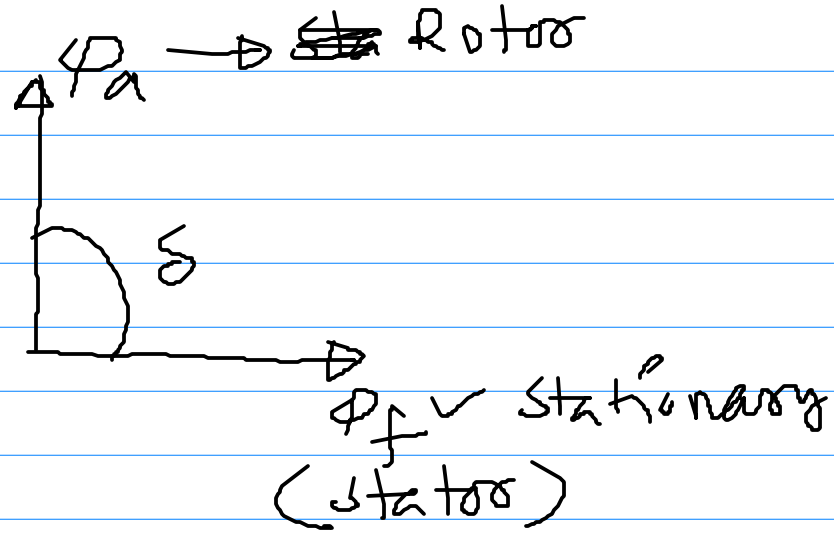
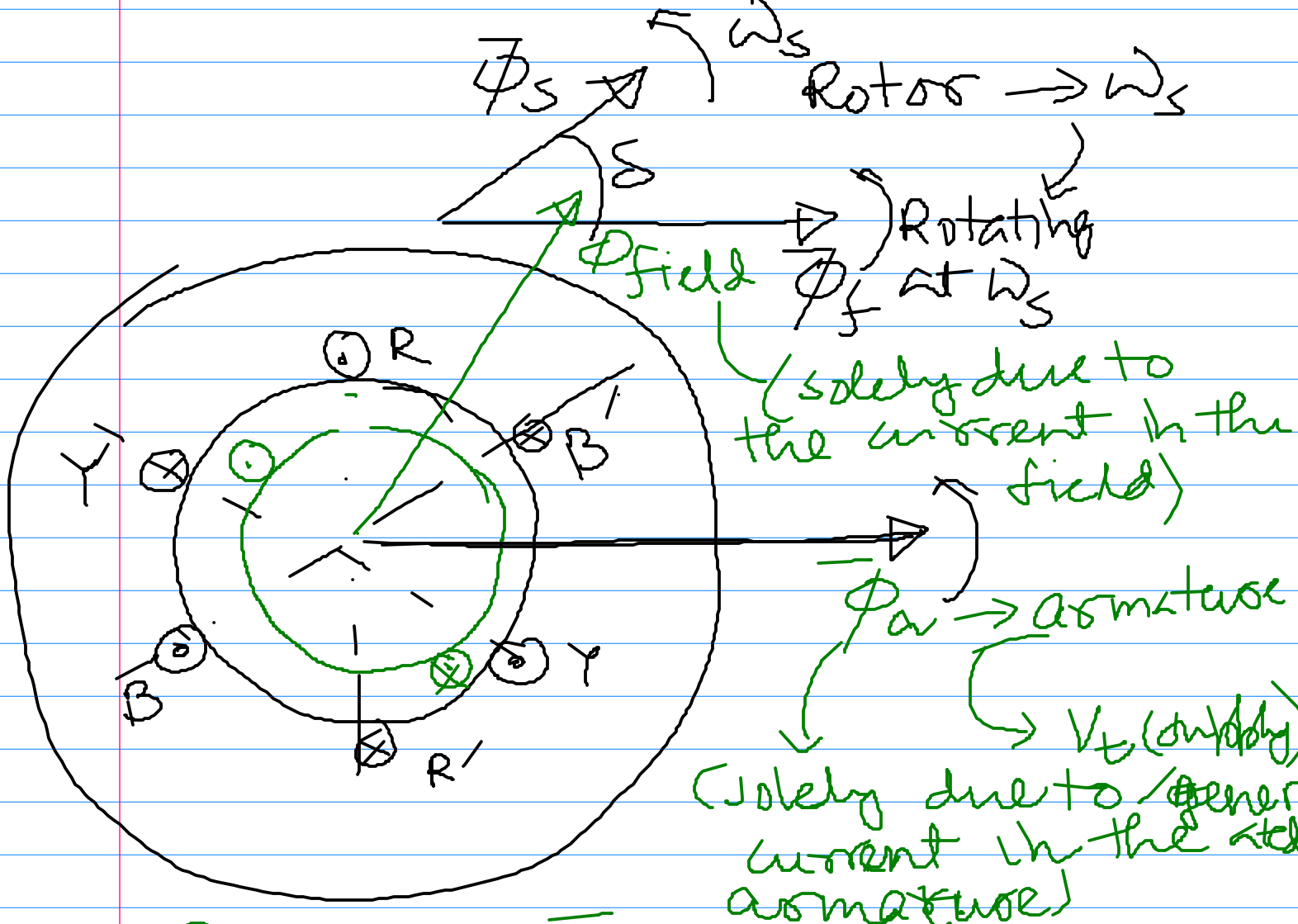




