

Code of practice for

Distribution of electricity on construction and building sites

ICS 29.260.10; 91.200

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Committees responsible for this British Standard

The preparation of this British Standard was entrusted by Technical Committee PEL/17, Switchgear, controlgear and HV-LV co-ordination, to Subcommittee PEL/17/3, Low voltage switchgear and controlgear assemblies, upon which the following bodies were represented:

- Association of British Mining Equipment Companies
- Association of Consulting Engineers
- ASTA Certification Services
- Building Employers' Confederation
- Department of Trade and Industry (Consumer Safety Unit, CA Division)
- Electrical Installation Equipment Manufacturers' Association (BEAMA Ltd.)
- Electricity Association
- ERA Technology Ltd.
- Gambica (BEAMA Ltd.)
- Health and Safety Executive
- Institute of Petroleum
- Institution of Incorporated Executive Engineers
- National Inspection Council for Electrical Installation Contracting

The following body was also represented in the drafting of the standard through Panel PEL/17/3/1:

National Quality Assurance

This British Standard, having been prepared under the direction of the Electrotechnical Sector Board, was published under the authority of the Standards Board and comes into effect on 15 November 1996

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First published December 1991
Second edition November 1996

The following BSI references relate to the work on this standard:
Committee reference PEL/17/3
Draft for comment 94/212844 DC

ISBN 0 580 26733 4

Amendments issued since publication

Amd. No.	Date	Text affected

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Foreword

This British Standard has been prepared by Subcommittee PEL/17/3. It supersedes BS 7375 : 1991, which is withdrawn. This revision takes into account the issue of BS EN 60439-4, BS 7671, and updates current practice. BS 4363 : 1991 is also being revised to reflect the above.

As a code of practice, this British Standard takes the form of guidance and recommendations. It should not be quoted as if it were a specification and particular care should be taken to ensure that claims of compliance are not misleading.

It has been assumed in the drafting of this British Standard that the execution of its provisions is entrusted to appropriately qualified and experienced people.

It should be noted that current using equipment is not dealt with in this standard.

The use of reduced low voltage systems as recommended in this standard have made a major contribution to electrical safety on construction sites.

For some construction site installations, by reason of their siting in relation to the available electricity supply, it may be necessary to use supplies at high voltage. Supplies at 11 kV and 33 kV are not unknown in such circumstances. These parts of construction site installations are outside the scope of this British Standard.

Similarly, high frequency power tools are used to advantage in certain site work applications and for their connection to a supply source the use of a frequency changer is needed. The recommendations made in this British Standard apply only to the input circuits of such devices.

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

Section 1. General

1.1 Scope

This British Standard deals with the distribution of electricity for construction and building sites. It aims to provide guidance to builders, contractors, engineers and others concerned with the provision of electrical installation equipment suitable for the arduous duty imposed by site conditions.

Current using equipment is not dealt with in this standard.

If high frequency power tools are used, a frequency changer is necessary for their connection to a source of supply. This British Standard is applicable only to the input circuits of such devices.

The following are outside the scope of this standard:

- a) high-voltage incoming supplies (i.e. voltages in excess of 1 kV a.c. or 1.5 kV d.c.) and equipment;

NOTE. For some site installations, supplies at high voltage e.g. 11 kV a.c. and 33 kV a.c. are used.

- b) underground mining operations.

1.2 References

1.2.1 Normative references

This British Standard incorporates, by dated or undated reference, provisions from other publications. These normative references are made at the appropriate places in the text and the cited publications are listed on page 22. For dated references, only the edition cited applies; any subsequent amendments to or revisions of the cited publication apply to this British Standard only when incorporated in the reference by amendment or revision. For undated references, the latest edition of the cited publication applies, together with any amendments.

1.2.2 Informative references

This British Standard refers to other publications that provide information or guidance. Editions of these publications current at the time of issue of this standard are listed on page 22, but reference should be made to the latest editions.

1.3 Definitions

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

1.3.1 site

An area where any of the following works are undertaken/executed:

- a) new building construction;
- b) repair, alteration, extension or demolition of existing buildings or parts of buildings;
- c) engineering construction;
- d) earthworks;
- e) works similar to those listed in items a) to d).

