
British Standard Glossary of Electrotechnical, power, telecommunication, electronics, lighting and colour terms

Part 1. Terms common to power, telecommunications
and electronics

Group 04. Measurement terminology

Glossaire des termes relatifs à l'électrotechnique, à l'électricité, aux télécommunications,
à l'électronique, à l'éclairage et à la couleur

Partie 1. Termes communs à la puissance, à la télécommunication et à l'électronique

Groupe 04. Mesurage — Terminologie

Glossarium von Begriffen aus der Elektrotechnik, Energietechnik, Fernmeldetechnik,
Elektronik, Lichttechnik und Farbphysik

Teil 1. Gemeinsame Begriffe für Energietechnik, Fernmeldetechnik und Elektronik

Gruppe 04. Begriffe für das Messen

Guide to the glossary

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Titles to any further groups will be added in due course.

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Titles to any further groups will be added in due course.

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Titles to any further groups will be added in due course.

*Not yet published, as at February 1986.

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Foreword

This Group of Part 1 of this British Standard glossary, prepared under the direction of the General Electrotechnical Engineering Standards Committee, contains terms and definitions relating to electrical and electronic measurement. It supersedes BS 4727 : Part 1 : Group 04 : 1971 which is withdrawn. The text of this British Standard is technically identical with the English text of Chapters 301, 302 and 303, first edition, 1983, of the International Electrotechnical Vocabulary (IEV) published by the International Electrotechnical Commission (IEC).

These three chapters have been published as an 'advance edition' of the IEV so as not to prejudice the work of the joint BIPM, IEC, ISO, OIML working group which has produced the International Vocabulary of Basic and General Terms in Metrology (see PD 6461). It is recognized that in due course some minor changes in chapters 301, 302 and 303 of the International Electrotechnical Vocabulary may be needed as a result of that publication.

BS 4727 combines into one glossary the subjects previously covered by BS 204 'Glossary of terms used in telecommunication (including radio) and electronics', BS 205 'Glossary of terms used in electrical engineering', BS 233 'Glossary of terms used in illumination and photometry' and BS 1611 'Glossary of colour terms used in science and in industry'. These four glossaries have now been withdrawn.

The glossary is divided into five main Parts, each of which is further subdivided into Groups. Each Group will comprise the terms and definitions used in a particular branch of electrical engineering and will be issued individually as soon as it is completed. This arrangement makes it possible to add new Groups or revise existing Groups at any time without affecting the remainder of the glossary.

The five main Parts of the glossary are as follows.

- Part 1 Terms common to power, telecommunications and electronics
- Part 2 Terms particular to power engineering
- Part 3 Terms particular to telecommunications and electronics
- Part 4 Terms particular to lighting and colour
- Part 5 Terms particular to electromedical equipment

Fundamental and general terms common to power, telecommunications and electronics respectively form the first two Groups of Part 1. General terms particular to Part 2 and Part 3 similarly form the first Groups of their respective Parts. The specialist Groups contain only the terms and definitions relating to their subject.

As far as has been practicable all terms and definitions established in current usage and falling within the scope of this glossary have been included. Experience has shown that it is rarely possible to replace, or even to modify, a well established term no matter what the logical or aesthetic

shortcomings of that term may be. Current usage has therefore been accepted as the authority for terms and their meanings except where there has been a very good reason for doing otherwise, e.g. where terms have been considered to be fundamentally wrong, ambiguous, superfluous or in need of standardization. Where two or more synonymous terms are in use, those which are deprecated are omitted from the body of the text but are entered in the alphabetical index with a cross-reference to the standard term. In cases where it was felt that the time was not yet right to deprecate a synonym, preferred terms are given first and other terms are printed in less prominent type to indicate the intention to deprecate them in the course of time. Where synonyms are considered of equal value they are shown in the same type.

Where terms are used with somewhat different meanings in different branches of electrical engineering, appropriate definitions are given in the Groups of the glossary corresponding to these branches. Such a definition, when taken out of the context of its Group, should always be quoted with a preamble indicating its proper context.

It is to be noted that the given definition of a term represents the generally accepted meaning of that term. Under no circumstances should it be regarded as taking the place of a specification.

