



SLOVENSKI STANDARD SIST EN 50123-6:1998

01-november-1998

Railway applications - Fixed installations - D.C. switchgear - Part 6: D.C. switchgear assemblies

Railway applications - Fixed installations - D.C. switchgear -- Part 6: D.C. switchgear assemblies

Bahnanwendungen - Ortsfeste Anlagen - Gleichstromschalteinrichtungen -- Teil 6: Gleichstrom-Schaltanlagen

Applications ferroviaires - Installations fixes - Appareillage en courant continu -- Partie 6: Montage d'appareillage en courant continu

<https://standards.iteh.ai/catalog/standards/sist/8e10ff84-6fce-44ed-991e-e4d5ccaf4130/sist-en-50123-6-1998>

Ta slovenski standard je istoveten z: EN 50123-6:1998

ICS:

29.130.99	Druge stikalne in krmilne naprave	Other switchgear and controlgear
29.280	Ò\ dã } æ } æ] ^ { æ	Electric traction equipment

SIST EN 50123-6:1998

en

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[SIST EN 50123-6:1998](https://standards.iteh.ai/catalog/standards/sist/8e10ff84-6fce-44ed-991e-e4d5ccaf4130/sist-en-50123-6-1998)

<https://standards.iteh.ai/catalog/standards/sist/8e10ff84-6fce-44ed-991e-e4d5ccaf4130/sist-en-50123-6-1998>

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 50123-6

March 1998

ICS 29.120.60; 45.020

Descriptors: Railway fixed equipment, electric traction, electrical equipment, direct current, assembling, definitions, equipment specifications, earthing, degree of protection, tests, information, marking

English version

**Railway applications - Fixed installations - D.C. switchgear
Part 6: D.C. switchgear assemblies**

Applications ferroviaires - Installations
fixes - Appareillage en courant continu
Partie 6: Montage d'appareillage en
courant continu

Bahnanwendungen - Ortsfeste Anlagen
Gleichstrom-Schaltenrichtungen
Teil 6: Gleichstrom-Schaltanlagen

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[SIST EN 50123-6:1998](https://standards.iteh.ai/catalog/standards/sist/8e10ff84-6fce-44ed-991e-e4d5cca4130/sist-en-50123-6-1998)

<https://standards.iteh.ai/catalog/standards/sist/8e10ff84-6fce-44ed-991e-e4d5cca4130/sist-en-50123-6-1998>

This European Standard was approved by CENELEC on 1997-10-01. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the Central Secretariat has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

CENELEC

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

Central Secretariat: rue de Stassart 35, B - 1050 Brussels

Foreword

This European Standard was prepared by SC 9XC, Electric supply and earthing systems for public transport equipment and ancillary apparatus (fixed installations) of Technical Committee CENELEC TC 9X, Electrical and electronic applications for railways.

The text of the draft was submitted to the Unique Acceptance Procedure and was approved by CENELEC as EN 50123-6 on 1997-10-01.

The following dates were fixed:

- latest date by which the EN has to be implemented
at national level by publication of an identical
national standard or by endorsement (dop) 1998-10-01
- latest date by which the national standards conflicting
with the EN have to be withdrawn (dow) 1998-10-01

Annexes designated "informative" are given for information only.
In this standard, annex A is informative.

iTeh STANDARD PREVIEW

(standards.iteh.ai)

SIST EN 50123-6:1998

<https://standards.iteh.ai/catalog/standards/sist/8e10ff84-6fce-44ed-991e-e4d5ccaf4130/sist-en-50123-6-1998>

Contents

	Page
1 Scope	4
2 Normative references	4
3 Definitions	5
4 Service conditions	9
5 Characteristics of the assemblies	9
6 Construction characteristics	9
7 Information and marking	18
8 Tests	18
Annex A Information required	28

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN 50123-6:1998

<https://standards.iteh.ai/catalog/standards/sist/8e10ff84-6fce-44ed-991e-e4d5ccaf4130/sist-en-50123-6-1998>

1 Scope

This EN 50123-6 covers d.c. metal-enclosed and non-metallic enclosed switchgear assemblies used in indoor stationary installations of traction systems, with nominal voltage not exceeding 3 000 V.

It is intended that individual items of equipment, for example circuit breakers, housed in the assembly are designed, manufactured and individually tested (simulating the enclosure when necessary) in accordance with their respective parts of EN 50123 or, when appropriate, with another applicable standard.

