



SLOVENSKI STANDARD
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Železniške naprave - Voznikova kabina - 8. del: Razpored v tramvaju in dostop (vključno z dopnilom A1)

Railway applications - Driver's cab - Part 8: Tram vehicle layout and access

Bahnanwendungen - Führerraum - Teil 8: Gestaltung und Zugang bei Straßenbahnfahrzeugen

Applications ferroviaires - Cabines de conduite - Partie 8 : Agencement et accès pour les tramways

Ta slovenski standard je istoveten z: EN 16186-8:2022+A1:2024

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ICS:

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45.140	Oprema za podzemne vlake, tramvaje in lahka tirna vozila	Metro, tram and light rail equipment

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8 : Agencement et accès pour les tramways

Bahnanwendungen - Führerraum - Teil 8: Gestaltung
und Zugang bei Straßenbahnfahrzeugen

This European Standard was approved by CEN on 13 March 2022 and includes Amendment 1 approved by CEN on 24 June 2024.

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EN 16186-8:2022+A1:2024 (E)**European foreword**

This document (EN 16186-8:2022+A1:2024) has been prepared by Technical Committee CEN/TC 256 “Railway applications”, the secretariat of which is held by DIN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by January 2025, and conflicting national standards shall be withdrawn at the latest by January 2025.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document includes Amendment 1 approved by CEN on 24 June 2024.

This document supersedes A1 EN 16186-8:2022 A1.

The start and finish of text introduced or altered by amendment is indicated in the text by tags A1 A1.

EN 16186 *Railway applications — Driver’s cab* consists of the following parts:

- *Part 1: Anthropometric data and visibility*
- *Part 2: Integration of displays, controls and indicators*
- *Part 3: Design of displays for heavy rail vehicles*
- *Part 4: Layout and access*
- *Part 5: External visibility for tram vehicles*
- *Part 6: Integration of displays, controls and indicators for tram vehicles*
- *Part 7: Design of displays for tram vehicles¹*
- *Part 8: Tram vehicle layout and access*

Any feedback and questions on this document should be directed to the users’ national standards body. A complete listing of these bodies can be found on the CEN website.

According to the CEN-CENELEC Internal Regulations, the national standards organisations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

¹ To be published.

1 Scope

This document gives design rules and requirements in order to ensure proper access, lighting, seating and exit of driver's cabs. The different dimensions are based on the anthropometric data defined in EN 16186-5. The corresponding assessment methods are also included in this document. It covers the following aspects:

- dimension and interior layout;
- door access, steps, floor characteristics;
- seats dimension and clearance;
- interior cab lighting;
- emergency exit;
- marking and labelling.

This document is applicable to vehicles operating on tram networks.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 894-3, *Safety of machinery - Ergonomics requirements for the design of displays and control actuators - Part 3: Control actuators*

EN 1005-3, *Safety of machinery - Human physical performance - Part 3: Recommended force limits for machinery operation*

EN 12663-1, *Railway applications - Structural requirements of railway vehicle bodies - Part 1: Locomotives and passenger rolling stock (and alternative method for freight wagons)*

EN 13272-2, *Railway applications - Electrical lighting for rolling stock in public transport systems - Part 2: Urban rail*

EN 15152, *Railway applications - Windscreens for trains*

EN 15227, *Railway applications - Crashworthiness requirements for rail vehicles*

EN 16186-5 ^{A1}, *Railway applications - Driver's cabs - Part 5: External visibility for tram vehicles*

EN 16186-6:—,² *Railway applications - Driver's cabs - Part 6: Integration of displays, controls and indicators for tram vehicles*

EN 17530, *Railway applications - Interior glazing for rail vehicles*

² Under preparation: Stage at the time of publication: prEN 16186-6:2022.

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EN 45545-4:2013, *Railway applications - Fire protection on railway vehicles - Part 4: Fire safety requirements for rolling stock design*

EN ISO 2813:2014, *Paints and varnishes - Determination of gloss value at 20°, 60° and 85° (ISO 2813:2014)*

EN ISO 3385, *Flexible cellular polymeric materials - Determination of fatigue by constant-load pounding (ISO 3385)*

EN ISO 7010:2020, *Graphical symbols - Safety colours and safety signs - Registered safety signs (ISO 7010:2019, Corrected version 2020-06)*

ISO 2631-1, *Mechanical vibration and shock — Evaluation of human exposure to whole-body vibration — Part 1: General requirements*

ISO 3864-1:2011, *Graphical symbols — Safety colours and safety signs — Part 1: Design principles for safety signs and safety markings*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at <https://www.iso.org/obp>

— IEC Electropedia: available at <https://www.electropedia.org/>

3.1**gloss**

optical property of a surface, characterised by its ability to reflect light specularly

[SOURCE: EN ISO 2813:2014, definition 3.1 modified, the Note 1 to entry has been deleted]

3.2**primary controls**

controls having high importance and/or high frequency and/or prolonged periods of use

Note 1 to entry: Safety related controls are high importance controls.

