SHORT CIRCUIT PROTECTION USING RELAY

CONTENTS

ABSTRACT

- In this project we are using a relay for detecting the short circuit and to disconnect the current to the load.
- The relay detects the intolerable or undesirable condition with an assigned area and disconnect the affected area. Thus it protects the system from damage.
- In this project, a LED is used to indicate the short circuit condition.The circuit is again reset with a reset button.

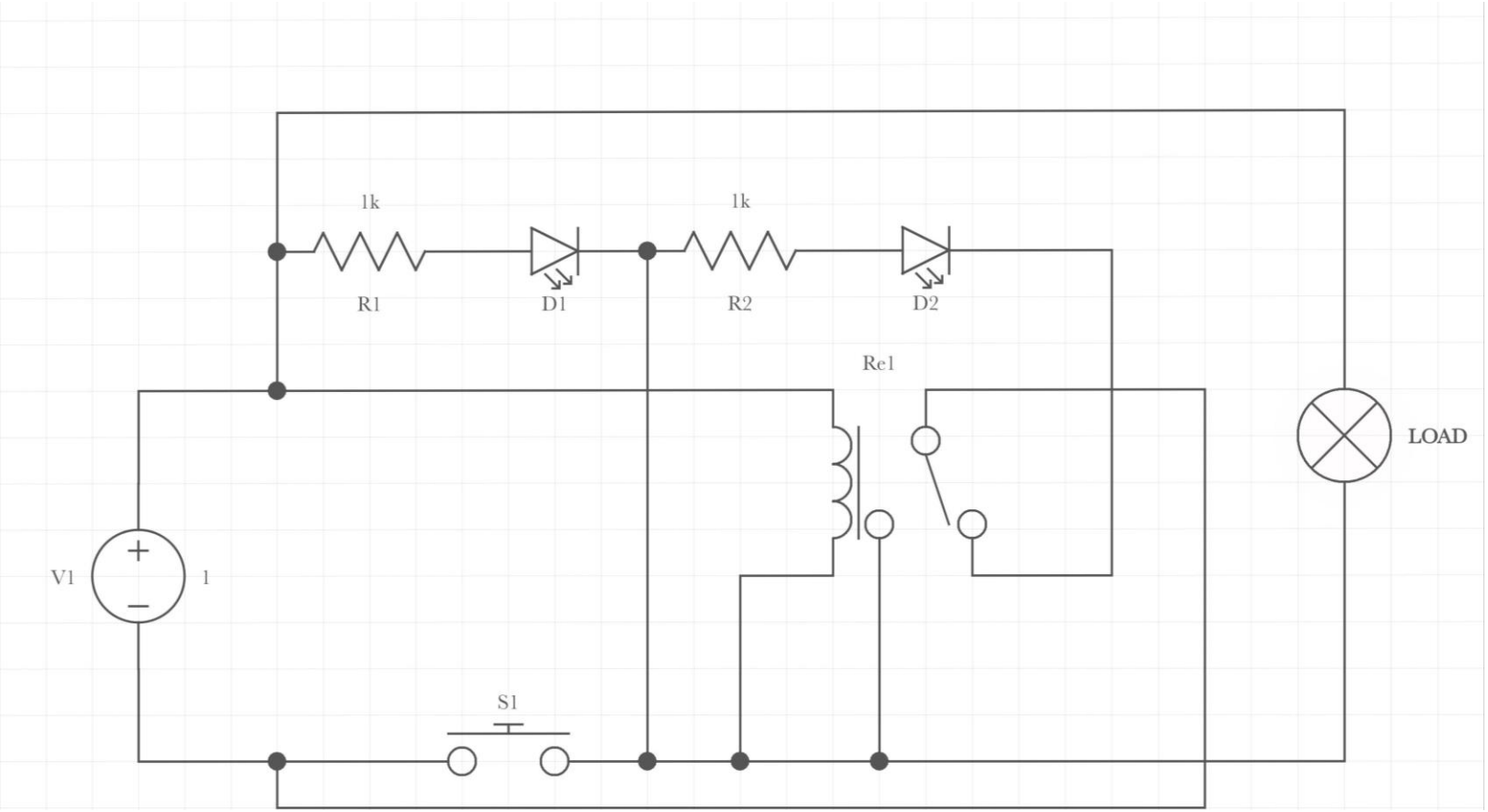
OBJECTIVE

- Through this project we can switch off the power supply immediately to save valuable components.
- The approach for this project is to design an alternative reasonably-priced yet fairly powerful brief circuit protection circuit is defined under which can be used for protecting power supply circuit from damage.

INTRODUCTION

- A short circuit is a circuit or a portion of a circuit that is shorted. If the two ends of the load and power supply are connected by wires, it is called a short circuit. It occurs in both AC and DC circuits.
- To avoid short circuit, we need to add short circuit protection circuit. The short circuit protection circuit will shunt part of the current or cut off the connection between the circuit and the power supply.