NOTE 1: The requirements covered in EN 50123-6 are those concerning the assembly as such, its enclosure and the mutual influence of the equipment enclosed.

NOTE 2: EMC requirements are covered by EN 50121-5 and additional requirements concerning dependability (RAMS) are covered by EN 50126.

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated reference the latest edition of the publication referred to applies.

EN 50123	series	Railway applications - Fixed installations - D.C. switchgear
EN 50123-1	1995	Part 1: General (normative references mentioned in this document also apply)
EN 50123-2 + A1	1995 1996	Part 2: D.C. circuit breakers
EN 50123-3	1995	Part 3: Indoor d.c. switch-disconnectors and d.c. disconnectors
EN 50123-4	199X (*)	Part 4: Outdoor d.c. in-line switch-disconnectors and d.c. earthing switches
EN 50123-5	1997	Part 5: Surge arresters and low-voltage limiters for specific use in d.c. systems
EN 50123-7	199X (*)	Part 7: Measurement, control and protection of d.c. traction systems
EN 50124-1	199X (*)	Railway applications - Insulation coordination -- Part 1: Basic requirements - Clearances and creepage distances
EN 60529	1991	Degrees of protection provided by enclosures (IP Code) (IEC 60529:1989)
HD 559.1 S1	1991	Methods of tests for electric strength of solid insulating materials -- Part 1: Tests at power frequencies (IEC 60243-1:1988, modified)
EN 60298	1996	A.C. metal-enclosed switchgear and controlgear for rated voltages above 1 kV and up to and including 52 kV (IEC 60298:1990 + corr. April 1995 + A1:1994)
IEC 60466	1987	A.C. insulation-enclosed switchgear and controlgear for rated voltages above 1 kV and up to and including 38 kV

(*) In preparation

3 Definitions

For the purposes of this standard, the definitions given in clause 3 of EN 50123-1:1995 apply. The following additional definitions, taken from EN 60298:1996, but subject to small adaptation as follows, also apply:

3.1 switchgear (EN 60298:1996 - 3.101)

A general term covering switching devices and their combination with associated control, measuring, protective and regulating equipment; it covers also assemblies of such devices and equipment with associated interconnections, accessories, enclosures and supporting structures.

NOTE: For sake of simplicity in this Standard the term "switchgear" means "switchgear and controlgear".

3.2 metal-enclosed switchgear (EN 60298:1996 - 3.102)

Switchgear assemblies with an external metallic enclosure intended to be earthed and complete except for external connections.

NOTE: The metal-enclosed switchgear is subdivided into three types:

- metal-clad switchgear;
- compartmented switchgear (with one or more non-metallic partitions);
- cubicle switchgear.

3.2.1 metal-clad switchgear (EN 60298:1996 - 3.102.1)

Metal-enclosed switchgear in which components are arranged in separate compartments with metal partitions intended to be earthed.

NOTE 1: This term applies to metal-enclosed switchgear with metal partitions providing the degree of protection included in table 2 of 6.6.1 (or higher) and having separate compartments at least for the following components:

- a) each main switching device;
- b) components connected to one side of a main switching device, for example feeder circuit;
- c) components connected to the other side of the main switching device, for example busbars; where more than one set of busbars is provided, each set being in a separate compartment.

NOTE 2: Metal-enclosed switchgear having metal partitions and meeting all the requirements of note 1, may utilize an insulating shutter barrier as a part of a shutter arrangement, the combination of which provides the degree of protection included in table 2 of 6.6.1 (or higher) and satisfies the requirements of this Standard for partitions and shutters made of insulating material.

3.2.2 compartmented switchgear (with non-metallic partitions) (EN 60298:1996 - 3.102.2)

Metal-enclosed switchgear in which components are arranged in separate compartments as for metal-clad switchgear, but with one or more non-metallic partitions providing the degree of protection included in table 2 of 6.6.1 (or higher).

NOTE: Metal-enclosed switchgear in which the main circuit components are individually embedded in solid insulating material can be considered as an alternative, provided that the conditions specified in IEC 60466 are met.

3.2.3 cubicle switchgear (EN 60298:1996 - 3.102.3)

Switchgear, other than metal-clad and compartmented switchgear.

NOTE: This term applies to switchgear having a metal enclosure and having either:

- a) a number of compartments less than required for metal-clad or compartmented switchgear;
- b) partitions having a degree of protection lower than those indicated in table 1 of 6.6.1;
- c) no partitions.

