



SLOVENSKI STANDARD

SIST EN 14817:2006

01-oktober-2006

Železniške naprave – Vzmetenje – Kontrolni elementi pri zračnih vzmeteh

Railway applications - Suspension components - Air spring control elements

Bahnanwendungen - Federungselemente - Luftfedersteuerglieder

Applications ferroviaires - Pieces de suspension - Éléments de commande de ressort
pneumatique

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

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**Railway applications - Suspension components - Air spring
control elements**

Applications ferroviaires - Pièces de suspension - Eléments
de commande de ressort pneumatique

Bahnanwendungen - Federungselemente -
Luftfedersteuerglieder

This European Standard was approved by CEN on 9 January 2006.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Central Secretariat has the same status as the official versions.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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Foreword

This European Standard (EN 14817:2006) 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of an identical text or by endorsement, at the latest by October 2006, and conflicting national standards shall be withdrawn at the latest by October 2006.

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

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

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Introduction

Designing an air spring control element initially requires knowledge of the mechanical system into which it is integrated. From this come the performance requirements specific to each case that only the customer is able to specify.

The requirements of the standard should be applied jointly to the supply conditions for the air spring control elements.

This standard puts into concrete form the studies and work carried out to improve the performance and quality of the air spring control elements in order to meet the requirements of modern rail transport equipment.

This standard is intended for the users of rail networks, manufacturers and suppliers of rail equipment and suppliers of air brake control elements.

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EN 14817:2006 (E)**1 Scope**

This standard specifies:

- the characteristics the air brake control elements shall have and the tests to be carried out;
- the guidelines for drafting the approval procedure applied by the customer;
- the guidelines for drafting the qualification procedure for the product based on the requirements specified;
- the guidelines for drafting the quality surveillance provisions for the manufacture of the air spring control elements.

The requirements of this standard are applicable to air spring control elements having to equip rail vehicles operating on a reserved track under permanent guidance without any distinction between the nature or the route of the track.

It covers complete control elements. It is essential that the various components are defined by particular specifications.

This standard specifies:

- the differential valves;
- the filters;
- the levelling valves;
- the non-return valves;
- the minimum pressure valves;
- the pressure-reducing valves;
- the end stop valves;
- the isolating valves.

This standard does not take into account the other air suspension control elements such as the installation of pipes, pipework elements and air production elements.

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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 50102, *Degrees of protection provided by enclosures for electrical equipment against external mechanical impacts (IK code)*

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

ISO 31-1, *Quantities and units – Part 1: Space and time*

ISO 31-3, *Quantities and units – Part 3: Mechanics*

ISO 1219-1, *Fluid power systems and components – Graphic symbols and circuit diagrams – Part 1: Graphic symbols*

ISO 8573-1, *Compressed air for general use – Part 1: Contaminants and quality classes*

ISO 9227, *Corrosion tests in artificial atmospheres – Salt spray tests*

ISO 10209-1, *Technical product documentation – Vocabulary - Part 1: Terms relating to technical drawings - General and types of drawings*

3 Terms, definitions, symbols and abbreviations

3.1 Terms and definitions

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

3.1.1

differential valve

appliance whose basic function is to permit a flow of air between two air springs of the same bogie when their pressure differential is greater than a specified threshold

3.1.2

filter

appliance whose basic function is to catch the pollutants in the compressed air

3.1.3

levelling valve

appliance whose basic function is to maintain the height of an air spring at a predetermined constant value whatever the static load applied whilst admitting or discharging air

3.1.4

end stop valve

appliance whose basic function is to limit the height of an air spring to a predetermined value by purging it rapidly into the atmosphere

3.1.5

minimum pressure valve

appliance whose basic function is to admit an air flow in one single direction above a given pressure

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3.1.6

non-return valve

appliance whose basic function is to admit an air flow in one single direction

3.1.7

pressure drop

difference between the inlet pressure and outlet pressure of a control element at a given moment

3.1.8

pressure reducing valve

appliance that supplies a relatively constant outlet pressure regardless of the inlet pressure and outlet air flow

NOTE It is essential that the inlet pressure, however, remains higher than the regulated outlet pressure.

3.1.9

isolating valve

appliance whose basic function is to permit air to flow or not whatever the direction

3.1.10

isolating valve with vent hole

appliance whose basic function is to permit air to flow in whatever direction or to oppose it by venting one part of the air circuit

3.2 Symbols and abbreviations

For the purposes of this European Standard, the following symbols and abbreviations apply.

