EXPERIMENT: 2

OBJECTIVE:

To measure Positive, Negative and zero sequence impedance of the given 3 phase transformer

APPARATUS:

       (1)   3 Phase variac

       (2)   Ammeter, voltmeter, watt meter.

Range of apparatus depends on rating of transformer.

THEORY:

(A)   Positive and negative sequence impedance: Refer fig 1. (Assuming Y-Y connections. However, connections do not change value of -ve and +ve sequence impedance.

(B)   Zero sequence impedance: here neutral connection will depend upon magnitude of the impedance besides the nature of connection of windings. [Refer fig 2,3 and 4]

PROCEDURE:

FOR Z1 (or Z2) L. V winding for Zo, give reduced voltage and take measurements.
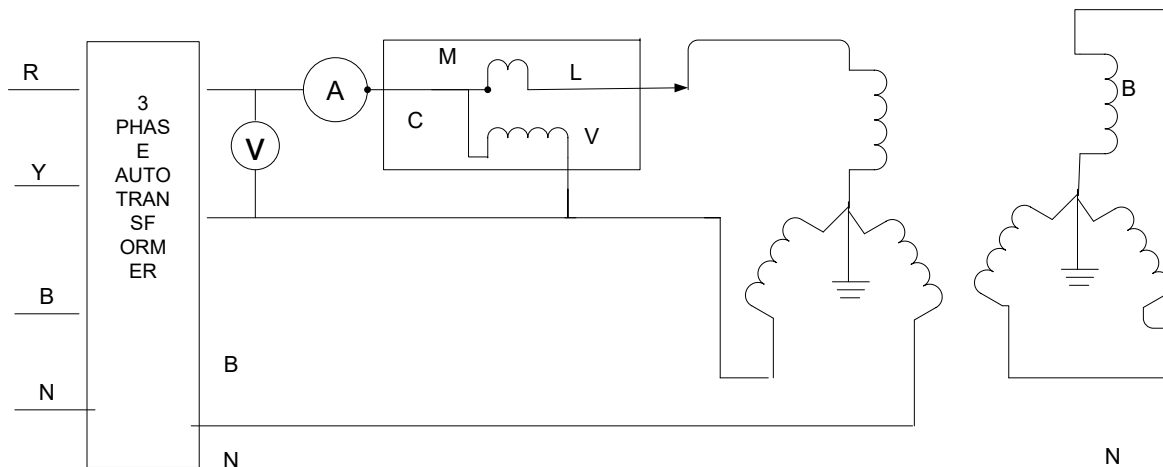
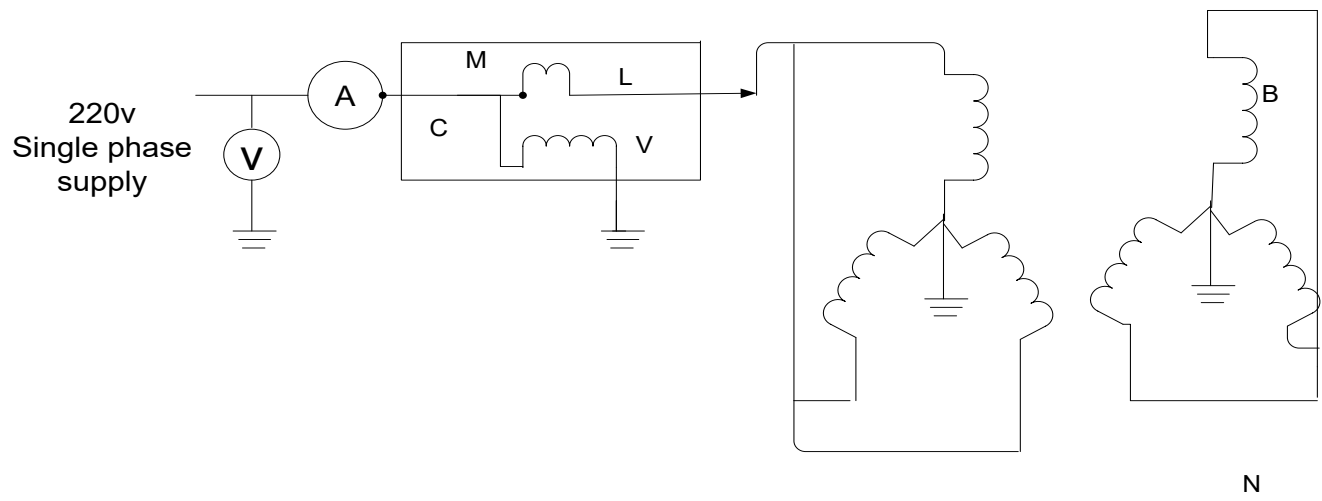## CONNECTION DIAGRAM:

