

Specification for

Distribution assemblies for electricity supplies for construction and building sites

Committees responsible for this British Standard

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- ASTA Certification Services
- Association of British Mining Equipment Companies
- Association of Supervisory and Executive Engineers
- British Gas plc
- Department of Trade and Industry (Consumer Safety Unit, CA Division)
- ERA Technology Ltd
- Electrical Installation Equipment Manufacturers Association (BEAMA Ltd)
- Electricity Supply Industry in United Kingdom
- Engineering Equipment and Materials Users Association
GAMBICA (BEAMA Ltd)
- Health and Safety Executive
- National Inspection Council for Electrical Installation Contracting

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Foreword

This British Standard had been prepared under the direction of the Power Electrical Engineering Standards Policy Committee and is a revision of BS 4363:1968 which is withdrawn.

The use of electrical power on construction and building sites is widespread. In addition to providing site lighting and power supplies for small portable tools and equipment, provision has to be made for major power consuming apparatus.

The essential requirements for the various types of electricity distribution assemblies intended for use on construction and building sites have been established for over 20 years. These requirements are embodied in this British Standard which has been updated to avoid conflicting with the constructional requirements of BS EN 60439-4.

Experience has shown that to obtain effective use of the assemblies, uniformity of practice as regards plugs and socket-outlets is essential, and these are, therefore, specified with no admissible variations.

In practice it has been found that space heating and lighting loads should be allowed at their full connected capacity, whilst in the case of motor loads 50 % of the connected load is generally acceptable.

Typical system voltages at mains frequency (50 Hz) employed on sites, together with recommended applications, are detailed in Appendix A .

Appendix B shows a typical schematic layout indicating how the assemblies may be interconnected to give a single-phase 110 V distribution supply, and Appendix C shows similar layout when both single-phase and three-phase 110 V supplies are required.

BS 7375 gives guidance on the use of distribution assemblies described in this specification.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 14, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

1 Scope

This British Standard specifies the requirements for distribution assemblies manufactured in accordance with BS EN 60439-4, suitable for the control and distribution of electricity from a three-phase four-wire a.c. system at declared voltage up to 415 V (240 V to earth). These units are intended to be used for the protection and control of electricity supplies on construction and building sites in the UK.

NOTE 1 For distribution assemblies having a maximum capacity greater than 315 A per phase, the minimum space requirements for incoming supply assemblies and for incoming supply and distribution assemblies may have to be the subject of discussion between the electricity supplier and the contractor.

NOTE 2 The titles of the publications referred to in this standard are listed on the inside back cover.

2 Definitions

For the purposes of this British Standard the following definitions apply.

2.1 site

an area where a building operation or work of engineering construction is being undertaken

2.2 rating (of an assembly)

the current rating per phase of the incoming switchgear or the transformer, as appropriate

2.3 incoming supply assembly (ISA)

an assembly of equipment for the control and distribution of electricity on a site arranged to accommodate the electricity supplier's equipment, and to provide facilities for connecting one outgoing circuit

2.4 incoming supply and distribution assembly (ISDA)

an assembly of equipment for the control and distribution of electricity on a site arranged to accommodate the electricity supplier's equipment and to provide facilities for connecting circuits at system voltages up to 415 V three-phase and 240 V single-phase a.c.

2.5 main distribution assembly (MDA)

an assembly of equipment for the control and distribution of electricity on a site at system voltages up to 415 V three-phase and 240 V single-phase a.c.

2.6 transformer assembly

an assembly of equipment incorporating a transformer and arranged to distribute electricity at a reduced voltage

NOTE Designated as TA/1 for single-phase, TA/3 for three-phase, TA/1/3 for single- and three-phase.

2.7 socket-outlet assembly

an assembly of equipment providing facilities for the control, protection and connection of final sub-circuits operating at a voltage lower than the incoming supply system voltage

NOTE Designated as SOA/1 for single-phase, SOA/3 for three-phase.

2.8 extension-outlet assembly

an assembly of equipment providing facilities for the control and connection of final sub-circuits operating at a voltage lower than the incoming supply system voltage

NOTE 1 Designated as EOA/1 for single-phase, EOA/3 for three-phase.

NOTE 2 The extension-outlet assembly is similar to a socket-outlet assembly but has no facilities for protection.

2.9 ambient temperature

the temperature of the medium surrounding an assembly

NOTE For the assemblies covered in this standard, the cooling medium will be air, and the ambient temperature should not be confused with the temperature of the air inside the assembly, which may affect the design of items fitted within the enclosure.

