AHSANULLAH UNIVERSITY OF SCIENCE & TECHNOLOGY

Department of Electrical and Electronic Engineering

Course No:EEE 2211

Course Name:Measurement and Instrumentation

Project Name:Voltage Surge Protector

Section:A

Year:2nd

Semester:2nd

Submitted by –

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ID: 11.01.05.025

Group: Single.

Experimental Equipment:

Equipment required:

IC 555
Relay-4V
X-former-6V
Diode 1N4001 × 3
Resistor - 10K,1K
Capacitor- 1µF, 1000 µF × 2, 10pF
Red LED × 1
DVM

Working Principle:

We may wish to apply power to one part of a system and wait for a short interval before starting some other part of a system. For example, we may need to re-set all counter to zero before starting a personal computer at the beginning of a business day. A circuit that solves this problem is shown in Fig-02

In the circuit of Fig-01, power is applied to a system when the switch is closed. The IC555's output goes high for a period of time T and then goes low. T is found from equation $t=1.1R_aC$. This type of startup pulse is typically used to reset counters and initialized computer sequences after a power failure. It can also allow time for an operator to exit after an alarm system has been turned ON before the system is being alarmed.
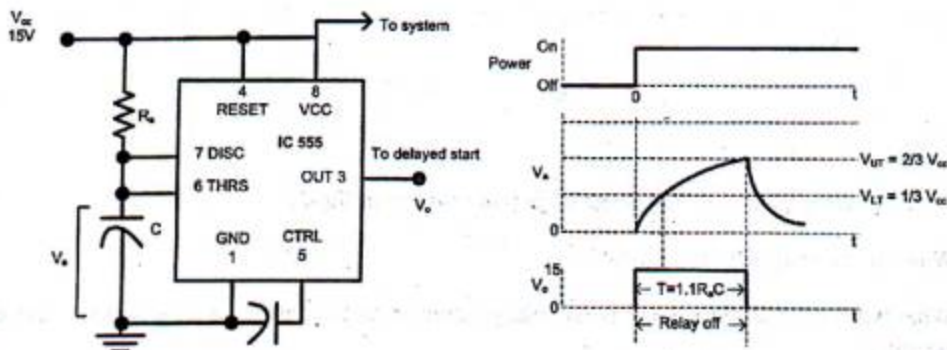

Fig 1: Output V_o does not high until a time interval after power is applied.

Sometimes while any electrical or electronic equipment is ON, the electricity might be fail. For some reasons we may not be able to switch OFF the supply after the supply is cut or power may be restored before we can switch the supply OFF. A voltage surge at the time of power ON may damage sensitive appliances like TV, VCR, Refrigerator, PC etc.

The first part of the circuit is step-down the mains supply and rectify it to DC voltage which includes a step-down transformer, two rectifier diodes, and a smoothing capacitor. The second part is a monostable multivibrator using a 555 IC. The output of this IC is sufficient to drive the relay.

It disconnects the power supply when power fails and connects it again automatically after a few sec/min. Red LED starts glowing when power comes back. The time period can be adjusted by changing the values of R_T and C_T from the equation $T = 1.1 R_T C_T$, as time interval in seconds.
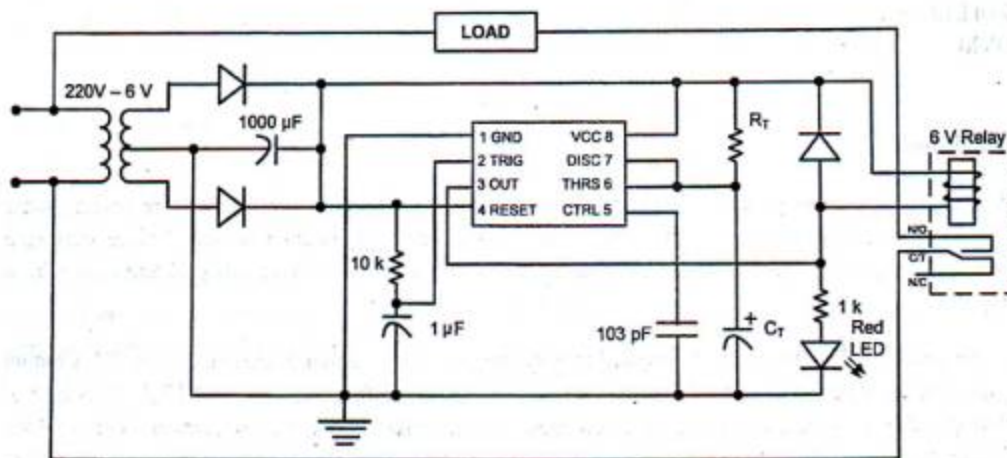

Fig 2: Voltage surge protector circuit.

Application: Any Electrical Devices like TV, Freeze etc.

Conclusion: Actually this device protects any electrical instrument from damage when power is delivered to them. Electricity off and comes back the flow of current is high .This can damage any instrument. So this project will prevent us from voltage surge.