

Specification for

Cooker control units

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Committees responsible for this British Standard

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- Association of Consulting Engineers
- Association of Control Manufacturers [TACMA (BEAMA Ltd.)]
- Association of Manufacturers of Domestic Electrical Appliances
- ASTA Certification Services
- British Electrical Systems Association (BEAMA Ltd.)
- British Electrotechnical Approvals Board
- British Plastics Federation
- Consumer Policy Committee of BSI
- Decorative Lighting Association
- Department of Health
- Department of Trade and Industry (Consumer Safety Unit, CA Division)
- Electrical Installation Equipment Manufacturers' Association (BEAMA Ltd.)
- Electricity Supply Industry in United Kingdom
- Institution of Electrical Engineers
- Lighting Industry Federation Ltd.
- National Inspection Council for Electrical Installation Contracting

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Foreword

This revision of BS 4177 has been prepared under the direction of the Power Electrical Engineering Standards Policy Committee and it supersedes BS 4177:1967, which is withdrawn.

The start and finish of text introduced or altered by Amendment No. 4 is indicated in the text by tags **A1** **A1**.

This revision updates the specification in line with current practices and test methods. Amendment No. 4 introduces certain changes to introduce modern test and performance requirements to verify the suitability of the main switch to provide isolation.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

Compliance with a British Standard cannot confer immunity from legal obligations.

Summary of pages

This document comprises a front cover, an inside front cover, pages i to iv, pages 1 to 49 and a back cover.

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1 Scope

This British Standard specifies requirements and tests for those cooker control units primarily intended for the control of the electric supply to cookers consisting of a main switch with certain auxiliaries and rated at a voltage not exceeding 250 V at 50 Hz. Such units comprise the following:

- a) a main switch, for controlling the electric supply to the cooker, having a rated current not exceeding 45 A;
- b) a socket-outlet and associated switch having a rated current not exceeding 15 A.

Cooker control units complying with this standard are suitable for use under the following conditions:

- 1) in air temperatures from -5°C to $+40^{\circ}\text{C}$ with an average value over a period of 24 h not exceeding $+25^{\circ}\text{C}$;
- 2) where the altitude of the site of installation does not exceed 2 000 m;
- 3) in an atmosphere not subject to pollution by smoke, chemical fumes, rain, spray, prolonged periods of high humidity or other conditions.

NOTE 1 Direct radiation from the sun should be avoided and instructions to this effect are recommended.

In locations where special conditions prevail, e.g. in ships and vehicles, and in hazardous locations, for instance where explosions are liable to occur, special constructions may be required. Appendix A gives a guideline regarding the EMC Directive 89/336/EEC.

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

2 Definitions

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

2.1

cooker control unit

assembly of parts enclosed in a case or mounting box for the purpose of controlling the electric supply to a cooker, as well as the electric supply to other electrical appliances, connected by a plug to the socket-outlet forming an integral part of the cooker control unit

2.2

surface-type cooker control unit

cooker control unit having a case or mounting box which is intended to be mounted on the surface of a wall

2.3

flush-type cooker control unit

cooker control unit having a mounting box which is intended to be recessed into a wall, the bearing surfaces of the cover being mounted flush with the surface of the wall

NOTE For the purpose of attachment and adjustability of flush-type units, the assembly of parts and the cover are considered as one unit.

2.4

panel mounting cooker control unit

cooker control unit intended for incorporation into equipment panels or electrical trunking and which depends upon such incorporation for its enclosure

2.5

mounting box

box in or on a wall, for flush or surface application, intended to house a cooker control unit

2.6

enclosure

mounting box complete with a protective cover or lid

NOTE The protective cover may be part of the cooker control unit.

2.7

cooker circuit

circuit from the cooker control unit to the cooker, including the main switch in the cooker control unit

2.8

auxiliary circuit

circuit from the cooker control unit, including the switched socket-outlet in the cooker control unit supplying the portable appliance intended to be connected thereto

2.9

switch

device designed to make or break the current in one or more electric circuits

2.10

main switch

switch incorporated in the cooker control unit designed to make and break the current in all current-carrying poles of an electric circuit to provide the safe disconnection of the cooker from the supply

2.11

rotary switch

switch having an actuating member which is turned in a circular motion

2.12

actuating member

part which is moved, e.g. pulled, pushed or turned by the user to operate the switch mechanism

