BRITISH STANDARD

BS 5972:1980

Incorporating Amendment Nos. 1 and 2

Specification for

Photoelectric control units for road lighting

UDC 628.971.6:628.9.041.6 – 523:621.316.5:621.383.4

Cooperating organizations

The Electrical Illumination Standards Committee, under whose direction this British Standard was prepared, consists of representatives from the following:

Association of Manufacturers Allied to the Electrical and Electronic Industry (BEAMA)*
Association of Public Lighting Engineers*
British Glass Industry Research Association
British Railways Board*
Cbmpe
Chartered Institution of Building Services*
Civil Aviation Authority
Consumer Standards Advisory Committee of BSI*
Department of Industry (National Physical Laboratory)
Department of the Environment (Building Research Establishment)
Department of Transport*
Electricity Supply Industry in England and Wales*
Engineering Equipment Users' Association
Institute of Purchasing and Supply
Institution of Electrical and Electronics Technicians Engineers Ltd.
Institution of Electrical Engineers
Lighting Industry Federation Ltd.*
London Transport Executive
National Illumination Committee of Great Britain
Royal Institute of British Architects
Society of British Gas Industries

The organizations marked with an asterisk in the above list, together with the following, were directly represented on the Technical Committee entrusted with the preparation of this British Standard:

Association of Control Manufacturers Tacma (BEAMA)
Association of County Councils
British Plastics Federation
Decorative Lighting Association
Department of Trade
Electrical Contractors' Association
Glass Manufacturers' Federation
Health and Safety Executive
Society of Glass Technology

This British Standard, having been prepared under the direction of the Electrical Illumination Standards Committee, was published under the authority of the Executive Board and comes into effect on
30 September 1980

The following BSI references relate to the work on this standard:
Committee reference LGL/3
Draft for comment 77/24298 DC

ISBN 0 580 11595 X

Amendments issued since publication

Amd. No.	Date of issue	Comments
4094	December 1982	
4486	February 1984	Indicated by a sideline in the margin

Contents

Foreword

This standard has been prepared under the direction of the Electrical Illumation Standards Committee.

Certification. Attention is drawn to the certification facilities described on the inside back cover of this standard.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 14, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

Section 1. General

1 Scope

This standard specifies requirements for the safety and performance of:

a) photoelectric control units (PECU);

b) photocell sockets.

Both items are for use in switching road lighting lanterns, road traffic signs and other apparatus in response to variations in daylight. The PECU and sockets are for operation on supply voltages not exceeding 250 V to earth or between terminals, and for switching a current not exceeding 10 A.

2 References

The titles of the publications referred to in this standard are listed on page 14.

3 Definitions

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

3.1
photoelectric control unit

a device which comprises a photoelectric sensor responding to variations in illuminance combined with means for switching an electric load

3.2
one-part control unit

a photoelectric control unit in which the photoelectric sensor and the load-switching means are housed in the same enclosure

3.3
two-part control unit

a photoelectric control unit in which the photoelectric sensor and the load switching means are housed in separate enclosures

3.4
detector

that part of a two-part control unit which contains the photoelectric sensor

3.5
switching unit

that part of a two-part control unit which contains the load-switching means

3.6
switch-on level

the illuminance at the photoelectric control unit which will cause it to change from the "off" to the "on" mode under standard test conditions

3.7
switch-off level

the illuminance at the photoelectric control unit that will cause it to change from the "on" to the "off" mode under standard test conditions

3.8
on/off ratio

the ratio of the measured switch-on level to the measured switch-off level

3.9
socket

a receptacle into which a one-part control unit may be inserted

4 General test requirements

4.1 Tests according to this standard are type tests.

NOTE The marking of BS 5972 on an article implies that one or more representative products have complied with all the type test requirements of the relevant section of this standard. It does not necessarily mean that every article so marked has been individually tested in accordance with every requirement of the standard (see clause **6**).

4.2 Unless otherwise specified in this standard PECU and sockets shall be tested in an ambient temperature of 25 ± 5 °C and at the rated voltage. The PECU and sockets shall be tested "as delivered" and as installed in normal use. Unless otherwise specified in this standard the tests are made on a single sample which shall withstand all the relevant tests.

5 Classification

5.1 Classification according to type of protection against electrical shock

5.1.1 *Class I PECU or socket.* A PECU or socket having at least functional insulation throughout and provided with an earth lead, an earthing terminal or earthing contact, and, for PECU or sockets designed for connection by means of a flexible cable or cord, provided with either an appliance inlet with earthing contact, or a non-detachable flexible cable or cord with earthing conductor and a plug with an earthing contact.

5.1.2 *Class II PECU or socket.* A PECU or socket with double insulation and/or reinforced insulation throughout and without provision for earthing.

5.2 Classification according to degree of protection against ingress of dust and moisture. PECU and sockets may be classified in accordance with the "IP number" system of classification as specified in BS 5490.

