

中華民國國家標準	低電壓電機裝備－第 1 部：基本 原則、一般特性之評鑑、定義	總號	
CNS		類號	C4

Low-voltage electrical installations – Part 1: Fundamental principles,
assessment of general characteristics, definitions

編訂說明：本草案建議案號為「建-制 1030085」，草案編號為「CNS 草-制 1030140」，
係參照 IEC 60364-1:2005 編擬而成。本案依程序辦理徵求意見，敬請 惠
賜卓見。

11 Scope ¹

IEC 60364-1 gives the rules for the design, erection, and verification of electrical installations. The rules are intended to provide for the safety of persons, livestock and property against dangers and damage which may arise in the reasonable use of electrical installations and to provide for the proper functioning of those installations.

¹ The numbering system is explained in Annex A.

11. 適用範圍 ⁽¹⁾

本標準敘述電機裝備之設計、建造及查證的規則。此規則用以提供人員、家畜及財產之安全，以避免電機裝備於正當使用中可能發生之危險及傷害，並提供該等裝備合適之功用。

註 ⁽¹⁾ 關於編碼體系，如附錄 A 之說明。

11.1 IEC 60364-1 applies to the design, erection and verification of electrical installations such as those of

- a) residential premises;
- b) commercial premises;
- c) public premises;
- d) industrial premises;
- e) agricultural and horticultural premises;
- f) prefabricated buildings;
- g) caravans, caravan sites and similar sites;
- h) construction sites, exhibitions, fairs and other installations for temporary purposes;
- i) marinas;
- j) external lighting and similar installations (see, however, 11.3e));
- k) medical locations;
- l) mobile or transportable units;
- m) photovoltaic systems;
- n) low-voltage generating sets.

NOTE "Premises" covers the land and all facilities including buildings belonging to it.

11.1 本標準適用於下列各項所使用之電機裝備的設計、建造及查證。

(a) 住宅房舍。

(共 38 頁)

公 年	布 月	日 期	經 濟 部 標 準 檢 驗 局 印 行	修 年	訂 月	公 日	布 期
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- (b) 商業用房舍。
- (c) 公共房舍。
- (d) 工業用房舍。
- (e) 農業及園藝用房舍。
- (f) 預鑄組合式建築物。
- (g) 活動式房屋、營地及類似場所。
- (h) 暫時用途之建築用地、展示會、市集及其他裝備。
- (i) 海濱休閒地(marina)。
- (j) 外景燈光及類似裝備(另參照 11.3(e))。
- (k) 醫療場所。
- (l) 機動或可運送之單元。
- (m) 太陽光電(photovoltaic)系統。
- (n) 低電壓發電機組。

備考：「房舍(premises)」一詞涵蓋土地及其附屬建築物在內之所有設施。

11.2 IEC 60364-1 covers

- a) circuits supplied at nominal voltages up to and including 1 000 V a.c. or 1 500 V d.c.;
For a.c., the preferred frequencies which are taken into account in this standard are 50 Hz, 60 Hz and 400 Hz. The use of other frequencies for special purposes is not excluded.
- b) circuits, other than the internal wiring of apparatus, operating at voltages exceeding 1 000 V and derived from an installation having a voltage not exceeding 1 000 V a.c., for example, discharge lighting, electrostatic precipitators;
- c) wiring systems and cables not specifically covered by the standards for appliances;
- d) all consumer installations external to buildings;
- e) fixed wiring for information and communication technology, signalling, control and the like (excluding internal wiring of apparatus);
- f) the extension or alteration of the installation and also parts of the existing installation affected by the extension or alteration.

NOTE The rules of IEC 60364-1 are intended to apply to electrical installations generally but, in certain cases, they may need to be supplemented by the requirements or recommendations of other IEC standards (for example, for installations in explosive gas atmospheres).

11.2 本標準涵蓋下列項目。

- (a) 以交流 1,000 V 或直流 1,500 V 以下之標稱電壓供電之電路。
對交流系統而言，本標準所考量之首選頻率為 50 Hz、60 Hz 及 400 Hz。但並不排除特殊用途使用其他頻率。
- (b) 在電壓不超過交流 1,000 V 之裝備、而在電壓超過 1,000 V 運轉之電路(例：投光燈、靜電集塵器)。但器具(apparatus)之內部配線除外。
- (c) 未明確列於電器標準內之配線系統及電纜。
- (d) 建築物外之所有消費者的裝備。
- (e) 資訊及通訊技術、信號、監控及其類似事物用之固定式配線(不含器具之內部配線)。
- (f) 擴充後或變更後之裝備，且亦為其影響所及之現有裝備之一部分。

備考：本標準中之規則原擬廣泛適用於所有電機裝備，然而在某種情況中，此

等規則可能需要以其他標準之要求或建議加以補充(例：在爆炸性氣體環境中使用之裝備)。

11.3 IEC 60364-1 does not apply to

- a) electric traction equipment, including rolling stock and signaling equipment;
- b) electrical equipment of motor vehicles, except those covered in Part 7;
- c) electrical installations on board ships and mobile and fixed offshore platforms;
- d) electrical installations in aircraft;
- e) public street-lighting installations which are part of the public power grid;
- f) installations in mines and quarries;
- g) radio interference suppression equipment, except where it affects the safety of the installation;
- h) electric fences;
- i) external lightning protection systems for buildings (LPS);

NOTE Atmospheric phenomena are covered in IEC 60364-1 but only insofar as effects on the electrical installations are concerned (for example, with respect to selection of surge protective devices).