An effort has been made to arrange the terms in a logical order proceeding from the general to the specific and from the whole to the part and placing allied terms in proximity. Each term has assigned to it a Part number (one digit) and a Group number of two digits followed by a space and four digits, the first digit of which represents the section, the second digit the subsection and the last two digits the place within the subsection. The International Electrotechnical Vocabulary employs a different numbering system and for convenience the IEV number is given in parentheses after the BS number for each term.

A general view of the arrangement of the Group in the glossary can be obtained from the guide to the glossary. An alphabetical index of the terms of the Group is provided at the end to facilitate reference to particular terms. For simplicity, only the last four digits of a term's number are quoted in the index. It is recommended that the user of any Group of the glossary should consider the Group in association with the Groups covering general or fundamental terms within the Part, for Parts 2 and 3, and also together with Groups 01 and 02 of Part 1.

In this glossary parentheses () enclose words or phrases that are not part of the term or definition and can be omitted without affecting the meaning. Square brackets enclose words or numbers that may replace a preceding part of an expression.

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

Glossary

104 1 General terms on measurements in electricity

104 11 (301-01) Methods of measurement

No.	Term	Definition
104 1101 (301-01-01)	direct (method of) measurement	A method of measurement in which the value of a quantity to be measured is obtained directly, without the necessity for supplementary calculations based on a functional relationship between the quantity to be measured and other quantities actually measured. NOTE 1. The measured quantity is considered to be obtained directly even when the scale of a measuring instrument has values which are linked to corresponding values of the measured quantity by means of a table or a graph. NOTE 2. The method of measurement remains direct even if it is necessary to make supplementary measurements to determine the values of influence quantities in order to make corrections.
104 1102 (301-01-02)	indirect (method of) measurement	A method of measurement in which the value of a quantity is obtained from measurements made by direct methods of measurement of other quantities linked to the quantity to be measured by a known relationship.
104 1103 (301-01-03)	comparison (method of) measurement	A method of measurement based on the comparison of the value of a quantity to be measured with a known value of the same kind.
104 1104 (301-01-04)	substitution (method of) measurement	A comparison method of measurement in which the value of the quantity to be measured is replaced by a known value of the same kind chosen in such a manner that the effects on the measuring instrument of these two values are the same.
104 1105 (301-01-05)	complementary (method of) measurement	A comparison method of measurement in which the value of the quantity to be measured is combined with a known value of the same quantity so adjusted that the sum of these two values is equal to a predetermined comparison value.
104 1106 (301-01-06)	differential (method of) measurement	A comparison method of measurement, based on comparing the quantity to be measured with a quantity of the same kind having a known value only slightly different from that of the quantity to be measured, and measuring the algebraic difference between the values of these two quantities.
104 1107 (301-01-07)	null (method of) measurement	A differential method of measurement where the difference between the value of the measured quantity and the known value of the same kind with which it is compared is brought to zero.
104 1108 (301-01-08)	beat method	<i>Of measurement.</i> A differential method of measurement which uses the phenomenon of beating between the frequencies related to two compared quantities, one being the quantity to be measured and the other the reference quantity.
104 1109 (301-01-09)	resonance method	<i>Of measurement.</i> A comparison method of measurement in which a known relationship between the compared values of a particular quantity is established by means of the attainment of a condition of resonance or near-resonance.