6 Marking

6.1 General. The following information shall distinctly and durably be marked on the PECU and socket, as appropriate, in a position where it can be seen during maintenance. In the list below, B indicates both shall be marked and P that only PECU are so marked.

a) Mark of origin. (This may take the form of a trade mark, manufacturer's identification mark, or the name of the responsible vendor.) (B)

b) Manufacturer's model number or type reference. (B)

c) Rated supply voltage (in V). (B)

d) Switched voltage rating if different from above. (P)

e) Rated current, i.e. 10 A. (B)

f) Switch-on level (in lux). (P)

g) Calendar and/or space for user to mark the year and month of installation. (P)

In addition PECU or sockets complying with this specification may, at the manufacturer's discretion, be marked with the number of this standard (i.e. BS 5972).

NOTE Marking BS 5972 on or in relation to a product is a claim by the manufacturer that the product has been manufactured in accordance with the requirements of the standard. The accuracy of such a claim is therefore solely the manufacturer's responsibility. Enquiries as to the availability of third party certification to support such claims should be addressed to the Director, British Standards Institution, Maylands Avenue, Hemel Hempstead, Herts HP2 4SQ in the case of certification marks administered by BSI or to the appropriate authority for other certification marks.

6.2 Terminals. The terminals of a PECU or socket shall be marked to give a clear indication as to how they should be connected to ensure safe, satisfactory operation. Where terminals are marked with abbreviations the following symbols shall be used:

Line connection:	L
Neutral connection:	N
Load connection:	Lo
Cell connection:	C1 and C2

6.3 Test switch. Any test switch shall be clearly marked to indicate the switch position for automatic operation and for circuit testing.

The following symbols shall be used:

Switch position for testing circuit:	Test
Switching position for normal operation:	Auto

6.4 Orientation. If the detector has to be mounted with particular orientation it shall be clearly and suitably marked. All sockets shall be marked with a direction arrow as specified in clause **12**.

6.5 Test for marking. The durability of the marking shall be checked by inspection and by trying to remove the marking by rubbing lightly for 15 s with a piece of cloth soaked with water and for a further 15 s with a piece of cloth soaked with petroleum spirit. The marking shall be legible after test.

6.6 Manufacturer's instructions. The manufacturer shall supply instructions which shall include:

a) a wiring diagram;

b) instructions regarding any limitations of use (e.g. temperature) which are not marked on the control;

c) instructions on orientation of the photoelectric sensors (where applicable).

NOTE The direction arrow on sockets for one-part control units described in **12.1** is provided for sensors designed to operate at a particular orientation, e.g. an arrow pointing to north (see also **C.5**).

Section 2. Photoelectric control units

7 Construction

7.1 Mechanical strength. Photoelectric control units shall be of adequate mechanical strength and so constructed as to withstand such handling and vibration as may be expected in normal use.

Compliance shall be checked by the impact test described in **4.13** of BS 4533-101:1981. The test shall be applied using an impact energy of 0.50 Nm, with a spring compression of 20 mm.

7.2 Terminations. Terminals and supply connections shall comply with the requirements of section 14 or 15 of BS 4533-101.

Fixings of electrical conductors through insulation material liable to shrinkage shall comply with the requirements of **4.11.1** of BS 4533-101:1981.

Terminals for supply connection to a two-part control shall allow the connection of conductors having nominal cross-sectional areas of 1.0 mm^2 to 2.5 mm^2 in accordance with **5.2** of BS 4533-101:1981.

The detector of a two-part control unit shall be provided with a cable or cord not less than 500 mm in length. The insulation shall be capable of continuous usage at a temperature of 120 °C.

7.3 Test switches. Any test switch incorporated in parallel with the PECU contacts shall have a current rating of at least 10 A.

7.4 Electrical contacts. The effectiveness of contacts and test switches shall each be checked separately by the following test.

A test current of 11 A is passed between the contacts L and Lo. After a period of 4 h the voltage drop between L and Lo is measured and shall not exceed 100 mV.

NOTE Requirements for solid-state switches are under consideration.

7.5 Resistance to the ingress of moisture. The enclosure of one-part controls, unless designed to be mounted internally, and the detector of two-part controls shall be designed to be rain-proof. The body of a detector of a two-part control unit shall be designed to provide a rain-proof seal when inserted into a hole of 14 mm nominal diameter in the canopy of a lantern or other equipment. Compliance shall be checked by satisfying the appropriate test specified in clause **8** of BS 5490:1977 for protection IPX3. For the purpose of this test the control unit and its socket, if applicable, shall be mounted in accordance with the manufacturer's installation instructions.

The switching part of two-part controls shall be designed to be drip-proof. Compliance shall be checked by satisfying the appropriate test specified in clause **8** of BS 5490:1977 for protection IPX2.

7.6 Fixings and dimensions. The switching unit of a two-part control unit shall incorporate a robust means of fixing.

The dimensions of the blade connections on three-blade one-part control units shall be as detailed in Figure 1. Compliance shall be checked by inspection.

8 Insulation resistance and electric strength

8.1 Humidity test. A one-part control, mounted in a socket, or a detector of a two-part control mounted in a hole on a metal plate to simulate the lantern canopy, shall be placed in a humidity cabinet containing air with the relative humidity maintained at between 91 % and 95 %.

The temperature (t) of the air, at all places where the control can be located, shall be maintained within 1 °C of any convenient value between 20 °C and 30 °C.

Before being placed in the humidity cabinet the control unit shall be brought to a temperature between t and (t + 4) °C.

