Power Quality Cyclopedia

CLP 中電

- Lifts and Escalators in Shopping Malls
- Can lifts and escalators be protected from voltage dips?

Different designs of lift and escalator have different constraints, so they need to be studied case by case. If you have any power quality queries about your lifts and escalators, please contact us at 2678 2678 to carry out a joint site investigation.

We are ready to provide you with our

Consultancy Service on Power Quality!

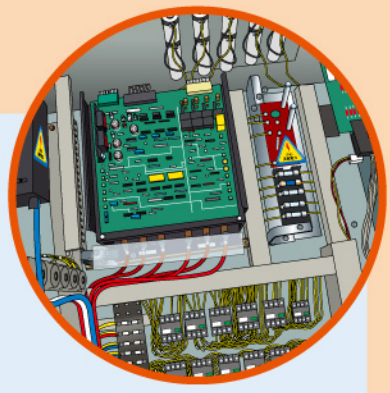
Want to know more...

Escalators and lifts are widely-used means of transportation for cross-slope and vertical movement in modern high-rise buildings. However, they are vulnerable to tripping and may suddenly stop during voltage dip incidents.

Escalators

Reasons for tripping during voltage dips:

- The contactors, control relays and PLCs malfunction.
- No time delay from the phase–monitoring relay causes tripping.
- Variable speed drives (VSD) are tripped.



Control circuitry

Recommendations:

- Add a true on-line uninterruptible power supply (UPS) to protect the control supply to the contactors, control relays and PLCs.
- Upgrade the phase-monitoring relay with time-delay setting enabling escalators to ride through voltage dips for 0.2sec.
- Modify the VSD setting to enhance ride-through capability.
- To protect against tripping, add an "External Buffer Unit" to the VSD to maintain a normal DC bus voltage during voltage dips.

Lifts

Most lifts are designed to auto re-start after a voltage dip and engage the "Homing" function (Post-Voltage-Dip-Operation).

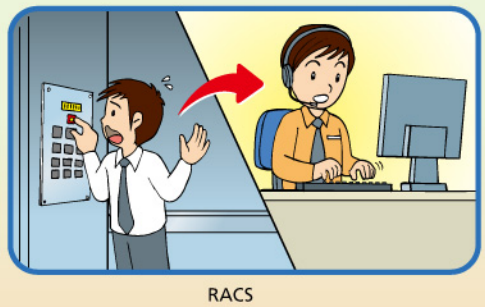
Reasons for tripping during voltage dips:

- Mechanical safety devices are activated or damaged, e.g. activation of landing-door safety switches and over-speed governors, sticking of lift-door rollers, malfunction of over-speed governors and limit switches.
- Electrical devices malfunction or sustain damage, including control circuit tripping, motor-drive malfunction, blown fuses or control PCBs, etc.

UPS

Recommendations:

- Clear and replace the defective mechanical and electrical parts and damaged voltage arrestors during compulsory routine maintenance.
- Add a true on-line UPS to protect the control supply and an "External Buffer Unit" to the VSD to enhance ride-through capability.
- Install an "Emergency Rescue Device" (ERD), a self-powered system with the ability to take over control of the lift when normal control fails.
- Install a "Remote Alarming and Communication System" (RACS) to provide effective communication between any trapped passengers and the relevant lift service centre in an emergency.



RACS

For the requirements regarding the ride-through capability of lifts and escalators, please refer to the latest "Code of Practice on the Design and Construction of Lifts & Escalators". Please also refer to international voltage-dip immunity standards such as SEMI F47, IEC 61000-4-34, -4-11 and the ITIC Curve to verify the ride-through capability of new equipment procured.