

Table 11(6)

Minimum Cross-sectional Area of Protective Conductor for Circuit Protected by Miniature Circuit Breaker (MCB) Type 3, Type B & Type C to IEC 60898 or Equivalent

MCB Rating (Amp)		5	10	15	20	30	50	60	80	100
Minimum cross-sectional area (sq. mm) of protective conductor for 5 sec. (not including within 0.4 sec.) disconnection	Copper	1	1.5	2.5	2.5	4	10	10	16	16
	Aluminum	16	16	16	16	16	16	16	16	25
Minimum cross-sectional area (sq. mm) of protective conductor for 0.4 sec. disconnection	(Please refer to Table 11(5))									

Note: The table is based on nominal voltage to earth with nominal voltage U_0 at 220V and for reference only. Please refer to the manufacturer's data.

Table 11(7)

Minimum Cross-sectional Area of Protective Conductor for Circuit Protected by Moulded Case Circuit Breaker (MCCB) to IEC 60947-2 or Equivalent for 5 Sec. Disconnection

MCCB Rating (Amp)		30	50	60	100	150	200	250	300	400
Minimum cross-sectional area (sq. mm) of protective conductor	Copper	6	10	10	10	10	10	10	16	16
	Aluminum	16	16	16	16	16	16	16	25	25

Note: The table is based on nominal voltage to earth with nominal voltage U_0 at 220V and for reference only. Please refer to the manufacturer's data.

Table 11(8)

Maximum Earth Fault Loop Impedance for 0.4 Sec Disconnection when the Circuit is Protected by General Purpose (gG) Fuses and Motor Circuit Application (gM) fuses to BS88-2 Fuse Systems E (bolted) and G (clip-in) with Nominal Voltage U_0 220V

Fuse Rating (Amp)	2	4	6	10	16	20	25	32
Zs (ohm)	33.3	15.7	7.85	4.68	2.44	1.69	1.29	1.00

Note: The table is based on nominal voltage to earth with nominal voltage U_0 at 220V and for reference only. Please refer to the manufacturer's data.

Table 11(9)

Maximum Earth Fault Loop Impedance for 0.4 Sec. Disconnection when the Circuit is Protected by Fuses to BS1361 or Equivalent with Nominal Voltage U_o 220V

Fuse Rating (Amp)	5	15	20	30	45
Z _s (ohm)	10	3.1	1.6	1.1	0.55

Note: The table is based on nominal voltage to earth with nominal voltage U_o at 220V and for reference only. Please refer to the manufacturer's data.

Table 11(10)

Maximum Earth Fault Loop Impedance for 0.2 Sec., 0.4 Sec. and 5 Sec. Disconnection when the Circuit is Protected by Miniature Circuit Breaker (MCB) to IEC 60898 or Equivalent with Nominal Voltage U_o 220V

Rating (Amp)	6	10	16	20	32	40	50	63	80	100
Z _s (ohm) for type B MCB and RCBO	7.33	4.4	2.75	2.2	1.38	1.1	0.88	0.70	0.55	0.44
Z _s (ohm) for type C MCB and RCBO	3.67	2.2	1.38	1.1	0.69	0.55	0.44	0.35	0.28	0.22

Note: The table is based on nominal voltage to earth with nominal voltage U_o at 220V and for reference only. Please refer to the manufacturer's data.

Table 11(11)

Maximum Earth Fault Loop Impedance for 5 Sec Disconnection when the Circuit is Protected by General Purpose (gG) Fuses and Motor Circuit Application (gM) fuses to BS88-2 Fuse Systems E (bolted) and G (clip-in) with Nominal Voltage U_o 220V

Fuse Rating (Amp)	2	4	6	10	16	20	25	32	40	50	63	80	100	125	160	200
Z _s (ohm)	44.0	20.9	12.2	6.87	4.00	2.82	2.20	1.76	1.29	1.00	0.78	0.55	0.42	0.32	0.26	0.18

Note: The table is based on nominal voltage to earth with nominal voltage U_o at 220V and for reference only. Please refer to the manufacturer's data.

