

# **Requirements for electrical installations**

Part 2:

## **Definitions**

## DKS 662-2: 2026

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# Requirements for electrical installations

Part 2:

## Definitions

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## Foreword

This Kenya Standard was prepared by the **Electrical Installations and Distribution Systems** Technical Committee under the guidance of the Standards Projects Committee, and it is in accordance with the procedures of the Kenya Bureau of Standards.

Kenya Bureau of Standards (KEBS) has established Technical Committees (TCs) mandated to develop Kenya Standards (KS). The Committees are composed of representatives from the public and private sector organizations in Kenya.

Kenya Standards are developed through Technical Committees that are representative of key stakeholders including government, academia, consumer groups, private sector and other interested parties. Draft Kenya Standards are circulated to stakeholders through the KEBS website and notifications to World Trade Organization (WTO). The comments received are discussed and incorporated before finalization of the standards, in accordance with the Procedures for Development of Kenya Standards.

Kenya Standards are subject to review, to keep pace with technological advances. Users of the Kenya Standards are therefore expected to ensure that they always have the latest versions of the standards they are implementing.

This **third** edition cancels and replaces the **second** edition (KS 662-2:2018), which has been technically revised.

The revision of this standard is based on BS 7671:2018 (18<sup>th</sup> Edition) with its several amendments and the different parts of IEC 60364 and is split into the following parts:

- Part 1, Scope, object and fundamental principles.
- Part 2. Definitions.
- Part 3. Assessment of general characteristics.
- Part 4: Protection for safety.
- Part 5. Selection and erection of electrical equipment.
- Part 6. Verification.
- Part 7. Requirements for special installations or locations.

These parts are in line with those of IEC 60364 and they also match the chapters and sections of BS 7671:2018.

During the preparation of this standard, reference was made to the following documents:

- IEC 60364 (All parts): Low-voltage installations.
- BS 7671:2008. (18th Edition) Requirements for electrical installations.

Acknowledgement is hereby made for the assistance derived from these sources.

## NOTES ON THE PLAN OF THIS EDITION

The edition is based on the plan agreed internationally for the arrangement of safety rules for electrical installations.

In the numbering system used, the first digit signifies a Part, the second digit a Chapter, the third digit a Section and the subsequent digits the Regulation number. For example, the Section number 413 is made up as follows:

PART 4- PROTECTION FOR SAFETY

Chapter 41 (first chapter of Part 4) - PROTECTION AGAINST ELECTRIC SHOCK.

Section 413 (third section of Chapter 41) - PROTECTIVE MEASURE: ELECTRICAL SEPARATION

Part 1 sets out the scope, object and fundamental principles.

Part 2 defines the sense in which certain terms are used throughout the Regulations, and provides a list of symbols used.

The subjects of the subsequent parts are as indicated below:

Part

Subject

Part 3 Identification of the characteristics of the installation that will need to be taken into account in choosing and applying the requirements of the subsequent Parts. These characteristics may vary from one part of an installation to another and should be assessed for each location to be served by the installation.

Part 4 Description of the measures that are available for the protection of persons, livestock and property, and against the hazards that may arise from the use of electricity.

Part 5 Precautions to be taken in the selection and erection of the equipment of the installation.

Part 6 Inspection and testing.

Part 7 Special installations or locations — particular requirements.

The sequence of the plan should be followed in considering the application of any particular requirement of the Regulations. The general index provides a ready reference to particular regulations by subject, but in applying any one regulation the requirements of related regulations should be borne in mind. Cross-references are provided, and the index is arranged to facilitate this.

In many cases, a group of associated regulations is covered by a side heading which is identified by a two-part number, e.g. 544.2. Throughout the Regulations where reference is made to such a two-part number, that reference is to be taken to include all the individual regulation numbers which are covered by that side heading and include that two-part number.



## Requirements for electrical installations

### Part 2:

### Definitions

#### 1 Scope

This Kenya Standard contains the definitions to be used in the KS 662 series Requirements of Electrical Installations.

#### 2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

KS IEC 61140, *Protection against electric shock — Common aspects for installation and equipment*

KS IEC 61851-1, *Electric vehicle conductive charging system — Part 1: General requirements*

KS IEC 61439 Part 1, *Low-voltage switchgear and controlgear assemblies — Part 1: General rules*

KS IEC 61439 Part 2, *Low-voltage switchgear and controlgear assemblies — Part 2: Power switchgear and controlgear assemblies*

IEC 61535, *Installation couplers intended for permanent connection in fixed installations*

KS IEC 60904-3, *Photovoltaic devices — Part 3: Measurement principles for terrestrial photovoltaic (PV) solar devices with reference spectral irradiance data*

#### 3 Definitions

For the purposes of this standard, the following definitions shall apply. Other terms not defined herein are used in the sense defined in IEC 60050-826.

**8/20 current impulse** — a current impulse with a virtual front time of 8  $\mu\text{s}$  and a time to half-value of 20  $\mu\text{s}$  where:

- the front time is defined as  $1.25 (t_{90} - t_{10})$ , where  $t_{90}$  and  $t_{10}$  are the 90% and 10% points on the leading edge of the waveform
- the time to half-value is defined as the time between the virtual origin and the 50 % point on the tail. The virtual origin is the point where a straight line drawn through the 90 % and 10 % points on the leading edge of the waveform intersects the  $I = 0$  line.

**Accessory** — a device, other than current-using equipment, associated with such equipment or with the wiring of an installation.

**Agricultural and horticultural installations** — Electrical installations on agricultural and horticultural holdings but excluding buildings or parts of buildings used as dwellings.

**Agricultural and horticultural premises.** Rooms, locations or areas where:

- livestock are kept, or

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- feed, fertilizers, vegetable and animal products are produced, stored, prepared or processed, or
  - plants are grown, such as greenhouses.