NOTE. See 604-01-01 of BS 7671 : 1992.

1.3.2 system¹⁾

An electrical system consisting of a single source of electrical energy and an installation. For the purposes of the Regulations, types of system are identified as follows, depending upon the relationship of the source, and of exposed-conductive-parts of the installation, to earth.

1.3.2.1 TN system¹⁾

A system having one or more points of the source of energy directly earthed, the exposed-conductive-parts of the installation being connected to that point by protective conductors.

1.3.2.2 TN-C system¹⁾

A system in which neutral and protective functions are combined in a single conductor throughout the system, (see figure 1).

1.3.2.3 TN-S system¹⁾

A system having separate neutral and protective conductors throughout the system, (see figure 2).

1.3.2.4 TN-C-S system¹⁾

A system in which neutral and protective functions are combined in a single conductor in part of the system, (see figure 3).

1.3.2.5 TT system¹⁾

A system having one point of the source of energy directly earthed, the exposed-conductive-parts of the installation being connected to earth electrodes electrically independent of the earth electrodes of the source, (see figure 4).

1.3.2.6 IT system¹⁾

A system in which the source of energy is either connected to earth through a deliberately introduced earthing impedance or is isolated from earth (see figure 5).

1.3.3 reduced low voltage (RLV) system

A system in which the nominal phase to earth voltage does not exceed 63.5 V and the nominal phase to phase voltage does not exceed 110 V (see figures 6a) and 6b).