- j) certain aspects of lift installations;
- k) electrical equipment of machines.

11.3 本標準不適用於下列項目。

- (a) 電力牽引設備(electric traction equipment)，包括滾轉台(rolling stock)及發信設備。
- (b) 電動車輛之電機設備，但本系列標準第 7 部中所列者除外。
- (c) 輪船上及機動式與固定式離岸月台上使用之電機裝備。
- (d) 飛機上使用之電機裝備。
- (e) 屬於公共電力網中之公共路燈。
- (f) 礦坑內及採石場使用之裝備。
- (g) 無線電干擾抑制設備，但會影響裝備之安全者除外。
- (h) 電氣柵欄。
- (i) 建築物之外雷保護系統(LPS)。

備考：大氣現象涵蓋於本標準中，但僅指對電機裝備有影響之相關部分(例：關於避雷裝置之選擇)。

- (j) 某些吊運裝備。
- (k) 機器之電機設備。

11.4 IEC 60364-1 is not intended to apply to

- systems for distribution of energy to the public, or
- power generation and transmission for such systems.

NOTE 1 Countries wishing to do so may, however, use this standard in whole or in part for that purpose.

NOTE 2 According to IEC 61936 which provides common rules for the design and the erection of electrical power installations in systems with nominal voltages above 1kV a.c. and nominal frequency up to and including 60 Hz, low-voltage a.c. and d.c. protection and monitoring systems should be in accordance with IEC 60364 series.

11.4 本標準不擬適用於下列項目。

- 大眾配電系統。或
- 此等系統之發電及輸電。

備考 1. 某些國家若擬將本標準適用於此等系統時，可將本標準之全部或一部

分適用於該用途上。

備考 2. 根據 IEC 61936 所述，該標準供作標稱電壓為交流 1 kV 以上、標稱頻率為 60 Hz 以下系統中之電力裝備的設計及建造之通用準則，然而，交流及直流低電壓保護監控系統則需遵循本系列標準。

11.5 Electrical equipment is dealt with only so far as its selection and application in the installation are concerned.

This applies also to assemblies of electrical equipment complying with the relevant standards.

11.5 電機設備僅就其在裝備中如何選用及應用上進行討論。

此論點亦適用於符合相關標準之電機設備的組裝品。

12. 引用標準

下列標準因本標準所引用，成為本標準之一部分。有加註年分者，適用該年分之版次，不適用於其後之修訂版(包括補充增修)。無加註年分者，適用該最新版(包括補充增修)。

IEC 60038	IEC standard voltages
IEC 60050(691)	International Electrotechnical Vocabulary (IEV) – Chapter 691: Tariffs for electricity
IEC 60050-826	International Electrotechnical Vocabulary (IEV) – Part 826: Electrical installations
IEC 60364-4-41:2005	Low-voltage electrical installations – Part 4-41: Protection for safety – Protection against electric shock
IEC 60364-4-42	Electrical installations of buildings – Part 4-42: Protection for safety – Protection against thermal effects
IEC 60364-4-43	Electrical installations of buildings – Part 4-43: Protection for safety – Protection against overcurrent
IEC 60364-4-44	Electrical installations of buildings – Part 4-44: Protection for safety – Protection against voltage disturbances and electromagnetic disturbances
IEC 60364-5-51	Electrical installations of buildings – Part 5-51: Selection and erection of electrical equipment – Common rules
IEC 60364-5-52	Electrical installations of buildings – Part 5-52: Selection and erection of electrical equipment – Wiring systems
IEC 60364-5-53:2001	Electrical installations of buildings – Part 5-53: Selection and erection of electrical equipment – Isolation, switching and control
IEC 60364-5-54	Electrical installations of buildings – Part 5-54: Selection and erection of electrical equipment – Earthing arrangements, protective conductors and protective bonding conductors
IEC 60364-5-55:2001	Electrical installations of buildings – Part 5-55: Selection and erection of electrical equipment – Other equipment

IEC 60445	Basic and safety principles for man-machine interface, marking and identification – Identification of equipment terminals and of terminations of certain designated conductors, including general rules for an alphanumeric system
IEC 60446	Basic and safety principles for man-machine interface, marking and identification – Identification of conductors by colours or numerals
IEC 60617-DB:2001 ⁽²⁾	Graphical symbols for diagrams

² "DB" refers to the IEC on-line database.

註⁽²⁾ “DB” 參照 IEC 線上資料庫。

IEC 60721 (all parts) Classification of environmental conditions

13 Fundamental principles

NOTE 1 Where countries not yet having national regulations for electrical installations deem it necessary to establish legal requirements for this purpose, it is recommended that such requirements be limited to fundamental principles which are not subject to frequent modification on account of technical development. The contents of Clause 13 may be used as a basis for such legislation.

NOTE 2 This clause contains basic requirements. In other parts of this standard (see Table A.2), more detailed requirements may be given.

13. 基本原則

備考 1. 凡未備有電機裝備之國家法規的國家認為有必要建立法律要求者，建議此類要求僅限於基本原則，不跟隨技術之進步而頻於修訂。本節內容可作為此類立法之基礎。

備考 2. 本節包含各項基本要求。本系列標準之其他標準(參照表 A.2)中，可能會有更詳細之要求。

131 Protection for safety

131.1 General

The requirements stated in 131.2 to 131.7 are intended to provide for the safety of persons, livestock and property against dangers and damage which may arise in the reasonable use of electrical installations. The requirements to provide for the safety of livestock are applicable in locations intended for them.

NOTE In electrical installations, the following hazards may arise:

- shock currents;
- excessive temperatures likely to cause burns, fires and other injurious effects;
- ignition of a potentially explosive atmosphere;
- undervoltages, overvoltages and electromagnetic influences likely to cause or result in injury or damage;
- power supply interruptions and/or interruption of safety services;
- arcing, likely to cause blinding effects, excessive pressure, and/or toxic gases;
- mechanical movement of electrically activated equipment.

131 安全保護

131.1 一般

131.2 至 131.7 所述之要求係用以提供人員、家畜及財產之安全，以避免電機裝備於正當使用中可能發生之危險及傷害。此提供家畜安全之要求，可適用於該等活動場所。

備考：電機裝備可能會產生下列風險。

- 衝擊電流。

- 可能會引起灼傷、火災及其他有害效應之過高溫度。
- 潛在爆炸性環境之燃燒。
- 可能會引起或導致傷害或損壞之欠電壓、過電壓及電磁干擾。
- 電力中斷及/或提供安全服務之中斷。
- 可能會引起盲光效應、過度壓力及/或有害氣體之弧光。
- 電氣上活動設備之機械性移動。

131.2 Protection against electric shock

131.2.1 Basic protection (protection against direct contact)

NOTE For low-voltage installations, systems and equipment, basic protection generally corresponds to protection against direct contact.

Protection shall be provided against dangers that may arise from contact with live parts of the installation by persons or livestock.

This protection can be achieved by one of the following methods:

- preventing a current from passing through the body of any person or any livestock;
- limiting the current which can pass through a body to a non-hazardous value.

131.2 電擊之保護

131.2.1 基本保護(防直接接觸之保護)

備考：低電壓裝備、系統及設備之基本保護通常均能合乎直接接觸保護之要求。

對人員或家畜與裝備之帶電零件接觸而引起之危險，應備有保護措施。

此保護措施可藉由下列方法之一達成。

- 防止電流通過任何人員或家畜之身體。
- 會通過身體之電流限制在不會發生危害之值以內。

131.2.2 Fault protection (protection against indirect contact)

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.

Protection shall be provided against dangers that may arise from contact with exposed-conductive-parts of the installation by persons or livestock.

This protection can be achieved by one of the following methods:

- preventing a current resulting from a fault from passing through the body of any person or any livestock;
- limiting the magnitude of a current resulting from a fault, which can pass through a body, to a non-hazardous value;
- limiting the duration of a current resulting from a fault, which can pass through a body, to a non-hazardous time period.

131.2.2 防故障之保護(防間接接觸之保護)

備考：低電壓裝備、系統及設備之故障保護通常均能合乎間接接觸保護之要求，主要為關於基本絕緣之失效。

對人員或家畜與裝備之外露導電零件接觸而引起之危險，應備有保護措施。

此保護措施可藉由下列方法之一達成。

- 防止故障產生之電流通過任何人員或家畜之身體。
- 將故障所產生並通過身體內之電流大小，限制在無危險之值。
- 將故障所產生並通過身體內之電流通過時間，限制在無危險之時間以內。

131.3 Protection against thermal effects

The electrical installation shall be so arranged to minimize the risk of damage or ignition of flammable materials due to high temperature or electric arc. In addition, during normal operation of the electrical equipment, there shall be no risk of persons or livestock suffering burns.

131.3 防熱效應之保護

電機裝備應予妥善配置，以降低由於高溫或電弧而使可燃性材料受損或燃燒之風險至最低限度。另外，在電機設備正常運轉期間，人員或家畜應無受灼傷之風險。

131.4 Protection against overcurrent

Persons and livestock shall be protected against injury and property shall be protected against damage due to excessive temperatures or electromechanical stresses caused by any overcurrents likely to arise in conductors.

Protection can be achieved by limiting the overcurrent to a safe value or duration.

131.4 防過電流之保護

導體內可能因任何之過電流而引起溫度過高或產生機電應力，故人員及家畜應受保護以免受傷，財產亦應受保護以免受損。

過電流之保護可藉由限制過電流在安全值以內或限制過電流通過時間達成。

131.5 Protection against fault currents

Conductors, other than live conductors, and any other parts intended to carry a fault current shall be capable of carrying that current without attaining an excessive temperature. Electrical equipment, including conductors shall be provided with mechanical protection against electromechanical stresses of fault currents as necessary to prevent injury or damage to persons, livestock or property.

Live conductors shall be protected against overcurrents arising from faults by the methods in 131.4.

NOTE Particular attention should be given to PE conductor and earthing conductor currents.

131.5 防故障電流之保護

導體(帶電導體除外)及任何其他零件擬用於承載故障電流者，應能承載該電流而不會使溫度過高。電機設備，包含導體在內，應具備所需之機械性保護能力以抗拒機電應力，避免人員、家畜或財產受到傷害或損害。

帶電導體應以 131.4 所述之方法加以保護，以免因故障時發生過電流現象。

備考：對 PE 導體及接地導體之電流，須特加注意。

131.6 Protection against voltage disturbances and measures against electromagnetic influences

131.6.1 Persons and livestock shall be protected against injury and property shall be protected against any harmful effects as a consequence of a fault between live parts of circuits supplied at different voltages.

131.6.2 Persons and livestock shall be protected against injury and property shall be protected against damage as a consequence of overvoltages such as those originating from atmospheric events or from switching.

NOTE For protection against direct lightning strikes, see IEC 62305 series.

131.6.3 Persons and livestock shall be protected against injury and property shall be protected against damage as a consequence of undervoltage and any subsequent voltage recovery.

131.6 防電壓擾動之保護及防電磁干擾之措施

131.6.1 人員及家畜均應加以保護，以免受到傷害；財產亦應加以保護，以免發生任何有害之效應。因此等結果可能均由不同電壓所供電之電路上的帶電零件相互間發生之故障所引起。

131.6.2 人員及家畜均應加以保護，以免受到傷害；財產亦應加以保護，以免遭受損害。因此等結果可能均由周圍環境事件或開關操作而導致之過電壓所引起。

備考：關於直擊雷之保護，參照 IEC 62305 系列標準。

131.6.3 人員及家畜均應加以保護，以免受到傷害；財產亦應加以保護，以免遭受損害。因此等結果可能均由低電壓及任何繼起之電壓復元所引起。

131.6.4 The installation shall have an adequate level of immunity against electromagnetic disturbances so as to function correctly in the specified environment. The installation design shall take into consideration the anticipated electromagnetic emissions, generated by the installation or the installed equipment, which shall be suitable for the current-using equipment used with, or connected to, the installation.

131.6.4 電機裝備應備有充分之免疫位準以抗拒電磁擾動，俾便在規定之環境中能正確發揮其功能。此裝備於設計時應將該裝備本身或安裝之設備所產生之預期電磁放射量列入考量。此設計應能適合現時使用(current-using)之設備與該裝備一併使用或與其連接。

131.7 Protection against power supply interruption

Where danger or damage is expected to arise due to an interruption of supply, suitable provisions shall be made in the installation or installed equipment.

131.7 防斷電之保護

預期斷電會發生危險或損害時，裝備或所安裝之設備應備有預防措施。

132 Design

132.1 General

For the design of the electrical installation, the following factors shall be taken into account to provide

- the protection of persons, livestock and property in accordance with Clause 131;
- the proper functioning of the electrical installation for the intended use.

The information required as a basis for design is listed in 132.2 to 132.5. The requirements with which the design shall comply are stated in 132.6 to 132.12.

132 設計

132.1 一般

電機裝備於設計時，應考量下列因素，以備

- 人員、家畜及財產均能依第 131 節加以保護。
- 電機裝備擬於運轉時能正確發生功用。

設計時所需之基礎資訊列示於 132.2 至 132.5；至於設計時所需符合之要求事項則於 132.6 至 132.12 中敘述。

132.2 Characteristics of available supply or supplies

When designing electrical installations in accordance with IEC 60364 series it is necessary to know the characteristics of the supply. Relevant information from the network operator is necessary to design a safe installation according to IEC 60364 series. The characteristics of the power supply should be included in the documentation to show conformity with IEC 60364 series. If the network operator changes the characteristics of the power supply this may affect the safety of the installation.

132.2 可用電源之特性

當電機裝備於依本系列標準設計時，有需先瞭解電源之特性。當依本系列標準之規定擬設計出一套安全之裝備時，有必要獲取來自網路管理員(network operator)之相關資訊。電源之特性須登載於文件中，以顯現其與本系列標準之一致性。一旦網路管理員改變了電源之特性，此將可能影響裝備之安全性。

132.2.1 Nature of current: a.c. and/or d.c.

132.2.2 Function of conductors:

- for a.c.: line conductor(s);
neutral conductor;
protective conductor.
- for d.c.: line conductor(s);
midpoint conductor;
protective conductor.

NOTE The function of some conductors may be combined in a single conductor.

132.2.1 電流種類：交流及/或直流。

132.2.2 導體之功能如下。

- 交流：線導體。
中性導體。
保護性導體。
- 直流：線導體。
中點導體。
保護性導體。

備考：單一導體可兼具若干導體之功能。

132.2.3 Values and tolerances:

- voltage and voltage tolerances;
- voltage interruptions, voltage fluctuations and voltage dips;
- frequency and frequency tolerances;
- maximum current allowable;
- earth fault loop impedance upstream of the origin of the installation;
- prospective short-circuit currents.

For standard voltages and frequencies, see IEC 60038.

132.2.3 量值與許可差如下。

- 電壓及電壓許可差。
- 電壓中斷、電壓波動及電壓驟降。
- 頻率及頻率許可差。
- 最大可容許之電流。
- 裝備之原始上游接地故障環路阻抗(earth fault loop impedance upstream of the origin of the installation)。

— 預期短路電流。

有關標準電壓及頻率，參照 IEC 60038。

132.2.4 Protective provisions inherent in the supply, for example, system earthing or mid-point earthing.

132.2.5 Particular requirements of the supply undertaking.

132.2.4 電源之固有保護性規定，例：系統接地或中點接地。

132.2.5 電力事業之個別要求。

132.3 Nature of demand

The number and type of circuits required for lighting, heating, power, control, signalling, information and communication technology, etc. shall be determined by

- location of points of power demand;
- loads to be expected on the various circuits;
- daily and yearly variation of demand;
- any special conditions such as harmonics;
- requirements for control, signalling, information and communication technology, etc;
- anticipated future demand if specified.

132.3 需求之本質

照明、暖氣、電力、監控、發信、資通訊技術等所需之電路數及型式，應取決於

- 電力需求點之位置。
- 各種電路所預期之負載。
- 日及年需求變化量。
- 任何特殊情況，如諧波現象。
- 監控、發信、資通訊技術等之要求事項。
- 若有規定時之未來預期需求量。

132.4 Electric supply systems for safety services or standby electric supply systems

- Source of supply (nature, characteristics).
- Circuits to be supplied by the electric source for safety services or the standby electrical source.

132.4 安全設施電力系統或備用電力系統

- 電源(種類、特性)。
- 安全設施之電源或備用電源所供電之電路。

132.5 Environmental conditions

The design of the electrical installation shall take into account the environmental conditions to which it will be subjected, see IEC 60364-5-51 and IEC 60721.

132.5 環境條件

電機裝備於設計時應考量其所處之環境條件。參照 IEC 60364-5-51 及 IEC 60721。

132.6 Cross-sectional area of conductors

The cross-sectional area of conductors shall be determined for both normal operating conditions and for fault conditions according to

- a) their admissible maximum temperature;
- b) the admissible voltage drop;
- c) the electromechanical stresses likely to occur due to earth fault and short-circuit currents;
- d) other mechanical stresses to which the conductors can be subjected;
- e) the maximum impedance with respect to the functioning of the protection against fault currents;
- f) the method of installation.

NOTE The items listed above concern primarily the safety of electrical installations. Cross-sectional areas greater than those required for safety may be desirable for economic operation.

132.6 導體截面積

導體截面積應針對正常操作狀況及故障狀況兩者依下列各項加以決定。

- (a) 導體可接受之最高溫度。
- (b) 可接受之電壓降。
- (c) 由於接地故障及短路電流而可能發生之機電應力。
- (d) 導體可能遭遇之其他機械應力。
- (e) 與故障電流防護功能運作有關之最大阻抗。
- (f) 安裝方法。

備考：以上所列項目主要與電機裝備之安全有關。為了經濟運轉，比安全上所需更大截面積值得採納。

132.7 Type of wiring and methods of installation

For the choice of the type of wiring and the methods of installation the following shall be taken into account:

- the nature of the locations;
- the nature of the walls or other parts of the building supporting the wiring;
- accessibility of wiring to persons and livestock;
- voltage;
- the electromagnetic stresses likely to occur due to earth fault and short-circuit currents;
- electromagnetic interference;
- other stresses to which the wiring can be subjected during the erection of the electrical installation or in service.

132.7 配線型式及安裝方法

選擇配線型式及安裝方法時，應考量下列事項。

- 場地之種類。
- 圍牆之種類或建築物上支撐配線之其他部位。
- 人員及家畜對配線之可接近性。
- 電壓。
- 由於接地故障及短路電流而可能發生之電磁應力。
- 電磁干擾。
- 電機裝備於建造或運轉期間，配線所能承受之其他應力。

132.8 Protective equipment

The characteristics of protective equipment shall be determined with respect to their function which may be, for example, protection against the effects of

- overcurrent (overload, short-circuit);
- earth fault current;
- overvoltage;
- undervoltage and no voltage.

The protective devices shall operate at values of current, voltage and time which are suitably related to the characteristics of the circuits and to the possibilities of danger.

132.8 保護性設備

保護性設備之特性應就其具有之功能加以決定，例：對下列效應之保護。

- 過電流(過負載、短路)。
- 接地故障電流。
- 過電壓。
- 欠電壓及無電壓。

保護性裝置應於與電路特性及發生危險之可能性適度有關聯之電流值、電壓值及時間之下動作。

132.9 Emergency control

Where, in case of danger, there is the necessity for the immediate interruption of supply, an interrupting device shall be installed in such a way that it can be easily recognized and effectively and rapidly operated.

132.9 緊急控制

於危險狀況發生時，凡需要立即中斷電源之處，應裝設中斷裝置，以便易於認出且能有效且快速動作。

132.10 Disconnecting devices

Disconnecting devices shall be provided so as to permit switching and/or isolation of the electrical installation, circuits or individual items of apparatus as required for operation, inspection and fault detection, testing, maintenance and repair.

132.10 切離裝置

應備有切離裝置，以便容許進行開關操作及/或隔離電機裝備、電路或設備之各項器具，以供執行操作、檢驗與故障偵測、試驗、維護及修理作業。

132.11 Prevention of mutual detrimental influence

The electrical installation shall be arranged in such a way that no mutual detrimental influence will occur between electrical installations and non-electrical installations.

132.11 相互間不利影響之預防

電機裝備應妥予配置，使得電機裝備與非電機裝備相互間不會有不利之影響。

132.12 Accessibility of electrical equipment

The electrical equipment shall be arranged so as to afford as may be necessary:

- sufficient space for the initial installation and later replacement of individual items of electrical equipment;
- accessibility for operation, inspection and fault detection, testing, maintenance and repair.

132.12 電機設備之可接觸性

電機裝備應妥予配置，以便於可能有必要時能提供

- 於最初安裝時及日後更換電機裝備之個別零組件時，能有充分之空間。
- 於操作、檢驗與故障偵測、試驗、維護及修理時之可接近性。

132.13 Documentation for the electrical installation

Every electrical installation shall be provided with appropriate documentation.

132.13 電機裝備之文件

每套電機裝備應備有適當之說明文件。

133 Selection of electrical equipment

133.1 General

Every item of electrical equipment used in electrical installations shall comply with such IEC standards as are appropriate. In the absence of an IEC standard the equipment shall comply with the appropriate national standards. Where there are no applicable standards, the item of equipment concerned shall be selected by special agreement between the person specifying the installation and the installer.

133 電機設備之選擇

133.1 一般

裝在電機裝備上之電機設備，其每件零組件均應符合合適之 IEC 標準。若無 IEC 標準時，該設備應符合合適之 CNS 國家標準。當下若完全無合宜之標準，則設備之相關零組件應經制訂該裝備規範之人員與安裝人員之間取得特別協議後加以選擇。

133.2 Characteristics

Every item of electrical equipment selected shall have suitable characteristics appropriate to the values and conditions on which the design of the electrical installation (see Clause 132) is based and shall, in particular, fulfil the following requirements.

133.2 特性

電機設備內經選用之每一零組件均應具有合宜之特性，以便以合適之數值及條件作為該電機裝備(參照第 132 節)之設計基礎，尤其應履行下述規定。

133.2.1 Voltage

Electrical equipment shall be suitable with respect to the maximum steady-state voltage (r.m.s. value for a.c.) likely to be applied, as well as overvoltages likely to occur.

NOTE For certain equipment, it may be necessary to take account of the lowest voltage likely to occur.

133.2.1 電壓

電機設備應考量能否適應會被施加之最高穩態電壓(交流時為 r.m.s.值)及可能會發生之過電壓。

備考：對某些設備而言，須考量可能會發生之最低電壓。

133.2.2 Current

All electrical equipment shall be selected with respect to the maximum steady-state current (r.m.s. value for a.c.) which it has to carry in normal service, and with respect to the current likely to be carried in abnormal conditions and the period (for example, operating time of protective devices, if any) during which it may be expected to flow.

133.2.2 電流

所有電機設備之選擇應考量其本身於正常運轉中須承載之最大穩態電流(交流時為 r.m.s.值)及在異常狀態中與預期會通過之期間(例：備有保護裝置時之動作時間)內須承載之電流。

133.2.3 Frequency

If frequency has an influence on the characteristics of electrical equipment, the rated frequency of the equipment shall correspond to the frequency likely to occur in the circuit.

133.2.3 頻率

若頻率對電機設備之特性會有影響時，該設備之額定頻率應能與電路上可能發生之頻率相調和。

133.2.4 Load factor

All electrical equipment which is selected on the basis of its power characteristics shall be suitable for the duty demanded of the equipment taking into account the design service conditions, see IEC 60910-02.

133.2.4 負載因數

所有電機設備經根據其電力特性加以選擇者，於設計時應考量其在運轉狀態下能否適應該設備所要求之任務(duty)。參照 IEC 60910-02。

133.3 Conditions of installation

All electrical equipment shall be selected so as to withstand safely the stresses and the environmental conditions (see 132.5) characteristic of its location and to which it may be subjected. If, however, an item of equipment does not have by design the properties corresponding to its location, it may be used on condition that adequate additional protection is provided as part of the completed electrical installation.

133.3 安裝條件

所有電機設備應妥予選擇，以便能安全耐受應力及在其安裝場所可能承受之環境條件(參照 132.5)。然而若設備在設計上有一項性能無法符合其安裝場所之要求時，僅能於完整之電機裝備中具備充分之額外保護措施作為在其一部分之性能條件下，始能使用。

133.4 Prevention of harmful effects

All electrical equipment shall be selected so that it will not cause harmful effects on other equipment or impair the supply during normal service including switching operations. In this context, the factors which can have an influence include, for example:

- power factor;
- inrush current;
- asymmetrical load;
- harmonics;
- transient overvoltages generated by equipment in the installation.

133.4 有害影響之防制

所有電機設備應妥予選擇，以便不致對其他設備產生有害之影響，或在正常運轉中(包括開關操作作業)損害電源。在本標準內文中，會有影響之因素舉例而言，包括下列。

- 功率因數。
- 湧入電流(inrush current)。
- 非對稱負載。
- 諧波。
- 裝備內之設備所產生之暫態過電壓。

134 Erection and verification of electrical installations

134.1 Erection

134.1.1 Good workmanship by competent persons and proper materials shall be used in the erection of the electrical installation. Electrical equipment shall be installed in accordance with the instructions provided by the manufacturer of the equipment.

134. 電機裝備之建造及查證

134.1 建造

134.1.1 電機裝備之建造應利用可勝任人員之優異工藝及適當之材料。電機設備應依設備製造商所提供之說明書安裝。

134.1.2 The characteristics of the electrical equipment, as determined in accordance with Clause 133, shall not be impaired during erection.

134.1.2 依第 133 節所決定之電機設備特性，於建造中不應遭受損害。

134.1.3 Conductors shall be identified in accordance with IEC 60446. Where identification of terminals is necessary, they shall be identified in accordance with IEC 60445.

134.1.3 導體應依 IEC 60446 加以鑑定。當端子有必要鑑定時，應依 IEC 60445 鑑定。

134.1.4 Connections between conductors and between conductors and other electrical equipment shall be made in such a way that safe and reliable contact is ensured.

134.1.4 導體之間以及導體與其他電機設備之間的連接，應能確保安全且可靠接觸。

134.1.5 All electrical equipment shall be installed in such a manner that the designed heat dissipation conditions are not impaired.

134.1.5 所有電機設備於安裝時，應能使所設計之散熱狀況不受損害。

134.1.6 All electrical equipment likely to cause high temperatures or electric arcs shall be placed or guarded so as to minimize the risk of ignition of flammable materials. Where the temperature of any exposed parts of electrical equipment is likely to cause injury to persons, those parts shall be so located or guarded as to prevent accidental contact therewith.

134.1.6 可能會引起高溫或電弧之所有電機裝備應予配置或保護妥善，以降低可燃性材料燃燒之風險至最低程度。凡電機設備之任何外露零件溫度可能會引起人員傷害時，此等零件應予配置或保護妥善，以防意外之接觸。

134.1.7 Where necessary for safety purposes, suitable warning signs and/or notices shall be provided.

134.1.7 為安全之目的，視需要應備有警示記號及/或告示。

134.1.8 Where an installation is erected by using new materials, inventions or methods leading to deviations from the rules of IEC 60364 series, the resulting degree of safety of the installation shall not be less than that obtained by compliance with IEC 60364 series.

134.1.8 當裝備於建造時所採用之新材料、創意或方法導致與本系列標準之準則有所差異時，其結果之裝備安全等級不應比符合本系列標準之安全等級為低。

134.1.9 In the case of an addition or alteration to an existing installation, it shall be determined that the rating and condition of existing equipment, which will have to carry any additional load, is adequate for the altered circumstances. Furthermore, the earthing and bonding arrangements, if necessary for the protective measure applied for the safety of the addition or alteration, shall be adequate.

134.1.9 當現有之裝備有追加或有變更時，應確認當此裝備有需承載額外負載時，其定額與條件是否能充分適應變更後之狀況。再者，若為需要而對追加或變更採取安全保護措施時，應有足夠之接地與搭接(bonding)之安排。

134.2 Initial verification

Electrical installations shall be verified before being placed in service and after any important modification to confirm proper execution of the work in accordance with this standard.

134.2 初始查證

電機裝備於投入運轉前及任何重要之修正後，應確認其是否能依本標準之規定正確執行工作。

134.3 Periodic verification

It is recommended that every electrical installation is subjected to periodic verification.

134.3 定期查證

建議對每套電機裝備進行定期查證。

20 Terms and definitions

For the purposes of this document, the terms and definitions of IEC 60050-826 apply. For further explanations to several terms of IEC 826, see Annex B.

20. 用語及定義

IEC 60050-826 之用語及定義適用於本標準。至於若干 IEC 826 用語之進一步解釋，參照附錄 B。

30 Assessment of general characteristics

An assessment shall be made of the following characteristics of the installation in accordance with the clauses indicated:

- the purposes for which the installation is intended to be used, its general structure and its supplies (Clauses 31, 35 and 36);
- the external influences to which it is to be exposed (Clause 32);
- the compatibility of its equipment (Clause 33);
- its maintainability (Clause 34).

30. 一般特性之評鑑

下列之裝備特性應依括弧內所示之節次內容加以評估。

- 裝備之使用目的，其一般結構及其電源(第 31 節、第 35 節及第 36 節)。
- 裝備所暴露之對外影響(第 32 節)。
- 其設備之相容性(第 33 節)。
- 維護性(第 34 節)。

Those characteristics shall be taken into account in the choice of methods of protection for safety (see IEC 60364-4-41 to IEC 60364-4-44) and the selection and erection of equipment (see IEC 60364-5-51 to IEC 60364-5-55).

NOTE For other types of installation, for example, for telecommunication installations or Home and Building Electronic Systems (HBES) etc., account should be taken of IEC standards relevant to the type of installation concerned. For telecommunication installations, also the publications of the ITU-T and ITU-R are to be taken into account.

於選擇安全保護方式(參照 IEC 60364-4-1 至 IEC 60364-4-44)及設備之選定與建造(參照 IEC 60364-5-51 至 IEC 60364-5-55)時，該等特性應列入考量。

備考：對其他型式之裝備，例：遠距通信裝備或住宅及建物電子系統(HBES)等，須注意裝備型式有關之 IEC 標準。尤須對遠距通信裝備，亦須將 ITU-T 及 ITU-R 之刊物列入考量。

31 Purposes, supplies and structure

311 Maximum demand and diversity

For economic and reliable design of an installation within thermal and voltage drop limits, a determination of maximum demand is essential. In determining the maximum demand of an installation, or part thereof, diversity may be taken into account.