NOTE In most cases, the control unit may be brought to the specified temperature between t and (t + 4) °C by keeping it in a room at this temperature for at least 4 h before the humidity treatment.

The control unit shall be kept in the cabinet for 48 h. After this treatment there shall be no visible damage and the marking shall still be legible.

8.2 Test sequence. The insulation resistance and the electric strength of photoelectric control units shall be checked by the insulation resistance test specified in **8.3** and the electric strength test specified in **8.4**, these tests being made immediately after the treatment specified in **8.1** in the humidity cabinet or in the room in which the samples were brought to the prescribed temperature after reassembly of those parts which may have been removed.

8.3 Insulation resistance test. The insulation resistance shall be measured in accordance with the test specified in **10.2.1** of BS 4533-101:1981.

The insulation resistance shall be not less than the value shown in Table 1.

8.4 Electric strength test. Electric strength shall be tested in accordance with the test specified in **10.2.2** of BS 4533-101:1981 except that the voltages applied shall be those specified in Table 1 of this standard.

No flashover or breakdown shall occur during the test.

Table 1 — Insulation resistance and electric strength of PECU

Points of application of test voltages	Minimum insulation resistance	Test voltage	
		Class I	Class II
	MΩ	kV	kV
a) Between live parts and accessible metal	5	2	3.75
b) Between live metal parts at different polarity	2	2	2
c) Between live parts which can achieve different polarity through action of switch	2	2	2
d) Between live parts and non-earthed accessible metal or metal foil over non-metal surfaces	2	3.75	3.75

NOTE 1 During tests a) and d) all live parts should be connected together.

NOTE 2 For test c) flashover is permitted to occur between contact members of the switch.

NOTE 3 For test d) metal foil is applied in such a way that the sealing compound, if any, is effectively tested. Care should be taken when applying the metal foil to class I PECU to see that adequate clearance is maintained between the foil and external metal parts in order to avoid over-stressing the insulation between live parts and the earthed metal parts. When metal foil is applied to surfaces other than flat surfaces, it should be applied by using the tip of the test finger shown in Figure 1 of BS 5490:1977.

NOTE 4 During the test any components such as coils, windings or capacitors are disconnected if their continued connection would render the test impractical. Where these disconnections are impractical, the tests are only carried out as specified in clause **10**.

9 Creepage distances and clearances

9.1 Creepage distances and clearances shall not be less than those given in Table 2. Measurements shall be made with and without conductors of the largest cross section (as specified in **7.2**) connected to the terminals of the PECU.

9.2 The requirements of Table 2 do not apply to distances between live parts which are part of the same pole but which acquire potential differences because of intentionally introduced impedance such as a bi-metal blade which is used as a series heater, or because of a series heating element on a bi-metal blade. Such creepage distances and clearances shall satisfy the following requirements.

Creepage distance shall not be less than 0.2 mm and clearance distance shall not be less than 0.1 mm provided the design and construction are such that any movement of the parts which reduces the distances still further is unlikely to occur.

NOTE The ends of a two-pronged or three-pronged fork of bi-metal fabricated from substantially flat material are considered to be satisfactory in this respect.

These minimum dimensions may be further reduced without restriction if the shorting-out of the appropriate minimum distance does not result in a hazardous situation in the control unit itself or cause any declared manufacturing deviation or drift limits of an operational characteristic to be exceeded.

10 Electrical performance

10.1 PECU. The control unit shall make and break a current of 10 A using an inductive test load such as that illustrated in Figure 2. The test procedure of Appendix A shall be followed and the control unit shall operate satisfactorily 2 500 times.

NOTE The test circuit may be modified to create a 10 A load for PECU designed to switch voltages other than 240 V.

10.2 Manual test switch. The manual test switch, which is supplied on a two-part control unit, shall make and break a current of 10 A 100 times at a rate of at least 7.5 times per minute, using as its load the circuit employed for the test specified in **10.1**. Compliance shall be checked by visual inspection after the test to ensure there has been no loosening of electrical or mechanical connections.

11 Photometric performance

11.1 Tests for switch-on and switch-off levels shall be carried out in accordance with the method described in Appendix B.

11.2 The switch-on level shall be within ± 20 % of the declared level.

11.3 The switch-off level shall be not greater than twice the switch-on level.

11.4 This test shall be carried out twice, before and after the electrical performance test specified in **10.1**. The switch-on and switch-off levels shall not differ in the two tests by more than 10 %.

Table 2 — Minimum creepage distances and clearances of PECU

Environment	Working voltage: 0 V to 50 V					Working voltage: over 50 V to 130 V					Working voltage: over 130 V to 250 V				
	Clearance	Creepage with CTI of:				Clearance	Creepage with CTI of:				Clearance	Creepage with CTI of:			
		120 to 174	175 to 249	250 to 699	Over 700		120 to 174	175 to 249	250 to 699	Over 700		120 to 174	175 to 249	250 to 699	Over 700
Sealed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Encapsulated	0.3	0.5	0.4	0.3	0.3	0.5	0.8	0.7	0.6	0.5	0.9	1.4	1.2	1.0	0.9
Internal	0.4	0.6	0.5	0.4	0.4	0.6	1.0	0.8	0.7	0.6	1.0	1.7	1.4	1.2	1.0
External	0.8	1.4	1.1	0.8	0.8	1.2	2.0	1.7	1.4	1.2	2.0	3.4	2.8	2.3	2.0

Dimensions are in millimetres.