CIRCUIT DIAGRAM



COMPONENTS

COMPONENTS	PRICE
Relay	Rs.150
PCB	Rs.50
1k resistor - 2	Rs.10
Push button	Rs.20
LED - 2	Rs.10

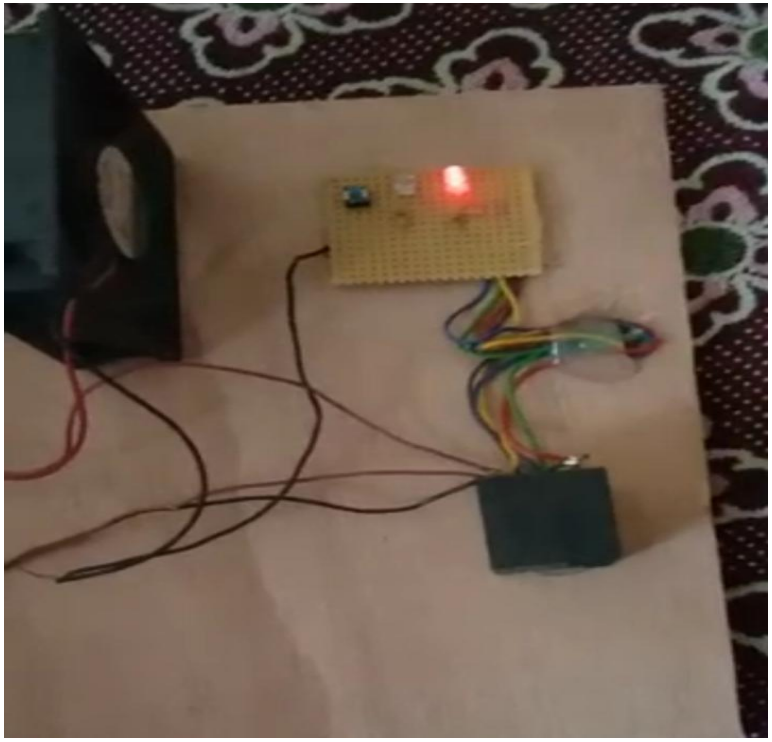
COMPONENTS	PRICE
Mini DC fan	Rs.100
Power adaptor	Rs.150
Connecting wires	Rs.30
TOTAL	**Rs.520**

WORKING PRINCIPLE

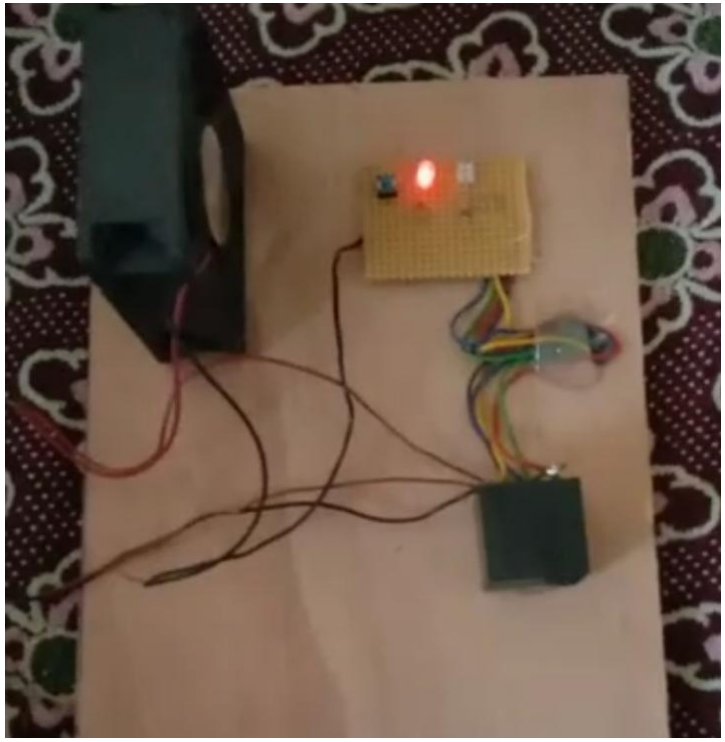
- When the push button is pressed once, the current starts to pass to the relay coil and suddenly at the same time the relay will activate, then also current starts flowing to output through relay NO pin and starts to conducting the current continuously.
- But if a short circuit occurs at the output portion then the potential difference will go to zero at the coil of the relay and then the relay will Deactivate.
- Now the supply is automatically stopped to flowing the current.A LED is used to indicate the short circuit condition.
- Now the circuit is reset for further use using reset button.

