

Detection and Instantaneous Prevention of Power Theft

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Abstract: Survey of different components during project survey led us to an idea of “Prevention of ENERGY THEFT” by different methods like phase bypassing, EMI (Electro-Magnetic Interference) as well as other methods like partial earthing of load, full earthing of load, over loading. Nowadays the “Electronic Energy Meter” used in houses & industries can detect the above mentioned faults which help Electricity Boards to confirm tampering. So the circuit we are designing will prevent/stop the Energy Theft done by any of the above mentioned methods by disconnecting the main supply of the house/industry which may compel the individual to notify the Electricity Board to reconnect the main supply. Also our circuit is cost effective consisting of readily available components like opto-couplers, relays, sensors etc.

Keywords: Energy Meter; Overload; Phase Bye-pass; Power Theft.

I. Introduction

In India, electricity is not a commodity that is taken for granted by consumers. Power is so valuable to Indian citizens that inspectors from electricity companies have been brutally attacked so that they would not have to pay power bills. In addition to these attacks, some have even tampered with meters to lower readings just to dodge payments. The problem is so prevalent in India that Bloomberg estimates an annual loss of \$17 billion in revenue due to electricity theft alone. But we should keep in mind that the electrical energy produced is limited so it is important to make its conservative use. If we just take an insight of where loss of electricity takes place than the most loss will occur in transmission and distribution (T & D), the other most loss takes place is in its theft. Since there is a cost of production of electricity as most of electrical energy in India is produced by Thermal power plant and it uses coal as a fuel, which is much costly. Today our society is facing a huge problem corresponding to power theft. The ways people are committing thefts are such as they either attach magnets in case of electro-magnetic energy meter or might attach a simple circuits generating electromagnetic rays which would stop regular working of electronic energymeter. Moreover people even try breach the energymeter seals for making various circuited connections that will help them to reduce their electricity bills.

II. Methods For Power Theft

Theft of electricity is the criminal practice by stealing electric power. It is a crime and punishable by heavy fines and, in some cases, imprisonment. The most basic method of stealing electricity is a direct wire-connection to a main power route passing by a house or shop so that electricity can flow to the consumer without crossing the electric meter installed by a governmental agency which is responsible for providing electrical services to customers. Other methods may include opening the meter itself, without damaging its seals and reversing the dials, a complicated procedure that requires expert skill.

The various types of electrical power theft are as follows:

- 1) Direct Hooking From Line.
- 2) Bypassing the Energy Meter.

III. Block Diagram & Simulation

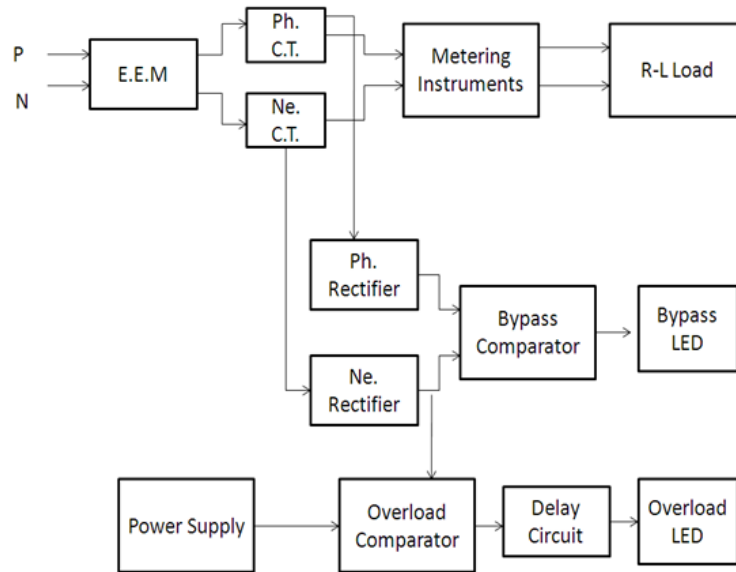


Figure 1: Block Diagram of the Circuit.