- (iii) Determine the current carrying capacity of the conductors required by applying suitable correction factors to the nominal setting or current rating of the overcurrent protective device as divisors.

Typical correction factors for ambient temperature, grouping, thermal insulation and type of protective device are given in Appendix 5.

- (iv) Choose suitable size of the conductors according to the current carrying capacity required. Appendix 6 gives the current carrying capacities for various copper conductor sizes of PVC/XLPE insulated cables according to their installation methods. For other types of cables, reference should be made to BS 7671 or IEC 60364.
- (v) The resulting voltage drop in the circuit should be checked so that under normal service conditions the voltage at the terminals of any fixed current using equipment should be greater than the lower limit corresponding to recognised standards relevant to the equipment.

Where the fixed current using equipment concerned is not the subject of a recognised standard, the voltage at the terminals should be such as not to impair the safe function of that equipment.

The above requirements are deemed to be satisfied if the voltage drop between the origin of the installation (usually the supply terminals) and the fixed current using equipment does not exceed 4% of the nominal voltage of the supply.

A greater voltage drop may be accepted for a motor during starting periods and for other equipment with high inrush current provided that voltage variations are within the limits specified in the relevant recognised standards for the equipment or, in the absence of a recognised standard, in accordance with the manufacturer's recommendations.

Table in Appendix 6 also gives the values of voltage drop caused by one ampere for a metre run of PVC/XLPE insulated cables with copper conductors.

If the voltage drop so determined is unsatisfactory, a conductor of larger size should be chosen accordingly.

(4) *Typical sizes of cable conductor used in general installations*

For general installations under the conditions listed below, the sizes of copper conductor in compliance with Table 13(1) are generally acceptable:

**Checklist No. 2—Additional Items For New L.V. Installation
or Items For Periodic Testing of L.V.
Installations connected on or after 1.1.85
but before 1.6.92**

Installation Address: _____

Tested by/Date
(N/A if not applicable)

(a) *Earth*

- (i) A warning notice 'SAFETY *EARTH/
ELECTRICAL CONNECTION — DO NOT
REMOVE and '安全接地終端 —— 切勿移去'
provided at all main earthing terminal
and main bonding connections. _____
- (ii) Main equipotential bonding conductors
effectively connected to main water pipes,
main gas pipes, other services pipes/ducting
and exposed metallic parts of structural
framework. _____
- (iii) Supplementary equipotential bonding
effectively provided between exposed
conductive parts and extraneous
conductive parts. _____
- (iv) Exposed conductive parts of fixed
equipment installed outside equipotential
zone effectively earthed for the required
disconnection time. _____
- (v) Exposed conductive parts of fixed
equipment installed within equipotential
zone effectively earthed for the required
disconnection time. _____
- (vi) Effectiveness of the main equipotential
bonding connection to the main earthing
terminal. _____
- (vii) Effectiveness of the main equipotential
bonding connection to the lightning
protection system. _____

*Delete whichever is inapplicable

**Checklist No. 3—Additional Items For New L.V. Installation
or Items For Periodic Testing of L.V.
Installations connected on or after 1.6.92**

Installation Address: _____

Tested by/Date
(N/A if not applicable)

(a) *Substations*

- (i) A warning notice 'DANGE—SUBSTATION, UNAUTHORISED ENTRY PROHIBITED' and '危險——電力分站 未經授權不得內進' provided at every entrance of substations in compliance with Code 17A(1). _____
- (ii) Suitable locking facilities provided for H.V. substations in compliance with Code 4F(1)(c). _____
- (iii) Suitable lighting provided in compliance with Code 4F(3)(a). _____
- (iv) Suitable ventilation provided in compliance with Code 4F(3)(a). _____
- (v) Entrance/exit free of obstruction in compliance with Code 4F(2)(c). _____