NOTE 1 Comparative tracking indices, CTI, are as defined in BS 5901.

NOTE 2 When considering the clearances between live parts separated by the action of the control then:

a) the clearances specified in Table 2 do not apply to the clearance between contacts;

b) the clearance in Table 2 between component parts other than contacts and for terminals may be reduced to a value equal to that of the associated contact gap but not less than 0.5 mm, provided the design is such that these distances cannot be reduced by displacement of the parts concerned.

Section 3. Sockets

12 Mechanical construction

12.1 Dimensions. Figure 3 shows a typical shape of socket. Figure 4 shows the angular spacing of the entry slots for the contacts.

The protrusion above the flange in which the slots for the contacts are formed shall not exceed 35.3 mm diameter or 2.5 mm height. The overall diameter of the flange shall not exceed 66.5 mm. There shall be four equally spaced mounting holes in the flange on a pitch circle of 49.2 mm diameter, each hole having a diameter of 4 mm and a 45° bevel extending to 8 mm diameter. The orientation of these mounting holes shall be at 45° to the direction arrow marked on the flange.

The direction arrow marked on the flange shall be in line with the reference line shown in Figure 4, namely at 35° from the centre of the neutral contact slot.

The body portion shall not exceed 38 mm diameter or 40 mm overall depth below the flange.

12.2 Test. Test shall be by inspection and measurement, including a ring gauge of 38 mm diameter which shall pass freely over the whole extent of the body portion.

13 Resistance to heat, fire and tracking

The relevant provisions of section 13 of BS 4533-101 shall apply.

14 Ingress of moisture

14.1 Flange. The flange of the socket shall be nominally flat and shall remain so when mounted in service, e.g. in a lantern. A gasket shall be provided to provide a rain-proof seal with the surface on which it is mounted.

14.2 Temporary cover. All sockets shall be provided with a rain-proof temporary cover.

14.3 Test. The socket, with the temporary cover and the gasket in position, shall be mounted in a flat metal plate not less than 3 mm thick and the underside of the socket shall be suitably enclosed.

The socket shall comply with the requirements of the appropriate test in clause **8** of BS 5490:1977 for protection IPX3.

15 Electrical contacts and connections

The provisions of **4.11** of BS 4533-101:1981 shall apply together with the following.

15.1 Contacts. Provision shall be made to prevent a control unit from turning in the socket due to vibration. This shall be checked by inspection. A sketch of a typical arrangement is shown in the part section A–A of Figure 4.

Contacts shall be so designed as to ensure that sufficient contact pressure is achieved to allow the maximum current capacity to be realized without causing overheating or any deterioration in the material or functioning of the contacts.

15.1.1 Test. A contact blade assembly of a control unit shall be inserted in the socket. The potential difference between each control blade and the corresponding terminal of the socket, when a current of 11 A is passed through them for a period of 4 h in an ambient temperature of 125 °C shall not exceed 25 mV.

16 Creepage distances and clearances

The provisions of section 11 of BS 4533-101 shall apply.

17 Terminations

The provisions of section 14 or 15 of BS 4533-101 shall apply, together with the following.

17.1 Terminals for supply and load connection shall allow the connection of conductors having nominal cross-sectional areas of 1.0 mm^2 to 2.5 mm^2.

18 Protection against electric shock

The provisions of section 8 of BS 4533-101:1971 shall apply except for **8.2.1** which shall be replaced by the following.

All live parts including terminals with their screws in the fully retracted position so as to expose the full bore of the cable entry, shall be effectively screened when the socket is installed in a lantern or other equipment and is ready for use.

19 Insulation resistance and electric strength

The provisions of section 10 of BS 4533-101 shall apply.

20 Provision for earthing

Class I sockets shall be fitted with an earthing connection or contact which shall comply with the requirements of section 7 of BS 4533-101.

