

Specification for

Electronic variable control switches (dimmer switches) for tungsten filament lighting

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Cooperating organizations

The Power Electrical Engineering Standards Committee, under whose direction this British Standard was prepared, consists of representatives from the following Government departments and scientific and industrial organizations:

- Association of Short Circuit Testing Authorities*
- British Electrical and Allied Manufacturers Association (BEAMA)
- British Railways Board
- British Steel Corporation
- Department of Energy (Electricity)
- Electrical Contractors Association*
- Electrical Contractors' Association of Scotland
- Electrical Research Association*
- Electricity Supply Industry in England and Wales*
- Engineering Equipment Users Association
- Institution of Electrical Engineers*
- Ministry of Defence
- National Coal Board
- Trades Union Congress

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

- Association of Consulting Engineers
- Association of Control Manufacturers (BEAMA)
- Association of Supervisory and Executive Engineers
- British Electrical Systems Association (BEAMA)
- British Plastics Federation
- Consumers Association
- Consumer Standards Advisory Committee of BSI
- Department of Prices and Consumer Protection
- Department of the Environment (PSA)
- Electrical Association for Women
- Electrical Installation Equipment Manufacturers Association (BEAMA)
- Electrical Power Engineers' Association
- Electricity Consultative Councils
- Electronic Components Industry Federation
- Fire Offices Committee
- Lighting Industry Federation Ltd
- National Inspection Council for Electrical Installation Contracting

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Foreword

This British Standard has been prepared under the authority of the Power Electrical Engineering Standards Committee.

It is mainly concerned with requirements for the safety of manually operated dimmer switches for tungsten filament lighting but in addition it includes some performance requirements.

An extension of the scope of this standard to cover dimmer switches for ceiling mounting, for incorporation in cords or lampholders, or in suitable luminaires, is under consideration.

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.

1 Scope

1.1 This British Standard specifies requirements for manually operated, variable control, wall mounted dimmer switches of the surface, semi-recessed or flush type intended for the control of tungsten filament lamps in which the power supplied to the lamps is variable by means of phase control of the voltage.

1.2 The specification applies to dimmer switches containing an electronic device unit or assembly in association with a switch for the electrical disconnection of at least one pole of the supply, for use with voltages up to 250 V a.c., 50 Hz, in substantially non-inductive circuits having a maximum continuous full load rating of up to 1 000 W. The switch may be integral with the variable control or it may be a separately actuated switch.

NOTE The maximum rating of 1 000 W may subsequently be amended to accord with requirements for electromagnetic compatibility.

1.3 Control switches intended specifically for the control of fluorescent lighting circuits, transformer connected [ELV (extra low voltage)] lighting circuits, electric motors or other electrical appliances are not covered by this specification.

2 References

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

3 Definitions

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

3.1

electronic variable control switch

an accessory, referred to in this standard as a dimmer switch, incorporating an electronic device unit or an electronic assembly and a switch intended for the variable control of lighting

3.2

actuating member

that part which is moved, pulled, pushed or turned to provide the variable output of the control and which may also actuate a manual switch

3.3

surface dimmer switch

a dimmer switch provided with a seating surface so that, when mounted, it projects wholly above the surface on which it is mounted

3.4

flush dimmer switch

a dimmer switch for mounting behind, or incorporating a switch-plate, the back of the plate being flush with the surface of the wall or enclosure

3.5

semi-recessed dimmer switch

a dimmer switch for mounting with its base partially sunk into the surface of a wall or enclosure

3.6

electronic device

a part in which conduction of electricity is in a vacuum, gas, or a semi-conductor

3.7

electronic device unit

an indivisible group of components, at least one of which is an electronic device

NOTE An example of this is an integrated circuit. Such a unit is indivisible if its components cannot be replaced.

3.8

electronic assembly

a collection of components and electronic devices interconnected as a unit, but in which the individual parts can be replaced without damage to the assembly

NOTE An example of this is a circuit assembled on a printed circuit board.

3.9

phase control

an electronic control which operates by switching the circuit at selected points in each half cycle of the voltage wave

3.10

dimmer switch plate

a plate designed to act as the cover of one or more flush dimmer switches in a box

3.11

current carrying parts

those parts through which the current flows

3.12

live parts

the current carrying parts and those metal parts in contact with them during normal service

3.13

pillar type terminal

a terminal in which the conductor is secured in a hole or slot by pressure from a screw, the axis of which is at an angle to the conductor

3.14**rated voltage**

the voltage or voltage range assigned to the dimmer switch by the manufacturer as that which may normally be associated with the dimmer switch

3.15**load**

the total wattage of the lamps connected to the dimmer switch

3.16**rated load**

the maximum permissible continuous load at rated voltage, or at the minimum voltage of a rated voltage range, assigned to the dimmer switch by the manufacturer

3.17**output**

the actual output, as determined by the dimmer switch with a given load in watts

3.18**mounting box**

a box without cover or lid suitable for containing one or more electrical accessories and for recessing into or mounting on a wall or ceiling or similar flat-surfaced structure

3.19**type test**

a test for the purpose of checking compliance of the design of a given product with the requirements of the relevant British Standard

NOTE It is carried out on one sample consisting of one or more items submitted for the purpose of the type test (see Table 1).

3.20**routine or sampling test**

a test conducted on a sufficient number of articles selected from each batch to establish consistency of manufacture and performance

3.21**accessible metal part**

a metal part of a dimmer switch which can be touched by test finger I of BS 3042:1971 when the switch is installed

4 Conditions of service

4.1 Dimmer switches complying with the requirements of this specification are intended for use under the following conditions of service.

- a) An ambient temperature having a peak value not exceeding 40 °C, with an average value not exceeding 35 °C over 24 h periods, but not subject to exposure to direct radiation from the sun or other source of heat likely to raise temperatures above the specified ambient temperature.

NOTE Under normal conditions of service the available cooling air is subject to natural atmospheric variations of temperature and hence the peak temperature occurs only occasionally during the hot season, and on those days when it does occur it does not persist for lengthy periods.

Meteorological records indicate that temperatures of at least 10 °C below the peak temperature will occur within the 24 h period, and that the average temperature over any 24 h period that includes the peak temperature will be at least 5 °C below the peak value.

- b) An altitude not exceeding 1 000 m above sea level.
- c) An atmosphere not subject to excessive pollution by smoke, chemical fumes, salt-laden spray, prolonged periods of high humidity or other abnormal conditions.

5 General requirement

Dimmer switches shall be so designed and constructed that in normal use their performance is reliable and without danger to the user or surroundings.

Compliance shall be checked by inspection, measurement, and by carrying out all the tests specified in this standard.

6 General requirements for tests

6.1 Tests according to this standard shall be type tests. Manufacturers claiming compliance with the requirements of this standard shall carry out routine or sampling tests as necessary to ensure that their production dimmer switches continue to comply with the requirements.

6.2 Dimmer switches shall be connected and mounted as for normal service, and tests shall be made at an ambient temperature of 20 ± 5 °C except where otherwise specified.

6.3 All loads used in tests shall be made up as follows so that at rated voltage with the dimmer switch short circuited the load required will be obtained:

- a) **loads less than 200 W:** one lamp of the highest suitable rating with additional resistors if necessary;