(b) *Switchrooms*

- (i) A warning notice 'DANGER—ELECTRICITY, UNAUTHORISED ENTRY PROHIBITED' and '危險——有電 未經授權不得內進' provided at every entrance of switchrooms in compliance with Code 17A(2). _____
- (ii) Suitable locking facilities provided for H.V. substations in compliance with Code 4F(1)(c). _____
- (iii) Suitable lighting provided in compliance with Code 4F(3)(a). _____
- (iv) Suitable ventilation provided in compliance with Code 4F(3)(a). _____
- (v) Entrance/exit free of obstruction in compliance with Code 4F(2)(c). _____

(c) *Switchboards, circuit breakers and main switch*

An up-to-date notice of periodic inspection and testing provided at point of supply (i.e. a switchboard, a circuit breaker or a distribution board) of the installation in compliance with Code 17D. _____

Appendix 15B (Sample)

Electrical Safety Assessment Form (電力安全評估表格)

Form No. (表格編號) :

Date (日期) : Time (時間) : Location (地點) :

Details of work to be done (要進行的工程詳情) :

由負責評估者評估

Assessed by (姓名)
Responsible Assessor (Name)

(簽署)
(Signed)

由負責工作人士接收

Received by (姓名)
Person in-charge (Name)

(簽署)
(Signed)

在帶電工作時，如上游開關裝置已停用但中性導體沒有隔離時，請只盡填寫“甲部”。如上游開關裝置沒有停用時，請只盡填寫“乙部”。
Please complete Part A only when carrying out LIVE work with switching device at upstream “OFF” but neutral conductor not isolated. Complete Part B only when carrying out LIVE work with switching device at upstream “ON”

甲部 Part A

帶電工作時上游開關器件狀況

(Condition of Switching Device at Upstream under LIVE WORK)

- 三極及中性線連桿空氣斷路器停用中 TPN ACB “OFF” 三極及中性線連桿模製外殼斷路器停用中 TPNMCCB “OFF”
- 三極及中性線連桿熔斷器開關擊停用中 TPN Fused-Switch “OFF” 單極微型斷路器停用中 Single -pole MCB “OFF”
- 單極開關擊停用中 Single-Pole Switch “OFF” 其他 (請註明)
Others (Please specify)

請在適當方格加上剔號

Please tick in the appropriate boxes

注意：

➤ 小心中性導體有電

CAUTION : ➤ 請確認電力器具已放電

➤ 請確認相性導體已截斷電源

➤ 請使用適當的個人保護設備

BEWARE OF ELECTRICITY AT NEUTRAL CONDUCTORS

ENSURE ELECTRICAL EQUIPMENT HAS BEEN DISCHARGED

ENSURE PHASE CONDUCTORS HAVE BEEN MADE DEAD

PLEASE USE APPROPRIATE PERSONAL PROTECTIVE EQUIPMENT (PPE)

乙部 Part B

帶電工作時上游開關器件狀況

(Condition of Switching Device at Upstream under LIVE WORK)

- 請在適當方格加上剔號
- Please tick in the appropriate boxes
- 四極空氣斷路器供電中 4P ACB "ON" 四極模對外殼斷路器供電中 4P MCCB "ON"
- 三極及中性線連桿模對外殼斷路器供電中 TPNACB "ON" 三極及中性線連桿空氣斷路器供電中 TPN ACB "ON"
- 雙極開關型供電中 Double-pole Switch "ON" 雙極微型斷路器供電中 Double-pole MCB "ON"
- 單極開關型供電中 Single-pole Switch "ON" 單極微型斷路器供電中 Single-pole MCB "ON"
- 其他 (請註明)
- Others (Please specify)

在帶電工作時，沒有將上游開關器件停用的原因 (見附錄 15)