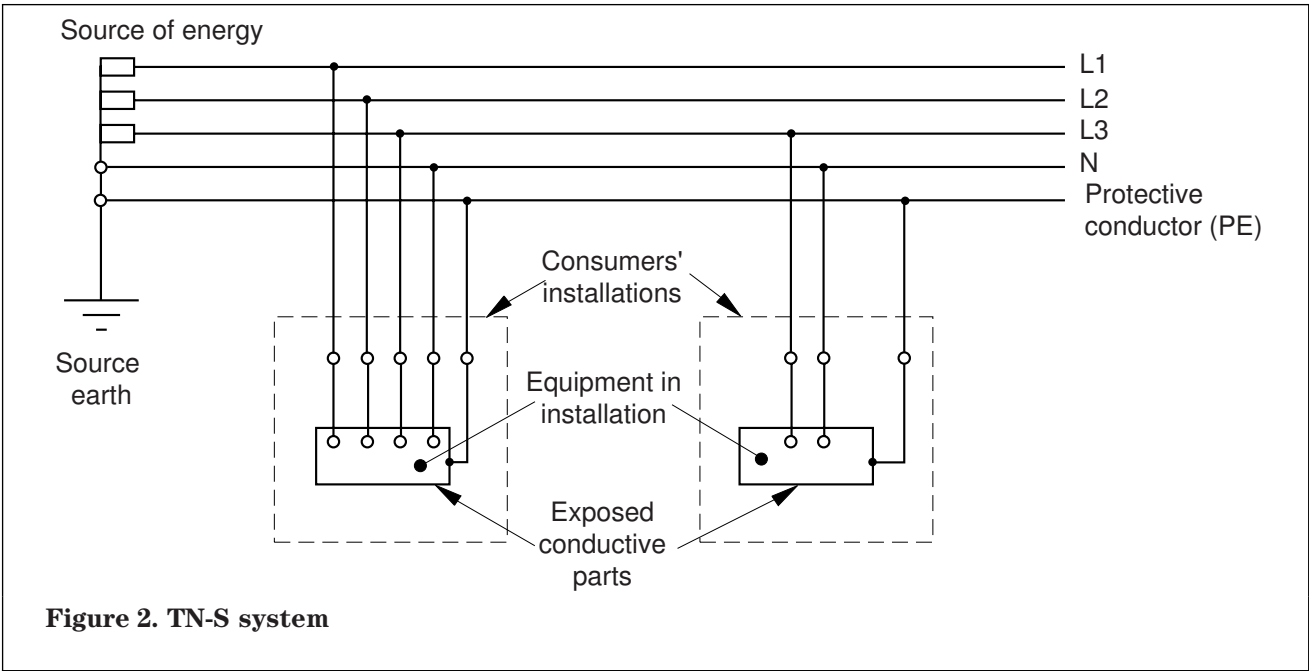
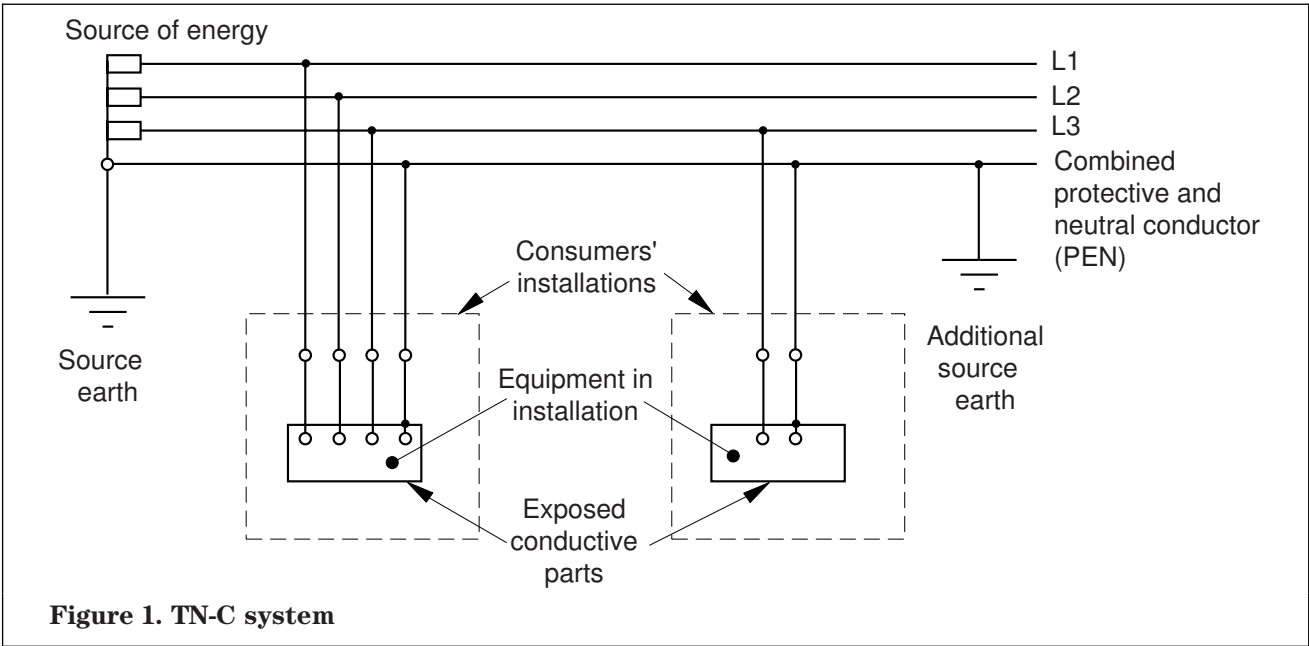
1.3.4 separated extra-low voltage (SELV) system

