

EXPERIMENT-3

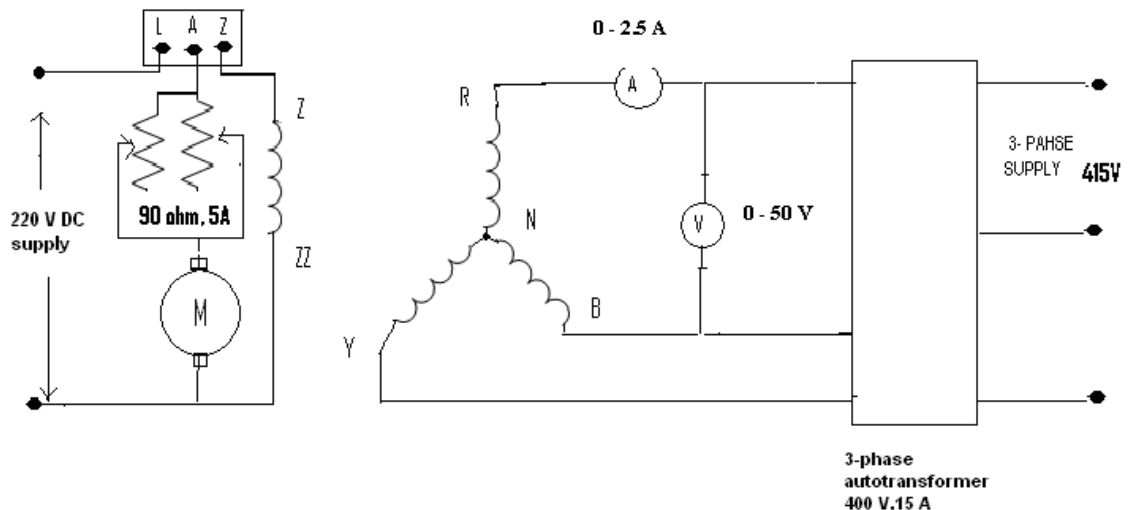
OBJECTIVE

To measure the direct axis and quadrature axis synchronous reactance of a synchronous machine by slip test.

APPARATUS REQUIRED

S.No.	Name	Type	Range	Quantity
1.	Ammeter	MC	0-2.5 A	1
2.	Voltmeter	MI	0-50 V	1
3.	3-phase variac	-	400/0-400V,15A	1
5.	Rheostat	Single tube	90ohm, 5A	1

CIRCUIT DIAGRAM



PROCEDURE

1. Connect the circuit of alternator as shown in circuit diagram.
2. Ensure that the resistance in the field circuit of dc motor is minimum.
3. Switch on the dc supply in the motor.
4. Adjust the speed of the dc motor slightly less than the synchronous speed of the alternator by varying the resistance in the field circuit of the motor. Slip should be extremely low, preferably less than 4 percent.
5. Ensure that the setting of three phase variac is at zero position.
6. Switch on three phase ac supply to the stator winding of alternator.
7. Adjust the voltage applied to the stator winding, till the current in the stator winding is approximately full load rated value.
8. Under these conditions, the stator current, the applied voltage to the stator winding and induced voltage in the open field circuit will fluctuate from min value to maximum value.

9. Reduce the applied voltage to the stator winding of alternator and switch off 3 phase ac supply.

OBSERVATIONS

S.No.	V _{max}	V _{min}	I _{max}	I _{min}	X _d	X _q	N

$$X_d = V_{\max} / I_{\min}$$

$$X_q = V_{\min} / I_{\max}$$

PRECAUTIONS

1. Avoid loose connections in the circuit.
2. Readings should be taken without parallex error.

RESULTS