
Železniške naprave - Kazalniki zavor - 1. del: Kazalniki delovanja zračnih zavor

Railway applications - Brake indicators - Part 1: Pneumatically operated brake indicators

Bahnanwendungen - Bremsanzeigevorrichtungen - Teil 1: Pneumatische Bremsanzeiger

Applications ferroviaires - Indicateurs de frein - Partie 1: Indicateurs de frein
pneumatiques**(standards.iteh.ai)****Ta slovenski standard je istoveten z: EN 15220-1:2008**

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Indicateurs de frein pneumatiques

Bahnwendungen - Bremsanzeigevorrichtungen - Teil 1:
Pneumatische Bremsanzeiger

This European Standard was approved by CEN on 13 September 2008.

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COMITÉ EUROPÉEN DE NORMALISATION
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EN 15220-1:2008 (E)**Foreword**

This document (EN 15220-1:2008) 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of an identical text or by endorsement, at the latest by April 2009, and conflicting national standards shall be withdrawn at the latest by April 2009.

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

This document has been prepared under a mandate given to CEN/CENELEC/ETSI by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directives 96/48/EC and 2001/16/EC, as amended by 2004/50/EC.

For relationship with EU Directives, see informative Annexes ZA and ZB, which are integral parts of this document.

This series of European Standards *Railway applications — Brake indicators* consists of:

— *Part 1: Pneumatically operated brake indicators*

— *Part 2: Electrically operated brake indicators*

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

1 Scope

This European Standard specifies the requirements for the design, dimensions, performance and testing of single/double brake indicators with or without electrical contacts. It applies to pneumatically operated brake indicators visible from the outside of the vehicle.

NOTE Brake indicators are for giving precise and accurate information about release and application of the brake.

This European Standard applies to brake indicators on railway vehicles used on the main national networks, urban networks, underground railways, trams and private networks (regional railways, company railways etc.).

2 Normative references

The following referenced documents are indispensable for the application 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 14478:2005, *Railway applications — Braking — Generic vocabulary*

EN 50125-1, *Railway applications — Environmental conditions for equipment — Part 1: Equipment on board rolling stock*

EN 50155:2007, *Railway applications — Electronic equipment used on rolling stock*

EN 60529:1991, *Degrees of protection provided by enclosures (IP code) (IEC 60529:1989)*

EN 61373:1999, *Railways applications — Rolling stock equipment — Shock and vibration tests (IEC 61373:1999)*

EN ISO 228-2, *Pipe threads where pressure-tight joints are not made on the threads — Part 2: Verification by means of limit gauges (ISO 228-2:1987)*

EN ISO 9227, *Corrosion tests in artificial atmospheres — Salt spray tests (ISO 9227:2006)*

ISO 5208, *Industrial valves — Pressure testing of metallic valves*

ISO 8573-1:2001, *Compressed air — Part 1: Contaminants and purity classes*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 14478:2005 and the following apply.

3.1 General

3.1.1

brake indicator

apparatus for visual indication of the brake applied status of a vehicle by means of a red indication, with black line or black dot, and the release status by means of a green indication

NOTE 1 Brake indicators can be equipped with electrical contacts.

NOTE 2 An optional visual state, for parking brake indicators only, of a white flag with black cross would indicate an “uncertain braking status”. This status refers to the condition of parking brake applied but released by the manual release lever.

EN 15220-1:2008 (E)**3.2 Components****3.2.1****port**

terminus of a compressed air passage in a component, to which pipelines can be connected, for the transmission of compressed air to or from the component

3.2.2**threaded port**

port arranged to accept screw threaded connections

3.3 Types of brake indicator**3.3.1****single brake indicator and
single parking brake indicator**

examples for single brake indicator and single parking brake indicator are contained in Figure A.1

NOTE 1 Brake indicators can be single, double or multiple.

NOTE 2 Examples for single and double brake indicators are contained in Figure A.1, Figure A.2, Figure A.3 and Figure A.4.

3.3.2**single brake indicator with switch and
single parking brake indicator with switch**

examples for single brake indicator with switch and single parking brake indicator with switch are contained in Figure A.2

3.3.3**double brake indicator and double parking brake indicator**

examples for double brake indicator and double parking brake indicator with switch overall dimensions are contained in Figure A.3

3.3.4**multiple brake indicator**

multiple brake indicators follows the principles of single and double indicators

3.4 States**3.4.1 Service brake****3.4.1.1****braking condition of the service brake**

condition which indicates that the brake is applied and the pressure in the brake indicator exceeds its set value

3.4.1.2**release condition of the service brake**

condition which indicates that the brake is released and the pressure in the brake indicator is below its set value

3.4.2 Parking brake**3.4.2.1****braking condition of the parking brake**

condition of pressure reflecting that the brake is applied or not completely released in which the brake indicator air pressure is below its set value

NOTE This applies to both stored energy systems requiring release by air pressure and mechanical systems sensing pneumatically.

3.4.2.2

release condition of the parking brake

condition of pressure reflecting that the brake is not applied in which the brake indicator compressed air pressure exceeds its set value

NOTE This applies to both stored energy systems requiring release by air pressure and mechanical systems sensing pneumatically.

3.5

temperature range

range of the temperature within which the apparatus can operate according to the requirements of this European Standard

3.6

leakage

leakage of the compressed air from the brake indicator to the atmosphere

3.7

life expectancy

predicted working period during which a component or system will maintain a specified level of performance under specified conditions

3.8

RAL¹⁾

colour standardisation system of the German Institute for Quality Assurance and Certification e.V.

NOTE Recognised equivalent colours from other national colour standards may be used.

