SLOVENSKI STANDARD
SIST EN 15355:2008

01-december-2008

Železniške naprave - Zavore - Krmilni ventili in naprave za ločitev krmilnih ventilov od zavornega voda

Railway applications - Braking - Distributor valves and distributor-isolating devices

Bahnanwendungen - Bremse - Steuerventile und Bremsabsperrhähne

Applications ferroviaires - Freinage - Distributeur de freinage et robinet d'isolment

Ta slovenski standard je istoveten z: **EN 15355:2008**

ICS:

45.040	Materiali in deli za železniško tehniko	Materials and components for railway engineering

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Railway applications - Braking - Distributor valves and distributor-isolating devices

Applications ferroviaires - Freinage - Distributeurs de freinage et robinet d'isolement

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Foreword

This document (EN 15355:2008) 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of an identical text or by endorsement, at the latest by April 2009, and conflicting national standards shall be withdrawn at the latest by April 2009.

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For relationship with EU Directives, 96/48/EC and 2001/16/EC see informative Annexes ZA and ZB, which are integral parts of this document.

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1 Scope

This European Standard applies to distributor valves and distributor-isolating devices.

The distributor valves contained in this European Standard are of graduated release type. Direct release types are not included.

Functionally they are regarded as not containing relay valves of any type, even if the relay valves are physically an integral part of the distributor valves.

This European Standard applies to both distributor-isolating devices mounted separate from the distributor valve and distributor-isolating devices integral with the distributor valve.

This European Standard specifies the requirements for the design, testing and quality assurance of distributor valves and distributor-isolating devices.

For interoperable freight wagons, these devices which are operated by compressed air according to EN 14198 are assessed according to the respective technical specification of interoperability.

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 14198, *Railway applications — Braking — Requirements for the brake system of trains hauled by a locomotive*

EN 14478:2005, *Railway applications — Braking — Generic vocabulary*

EN 60721-3-5:1997, *Classification of environmental conditions — Part 3: Classification of groups of environmental parameters and their severities — Section 5: Ground vehicle installations (IEC 60721-3-5:1997)*

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

EN ISO/IEC 17025, *General requirements for the competence of testing and calibration laboratories (ISO IEC 17025:2005)*

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

3 Symbols, and abbreviations, terms and definitions

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

3.1 Symbols

t time

p pressure

3.2 Abbreviations

P Braking mode “passenger”

G Braking mode “goods” (freight)

3.3 Terms and definitions

3.3.1
general
some of the curves in this clause are simplified, not showing the real pressure development. This is considered to be sufficient for the purpose of this clause

3.3.2
distributor valve
apparatus to control a pneumatic output pressure as an inverse function of the variation of an input pressure as the main function

NOTE 1 See Figure 1 and Figure 2.

NOTE 2 For the purpose of this European Standard, input pressure is considered to be the brake pipe pressure and output pressure is considered to be the brake cylinder pressure or the pilot pressure, which controls the brake cylinder pressure via a relay valve.

