Switches and relays

They are electromehchanical devices designed to control and protect the system.

Types of relays:

1- Rocker Switches

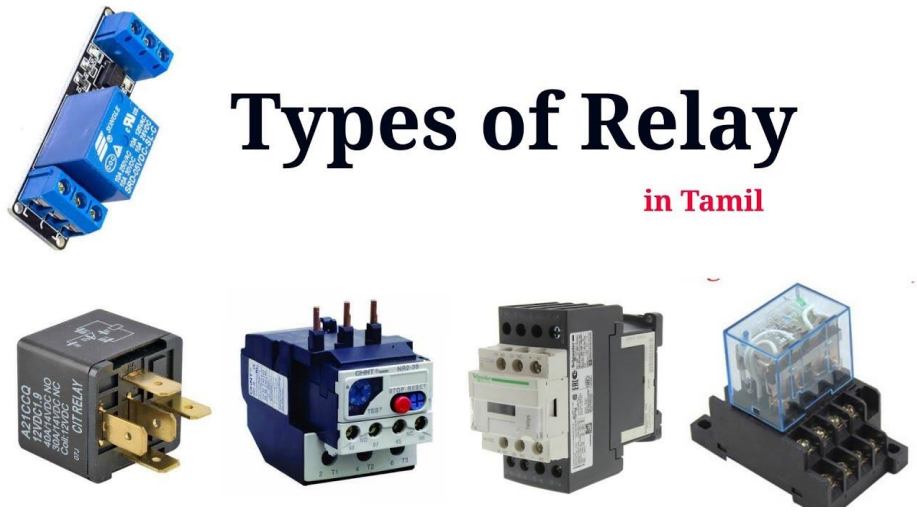
2- Toggle Switches

3-Push Button Switches

4-Rotary Swithes

5-Slide Switches

6-Micro Swithches

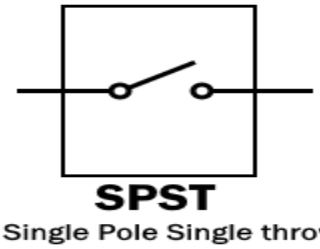


Relays are specially operated electrical switches that can be turned On or Off by current so it don't need user to be near to it to use it so it requires a current or voltage but Switch requires the user to push the button (open circuit and short circuit).

Each of these types of relays is used for a specific application & it is necessary to select the appropriate relay before using in any circuit.

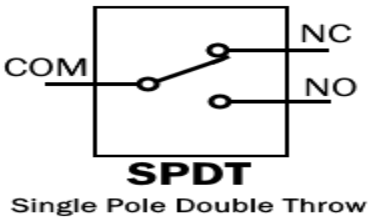
The relays are used in circuits with high voltage and power cause it can controll high voltage circuit by low power and remotely.

SPST Relay: The single pole means that it can control only one circuit while the single throw means its pole has only one position in which it can conduct. SPST diagram is given .



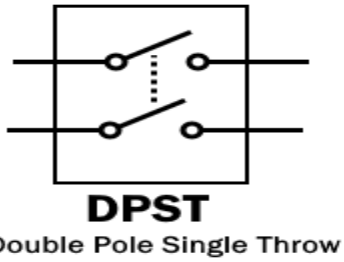
SPDT Relay:

SPDT refers to single pole double throw relay.The single pole means it can control only one circuit at a time. The double throw means its pole has two positions in which it can conduct.



DPST Relay:

DPST refers to double pole single throw.The double pole means it can control two completely isolated individual circuits. The single throw means that each pole has one position in which it can conduct.
The DPST relay can switch two circuits simultaneously



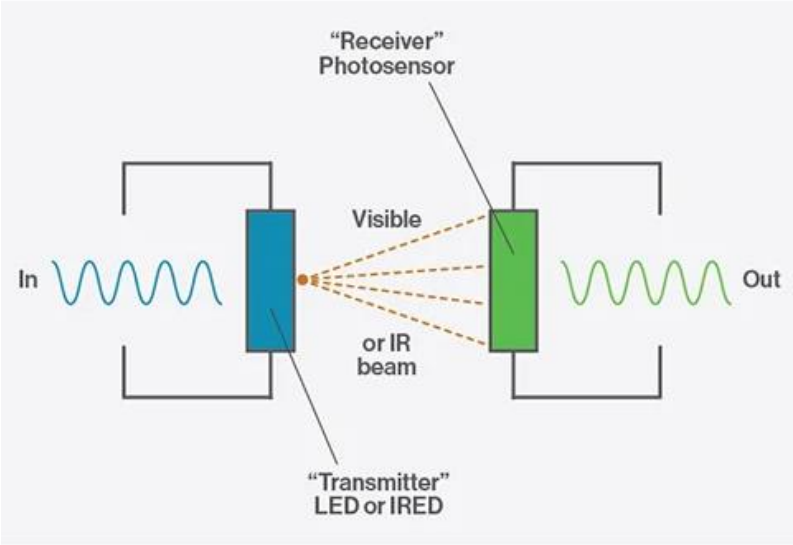
Based on operation principles

1-EMR (Electromechanical Relay).

2-SSR (Solid State Relay).

Optocoupler:

Optocoupler is a semiconductor device that allows an electrical signal to be transmitted between two isolated circuits.A current is first applied to the Optocoupler, which makes the infrared LED emit a light that's proportional to the current. When the light hits the photosensitive device, it switches on and starts to conduct a current as any ordinary transistor might.



Usage of Optocoupler:

1-Remove electrical noise from signals.

2-Isolate low-voltage devices from high-voltage circuits. The device is able to avoid disruptions from voltage surges (from radio frequency transmissions, lightning strikes, and spikes in a power supply).

3-Allow the usage of small digital signals to control larger AC voltages.

4-DC and AC power control

5-PC communications

6- signal isolation and power supply regulation which suffer from current ground loops

Types of Optocoupler:

1-Photo-transistor

2-Photo-darlington

3-Photo-SCR

4-Photo-triac

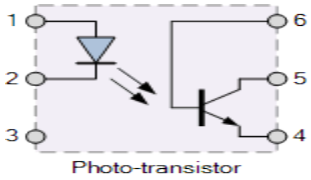


Photo-transistor

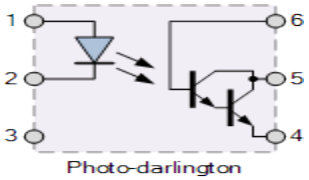


Photo-darlington

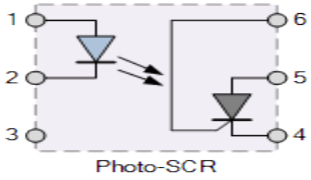


Photo-SCR

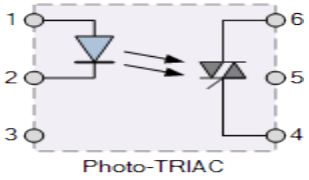


Photo-TRIAC