

इंटरनेट

मानक

Disclosure to Promote the Right To Information

Whereas the Parliament of India has set out to provide a practical regime of right to information for citizens to secure access to information under the control of public authorities, in order to promote transparency and accountability in the working of every public authority, and whereas the attached publication of the Bureau of Indian Standards is of particular interest to the public, particularly disadvantaged communities and those engaged in the pursuit of education and knowledge, the attached public safety standard is made available to promote the timely dissemination of this information in an accurate manner to the public.

“जानने का अधिकार, जीने का अधिकार”

Mazdoor Kisan Shakti Sangathan

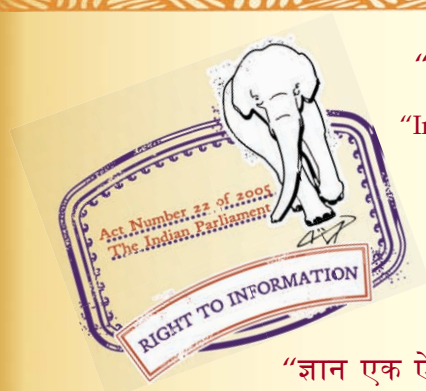
“The Right to Information, The Right to Live”

“पुराने को छोड़ नये के तरफ”

Jawaharlal Nehru

“Step Out From the Old to the New”

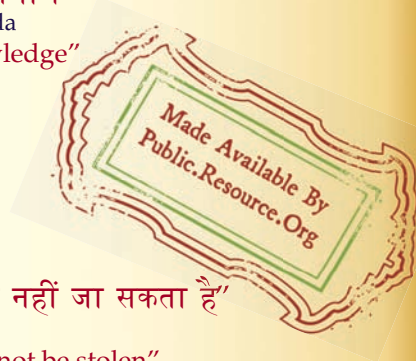
IS 1885-78 (1993): Electrotechnical Vocabulary, Part 78: Generation, transmission and distribution of electricity - General [ETD 1: Basic Electrotechnical Standards]



“ज्ञान से एक नये भारत का निर्माण”

Satyanarayan Gangaram Pitroda

“Invent a New India Using Knowledge”



“ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है”

Bhartrhari—Nitiśatakam

“Knowledge is such a treasure which cannot be stolen”

BLANK PAGE



IS 1885 (Part 78) : 1993
IEC Pub 50 (601) (1985)

भारतीय मानक

विद्युत तकनीकी शब्दावली

भाग 78 विद्युत उत्पादन, प्रेषण और वितरण — सामान्य

Indian Standard

ELECTROTECHNICAL VOCABULARY

PART 78 GENERATION, TRANSMISSION AND DISTRIBUTION OF
ELECTRICITY — GENERAL

UDC 621.311 : 001.4

© BIS 1993

BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

May 1993

Price Group 3

CONTENTS

Section							Page
601-01 Fundamental terms	...	...	...	...	...	...	1
601-02 System configuration	...	...	...	...	...	...	2
601-03 Equipment	...	...	..	...	...	...	4
601-04 High-voltage d.c. systems	...	...	...	...	...	—	4
Index	...	...	...	...	...	...	5

NATIONAL FOREWORD

This Indian Standard (Part 78) which is identical with IEC Pub 50 (601) (1985) ‘International electrotechnical vocabulary — Chapter 601 : Generation, transmission and distribution of electricity — General’, issued by the International Electrotechnical Commission (IEC), was adopted by the Bureau of Indian Standards on the recommendation of the Basic Electrotechnical Standards Sectional Committee and approval of the Electrotechnical Division Council.

Only the English text given in the IEC publication has been retained while adopting as Indian Standard, and as such the page numbers given here are not same as in IEC Publication.

Textual error — When adopting the text of the International Standard, the textual error given below was discovered. It has been marked in the text.

Error	Correction
Security supply	Security of supply

Indian Standard

ELECTROTECHNICAL VOCABULARY

PART 78 GENERATION, TRANSMISSION AND DISTRIBUTION OF ELECTRICITY – GENERAL

SECTION 601-01 — FUNDAMENTAL TERMS

Preliminary remark

The term "network" can in some countries and some situations be preferred to the term "system". In many cases the terms are synonymous.

