Earth Fault Protection

# Introduction:

Earth fault current is the current that flows through earth,and it occurs due to a break or damage in the insulation which causing the conductor to touch the hull of the electric circuit.If a human touched the circuit accedently,he will get a shock and might be fatal. Earth fault current can also damage the electric equipements.

We can figure the fault if the neutral current in the loop is not eqaul to the line current, another method is by checking the resistance between the terminal and earth,if the reading was less than infinite then there is a fault.

There are several schemes for protection from earth fault:

* **Restricted earth fault protection (REFP)** : in this method the device trips the circuit when an earth fault occurs, and the current is restricted.Some of the devices that are used is: earth fault rely ,earth leakage circuit breaker ,etc.
* **Transformers** : we will not be discussing this method for the mean time due to the heavy bulk of transormers.

# Methodolgy

The current that directly flows from the line conductor is measured using current sensor and the results are sent to a controller, the same thing is done for the current that flows through the neutral condcuctor, the controller measures the difference between the line and the neutral, once the difference exceeds 200 m Amps as a maximum it will send a command to the switch – rely- to tripp the circuit and restrict the current from flowing through the cicuit with a response time of 100 ms, simultaneously the controller sends a signal to the timer to count 5 min from the first occurrence of the fault, after five minutes the timer will send a signal to the controller to reconnect the circuit and the current will flow again.

# Preliminary design:

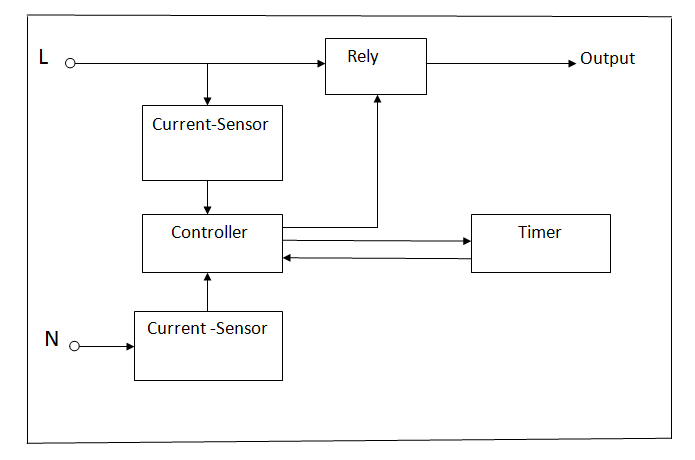
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Figure 1 Earth fault block diagrams