RAUDTEEALASED RAKENDUSED. JUHIKABIIN. OSA 3: NÄIDIKUTE KUJUNDUS

Railway applications - Driver's cab - Part 3: Design of displays for heavy rail vehicles

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

See Eesti standard EVS-EN 16186-3:2022 sisaldab Euroopa standardi EN 16186-3:2022 ingliskeelset teksti.	This Estonian standard EVS-EN 16186-3:2022 consists of the English text of the European standard EN 16186-3:2022.
Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas	This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation and Accreditation.
Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 30.03.2022.	Date of Availability of the European standard is 30.03.2022.
Standard on kättesaadav Eesti Standardimis-ja Akrediteerimiskeskusest.	The standard is available from the Estonian Centre for Standardisation and Accreditation.

Tagasisidet standardi sisu kohta on võimalik edastada, kasutades EVS-i veebilehel asuvat tagasiside vormi või saates e-kirja meiliaadressile standardiosakond@evs.ee.

ICS 45.060.10

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 16186-3

March 2022

ICS 45.060.10

Supersedes EN 16186-3:2016+A1:2018

English Version

Railway applications - Driver's cab - Part 3: Design of displays for heavy rail vehicles

Applications ferroviaires - Cabine de conduite - Partie 3 : Conception des affichages pour véhicules ferroviaires lourds

Bahnanwendungen - Führerraum - Teil 3: Displaygestaltung für Vollbahnfahrzeuge

This European Standard was approved by CEN on 31 January 2022.

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Ref. No. EN 16186-3:2022 E

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European foreword

This document (EN 16186-3:2022) 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of an identical text or by endorsement, at the latest by September 2022, and conflicting national standards shall be withdrawn at the latest by September 2022.

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 supersedes EN 16186-3:2016+A1:2018.

EN 16186, *Railway applications — Driver’s cab* is written as an EN series on all the aspects to be considered when designing a driver’s cab, from anthropometric data and visibility, over the integration of displays, controls and indicators as well as the design of displays to cab layout and access facilities. The background information on the anthropometric data used is provided in CEN/TR 16823 [1].

EN 16186, *Railway applications — Driver’s cab* currently 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* [1)];

— *Part 7: Design of displays for tram vehicles* [2)];

— *Part 8: Tram vehicle layout and access*.

EN 16186-3:2022 includes the following significant technical changes with respect to EN 16186-3:2016+A1:2018:

— consistency of display application;

— luminance;

— appearance of a flashing yellow frame;

— typography;

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

2) Under development.

— audible feedback;

— characterization of the pictograms according to the reversibility of the function by the driver (Table A.1);

— creation or modification of pictograms 18, 19b, 29, 39b, 46b, 95, 109.

This document has been prepared under a Standardization Request given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s) / Regulation(s).

For relationship with EU Directive(s) / Regulation(s), see informative Annex ZA, which is an integral part of this document.

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.

Introduction

The requirements of this document, which interface with vehicle functions, have been elaborated with the commitment to respect the standards specifying these functions and in addition to respect the state of the art of other rolling stock functions.

For the tracing of requirements, a link to CLC/TS 50459 series [2] or the ERA DMI document [3] serving as a source for the related requirements is added.

The reasons for defining the information are as follows:

— achieving harmonized and coherent presentation of information;

— defining Driver-Machine Interface ergonomics that is compatible with agreed interoperable specifications;

— reducing the risk of incorrect operation by a driver working with different trains fitted with displays;

— facilitating train operation with unified ergonomics, hence reducing the cost of driver training.

Information designed according to this document is deemed to fulfil the following basic principles:

— be clear, correct and necessary;

— indicate its priority, whether by positioning, size, colour, sounds, sound levels, etc.;

— minimize confusion of the driver;

— prevent unnecessary distraction of the drivers' attention while performing their normal duties.

If a requirement contains an option, the choice of this option is purely up to the applicant.

NOTE The term “option” is to be understood as a possibility that is usually expressed by the word “can”.

1 Scope

This document specifies all necessary design rules and associated assessment criteria as well as guidance concerning the design of information and the corresponding user interfaces of driver's cabs.

It considers the tasks the driver has to carry out and human factors. This document specifies how information is arranged and displayed. It is explicitly applicable to display applications like TRD, ETD, CCD and TDD and may be completed by the CLC/TS 50459 series.

This document is not applicable to legacy ATP systems. If requirements in this document are in conflict with the ERA DMI document (ERA_ERTMS_015560) the requirements of the ERA DMI document should prevail for the CCD ETCS application.

NOTE 1 For resolving any discrepancies (e.g. 5.4.2.3) ERA is expected to harmonize the usage philosophy of the ERA DMI with this document.

All assessments based on the normative requirements of this document are applicable mainly to

— symbols provided by Annex A;

— arrangement of screen areas conforms to Figure 1 (generic organization of information);

— colours, fonts;

— audible information.

This document is applicable to the following aspects:

— legibility and intelligibility of displayed information: general rules concerning the layout of information on the displays, including character size and spacing;

— definition of harmonized colours, symbols, etc.;

— definition of harmonized principles for the command interface (by physical or touchscreen buttons): size, symbols, reaction time, way to give feedback to the driver, etc.;

— general arrangements (dialogue structures, sequences, layout philosophy, colour philosophy), symbols, audible information, data entry arrangements.

NOTE 2 If this document deals with how information can be given for operation and in degraded situations, it does not define operating rules and degraded situations.

This document does not request any safety requirement related with displayed information.

This document specifies minimum requirements and does not prevent more complex solutions.

Requirements describing the functions using the display are out of scope of this document.

This document applies to driver's cabs of locomotives and driving vehicles of the heavy rail system.

EXAMPLES Locomotives, railcars, power heads, driving trailers.

This standard is not applicable for vehicles of urban rail systems.

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.

CLC/TS 50459-2:2021, *Railway applications — Communication, signalling and processing systems — European Rail Traffic Management System — Part 2: Ergonomic arrangements of GSM-R information*

CLC/TS 50459-3:2021, *Railway applications — Communication, signalling and processing systems — European Rail Traffic Management System — Part 3: Ergonomic arrangements of non ETCS information*

EN 894-2:1997+A1:2008, *Safety of machinery — Ergonomics requirements for the design of displays and control actuators — Part 2: Displays*

EN 14198:2016+A2:2021, *Railway applications — Braking — Requirements for the brake system of trains hauled by locomotives*

EN 16186-1:2014+A1:2018, *Railway applications — Driver's cab — Part 1: Anthropometric data and visibility*

EN 16186-2:2017, *Railway applications — Driver's cab — Part 2: Integration of displays, controls and indicators*

EN 16334:2014, *Railway applications — Passenger Alarm System — System requirements*

EN 16683:2015, *Railway applications — Call for aid and communication device — Requirements*

EN ISO 9241-307:2008, *Ergonomics of human-system interaction — Part 307: Analysis and compliance test methods for electronic visual displays (ISO 9241-307:2008)*

EN ISO 9241-303:2011, *Ergonomics of human-system interaction — Part 303: Requirements for electronic visual displays (ISO 9241-303:2011)*

ISO 2575:2021, *Road vehicles — Symbols for controls, indicators and tell-tales*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 16186-1:2014+A1:2018, EN 16186-2:2017 and the following 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
activated
put into a functional state following a validated input