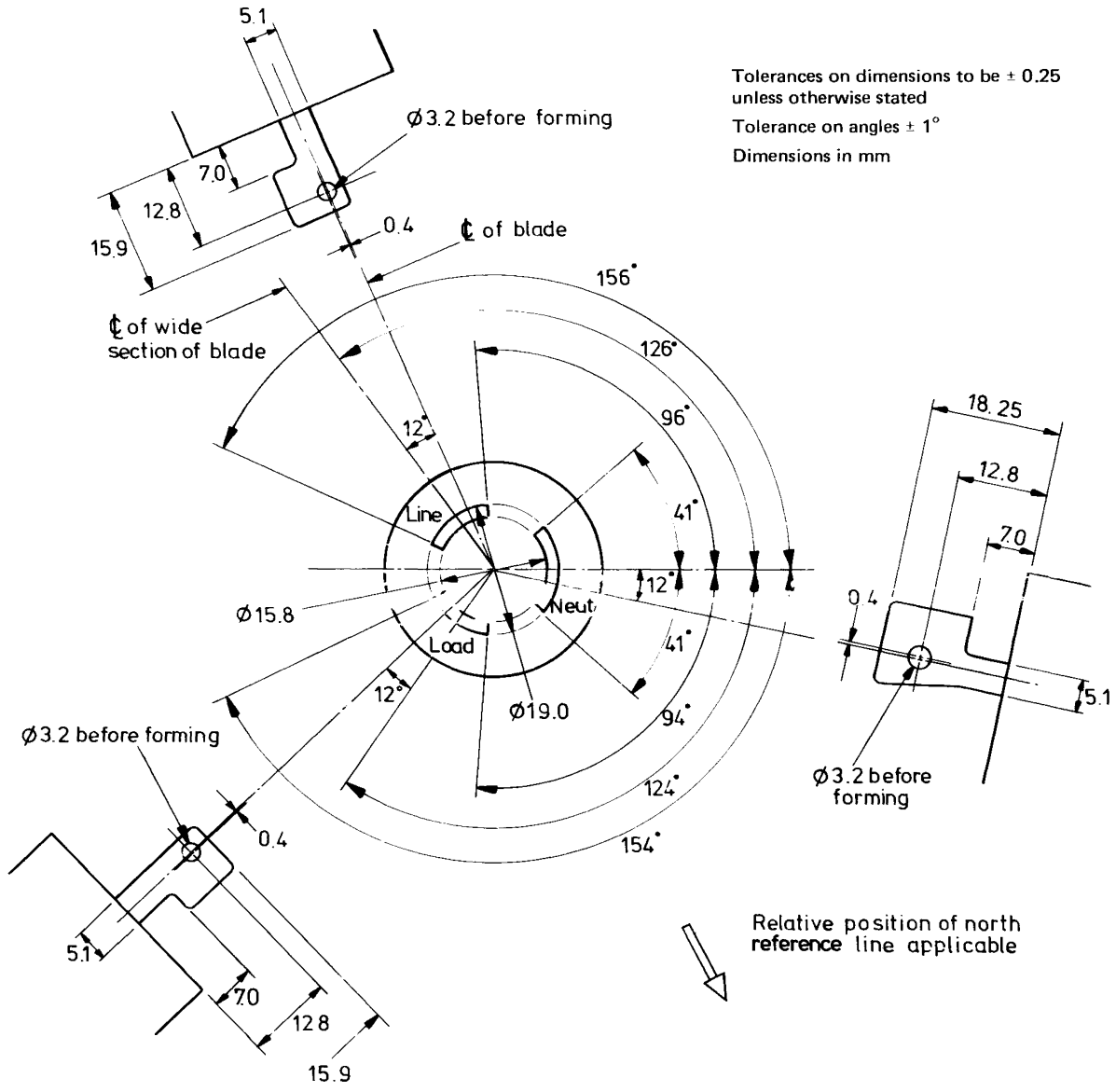
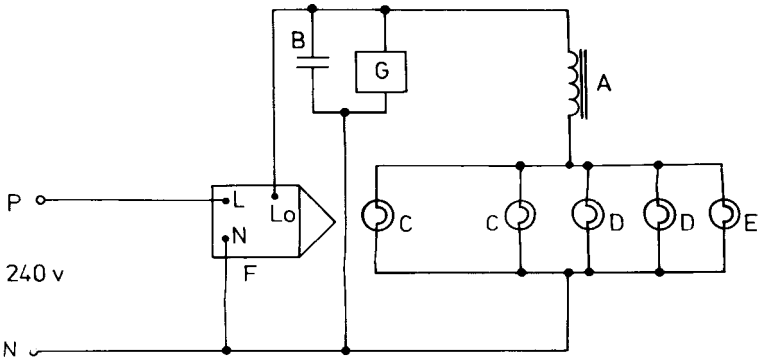


Figure 1 — Blade dimensions of one-part controls



A. 1 kW MBF/U reference ballast in accordance with BS 4782
B. 40 µF capacitor
C. 150 W 240 V filament lamp
D. 1 kW 240 V filament lamp
E. 100 W 240 V filament lamp
F. Photoelectric control unit under test — viewing test light source C
G. Counter