3 Service conditions

All assemblies shall be suitable for continuous operation in an ambient temperature within the range of $-25\text{ }^{\circ}\text{C}$ to $+40\text{ }^{\circ}\text{C}$ in any condition of loading up to the rating of the complete assembly provided that the average temperature over a 24 h period does not exceed $35\text{ }^{\circ}\text{C}$.

The design shall be such that the assemblies shall be capable of operating continuously in conditions, of 85 % relative humidity at $20\text{ }^{\circ}\text{C}$.

4 General

4.1 Mechanical design

The enclosure of each assembly shall be robustly constructed so as to have adequate strength and rigidity to resist damage which could result from transportation, rough handling, heavy objects falling on it and exposure to all atmospheric conditions as experienced under typical site conditions.

The enclosure design shall be such that maintenance can be carried out and components changed under site conditions without additional protection, and that liquid, solid particles or fine driven snow, falling or coming towards it, cannot enter in an amount sufficient to interfere with safe and satisfactory operation of the enclosed apparatus.

Access doors or panels to the interior of the enclosure shall be provided with a seal on the periphery to ensure satisfactory mating with the main body of the enclosure when closed.

The roof of the enclosure shall be so designed that rain-water cannot be retained on its surface.

NOTE A sloping roof or a domed roof is found to be suitable. The roof may be demountable.

Except for the smaller units detailed in clauses **10** and **11** and for transformers having a rating lower than 2 kVA the roof shall extend at least 76 mm beyond the main body of the enclosure.

The material used in the manufacture of the enclosure when tested in accordance with BS 476-3, shall not be penetrated in less than half an hour and shall not be worse than category BC in relation to the distance of spread of flame.

4.2 Transit facilities

Means shall be provided to give protection to any projecting control operating handles and all sides of the assembly when the assembly is in transit.

Adequate means shall be provided for the lifting and manoeuvring into position of assemblies on site.

Lifting handles and lugs, if fitted, shall have a minimum hole diameter of 65 mm so that scaffold tubes can be passed through them and shall be capable of withstanding twice the mass of the assembly.

Steel eyebolts, if fitted, shall comply with BS 4278.

4.3 Earthing and bonding

The earth tubes of all socket-outlets, the star point of three-phase transformer secondary windings and the centre-tap of single-phase transformer secondary windings shall be connected to the metal frame of the assembly.

Provision shall be made so that on installation all cable armourings and earth continuity conductors can be readily bonded together and to the metal frame of the assembly.

4.4 Access

Live parts shall be made completely inaccessible in the normal operation of switches and circuit-breakers by ensuring that access cannot be gained to these live parts and wiring without the use of tools or keys or unless the parts are isolated from the supply.

It shall be practicable for an out-going circuit to be connected or disconnected safely without making any other circuit dead.

Live parts shall not be accessible through the outer enclosure to the test finger I specified in BS 3042 when the assembly is mounted for normal service.

All combinations of switches and fuses shall be arranged to ensure that the switch will isolate the fuse from the supply.

Access to fuses in the assembly shall be gained only by the use of a tool or key.

4.5 Circuit-breakers

Each circuit-breaker shall be clearly and permanently marked to associate it with the socket-outlet or feed that it controls, and a means of indicating the description, e.g. a blank label, of the actual circuit shall be provided.

Means shall be provided for ensuring that individual circuit-breakers cannot be inadvertently switched to the ON position.

In any assembly the direction of the operating lever for the ON position shall be the same.

4.6 Cable entry and anchoring

Facilities shall be provided for anchoring and terminating incoming and outgoing cables.

Openings in the form of at least two blanking plates shall be provided for cable entry.

4.7 Ratings

On any assembly except single-phase socket-outlet assemblies (see clause **10**), the sum of the individual current ratings of the protective devices on outgoing circuits in any phase shall not exceed the rating assigned to the assembly by more than 100 %.

NOTE When selecting protective devices it is advantageous to select those which have the same fixing dimensions over a range of current ratings.

5 Materials

When not specified in this standard, the materials and components of the assemblies shall comply with the relevant British Standards as regards materials, construction and performance.

Fuses shall comply with BS 88.

Circuit-breakers shall comply with BS 3871 and BS 4752-1.

Transformers shall comply with BS 171 or where appropriate with BS 3535.

Plugs and socket-outlets shall comply with BS 4343 and be of the splash-proof classification in that standard.

Composite units of switches and fuses shall comply with BS 5419.

Switches shall comply with BS 5419.