104 12 (301-02) Basic and general terms

No.	Term	Definition
104 1201 (301-02-01)	measuring instrument	A device intended to detect or measure a quantity or to supply a quantity for measurement purposes.
104 1202 (301-02-02)	measuring instrument	A measuring device intended to transform the measured quantity or a related quantity into an indication or equivalent information.
104 1203 (301-02-03)	material measure	A measuring device which reproduces, in a permanent manner during its use, one or more known values of a defined quantity.
104 1204 (301-02-04)	electrical measuring instrument	A measuring instrument intended to measure an electrical or non-electrical quantity using electrical means.
104 1205 (301-02-05)	electronic measuring instrument	A measuring instrument intended to measure an electrical or non-electrical quantity using electronic means.
104 1206 (301-02-06)	measuring equipment	An assembly of measuring instruments intended for specified measurement purposes.
104 1207 (301-02-07)	measuring system	A set of independent elements constituted to achieve a given objective by performing specified measurements.
104 1208 (301-02-08)	detecting instrument	An instrument intended to detect a quantity without special regard to its value, in some cases showing the approximate value and/or the sign of the quantity.
104 1209 (301-02-09)	analogue (measuring) instrument	A measuring instrument intended to present or display the output information as a continuous function of the measured quantity.
104 1210 (301-02-10)	digital (measuring) instrument	A measuring instrument in which the quantity to be measured is accepted as, or is converted into, coded discrete signals and which provides an output or display in digital form.
104 1211 (301-02-11)	indicating (measuring) instrument	A measuring instrument which displays at any time the value of the measured quantity without recording it.
104 1212 (301-02-12)	recording (measuring) instrument; recorder	A measuring instrument which records on a recording medium information corresponding to the values of the measured quantity. NOTE 1. Some recording instruments may incorporate an indicating device. NOTE 2. Some recording instruments may record information corresponding to more than one measured quantity.
104 1213 (301-02-13)	oscilloscope	An instrument intended to show, in the form of a transitory trace, instantaneous values of a quantity.
104 1214 (301-02-14)	oscillograph	An instrument intended to record, in the form of a permanent trace, instantaneous values of a quantity.
104 1215 (301-02-15)	integrating (measuring) instrument	A measuring instrument which gives the integral of an input quantity with respect to another quantity, generally time. NOTE. An electricity meter is an example of an integrating instrument.

No.		Term	Definition
104 1216	(301-02-16)	measuring transducer	<i>With electric output.</i> A device intended to transform, with a specified accuracy and according to a given law, the measured quantity, or a quantity already transformed therefrom, into an electrical quantity. NOTE 1. If the input quantity is electrical, the input and output quantities may not be of the same kind, e.g. a voltage and a current. NOTE 2. In certain cases, measuring transducers also have a specific name in respect of their function, e.g. amplifier, converter, transformer, etc..
104 1217	(301-02-17)	telemeasuring equipment	An assembly of instruments intended to indicate or record the value of the measured quantity at a distance from the measuring point, using telecommunication techniques. NOTE. The term 'telemetering equipment' is deprecated in this sense.
104 1218	(301-02-18)	fixed (measuring) instrument	A measuring instrument designed to be permanently mounted and which is intended to be connected to (an) external circuit(s) by means of permanently installed conductors.
104 1219	(301-02-19)	portable (measuring) instrument	A measuring instrument designed to be carried by hand and to be connected and disconnected by the user.
104 1220	(301-02-20)	single range (measuring) instrument	A measuring instrument having only one measuring range.
104 1221	(301-02-21)	multi-range (measuring) instrument	A measuring instrument having more than one measuring range.
104 1222	(301-02-22)	multi-scale (measuring) instrument	A measuring instrument having more than one scale.
104 1223	(301-02-23)	single function (measuring) instrument	A measuring instrument intended for the measurement of one kind of quantity only.
104 1224	(301-02-24)	multi-function (measuring) instrument	A measuring instrument having a single indicating device intended to measure more than one kind of quantity.
104 1225	(301-02-25)	multimeter	A multi-range multi-function measuring instrument intended to measure voltage, current and sometimes other electrical quantities such as resistance.
104 1226	(301-03-01)	measuring instrument with circuit control devices	An instrument which provides electric control signals at predetermined values of the measured quantity.
104 1227	(301-03-02)	differential measuring instrument	An instrument intended to measure the difference between the values of two quantities of the same kind existing at practically the same time in different circuits.
104 1228	(301-03-03)	summation instrument; totalizer	An instrument intended to determine the sum of the values of quantities of the same kind measured simultaneously in different circuits.
104 1229	(301-03-04)	ratio-meter	An instrument intended to measure the ratio of the values of two quantities of the same kind.

No.	Term	Definition
104 1230 (301-03-05)	quotient-meter	An instrument intended to measure the quotient of the values of two quantities of different kinds.
104 1231 (301-03-06)	XY recorder	A recording instrument in which the marking device is moved along two orthogonal axes by two separate devices, to each of which a quantity to be recorded is applied. NOTE. When one of the quantities is time, the instrument is called an X(t) or a Y(t) recorder.