3.3 transport unit (EN 60298:1996 - 3.103)

A part of a switchgear suitable for shipment without being dismantled.

3.4 functional unit (EN 60298:1996 - 3.104)

A part of switchgear comprising all the components of the main circuits and auxiliary circuits that contribute to the fulfilment of a single function.

NOTE: Functional units may be distinguished according to the function for which they are intended, for example: incoming unit, outgoing unit, etc.

3.5 enclosure (EN 60298:1996 - 3.105)

A part providing a specific degree of protection of equipment against external influences and a specified degree of protection against approach to or contact with live parts and against contact with moving parts. (standards.iteh.ai)

3.6 compartment (EN 60298:1996 - 3.106)

A part of switchgear enclosed except for openings necessary for interconnects, control or ventilation.

NOTE 1: A compartment may be designated by the main component contained therein, e. g. circuit breaker compartment, busbar compartment, etc.

NOTE 2: Openings necessary for interconnections between compartments are closed with bushings or other equivalent means.

NOTE 3: Busbar compartments may extend through several functional units without the need for bushings or other equivalent means.

3.7

Void.

3.8 component

An essential part of the switchgear which serves a specific function (for example circuit breaker, disconnecter, switch, fuse, shunt, voltage and current transducers, bushing, busbar, etc.).

3.9 partition (EN 60298:1996 - 3.109)

A part of switchgear separating one compartment from other compartments.

3.10 shutter

A part of switchgear that can be moved from a position where it is a part of the enclosure or partition shielding the live parts, to a position where it permits contacts of a removable part to engage live parts.

3.11 bushing (EN 60298:1996 - 3.111)

A structure carrying one or more conductors through an enclosure and insulating it therefrom, including the means of attachment.

3.12 removable part (EN 60298:1996 - 3.112)

A part of switchgear that may be removed entirely from the metal-enclosed switchgear and replaced, even though the main circuit is alive.

3.13 withdrawable part (EN 60298:1996 - 3.113)

A removable part of a switchgear that can be moved to positions in which an isolating distance (see 6.2) or segregation between open contacts is established, while the part remains mechanically attached to the enclosure.

3.14

Void.

iTeh STANDARD PREVIEW
(standards.iteh.ai)

3.15 service position (connected position) (EN 60298:1996 - 3.115)

The position of a removable part in which it is fully connected for its intended function.

3.16

Void.

3.17 test position (of a withdrawable part) (EN 60298:1996 - 3.117)

The position of a withdrawable part in which an isolating distance or segregation is established in the main circuit and in which the control circuits are connected.

3.18 disconnected position (of a withdrawable part) (EN 60298:1996 - 3.118)

The position of a withdrawable part in which an isolating distance or segregation is established in the circuits of the withdrawable part, that part remaining mechanically attached to the enclosure.

NOTE: In switchgear the auxiliary circuits may not be disconnected.

3.19 removed position (of a withdrawable part) (EN 60298:1996 - 3.119)

The position of a removable part when it is outside and mechanically and electrically separated from the enclosure.

3.20 Circuits at main supply voltage

3.20.1 main circuit (of a switchgear assembly)

All conductive parts of a switchgear assembly which are at the main supply voltage, carrying power current, but excluding the busbars.

3.20.2 busbars (of a switchgear assembly)

The conductive parts of a switchgear assembly, at the main supply voltage, which are intended to distribute power current to one or more functional units.

3.21 auxiliary circuit (EN 60298:1996 - 3.121 mod.)

All the conductive parts of switchgear included in a circuit (other than the main circuit) intended to control, measure, signal and regulate.

NOTE: The auxiliary circuits of switchgear include the control and auxiliary circuits of the switching devices.

3.22 rated values

See clause 3 of EN 50123-1:1995.

3.22.1 supply voltages of control devices and auxiliary circuits in a switchgear

The supply voltages shall be the voltage measured at the circuit terminals of the apparatus itself during its operation, including, if necessary, the auxiliary resistors or accessories supplied or required by the manufacturer to be installed in series with it, but not including the conductors for the connection to the electrical supply.

NOTE: This standard values given in table 2 of EN 50123-1 should be used for the selection of rated voltages.

3.22.2 rated earth fault current

The maximum short-time withstand current which can be carried in the earthing circuit.

3.23 degree of protection (EN 60298:1996 - 3.123)

The degree of protection provided by an enclosure to protect persons against contact with or approach to live parts and against contact with moving parts inside the enclosure and to protect the equipment against ingress of solid bodies.