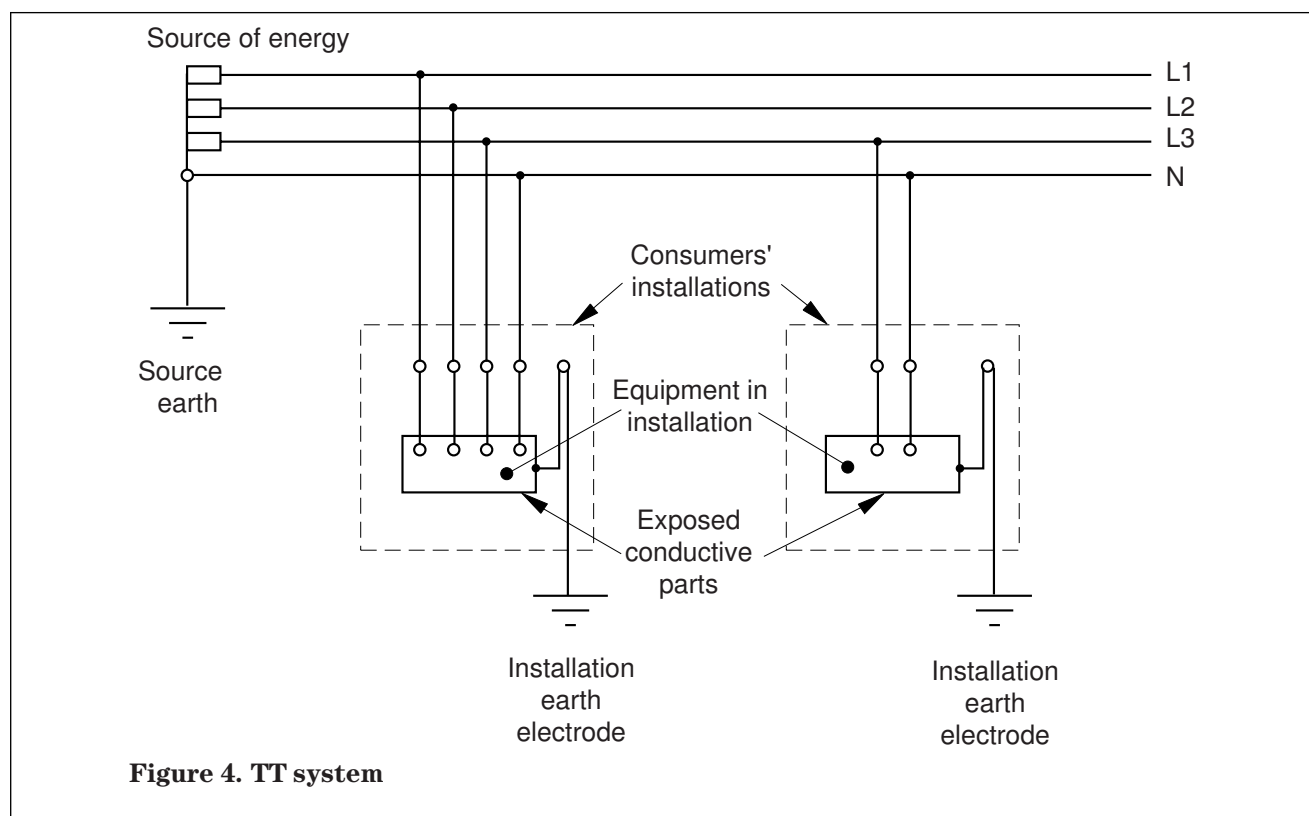
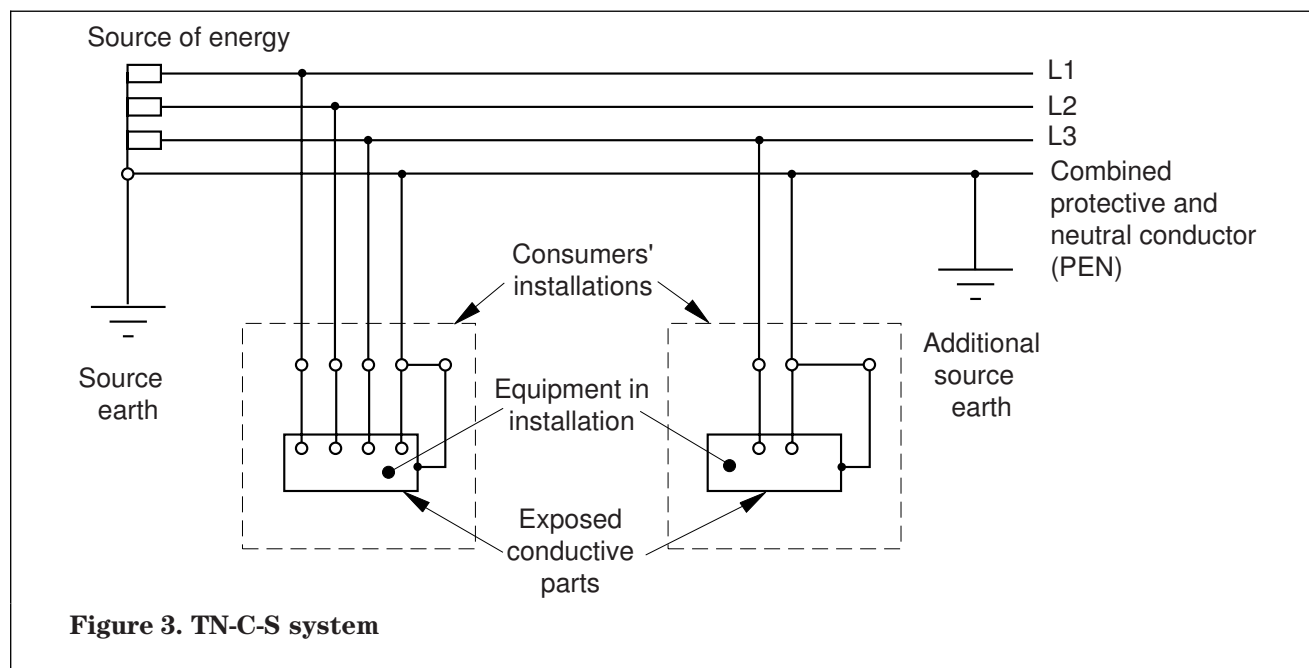
An extra-low voltage system which is electrically separated from earth and from other systems in such a way that a single fault cannot give rise to the risk of electric shock.

