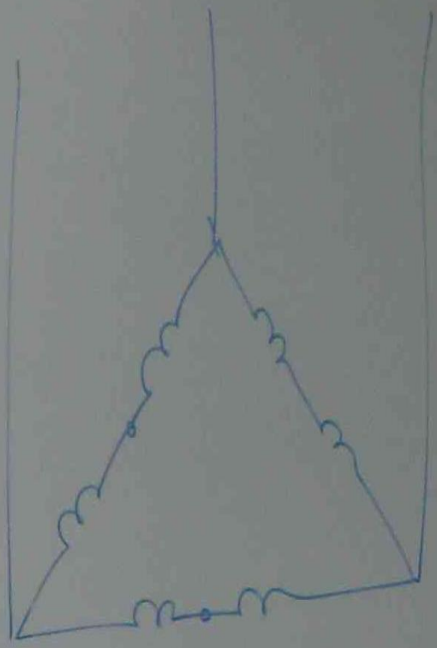




PARALLEL STAR



SERIES STAR



SERIES DELTA