104 13 (301-04) Measuring instruments

104 1301 (301-04-01)	ammeter	An instrument intended to measure the value of a current.
104 1302 (301-04-02)	galvanometer	An instrument intended to detect or measure a very small current.
104 1303 (301-04-03)	voltmeter	An instrument intended to measure the value of a voltage.
104 1304 (301-04-04)	electrometer	An instrument intended to detect or measure a voltage, absorbing negligible energy.
104 1305 (301-04-05)	peak voltmeter	A voltmeter intended to measure the maximum instantaneous value of a fluctuating voltage.
104 1306 (301-04-06)	wattmeter; active power meter	An instrument intended to measure active power.
104 1307 (301-04-07)	varmeter; reactive power meter	An instrument intended to measure reactive power.
104 1308 (301-04-08)	volt-ampere meter; apparent power meter	An instrument intended to measure apparent power.
104 1309 (301-04-09)	ohmmeter; resistance meter	An instrument intended to measure electric resistance.
104 1310 (301-04-10)	earth resistance meter	An instrument intended to measure the resistance of an earth connection.
104 1311 (301-04-11)	insulation resistance meter	An instrument intended to measure insulation resistance.
104 1312 (301-04-12)	frequency meter	An instrument intended to measure the frequency of a periodic quantity.
104 1313 (301-04-13)	phase meter	An instrument intended to measure the phase angle between two alternating electrical quantities of the same frequency, one of which is accepted as the phase reference.
104 1314 (301-04-14)	power factor meter	An instrument intended to measure the ratio between the active and the apparent power in an electrical circuit.
104 1315 (301-04-15)	coulometer	An instrument intended to measure an amount of electric charge (quantity of electricity).
104 1316 (301-04-16)	ampere-hour meter	An instrument intended to measure a quantity of electricity by integrating current with respect to time.

No.		Term	Definition
104 1317	(301-04-17)	watt-hour meter; (active) energy meter	An instrument intended to measure active energy by integrating active power with respect to time.
104 1318	(301-04-18)	var-hour meter; reactive energy meter	An instrument intended to measure reactive energy by integrating reactive power with respect to time.
104 1319	(301-04-19)	volt-ampere-hour meter; apparent energy meter	An instrument intended to measure apparent energy by integrating apparent power with respect to time.
104 1320	(301-04-20)	flux meter	An instrument intended to measure magnetic flux.
104 1321	(301-04-21)	magnetometer	An instrument intended to measure the value of a magnetic flux density in a given direction.
104 1322	(301-04-22)	permeameter	Equipment intended for the determination of the magnetic characteristics of substances.

104 14 (301-05) Miscellaneous devices

104 1401	(301-05-01)	reference source	A device which is intended to produce, for reference purposes, an electrical or magnetic quantity within specified tolerances.
104 1402	(301-05-02)	(measurement) standard	A measuring instrument, apparatus or system intended to define, represent physically, conserve or reproduce either the unit of measurement of a quantity, or a multiple or submultiple thereof (e.g. standard resistor) or a known value of a quantity (e.g. standard cell).
104 1403	(301-05-03)	reference-value method	A mode of reproducing a unit of measurement (or a multiple or submultiple of that unit) either in terms of fixed values of certain properties of bodies or in terms of physical constants.
104 1404	(301-05-04)	primary standard	A standard of a particular quantity which has the highest metrological qualities in a given field. NOTE 1. The concept of a primary standard is equally valid for base units and for derived units. NOTE 2. The primary standard is never used directly for measurement other than for comparison with duplicate standards or reference standards.
104 1405	(301-05-05)	secondary standard	A standard, whose value is fixed by direct or indirect comparison with a primary standard or by means of a reference-value method.
104 1406	(301-05-06)	reference standard	A secondary standard with which standards of lower accuracy are compared.
104 1407	(301-05-07)	working standard	A standard which, calibrated against a reference standard, is intended to verify working measuring instruments of lower accuracy.
104 1408	(301-05-08)	international standard	A standard recognized by an international agreement to serve internationally as the basis for fixing the value of all other standards of the given quantity.