3.3**primary information**

information having high importance and/or high frequency of checking

Note 1 to entry: Safety related information is high importance information.

4 Symbols and abbreviations

For the purposes of this document, the following abbreviations are used.

g	Standard acceleration due to gravity (9,81 m/s ²)
FLP	Footrest Lowest Position
GU	Gloss Unit as defined in EN ISO 2813
HP	Heel point
RAL	Colour codification from Deutsches Institut für Gütesicherung und Kennzeichnung, former Reichs-Ausschuss für Lieferbedingungen
SRP	Seat Reference Point

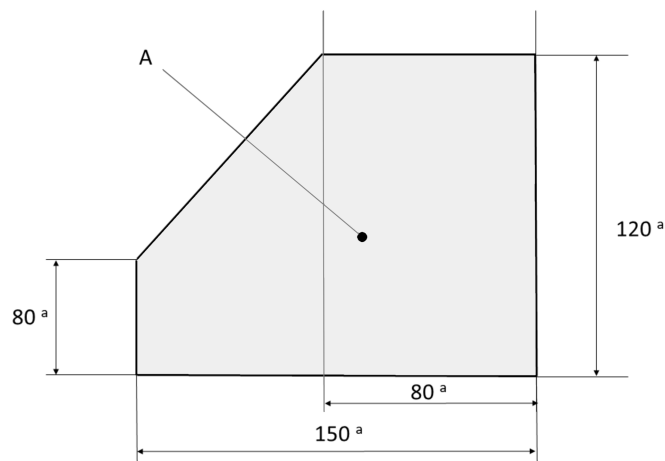
5 Access, egress and doors

5.1 General

5.1.1 External steps and handrails

The access steps shall be in the same vertical plane or in a plane with an angle of pitch less than 90° (except where not possible due to different mounting conditions, for example, where some steps are bogie mounted and some are body mounted). The access steps shall be located one above the other and are equidistant from one another. The vertical distance between the steps is recommended to be in between 250 mm and 350 mm, but shall not exceed 450 mm. The bottom step shall be as low as permitted by the gauge and should not be higher than 600 mm above top of rail.

A1 The steps shall be of the same width which shall be 300 mm as a minimum. The depth of the step shall be at least 80 mm. There shall be a free space over the step. The depth of this space shall be at least 150 mm. The minimum height of the space over the step should be 120 mm but shall not be less than 120 mm. The height may decrease to 80 mm at a depth of 150 mm, as shown in Figure 1.



Key

- A free space over the step
- a minimum value

Figure 1 — Free space and step dimensions **A1**

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The level of the access door does not have to comply with the requirements above.

The floor or any sealing frame at the access door needs not be considered as a step but the height of the floor level above the adjacent step shall not be more than 450 mm and it is recommended that this height is equidistant to the other steps.

A handrail shall be provided in all cases on each side of external doors and steps directly leading to a driver's cab. The handrails shall be mounted solely at each end. The distance from the lower extremity of the handrail to top of rail should not be higher than 1 100 mm, but shall not exceed 1 250 mm. The distance from the top end of the handrail to the driver's cab floor level should be 1 200 mm but shall not be less than 1 000 mm.

The handrail shall be made of round bar with a diameter of min. 20 mm to max. 35 mm and shall withstand a force applied by staff of 1,5 kN at any point in any direction without causing permanent deformation to it or its fixings.

5.1.2 Access and security

Access to the driver's cab shall be from the exterior via a direct external door, and/or through a door from an adjacent compartment or area behind the cab.

These doors shall be designed to have an operational envelope that does not conflict with the envelope of another door.

The driver's cab and its access shall be designed so that the staff are able to prevent the cab being accessed by non-authorized persons, whether the cab is occupied or not. This requirement is deemed to be fulfilled by a locking system.

An emergency escape device shall permit to open any cab door from inside the cab without using any tool or key.

Egress and access to the driver's cab shall be possible without any energy supply.

5.1.3 Door handles

Door handles on the inside of the cab which are intended to be operated from a standing position shall be located at a height between 820 mm and 1 200 mm (distance between the rotation axis of the handle and the cab floor). The recommended value for the height of the door handles is 850 mm.

The handles shall have rounded edges and the force required to operate it should be adapted to the driver's population. In all cases, the force shall not exceed 50 N.

5.1.4 Threshold

The height of door threshold shall not be more than:

- 20 mm from the floor adjacent to the door, for interior doors, from the highest adjacent floor level;
- 60 mm from the floor adjacent to the door, for exterior doors.

5.1.5 Ergonomics

For handles inside the cab in regular use at least 40 mm clearance to surrounding surfaces shall be provided.

5.1.6 External doors

External cab doors when opened shall not infringe the intended maximal construction gauge defined from gauge rules of the vehicle.