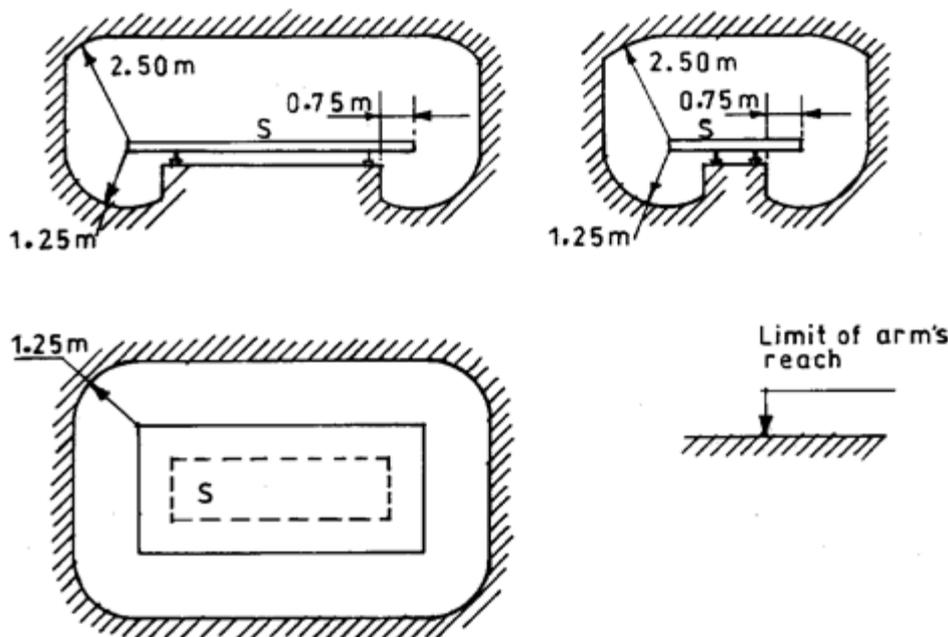
**Amusement device.** Ride, stand, textile or membrane building, side stall, side show, tent, booth or grandstand intended for the entertainment of the public.

**Ambient temperature** — the temperature of the air or other medium where the equipment is to be used.

**Appliance** — an item of current-using equipment other than a luminaire or an independent motor.

**Arm's reach** — A zone of accessibility to touch, extending from any point on a surface where persons usually stand or move about, to the limits which a person can reach with his hand in any direction without assistance.

This zone of accessibility is illustrated by Figure 1 in which the values refer to bare hands without any assistance, e.g. from tools or a ladder.



**Figure 1 — zone of accessibility**

**Arrangements for livestock keeping** — Buildings and rooms (housing for animals), cages, runs or other containers used for continuous accommodation of livestock.

**Back-up protection** — Protection which is intended to operate when a system fault is not cleared, or abnormal condition not detected, in the required time because of failure or inability of other protection to operate or failure of the appropriate circuit-breaker(s) to trip.

**Barrier** — A part providing a defined degree of protection against contact with live parts, from any usual direction of access.

**Basic insulation** — Insulation applied to live parts to provide basic protection against electric shock and which does not necessarily include insulation used exclusively for functional purposes.

**Basic protection** — Protection against electric shock under fault-free conditions.

NOTE For low voltage installations, systems and equipment, basic protection generally corresponds to protection against direct contact, that is "contact of persons or livestock with live parts".

**Basin of fountain** — a basin not intended to be occupied by persons and which cannot be accessed (reached by persons) without the use of ladders or similar means. For basins of fountains which may be occupied by persons, the requirements for swimming pools apply.

**Bonded (as applied to items of metalwork)** — Connected together electrically, not normally for the purpose of carrying current but so as to ensure a common potential.

**Bonding conductor** — a protective conductor providing equipotential bonding.

**Bonding Network (BN)** — A set of interconnected conductive parts that provide a path for currents at frequencies from direct current (d.c.) to radio frequency (RF) intended to divert, block or impede the passage of electromagnetic energy.

**Bonding ring conductor (BRC)** — a bus earthing conductor in the form of a closed ring.

NOTE Normally the bonding ring conductor, as part of the bonding network, has multiple connections to the common bonding network (CBN) that improves its performance.

**Booth** — Non-stationary unit intended to accommodate equipment generally for pleasure or demonstration purpose

**Building void, accessible** — a space within the structure or the components of a building accessible only at certain points.

**Building void, non-accessible** — a space within a structure or the components of a building which has no ready means of access.

**Bunched** — Cables are said to be bunched when two or more are contained within a single conduit, duct, ducting, or trunking or, if not enclosed, are not separated from each other by a specified distance.

**Busbar trunking system** — A verified assembly, in the form of an enclosed conductor system comprising solid conductors separated by insulating material. The assembly may consist of units such as:

- a) Busbar trunking units, with or without tap off facilities
- b) Tap-off units where applicable
- c) Phase- transportation, expansion, building- movement, flexible, end-feeder and adaptor units

NOTE Other system components may include tap-off units.

**Bypass bonding conductor** — Bonding conductor connected in parallel with the screens of cables.

**Cable channel** — An enclosure situated above or in the ground, ventilated or closed, and having dimensions which do not permit the access of persons but allow access to the conduits and/or cables throughout their length during and after installation. A cable channel may or may not form part of the building construction.

**Cable cleat** — A component of a support system, which consists of elements, spaced at intervals along the length of the cable or conduit and which mechanically retains the cable or conduit.

**Cable coupler** — A means of enabling the connection or disconnection, at will, of two flexible cables. It consists of a connector and a plug.

**Cable ducting** — An enclosure of metal or insulating material, other than conduit or cable trunking, intended for the protection of cables which are drawn in after erection of the ducting.

**Cable ladder** — A cable support consisting of a series of transverse supporting elements rigidly fixed to main longitudinal supporting members.

**Cable tray** — A cable support consisting of a continuous base with raised edges and no covering. A cable tray may or may not be perforated.

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**Cable trunking** — A closed enclosure normally of rectangular cross-section, of which one side is removable or hinged, used for the protection of cables and for the accommodation of other electrical equipment.

**Cable tunnel** — A corridor containing supporting structures for cables and joints and/or other elements of wiring systems and whose dimensions allow persons to pass freely throughout the entire length.

**Capacitor** — A piece of apparatus capable of storing electrical energy as electric stress in insulating material and generally consisting of conducting surface (known as 'plates' or electrodes) at a small distance apart and separated by insulation material.

**Caravan** — A trailer leisure accommodation vehicle, used for touring, designed to meet the requirements for the construction and use of road vehicles (see also definitions of Motor caravan and Leisure accommodation vehicle).

**Caravan park / camping park** — Area of land that contains two or more caravan pitches and/or tents.

**Caravan pitch** — Plot of ground intended to be occupied by a leisure accommodation vehicle.

**Caravan pitches electrical supply equipment** — Equipment that provides means of connecting and disconnecting supply cables from leisure accommodation vehicles or tents with a mains electrical supply.

**Cartridge fuse link** — A device comprising a fuse element or two or more fuse elements connected in parallel enclosed in a cartridge usually filled with arc-extinguishing medium and connected to terminations (see fuse link).

**Central power supply system** — A system supplying the required emergency power to essential safety equipment.

**Central power supply system (low power output)** — Central power supply system with a limitation of the power output of the system at 500 W for 3 h or 1500 W for 1 h.

NOTE — A low power supply system normally comprises a maintenance-free battery and a charging and testing unit.

**Circuit** — An assembly of electrical equipment supplied from the same origin and protected against overcurrent by the same protective device(s).

