



SLOVENSKI STANDARD
SIST EN 1491:2000

01-november-2000

Ventili v stavbah - Ekspanzijski ventili - Preskusi in zahteve

Building valves - Expansion valves - Tests and requirements

Gebäudearmaturen - Sicherheitsventile für Expansionswasser - Prüfungen und Anforderungen

Robinetterie de bâtiment - Soupapes d'expansion - Essais et prescriptions

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ICS:

91.140.60 Sistemi za oskrbo z vodo Water supply systems

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en

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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 1491

March 2000

ICS 91.140.60

English version

Building valves - Expansion valves - Tests and requirements

Robinetterie de bâtiment - Soupapes d'expansion - Essais
et prescriptions

Gebäudearmaturen - Sicherheitsventile für
Expansionswasser - Prüfungen und Anforderungen

This European Standard was approved by CEN on 3 February 2000.

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.

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

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

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FOREWORD

This European Standard has been prepared by Technical Committee CEN/TC 164 "Water supply", the secretariat of which is held by AFNOR.

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of an identical text or by endorsement, at the latest by September 2000, and conflicting national standards shall be withdrawn at the latest by September 2000.

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, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

Annex A of this European Standard is informative.

INTRODUCTION

In respect of potential adverse effect on the quality of water intended for human consumption, caused by the product covered by this standard:

- a) This standard provides no information as to whether the product may be used without restriction in any of the Member States of the EU or EFTA.
- b) It should be noted that, whilst awaiting the adoption of verifiable European criteria, existing national regulations concerning the use and or the characteristics of this product remain in force.

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1 SCOPE

This European Standard specifies, dimensions, materials and performance requirements (including methods of test) for expansion valves, of nominal sizes from DN 15 to DN 40, having working pressures¹⁾ from 0,1 MPa (1 bar) to 1,0 MPa (10 bar).

Expansion valves are intended for fitting to the cold water supply of storage water heaters, having a maximum distribution temperature of 95 °C, for all energy sources.

Expansion valves do not control the temperature and alone does not constitute the protection required for storage water heaters. Expansion valves limit pressure, in the water heaters to what they are fitted, that is produced by thermal expansion of the water.

NOTE : The use of the device specified in this Standard does not override the need to use controls (e.g. thermostats and cut-outs) which act directly on the power sources of water heaters.

2 NORMATIVE REFERENCES

This European Standard incorporates, by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest addition of the publication referred to applies.

EN 1254-2	Copper and copper alloys - Plumbing Fittings - Part 2: Fittings with compression ends for use with copper tubes.
EN 1982	Copper and copper alloys - ingots and castings
EN 12420	Copper and copper alloys - forgings
EN ISO 6509	Corrosion of metals and alloys - Determination of dezincification resistance of brass (ISO 6509 : 1981)
ISO 7-1:1994	Pipe threads where pressure-tight joints are made on the threads - Part 1: Dimensions, tolerances and designation.
ISO 228-1:1994	Pipe threads where pressure-tight joints are not made on the thread - Part 1: Dimensions, tolerances and designation.
ISO 7005-3:1988	Metallic flanges - Part 3 : Copper alloy and composite flanges.

3 DEFINITIONS

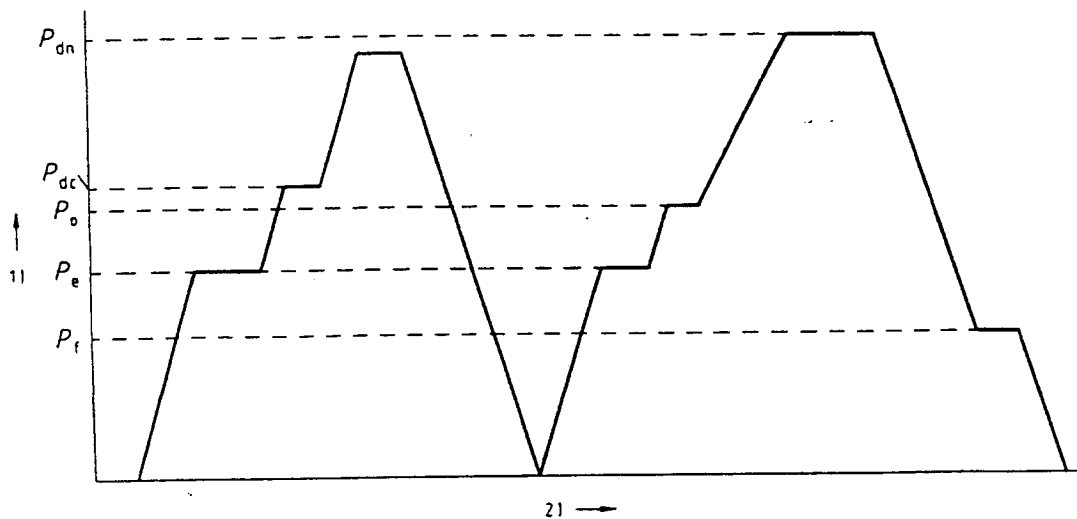
For the purposes of this Standard, the following definitions apply:

3.1 expansion valve opens automatically at a specified set pressure to discharge fluid. It is fitted to prevent the pressure of the water in the water heater from exceeding the maximum working pressure by discharging a quantity of water to the drain.

3.1 Pressures

3.2.1 nominal set pressure (P_{nr}) is the pressure of the expansion valve which is set on production.

¹⁾ All pressures are gauge unless otherwise stated



Key

- 1) Pressure
- 2) Time

iTeh STANDARD PREVIEW Figure 1 - Pressures - see Section 3 Definitions (standards.iteh.ai)

3.2.2 water tightness pressure (P_e) is the pressure up to which the expansion valve is still closed (see figure 1).

