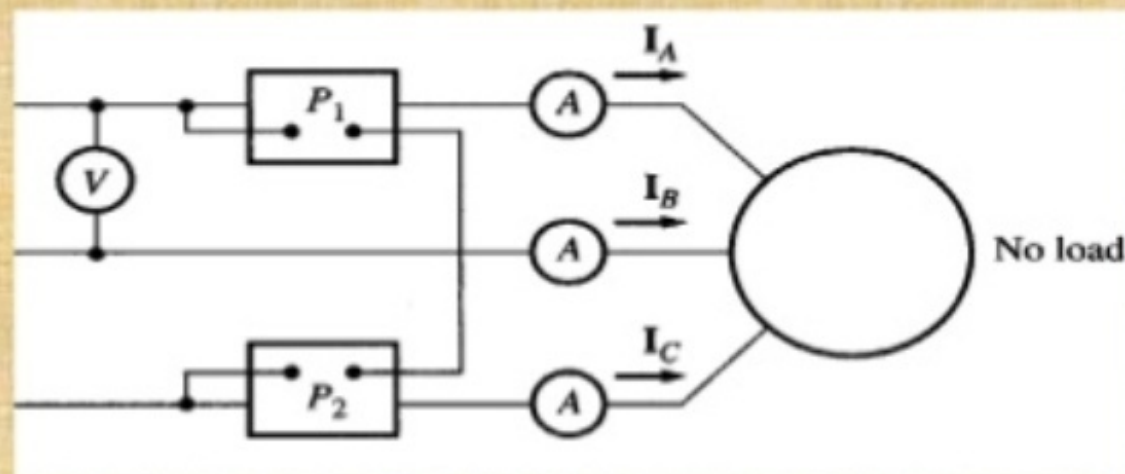


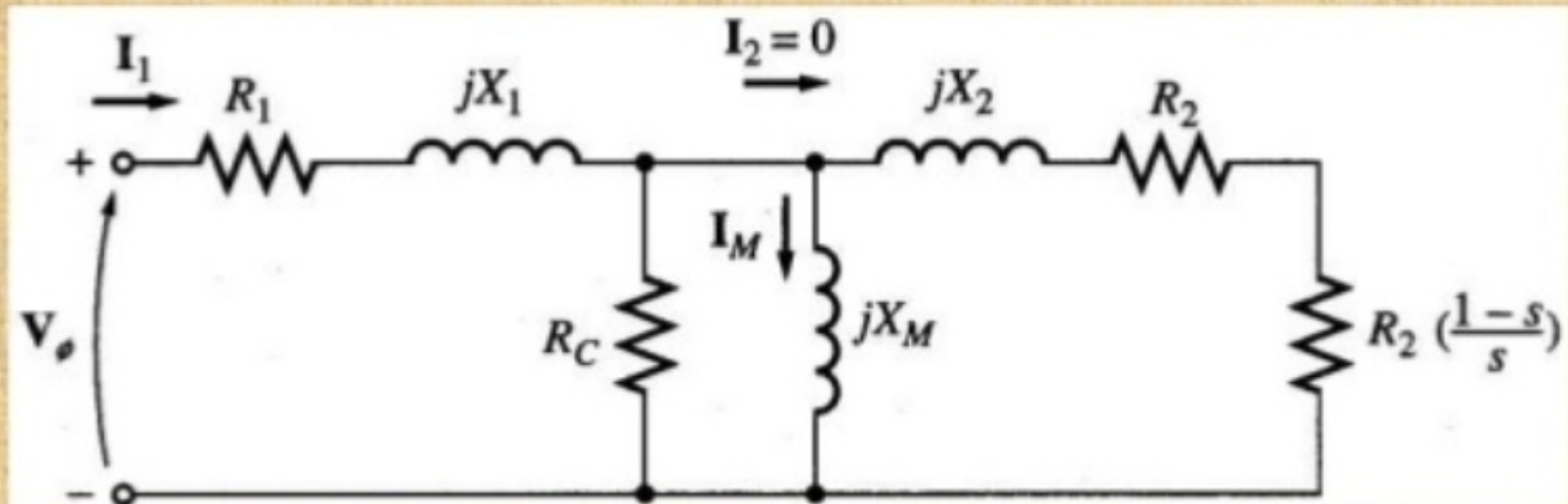
## No Load Test



- The test is conducted by rotating the motor without load.
- The test is performed at rated frequency and with balanced poly-phase voltages applied to the stator terminals
- The only load on the motor is the friction and windage losses, so all  $P_{conv}$  is consumed by mechanical losses
- As the motor is on no load, the power factor is very low which is less than 0.5.