**Circuit-breaker** — A device capable of making, carrying and breaking normal load currents and also making and automatically breaking, under predetermined conditions, abnormal currents such as short-circuit currents. It is usually required to operate infrequently although some types are suitable for frequent operation.

**Circuit-breaker, Instantaneous trip (ICB)**. Circuit-breaker which only fulfils the short-circuit portion of overcurrent protection.

**Circuit-breaker, linked** — A circuit-breaker the contacts of which are so arranged as to make or break all poles simultaneously or in a definite sequence.

**Circuit protective conductor (cpc)** — A protective conductor connecting exposed-conductive-parts of equipment to the main earthing terminal.

**Class I equipment** — Equipment in which protection against electric shock does not rely on basic insulation only, but which includes means for the connection of exposed-conductive-parts to a protective conductor in the fixed wiring of the installation (see IEC 61140).

**Class II equipment** — Equipment in which protection against electric shock does not rely on basic insulation only, but in which additional safety precautions such as supplementary insulation are provided, there being no provision for the connection of exposed metalwork of the equipment to a protective conductor, and no reliance upon precautions to be taken in the fixed wiring of the installation (see IEC 61140).

**Class III equipment** — Equipment in which protection against electric shock relies on supply at SELV and in which voltages higher than those of SELV are not generated (see IEC 61140).

**Cold tail** — The interface between the fixed installation and a heating unit.

**Combined short-circuit current capability.** Maximum short-circuit current which can be handled by two short-circuit protective devices in series.

**Combined short-circuit protection.** Overcurrent co-ordination, in short-circuit conditions, of two OCPDs in series, resulting in a combined short-circuit current capability higher than one OCPD alone.

**Common equipotential bonding system, common bonding network (CBN)** — Equipotential bonding system providing both protective equipotential bonding and functional equipotential bonding.

**Competent person** — A person who possesses sufficient technical knowledge, relevant practical skills and experience for the nature of the electrical work undertaken and is able at all times to prevent danger and, where appropriate, injury to him/herself and others.

**Complementary floor heating** — Direct heating system integrated into the floor construction, for example, in the border zones close to outer walls, which complements the heat dissipation of a thermal storage floor heating system.

**Conditional short-circuit current.** Prospective current that a circuit or a switching device, protected by a specified short-circuit protective device, can satisfactorily withstand for the total operating time of that device under specified conditions of use and behaviour.

**Conducting location with restricted movement** — A location comprised mainly of metallic or conductive surrounding parts, within which it is likely that a person will come into contact through a substantial portion of their body with the conductive surrounding parts and where the possibility of preventing this contact is limited.

**Conduit** — A part of a closed wiring system for cables in electrical installations. Allowing them to be drawn in and/or replaced, but not inserted laterally.

**Connector** — The part of a cable coupler or of an appliance coupler which is provided with female contacts and is intended to be attached to the end of the flexible cable remote from the supply.

**Consumer unit** — (may also be known as a consumer control unit or electricity control unit). A particular type of distribution board comprising a type-tested co-ordinated assembly for the control and distribution of electrical energy, principally in domestic premises, incorporating manual means of double-pole isolation on the incoming circuit(s) and an assembly of one or more fuses, circuit-breakers, residual current operated devices or signalling and other devices proven during the type-test of the assembly as suitable for such use.

**Continuity of service.** The extent to which the operation of an electrical system approaches the intended state of freedom from supply interruption.

**Continuous operating voltage (Uc)** — Maximum rms voltage which may be continuously applied to an SPD's mode of protection. This is equal to the rated voltage.

**Control and protective switching device (CPS device).** Switching device (or equipment) capable of operation other than by hand, but with or without local manual operating means. A CPS device provides both functions of contactor and OCPD.

**Controlgear** — (see Switchgear).

**Conventional impulse withstand voltage** — The peak value of an impulse test voltage at which insulation does not show any disruptive discharge when subjected to a specified number of applications of impulses of this value, under specified conditions.

**Co-ordination of electrical equipment.** Correct way of selecting electrical devices in series to provide safety and continuity of service of the installation, taking into account short-circuit protection and/or overload protection and/ or selectivity.

**Current carrying capacity of a conductor** — The maximum current which can be carried by a conductor under specified conditions without its steady state temperature exceeding a specified value.

**Current using equipment** — Equipment which converts electrical energy into another form of energy, such as light, heat or motive power.

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**d.c. system** — See KS 662-3

**Danger** — Risk of injury to persons (and livestock where expected to be present) from:

- a) Fire, electric shock, burns, arcing and explosion arising from the use of electrical energy, and
- b) mechanical movement of electrically controlled equipment, in so far as such danger is intended to be prevented by electrical emergency switching or by electrical switching for mechanical maintenance of non-electrical parts of such equipment.

**Departure.** Deliberate decision not to comply fully with the requirements of this Standard, for which the designer must declare that the resultant degree of safety is not less than that achievable by full compliance.

**Design current (of a circuit)** — The magnitude of the current (rms value for a.c.) to be carried by the circuit in normal service.

**Device for connecting a luminaire (DCL)** — System comprising an outlet and a connector providing a fixed luminaire with electrical connection to and disconnection from a fixed installation but not providing mechanical support for a luminaire.

**Direct contact** — (see Basic protection).

**Direct heating system** — Heating system which generates heat from electrical energy and dissipates it to the room to be heated with a response time being as low as possible.

**Disconnecter** — A mechanical switching device which, in the open position, complies with the requirements specified for the isolating function.

NOTE 1 A disconnector is otherwise known as an isolator.

NOTE 2 A disconnector is capable of opening and closing a circuit when either a negligible current is broken or made, or when no significant change in the voltage across the terminals of each pole of the disconnector occurs. It is also capable of carrying currents under normal circuit conditions and carrying for a specified time current under abnormal conditions such as those of short-circuit.

**Discrimination** — Ability of a protective device to operate in preference to another protective device in series.

**Distribution board** — An assembly containing switching or protective devices (e.g. fuses, circuit-breakers, residual current operated devices) associated with one or more outgoing circuits fed from one or more incoming circuits, together with terminals for the neutral and circuit protective conductors. It may also include signalling and other control devices. Means of isolation may be included in the board or may be provided separately.

**Distribution circuit** — A circuit supplying a distribution board or switchgear.

A distribution circuit may also connect the origin of an installation to an outlying building or separate installation, when it is sometimes called a sub-main.

**Distributor** — An entity which distributes electricity to consumers using electrical lines and equipment that it owns or operates.

**Double insulation** — Insulation comprising both basic insulation and supplementary insulation.

**Duct, Ducting** — (see Cable ducting).

**Earth** — The conductive mass of the Earth, whose electric potential at any point is conventionally taken as zero.

**Earth electrode** — Conductive part, which may be embedded in the soil or in a specific conductive medium, e.g. concrete or coke, in electrical contact with the Earth.