Figure 2 — Switching test circuit

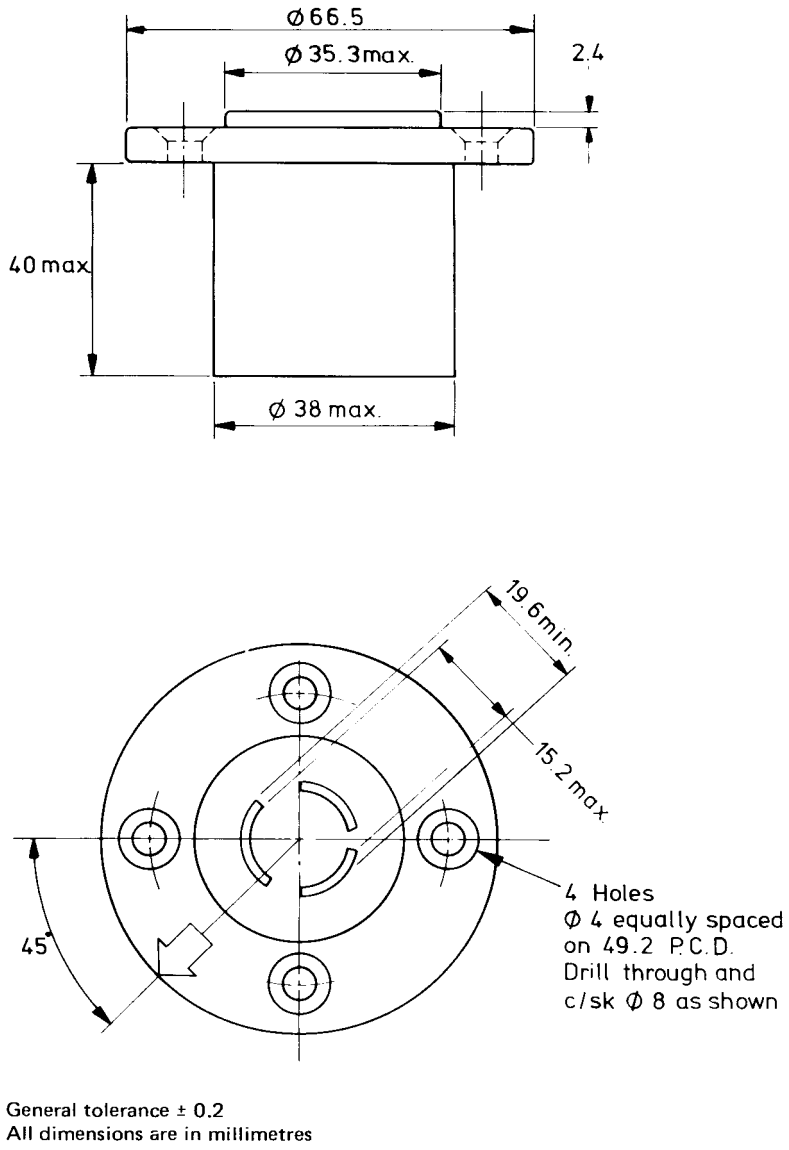
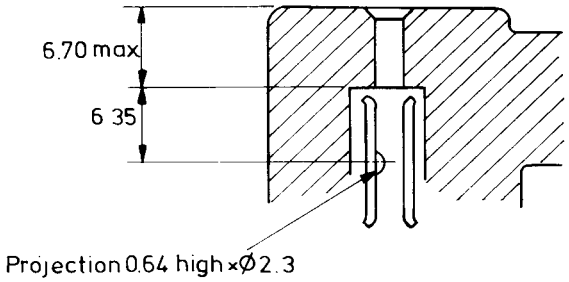
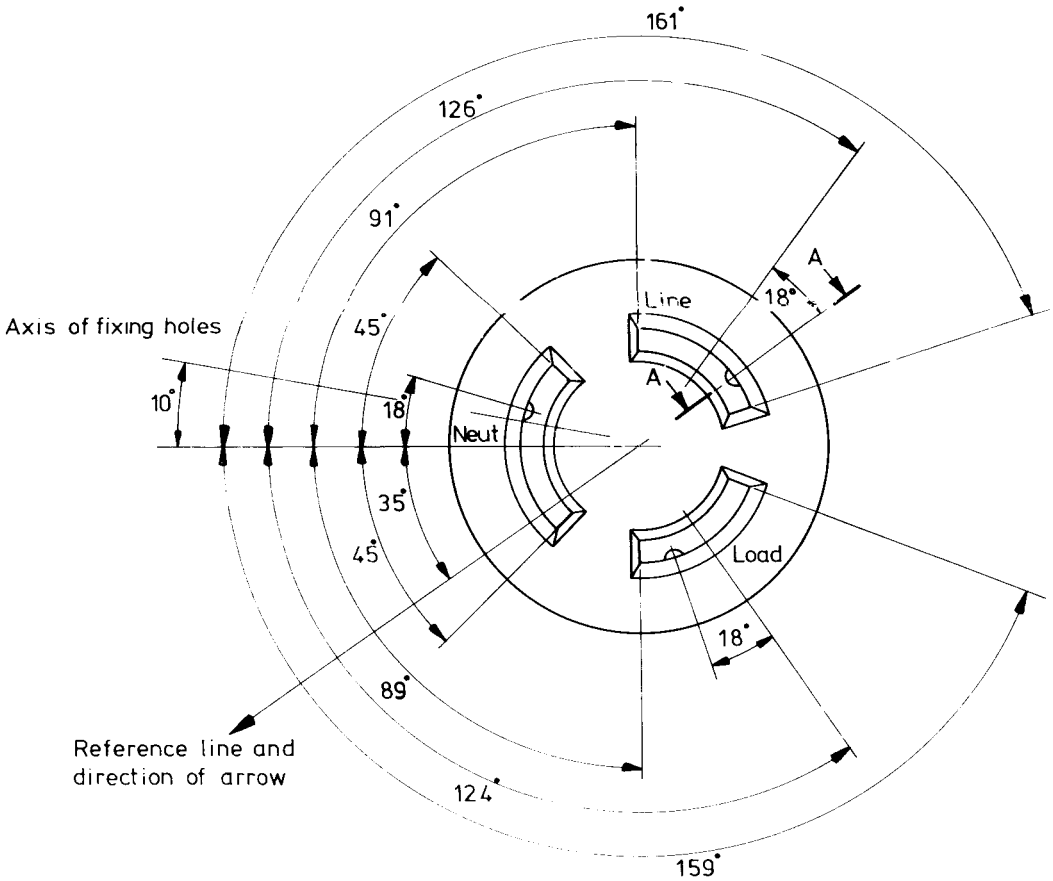