- Reasons for keeping switching device at upstream "ON" when carrying out LIVE work (see Appendix 15)
- 從安全的角度 (不論是否從電力安全的角度) 來看，有需要帶電進行工作 (例如醫院設備進行電力工作)
- It is necessary in the interests of safety, whether or not electrical safety, for the work to be performed while the electrical equipment is energized (e.g. work on hospital equipment)
- 有必要提供電力，以便適當地進行電力量度 (例如進行測試及故障探測)
- A supply of electricity is essential for the proper performance of the electrical measurement (e.g. testing and fault finding)
- 除了在器具帶電的情況下進行電力工作外，沒有其他切實可行的選擇 (例如不獲准進行帶電工作，樓宇會出現廣泛停電)
- There is no reasonable alternative to perform the electrical work by live work (e.g. widespread outages of a building would occur if live work is not allowed)
- 註冊電業工程人員、註冊電業承辦商及電力裝置擁有人均認為進行這類工作理由充份 (例如隔離電路會為公眾帶來嚴重不便)，並批准進行這類工作
- It is justified and approved by the registered electrical worker, registered electrical contractor and owner of the installation (e.g. serious public inconvenience would arise from isolating the circuits)

評估結果 Evaluation Results	受影響人士及環境 Persons and Environment Affected	建議控制措施 Control Measures Suggested	備註 Remark
<input type="checkbox"/> 觸電 Electric Shock	<input type="checkbox"/> 協助帶電工作的人士 Persons assisting for LIVE WORK	<input type="checkbox"/> 使用適當的帶電作業手持工具 (見附錄 14) The use of appropriate hand tools for live working (see Appendix 14)	
<input type="checkbox"/> 爆炸 Explosion	<input type="checkbox"/> 其他不涉及帶電工作的工人 (例如：建築工人、水喉匠、等等) Other workers not involving in the LIVE WORK (e.g. builders, plumbers, etc.)	<input type="checkbox"/> 使用適當的帶電作業用絕緣材料手套 (見附錄 14) The use of appropriate gloves for live working (see Appendix 14)	
<input type="checkbox"/> 其他 (請註明) Others (Please specify)	<input type="checkbox"/> 附近的住戶/租戶 Tenants in the vicinity <input type="checkbox"/> 附近的公眾 Public in the vicinity	<input type="checkbox"/> 使用適當的安全鞋靴 (見附錄 14) The use of appropriate safety footwear (see Appendix 14) <input type="checkbox"/> 使用適當的電工用絕緣材料膠 (見附錄 14) The use of appropriate matting for electrical purpose (see Appendix 14)	
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> 其他 (請註明) Others (Please specify)	<input type="checkbox"/> 使用適當的電工用絕緣材料毯 (見附錄 14) The use of appropriate blankets for electrical purpose (see Appendix 14)	
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> 使用屏障或其他設備，以防止無意觸及帶電部分 The use of screen or other means to avoid inadvertent contact with live parts	
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> 不應將工具放在電氣設施之內或頂部上 facilities No equipment should be placed inside or at top of electric facilities	
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> 其他 (請註明) Others (Please specify)	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	

工作許可證 PERMIT-TO-WORK

組之處
SECTION/OFFICE
部門
DEPARTMENT

許可證號碼
Permit No.
地點
Location

第 1 部 —— 簽發 (由負責人員填寫)

PART 1. —— ISSUE (to be completed by Responsible Person)

本人謹此聲明，下述電力器具已根據電力(線路)規例工作守則第 4 條的安全規定，截斷電源、隔離、放電和接地（如需要），可以安全進行工程，本人已提醒負責工作人士注意這些安全規定。

I hereby declare that it is safe to work on the following electrical equipment which has been made dead, isolated, discharged and earthed (if necessary) in accordance with the safety precautions in Code 4 of the Code of Practice for the Electricity (Wiring) Regulations. I have drawn the attention of the Person in-charge of the work to these precautions.

本人已向負責工作人士，直接指出該電力器具，說明工程範圍以及講解安全措施。

I have physically identified the electrical equipment, explained the extent of the work and demonstrated the safety arrangements to the Person in-charge.