**Earth electrode network** — Part of an earthing arrangement comprising only the earth electrodes and their interconnections.

**Earth electrode resistance** — The resistance of an earth electrode to Earth.

**Earth fault current** — A current resulting from a fault of negligible impedance between a line conductor and an exposed-conductive-part or a protective conductor.

**Earth fault loop impedance** — The impedance of the earth fault current loop starting and ending at the point of earth fault. This impedance is denoted by the symbol  $Z_s$ .

The earth fault loop comprises the following, starting at the point of fault:

- the circuit protective conductor, and
- the consumer's earthing terminal and earthing conductor, and
- for TN systems, the metallic return path, and
- for TT and IT systems, the Earth return path, and
- the path through the earthed neutral point of the transformer, and
- the transformer winding, and
- the line conductor from the transformer to the point of fault.

**Earth leakage current** — (See Protective conductor current).

**Earthed concentric wiring** — A wiring system in which one or more insulated conductors are completely surrounded throughout their length by a conductor, for example a metallic sheath, which acts as a PEN conductor.

**Earthing** — Connection of the exposed-conductive-parts of an installation to the main earthing terminal of that installation.

**Earthing conductor** — A protective conductor connecting the main earthing terminal of an installation to an earth electrode or to other means of earthing.

**Electric shock** — A dangerous physiological effect resulting from the passing of an electric current through a human body or livestock.

**Electric vehicle (EV)** — Any vehicle propelled by an electric motor drawing current from a rechargeable storage battery or from other portable energy devices (rechargeable, using energy from a source off the vehicle such a residential or public electricity service), which is manufactured primarily for use on public streets, roads or highways.

**Electric vehicle charging point** The point where the electric vehicle is connected to the fixed installation

NOTE The charging vehicle is a socket-outlet where the charging cable belongs to the vehicle, or a connector, where the charging cable is a fixed part of the electric vehicle supply equipment.

- **Mode 1 charging** Connection of the EV to the a.c supply network utilizing standardized socket-outlets not exceeding 16A and within voltage not exceeding  $\pm 6\%$ , 240V a.c single phase or  $\pm 6\%$ , 415V a.c three phase, at the supply side, and utilizing the power and protective earth conductors. (According to KS IEC 61851-1).
- **Mode 2 charging** Connection of the EV to the a.c supply network utilizing standardized socket-outlets not exceeding 32A and within voltage not exceeding  $\pm 6\%$ , 240V a.c single phase or  $\pm 6\%$ , 415V a.c, at the supply side, and utilizing the power and the protective earth conductors together with a control pilot function and system of personnel protection against electric shock (RCD) between the EV and the plu or as part of the in-cable control box.

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- Mode 3 charging Connection of the EV to the a.c supply network utilizing dedicated electric vehicle supply equipment where the control pilot function extends to control equipment in the electric vehicle supply equipment, permanently connected to the a.c supply network.
- Mode 4 Charging Connection of the EV to the a.c supply network utilizing an off-board charger where the control pilot function extends to equipment permanently connected to the a.c supply.
- Vehicle connector Part of a vehicle coupler integral with, or intended to be attached to, the flexible cable connected to the a.c supply network (mains)
- Vehicle coupler Means of enabling the manual connection of a flexible cable to an EV for the purpose of charging.

NOTE A vehicle coupler consists of two part: a vehicle connector and a vehicle inlet

**Electrical circuit for safety services** — Electrical circuit intended to be used as part of an electrical supply system for safety services.

**Electrical equipment (abbr: Equipment)** — Any item for such purposes as generation, conversion, transmission, distribution or utilisation of electrical energy, such as machines, transformers, apparatus, measuring instruments, protective devices, wiring systems, accessories, appliances and luminaires.

**Electrical installation (abbr: Installation)** — An assembly of associated electrical equipment having co-ordinated characteristics to fulfil specific purposes.

**Electrical source for safety services** — Electrical source intended to be used as part of an electrical supply system for safety services.

**Electrical supply system for safety services** — A supply system intended to maintain the operation of essential parts of an electrical installation and equipment:

- a) For the health and safety of persons and livestock, and
- b) To avoid damage to the environment and to other equipment.

NOTE The supply system includes the source and the circuit(s) up to the terminals of the electrical equipment.

**Electrically independent earth electrodes** — Earth electrodes located at such a distance from one another that the maximum current likely to flow through one of them does not significantly affect the potential of the other(s).

**Electrode boiler (or electrode water heater)** — Equipment for the electrical heating of water or electrolyte by the passage of an electric current between electrodes immersed in the water or electrolyte.

**Electronic convertor (static convertor)** — A convertor having no moving parts and notably using semiconductor rectifiers.

**Emergency stopping** — Emergency switching intended to stop an operation.

**Emergency switching** — An operation intended to remove, as quickly as possible, danger, which may have occurred unexpectedly.

**Enclosure** — A part providing protection of equipment against certain external influences and in any direction providing basic protection.

**Equipment** — (see Electrical equipment).

**Equipotential bonding** — Electrical connection maintaining various exposed-conductive-parts and extraneous-conductive-parts at substantially the same potential. (See also Protective equipotential bonding.)

**Escape route** — Path to follow for access to a safe area in the event of an emergency.

**Exhibition** — Event intended for the purpose of displaying and/or selling products etc., which can take place in any suitable location, either a room, building or temporary structure.

**Exposed conductive part** — Conductive part equipment which can be touched and which is not normally live, but which can become live under fault conditions

**External influence** — Any influence external to an electrical installation which affects the design and safe operation of that installation

**Extra low voltage** — (see Voltage, nominal)

**Extraneous-conductive-part** — A conductive part liable to introduce a potential, generally Earth potential, and not forming part of the electrical installation.

**Fairground** — Area where one or more stands, amusement devices or booths are erected for leisure use.

**Fault** — A circuit condition in which current flows through an abnormal or unintended path. This may result from an insulation failure or a bridging of insulation. Conventionally the impedance between live conductors or between live conductors and exposed- or extraneous-conductive-parts at the fault position is considered negligible.

**Fault current** — A current resulting from a fault.

**Fault protection** — Protection against electric shock under single fault conditions.

NOTE For low voltage installations, systems and equipment, fault protection generally corresponds to protection against indirect contact, mainly with regard to failure of basic insulation. Indirect contact is "contact of persons or livestock with exposed-conductive-parts which have become live under fault conditions".

**Final circuit** — A circuit connected directly to current-using equipment, or to a socket-outlet or socket-outlets or other outlet points for the connection of such equipment.