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3.2.3 initial opening pressure (P_{dc}) is the pressure at which the expansion valve opens for the first time, as indicated by the first droplet of water, after a period of storage (see figure 1).

3.2.4 opening pressure (P_o) is the pressure at which a flow rate of 2,4 litre/hour of water is attained (see figure 1) through the expansion valve.

3.2.5 rating pressure (P_{dn}) is the pressure at which the water discharge capacity of the expansion valve corresponds to the rated flow (see figure 1 and table 3).

3.2.6 closing pressure (P_f) is the pressure at which the expansion valve closes after having reached the rating pressure (see figure 1).

4 MATERIALS AND SURFACE FINISHES

4.1 General

The selection of materials is the responsibility of the manufacturer, provided they satisfy the following requirements:

- a) materials and coatings shall not contaminate the drinking water, when in normal or accidental contact,
- b) in a technical document, the manufacturer shall state the nature of the materials and coatings used,
- c) materials with inadequate corrosion resistance shall have additional protection, and
- d) the materials used shall not deteriorate at a temperature of 95 °C for 1 hour and be suitable under the temperatures specified in the tests in this Standard.

4.2 Nature of materials

Examples of bronze and brass which may be used, without coating, for manufacturing purposes are given in table 1.

Table 1 - Examples of copper alloys

Material Designation		
Symbol	Reference Number	EN Standard
Cu Sn 5 Pb 5 Zn 5 - C	CC491K	EN 1982
Cu Sn 3 Zn 8 Pb 5 - C	CC490K	EN 1982
Cu Zn 39 Pb 3	CW614N	EN 12420
Cu Zn 40 Pb 2	CW617N	EN 12420
Cu Zn 36 Pb 2 As	CZ132	-

Copper-zinc alloys containing more than 10 % zinc are subject to dezincification when submitted to water capable of dezincification. In the countries where the use of products made of dezincification resistant materials is required, the products have to guarantee a dezincification depth less than 200 μm in any direction, they have to be tested in accordance with the standard EN ISO 6509 and have to be marked in compliance with the indications under section „MARKING“ (point 11).

5 DESIGN AND DIMENSIONAL REQUIREMENTS

5.1 General guidance

- a) The expansion valve shall be of the type where the spring is isolated from the water by a diaphragm or equivalent.
- b) All sliding elements shall be designed to prevent any risk of seizure, scaling or sticking.
- c) Sliding or rotating parts of expansion valves shall not be in contact with water.
- d) The components controlling the setting of the expansion valve shall not be accessible to the end user without damage to the valve.
- e) The expansion valve shall be designed as to make the opening pressure in no case greater than $1,3 P_{nr}$ and under this pressure, manual lift of the expansion valve shall be in conformity with the requirements of the tests given in section 6.4.1.
- f) Wing or similar guides of the expansion valve shall not be used on the inlet side of the expansion valve.
- g) The normal operation of the expansion valve shall not be influenced by external forces.
- h) The body of the expansion valve shall have two suitable flats to apply a spanner.
- i) If there is only one direction for operation of rotary controls of an expansion valve it shall be anti-clockwise.

5.2 Pressures

General: For set pressures below 0,3 MPa (3 bar) the same differential pressures shall be used as for 0,3 MPa (3 bar).

EXAMPLE: an expansion valve with the set pressure of 0,2 MPa (2 bar) shall have a rating pressure P_{dn} equal to 0,23 MPa (2,3 bar).

5.2.1 Nominal set pressure (P_{nr})

The nominal set pressure shall not be greater than 1,0 MPa (10 bar); and a set pressure of 0,6 MPa (6 bar) is recommended.

5.2.2 Water tightness pressure (P_c)

The water tightness pressure is related to the nominal set pressure (P_{nr}) by:

$$P_{c \text{ minimum}} = 0,95 P_{nr}$$

5.2.3 Opening pressure (P_o)

The opening pressure is related to the nominal set pressure (P_{nr}) by:

$$P_o = 1,1 P_{nr}$$

5.2.4 Rating pressure (P_{dn})

The rating pressure is related to the nominal set pressure (P_{nr}) by:

$$P_{dn} = 1,2 P_{nr}$$

5.2.5 Closing pressure (P_f)

The closing pressure is related to the nominal set pressure (P_{nr}) by:

$$P_{f \text{ minimum}} = 0,75 P_{nr}$$

5.3 Dimensional characteristics

The nominal outlet diameter of the expansion valve shall be at least equal to the inlet dimension.

5.3.1 End connections

Examples of end connections are given in [table 2](#). [1491:2000](#)

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5.3.2 Other connections (e.g. unions)

[b74bcfa7e06/sist-en-1491-2000](https://standards.iteh.ai/catalog/standards/sist/b74bcfa7e06/sist-en-1491-2000)

Connections, other than those specified in section 5.3.1, shall be tested in accordance with section 7.2.3.

5.3.3 Exclusions

Connections requiring the use of heat to make or break the joint (e.g. capillary) are not permitted.

6 HYDRAULIC TESTS AND REQUIREMENTS

6.1 Tolerances

Unless otherwise specified, all tolerances shall be $\pm 5\%$.

6.2 Cold water pressure tests

6.2.1 General

The expansion valve shall be stored, in the closed position, at ambient temperature for a minimum of period of 8 days before commencing tests.

Connect the expansion valve by its water heater connection to the test apparatus having water at ambient temperature (maximum 25 °C).