2.13

type test

test of one or more cooker control units to show that all units made to the same specification and having the same essential details would pass an identical test

2.14

ambient temperature

specified temperature of the environment within which specified type tests are undertaken

2.15

fine wire thermocouple

thermocouple having wires not exceeding 0.3 mm in diameter

2.16

luminous indicator

luminous means of indicating that the cooker control unit or auxiliary switched socket-outlet, as appropriate, is energized

2.17

terminal

conductive part of a device, provided for reusable electrical connection to external circuits

2.18

terminal with screw clamping

terminal intended for the connection, by clamping only, of external rigid or flexible conductors

2.19

pillar terminal

terminal with screw clamping in which the conductor is inserted into a hole or cavity, where it is clamped under the end of the screw or screws

NOTE 1 The clamping pressure may be applied directly by the end of the screw or through an intermediate clamping member to which pressure is applied by the end of the screw.

NOTE 2 Examples of pillar terminals are given in Table 1 and shown in Figure 1.

Table 1 — Pillar terminals

Conductor capacity of terminal mm ²	Minimum distance <i>g</i> between clamping screw and end of conductor when fully inserted	
	One screw mm	Two screws mm
0.5 to 1.0	1.5	1.5
1.0 to 1.5	1.5	1.5
1.0 to 2.5	1.8	1.5
1.5 to 4.0	1.8	1.5
4.0 to 6.0	2.0	1.5
6.0 to 10.0	2.5	2.0
10.0 to 16.0	3.0	2.0

2.20**screw terminal**

terminal with screw clamping in which the conductor is clamped under the head of the screw

NOTE 1 The clamping pressure may be applied directly by the head of the screw or through an intermediate part, such as a washer, a clamping plate or an anti-spread device.

NOTE 2 Examples of screw terminals are shown in Table 1a and Figure 2.

2.21**stud terminal**

terminal with screw clamping in which the conductor is clamped under a nut

NOTE 1 The clamping pressure may be applied directly by a suitably shaped nut or through an intermediate part, such as a washer, a clamping plate or an anti-spread device.

NOTE 2 Examples of stud terminals are shown in Table 1a and Figure 2.

2.22**saddle terminal**

terminal with screw clamping in which the conductor is clamped under a saddle by means of two or more screws or nuts

NOTE Examples of saddle terminals are shown in Table 1a and Figure 3.

2.23**mantle terminal**

terminal with screw clamping in which the conductor is clamped against the base of a slot in a threaded stud by means of a nut

NOTE 1 The conductor is clamped against the base of the slot by a suitably shaped washer under the nut, by a central peg if the nut is a cap nut, or by equally effective means for transmitting the pressure from the nut to the conductor within the slot.

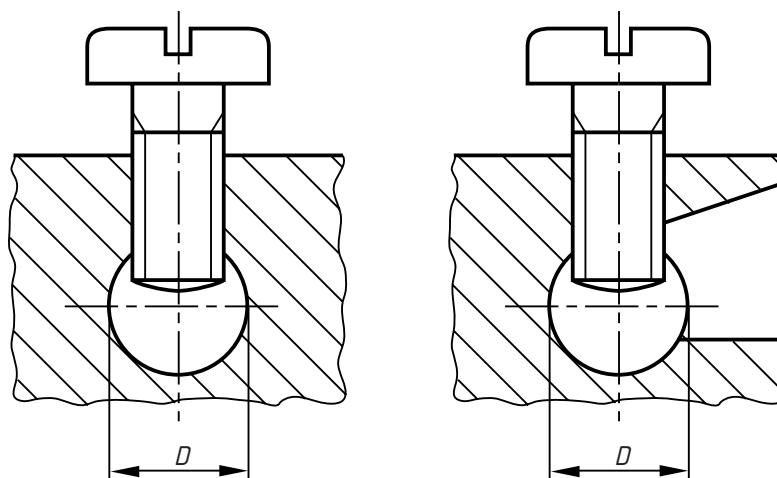
NOTE 2 Examples of mantle terminals are given in Table 2 and shown in Figure 4.