**Fixed equipment** — Equipment designed to be fastened to a support or otherwise secured in a specific location.

**Flexible cable** — A cable whose structure and materials make it suitable to be flexed while in service.

**Flexible cord** — (see Flexible cable).

**Flexible sheet heating element** — Heating element consisting of sheets of electrical insulation laminated with electrical resistance material, or a base material on which electrically insulated heating wires are fixed.

**Flexible wiring system** — A wiring system designed to provide mechanical flexibility in use without degradation of the electrical components

**Follow-current interrupting rating** — The level of prospective short-circuit current that an SPD is able to interrupt without back-up protection.

**Functional bonding conductor** — Conductor provided for functional equipotential bonding.

**Functional earth** — Earthing of a point or points in a system or in an installation or in equipment, for purposes other than electrical safety, such as for proper functioning of electrical equipment.

**Functional extra-low voltage (FELV)** — An extra-low voltage system in which not all of the protective measures required for SELV or PELV have been applied.

**Functional switching** — An operation intended to switch 'on' or 'off' or vary the supply of electrical energy to all or part of an installation for normal operating purposes.

**Fuse** — A device which, by the melting of one or more of its specially designed and proportioned components, opens the circuit in which it is inserted by breaking the current when this exceeds a given value for a sufficient time. The fuse comprises all the parts that form the complete device.

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**Fuse carrier** — The movable part of a fuse designed to carry a fuse link.

**Fuse element** — A part of a fuse designed to melt when the fuse operates.

**Fuse link** — A part of a fuse, including the fuse element(s), which requires replacement by a new or renewable fuse link after the fuse has operated and before the fuse is put back into service.

**Fused connection unit** — A device associated with the fixed wiring of an installation by which appliances may be connected, and having provision for a replaceable cartridge fuse link.

**Gas installation pipe** — Any pipe, not being a service pipe (other than any part of a service pipe comprised in a primary meter installation) or a pipe comprised in a gas appliance, for conveying gas for a particular consumer and including any associated valve or other gas fitting.

**Harmonized Standard** — A standard which has been drawn up by common agreement between national standards bodies notified to the East African Community by all member states and published under national procedures.

**Hazardous-live-part** — A live part which can give, under certain conditions of external influence, an electric shock.

**Heating cable** — Cable with or without a shield or a metallic sheath, intended to give off heat for heating purposes.

**Heating-free area** — Unheated floor or ceiling area which is completely covered when placing pieces of furniture or kept free for built-in furniture.

**Heating unit** — Heating cable or flexible sheet heating element with rigidly fixed cold tails or terminal fittings which are connected to the terminals of the electrical installation.

**High-density livestock rearing** — Breeding and rearing of livestock for which the use of automatic systems for life support is necessary.

NOTE Examples of automatic life support systems are those for ventilation, feeding and air-conditioning.

**High voltage** — (see Voltage, nominal).

**Highway** — A highway means any way (other than a waterway) over which there is public passage and includes the highway verge and any bridge over which, or tunnel through which, the highway passes.

**Highway distribution board** — A fixed structure or underground chamber, located on a highway, used as a distribution point, for connecting more than one highway distribution circuit to a common origin. Street furniture which supplies more than one circuit is defined as a highway distribution board. The connection of a single temporary load to an item of street furniture shall not in itself make that item of street furniture into a highway distribution board.

**Highway distribution circuit** — A Band II circuit connecting the origin of the installation to a remote highway distribution board or items of street furniture. It may also connect a highway distribution board to street furniture.

**Highway power supply** — An electrical installation comprising an assembly of associated highway distribution circuits, highway distribution boards and street furniture, supplied from a common origin.

**Houseboat** — Floating decked structure which is designed or adapted for use as a place of permanent residence often kept in one place on inland water.

**Impulse current (limp)** — A parameter used for the classification test for SPDs; it is defined by three elements, a current peak value, a charge Q and a specific energy W/R.

**Impulse withstand voltage** — The highest peak value of impulse voltage of prescribed form and polarity which does not cause breakdown of insulation under specified conditions.

**Inspection** — Examination of an electrical installation using all the senses as appropriate.

**Installation** — (see Electrical installation).

**Instructed person** — A person adequately advised or supervised by skilled persons to enable him/her to avoid dangers which electricity may create.

**Insulation** — Suitable non conductive material enclosing, surrounding or supporting a conductor.

**Insulation co-ordination** — The selection of the electric strength of equipment in relation to the voltages which can appear on the system for which the equipment is intended, taking into account the service environment and the characteristics of the available protective devices.

**Isolation** — A function intended to cut off for reasons of safety the supply from all, or a discrete section, of the installation by separating the installation or section from every source of electrical energy.

**Isolator** — A mechanical switching device which, in the open position, complies with the requirements specified for the isolating function. An isolator is otherwise known as a disconnecter.

**Ladder** — (see Cable ladder).

**Leakage current** — Electric current in an unwanted conductive path under normal operating conditions.

**Leisure accommodation vehicle** — Unit of living accommodation for temporary or seasonal occupation which may meet requirements for construction and use of road vehicles.

**Lighting protection zone (LPZ)** — Zone where the lighting electromagnetic environment is defined.

**Line conductor** — A conductor of an a.c. system for the transmission of electrical energy other than a neutral conductor, a protective conductor or a PEN conductor. The term also means the equivalent conductor of a d.c. system unless otherwise specified in the regulations.

**Live conductor** — (see Live part)

**Live part** — A conductor or conductive part intended to be energized in normal use, including a neutral conductor but, by convention, not a PEN conductor.

**Low voltage** — (see Voltage, nominal).

**Luminaire** — Equipment which distributes, filters or transforms the light transmitted from one or more lamps and which includes all the parts necessary for supporting, fixing and protecting the lamps, but not the lamps themselves, and where necessary, circuit auxiliaries together with the means for connecting them to the supply.

NOTE Lamps includes devices such as light emitting diodes.

**Luminaire supporting coupler (LSC)** — A means, comprising an LSC outlet and an LSC connector, providing mechanical support for a luminaire and the electrical connection to and disconnection from a fixed wiring installation.

**LV switchgear and controlgear assembly** — A combination of one or more low voltage switching devices together with associated control, measuring, signalling, protective, regulating equipment, etc., completely assembled under the responsibility of the manufacturer with all the internal electrical and mechanical interconnection and structural parts. The components of the assembly may be electromechanical or electronic. The assembly may be either verified or partially type-tested (see IEC 61439-1 & 2).

**Main earthing terminal** — The terminal or bar provided for the connection of protective conductors, including protective bonding conductors, and conductors for functional earthing, if any, to the means of earthing.

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**Maintenance** — Combination of all technical and administrative actions, including supervision actions, intended to retain an item in, or restore it to, a state in which it can perform a required function.