Figure 3 — Typical arrangement of a socket



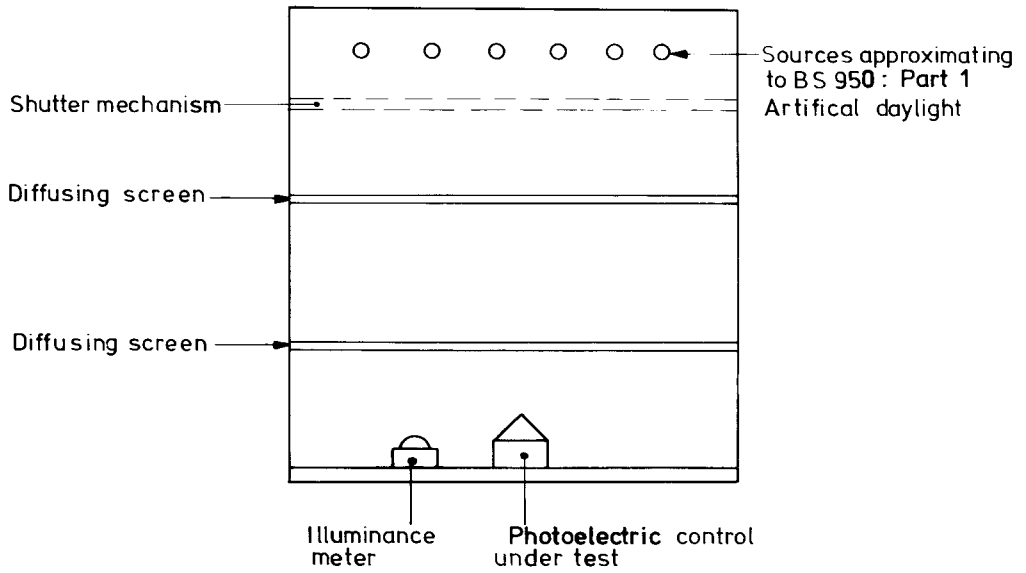
Part section on A—A
Typical anti-vibration device

All dimensions are in millimetres: tolerance ± 0.2
All angles ± 1°



Angular spacing of control slots

Figure 4 — Details of photocell socket design



Suggested components

Source. Colour matching or northlight fluorescent tubes.

Cabinet. 600 mm cube. All internal surfaces finished matt white.

Diffusing screen. Opal acrylic 3 mm thick 030 grade or equivalent mounted 150 mm and 350 mm above base.

Illuminance meter: Cosine-corrected photocell calibrated for artificial daylight.

Figure 5 — Typical apparatus for test of illuminance levels for switching

Appendix A Test for switching

A.1 Test circuit. A suitable test circuit for the test specified in clause **10** comprises two 1 kW, two 150 kW and one 100 W 240 V filament lamps in parallel to form a tungsten lamp load in series with a 1 kW MB 240 V choke with the appropriate shunt capacitor (see Figure 2).

The timing of the on and off periods of the switching cycle can be controlled by the light falling on the cell and it is convenient to do this by housing the cell in a box 250 mm × 125 mm. One end of the box is open with the open end near one of the 150 W tungsten ballast lamps.

A.2 Test procedure. With the room lighted as normal the control is placed in the box with the cell facing the 150 W tungsten ballast lamp. The light falling on the cell during the "off" mode can be controlled by varying the distance between the cell and the mouth of the box. The light during the "on" mode can be controlled by varying the distance between the lamp and cell.

The "off" period is extended by increasing the amount of light falling on the cell, and the "on" period increased by reducing the light from the lamp.

The minimum extent of the ON and OFF periods are:

ON: 3 seconds

OFF: 15 seconds

Appendix B Test of illuminance levels of switching of PECU

B.1 Test for switch-on and switch-off levels of illuminance. The test shall be carried out at the rated supply voltage and in an ambient temperature of 25 ± 5 °C.

B.2 Test apparatus. PECU is tested in a cubic box, as shown in Figure 5, containing six 15 W 450 mm fluorescent tubular lamps in accordance with BS 950-1, having a colour temperature of 6 500 K mounted parallel to each other at 50 mm from the top of the box with a stabilized power supply to the lamps. Below the lamps a shutter mechanism is provided to control the illuminance at the PECU under test. Two diffusing panels of 030 grade acrylic plastic are mounted horizontally and contiguous with the walls appropriate distances above the base of the box. The interior surface of the box is painted matt white in accordance with section 4 of BS 5225-1:1975. The sensor of the PECU is placed horizontally at the base of the box with a cosine-corrected illuminance meter adjacent.

B.3 Test method

B.3.1 Before starting the tests any delay arrangements on the control unit may be overriden if necessary to reduce the time taken for testing provided it will not affect the response of the unit to illuminance levels.

