SLOVENSKI STANDARD
SIST EN 13959:2005

01-marec-2005

Protipovratni ventili za preprečevanje onesnaževanja iz DN 6 do DN 250, vključno z družino E, vrste A, B, C in D

Anti-pollution check valves - DN 6 to DN 250 inclusive family E, type A, B, C and D

Rückflussverhinderer - DN 6 bis DN 250 - Familie E, Typ A, B, C und D

Clapets de non-retour antipollution - DN 6 à DN 250 inclus - Famille E, Type A, B, C et D

Ta slovenski standard je istoveten z: **EN 13959:2004**

ICS:

23.060.50 Blokirni ventili Check valves

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EUROPEAN STANDARD

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English version

Anti-pollution check valves - DN 6 to DN 250 inclusive family E, type A, B, C and D

Clapets de non retour antipollution DN 6 à DN 250 - Famille E, Type A, B, C et D

Rückflussverhinderer - DN 6 bis DN 250 - Familie E, Typ A, B, C und D

This European Standard was approved by CEN on 22 July 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.

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Contents

page

Foreword

This document (EN 13959:2004) 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of an identical text or by endorsement, at the latest by April 2005, and conflicting national standards shall be withdrawn at the latest by April 2005.

This standard has been worked out in reference 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.

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 the adoption of verifiable European criteria, existing national regulations concerning the use and/or the characteristics of this product remain in force.

1 Scope

The purpose of this document is to specify:

— field of application of anti-pollution check valves;

— backflow prevention properties, dimensional and physio-chemical properties, and properties of general hydraulic, mechanical and acoustic design for anti-pollution check valves of nominal sizes DN 6 to DN 250 inclusive;

— family E, type A, controllable anti-pollution check valve (with test port);

— family E, type B, non-controllable anti-pollution check valve, including cartridge check valve;

— family E, type C, controllable anti-pollution double check valve (with test ports);

— family E, type D, non-controllable anti-pollution double check valve, including cartridge double check valve;

— test procedures and requirements for verifying the backflow protection properties of stop valves, draw-off taps etc. which incorporate a check valve function. Stop valves, draw off taps etc, need also to comply with a recognised standard;

— marking;

— presentation at delivery.

This document specifies the characteristics of anti-pollution check valves of DN 6 up to and including DN 250 that are suitable for use in drinking water systems. For application feasibility see Table 1.

Table 1 — Nominal size vs Conditions of use

Nominal size (DN)	Max. Operating temperature	Max. Operating pressure	Installation
DN ≤ 50	65 °C + 90 °C, 1 h	1 000 kPa (10 bar)	Any position
DN > 50	65 °C	1 000 kPa (10 bar)	Horizontal only

Anti-pollution check valves covered by this document are of pressure class PN 10. In case of devises with pressure class PN 16, the anti–pollution check valves has to comply with the tests which characterise the PN of the devise.

The field of application of EN 1717 is limited to 10 bar, flanges could be drilled in PN 16 pattern.

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 558-1, *Industrial valves — Face-to-face and centre-to-face dimensions of metal valves for use in flanges pipe systems — Part 1: PN-designated valves.*

EN 1092-1, *Flanges and their joints — Circular flanges for pipes, valves, fittings and accessories, PN designated — Part 1: Steel flanges.*

EN 1092-2, *Flanges and their joints — Circular flanges for pipes, valves, fittings and accessories, PN designated — Part 2: Cast iron flanges.*

EN 1092-3, *Flanges and their joints — Circular flanges for pipes, valves, fittings and accessories, PN designated — Part 3: Copper alloy flanges.*

EN 1254-1, *Copper and copper alloys — Plumbing fittings — Part 1: Fittings with ends for capillary soldering or capillary brazing to copper tubes.*

EN 1254-2, *Copper and copper alloys — Plumbing fittings — Part 2: Fittings with compression ends for use with copper tubes.*

EN 1254-3, *Copper and copper alloys — Plumbing fittings — Part 3: Fittings with compression ends for use with plastics pipes.*

EN 1254-4, *Copper and copper alloys — Plumbing fittings — Part 4: Fittings combining other end connections with capillary or compression ends.*