Table 1a — Minimum diameters of conductor spaces

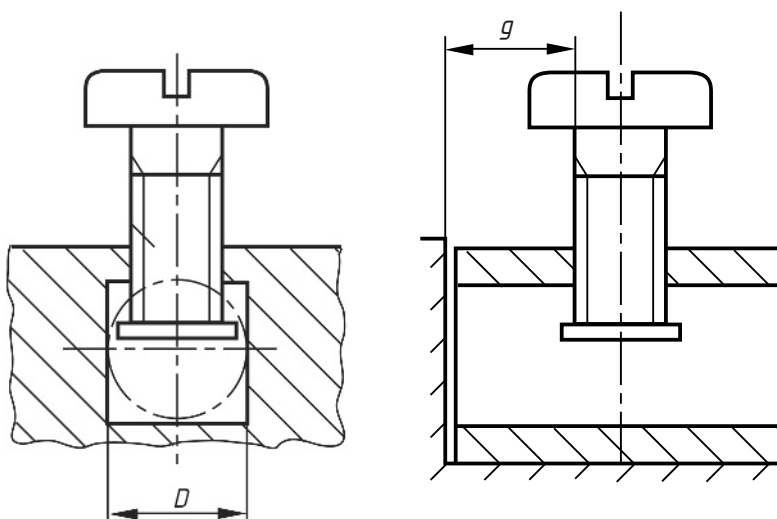
Cross-section of conductor accepted by the terminal capacity mm ²	Minimum diameter <i>D</i> of conductor space			
	Pillar terminals mm	Screw terminals and stud terminals mm	Saddle terminals mm	Mantle terminals mm
Up to 2.5	3.0	2.0	—	2.0
>2.5 to 4.0	3.6	2.7	3.0	2.7
>4.0 to 6.0	4.0	3.6	4.0	3.6
>6.0 to 10.0	4.5	4.3	4.5	4.3
>10.0 to 16.0	5.5	5.5	5.5	5.5

Table 2 — Mantle terminals

Conductor capacity of terminal mm ²	Minimum distance between fixed part and end of conductor when fully inserted mm
0.5 to 1.0	1.5
1.0 to 1.5	1.5
1.0 to 2.5	1.8
1.5 to 4.0	1.8
4.0 to 6.0	2.0
6.0 to 10.0	2.5
10.0 to 16.0	3.0



