



SLOVENSKI STANDARD
SIST EN 1488:2000

01-november-2000

Ventili v stavbah - Ekspanzijski bloki - Preskusi in zahteve

Building valves - Expansion groups - Tests and requirements

Gebäudearmaturen - Sicherheitsgruppen für Expansionswasser - Prüfungen und Anforderungen

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

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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 1488

March 2000

ICS 91.140.60

English version

Building valves - Expansion groups - Tests and requirements

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

Gebäudearmaturen - Sicherheitsgruppen 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

Central Secretariat: rue de Stassart, 36 B-1050 Brussels

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of an identical text or by endorsement, at the latest by September 2000, and conflicting national standards shall be withdrawn at the latest by September 2000.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

The product standards on check valves are currently being worked out within CEN/TC 164/WG 4. The requirements for the endurance tests that will be laid down for these products may cause the revision of the present standard for reasons of homogeneity.

INTRODUCTION

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

- 1) 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.
- 2) It should be noted that, whilst awaiting the adoption of verifiable European criteria, existing national regulations concerning the use and on 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 groups, 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 groups 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 groups limit pressure, in the water heater to which they are fitted, that is produced by thermal expansion of the water.

Expansion groups do not control temperature and alone do not constitute the protection required for storage water heaters.

NOTE : The use of the device specified in this Standard does not override the need to use controls (eg thermostats and thermal 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 alloy - Plumbing fittings - Part 2: Fittings with compression ends for use with copper tube. SIST EN 1488:2000
EN 1982	Copper and copper alloys - Ingots and castings http://standards.iteh.ai/catalog/standards/sist-en-1488-2000-62b5bcaae749/sist-en-1488-2000
EN 12420	Copper and copper alloys - Forgings
EN ISO 3822-1	Acoustics - Laboratory tests on noise emission from appliances and equipment used in water supply installations - Part 1: Method of Measurement (ISO 3822-1 : 1999).
EN ISO 3822-3:1997	Acoustics - Laboratory tests on noise emission from appliances and equipment used in water supply installations - Part 3: Mounting and operating conditions for in-line valves and appliances (ISO 3822-3:1997).
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 thread - 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.

¹⁾ All pressures are gauge unless otherwise stated

3 DEFINITIONS

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

3.1 expansion group controls and limits the increase in fluid pressure, due to the normal increase in volume when water is heated, contained in a hot water heater, prevents the backflow of the heated water into the circuit and the contamination of water contained in the water heater with discharged water.

An expansion group comprises, at least the following items in a single unit, in an upstream to downstream order as shown in table 1.

Table 1 - Components of expansion groups

	DN 15	DN 20	DN 25	DN 32	DN 40
an isolating valve	1	1	1	1	1
a test port for monitoring the check valve	1	1	1	1	1
a check valve	1	1	1	1	1
an isolating valve	1*	1*	1*	1*	1*
an expansion valve	1	1	1	1	1
a drain device	1*	1*	1*	1*	1*
an air break to drain	1	1	1	1	1
a pressure tapping	1*	1*	1*	1*	1*
* optional					

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3.2 isolating valve allows the heated water produced to be isolated from the drinking water supply. If a second valve is to be fitted, it shall be between the check valve and the expansion valve.

3.3 check valve allows water to flow in the cold to hot direction when fitted to a water heater, and automatically prevents heated water returning to the cold water supply.

3.4 expansion valve limits the pressure of the water in the water heater to a predetermined value by discharging water to drain.

3.5 drain device allows the water heater to be drained without it having to be removed. The outlet connection is also used to discharge water from the expansion valve.

3.6 air gap prevents discharged water from returning to the expansion group and thus to the water heater.

3.7 pressure tapping allows pressure measuring equipment to be connected.

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

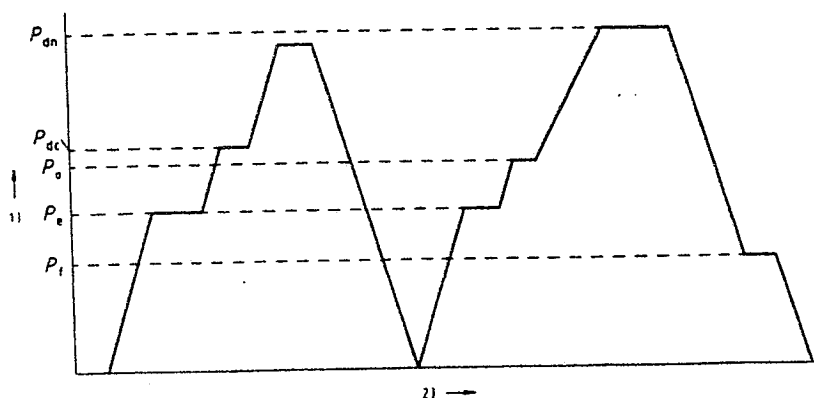
3.9 water tightness pressure (P_e) is the pressure up to which the expansion valve is closed (see figure 1).

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

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

3.12 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 7).