RESULT WITH INFERENCES

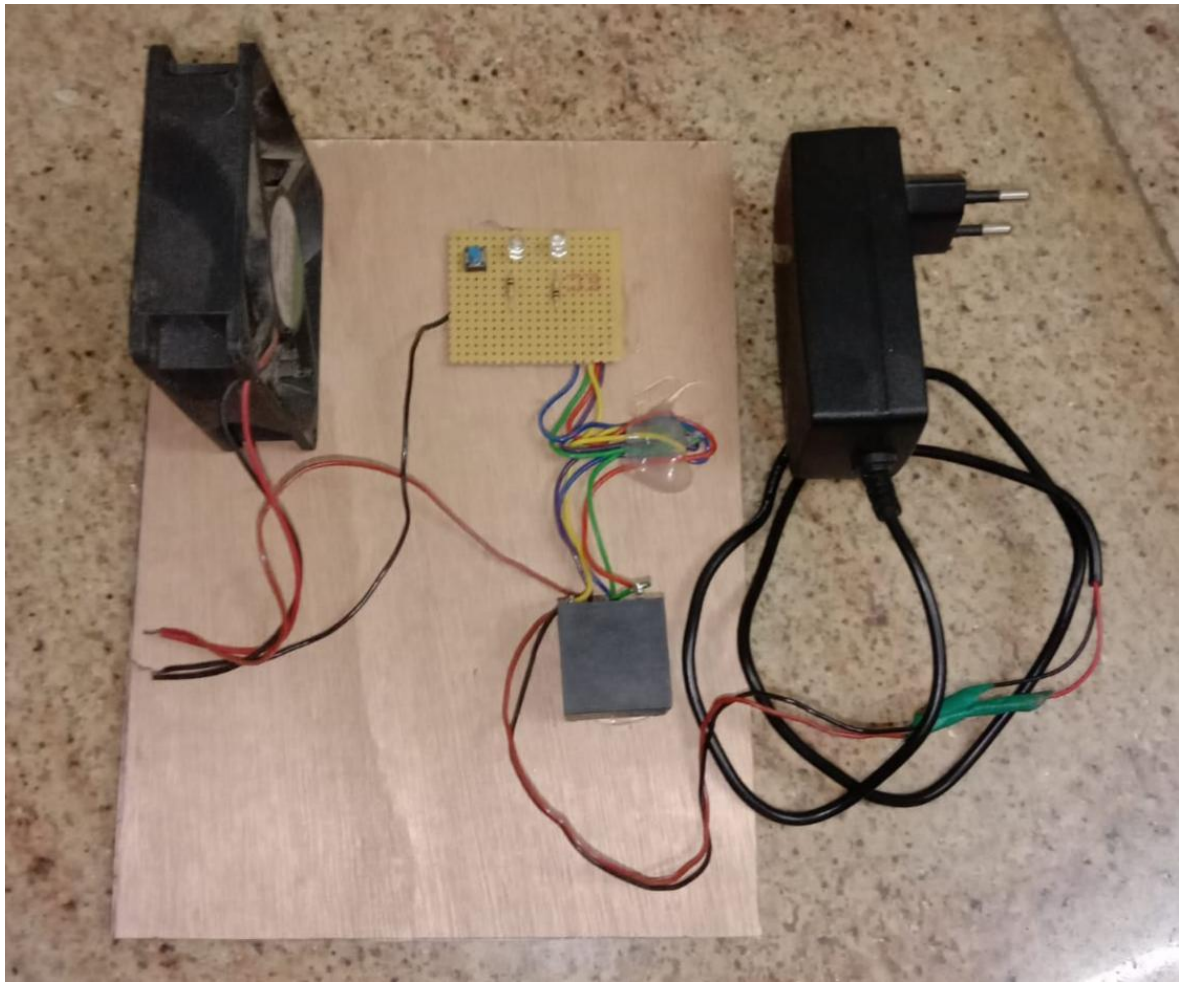
ON CONDITION



SHORT CIRCUIT CONDITION



PROJECT KIT IMAGE



ADVANTAGES

- Reduces the risk of equipment damage and fires
- Relays allow for small voltage signals to switch much larger loads. For example, a 24 V DC 10 mA signal can be used to switch a 230 V AC 16 A load. Larger loads can be controlled with a small amount of energy.
- This is easy to build and very few components used in this circuit .

APPLICATIONS

- Commonly used in switching circuits.
- For Home Automation projects to switch AC loads.
- Used in safety circuits to disconnect the load from supply in event of failure.
- Used in Automobiles electronics for controlling indicators glass motors etc.

CONCLUSION

- Short circuits are abnormal electric connections which allow additional electricity to run through your switches, appliances, and outlets. The additional heat generated by the extra electricity can also cause fires in the affected wires .
- Thie project is very useful for damage protection to the circuit from the Short circuit.
- This is not a digital sensor circuit but this is based on the simple relay detection analog circuit.

REFERENCE

- https://components101.com/switches/12v-relay
- https://circuitspedia.com/short-circuit-auto-cut-relay-switch-for-dc/?amp=1
- https://youtu.be/Cke5iBNfwi4