(a) Terminals without pressure plate



(b) Terminals with pressure plate

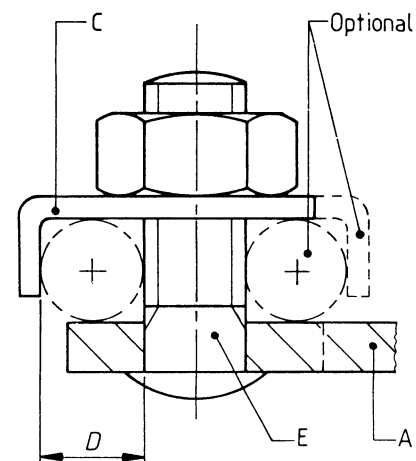
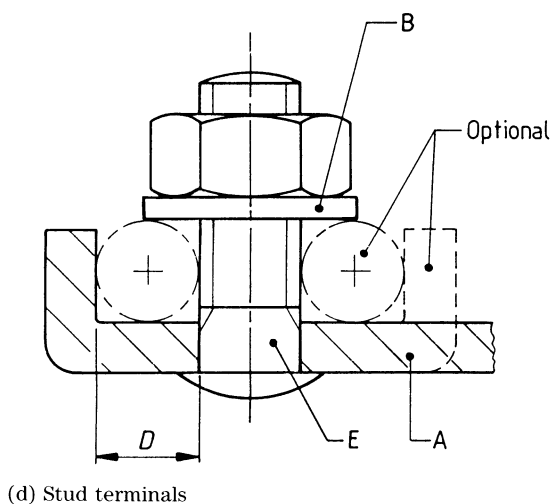
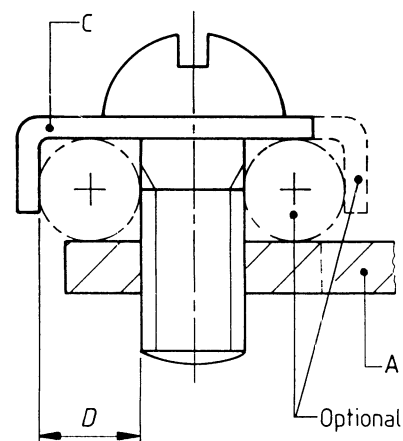
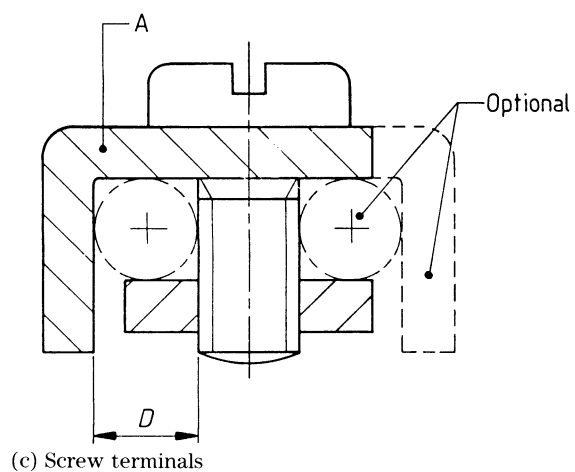
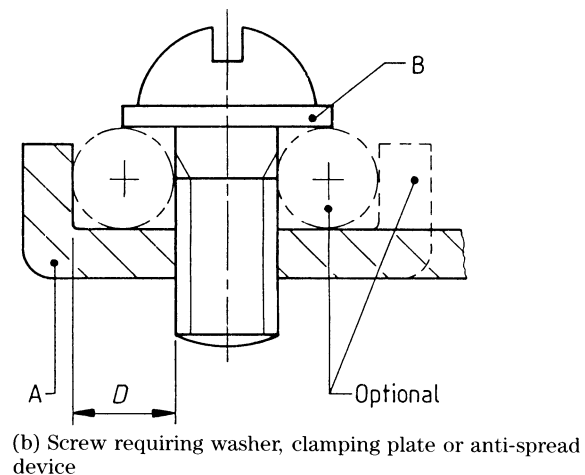
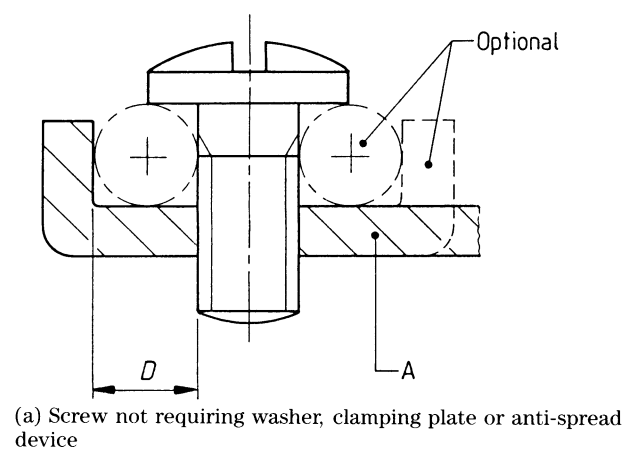
Key

D conductor space
 g minimum distance

NOTE 1 The part of the terminal containing the threaded hole and the part of the terminal against which the conductor is clamped by the screw may be two separate parts as in the case of terminals provided with a stirrup.

NOTE 2 The shape of the conductor space may differ from those shown.

