



SNS COLLEGE OF ENGINEERING

Kurumbapalayam (Po), Coimbatore – 641 107

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DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

COURSE NAME : 19EE605 PROTECTION AND SWITCHGEAR

III YEAR /VI SEMESTER

Unit 2- ELECTROMAGNETIC RELAY

Topic: Electromechanical Relay



ELECTROMECHANICAL RELAYS



- Its operate by mechanical forces generated on moving parts due to electromagnetic or electrothermic forces created by the input quantities.
- The mechanical force results in physical movement of the moving part which closes the contacts of the relay for its operation.
- The operation of the contact arrangement is used for relaying the operated condition to the desired circuit in order to achieve the required function.
- Since the mechanical force is generated due to the flow of an electric current, the term 'electromechanical relay' is used.



ELECTROMECHANICAL RELAYS



- Most electromechanical relays use either electromagnetic attraction or electromagnetic induction principle for their operation.
- Such relays are called electromagnetic relays.
- Depending on the principle of operation, the electromagnetic relays are of two types, i.e., (i) attracted armature relays, and (ii) induction relays.
- Some electromechanical relays also use electrothermic principle for their operation and are based upon the forces created by expansion of metals caused by temperature rise due to flow of current.
- Such relays are called thermal relays.
- Most of the present day electromechanical relays are of either induction disc type or induction cup type.



The following are the principal types of electromechanical relays:

1. Electromagnetic relays

(i) Attracted armature relays, and

(ii) Induction relays

2. Thermal relays



Attracted Armature Relays



- Attracted armature relays are the simplest type which respond to **ac as well as dc**.
- These relays operate through an armature which is attracted to an electromagnet or through a plunger which is drawn into a solenoid.
- All these relays use the same electromagnetic attraction principle for their operation.
- The electromagnetic force exerted on the moving element, i.e., the armature or plunger, is proportional to the square of the flux in the air gap or the square of the current.
- In dc relays this force is constant. In case of ac relays, the total electromagnetic force pulsates at double the frequency.
- The motion of the moving element is controlled by an opposing force generally due to gravity or a spring.



The following are the different types of construction of attracted armature relays.

- (i) Hinged armature type
- (ii) Plunger type
- (iii) Balanced beam type
- (iv) Moving-coil type
- (v) Polarised moving-iron type
- (vi) Reed type



Assessment



1. What is the main function of a relay?
 - A) To amplify the current in a circuit
 - b) To control the flow of current in a circuit.
 - c) To store energy in a circuit
 - d) None of these





References



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3. Badriram, Vishwakarma B.H, “Power System Protection and Switchgear”, New Age International Pvt Ltd Publishers, 2nd Edition 2017.

Thank You