NOTE 1. Definition taken from BS 7671 : 1992.

NOTE 2. Extra-low voltage is defined in BS 7671 : 1992 as a voltage normally not exceeding 50 V a.c. (r.m.s. value) or 120 V ripple free d.c., whether between conductors or to earth. This is a nominal voltage (i.e. the voltage by which an installation, or part of an installation, is designated). The actual voltage of the installation may differ from the nominal value by a quantity within normal tolerances.

¹⁾ Definitions taken from BS 7671 : 1992. The 'Regulations' referred to are the IEE Wiring Regulations (published as BS 7671). TN, TN-C, TN-S, TN-C-S, TT and IT are codes taken from BS 7671.





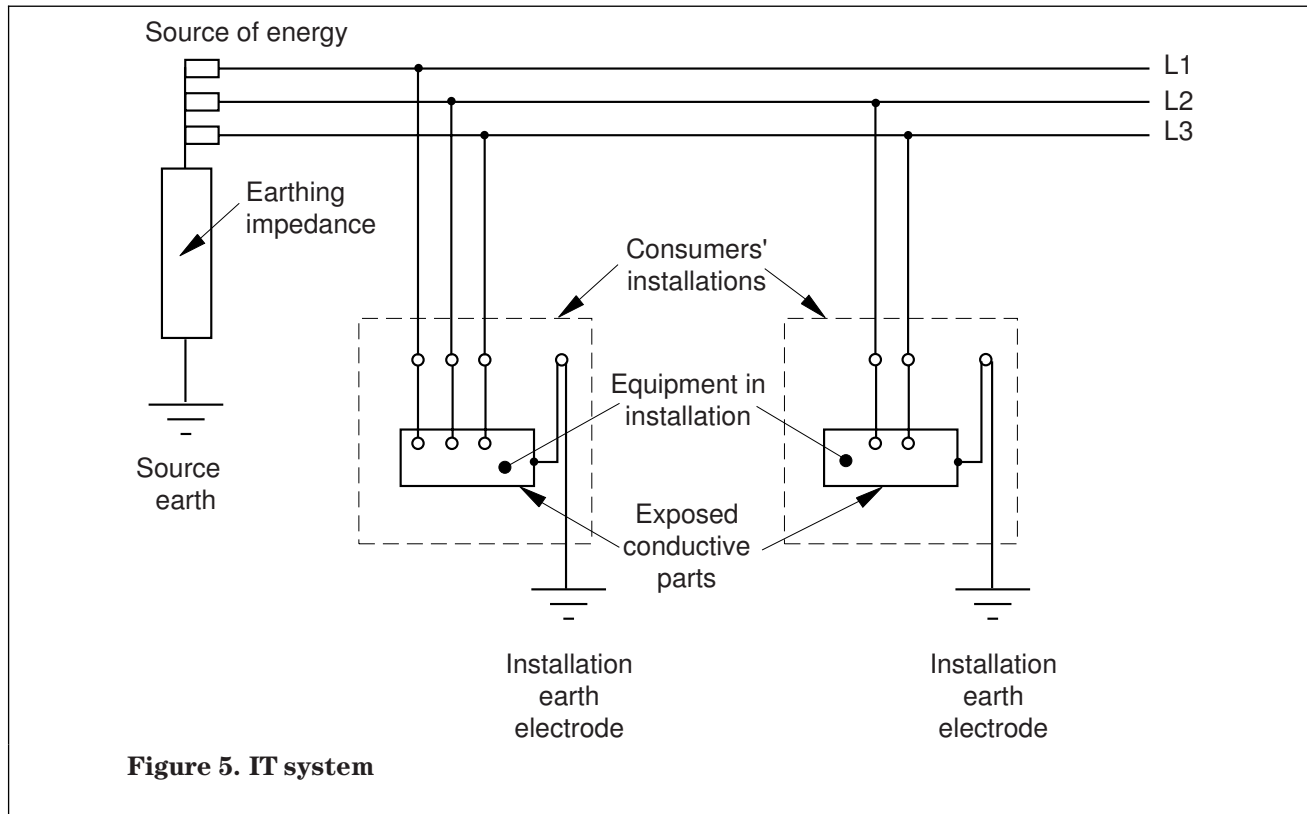


Figure 5. IT system

1.4 Regulations and guidance documents

In Great Britain electrical installations on construction and building sites are subject to the requirements of the Electricity at Work Regulations, 1989 [1], see the Memorandum of Guidance on the Electricity at Work Regulations [HS(R)25] [2], administered by the Health and Safety Executive.

The Electricity at Work Regulations, 1989 [1] include requirements concerning precautions to be taken against contact with overhead lines and underground cables encountered on site. (See also Health and Safety Executive Guidance Note HS (G) 47 *Avoiding danger from underground services* [3] and Health and Safety Executive Guidance Note GS6 *Avoidance of danger from overhead electric lines* [4].) The Health and Safety Executive also publishes Guidance Note HS(G) 141 *Electrical safety on construction sites* [5].

Where welding equipment is installed and used guidance may be found in Health and Safety Executive Guidance Note HS(G) 118 *Electrical safety in arc welding* [6] and in BS 638.

Section 604 of BS 7671 : 1992 gives requirements for the supply of electricity on construction and building sites.

Electrical installations of offices, cloakrooms, meeting rooms, canteens, restaurants, dormitories, toilets etc. on construction and building sites are covered by the general clauses of BS 7671 : 1992.

Guidance on earthing is given in BS 7430.

