

Stabilized power supplies, d.c. output —

Part 1: Terms and definitions

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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.

- Associated Offices Technical Committee
- 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*
- Institute of Purchasing and Supply
- 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:

- Accumulator Makers' Association
- Association of Consulting Engineers
- Association of Supervisory and Executive Engineers
- British Steel Industry
- Control and Automation Manufacturers' Association (BEAMA)
- Electric Vehicle Association of Great Britain
- Electronic Components Industry Federation
- Electronic Engineering Association
- Home Office
- London Transport Executive
- Post Office
- Scientific Instrument Manufacturers' Association

This British Standard, having been prepared under the direction of the Power Electrical Engineering Standards Committee, was published under the authority of the Executive Board and comes into effect on 28 February 1979

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The following BSI references relate to the work on this standard:
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Contents

	Page
Cooperating organizations	Inside front cover
National foreword	ii
1 General remarks	1
2 General terms	1
3 Terms related to physical and environmental aspects	2
4 Terms related to static operation	3
5 Terms related to dynamic operation	5
6 Terms related to combined operation of two or more power supplies	6
7 Protection terms	7
Alphabetical index of terms	14
Figure 1 — Settling effect	8
Figure 2A — Transient terms when transient initiation band and transient recovery band are specified	9
Figure 2B — Transient terms when tolerance band is specified	9
Figure 3 — Relationship of control to output quantities	10
Figure 4 — Relationship of effect bands to tolerance band	11
Figure 5 — Types of current limiting	12
Figure 6 — Voltage limiting in a constant current supply	13
Publications referred to	Inside back cover

National foreword

This British Standard has been prepared under the direction of the Power Electrical Engineering Standards Committee. It is identical with Publication 478-1:1974 “*Stabilized power supplies, d.c. output*” Part 1 “*Terms and definitions*” published by the International Electrotechnical Commission (IEC).

“1.1 Scope” in the IEC text applies generally to all the Parts of IEC Publication 478. For the purposes of Part 1 the following should be added: “This Part gives definitions for terms used in other Parts of the standard”.

Terminology and conventions. The text of the International Standard has been approved as suitable for publication, without deviation, as a British Standard. Some terminology and certain conventions are not identical with those used in British Standards; attention is especially drawn to the following.

Wherever the word “recommendation” appears, referring to this standard, it should be interpreted as “British Standard”.

Cross-references. For the following International Standard referred to in the text, there is a corresponding British Standard; this is as given below:

International Standard	Corresponding British Standard
International Electrotechnical Vocabulary (IEV)	BS 4727:1971 <i>Glossary of electrotechnical, power, telecommunications, electronics, lighting and colour terms</i> (Technically equivalent)

NOTE Although the IEV reference in clause 2.12 is not specific, Part 2:Group 01 201 1007 is appropriate.

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 General remarks

1.1 Scope

This recommendation applies to stabilized power supplies designed to supply d.c. power from an a.c. or d.c. source for applications such as, but not necessarily limited to, the following:

- computers,
- telecommunications,
- laboratories,
- industrial equipment.

Calibrated stabilized power supplies for electrical measurement purposes are excluded from the scope of this recommendation.

2 General terms

2.1

source

a point of origin of electrical energy. In this recommendation it is used as an adjective to describe the input to the equipment

2.2

influence quantity

any quantity generally external to a power supply which may affect its performance

2.3

stabilization

the reduction of the effect of changes of influence quantities on the output quantity by means inside the power supply

2.4 Stabilized power supply

An apparatus which takes electrical energy from a source and supplies it in a stabilized form to one or more pairs of output terminals.

2.4.1

constant voltage power supply

a power supply that stabilizes output voltage with respect to changes of influence quantities

2.4.2

constant current power supply

a power supply that stabilizes output current with respect to changes of influence quantities

2.4.3

constant voltage/constant current power supply

a power supply that operates as a constant voltage power supply or constant current power supply depending on load conditions

2.5 Crossover area

The range of values of the output quantities within which a change of mode of operation occurs.