**Marina** — Facility for mooring and servicing of pleasure craft with fixed wharves, jetties, piers or pontoon arrangements capable of berthing one or more pleasure craft.

**Mechanical maintenance** — The replacement, refurbishment or cleaning of lamps and non-electrical parts of equipment, plant and machinery.

**Medical location** — Location intended for purposes of diagnosis, treatment including cosmetic treatment, monitoring and care of patients.

- a) **Applied part.** Part of medical electrical equipment that in normal use necessarily comes into physical contact with the patient for ME equipment or an ME system to perform its function.
- b) **Group 0.** Medical location where no applied parts are intended to be used and where discontinuity (failure) of the supply cannot cause danger to life.
- c) **Group 1.** Medical location where discontinuity of the electrical supply does not represent a threat to the safety of the patient and applied parts are intended to be used:
- externally
  - invasively to any part of the body except where group 2 applies.
- d) **Group 2.** Medical location where applied parts are intended to be used, and where discontinuity (failure) of the supply can cause danger to life, in applications such as:
- intracardiac procedures
  - vital treatments and surgical operations.

**NOTE** An intracardiac procedure is a procedure whereby an electrical conductor is placed within the heart of a patient or is likely to come into contact with the heart, such conductor being accessible outside the patient's body. In this context, an electrical conductor includes insulated wires such as cardiac pacing electrodes or intracardiac ECG electrodes, or insulated tubes filled with conducting fluids.

- e) **Medical electrical equipment (ME equipment)** — Electrical equipment having an applied part or transferring energy to or from the patient or detecting such energy transfer to or from the patient and which is
- i) provided with not more than one connection to a particular supply mains, and
  - ii) intended by the manufacturer to be used
    - in the diagnosis, treatment or monitoring of a patient, or
    - for compensation or alleviation of disease, injury or disability.

**NOTE** ME equipment includes those accessories as defined by the manufacturer that are necessary to enable the normal use of the ME equipment.

- f) **Medical electrical system (ME system)** — Combination, as specified by the manufacturer, of items of equipment, at least one of which is medical electrical equipment to be interconnected by functional connection or by use of a multiple socket-outlet.

**NOTE** The system includes those accessories which are needed for operating the system and are specified by the manufacturer.

- g) **Medical IT system** — IT electrical system fulfilling specific requirements for medical applications.

**NOTE** These supplies are also known as isolated power supply systems.

- h) **Patient** — Living being (person or animal) undergoing a medical, surgical or dental procedure.

NOTE A person under treatment for cosmetic purposes may be considered a patient.

- i) **Patient environment** — Any volume in which intentional or unintentional contact can occur between a patient and parts of the medical electrical equipment or medical electrical system or between a patient and other persons touching parts of the medical electrical equipment or medical electrical system.

NOTE 1 For illustration see Figure 710.1 of KS 662-7.

NOTE 2 This applies when the patient's position is predetermined; if not, all possible patient positions should be considered.

**Meshed bonding network (MESH-BN)** — Bonding network in which all associated equipment frames, racks and cabinets and usually the d.c. power return conductor are bonded together as well as at multiple points to the CBN and may have the form of a mesh.

NOTE A MESH-BN improves the performance of a common bonding network.

**Minimum illuminance** — Illuminance for emergency lighting at the end of the rated operating time.

**Minor works** — Additions and alterations to an installation that do not extend to the provision of a new circuit.

NOTE Examples include the addition of socket-outlets or lighting points to an existing circuit, the relocation of a light switch etc.

**Mobile and offshore installations** — Installations used for the exploration or development of liquid or gaseous hydrocarbon resources.

**Mobile equipment (portable equipment (deprecated))** — Electrical equipment which is moved while in operation or which can easily be moved from one place to another while connected to the supply.

**Mobile home** — A transportable leisure accommodation vehicle which includes means for mobility but does not meet the requirements for construction and use of road vehicles.

**Monitoring** — Observation of the operation of a system or part of a system to verify correct functioning or detect incorrect functioning by measuring system variables and comparing the measured values with specified values.

**Motor caravan** — Self-propelled leisure accommodation vehicle, used for touring, that meets the requirements for the construction and use of road vehicles.

NOTE It is either adapted from a series production vehicle, or designed and built on an existing chassis, with or without the driving cab, the accommodation being either fixed or dismantlable.

**Neutral conductor** — A conductor connected to the neutral point of a system and contributing to the transmission of electrical energy. The term also means the equivalent conductor of an IT or d.c. system unless otherwise specified in the Regulations and also identifies either the mid-wire of a three-wire d.c. circuit or the earthed conductor of a two-wire earthed d.c. circuit.

**Nominal discharge current ( $I_{nspd}$ )** — A parameter used for the classification test for Class I SPDs and for preconditioning of an SPD for Class I and Class II tests; it is defined by the crest value of current through an SPD, having a current waveform of 8/20.

**Nominal voltage** — (see Voltage, nominal).

**Obstacle** — A part preventing unintentional contact with live parts but not preventing deliberate contact.

**Open circuit voltage under standard test condition  $U_{oc\ stc}$**  — Voltage under standard test conditions across an unloaded (open) generator or on the d.c. side of the convertor.

**Operating and maintenance gangway** — gangway providing access to facilitate operations such as switching controlling, setting observation and maintenance of electrical equipment

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**Ordinary person** — Person who is neither a skilled person nor an instructed person

**Origin of an installation** — The position at which electrical energy is delivered to an electrical installation.

**Origin of a temporary electrical installation** — Point on the permanent installation or other source of supply from which the electrical energy is delivered to the temporary electrical installation.

**Overcurrent** — A current exceeding the rated value. For conductors the rated value is the current-carrying capacity.

**Overcurrent detection** — A method of establishing that the value of current in a circuit exceeds a predetermined value for a specified length of time.

**Overload current** — An overcurrent occurring in a circuit which is electrically sound.

**PEL** — A conductor combining the functions of both a protective earthing conductor and a line conductor.

**PELV (protective extra-low voltage)** — An extra-low voltage system which is not electrically separated from earth, but which otherwise satisfies all the requirements for SELV.

**PEM** — A conductor combining the functions of both a protective earthing conductor and a midpoint conductor. PEN conductor. A conductor combining the functions of both protective conductor and neutral conductor.

**PEN conductor.** A conductor combining the functions of both protective conductor and neutral conductor.

**Person** — (see skilled, Instructed, ordinary)

**Phase conductor** — (see Line conductor)

**Pleasure craft** — Any boat, vessel, yacht, motor launch, houseboat or other floating craft used exclusively for sport or leisure.

**Plug** — Accessory having pins designed to engage with the contacts of a socket-outlet, and incorporating means for the electrical connection and mechanical retention of a flexible cable.