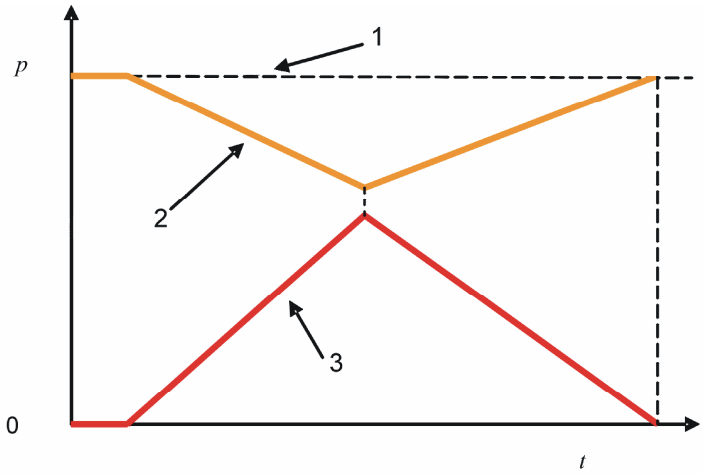
Key

1 input pressure

2 distributor valve

3 output pressure

Figure 1 — Distributor valve – Main function, block diagram



Key

1 operating pressure

2 input pressure

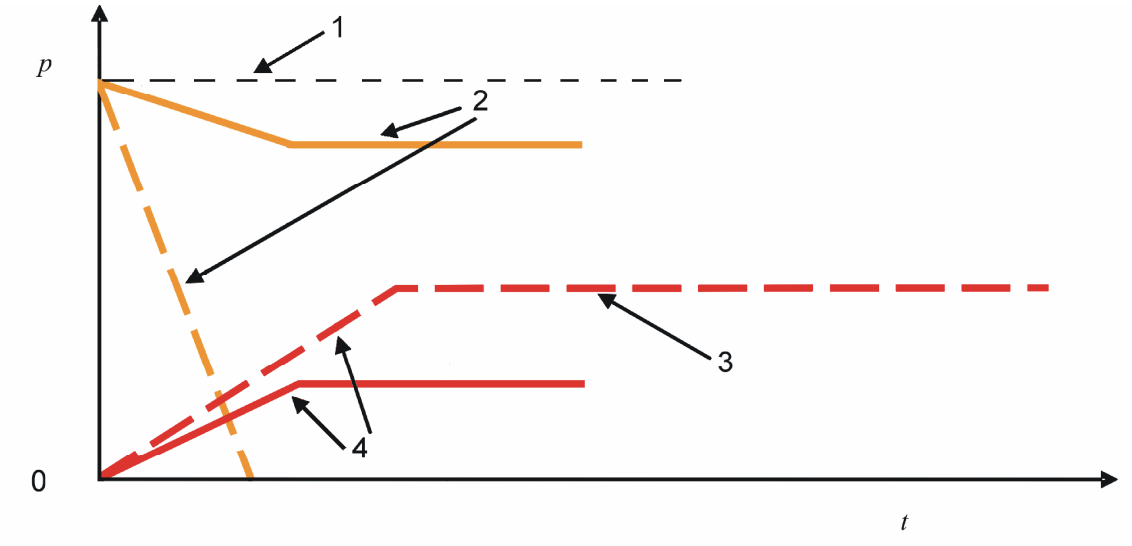
3 output pressure

Figure 2 — Distributor valve – Main function, pressure diagram

3.3.3
brake application

defined drop of input pressure (brake pipe pressure) in the range of pressure from the released position (operating pressure) to the pressure which causes the distributor valve to establish a corresponding output pressure level fed by the auxiliary (supply) reservoir

NOTE See Figure 3.



Key

1 operating pressure

2 input pressure

3 maximum output pressure

4 output pressure

——— service brake application

— — — emergency brake application

Figure 3 — Service and emergency brake application

3.3.3.1
service brake application
defined drop of input pressure (brake pipe pressure) beginning at the operating pressure level down to a value between the minimum reduction and the level of input pressure necessary for reaching maximum output pressure

NOTE This pressure drop causes the distributor valve to establish a corresponding output pressure.

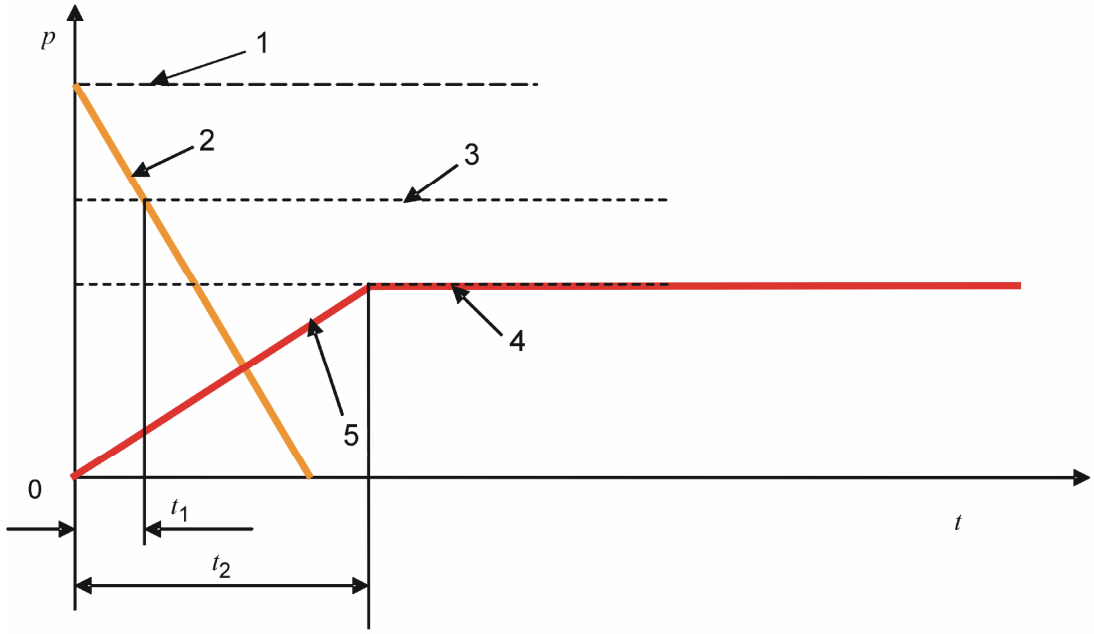
3.3.3.2
graduated braking
incremental increase of the output pressure controlled by an incremental reduction of the input pressure in the range of pressure from released position to the pressure corresponding to a full service braking

