

MCCB, SECTION BOARD & DISTRIBUTION BOARD

UK Compliance Guide | Industrial & Commercial Installations

A practical guide to the key considerations when designing, installing, altering and commissioning low-voltage electrical distribution equipment in industrial and commercial environments.

MCCBs, section boards and distribution boards form a critical part of an industrial or commercial site's electrical infrastructure. Compliance is not limited to the board itself: the complete design must consider the supply, fault level, protective devices, cables, earthing, isolation, environment, connected loads and the existing installation.

01 | KEY UK REQUIREMENTS

BS 7671:2018+A4:2026 - Requirements for Electrical Installations

The current IET Wiring Regulations provide the UK national standard for the design, installation, certification and maintenance of low-voltage electrical installations. New distribution work, additions and alterations should be designed and verified against the applicable requirements.

BS EN IEC 61439-1:2021 & BS EN IEC 61439-2:2021

These standards cover low-voltage switchgear and controlgear assemblies. Part 1 provides the general rules and Part 2 covers power switchgear and controlgear assemblies. They address matters including construction, technical characteristics and verification of the assembly.

Electricity at Work Regulations 1989

Electrical systems used at work must be constructed, maintained and worked on so as to prevent danger so far as is reasonably practicable. Selection, installation, maintenance and safe working practices therefore remain important throughout the life of the distribution system.

02 | DESIGN & ASSESSMENT

Before a new section board or distribution board is installed, the existing electrical system should be assessed. A compliant design should consider the actual site conditions rather than simply replacing equipment on a like-for-like basis.

Typical design considerations include:

- Maximum demand, diversity and anticipated future loads
- Supply characteristics, earthing arrangement and point of connection
- Prospective fault current and the breaking capacity of protective devices
- Cable current-carrying capacity, voltage drop and installation method
- Automatic disconnection requirements and earth fault loop impedance
- Discrimination/selectivity and coordination between protective devices
- Environmental conditions, accessibility and required enclosure protection
- Capacity for future machinery, plant or additional distribution circuits

03 | MCCB SELECTION & PROTECTION

MCCBs are commonly used to protect larger submains, section boards, machinery and plant. Selection should consider more than the device's nominal current rating.

The selected MCCB should be appropriate for the circuit design, fault level and connected load. Where adjustable electronic or thermal-magnetic protection is used, settings should be determined from the design and coordinated with upstream and downstream protection. Settings should not be altered without considering the effect on cable protection, disconnection times and discrimination.

04 | SECTION BOARDS & DISTRIBUTION BOARDS

New assemblies should be suitable for their intended application, location and electrical duty. The assembly manufacturer's instructions and verified configuration should be followed, including limitations relating to devices, busbars, terminals, enclosure arrangements and installation.

Key points include:

- Correct rated current and short-circuit withstand capability
- Suitable incomer and outgoing protective devices
- Appropriate neutral and protective conductor arrangements
- Adequate space for cable termination and safe maintenance
- Correct IP rating and environmental suitability
- Suitable labelling, circuit identification and warning notices
- Spare ways and future capacity where specified
- Assembly verification and manufacturer documentation where applicable

05 | SUBMAINS, CABLES & CONTAINMENT

The board and the cable supplying it must be designed as one system. Large industrial and commercial distribution projects may involve SWA cables, single-core cables, cable ladder, tray, trunking or other containment systems.

Cable selection should take account of load, protective device characteristics, grouping, ambient temperature, installation method, voltage drop and fault protection. Cable supports, containment and mechanical protection should be suitable for the environment and installed so the system can be safely inspected and maintained.

06 | EARTHING, BONDING & FAULT PROTECTION

The earthing arrangement must be established and the protective conductors sized and installed appropriately. The design should confirm that the protective measures provide the required level of protection against electric shock and that fault conditions will operate the relevant protective device within the required parameters.

Where existing distribution equipment is being altered, the condition and adequacy of the existing earthing and bonding arrangements should also be verified.

