SLOVENSKI STANDARD
oSIST prEN 16334-2:2019

01-februar-2019

Železniške naprave - Potniški alarmni sistem - 2. del: Sistemske zahteve za mestno železnico

Railway applications - Passenger alarm system - Part 2: System requirements for urban rail

Bahnanwendungen - Fahrgastalarmsystem - Teil 2: Systemanforderungen für Schienennahverkehr

Applications ferroviaires - Système d'alarme passager Partie 2 : Prescriptions relatives au système pour le rail urbain

Ta slovenski standard je istoveten z: **prEN 16334-2**

ICS:

13.320	Alarmni in opozorilni sistemi	Alarm and warning systems
45.060.20	Železniški vagoni	Trailing stock

oSIST prEN 16334-2:2019 **en,fr,de**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

DRAFT
prEN 16334-2

December 2018

ICS 13.320; 45.060.20

English Version

Railway applications - Passenger alarm system - Part 2: System requirements for urban rail

Applications ferroviaires - Système d'alarme passager Partie 2 : Prescriptions relatives au système pour le rail urbain

Bahnanwendungen - Fahrgastalarmsystem - Teil 2: Systemanforderungen für Schienennahverkehr

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European foreword

This document (prEN 16334-2:2018) has been prepared by Technical Committee CEN/TC 256 “Railway applications”, the secretariat of which is held by DIN.

This document is currently submitted to the CEN Enquiry.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association.

1 Scope

This document specifies the characteristics of the Passenger Alarm System (PAS) for Urban Rail.

This document covers the PAS fitted to the passenger carrying Urban Rail rolling stock and specifies:

— the safety related requirements;

— the functional requirements of PAS triggered by pasasengers;

— the requirements for the communication channel between passengers and the driver or OCC;

— the requirements for the functional behaviour of the PAS;

— the requirements for the degraded modes management;

— the requirements for the Passenger Alarm Device (PAD) and PAD area.

This document is applicable to the categories I to III of Urban Rail rolling stock defined in CEN/CLC Guide 26:

— (I) metros;

— (II) trams;

— (III) light rail.

NOTE 1 CEN/CLC Guide 26 defines Metro, Tram and Light Rail as public transport systems permanently guided at least by one rail, intended for the operation of local, urban and suburban passenger services with self-propelled vehicles and operated either segregated or not from general road and pedestrian traffic.

NOTE 2 The PAS function on existing vehicles may require modification to work in conjunction with vehicles that comply with this document.

NOTE 3 This European Standard covers urban rail rolling stock, both with or without a driver.

NOTE 4 For rolling stock devoted to suburban passenger services, this European Standard applies when the TSIs do not apply.

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.

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

EN 13452-1, *Railway applications — Braking — Mass transit brake systems — Part 1: Performance requirements*

EN 14478, *Railway applications - Braking - Generic vocabulary*

EN 62267:2009, *Railway applications — Automated urban guided transport (AUGT) — Safety requirements (IEC 62267:2009)*

EN 62290 (all parts), *Railway applications — Urban guided transport management and command/control systems (IEC 62290, all parts)*

ISO 3864-4:2011, *Graphical symbols — Safety colours and safety signs — Part 4: Colorimetric and photometric properties of safety sign materials*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 14478 and EN 13452-1 and the following apply.

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

- IEC Electropedia: available at http://www.electropedia.org/
- ISO Online browsing platform: available at http://www.iso.org/obp

3.1
Automated Urban Guided Transport
AUGT
system featuring driverless or unattended train operation (as defined below) with selfpropelled, guided vehicles, operating on an exclusive guideway

[SOURCE EN 62267:2009, 3.1.1]

3.2
Passenger Alarm System
PAS
alarm system for passengers that is intended to initiate appropriate measures in case of an emergency situation

3.3
Closed Circuit Television System
CCTV
system consisting of camera equipment, storage, monitoring and associated equipment for transmission and controlling purposes

[SOURCE: EN 50132-1:2010, 3.1.27, modified — The term originally defined was "CCTV system".]

3.4
Passenger Alarm Device
PAD
interface to the PAS through which the requirement for a defined Passenger Alarm System demand is indicated or initiated by passengers or on-board operational staff

Note 1 to entry: The PAD is sometimes called emergency handle or alarm handle. These short-terms should only be used where misunderstanding is not possible or in descriptions prepared for passengers.

[SOURCE: EN 16334:2014, 3.4, modified — The end of the definition was altered and the Note 1 to entry was shortened.]

3.5
PAD operated
status indicated in the PAS by the PAD when operated by changing its mechanical position

[SOURCE: EN 16334:2014, 3.2, modified – The notion of handle is removed as in urban rail it may be another type of device.]