3.3.3.3
full service brake application
defined drop of input pressure (brake pipe pressure) beginning at the operating pressure level down to the input pressure level which causes the distributor valve to establish maximum output pressure

3.3.3.4
emergency braking (emergency brake application)
increase of output pressure up to the maximum output pressure caused by a drop of input pressure starting with the value for operating pressure down to the level necessary for reaching the maximum output pressure in time t_1, faster than the specified time for reaching the maximum output pressure, t_2

NOTE 1 This causes the distributor valve to operate at his maximum capacity, meeting the system requirements (see Figure 4).

NOTE 2 Usually during emergency braking the input pressure is reduced to 0.



Key

1 operating pressure

2 input pressure

3 input pressure level necessary for reaching maximum output pressure

4 maximum output pressure

5 output pressure

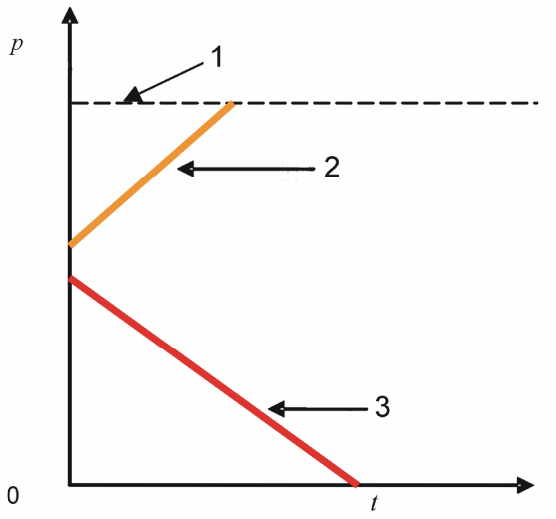
t_1 time to reach the input pressure necessary to establish maximum output pressure

t_2 time to reach the maximum output pressure

Figure 4 — Emergency braking (emergency brake application)

3.3.4
brake release
increase of input pressure (brake pipe pressure) after a brake application which causes the distributor valve to vent the output pressure to atmosphere

NOTE See Figure 5.



Key

1 operating pressure

2 input pressure

3 output pressure

Figure 5 — Brake release

3.3.4.1
full release
increase of input pressure (brake pipe pressure) after a brake application up to the operating pressure level, causing the complete venting of output pressure

3.3.4.2
graduated release
incremental reduction of output pressure by an incremental increase of input pressure in the range of pressure from full service braking to full release

3.3.5
brake application time
time for increasing output pressure from when it starts to rise from 0 bar up to 95 % of the maximum output pressure, when input pressure is reduced from operating pressure level down to 0 bar with a time of less than 2 s for the first pressure drop of 1,5 bar

3.3.6
release time
time for reducing the output pressure from when it starts to fall from maximum down to 0,4 bar, when input pressure is increased up to the operating pressure level, starting from 1,5 bar below it, in less than 2 s

3.3.7
manual release
function which requires deliberate and intentional manual action in order to cancel brake application (to release the distributor valve) provided by one distributor valve

NOTE Manual release function can be achieved in two ways as defined in 3.3.7.1 and 3.3.7.2.