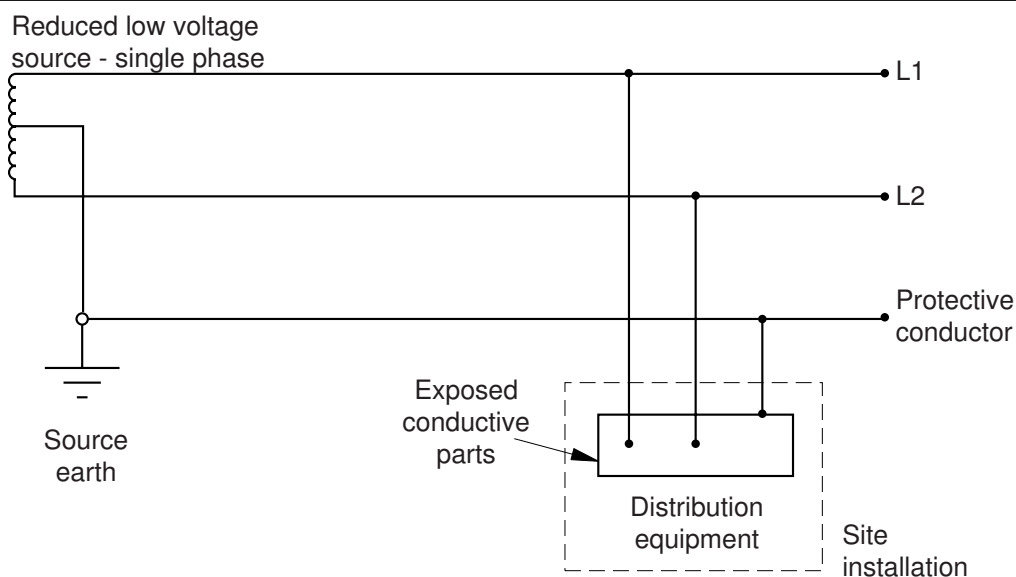
1.5 General

1.5.1 Specialist advice

Because of variations in local circumstances of different construction and building sites this British Standard gives general guidance only. It is important that, for each site, advice is sought from an electrical engineer regarding the details of the electrical installation most suitable for that site.

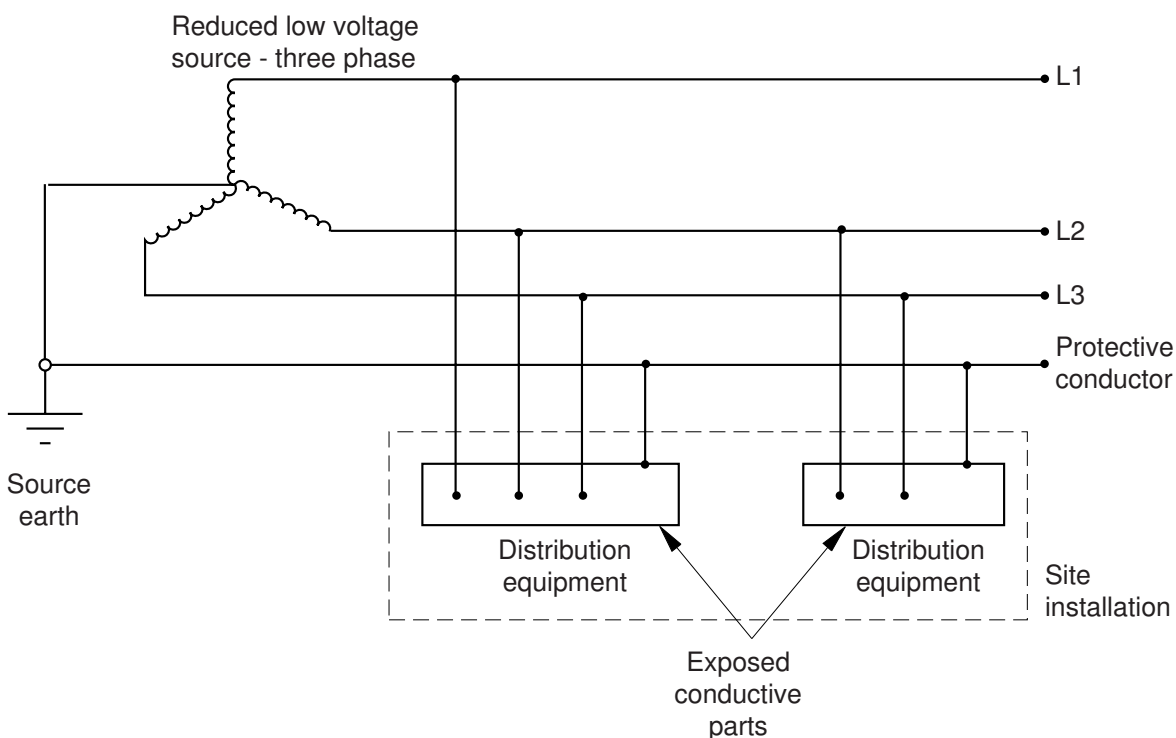
1.5.2 Alternating current supplies

All references throughout this British Standard to alternating current (a.c.) supplies relate to a frequency of 50 Hz unless otherwise stated. All references to alternating voltage and current relate to r.m.s. values unless otherwise stated.



NOTE. A system in which the line to line voltage does not exceed 110 V and the system line to earth voltage does not exceed 55 V. All exposed-conductive-parts are connected to the protective conductor.

a) Single phase source



NOTE. A system in which the phase to phase voltage does not exceed 110 V and the system phase to earth voltage does not exceed 63.5 V. All exposed-conductive-parts are connected to the protective conductor.

b) Three phase source

Figure 6. Reduced low voltage systems