Therefore, for the purposes of the definitions in this chapter, the term "system" has been used throughout for simplicity but "network" can be substituted according to the context or common usage or as defined herewith.

601-01-01

electrical power system

electricity supply system (in a broad sense)

All installations and plant provided for the purpose of generating, transmitting and distributing electricity.

601-01-02

electrical power system

electrical power network

Particular installations, substations, lines or cables for the transmission and distribution of electricity.

Note. – The boundaries of the different parts of this network are defined by appropriate criteria, such as geographical situation, ownership, voltage, etc.

601-01-03

alternating current system

a.c. system

An electrical system fed by alternating voltage.

601-01-04

direct current system

d.c. system

An electrical system fed by unidirectional voltage.

601-01-05

power frequency

Conventionally, the values of frequency used in the electricity supply systems.

601-01-06

generation of electricity

A process whereby electrical energy is obtained from some other form of energy.

601-01-07

conversion of electricity

The changing of the characteristics of the form and frequency of voltage and current by means of a converter.

601-01-08

transformation of electricity

The transfer of electricity through a power transformer.

601-01-09

transmission of electricity

The transfer in bulk of electricity, from generating stations to areas of consumption.

601-01-10

distribution of electricity

The transfer of electricity to consumers within an area of consumption.

601-01-11

interconnection (of power systems)

A single or multiple transmission link between transmission systems enabling electricity to be exchanged between these systems by means of circuits and/or transformers.

601-01-12

interconnected systems

Systems connected together by means of one or more interconnections links.

Note. – This term is also used in the singular for a system whose elements are interconnected.

601-01-13

asynchronous link

An interconnection between two a.c. systems operating at independent frequencies.

601-01-14

short-circuit power

The product of the current in the short circuit at a point of a system and a conventional voltage, generally the operating voltage.

601-01-15

load in a system

- 1) The active, reactive or apparent power generated, transmitted or distributed within a system.
- 2) The power demanded by a group of consumers classified according to their particulars, and characteristics, e.g. heating load, daytime reactive load, etc.

601-01-16

peak load

Maximum value of load during a given period of time, e.g. a day, a month, a year.

601-01-17

load curve

Graphical representation of the observed or expected variation of load as a function of time.

601-01-18

load duration curve

A curve showing the duration, within a specified period of time, when the load equalled or exceeded a given value.

601-01-19

active energy

The electrical energy transformable into some other form of energy.

601-01-20

reactive energy

In an a.c. system, the captive electrical energy exchanged continuously between the different electric and magnetic fields associated with the operation of the electrical system and of all the connected apparatus.

601-01-21

nominal voltage of a system

A suitable approximate value of voltage used to designate or identify a system.

601-01-22

operating voltage (in a system)

The value of the voltage under normal conditions, at a given instant and a given point of the system.

Note. — This value may be expected, estimated or measured.

601-01-23 [24]

highest [lowest] voltage of a system

The highest [lowest] value of operating voltage which occurs under normal operating conditions at any time and any point in the system.

Note. — Transient overvoltages due e.g. to switching operations and abnormal temporary variations of voltage, are not taken into account.

601-01-25

voltage level

One of the nominal voltage values used in a given system.

601-01-26

low voltage (abbreviations : LV)

A set of voltage levels used for the distribution of electricity and whose upper limit is generally accepted to be 1 000 V a.c.

601-01-27

high voltage (abbreviation : HV)

- 1) In a general sense, the set of voltage levels in excess of low voltage.
- 2) In a restrictive sense, the set of upper voltage levels used in power systems for bulk transmission of electricity.

601-01-28

medium voltage (abbreviation : MV)

(not used in the UK in this sense nor in Australia)

Any set of voltage levels lying between low and high voltage.

Note. — The boundaries between medium and high voltage levels overlap and depend on local circumstances and history or common usage. Nevertheless the band 30 kV to 100 kV frequently contains the accepted boundary.

601-01-29

phase to phase voltage

line to line voltage (USA)

The voltage between phases.