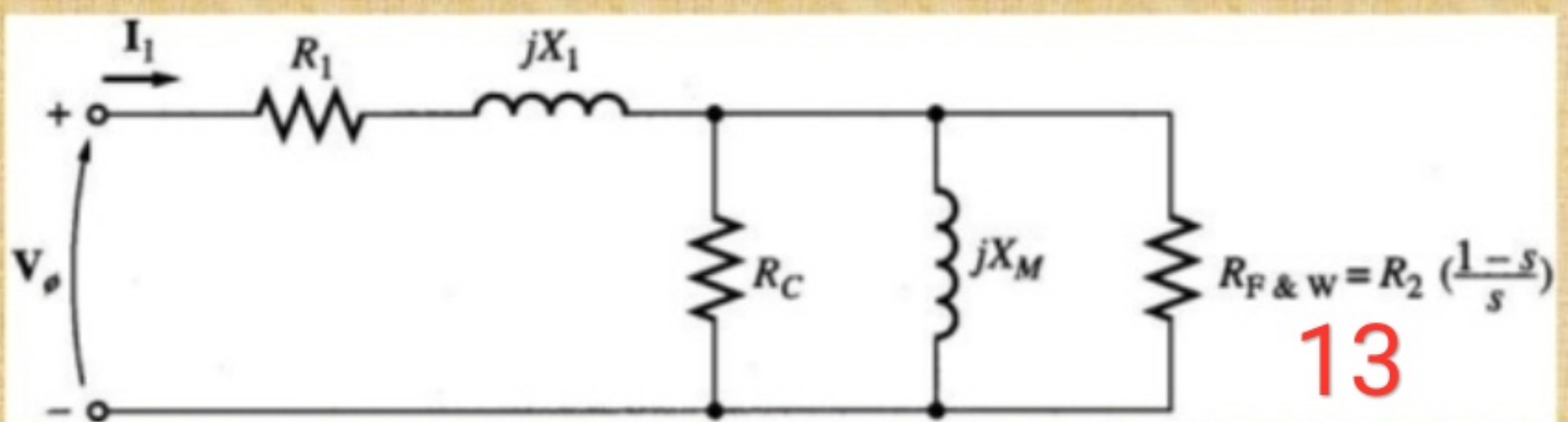
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The motor speed on no load is almost equal to its synchronous speed hence for practical purpose, the slip can be assumed to be zero.

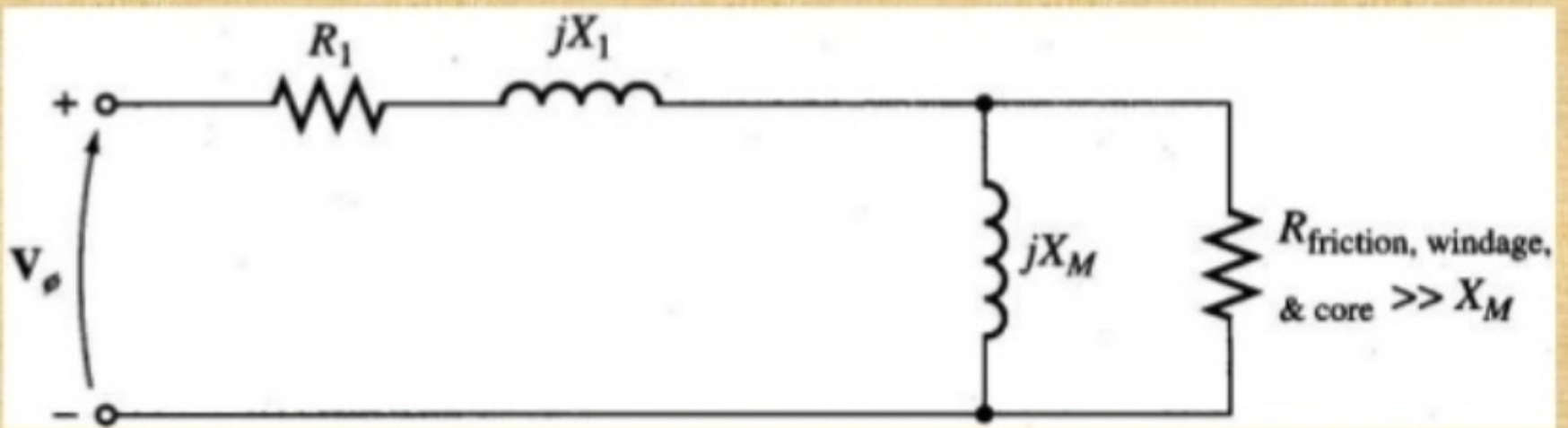
The equivalent circuit reduce to.....