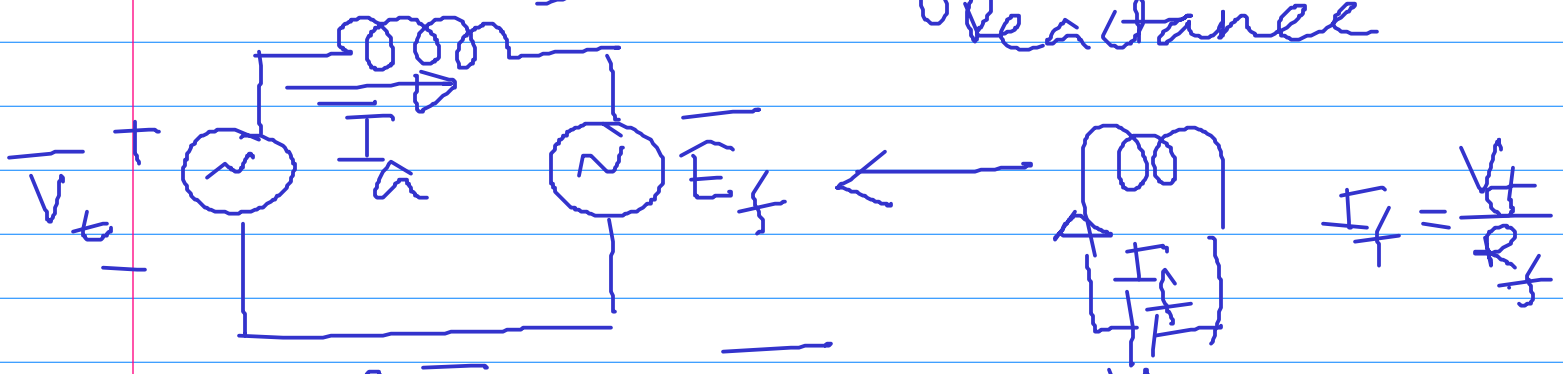
$$\bar{\phi}_t = \bar{\phi}_a + \bar{\phi}_f$$

$\bar{\phi}_t$ → V_t

$\bar{\phi}_a$ → I_a

Synchronous Motor

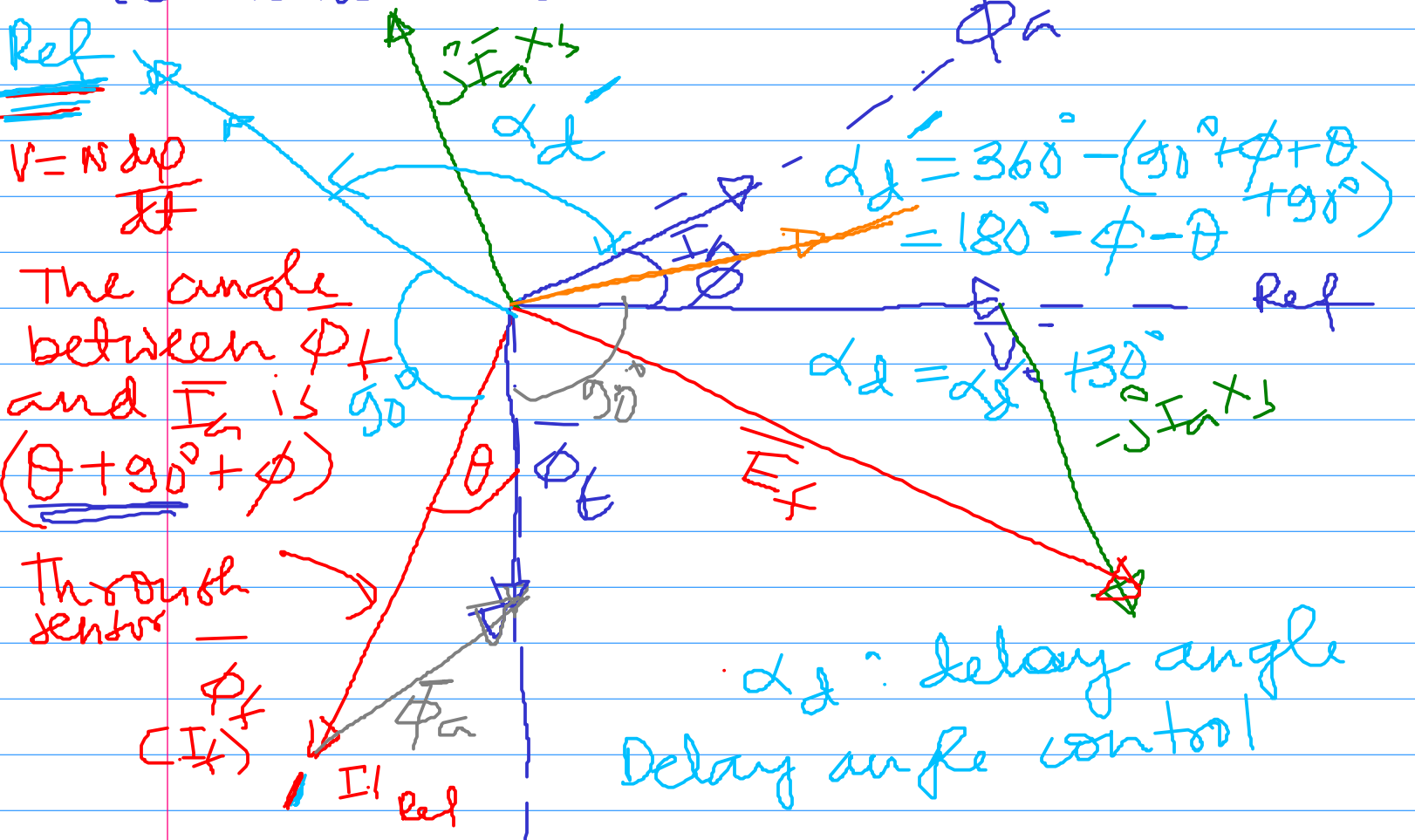
jX_s X_s: Synchronous Reactance



$$\bar{V}_t = j\bar{I}_a X_s + \bar{E}_f \rightarrow \bar{E}_f = \bar{V}_t - j\bar{I}_a X_s$$

Applied voltage at the motor terminal

At leading power factor (commutation requirement of Thyristor in the current source inverter) the phasor diagram is ~~taken~~ as shown —

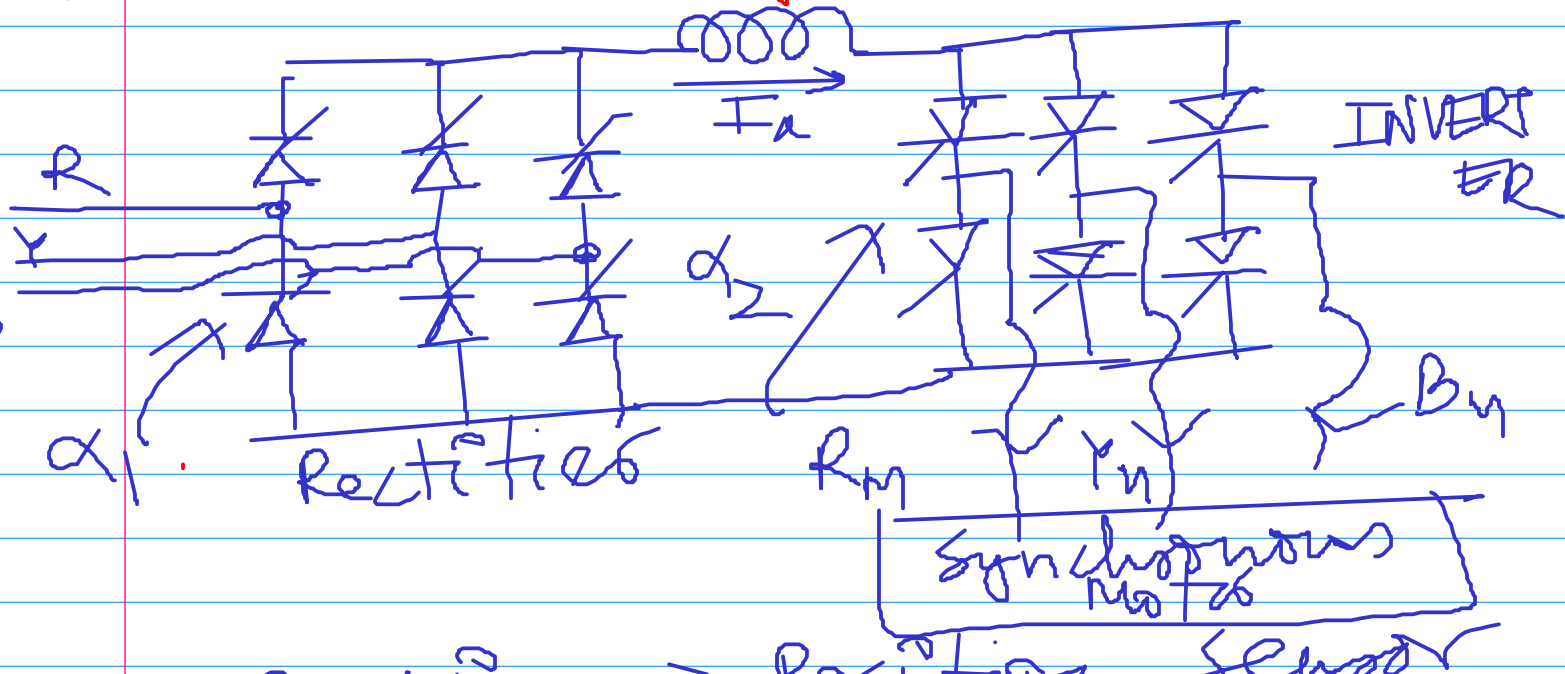


Position of the rotor is related to the position of the field flux. This information can be obtained from the position sensor.

$\phi = \phi^*$ the reference power factor chosen by us to satisfy the commutation required.

$|I_a^*|$ is decided by a speed controller and is imposed by the current source inverter to the machine.

I_a is converted into a current source I_d by controlling the firing of the thyristor rectifier bridge



$$\phi' \equiv \phi + 90^\circ + \theta$$