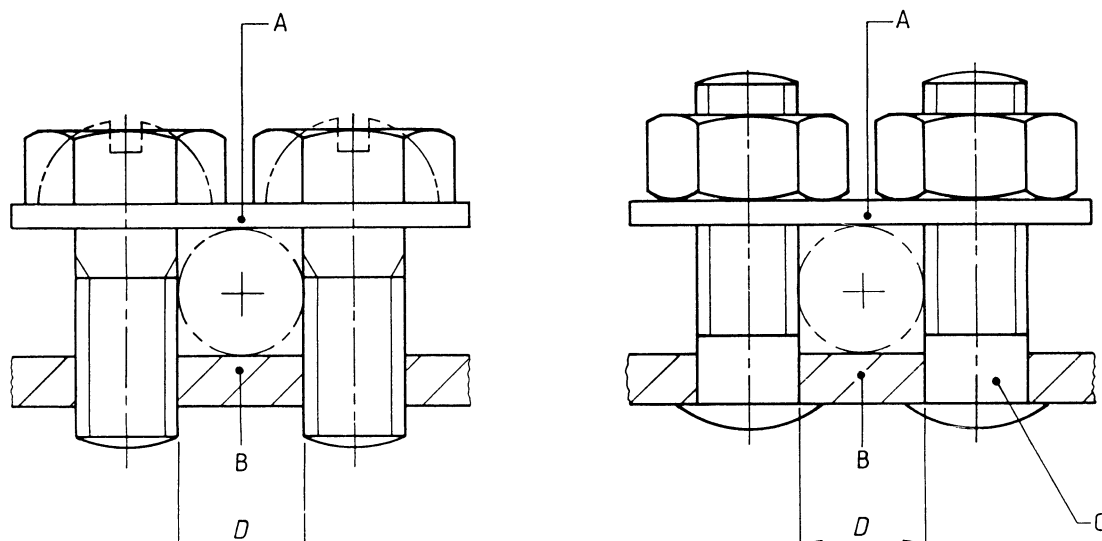
Figure 1 — Pillar terminals

**Key**

A Fixed part D Conductor space
 B Washer or clamping plate E Stud
 C Anti-spread device

NOTE The part which retains the conductor in position may be of insulating material provided the pressure necessary to clamp the conductor is not transmitted through the insulating material.

Figure 2 — Screw terminals and stud terminals

**Key**

A Saddle

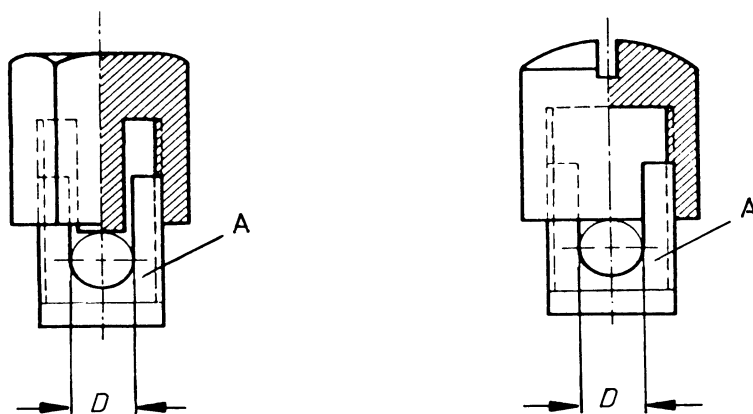
B Fixed part

C Stud

D Conductor space

NOTE 1 The shape of the conductor space may differ from that shown.

NOTE 2 The shape of the upper and lower faces of the saddle may be different, to accommodate conductors of either small or large cross-sectional areas by inverting the saddle.

Figure 3 — Saddle terminals**Key**

A Fixed part

D Conductor space

NOTE It is essential that the bottom of the conductor space is slightly rounded in order to obtain a reliable connection.

Figure 4 — Mantle terminals

2.24

auxiliary switched socket-outlet

socket-outlet, with an associated switch, incorporated within the cooker control unit

2.25

fused auxiliary switched socket-outlet

auxiliary switched socket-outlet incorporating a replaceable fuse-link between the line socket-contact and the line switch contact in the auxiliary circuit

2.26

fuse-link

part of a fuse including the fuse-element that is intended to be replaced after the fuse has been operated

2.27

fuse-carrier

movable or removable part designed to carry, retain, cover and/or remove a fuse-link

2.28

fuse-cover

fuse-carrier specifically intended to cover a fuse-link

2.29

easily removable parts

parts which are removed during the normal installation of the cooker control unit

2.30

basic insulation

insulation applied to live parts to provide basic protection against electric shock

2.31

supplementary insulation

independent insulation applied in addition to basic insulation, in order to ensure protection against electric shock in the event of a failure of the basic insulation

2.32

double insulation

insulation comprising both basic insulation and supplementary insulation

2.33

reinforced insulation

single insulation system applied to live parts, which provides a degree of protection against electric shock equivalent to double insulation under the conditions specified in this standard

NOTE The term “insulation system” does not imply that the insulation has to be one homogeneous piece. It may comprise several layers which cannot be tested singly as supplementary or basic insulation.

2.34

accessible external surfaces

surfaces of a cooker control unit which can be touched by test finger I of BS 3042 when the cooker control unit is installed as in use

2.35

base

part of a cooker control unit retaining current-carrying parts and, in general, the mechanism of a switch or switched socket-outlet, in position

2.36

current carrying parts

live parts and those parts in contact with them during normal use

NOTE Metal parts of the earthing circuit are not considered to be current carrying parts.