NOTE 1 Within this area, the output quantities are not well defined.

NOTE 2 Unless otherwise specified, the crossover area is given by the overlap of the load effect bands or of the tolerance bands.

2.5.1

crossover point

a point given by the intersection of the lines representing the nominal values of the two stabilized output quantities, usually the centre of the crossover area

2.5.2

adjustable crossover

a feature of a constant voltage/constant current power supply whereby the nominal values of the two stabilized output quantities can be adjusted independently within the range of rated values of the power supply

2.6 Control

The determination of the power supply output by means of a variable element or signal, the relevant value of which may be changed continuously or in steps.

2.6.1

local control

the determination of the power supply output by means of a control element integral with the power supply

2.6.2

remote control

the setting of the power supply output by means of an external control quantity

NOTE In general, particular modes of remote control will be designated according to the applied signal or signal quantity, for example:

- resistance control,
- voltage control,
- current control,
- digital control.

2.7

remote sensing

a means by which the power supply monitors a stabilized output quantity directly at the load using extra "sensing" leads

NOTE The resulting circuit action compensates for voltage drops in the load leads up to a specified limit.

2.8

reference source

the source of an electrical quantity, the value of which is referred to in closed loop stabilization

2.9 Power factor

The active source power divided by the apparent source power.

2.9.1 displacement factor

the active source power of the fundamental wave divided by the apparent source power of the fundamental wave

NOTE Displacement factor is also equal to the cosine of the phase angle separating the fundamental components of source voltage and current.

2.10 inrush current

the maximum instantaneous value of the input current to the power supply when switching on the power supply

2.11 Source distortion

The deviation of the source voltage or current from an ideal sine wave of the same r.m.s. value.

NOTE Source distortion can be expressed using quantities such as the following:

- total harmonic content,
- individual harmonic content,
- instantaneous amplitude deviation, its duration and rate of change.

2.11.1 source current distortion

that distortion of the source current resulting from the power supply presenting an impedance to the source which varies with time

2.11.2 source voltage distortion

that source distortion which exists without the power supply being connected

2.11.3 total source voltage distortion

the source voltage distortion together with that resulting from the interaction of the source current distortion with the source impedance

2.12 voltage unbalance

in a polyphase system, a condition in which the r.m.s. value of at least one phase voltage or line-to-line voltage is significantly different from the others

NOTE Unbalance can be expressed using quantities defined in BS 4727, such as the use of symmetrical components.

2.13 Efficiency

The total output power divided by the active input power.

2.13.1 system efficiency

efficiency, where the input power includes the power required to operate any auxiliary devices which are essential for operation

2.14 conversion factor

the ratio between the product of the mean values of direct voltage and direct current and the power on the a.c. side

3 Terms related to physical and environmental aspects

3.1 Ambient temperature

The temperature of the medium in which the power supply is immersed, usually the temperature of the air surrounding the power supply.

3.2 Cooling medium temperature

The temperature of the cooling medium when meeting the power supply, for example, in the case of air cooling, the temperature of the air immediately at the air inlet.

3.3 Thermal equilibrium

A state under which the internal temperature of a power supply does not change significantly.

3.4 Capacitance to frame

The capacitance measured between a specified terminal and a common point such as frame, guard or ground.

3.4.1 Capacitance to source terminals

The capacitance measured between the specified source terminals and output terminals.

NOTE Sometimes referred to as "leakage or transfer capacitance".

3.5 Insulation resistance

The resistance measured between any specified points insulated from each other.

3.5.1 Insulation test voltage

The a.c. or d.c. voltage applied between specified points and maintained for a specified length of time without breakdown or flashover.

3.6 Isolation voltage

In the case of a floating output, input or control input, the maximum voltage that may be permanently maintained between specified terminals.