601-01-30

phase to neutral voltage

line to neutral voltage (USA)

The voltage between a phase in a polyphase system and the neutral point.

601-01-31

phase to earth voltage

line to ground voltage (USA)

The voltage between phase and earth.

601-01-32

neutral point displacement voltage

The voltage between the real or virtual neutral point and the earth.

SECTION 601-02 — SYSTEM CONFIGURATION

601-02-01

system diagram

A topological representation of a system in which the information content depends on a specific requirement.

601-02-02

system operational diagram

A system diagram representing a particular operational condition.

601-02-03

three-phase system diagram

A diagram of a three-phase system in which all phase and neutral conductors are each represented by separate lines.

601-02-04

single-line diagram

A system diagram in which the polyphase links are represented by their equivalent single line.

601-02-05

system pattern

A repetitive arrangement of the nodes in a system and

their connections, e.g. feeder, ring, mesh etc.

601-02-06

system configuration

A permanent or temporary grouping of similar or dissimilar individual system patterns.

601-02-07

link in a system

A branch between two nodes of a system.

Note. — It generally comprises a line, a transformer or a connection between two adjacent bus-bars.

601-02-08

feeder

An electric line originating at a main substation and supplying one or more secondary substations.

601-02-09

single feeder

radial feeder

An electric line supplied from one end only.

601-02-10

branch line

spur

An electric line connected to a main line at a point on its route.

Note. — A branch line which is a final circuit is called a spur.

601-02-11

tapped line

teed line

A main line to which branch lines are connected.

601-02-12

supply service

line connection

A branch line from the distribution system to supply a consumer's installation.

601-02-13

ring feeder

loop (deprecated in this sense)

An arrangement of electric lines forming a complete ring and supplied only from a single source.

Note. — A ring can be operated open or closed.

601-02-14

mesh (of a system)

An arrangement of electric lines forming a closed loop and supplied from several supply sources.

601-02-15

radial system

A system or part of a system consisting of single feeders supplied from a single source of supply.

601-02-16

tree'd system

A modified radial system to which spurs have been added.

601-02-17

meshed system

A system or part of system consisting of multiple meshes.

601-02-18

single supply

A supply given to a load by one circuit only.

601-02-19

duplicate supply

A supply to a load by two circuits which are considered to be independent of each other in terms of security supply.

601-02-20

stand-by supply

A supply which can be used when the normal supply becomes unavailable or inadequate.

601-02-21

tapped (tee off) substation

A single supply substation fed from a single branch line.

601-02-22

neutral point in a polyphase system

The common point of the n -windings in a star-connected equipment such as a power transformer, or an earthing transformer.

601-02-23

neutral point connection

The means of electrical connection of the neutral point to earth.

601-02-24

isolated neutral system

A system where the neutral point is not intentionally connected to earth, except for high impedance connections for protection or measurement purposes.

601-02-25

solidly earthed (neutral) system

A system whose neutral point(s) is (are) earthed directly.

601-02-26

impedance earthed (neutral) system

A system whose neutral point(s) is (are) earthed through impedances to limit earth fault currents.

601-02-27

resonant earthed (neutral) system
arc-suppression-coil-earth (neutral) system

A system in which one or more neutral points are connected to earth through reactances which approximately compensate the capacitive component of a single-phase-to-earth fault current.

* See National Foreword for details of textual error.

SECTION 601-03 — EQUIPMENT

Note: General terms such as : *item, component, device, plant, equipment, installation*, are non-specifically electrical terms, the meaning of each depending on the context. There is no exact corresponding equivalence between the various languages.

601-03-01
power station
electrical generating station

An installation whose purpose is to generate electricity and which includes civil engineering works, energy conversion equipment and all the necessary ancillary equipment.

601-03-02
substation (of a power system)

A part of an electrical system, confined to a given area, mainly including ends of transmission or distribution lines, electrical switchgear and controlgear, buildings and transformers. A substation generally includes safety or control devices (for example protection).

Note. — The substation can be qualified according to the designation of the system of which it forms a part. Examples : transmission, substation (transmission system), distribution substation, 400 kV or 20 kV substation.

601-03-03
electric line

An arrangement of conductors, insulating materials and accessories for transferring electricity between two points of a system.

601-03-04
overhead line

An electric line whose conductors are supported above ground, generally by means of insulators and appropriate supports.

Note. — Certain overhead lines may also be constructed with insulated conductors.

601-03-05
underground cable

An electric line with insulated conductors buried directly in the ground, or laid in cable ducts, pipes, troughs, etc.

Note. — The same expression is used to describe the item physically.

601-03-06
gas insulated line
gas insulated circuit (deprecated)
GIC (deprecated)

An electric line whose conductors are contained in a enclosure and insulated with a compressed gas.

601-03-07
overhead system

A system consisting essentially of overhead lines.

601-03-08
underground system

A system consisting essentially of underground cables.

601-03-09
phase

The designation of any conductor, bundle of conductors, terminal, winding or any other element of a polyphase system, which is intended to be energized under normal use.

601-03-10
neutral

The designation of any conductor, terminal or any element connected to the neutral point of a polyphase system.

601-03-11

pole (of an equipment)

In certain types of equipment such as switchgear, the part corresponding to one of the phases in a.c. or to one of the polarities in d.c.

Note. — According to the number of poles within the equipment, it is called : singlepole equipment, two- pole equipment, etc.

601-03-12

pole (of a d.c. system)

The designation of a conductor, terminal or any other element of a d.c. system which is likely to be energized under normal conditions : e.g. positive pole, negative pole.

SECTION 601-04 — HIGH-VOLTAGE D.C. SYSTEMS¹⁾

601-04-01
high-voltage d.c. link
HVDC link

An installation for transmitting large quantities of electricity at high-voltage d.c., including the converter substations.

¹⁾ IEC Publications 633 contains detailed terminology for conversion systems and equipment used in HVDC transmission.

601-04-02
monopolar d.c. link

A link having only one energized pole whatever the means of return of the d.c. current.

601-04-03
bipolar d.c. link

A link having two poles normally operating at d.c. voltages of opposite polarity in relation to earth.

INDEX

A			
a.c. system	601-01-03	load duration curve	601-01-18
active energy	601-01-19	load in a system	601-01-15
alternating current system	601-01-03	loop (deprecated)	601-02-13
arc-suppression-coil-earth (neutral) system	601-02-27	low voltage	601-01-26
asynchronous link	601-01-13	lowest voltage of a system	601-01-24
		LV (abbreviation)	601-01-26
B		M	
bipolar d.c. link	601-04-03	medium voltage	601-01-28
branch line	601-02-10	(not used in the United Kingdom in this sense)	
C		mesh (of a system)	601-02-14
conversion of electricity	601-01-07	meshed system	601-02-17
D		monopolar d.c. link	601-04-02
d.c. system	601-01-04	MV (abbreviation)	601-01-28
direct current system	601-01-04	N	
distribution of electricity	601-01-10	neutral	601-03-10
duplicate supply	601-02-19	neutral point connection	601-02-23
E		neutral point displacement voltage	601-01-32
electrical generating station	601-03-01	neutral point in a polyphase system	601-02-22
electrical power network	601-01-02	nominal voltage of a system	601-01-21
electro power system	601-01-01	O	
electricity supply system (in a broad sense)	601-01-01	operating voltage (in a system)	601-01-22
electric line	601-03-03	overhead line	601-03-04
F		overhead system	601-03-07
feeder	601-02-08	P	
G		peak load	601-01-16
gas insulated circuit	601-03-06	phase	601-03-09
gas insulated line (deprecated)	601-03-06	phase to earth voltage	601-01-31
generation of electricity	601-01-06	phase to neutral voltage	601-01-30
GIC (deprecated)	601-03-06	phase to phase voltage	601-01-29
H		pole (of a d.c. system)	601-03-12
high voltage	601-01-27	pole (of an equipment)	601-03-11
high voltage d.c. link	601-04-01	power frequency	601-01-05
highest voltage of a system	601-01-23	power station	601-03-01
HV (abbreviation)	601-01-27	R	
HVDC link	601-04-01	radial feeder	601-02-09
I		radial system	601-02-15
impedance earthed (neutral) system	601-02-26	reactive energy	601-01-20
interconnected systems	601-01-12	resonant earthed (neutral) system	601-02-27
interconnection (of power systems)	601-01-11	ring feeder	601-02-13
isolated neutral system	601-02-24	S	
L		short-circuit power	601-01-14
line connection	601-02-12	single feeder	601-02-09
line to ground voltage (USA)	601-01-31	single-line diagram	601-02-04
line to line voltage (USA)	601-01-29	single supply	601-02-18
line to neutral voltage (USA)	601-01-30	solidly earthed (neutral) system	601-02-25
link in a system	601-02-07	spur	601-02-10
load curve	601-01-17	stand-by supply	601-02-20
		substation (of a power system)	601-03-02
		supply service	601-02-12
		system configuration	601-02-06