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



Key

- 1) Pressure
- 2) Time

Figure 1 - Pressures - see Section 3 definitions

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,
- 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, and
- e) the components making up the check valve shall be of a material resistant to scale formation.

4.2 Nature of materials

Examples of bronze and brass which may be used, without coating, for manufacturing purposes are given in table 2.

Table 2 - Examples of copper alloys

Material Designation		EN Standard
Symbol	Reference Number	
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“ (clause 12).

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 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 no greater than $1,3 P_{nr}$, and under this pressure, manual lift of the pressure safety valve shall be in conformity with the requirement of the test given in section 9.6.1.
- 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 group 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.

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5.2 Dimensional characteristics

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5.2.1 End connections

Examples of end connections are given in table 3.

5.2.2 Other connections (eg unions)

Connections, other than those specified in section 5.2.1, shall be tested in accordance with section 7.2.3.

5.3 Test port (see figure 2)

The test port, fitted with a plug, shall be positioned upstream of the seat of the check valve. It shall have the following dimensions:

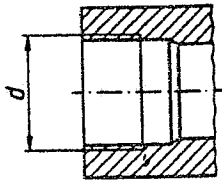
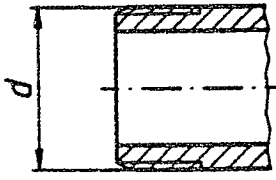
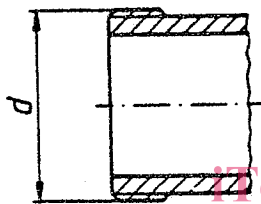
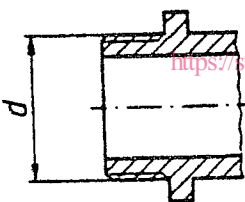
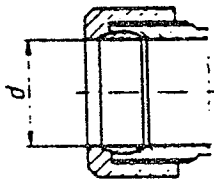
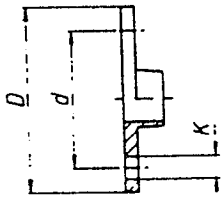
female thread diameter: G1/4,

depth of thread: $d > 6,5 \text{ mm}$,

diameter $a > 6 \text{ mm}$ (or equivalent surface area), and

diameter b shall allow sufficient gasket bearing surface.

Table 3 - Examples of end connections and nominal sizes (DN)

Type	1)	DN 15	DN 20	DN 25	DN 32	DN 40
 a) internal thread to ISO 7-1:1994	d	Rp 1/2	Rp 3/4	Rp 1	Rp 1 1/4	Rp 1 1/2
 b) External taper thread to ISO 7-1:1994	d	R 1/2	R 3/4	R 1	R 1 1/4	R 1 1/2
 c) Flat faced external thread to ISO 228-1:1994	d	G 3/4 B	G 1 B	G 1 1/4 B	G 1 1/2 B	G 1 3/4 B
 d) External thread with shoulder to ISO 228-1:1994	d	G 1/2 B	G 3/4 B	G 1 B	G 1 1/4 B	G 1 1/2 B
 e) compression fitting for copper pipe to EN 1254-2	d	15/18	22	28	35	42
 f) flange to ISO 7005-3:1988	D d K	95 75 14	105 75 14	115 85 14	140 100 18	150 110 18
1) reference dimension						

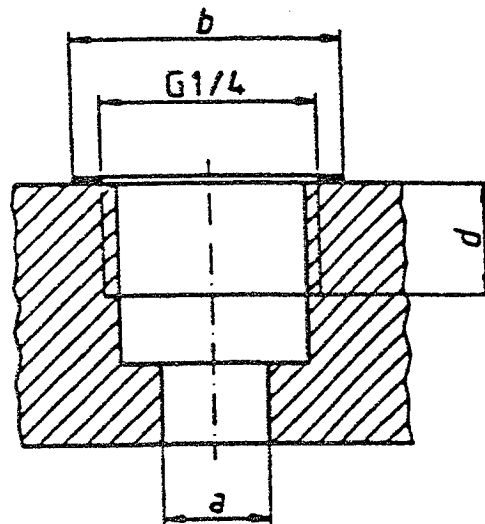


Figure 2 - Test port

5.4 Pressure tapping

When the expansion group is fitted with a pressure tapping for the connection of equipment to measure pressure, the dimensions of the tapping shall be as specified for the check valve test port, (see section 5.3).

5.5 Expansion valve outlet connection to air gap

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The expansion valve outlet connection to air gap shall have a minimum flow area of 78 mm². Each individual section shall be at least 25 mm² and the smallest dimension, used to calculate the cross-section, shall not be less than 4 mm.

5.6 Expansion valve discharge connection to drain device

The dimensions of the discharge connection downstream of the air gap shall be at least one nominal size greater than that of the expansion group for DN 15 and DN 20, and at least equal to the nominal size for larger expansion groups.

5.7 Other threads

Threads not included in this Standard shall be determined by the manufacturer.

5.8 Exclusions

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

6 HYDRAULIC TESTS AND REQUIREMENTS

6.1 Tolerances

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