The research involves construction of water resistor and study of using water resistor as an electric load for alternating current, 3 phase, 220 volts with power less than 10 kilowatts. The water resistor is compased of container, solution and three electrodes. The containers are earthen ware jar and painted steel tank. The solutions are pure water and saline solution. The electrodes used in testing are round stainless steel rod, ground electrode rod, round iron rod, rectangular stainless steel rod and rectangular iron rod. To sum up :

1. Resistance of the water resistor is a balanced pure resistive load when used with either Y or Δ connection.

2. By using multiple regression technique, the equation of the resistance is found to be a linear function of the area of the electrode, concentration of the solution, electrode type and distance between electrodes. The temperature of the solution is hept constant during the experiment.

Earthen ware jar :

$$Z (\Omega) = 5.082(TYPE) - 55.16(CONC) + 1.5(DIS) - 0.87(AREA) + 166.15$$

Painted steel tank :

$$Z (\Omega) = 3.91(TYPE) - 59.1(CONC) + 1.134(DIS) - 0.903(AREA) + 182.12$$

When Z (Ω) is resistance in ohms

TYPE is type of the electrodes

CONC is concentration of the saline solution, gm/litre.

DIS is distance between electrodes as measured with respect to the reference point, cm.

AREA is the area of the electrode, cm^2

The most suitable water resistor should be made of earthen ware jar with round stainless steel rod.