



CIT Relays and Switches In Harsh Environment Equipment

In harsh environments (like those with high vibration, temperature extremes, moisture, dust, or corrosive chemicals), electromechanical relays, switches, and solid-state relays are still widely used, but their **designs, materials, and applications** are tailored to withstand those conditions. Here's how each type is used and protected in such environments:

Electromechanical Relays (EMRs)

Use Cases:

- Power distribution systems
- Industrial machinery
- Transportation (trucks, trains, heavy equipment)
- Military and aerospace

Challenges: Prone to contact wear, vibration damage, and contamination.

Adaptations for Harsh Environments:

- **Sealed or hermetically sealed enclosures** to block out dust, moisture, and corrosives.
- **Heavy-duty contact materials** (e.g., silver alloys) for durability and arc resistance.
- **Shock and vibration-proof mounts** and designs.
- **Extended temperature ratings** (e.g., -40°C to +125°C or more).

Electromechanical Switches

Use Cases:

- Control panels
- Marine and outdoor control equipment
- Industrial automation
- Medical and defense systems

Challenges: Physical wear from mechanical action, contamination.

Adaptations for Harsh Environments:

- **IP-rated enclosures** (IP67 or IP68) for water/dust resistance.
- **Gold-plated or silver contacts** for corrosion resistance.
- **Rugged actuators** (toggle, pushbutton, rocker) that resist debris and impact.



- **Snap-action designs** to reduce arcing and improve longevity.

Solid-State Relays (SSRs)

Use Cases:

- HVAC systems
- Industrial heaters and ovens
- Pumps and motors in remote or hazardous areas
- Medical sterilizers

Advantages in Harsh Environments:

- **No moving parts** = immune to vibration, shock, and mechanical wear.
- **Silent operation** and faster switching.
- **Totally sealed housings** available for chemical, dust, and moisture resistance.

Considerations:

- Need **heat sinks** or thermal management, especially in hot environments.
- Must be rated for **transient voltage protection** due to electrical noise in harsh systems.

CIT Relay used in Harsh Environment Equipment:

- [PC775 Series](#)
- [PC776 Series](#)
- [A1 Series](#)
- [A1M Series](#)
- [A2 Series](#)
- [A2H Series](#)
- [A2K Series](#)
- [A3 Series](#)
- [A3K Series](#)
- [A6 Series](#)
- [A17 Series](#)

CIT Solid-State Relays used in Harsh Environment Equipment:

- [PCS33 Series](#)
- [PCS34 AC Input Series](#)
- [PCS34 DC Input Series](#)

CIT Switches used in Harsh Environment Equipment:

- [ME Series](#)
- [Anti-Vandal Switches](#)
- [Rocker Switches](#)