

**Don för att förhindra förorening av dricksvatten  
genom återströmning – Luftningsventil monterad  
nedströms pådragsventil DN 8 till DN 80 –  
Familj D, typ A**

**Devices to prevent pollution by backflow of  
potable water – Inline anti-vacuum valves DN 8  
to DN 80 inclusive – Family D, type A**

Europastandarden EN 14451:2005 gäller som svensk standard. Detta dokument innehåller den officiella engelska versionen av EN 14451:2005.

The European Standard EN 14451:2005 has the status of a Swedish Standard. This document contains the official English version of EN 14451:2005.

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EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

**EN 14451**

May 2005

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ICS 13.060.20; 23.060.50

English version

## Devices to prevent pollution by backflow of potable water - In-line anti-vacuum valves DN 8 to DN 80 - Family D, type A

Dispositifs de protection contre la pollution de l'eau potable  
par retour - Soupape anti-vide en ligne DN 8 à DN 80 -  
Famille D, type A

Sicherungseinrichtungen zum Schutz des Trinkwassers  
gegen Verschmutzung durch Rückfließen - Rohrbelüfter DN  
8 bis DN 80 - Familie D, Typ A

This European Standard was approved by CEN on 24 December 2004.

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, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.



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

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<b>Contents</b>	<b>Page</b>
Foreword.....	3
Introduction .....	4
1 Scope .....	5
2 Normative references .....	5
3 Terms and definitions .....	6
4 Nominal size .....	6
5 Designation .....	6
6 Marking and technical documents.....	6
7 Symbolization.....	8
8 General design characteristics .....	8
9 Physico-chemical characteristics .....	9
10 Characteristics and tests .....	10
11 Acoustic characteristics .....	19
Annex A (normative) Sampling and test sequence.....	21

## Foreword

This document (EN 14451:2005) 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 November 2005, and conflicting national standards shall be withdrawn at the latest by November 2005.

This document has been developed with reference to EN 1717 "Protection against pollution of potable water in water installations and general requirements of devices to prevent pollution by backflow".

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

## EN 14451:2005 (E)

### Introduction

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

- a) this document 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, while awaiting the adoption of verifiable European criteria, existing national regulations concerning the use and/or the characteristics of this product remain in force.

## 1 Scope

This document specifies:

- a) field of application;
- b) requirements for in line anti-vacuum valves;
- c) dimensional, the physico-chemical properties and the properties of general hydraulic, mechanical and acoustic design of in-line anti-vacuum valves DN 8 to DN 80;
- d) test method and requirements for verifying these properties;
- e) marking and presentation;
- f) acoustics.

This document specifies the characteristics of in-line anti-vacuum valves DN 8 to DN 80 that are suitable for use in drinking water systems at pressures up to 1 MPa (10 bar) and temperatures up to 65 °C and for 1 h at 90 °C.

## 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 806-1:2000, *Specifications for installations inside buildings conveying water for human consumption — Part 1: General*

EN 1717:2000, *Protection against pollution of potable water in water installations and general requirements of devices to prevent pollution by backflow*

EN ISO 228-1, *Pipe threads where pressure-tight joints are not made on the threads — Part 1: Dimensions, tolerances and designation (ISO 228-1:2000)*

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, *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 3822-4, *Acoustics — Laboratory tests on noise emission from appliances and equipment used in water supply installations — Part 4: Mounting and operating conditions for special appliances (ISO 3822-4:1997)*

EN ISO 5167-1, *Measurement of fluid flow by means of pressure differential devices inserted in circular cross-section conduits running full - Part 1: General principles and requirements (ISO 5167-1:2003)*

EN ISO 6509, *Corrosion of metals and alloys — Determination of dezincification resistance of brass (ISO 6509:1981)*

ISO 7-1, *Pipe threads where pressure-tight joints are made on the threads — Part 1: Dimensions, tolerances and designation*

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

**EN 14451:2005 (E)****3 Terms and definitions**

For the purposes of this document, the terms and definitions given in EN 1717:2000, EN 806-1:2000 and the following apply.

**in-line anti-vacuum valve**

mechanical device with an air inlet which is closed when water flows through it at or above atmospheric pressure, but which opens to admit air if there is a subatmospheric pressure at the water inlet or when the flow stops, and closes so as to be watertight when the flow of water is resumed at normal pressure. In case of subatmospheric pressure the obturator should admit air to the downstream pipework as well as throttling the inlet waterway of the device. It ensures no protection against back flow by back pressure. For the purpose of this document "in-line-anti-vacuum valve(s) DA" is hereafter referred to as "device(s)"

**4 Nominal size**

The nominal size (DN) of the device shall correspond to the denomination of the thread according to Table 1.

For the specification of threads see 8.2.

**Table 1 — Nominal size vs thread size**

DN	8	10	15	20	25	32	40	50	65	80
Thread size	¼	⅜	½	¾	1	1 ¼	1 ½	2	2 ½	3

**5 Designation**

The devices are designated by:

- a) name;
- b) reference to this document (EN 14451);
- c) family, type;
- d) nominal size (DN);
- e) body material;
- f) acoustic group ( $\leq$  DN 32 only).

Example of designation:

In-line antivacuum valve, EN 14451, family D, type A, DN 20, gun metal, I

**6 Marking and technical documents****6.1 General**

In countries where the use of products made of dezincification resistant materials is not required, the dezincification resistant products according to EN ISO 6509, as well as the products which do not contain zinc, may be marked "DR".