3.24 ambient air temperature (of switchgear) (EN 60298:1996 - 3.124)

The temperature, determined under prescribed conditions, of the air surrounding the enclosure of switchgear.

3.25 disruptive discharge (EN 60298:1996 - 3.125)

Phenomena associated with the failure of insulation under electric stress, in which the discharge completely bridges the insulation under test, reducing the voltage between the electrodes to zero or nearly to zero.

NOTE 1: The term applies to discharges in solid, liquid and gaseous dielectrics and to combination of these.

NOTE 2: A disruptive discharge in a solid dielectric produces permanent loss of dielectric strength (non-self restoring insulation).

NOTE 3: The term "sparkover" is used when a disruptive discharge occurs in a gaseous or liquid dielectric.

NOTE 4: The term "flashover" is used when a disruptive discharge occurs over the surface of a solid dielectric in gaseous or liquid medium.

NOTE 5: The term "puncture" is used when a disruptive discharge occurs through a solid dielectric.

4 Service conditions

Normal service conditions are detailed in clause 4 and annex B of EN 50123-1:1995 for indoor installations. In case a different service condition either regularly occurs in a given region or specially arises for a given installation, this fact shall be brought to the attention of the supplier by the purchaser in the tender specification.

SIST EN 50123-6:1998

5 Characteristics of the assemblies

<https://standards.iteh.ai/catalog/standards/sist/8e10ff84-6fce-44ed-991e-e4d5ccaf4130/sist-en-50123-6-1998>

The main characteristics of an assembly shall be indicated in the procurement specification as follows:

- a) type of the assembly enclosure;
- b) list of functional units enclosed;
- c) rated insulation voltages;
- d) rated values of the equipment enclosed as required in relevant standards;
- e) if constructed for an earth fault protection;
- f) detailed protection and control requirements (see EN 50123-7).

Other important characteristics are listed in A.2.

6 Construction characteristics

6.1 General

Enclosures are either metallic or non-metallic. Non-metallic enclosed switchgear shall not be used for nominal voltages above 1,5 kV.

NOTE: EN 50123-6, although applicable to metal enclosed switchgear assemblies can also be used for enclosures made of other materials.

All requirements specified herein also apply when both conductive and insulating materials are used, except for insulating clearances which shall be designed and tested as appropriate.

Page 10
EN 50123-6:1998

A cell made of masonry shall not be considered an enclosure, as far as this standard is concerned.

The floor surface may be considered as part of an enclosure. The measures to be taken in order to obtain the degree of protection provided by floor surfaces shall be subject to an agreement between purchaser and supplier.

The walls of a room shall not be considered as parts of the enclosure.

Switchgear assemblies and relevant enclosures shall be designed so that normal service, inspection and maintenance operations, earthing of connected cables or busbars, locating of cable faults, voltage tests on connected cables or other apparatus and the elimination of electrostatic charges, can be carried out easily and safely.

All materials used shall be of the quality and of the class most suitable for working under the conditions specified. Special attention is to be paid to its ability to withstand moisture and fire: unless Fire behaviour Class F0 is allowed (see EN 50123-1:1995, Annex B), materials used shall be metallic or of the self extinguishing type, such that the risk of propagation of fire from one cubicle or compartment to another is minimised.

The selection of materials and the construction of the assembly shall be such that corrosion due to atmospheric and electrolytic effects are minimized.

European rules concerning noxious or toxic materials shall be observed.

All like devices, forming part of an assembly for a given use and with the same characteristics, shall be interchangeable.

Withdrawable switching devices shall be prevented from insertion into functional units on the same switchgear assembly, having different function or higher current ratings.

Sufficient space shall be provided inside the compartments for the entry and termination of incoming cables without their minimum bending radii being infringed.

The detachable parts of the protection enclosures shall be firmly attached to the fixed parts as per 6.7. Accidental untightening or detachment shall not occur because of the operation of the equipment.

All apparatus and connections for the safe operation, control and protection of the equipment concerned, shall be provided whether or not specifically mentioned. The equipment shall be adequately earthed, insulated, screened or enclosed as may be appropriate to ensure the protection of the equipment and safety of those concerned in its operation and maintenance.

Control and auxiliary circuits and contacts shall comply with the requirements of 5.2 of EN 50123-1:1995.

All components contained within the enclosure shall comply with the relevant standard.