Fig: 1

For determination of Z_{01}
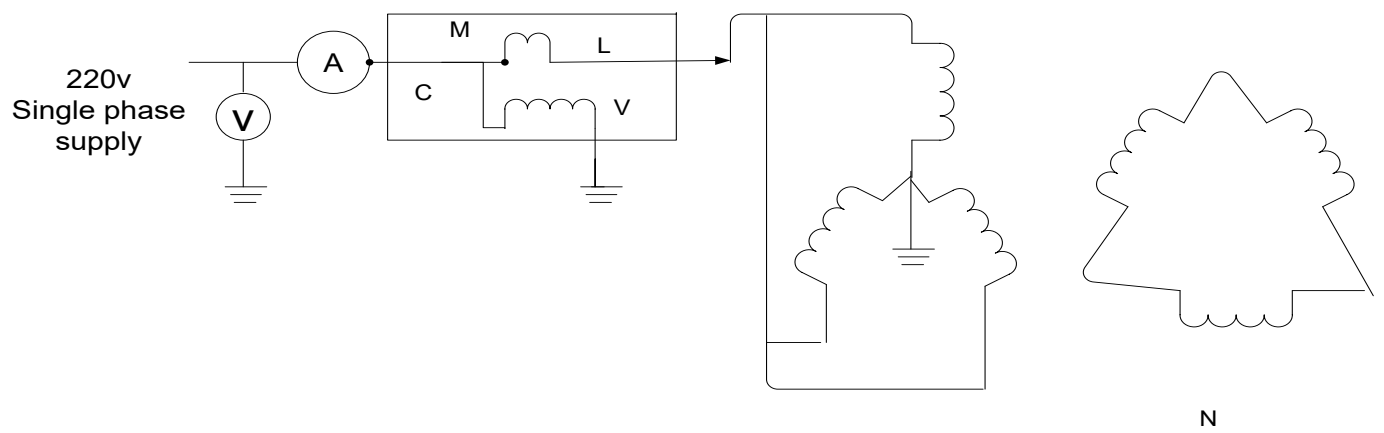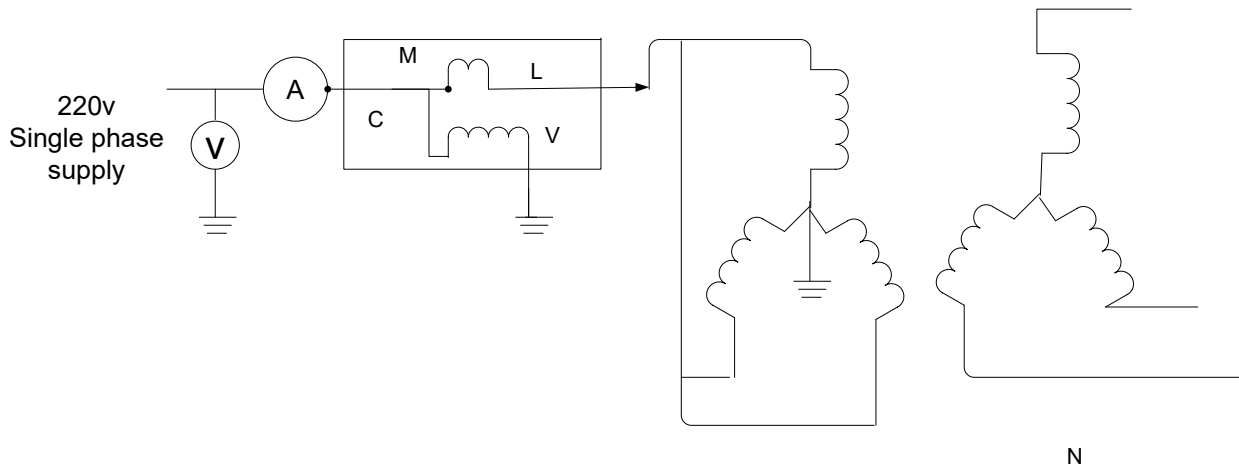

Fig: 2

For determination of Z_{02}

Fig: 3

For determination of Z_{03}

CALCULATIONS:

Z_1= Positive sequence impedance

Z2= Negative sequence impedance

$Z1=V/I_1$; $R_1=W/I_1{}^2$; $X_1{}^2=Z_1{}^2-R_1{}^2$

For Z_0,

$I=3*I_0$

$Z_0=E/I_0$

$R_0=W/(3*I_0)^2$

$X_0=Z_0{}^2-R_0{}^2$

Observations:

(1)   Positive / negative sequence imepedance:

Voltage(volts)	Current(amps)	Power(watts)

This is for finding Z_1 and Z_2

(2)   For Z_0 i.e, zero sequence impedance:

Voltage(volts)	Current(amps)	Power(watts)

Calculate Z_0 for fig 2, 3&4 (different connections)

RESULTS:

(1) $Z_{01}=$ $Z_{02}=$ $Z_{03}=$

(2) $Z_1=$ $Z_2=$