** 2.37**

isolation

function intended to make dead, for reasons of safety, all or a discrete section of the electrical installation by separating the electrical installation or section from every source of electrical energy 

3 General

Cooker control units shall be so designed and constructed that, in normal use, their performance is reliable and without danger to the user or surroundings.

NOTE Where tolerances are not specified in this standard the values should be regarded as nominal.

4 Type testing

NOTE The tests in this standard are type tests.

4.1 A manufacturer or responsible vendor who claims compliance with this standard, for any product, shall submit representative type test samples of that product to the relevant tests of this standard in the sequence specified in **4.4**.

NOTE The tests may be made by the manufacturer, or the responsible vendor, or may be made on his behalf by any competent testing laboratory or certification authority.

The results of such tests shall be recorded and retained for reference and inspection.

4.2 Unless otherwise specified, the samples shall be tested as delivered by the manufacturer or responsible vendor and under normal conditions of use.

Cooker control units shall be tested together with their appropriate boxes and/or enclosures.

4.3 Unless otherwise specified, the tests shall be carried out at an ambient temperature of 20 ± 5 °C.

4.4 For cooker control units 15 specimens shall be tested.

Each set of three specimens shall be tested as follows:

- a) three specimens in accordance with all the relevant tests of Clauses **7, 8, 9, 10, 12, 13, 19, 21** and **22**;
- b) three specimens in accordance with Clauses **14, 15** and **11**;
- c) three specimens in accordance with Clauses **16** and **18**;
- d) three specimens in accordance with Clause **17**;
- e) three specimens in accordance with Clauses **20, 23** and **24**.

4.5 If no specimens fail in the complete series of tests, specified in **4.4**, units of that type shall have complied with this standard.

If one specimen fails in any group in the complete series of tests specified in **4.4**, then units of that type shall have failed to comply with this standard, unless that unit can be shown to be not representative of normal production or design, in which case a further set of specimens shall be submitted to the test or tests in that group. If there is no failure in this retest then units of that type shall have complied with this standard.

If more than one specimen fails in the complete series of tests given in **4.4** then units of that type shall have failed to comply with this standard.

5 Ratings

5.1 Cooker control units shall have a rated voltage not exceeding 250 V a.c., at 50 Hz.

5.2 Cooker control units shall have rated currents as follows:

- a) for the switch controlling the electric supply to the cooker, 32 A or 45 A;
- b) for the switched socket-outlet, 13 A or 15 A.

6 Classification

6.1 Cooker control units shall be classified as follows:

- a) according to the method of installation:
 - 1) surface mounting;
 - 2) flush mounting;
 - 3) panel mounting;
- b) according to the auxiliary switched socket-outlet:
 - 1) 13 A, BS 1363 type;
 - 2) 15 A, BS 546 type;
- c) according to the method of enclosure:
 - 1) to suit the box shown in Figure 5;
 - 2) to suit the box shown in Figure 6;
 - 3) to suit the boxes specified in BS 4662;
 - 4) to suit boxes or enclosures not shown in Figure 5, Figure 6 or specified in BS 4662.
- d) according to indication:
 - 1) fitted with luminous indicators or other equivalent apparatus;
 - 2) not fitted with luminous indicators or other equivalent apparatus.

7 Marking

7.1 General

7.1.1 Requirement

Cooker control units shall be marked with the following:

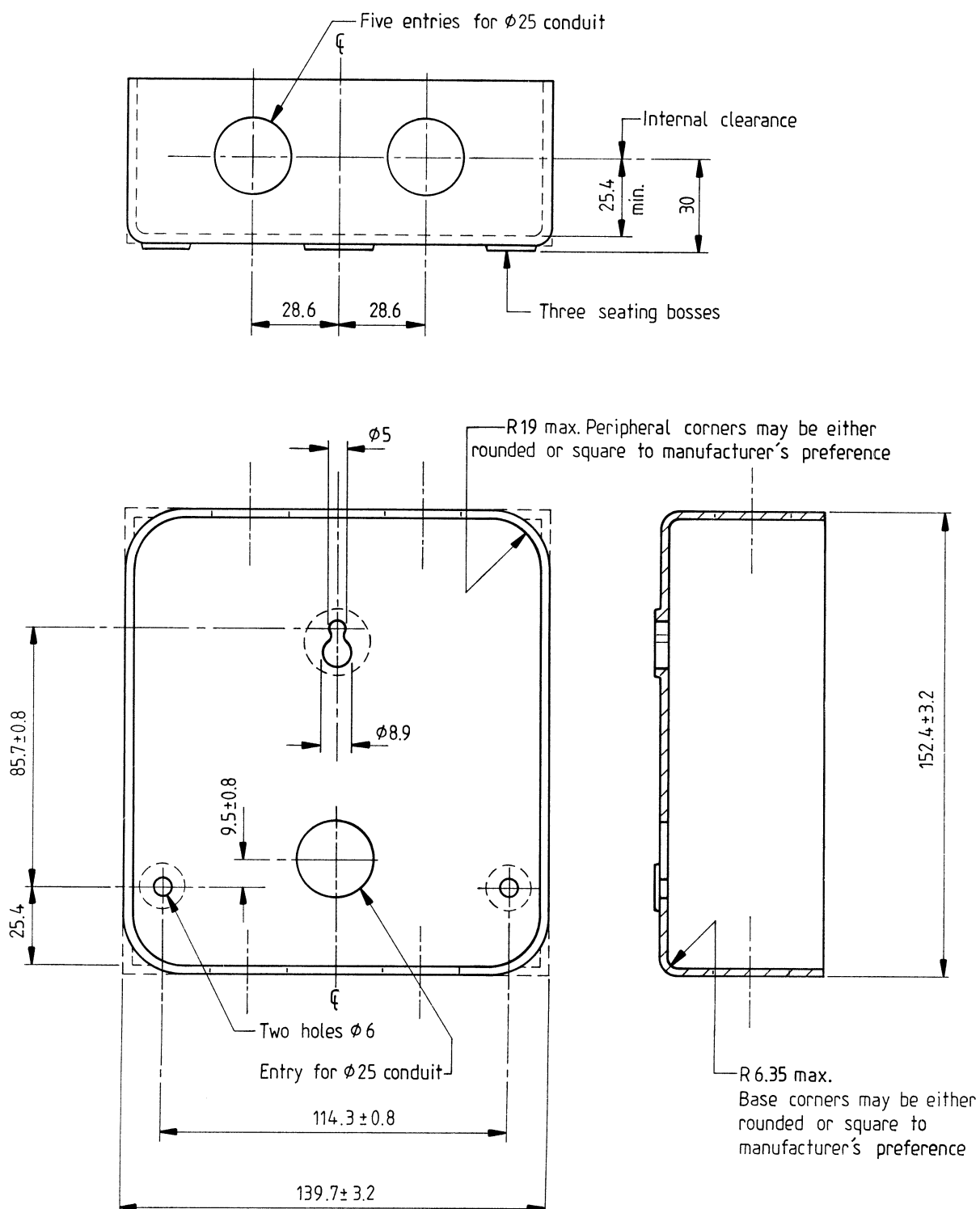
- a) the number and date of this British Standard, i.e. BS 4177¹⁾;
- b) the maker's or responsible vendor's name or trade mark or identification mark;
- c) the rated current of the main switch intended to control the electric supply to the cooker;
- d) the rated voltage in volts;
- e) the nature of supply (e.g. a.c. only);
- f) the word "COOKER" adjacent to the actuating member of the main switch intended to control the electric supply to the cooker;
- g) an indication of the main switch contact position, e.g. off and on;
- h) the word "FUSE" or "FUSED" for fused auxiliary switched socket-outlets or the appropriate symbol detailed in 7.2²⁾;
- i) terminal identification.

7.1.2 Test

Compliance with 7.1.1 shall be checked by inspection.

¹⁾ Marking BS 4177 on or in relation to a product represents a manufacturer's declaration of conformity, i.e. a claim by or on behalf of the manufacturer that the product meets the requirements of the standard. The accuracy of the claim is therefore solely the responsibility of the person making the claim. Such a declaration is not to be confused with third party certification of conformity, which may also be desirable.

²⁾ BS 6217 gives guidance on symbols for use on electrical equipment.



All dimensions are in millimetres.

NOTE 1 Entries for conduits are appropriate only for metal construction.

NOTE 2 Unless otherwise stated tolerances are ± 1 mm.

Figure 5 — Box for surface-type cooker control unit