請在適當方格加上剔號
Please tick in the appropriate boxes

(一) 進行工程的電力器具

(1) ELECTRICAL EQUIPMENT TO BE WORKED ON 高壓固定電力裝置 低壓固定電力裝置
High Voltage Fixed Electrical Installation Low Voltage Fixed Electrical Installation

(甲) 配電箱及其下游部分 (A) Distribution Board and the Parts at Its Downstream

- | | |
|--|---|
| <input type="checkbox"/> 配電箱 Distribution Board | <input type="checkbox"/> 最終電路 Final Circuit |
| <input type="checkbox"/> 插座 Socket Outlet | <input type="checkbox"/> 雙極開關掣 Double Pole Switch |
| <input type="checkbox"/> 單極開關掣 Single Pole Switch | <input type="checkbox"/> 熔斷器連接盒 Fused Connection Unit |
| <input type="checkbox"/> 燈具 Luminaire | <input type="checkbox"/> 熱水爐 Water Heater |
| <input type="checkbox"/> 冷氣機 Air-Conditioner | <input type="checkbox"/> 抽氣扇 Exhaust Fan |
| <input type="checkbox"/> 其他 (請註明)
Others (Please specify) | |

(乙) 配電箱的上游部分 (B) Upstream of Distribution Board

- | | |
|---|---|
| <input type="checkbox"/> 總掣櫃 Main Switchboard | <input type="checkbox"/> 上升總線 Rising Main |
| <input type="checkbox"/> 分配支電路 Distribution Sub-Circuit | <input type="checkbox"/> 支掣櫃 Sub-switchboard |
| <input type="checkbox"/> 匯流排 Busbar Chamber | <input type="checkbox"/> 模製外殼斷路器 MCCB |
| <input type="checkbox"/> 熔斷器開關掣 Fused Switch | <input type="checkbox"/> 其他 (請註明) Others (Please specify) |

(二) 電力器具的地點

(2) LOCATION OF ELECTRICAL EQUIPMENT

- | | |
|--|---|
| <input type="checkbox"/> 掣房 Switch Room | <input type="checkbox"/> 電錶房 Meter Room |
| <input type="checkbox"/> 電線房 Cable Duct Room | <input type="checkbox"/> 房號 Room No. |
| <input type="checkbox"/> 其他 (請註明)
Others (Please specify) | |

(三) 要進行的工程詳情

(3) DETAILS OF WORK TO BE DONE

- 種類 Category 加裝 Addition 改裝 Modification 更換 Replacement 維修 Repair 保養 Maintenance
- 定期檢查、測試及發出證明書 P/T/C 其他(請註明) Others (Please specify)

詳情 Details

(四) 隔離電力器具的確切位置

(4) EXACT POINT WHERE ELECTRICAL EQUIPMENT IS ISOLATED

- | | |
|--|---|
| <input type="checkbox"/> 四極空氣斷路器 4-pole ACB | <input type="checkbox"/> 四極模製外殼斷路器 4-pole MCCB |
| <input type="checkbox"/> 兩極微型斷路器 Double-pole MCB | <input type="checkbox"/> 其他 (請註明) Others (Please specify) |

(五) 電力器具接地的確切位置

(5) EXACT POINTS WHERE ELECTRICAL EQUIPMENT IS EARTHED

(六) 已鎖上安全鎖的位置

(6) SAFETY LOCKS APPLIED AT

(七) 警告告示和危險告示器立位置

(7) CAUTION NOTICES AND DANGER NOTICES HAVE BEEN POSTED AT

(八) 特別指示或安全措施

(8) SPECIAL INSTRUCTIONS, OR SAFETY MEASURES

姓名 Name: (負責人員) (Responsible Person) 簽署 Signed:

聯絡電話號碼 Contact Tel. No: 日期 Date: 時間 Time: