CIT Relays and Switches In Power Supply Equipment

Electromechanical relays play a crucial role in power supply systems by providing control, protection, and automation functions. Our EMRs are used to switch electrical circuits on and off, control power distribution, and act as an interface between low-voltage control circuits. They also detect abnormal conditions such as short circuits or voltage spikes and disconnect power supply to prevent damage to equipment. In UPS systems, relays help transfer loads between primary and backup power sources and facilitate load shedding by prioritizing critical loads when power is limited. EMRs help in power factor correction, isolation, and safety, and sequential control in power systems. Here's how they are typically used:

Electromechanical Switches

Used for:

- **Manual On/Off Control**:
    - Power switches for turning equipment on/off (rocker, toggle, or pushbutton types).
- **Mode Selection**:
    - Switches can select between operational modes (e.g., AC/DC input, voltage range selection).
- **Safety Interlocks**:
    - Used in maintenance or service panels to ensure disconnection during servicing.

Advantages:

- Simple, tactile feedback
- Good for low-frequency, manual operation

Electromechanical Relays (EMRs)

Used for:

- **Input/Output Switching**:
    - Switching AC or DC input and output lines in response to control signals.
- **Overload Protection**:
    - Trigger disconnection if current exceeds safe limits, often used in conjunction with sensors or circuit breakers.

- **Power Path Routing**:
    - Directing power from one source to another (e.g., from main AC to backup battery).
- **Sequencing Multiple Outputs**:
    - Turning on/off power rails in sequence (e.g., 12V, 5V, 3.3V), common in power distribution units (PDUs).

Advantages:

- Can switch high voltage/current
- Clear physical isolation between control and load circuits
- Cost-effective for lower switching frequency

Limitations:

- Mechanical wear over time
- Slower switching speed
- Audible clicking

Solid-State Relays (SSRs)

Used for:

- **Silent, Fast Switching**:
    - Ideal for high-speed switching or where audible noise is unacceptable.
- **High-Frequency Applications**:
    - Used in power supplies that regulate voltage with high-frequency switching (e.g., switch-mode power supplies).
- **Remote or Microcontroller-Based Control**:
    - Easily interfaced with low-voltage logic circuits (e.g., PLCs, microcontrollers).
- **Load Control in Industrial Power Supplies**:
    - SSRs are often used to switch large inductive or capacitive loads cleanly without arcing.

Advantages:

- No mechanical wear
- Silent operation

- Very fast switching
- Resistant to shock and vibration

Limitations:

- Higher cost than EMRs
- May require heat sinking due to internal dissipation
- Less physical isolation unless opto-isolated

CIT Relay used in Power Supply Equipment:

- J105E Series
- J107 Series
- J107F Series
- J115F1E Series
- J115F2E Series
- J115F3E Series
- J115F1 Series
- J115F2 Series
- J115F3 Series
- J115F 50Amp Series
- L115F1 Series

CIT Solid-State Relays used in Power Supply Equipment:

- PCS33 Series
- PCS34 AC Input Series
- PCS34 DC Input Series

CIT Switches used in Power Supply Equipment:

- Toggle Switches
- Rocker Switches
- CITR2 Series