

Electrical installations for open-cast mines and quarries —

Part 2: General recommendations for protection against direct contact and electric shock

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- Engineering Equipment and Materials Users' Association
- Federation of Civil Engineering Contractors
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- Health and Safety Executive
- Independent Engineering Insurers' Committee
- Institution of Mining and Metallurgy

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Foreword

This Part of BS 6907 has been prepared under the direction of the Mining and Quarrying Requisites Standards Committee.

BS 6907 is based on the International Electrotechnical Commission's publication IEC 621 "*Electrical installations for outdoor sites under heavy conditions (including open-cast mines and quarries)*" and, like that publication, is published in Parts as follows.

- *Part 1: Glossary;*
- *Part 2: General recommendations for protection against direct contact and electric shock;*
- *Part 3: Recommendations for equipment and ancillaries;*
- *Part 4: Recommendations for winning, stacking and processing machinery, pumps and low signal level and communications systems;*
- *Part 5: Recommendations for operation.*

BS 6907 sets out the guiding principles for the installation and operation of electrical equipment so as to ensure safety of persons, livestock, property and the proper functioning of the plant.

It applies to the installation and operation of electrical apparatus and systems associated with outdoor sites under heavy conditions, including open-cast mines, quarries, stockpiles, etc. It applies particularly to electrical apparatus and systems used for the following:

- a) winning, stacking and primary processing machinery;
- b) secondary processing machinery;
- c) conveyor systems;
- d) pumping and water supply systems;
- e) movable railway systems;
- f) control, signal, supervisory and communication systems.

BS 6907 does not cover temporary and provisional places of work in the open, such as building sites and earth-moving sites, unless the equipment used is similar to that used in surface mining applications.

It takes account of British practice, electrical regulations and law and thereby differs in several respects from the IEC publication. Both cover a subject not previously the subject of an International Standard or a British Standard.

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 to iv, pages 1 to 18, 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.

Section 1. General

1 Scope

This Part of BS 6907 gives recommendations for protection against direct contact and electric shock for all installations in normal service, and in cases of fault, overcurrent and fault current.

For winning, stacking and processing machinery, pumps and low signal level and communications systems, exemptions from these recommendations and supplementary recommendations are given in BS 6907-4, which should, therefore, be read in conjunction with this Part.

The recommendations given for low voltage installations are essentially from the IEE “Regulations for Electrical Installations” (the Wiring Regulations), as applicable.

NOTE 1 A glossary of terms used in this standard is given in BS 6907-1.

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

Section 2. Protection against electric shock in normal service

2 Protection against direct contact by limitation of voltage

Protection against direct contact is deemed to be ensured where the system is not more than 25 V a.c. or 60 V d.c. or where, as a protective measure, safety extra-low voltage or functional extra-low voltage is used.

3 Complete protection by means of barriers or enclosures

3.1 Protection from live parts

All live parts should be contained inside enclosures or behind barriers providing at least the following degrees of protection in accordance with BS 5490.

Low voltage Complete protection IP2X or IP4X for top surfaces or barriers or enclosures which are readily accessible. This applies in particular to those parts of enclosures which might serve as a standing surface.

Above 1 000 V Complete protection IP5X within arm's reach.

Partial protection IP2X beyond arm's reach.

3.2 Strength and stability of barriers and enclosures

Barriers and enclosures should be firmly secured in place. Taking into account their nature, size and arrangement, they should have sufficient stability and durability to resist the strains and stresses likely to occur in normal service.

3.3 Access to installation

Where it is necessary to make provision for the removal of barriers, the opening of enclosures, or the withdrawal of parts of enclosures (doors, casings, lids, covers, etc.), this should be accomplished by one of the following.

a) *Key or tool.* Removal, opening or withdrawal should necessitate the use of a key or tool.

b) *Interlocking device.* An interlocking device should be provided so that removal, opening or withdrawal without the use of a key or tool necessitates previous switching off of all live parts behind the barrier or enclosure which might be touched accidentally. Restoration of supply should be possible only after replacement or reclosure of the barriers or enclosures.

Provision should be made for the discharge of stored energy in capacitors or cable systems where they are likely to give rise to the risk of electric shock.

c) *Automatic disconnection.* Removal, opening or withdrawal without use of a key or tool should initiate automatic switching off before live parts behind the barrier or enclosure can be touched accidentally. Restoration of supply should be possible only after replacement or reclosure of the barriers or enclosures.

d) *Internal interposing screen.* An internal interposing screen should be so positioned that none of the live parts can be touched while the barrier or enclosure is removed. The screen should be either firmly secured in place or slid into place at the moment the barrier or enclosure is removed except where used as a second barrier [see item e)]. It should not be removable except by means of a tool or key.

Such a screen may be a protective shutter which, in the case of a disconnectable assembly, slides into place in front of the feed line contacts.

e) *Access to control circuit components.* Where any parts within an enclosure need occasional handling (such as the replacement of a lamp or of a fuse-link, instrument settings or adjustment of electronic controls) removal, opening or withdrawal without the use of a key or tool and without switching off should be possible only if the following conditions are simultaneously fulfilled.

1) A second barrier suitably labelled is provided within the enclosure so as to prevent persons from coming accidentally into contact with live parts.

It should not be possible to remove the second barrier except through the use of a key or tool.