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- Combining  $R_c$  and  $R_{F+W}$  we get,



- At the no-load conditions, the input power measured by meters must equal the losses in the motor.
- The input power equals

$$P_{in} = P_{stator} + P_{core} + P_{F+W}$$

$$= 3I_1^2 R_1 + P_{rotor}$$

Where,

$$P_{rotor} = P_{core} + P_{F+W}$$

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- The  $I_0$  and  $\cos \phi_0$  parameters of equivalent circuit can be obtained as,

$$I_C = I_0 \cos \phi_0$$

$$I_m = I_0 \sin \phi_0$$

$$R_0 = \frac{V_\phi}{I_C}$$

$$X_0 = \frac{V_\phi}{I_m}$$

And

$$W_0 = \sqrt{3}V_\phi I_0 \cos \phi_0$$

$$\cos \phi_0 = \frac{W_0}{\sqrt{3}V_\phi I_0}$$

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# Equivalent circuit with phasor diagram

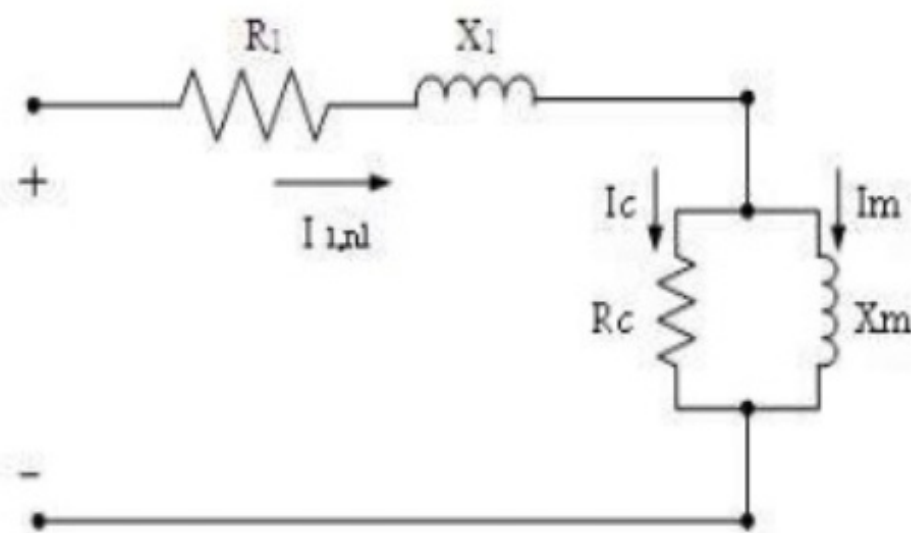


Fig. 1 : Equivalent Circuit for No-Load Test

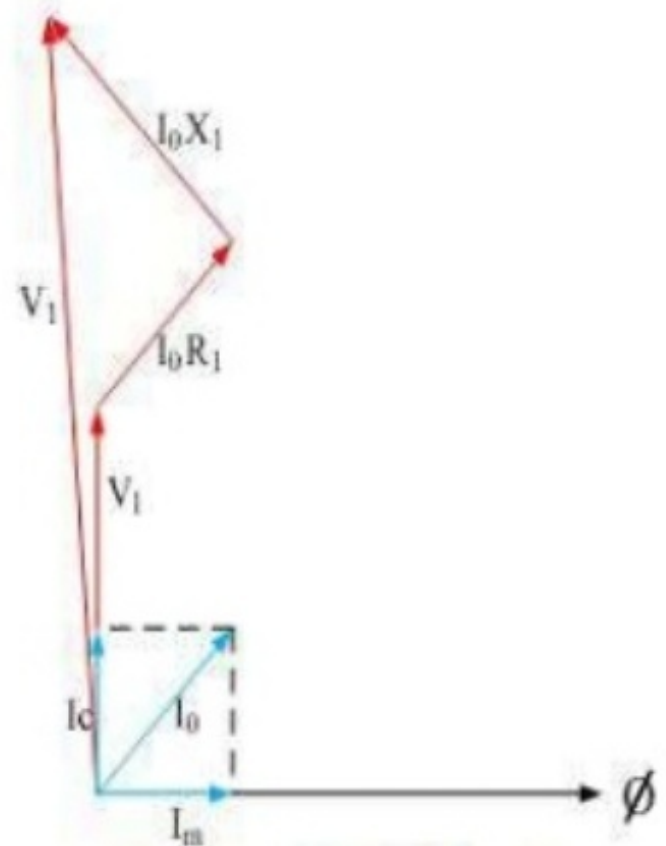


Fig. 1(a) : Phasor Diagram

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