3.6
Passenger Alarm Interface
PAI
arrangement of equipment close to each other or one single equipment, which includes:

— passenger alarm device (see Clause 10);

— microphone;

— loudspeaker;

— visual indicators (e.g. lights);

— resetting device(s), if any;

— information labels;

— a seal (optional)

[SOURCE: EN 16334:2014, 3.3, modified –"If any" was added after "resetting device(s)" and "lights" is now introduced by "e.g.".]

3.7
standstill signal
signal that indicated that the vehicle is at a standstill (as defined in EN 14478:2018, 4.6.22)

Note 1 to entry: Standstill signal is used for door release and/or braking control. The standstill condition is normally related to minimum velocity.

3.8
Operations Control Centre
OCC
centre from which operation of the line or the network is supervised and managed

[SOURCE: EN 62267:2009, 3.1.10]

3.9
operational rules
set of operational specifications and requirements defined by transport operators

Note 1 to entry: The precise content of these rules is defined in CEN/CLC Guide 26:2013, 5.1.2.

3.10
Train Control and Monitoring System
TCMS
means of controlling and monitoring function of the train internally, whether by software or hardware, and of providing information to the driver of the status of equipment on-board the train

[SOURCE: EN 16186-3:2016+A1:2018, 3.37]

3.11
on-board operational staff
persons on-board the train who are involved in the operation process of the train (including the driver)

3.12
driver
person tasked with operating a vehicle or a train by operating controls in a driver's cab or on a remote control unit

[SOURCE: EN 16186-1:2014+A1:2018, 3.1.1]

3.13
passenger area
area which is freely accessible to passengers

[SOURCE EN 45545-1:2013, 3.43]

4 Symbols and abbreviations

For the purposes of this document, the following abbreviated terms apply

AUGT Automated urban guided transport

CCTV Closed Circuit Television (see 3.3)

OCC Operations Control Centre (see 3.8)

PAI Passenger Alarm Interface (see 3.6)

PAD Passenger Alarm Device (see 3.4)

PAS Passenger Alarm System (see 3.2)

TCMS Train Control and Monitoring System (see 3.10)

5 System overview, architecture and interfaces

An example of a system overview is given in Annex E.

6 Safety requirements

6.1 Minimum satefy requirements

6.1.1 The failure rate of the PAS for the request of the brake application shall be less than 10^{-6} failure/h.

6.1.2 The failure rate of the PAS for a PAD activation announcement (acoustic and visual signalling) shall be less than 10^{-6} failure/h. For failure analysis a redundancy effect of the acoustic and the visual signalling may be taken into account.

6.1.3 The ability of the PAS to transmit the activation signal of a PAD to the driver shall be monitored by dedicated technical devices, if the reliability of the system in conveying the activation signal is insufficient (more than 10^{-6} failure/h). This may be reached by permanent monitoring of that ability, and it shall be demonstrated through a safety analysis.

6.1.4 A PAS passenger area module shall not be automatically or remotely isolated.

NOTE 1 This is to ensure that a member of the on-board operational staff carries out the isolation.

NOTE 2 Isolation of that part of the PAS passenger area module means to by-pass it or to switch it off. The consequence is that this module has no more function.

6.1.5 Further operation of the train after the isolation of a part of the PAS system shall only be possible if authorized by appropriate substitute measures (e.g. operational rules).

6.2 Complementary satefy requirements for AUGT

The complementary safety requirements for AUGT are defined in EN 62267:2009, 8.5.10 and 8.5.11.

7 Functional requirements

7.1 General

The aim of this Passenger Alarm System is to:

a) permit passengers in case of emergency situations to alert the driver or the Operations Control Centre (OCC);

b) stop the train automatically according to the operational rules;

c) permit the train to keep moving, subject to conditions, or to stop at a safe location.

7.2 Advise the driver (and optionally other on-board operation staff or OCC) of a potential danger

7.2.1 Mandatory functions

7.2.1.1 PAD shall be available in the passenger area (see Clause 10 for PAD installation requirements).

7.2.1.2 The information that at least one PAD has been operated shall be transmitted to the driver or in case of an AUGT to the OCC.

7.2.1.3 An acoustic and flashing visual signal shall be given to the driver when a PAD has been operated. For the duration of signals and triggering conditions see Clause 8.

Colour and frequency of visual and acoustic signals in the driver's cab can conform to the requirements of the EN 16186 series.

7.2.1.4 In addition, if remote resetting of PADs is available, an acoustic signal shall be activated for each new activation of a PAD, in accordance with the safety requirements given in Clause 6.

7.2.1.5 The maximum permitted delay from any PAD operated and the acoustic and visual signal for the driver shall be 2 s. If the optional link to the OCC is used the maximum permitted delay to trigger the train based subsystem that transmits the information to the OCC shall be 2 s.