31. 用途、電源與結構

311 最大需求與多樣性

為求裝備於溫度與電壓降之限度範圍內求取經濟與可靠之設計，最大需求之確定乃為極重要之事。於確立裝備或其一部分之最大需求時，多樣性可列入考量。

312 Conductor arrangement and system earthing

The following characteristics shall be assessed:

- arrangements of current-carrying conductors under normal operating conditions;
- types of system earthing.

312 導體之配置與系統之接地

下列特性應予評估。

- 於正常運轉狀況下，載流導體之配置。
- 系統接地之型式。

312.1 Current-carrying conductors depending on kind of current

NOTE The conductor arrangements described in this clause are not exhaustive. They are included as examples of typical arrangements. It is recommended to report other arrangements to the IEC.

The following arrangements of current-carrying conductors under normal operating conditions are taken into account in this standard:

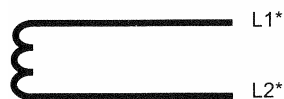
312.1 依電流種類配置之載流導體

備考：本節所述之導體配置方式並非完整，僅為典型配置之範例。建議向 IEC 制訂機構推介其他配置方式。

下列載流導體在正常運轉狀況下，其配置方式於本標準中列入考量。

312.1.1 Current-carrying conductors in a.c. circuits

312.1.1 交流電路中之載流導體

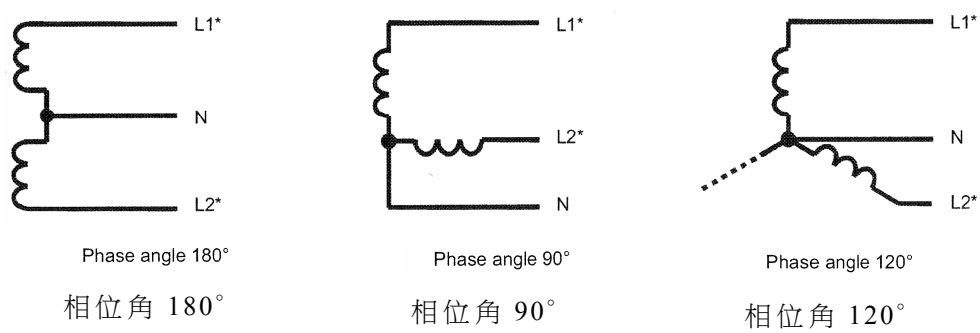
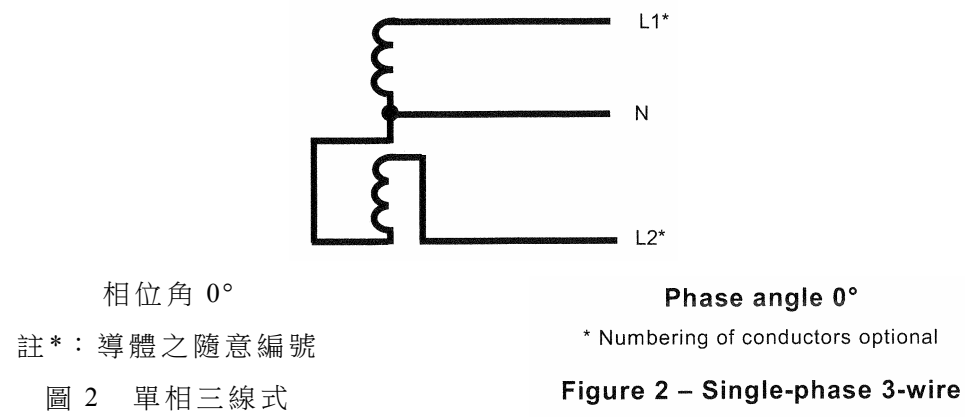


註*：導體之隨意編號

* Numbering of conductors optional

圖 1 單相二線式

Figure 1 – Single-phase 2-wire



註*：導體之隨意編號

圖 3 二相三線式

* Numbering of conductors optional

Figure 3 – Two-phase 3-wire

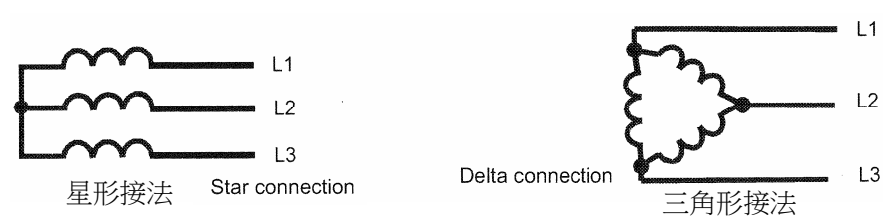


Figure 4 – Three-phase 3-wire

圖 4 三相三線式

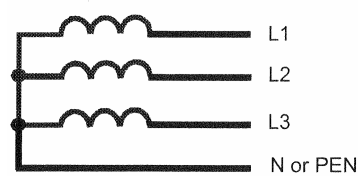


Figure 5 – Three-phase 4-wire

圖 5 三相四線式