IS 1885 (Part 78) : 1993
IEC Pub 50 (601) (1985)

system diagram
system operational diagram
system pattern

T

tapped line
tapped (tee off) substation
teed line
three-phase system diagram

601-02-01 transformation of electricity
601-02-02 transmission of electricity
601-02-05 tree'd system

U

601-02-11 underground cable
601-02-21 underground system

V

601-02-11
601-02-03 voltage level

601-01-08
601-01-09
601-02-16

601-03-05
601-03-08

601-01-25

Standard Mark

The use of the Standard Mark is governed by the provisions of the *Bureau of Indian Standards Act, 1986* and the Rules and Regulations made thereunder. The Standard Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well defined system of inspection, testing and quality control which is devised and supervised by BIS and operated by the producer. Standard marked products are also continuously checked by BIS for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

Bureau of Indian Standards

BIS is a statutory institution established under the *Bureau of Indian Standards Act, 1986* to promote harmonious development of the activities of standardization, marking and quality certification of goods and attending to connected matters in the country.

Copyright

BIS has the copyright of all its publications. No part of these publications may be reproduced in any form without the prior permission in writing of BIS. This does not preclude the free use, in the course of implementing the standard, of necessary details, such as symbols and sizes, type or grade designations. Enquiries relating to copyright be addressed to the Director (Publications), BIS.

Review of Indian Standards

Amendments are issued to standards as the need arises on the basis of comments. Standards are any reviewed periodically; a standard along with amendments is reaffirmed when such review indicates that no changes are needed; if the review indicates that changes are needed, it is taken up for revision. Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition by referring to the latest issue of 'BIS Handbook' and 'Standards Monthly Additions'. Comments on this Indian Standard may be sent to BIS giving the following reference:

Doc ; No. ET 01 (3448)

Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

BUREAU OF INDIAN STANDARDS

Headquarters:

Manak Bhavan, 9 Bahadur Shah Zafar Marg, New Delhi 110002
Telephones : 331 01 31, 331 13 75

Telegrams : Manaksanstha
(Common to all offices)

Regional Offices :

Telephone

Central : Manak Bhavan, 9 Bahadur Shah Zafar Marg
NEW DELHI 110002

{ 331 01 31
{ 331 13 75

Eastern : 1/14 C. I. T. Scheme VII M, V. I. P. Road, Maniktola
CALCUTTA 700054

{ 37 84 99, 37 85 61
{ 37 86 26, 37 86 62

Northern : SCO 445-446, Sector 35-C CHANDIGARH 160036

{ 53 38 43, 53 16 40
{ 53 23 84

Southern : C. I. T. Campus, IV Cross Road, MADRAS 600113

{ 235 02 16, 235 04 42
{ 235 15 19, 235 23 15

Western : Manakalaya, E9 MIDC, Marol, Andheri (East)
BOMBAY 400093

{ 632 92 95, 632 78 58
{ 632 78 91, 632 78 92

Branches : AHMADABAD. BANGALORE. BHOPAL. BHUBANESHWAR.
COIMBATORE. FARIDABAD. GHAZIABAD. GUWAHATI. HYDERABAD.
JAIPUR. KANPUR. LUCKNOW. PATNA. THIRUVANANTHAPURAM.