**Point (in wiring)** — A termination of the fixed wiring intended for the connection of current-using equipment.

**Portable equipment** — (see Mobile equipment).

**Powertrack** — A system component, which is generally a linear assembly of spaced and supported busbars, providing electrical connection of accessories.

**Powertrack system (PT system)** — An assembly of system components including a powertrack by which accessories may be connected to an electrical supply at one or more points (predetermined or otherwise) along the powertrack.

NOTE The maximum current rating of a powertrack system is 63A primarily for lighting and sockets.

**Prefabricated wiring system** — Wiring system consisting of wiring sections incorporating the means of interconnection designed to allow sections to be connected together to form a given system, and incorporating installation couplers conforming to IEC 61535.

**Prospective fault current (I<sub>pr</sub>)** — The value of overcurrent at a given point in a circuit resulting from a fault of negligible impedance between live conductors having a difference of potential under normal operating conditions, or between a live conductor and an exposed-conductive-part.

**Protective bonding conductor** — Protective conductor provided for protective equipotential bonding

**Protective conductor (PE)** — A conductor used for some measures of protection against electric shock and intended for connecting together any of the following parts:

- a) Exposed-conductive-parts

- b) Extraneous-conductive-parts
- c) The main earthing terminal
- d) Earth electrode(s)
- e) The earthed point of the source, or an artificial neutral.

**Protective conductor current** — Electric current appearing in a protective conductor, such as leakage current or electric current resulting from an insulation fault.

**Protective earthing** — Earthing of a point or points in a system or in an installation or in equipment for the purposes of safety.

**Protective equipotential bonding** — Equipotential bonding for the purposes of safety.

**Protective multiple earthing (PME)** — An earthing arrangement, found in TN-C-S systems, in which the supply neutral conductor is used to connect the earthing conductor of an installation with Earth, (see also Figure 3.9).

**Protective separation** — Separation of one electric circuit from another by means of:

- a) double insulation, or
- b) basic insulation and electrically protective screening (shielding), or
- c) reinforced insulation.

#### **PV, Solar photovoltaic**

- a) **PV a.c. module** — Integrated module/convertor assembly where the electrical interface terminals are a.c. only. No access is provided to the d.c. side.
- b) **PV array** — Mechanically and electrically integrated assembly of PV modules, and other necessary components, to form a d.c. power supply unit.
- c) **PV array cable** — Output cable of a PV array.
- d) **PV array junction box** — Enclosure where PV strings of any PV array are electrically connected and where devices can be located.
- e) **PV cell** — Basic PV device which can generate electricity when exposed to light such as solar radiation.
- f) **PV convertor** — Device which converts d.c. voltage and d.c. current into a.c. voltage and a.c. current.
- g) **PV d.c. main cable**— Cable connecting the PV generator junction box to the d.c. terminals of the PV convertor.
- h) **PV generator**— Assembly of PV arrays.
- i) **PV generator junction box** — Enclosure where PV arrays are electrically connected and where devices can be located.
- j) **PV installation** — Erected equipment of a PV power supply system.
- k) **PV module** — Smallest completely environmentally protected assembly of interconnected PV cells.
- l) **PV string** — Circuit in which PV modules are connected in series, in order for a PV array to generate the required output voltage.

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- m) **PV string cable** — Cable connecting PV modules to form a PV string.
- n) **PV supply cable** — Cable connecting the a.c. terminals of the PV convertor to a distribution circuit of the electrical installation.

**Rated current** — Value of current used for specification purposes, established for a specified set of operating conditions of a component, device, equipment or system.

**Rated impulse withstand voltage level (U<sub>w</sub>)** — The level of impulse withstand voltage assigned by the manufacturer to the equipment, or to part of it, characterizing the specified withstand capability of its insulation against overvoltages.

NOTE For the purposes of this standard only withstand voltage between live conductors and earth is considered.

**Reduced low voltage system** — A system in which the nominal line-to-line voltage does not exceed 110 volts and the nominal line to Earth voltage does not exceed 63.5 volts.

**Reinforced insulation** — Single insulation applied to live parts, which provides a degree of protection against electric shock equivalent to double insulation under the conditions specified in the relevant standard. The term 'single insulation' does not imply that the insulation must be one homogeneous piece. It may comprise two or more layers which cannot be tested singly as supplementary or basic insulation.

**Reporting** — Communicating the results of periodic inspection and testing of an electrical installation to the person ordering the work.

**Residences and other locations belonging to agricultural and horticultural premises** — Residences and other locations which have a conductive connection to the agricultural and horticultural premises by either protective conductors of the same installation or by extraneous-conductive parts.

NOTE Examples of other locations include offices, social rooms, machine-halls, workrooms, garages and shops.

**Residential park home** — A factory produced relocatable dwelling designed for permanent residence which may be used for leisure purposes.

**Residual Current** — Algebraic sum of the currents in the live conductors of a circuit at a point in the electrical installation.

**Residual current device (RCD)** — A mechanical switching device or association of devices intended to cause the opening of the contacts when the residual current attains a given value under specified conditions.

**Residual current operated circuit-breaker with integral overcurrent protection (RCBO)** — A residual current operated switching device designed to perform the functions of protection against overload and/or short-circuit.

**Residual current operated circuit-breaker without integral overcurrent protection (RCCB)** — A residual current operated switching device not designed to perform the functions of protection against overload and/or short-circuit.

**Residual operating current** — Residual current which causes the RCD to operate under specified conditions.

**Resistance area (for an earth electrode only)** — The surface area of ground (around an earth electrode) on which a significant voltage gradient may exist.

**Response time** — The time that elapses between the failure of the normal power supply and the ability of the auxiliary power supply to energize the equipment.

**Restrictive conductive location** — (see conducting location with restricted movement).

**Ring final circuit** — A final circuit arranged in the form of a ring and connected to a single point of supply.

**Safety service** — An electrical system for electrical equipment provided to protect or warn persons in the event of a hazard, or essential to their evacuation from a location.

**Sauna** — A room or location in which air is heated, in service, to high temperatures where the relative humidity is normally low, rising only for a short period of time when water is poured over the heater.

**SELV (separated extra-low voltage)** — 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.

**Selectivity** — (see Discrimination).

**Shock** — (see Electric shock).

**Shock current** — A current passing through the body of a person or livestock such as to cause electric shock and having characteristics likely to cause dangerous effects.

**Short-circuit current** — An overcurrent resulting from a fault of negligible impedance between live conductors having a difference in potential under normal operating conditions.

**Short-circuit current under standard test conditions  $I_{sc\ STC}$**  — Short-circuit current of a PV module, PV string, PV array or PV generator under standard test conditions.