In countries where the use of dezincification resistant materials is required, the dezincification resistant products, as well as the products which do not contain zinc, shall be marked "DR".

## 6.2 Marking

The devices shall be marked permanently and visibly on the casing or on a fixed data plate.

This information shall be on the upper side or on each lateral side of the device. The indications are to be indelible and obtained by moulding, engraving or similar procedures.

The marking shall indicate:

- a) name, manufacturer's brand or logo;
- b) arrow indicating normal direction of flow;
- c) nominal size (DN);
- d) acoustic group ( $\leq$  DN 32 only);
- e) letters indicating family and type of device;
- f) nominal pressure (PN);
- g) conformance with this document (EN 14451);
- h) maximum operating temperature °C.

Marking a), b), c), and e) are obligatory. In case there is no marking for d), the device shall be considered as not classified acoustically.

## 6.3 Technical documents

Each package and/or each batch and/or each catalogue of the supplier/manufacturer shall contain technical product information which shall be written in a commonly spoken language of the country in which the product is sold.

It shall provide the following information:

- a) designation and purpose of the product;
- b) installation instructions;
- c) minimum installation height;
- d) (brand) name and address of supplier / manufacturer;
- e) instructions for maintenance, if any;
- f) spare part list, if any.

EN 14451:2005 (E)

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## 7 Symbolization

The graphic representation of the device is as follows (see Figure 1).

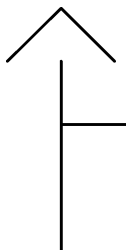
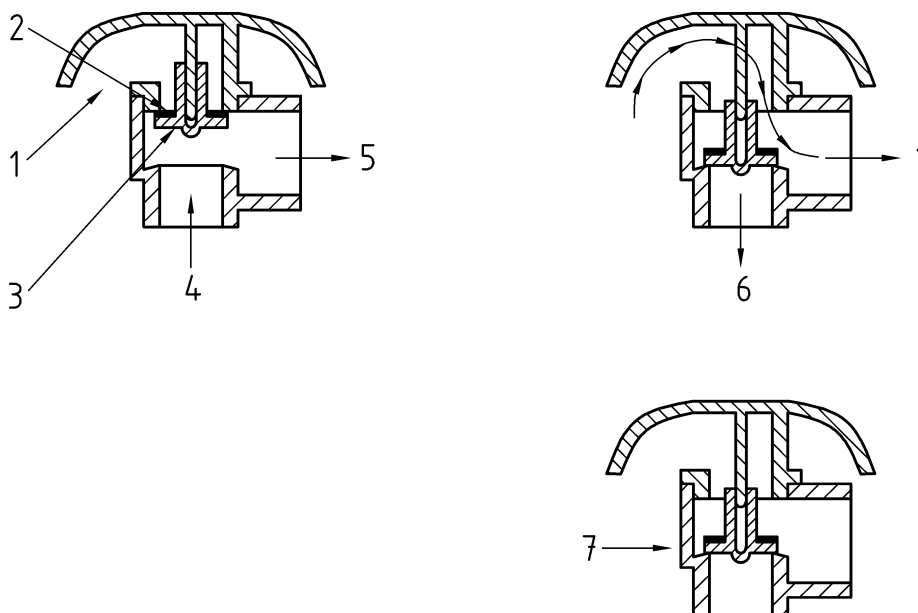


Figure 1 — Graphic symbol

## 8 General design characteristics

### 8.1 Design principle

A typical design principle of DA device is given in Figure 2.



#### Key

- 1 Air inlet
- 2 Seal
- 3 Floating disk
- 4 Water inlet
- 5 Water outlet
- 6 Vacuum back siphonage condition
- 7 Zero flow

Figure 2 — Design principle of DA in-line anti-vacuum valve

## 8.2 Connections

End connections shall comply with ISO 7-1 or EN ISO 228-1.

## 8.3 Air inlets

Air inlets shall be shrouded and designed to ensure that they cannot easily be blocked by deposits. Dimensions of external air inlets shall be minimum 4 mm (see Figure 2).

# 9 Physico-chemical characteristics

## 9.1 Materials

The materials and the coatings used, liable to come normally or accidentally in contact with potable water, shall satisfy the EU regulations concerning water quality.

The materials and the coatings shall be:

- a) corrosion resistant in accordance with ISO 9227;
- b) prone to the least scaling possible;
- c) in conformity with the associated standards and regulations;
- d) compatible among themselves and with:
  - water distributed;
  - fluids or matter liable to come into contact with them;
  - products normally used for disinfection operations of the network: potassium permanganate and sodium hypochlorite.

## 9.2 Nature of materials

The choice of materials is left to the discretion of the manufacturer.

- a) Copper-zinc alloys containing more than 10 % zinc are subject to dezincification when submitted to water capable of dezincification. In countries where the use of products made of dezincification resistant materials is required, the products shall guarantee a dezincification depth less than 200 µm in any direction, they shall be tested in accordance with EN ISO 6509 and shall be marked in compliance with the indications in Clause 6.
- b) Neither the materials nor coatings used shall, by normal or accidental contact with drinking water, cause any risk of affecting or modifying the water up to a temperature of 90 °C. The suitability of the water for human consumption is defined by national regulations;
- c) The manufacturer shall state in his technical and sales literature the nature of the materials and the coatings selected;
- d) The materials, and in particular copper alloys, for which recommendations or standards exist shall comply with the relevant recommendations or standards.