3.3.7.1
automatic manual release
operation requires short action by the command element after which the release function is completed automatically

3.3.7.2
non-automatic manual release
operation requires action by the command element during the entire process until the release function is completed

NOTE Stopping action before complete release results in incomplete release.

3.3.8
braking mode
state of the distributor valve in which it provides categories of application and release times for the output pressure, which a distributor valve might be able to provide depending on the operating conditions

3.3.8.1
braking mode "passenger" (short form "P")
braking mode characterized by fast brake application and release times specific for distributor valves used on trains for passenger traffic

3.3.8.2
braking mode "goods "("freight") (short form "G")
braking mode characterized by slow brake application and release times specific for distributor valves used on freight trains for slow speed

3.3.9
automatic braking
ability of the distributor valve to ensure the maximum output pressure in case of loss of input pressure

3.3.10
inexhaustibility
capability to ensure a significant level of output pressure from the distributor valve under all operating conditions

3.3.11
stand by position/ready for operation
condition of the distributor valve in which braking can be initiated in compliance with all specifications

3.3.12
operating pressure
reference input pressure in full released position

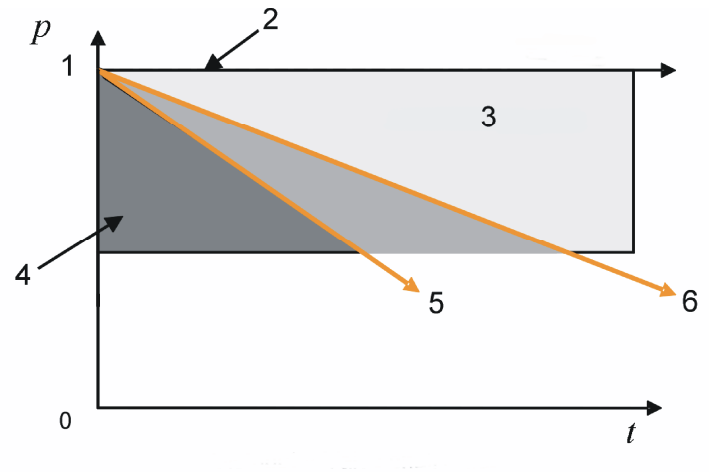
3.3.13
sensitivity
ability of the distributor valve to supply an output pressure under certain conditions of input pressure reduction

NOTE 1 See Figure 6.

NOTE 2 If a certain value is specified, it gives the minimum gradient of input pressure reduction which causes the distributor valve to react after a certain time.

3.3.14
insensitivity
ability of the distributor valve to avoid supplying an output pressure under certain conditions of input pressure reduction

NOTE If a certain value is specified it gives the maximum (fastest) gradient of the input pressure reduction which will not cause the distributor valve to react.



Key

	distributor valve shall react	1	input pressure
	distributor valve may react	2	operating pressure
	distributor valve shall not react	3	insensitivity area
		4	sensitivity area
		5	sensitivity limit
		6	insensitivity limit

Figure 6 — Sensitivity respectively insensitivity areas and limits

3.3.15
quick service function
function of a distributor valve which allows, when applying the brake from stand-by and released position, the local fast venting of brake pipe pressure by a certain specified amount and at a certain specified gradient, to provide pneumatic brake signal transmission through a train

3.3.16
propagation time
time between the initiation of a brake application by the driver's brake handle and the beginning of brake cylinder pressure build-up on the last vehicle of a train

3.3.17
propagation speed
propagation time related to the length of brake pipe

NOTE The length of brake pipe is measured from the driver's brake valve to the end cock located at the end of the last vehicle of the train and does not take into consideration any branches.

3.3.18
operating pressure overcharge
build up of distributor valve input pressure above operating pressure to reduce the release time of a train and/or to adjust the distributors control reservoir pressure of all vehicles of a complete train

3.3.19
inshot function
function of the distributor valve which allows, when operated in the braking mode "goods" ("freight"), a faster increase of the output pressure at the beginning of brake application (t_1 against t_2 without inshot function). The purpose is quick build up of the necessary pressure for initiating the friction braking process (see Figure 7)