

LIMIT SWITCH BOX



Limit Switches: Technical Overview

Definition: A limit switch is an electromechanical device designed to detect the presence or absence of an object, or to measure the position of equipment by mechanically linking an actuator to a set of electrical contacts. When an object interacts with the actuator, it triggers the switch to either make or break an electrical connection.

Function:

- **Regulation of Electrical Circuits:** Limit switches control the electrical circuits that manage machinery and its moving components. By activating or deactivating electrical connections, they play a crucial role in starting, stopping, slowing down, or accelerating machinery, such as electric motors.
- **Pilot Devices:** In magnetic starter control circuits, limit switches act as pilot devices. They enable precise control over machinery operations by managing electrical connections based on the position of the equipment.

Types of Limit Switches:

1. Mechanical Limit Switches:

- **Description:** Mechanical limit switches use physical interaction to determine equipment position. These switches are often designed with push-buttons.
- **Operation:** When a mechanical component, such as a valve extension, comes into contact with the limit switch, it depresses the button to either complete or break the electrical circuit. This interaction signals the system to respond appropriately, such as opening or closing the valve.



2. Visual Indication and Control:

- **Visual Indicator:** A limit switch can serve as a visual indicator to show whether a valve is in the open or closed position. This visual feedback is crucial for monitoring and operating equipment effectively.
- **Positioner Integration:** Limit switches are often integrated with positioners to control the valve's angle, typically between 0 and 90 degrees. The positioner ensures that the valve opens to the specified angle, allowing precise control of the flow.

3. Actuators:

- **Role:** Actuators are used in conjunction with limit switches to physically open or close the valve. The actuator executes the mechanical movement based on the signals received from the limit switch and positioner.

4. Safety Applications:

- **Example:** In furnace systems, a limit switch is installed below the plenum to act as a safety control device. If the plenum temperature exceeds a predetermined threshold, the limit switch deactivates the burner to prevent overheating and potential damage.

Summary: Limit switches are essential components in various applications, providing critical control and safety functions by detecting the position of mechanical parts and managing electrical circuits. Their versatility in applications ranges from simple mechanical switches to sophisticated control systems in industrial machinery and safety systems.