

Class :4<sup>th</sup> stage

Subject: Control

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## Ministry of Higher Education and Scientific Research Al-Mustaqbal University College Chemical Engineering and Petroleum Industries

## Control Laboratory Experiment No. 1 Introduction of Control Element

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A contactor is an electrically-controlled switch used for switching an electrical power circuit.

**Electromagnetic Contactor** is a single pole heavy duty contactor designed to be used on traction vehicles. In order to work efficiently both AC and DC circuits, the contactors are equipped with arc blow-out circuit.



**Electro pneumatic Contactor** is a double pole heavy duty contactor designed to be used on traction vehicles. In order to work efficiently both.



Circuit is a closed path that allows electricity to flow from one point to another.





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A relay is an electrically operated switch. It consists of a set of input terminals for a single or multiple control signals, and a set of operating contact terminals. The switch may have any number of contacts in multiple contact forms, such as make contacts, break contacts, or combinations thereof.



**An electronic control unit** (ECU), also known as an electronic control module (ECM), is an embedded system in automotive electronics that controls one or more of the electrical systems or subsystems in a car or other motor vehicle.



**Time switch** also known as a timer contactor or simply a timer is a device that controls an electric switch. The time switch is an electronic device that controls the 'on' and 'off' time of electrical equipment.





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**Fuse** is an electrical safety device that operates to provide overcurrent protection of an electrical circuit. Its essential component is a metal wire or strip that melts when too much current flows through it, thereby stopping or interrupting the current.



A circuit breaker is an electrical switch designed to protect an electrical circuit from damage caused by overcurrent/overload or short circuit.



**Overload relays** protect the motor, motor branch circuit, and motor branch circuit components from excessive heat from the overload condition.