No.		Term	Definition
104 1409	(301-05-09)	national standard	A standard recognized by an official national decision as the basis for fixing the value, in a country, of all other standards of the given quantity. NOTE. Generally, in a country, the national standard is also the primary standard.
104 1410	(301-05-10)	comparison standard	A standard intended for the comparison among themselves of standards of the same order of accuracy.
104 1411	(301-05-11)	measuring bridge	A measuring equipment consisting of at least four branches (arms) or groups of circuit elements (resistors, inductors, capacitors, etc.), connected in a quadrilateral, one of whose diagonals is supplied by a source and the other is connected to a null detector or a measuring instrument.
104 1412	(301-05-12)	(measuring) potentiometer	A voltage measuring instrument in which the voltage to be measured is opposed to a known voltage of the same waveform, frequency and value.
104 1413	(301-05-13)	voltage divider	A device comprising resistors, inductors, capacitors, transformer(s) or a combination of these components such that between two points of the device a desired fraction of the voltage applied to the device as a whole can be obtained.

104 15 (301-06) Terms relating to accessories

104 1501	(301-06-01)	accessory	<i>For a measuring instrument.</i> An element, group of elements or device associated with a measuring instrument in order to confer on it different specified characteristics.
104 1502	(301-06-02)	interchangeable accessory	An accessory having its own properties and accuracy, which are independent of those of the instruments with which it may be associated.
104 1503	(301-06-03)	accessory of limited interchangeability	An accessory, having its own properties and accuracy, which can only be associated with measuring instruments for which certain characteristics are within specified limits.
104 1504	(301-06-04)	non-interchangeable accessory	An accessory which is adapted to the characteristics of a specific instrument.
104 1505	(301-06-05)	shunt	A resistor connected in parallel with the current circuit of a measuring instrument in order to reduce, by a known ratio, the current passing through it. NOTE. A shunt is generally intended to provide a voltage proportional to the current to be measured.
104 1506	(301-06-[06] [07] [08])	series resistor [capacitor] [inductor]	Resistor [capacitor] [inductor] connected in series with the voltage circuit of a measuring instrument in order to extend its effective range.
104 1509	(301-06-09)	instrument lead	A lead comprising one or more conductors, specially designed for interconnecting measuring instruments and accessories.

104 16 (301-07) Terms relating to measuring instruments

No.		Term	Definition
104 1601	(301-07-01)	indicating device	<i>Of a measuring instrument.</i> The ensemble of components of a measuring instrument intended to indicate the value of the measured quantity. NOTE. By extension, the indicating means or setting device of any instrument such as a material measure or a signal generator.
104 1602	(301-07-02)	index	<i>Of an indicating device.</i> The fixed or movable part of the indicating device such as pointer, luminous spot or window, whose position, in relation to a scale, permits the value of the measured quantity to be determined.
104 1603	(301-07-03)	scale	<i>Of an analogue instrument.</i> A series of marks, figures or other signs on the indicating device.
104 1604	(301-07-04)	dial	The part of an indicating device carrying the scale or scales and generally including other information to characterize the instrument.
104 1605	(301-07-05)	scale marking	The series of marks distributed on a scale according to an appropriate law.
104 1606	(301-07-06)	scale numbering	Numbers assigned to certain scale marks.
104 1607	(301-07-07)	scale length	The length of the line (curved or straight) which passes through the centres of all the shortest scale marks, contained between the first and the last scale marks.
104 1608	(301-07-08)	scale division	The interval between any two consecutive scale marks.
104 1609	(301-07-09)	length of a scale division	The part of the scale length between two consecutive marks.
104 1610	(301-07-10)	scale interval	The difference between the values of the measured quantity corresponding to two consecutive scale marks.
104 1611	(301-07-11)	digital readout	Presentation of the values of the measured quantity by means of figures appearing discontinuously, forming a number which directly indicates each of those values.
104 1612	(301-07-12)	semidigital readout	Presentation of the values of the measured quantity by the combination of a digital readout and an indication by a scale and index.
104 1613	(301-07-13)	indication of a measuring instrument	The value of the measured quantity indicated by the measuring instrument. NOTE 1. This term can be applied most particularly to an indicating measuring instrument; however, when no ambiguity is possible, it can also be applied to the information displayed by a recording measuring instrument. NOTE 2. The concept of the indication of a measuring instrument also refers to material measures. NOTE 3. The term 'indication' also means a presumed indication, obtained by interpolation of the position of the index of the instrument between adjacent scale marks. NOTE 4. The value of the measured quantity can be directly indicated in units of that quantity or in conventional units. In this latter case, the direct indication must be multiplied by the constant of the instrument.