



Electrical Safety Handbook

Essential safety practices and compliance recommendations for electrical installations.

SAFETY STARTS WITH THE RIGHT PRACTICES

Electrical safety is built around preventing electric shock, overheating, fire, equipment damage, and unsafe operating conditions. Good design, correct installation, appropriate protection, regular inspection and safe working practices all work together.

What this handbook covers

- **Electrical shock protection** and safe isolation practices
- **Wiring, cables and protective devices** for safer installations
- **Earthing, bonding and residual-current protection**
- **Overload, short-circuit and fire prevention**
- **Inspection, maintenance and safe working practices**
- **Practical checklists** for residential, commercial and industrial environments

Important: This handbook is a general educational guide. It does not replace applicable laws, electrical codes, manufacturer instructions, project specifications, or the work of a qualified electrical professional. Always follow the requirements applicable to the installation and location.

Electrical Safety Fundamentals

The safest electrical installation is one that is designed for the intended load, correctly protected, properly installed and maintained throughout its service life.

01

Prevent electric shock

Keep live parts properly enclosed or otherwise protected. Do not touch electrical equipment with wet hands or while standing in wet conditions. Safe isolation should be established before work begins.

02

Use correct circuit protection

Protect circuits against overloads and short circuits with correctly selected protective devices. Protection should be coordinated with the cable and equipment ratings.

03

Provide effective earthing

Protective earthing and bonding help reduce dangerous touch voltages during faults. The earthing arrangement should be designed, installed and verified appropriately.

04

Use residual-current protection where required

RCD/RCCB-type protection can provide additional protection against certain earth-leakage conditions. The device type, rating and application must match the installation.

05

Control heat and fire risk

Loose connections, overloaded circuits, damaged insulation and unsuitable cables can create heat and fire hazards. Keep connections secure and use equipment within its rated conditions.

06

Keep installations accessible and identifiable

Distribution boards, isolation points, circuits and protective devices should be appropriately labelled and accessible for safe operation and maintenance.

Never improvise electrical repairs. Damaged cables, exposed conductors, repeated tripping, overheating, burning smells or unusual noise should be treated as warning signs and assessed by a competent professional.

Safer Installation & Maintenance

Safety continues after installation. Regular inspection, correct operating practices and timely maintenance help prevent avoidable failures.

Wiring & Cables

- Select cable type and size according to the design load, installation method, ambient conditions and applicable requirements.
- Protect cables from excessive heat, moisture, abrasion, chemicals, UV exposure and mechanical damage where applicable.
- Avoid loose, improvised or exposed connections. Use suitable terminals, glands, enclosures and accessories.
- Do not exceed the rated current, voltage, temperature or environmental limits of the cable.

Distribution Boards & Panels

- Keep panels closed, clean, clearly identified and accessible to authorised personnel.
- Use correctly rated protective devices and ensure circuits are identified for safe isolation.
- Watch for signs of overheating such as discolouration, burning odour, damaged insulation or repeated tripping.

Inspection & Maintenance

- Carry out inspection and testing at intervals appropriate to the installation and applicable requirements.
- Check cables, terminations, enclosures, protective devices, earthing/bonding and visible signs of damage.
- Record significant defects and corrective actions so recurring issues can be tracked.

IF AN ELECTRICAL INCIDENT OCCURS

Do not touch a person who may still be in contact with an energised source. If it is safe and you are authorised to do so, isolate the electrical supply. Call appropriate emergency services and seek qualified medical assistance. Treat electrical burns, shock and fire as serious incidents.

Workplace Good Practices

- Only competent and authorised persons should perform electrical work appropriate to their training and role.
- Use suitable tools and personal protective equipment for the task and environment.
- Establish safe isolation and verify the condition of the circuit before work where applicable.
- Keep unauthorised persons away from hazardous work areas and maintain clear access to isolation points.

Electrical Safety Checklist

Use this checklist as a practical review before commissioning, operating or maintaining an installation.

■	Are circuits and equipment correctly rated for their intended use?
■	Are cables protected against likely mechanical and environmental hazards?
■	Are overload and short-circuit protective devices correctly selected?
■	Is the earthing and bonding arrangement appropriate and verified?
■	Where required, is residual-current protection correctly selected and tested?
■	Are distribution boards, isolators and circuits clearly identified?
■	Are there any damaged cables, loose connections, exposed conductors or signs of overheating?
■	Are inspection, testing and maintenance records maintained as appropriate?
■	Are only competent/authorised personnel carrying out electrical work?
■	Are current applicable regulations, standards and manufacturer instructions being followed?

India: Reference Framework

For installations in India, safety and compliance should be checked against the applicable Central Electricity Authority (CEA) regulations and relevant Bureau of Indian Standards (BIS) codes. Useful reference documents include the CEA Measures relating to Safety and Electric Supply Regulations, IS 732:2019 for electrical wiring installations, IS 3043:2018 for earthing, and SP 30:2023, the National Electrical Code of India. Always verify the current applicable edition, amendments and project-specific requirements before relying on a standard.

Reference	Purpose
CEA Safety & Electric Supply Regulations	Regulatory framework for safety and electric supply requirements in India.
IS 732:2019	Code of practice for electrical wiring installations.
IS 3043:2018	Code of practice for earthing.
SP 30:2023	National Electrical Code of India.

Final reminder: Electrical safety is a design, installation, operation and maintenance responsibility. When in doubt, stop work and consult a qualified electrical professional.