B.3.2 The PECU is conditioned for a minimum period of 12 h by exposure to an illuminance of at least 1 000 lux. It is then transferred to the test box and exposed to an illuminance of approximately 1 000 lux for a period of 30 min. The illuminance is then reduced continuously at a constant rate such that the level decreases by 50 % every 5 min down to a value of 5 lux. The switch-on level is recorded. The PECU is then kept in darkness for 1 h after which it is illuminated to 5 lux and this value is increased continuously at a uniform rate, such that the illuminance is doubled every 5 min until switch-off occurs. The switch-off level is recorded.

Appendix C Desirable features of design of PECU and sockets

C.1 General. Apart from satisfying the specific tests set out in this standard, there are a number of design features which should be incorporated in photoelectric control units. Whilst not necessarily susceptible to measurement or test these features constitute good engineering practice and should be followed as far as possible.

C.2 Physical dimensions. PECU should be designed to provide a safe and reliable service for the environmental conditions likely to be met on site. The cover of the photoelectric sensor should be shaped and finished so as to facilitate maintenance and to minimize the accumulation of dirt; it should not encourage birds to perch.

C.3 Materials. Materials should be inherently resistant to corrosion or adequately protected from it. Plastic components should be ultra-violet stabilized or else protected from ultra-violet radiation where this is necessary for their proper performance. Materials used for gaskets and associated adhesives should not deteriorate unduly as a result of the radiation, heat, moisture and compression to which they are likely to be exposed in practice.

C.4 Electrical failure. A large proportion of PECU controls road lighting. In the interests of road safety PECU should be designed as far as practicable so that, in the event of failure, the control unit will cause the load to be switched "ON".

C.5 Switch-on levels. PECU may be supplied with different switch-on levels to meet the requirements of the customer. However, to cater for most usages the recommended values of switch-on levels are: 55 lux, 70 lux and 100 lux.

If the sensor of a PECU is mounted in service at positions other than horizontal with cell facing upwards, variations in performance may occur and there should be collaboration between the user and the manufacturer to overcome practical problems.

C.6 Light sensor. The light sensor contained within the PECU should itself be protected against ingress of moisture to prevent failure of this component through this cause.

Publications referred to

BS 950, *Artificial daylight for the assessment of colour.*

BS 950-1, *Illuminant for colour matching and colour appraisal.*

BS 4533, *Luminaires.*

BS 4533-101, *Specification for general requirements and tests.*

BS 4782, *Ballasts for high pressure mercury vapour and low pressure sodium vapour discharge lamps.*

BS 5225, *Photometric data for luminaires.*

BS 5225-1, *Photometric measurements.*

BS 5490, *Specification for degrees of protection provided by enclosures.*

BS 5901, *Method of test for determining the comparative and proof tracking indices of solid insulating materials under moist conditions.*

BSI certification marks

A licence to use the Kitemark or "Safety Mark" on or in relation to a product will be granted to any manufacturer or producer who demonstrates that he can and will be able consistently to make that product to the requirements specified in the British Standard. His capability of doing so is initially assessed by inspection of his production process, quality control organization and test facilities, and by independent testing of a sample of the product against all the criteria of the relevant standard. The licensee is required to accept, and to operate in accordance with, a BSI scheme of supervision and control which identifies the minimum level of quality control to be exercised during manufacture and the tests to be carried out on the completed product. BSI carries out unannounced inspection visits to the manufacturer's works and audit testing of the product, and may withdraw the licence for any failure of the manufacturer to comply with the relevant standard or the requirements of the scheme of supervision and control. The presence of the mark on or in relation to a product is an assurance that the goods have been produced under a system of supervision, control and testing, operated during manufacture and including periodical inspection of the manufacturer's works in accordance with the certification mark scheme of BSI.
Further particulars of the terms of licence may be obtained from the Certification and Assessment Department, British Standards Institution, Maylands Avenue, Hemel Hempstead, Herts HP2 4SQ.

The Kitemark

The 'Safety Mark'

BSI — British Standards Institution

BSI is the independent national body responsible for preparing British Standards. It presents the UK view on standards in Europe and at the international level. It is incorporated by Royal Charter.

Revisions

British Standards are updated by amendment or revision. Users of British Standards should make sure that they possess the latest amendments or editions.

It is the constant aim of BSI to improve the quality of our products and services. We would be grateful if anyone finding an inaccuracy or ambiguity while using this British Standard would inform the Secretary of the technical committee responsible, the identity of which can be found on the inside front cover. Tel: 020 8996 9000. Fax: 020 8996 7400.

BSI offers members an individual updating service called PLUS which ensures that subscribers automatically receive the latest editions of standards.

Buying standards

Orders for all BSI, international and foreign standards publications should be addressed to Customer Services. Tel: 020 8996 9001. Fax: 020 8996 7001.

In response to orders for international standards, it is BSI policy to supply the BSI implementation of those that have been published as British Standards, unless otherwise requested.

Information on standards

BSI provides a wide range of information on national, European and international standards through its Library and its Technical Help to Exporters Service. Various BSI electronic information services are also available which give details on all its products and services. Contact the Information Centre. Tel: 020 8996 7111. Fax: 020 8996 7048.

Subscribing members of BSI are kept up to date with standards developments and receive substantial discounts on the purchase price of standards. For details of these and other benefits contact Membership Administration. Tel: 020 8996 7002. Fax: 020 8996 7001.

Copyright

BSI
389 Chiswick High Road
London
W4 4AL