Most of the symbols used in this standard and defined in this subclause conform to ISO 31-1 and ISO 31-3.

Decimal multiples and sub-multiples of the units defined in Table 1 may be used.

Table 1 — Symbols and abbreviations

Symbol Abbreviation	Unit	Explanation
p	Pa	Absolute pressure. The value zero corresponds to an absolute vacuum.
p_1	Pa	Inlet pressure.
p_2	Pa	Outlet pressure.
p_{amb}	Pa	Ambient pressure outside the control element. Unless otherwise specified, $p_{amb} = p_{at}$.
p_{at}	Pa	Normal atmospheric pressure, with $p_{at} = 101325 \text{ Pa}$ ($\approx 1 \text{ bar}$)
p_e	Pa	Effective pressure. Pressure equal to the algebraic difference between the absolute pressure inside the element (p) and the ambient pressure (p_{amb}). $p_e = p - p_{amb}$
p_{mw}	Pa	Maximum working pressure. Maximum absolute pressure to which the control element is subjected in service for a given application.
p_{op}	Pa	Operating pressure.
T	°C	Ambient temperature outside the control element.
$T_{E\max}$	°C	Upper limit of range of exceptional operating temperatures.
$T_{E\min}$	°C	Lower limit of range of exceptional operating temperatures.

T_{Nmax}	°C	Upper limit of range of normal operating temperatures.
T_{Nmin}	°C	Lower limit of range of normal operating temperatures.
T_{Smax}	°C	Upper limit of range of stationary exposure temperatures.
T_{Smin}	°C	Lower limit of range of stationary exposure temperatures.
Δp	Pa	Pressure drop.
Δp_m	Pa	Maximum allowable pressure drop.

4 Documentation

4.1 Introduction

The element shall be defined in a technical specification comprising the following documents (see 4.2 and 4.3).

The types of drawings are specified in ISO 10209-1.

4.2 Documents to be provided by the customer

The customer shall prepare a technical specification comprising:

- a) an interface drawing (if possible, an assembly drawing of the mechanical system or a partial drawing) showing the following points at least:
 - the space envelope;
 - the functional dimensions and tolerances.
- b) technical data specifying the following points at least:
 - the working conditions (temperatures, assembly, environment, maintenance, storage, etc.);
 - the requirements (product characteristics, tolerances and desired service life);
 - the content of the approval procedure and the type testing requirements (for example: characteristics to be verified and tests to be carried out, sequence of tests and verifications).

4.3 Documents to be provided by the supplier

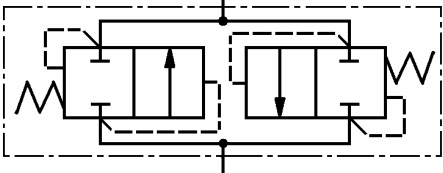
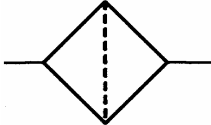
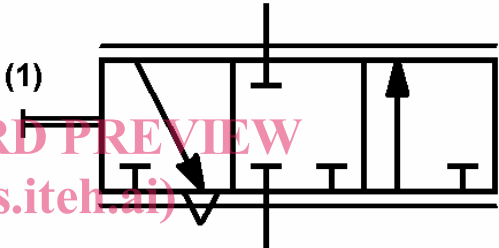
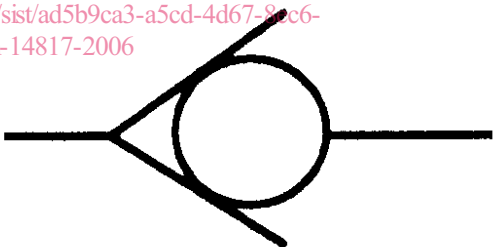
The supplier shall provide documentation describing the element and specifying:

- a) a specification drawing including at least:
 - the overall dimensions;
 - the position of the marking.
- b) a specification drawing (cross-section view) with a nomenclature;
- c) technical data specifying at least the necessary information on the control element (for example: assembly and maintenance instructions).

5 Graphical symbols

The control elements shall be represented in the diagrams by the symbols given in Table 2.

Table 2 — Graphical symbols

Element	Graphical symbol
Differential valve	
Filter	
Levelling valve	
Non-return valve	
Pressure reducing valve	