07 | ISOLATION, SWITCHING & SAFE WORKING

Distribution equipment must provide appropriate means of isolation and switching for the installation it serves. Work on or near electrical systems should be planned and carried out using suitable safe systems of work by competent persons.

Where existing operational sites are involved, shutdowns should be planned around production and site requirements. Wherever reasonably practicable, electrical work should be carried out with the system made dead and securely isolated.

08 | INSTALLATION QUALITY

Correct installation is essential to the long-term reliability of high-current distribution equipment. Particular attention should be given to cable preparation, lug selection, gland arrangements, conductor support, phase identification and terminal connections.

Connections should be completed in accordance with the equipment manufacturer's requirements, including specified tightening torques where applicable. Large cables should be supported so excessive mechanical stress is not transferred to switchgear terminals.

09 | INSPECTION, TESTING & COMMISSIONING

New work should be inspected, tested and verified before being placed into service. The exact tests depend on the installation and scope of work, but can include:

- Continuity of protective conductors
- Insulation resistance
- Polarity and phase sequence
- Earth fault loop impedance
- Prospective fault current
- Verification of protective device ratings and settings
- RCD testing where applicable
- Functional testing, isolation and circuit identification

Results should be recorded on the appropriate certification and schedules for the completed work. Test equipment should be suitable for the measurements being undertaken and maintained appropriately.

10 | ALTERATIONS TO EXISTING INSTALLATIONS

Replacing or adding a distribution board does not automatically make the existing circuits compliant. The designer and installer need to determine whether the existing installation is suitable for the alteration and whether any defects affect the safety of the new work.

Where issues are identified - such as unsuitable earthing, inadequate fault protection, damaged cabling or excessive fault current - these should be addressed or clearly brought to the client's attention as appropriate before the new installation is energised.

11 | DOCUMENTATION & HANDOVER

A well-documented installation is easier and safer to operate, maintain and modify. Depending on the project, handover information can include:

- Electrical Installation Certificate and test schedules
- Updated circuit charts and board schedules
- Protective device types, ratings and settings
- Single-line diagrams where appropriate
- Manufacturer information and assembly documentation
- Operating and isolation information
- Relevant design information and as-installed records

12 | ONGOING MAINTENANCE

Industrial and commercial distribution equipment should remain subject to appropriate inspection and maintenance throughout its service life. The frequency and extent should reflect the equipment, environment, duty, manufacturer guidance and previous inspection results.

Maintenance may include visual inspection, checking for signs of overheating or deterioration, examination of connections, functional checks, thermal imaging and periodic electrical inspection and testing where appropriate.

COMPLIANCE CHECKLIST

DESIGN	Maximum demand, fault level, cable sizing and protection assessed
ASSEMBLY	Suitable board/section board selected for the application
MCCBs	Ratings, breaking capacity and protection settings verified
CABLES	Submains sized for load, installation method and fault protection
EARTHING	Earthing and protective conductor arrangements verified
ISOLATION	Suitable isolation and safe switching arrangements provided
INSTALLATION	Terminations, containment, supports and labelling completed
TESTING	Inspection, electrical testing and functional checks completed
DOCUMENTS	Certification, schedules and handover information provided
MAINTENANCE	Future inspection and maintenance requirements considered

THE QUEST APPROACH

Industrial & Commercial Electrical Distribution - Delivered as a Complete System

QUEST Electrical can support distribution projects from the initial assessment through to MCCBs, section boards, distribution boards, large submains, containment, installation, testing and commissioning. By considering the board, cabling, protection and existing LV infrastructure together, the installation can be developed around the operational requirements of the site.

QUEST ELECTRICAL | LV Switchgear | MCCBs | Section Boards | Distribution Boards | Submains | Testing & Commissioning

Important: This guide is a general overview and is not a substitute for project-specific electrical design, manufacturers' instructions, risk assessment or the full requirements of applicable legislation and standards. Requirements should be determined by suitably competent persons for each installation.

Reference basis (checked September 2026): BS 7671:2018+A4:2026; BS EN IEC 61439-1:2021; BS EN IEC 61439-2:2021; Electricity at Work Regulations 1989; HSE HSG85 safe working guidance.