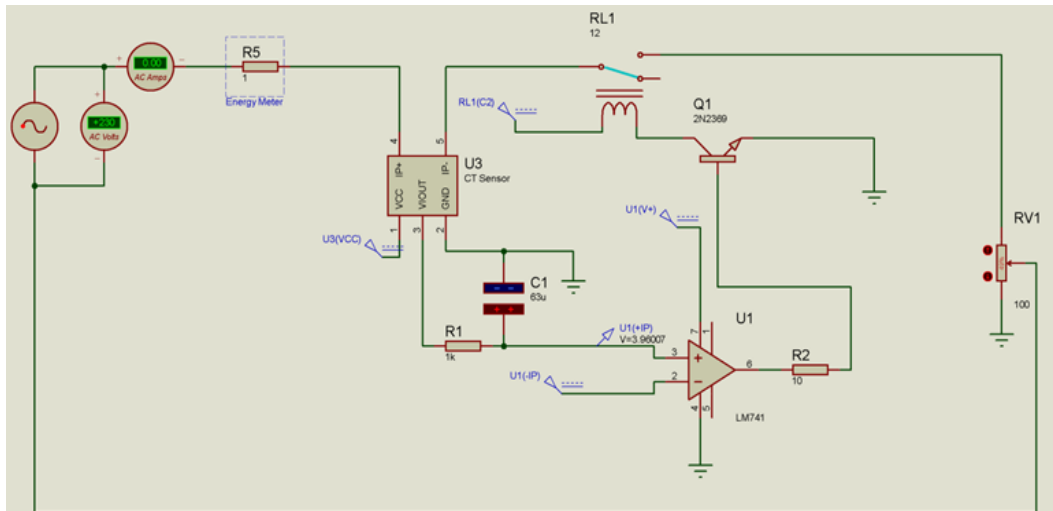


Figure 2: Overload Condition.

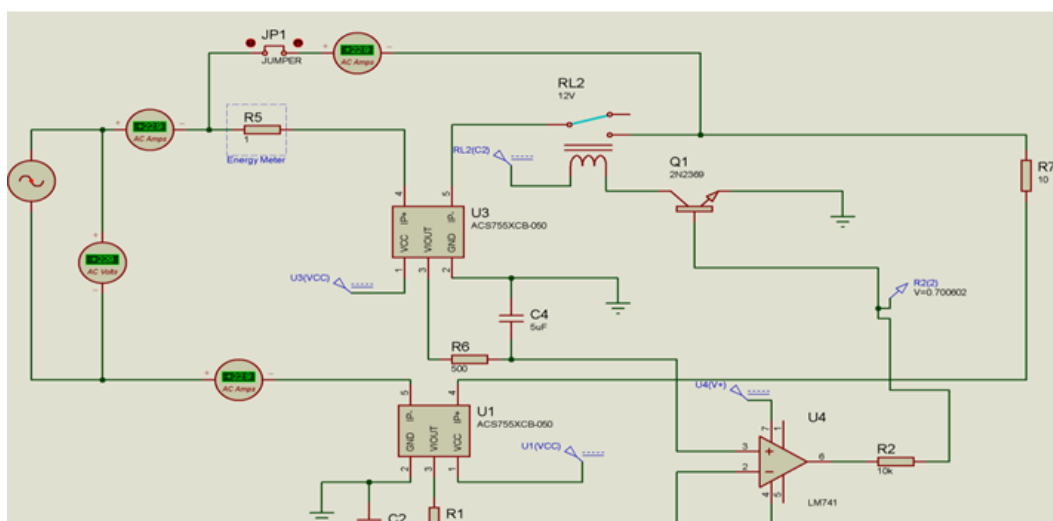


Figure 3: Phase by pass Condition.

IV. Conclusion

Phase and neutral cannot be by-passed at the same time as it will stop the working of the meter. The device used in the Energy Meter for sensing the current is CVT (Current-Voltage Transducer) having similar construction to Current Transformer. CVT's of phase and neutral in Energy Meter has different ratios. Using this circuit we can detect the power theft done in two various ways like A) Phase By-passing & B) Overloading of the system done using different ways and the same can be stopped by tripping the supply for overload condition and indicating the phase by-pass condition.

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