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3.8 Abbreviations

" inch

IP International Protection

NOTE IP is a coding system to indicate the degrees of protection provided by an enclosure against access to hazardous particles, ingress of solid foreign objects, ingress of water and to give additional information in connection with such protection.

U_n nominal voltage

4 Requirements

4.1 Design and manufacturing

The design and manufacture of the brake indicator shall, for all intended operating conditions, conform to the requirements of 4.2, 4.3 and 4.4.

NOTE Each manufacturer is responsible for ensuring that the quality of design, workmanship and construction is in accordance with good engineering practice.

1) Can be purchased from: Beuth Verlag GmbH, 10772 Berlin.

EN 15220-1:2008 (E)**4.2 Operating conditions**

The brake indicator shall be able to function:

4.2.1 When the upper pressure limit of the compressed air used is 10 bar. It shall be able to withstand a hydraulic test with a pressure of 15 bar in accordance with 5.3.3.

4.2.2 Where the quality of the compressed air is at least class 4-4-4 according to ISO 8573-1. This requirement is verified when tests are carried out in accordance with 5.3.7.1.

4.2.3 In the temperature range for the environmental conditions to which the railway vehicle is submitted during its operation. The purchaser can specify a higher temperature value if operational constraints demand it. This requirement is tested in accordance with 5.3.7.1 and 5.3.7.2.

4.2.4 To withstand the external ingress of dust and water as specified in EN 60529 (code IP 55). These requirements are tested in accordance with 5.3.4.

NOTE It can be necessary to use protection class IP 65 for indicators fitted with electrical components.

4.2.5 To withstand the external corrosion due to normal atmospheric pollutants as specified in EN 50125-1, the brake indicator shall be tested in accordance with the test shown in 5.3.12.

4.2.6 The brake indicator shall be able to function in the vibration environment, as described in EN 61373, of the railway vehicle on which it is mounted.

4.2.7 The brake indicator shall be able to withstand shocks and shall be tested in accordance with 5.3.10.

4.3 Functional characteristics

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4.3.1 General

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The following requirements are defined to ensure that no malfunction of the brake indicator occurs:

4.3.2 Braking/release status

The operating conditions of the braking/release flag and its change in status is defined and shall be tested in accordance with 5.3.8.

4.3.3 Lubrication

It shall be possible to operate the brake indicator at all pressures without additional lubrication.

4.3.4 Leakage

The sealing arrangement within the brake indicator shall prevent any unacceptable loss of air. The allowable loss of air shall be less than the leakage values when tested in accordance with 5.3.7.1

4.4 Constructional characteristics**4.4.1 External appearance**

The external surfaces of the brake indicator shall be free of sharp edges which could be a danger to those persons handling the brake indicator or to other equipment in the proximity of the brake indicator. This requirement shall be checked while testing the other constructional features in accordance with 5.3.2.

4.4.2 Fire/smoke behaviour

Non-metallic housings and components shall be made of self-extinguishing materials and shall comply with the requirements as defined in 5.3.13.

Where any specific requirements for the brake indicator for particular lines or train services have been agreed between supplier and purchaser, they shall be tested in accordance with 5.3.13.

4.4.3 Connections

The body of the brake indicator shall have an internal G ¼" thread for connection(s) according to EN ISO 228-2 to the brake cylinder pipe(s). If required by the purchaser, the body can have an electric connector(s). This requirement shall be checked while testing the other constructional features in accordance with 5.3.2.

4.4.4 Electric contacts

The contacts shall have "snap action operation" and be capable of operating within voltage limits of $0,7 U_n$ and $1,25 U_n$.

NOTE Contact characteristics (voltage, current, protection etc.) and cabling will be declared by the supplier.

4.4.5 Space envelope

The brake indicator shall be contained in the space envelope of Figure A.1, A.2, A.3, A.4 and A.5. Sizes shall be checked in accordance with 5.3.2.

4.4.6 Indicator window

The brake indicator shall have a window not less than $2\,400\text{ mm}^2$ for viewing:

- **red flag**: in the middle this flag shall have a black line 10 mm wide or a black dot 15 mm diameter;
- **green flag**.

NOTE White flag with black cross may be used to indicate uncertain braking status of a parking brake by physically operating in front of the red/green indicator window.

The following colours shall be used:

- red colour according to RAL **3020**;
- green colour according to RAL **6018**;
- black colour **no RAL**;
- white colour **no RAL**.

The colours shall remain recognisable during the overhaul period or lifetime of the indicator and shall be resistant to fading due to exposure to UV or bright sunlight.

EN 15220-1:2008 (E)**4.4.7 Brake indicator weight**

The weight shall not exceed 1,5 kg for the simple brake indicator and 3,0 kg for the double brake indicator.

4.4.8 Mechanical shock and vibration

The brake indicator shall withstand mechanical shock and vibrations to provide some confidence that it will survive the specified life under service conditions. These characteristics shall be tested in accordance with 5.3.9 and 5.3.10.

4.4.9 Life expectancy

The life expectancy shall be such that the brake indicator is able to function satisfactorily after 1 000 000 cycles in accordance with 5.3.11.

5 Type test methods**5.1 Sampling for type test**

A sample of eight brake indicators produced under the condition of line-production shall be tested.

5.2 Test requirements

All the type tests shall be performed at (20 ± 5) °C and the quality of the compressed air equivalent to class 4-4-4 specified in ISO 8573-1. The tests marked with a (*) shall be performed additionally at a wider temperature range if otherwise agreed between supplier and purchaser.

NOTE Pass/fail criteria for this case should be agreed between the supplier and purchaser.

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5.3 Test procedure**5.3.1 Principle**

Acceptance of the brake indicator requires that it shall pass all the designated acceptance tests.

The tests shall be carried out in the order shown in Table 1. This table is designed to avoid unnecessary test repetitions.