**Show** — Display or presentation in any suitable location, either a room, building or temporary structure.

**Simple separation** — Separation between circuits or between a circuit and Earth by means of basic insulation.

**Simultaneously accessible parts** — Conductors or conductive parts which can be touched simultaneously by a person or, in locations specifically intended for them, by livestock.

NOTE Simultaneously accessible parts may be: live parts, exposed-conductive-parts, extraneous-conductive-parts, protective conductors or earth electrodes.

**Skilled person (electrically)** — person who possesses, as appropriate to the nature of the electrical work to be undertaken, adequate education, training and practical skills, and who is able to perceive risks and avoid hazards which electricity can create.

NOTE The term " (electrically)" is assumed to be present where the term skilled person is used throughout this series of standard

**Socket-outlet** — A device, provided with female contacts, which is intended to be installed with the fixed wiring, and intended to receive a plug. A luminaire track system is not regarded as a socket-outlet system.

**Spur** — A branch from a ring or radial final circuit.

**Stand** — Area or temporary structure used for display, marketing or sales.

**Standard test conditions (STC)** — Test conditions specified in IEC 60904-3 for PV cells and PV modules.

**Standby electrical source** — Electrical source intended to maintain, for reasons other than safety, the supply to an electrical installation or a part or parts thereof, in case of interruption of the normal supply.

**Standby electrical supply system** — Supply system intended to maintain, for reasons other than safety, the functioning of an electrical installation or a part or parts thereof, in case of interruption of the normal supply.

**Static convertor** — A convertor having no moving parts and notably using semiconductor rectifiers.

**Stationary equipment** — Electrical equipment which is either fixed or which has a mass exceeding 18 kg and is not provided with a carrying handle.

**Street furniture** — Fixed equipment located on a highway.

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**Street located equipment** — Fixed equipment, located on a highway, the purpose of which is not directly associated with the use of the highway.

**Supplementary insulation** — Independent insulation applied in addition to basic insulation for fault protection.

**Supplier** — (see Distributor).

**Surge current** — A transient wave appearing as an overcurrent caused by a lightning electromagnetic impulse.

**Surge protective device (SPD)** — A device that is intended to limit transient over voltages and divert surge currents. It contains at least one non-linear component.

**Switch** — A mechanical device capable of making, carrying and breaking current under normal circuit conditions, which may include specified operating overload conditions, and also of carrying for a specified time currents under specified abnormal circuit conditions such as those of short-circuit. It may also be capable of making, but not breaking, short-circuit currents.

**Switch, linked** — A switch the contacts of which are so arranged as to make or break all poles simultaneously or in a definite sequence.

**Switch-disconnector** — A switch which, in the open position, satisfies the isolating requirements specified for a disconnector.

NOTE A switch disconnector is otherwise known as an isolating switch

**Switchboard** — An assembly of switchgear with or without instruments, but the term does not apply to groups of local switches in final circuits.

**Switchgear** — An assembly of main and auxiliary switching equipment for operation, regulation, protection or other control of an electrical installation.

**System** — An electrical system consisting of a single source or multiple sources running in parallel of electrical energy and an installation. For certain 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:

- a) **TN system** — 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.
- b) **TN-C system** — A system in which neutral and protective functions are combined in a single conductor throughout the system.
- c) **TN-S system** — A system having separate neutral and protective conductors throughout the system (see Figure 31A, KS 662-3).
- d) **TN-C-S system** — A system in which neutral and protective functions are combined in a single conductor in part of the system (see Figure 3.9, Annex II).
- e) **TT system** — 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 3.10, Annex II).
- f) **IT system** — A system having no direct connection between live parts and Earth, the exposed-conductive- parts of the electrical installation being earthed (see Annex 1 Figure 1C).
- g) **Multiple source and d.c systems** — See KS 662-3

**Temporary electrical installation** — Electrical installation erected for a particular purpose and dismantled when no longer required for that purpose.

**Temporary overvoltage (UTOV)** — A fundamental frequency overvoltage occurring on the network at a given location, of relatively long duration.

NOTE 1 TOVs may be caused by faults inside the LV system (UTOV, LV) or inside the HV system (UTOV, HV)

NOTE 2 Temporary overvoltages, typically lasting up to several seconds, usually originate from switching operations or faults (for example, sudden load injection, single phase faults, etc.) and/or from non-linearity (Ferro resonance effects, harmonics etc.)

**Temporary structure** — A unit or part of a unit, including mobile portable units, situated indoors or outdoors, designed and intended to be assembled and dismantled.

**Temporary supply unit** — Enclosure containing equipment for the purpose of taking a temporary electrical supply safely from an item of street furniture.

**Testing** — Implementation of measures to assess an electrical installation by means of which its effectiveness is proved. This includes ascertaining values by means of appropriate measuring instruments, where measured values are not detectable by inspection.

**Thermal storage floor heating system** — Heating system in which, due to a limited charging period, a restricted availability of electrical energy is converted into heat and dissipated mainly through the surface of the floor to the room to be heated with an intended time delay.

**Triplen harmonics** — The odd multiples of the 3rd harmonic of the fundamental frequency (e.g. 3rd, 9th, 15th, 21st)

**Trunking** — (see Cable trunking).

**Verification** — All measures by means of which compliance of the electrical installation with the relevant requirements of this standard are checked, comprising inspection, testing and certification.

**Voltage, nominal** — Voltage by which an installation (or part of an installation) is designated. The following ranges of nominal voltage (rms values for a.c.) are defined:

- a) Extra-low. Not exceeding 50 V a.c. or 120 V ripple-free d.c., whether between conductors or to Earth.
- b) Low. Exceeding extra-low voltage but not exceeding 1000 V a.c. or 1500 V d.c. between conductors, or 600 V a.c. or 900 V d.c. between conductors and Earth.
- c) High. Normally exceeding low voltage.

NOTE The actual voltage of the installation may differ from the nominal value by a quantity within normal tolerances, see Annex B.

**Voltage, reduced** — (see reduced low voltage system).

**Voltage band**

**Band I**

**Band I covers:**

- Installations where protection against electric shock is provided under certain conditions by the value of voltage;
- Installations where the voltage is limited for operational reasons (e.g. telecommunications, signaling, bell, control and alarm installations).
- Extra-low voltage (ELV) will normally fall within voltage Band I.

**Band II**

Band II contains the voltages for supplies to household and most commercial and industrial installations. Low voltage (LV) will normally fall within voltage Band II.

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NOTE Band II voltages do not exceed 1000 V a.c. rms or 1500 V d.c.

**Voltage protection level (Up)** — A parameter that characterizes the performance of an SPD in limiting the voltage across its terminals, which is selected from a list of preferred values; this value is greater than the highest value of the measured limiting voltages.

**Wiring system** — An assembly made up of cable or busbars and parts which secure and, if necessary, enclose the cable or busbars.

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