EN 1267, *Valves - Test of flow resistance using water as test fluid.*

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

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-live valves and appliances (ISO 3822-3:1997).*

EN ISO 5167-3, *Measurement of fluid flow by means of pressure differential devices inserted in circular cross-section conduits running full — Part 3: Nozzles and Venturi nozzles (ISO 5167-3:2003).*

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

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

3 Terms and definitions

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

3.1 Anti-pollution check valves

[ul5]**3.1.1**
family E, type A, controllable anti-pollution check valve (with test port)
controllable single check valve, consisting one closing element, is mechanical protection device to permit flow in one direction only. It will open automatically when the pressure in the direction of flow upstream of the valve is greater than the pressure downstream. In case when the pressure is higher downstream or no flow condition exists the valve is closed by anticipation acting under a force, for example of a mechanical assembly or a spring. For verification needs this type of check valve has a test cock upstream of the closing element

3.1.2
family E, type B, non-controllable anti-pollution check valve
non-controllable single check valve, consisting one closing element, is a mechanical protection device to permit flow in one direction only. It will open automatically when the pressure in the direction of flow upstream of the valve is greater than the pressure downstream. In case when the pressure is higher downstream or no flow condition exists the valve is closed by anticipation acting under a force, for example of a mechanical assembly or a spring. A family E, type B, non-controllable anti-pollution check valve is constructed in two formats:

— With housing (final product);
— Without housing (called cartridge check valve)

3.1.3
family E, type C, controllable double anti-pollution check valve (with test ports)
controllable double check valve, consisting of two independent acting closing elements, is a mechanical protection device to permit flow in one direction only. It will open automatically when the pressure in the direction of flow upstream of the valve is greater than the pressure downstream. In case when the pressure is higher downstream or no flow condition exists the valve is closed by anticipation acting under a force, for example of a mechanical assembly or a spring. For verification needs this type of check valve has a test cock upstream of each closing element

3.1.4
family E, type D, non-controllable anti-pollution double check valve
non-controllable double check valve, consisting two independent acting closing elements, is a mechanical protection device to permit flow in one direction only. It will open automatically when the pressure in the direction of flow upstream of the valve is greater than the pressure downstream. In case when the pressure is higher downstream or no flow condition exists the valve is closed by anticipation acting under a force, for example of a mechanical assembly or a spring. A family E, type D, non-controllable anti-pollution double check valve is constructed in two formats:

— With housing (final product);
— Without housing (called cartridge double check valve)

For the purpose of this document, "anti-pollution check valves" are hereafter referred to as "devices"

3.2
flanged anti-pollution check valves; class a and class b
controllable check valves need to be accessible for inspection, test and replacement.

To assist their repair, flanged check valves may be provided with an inspection hatch and for designation purposes two classes are specified:

— Class a : with an inspection hatch;

— Class b : without an inspection hatch;

The installation of either a class a device or a class b device depends on national installation requirements

3.3
combined product
a combined product is an end product which incorporates beside the check valve function other function(s)

EXAMPLES stop valves, draw-off taps etc. which incorporate a check valve function

4 Nominal size

For the purpose of this document the nominal size DN as given in Table 6 relates to flow characteristics.

The dimensions of the end connections shall be either equal to or one DN smaller, or one DN greater than the nominal size of the device, except for the flanged devices of which the connecting size shall correspond to DN.

The DN-range covered by this document for single check valves (type A and B) and double check valves (type C and D) is DN 6 to DN 250 inclusive. Limitations are given in the applicable tables.

5 Designation

Devices are designated by:

— its name;

— its family (E);

— its type (A, B, C and D);

— its class (a or b for flanged devices only, see 3.2 and 8.4.2.1);

— its nominal size (DN) (see Table 6);

— its pressure class (PN);

— its connections: type and size (not applicable to cartridge check valves);

— its housing material (not applicable to cartridge check valves);

— its surface finish (possible coating);

— the acoustic group (up to DN 32 inclusive only);

— reference to this document.

Examples of designation

Non-controllable anti-pollution check valve, family E, type B, DN 20, G ¾ × G ¾, bronze, I, EN 13959.

Controllable anti-pollution check valve, family E, type A, class a, DN 100, Flanged, Pressure class 10, Epoxy coated ductile iron, EN 13959.

6 Marking and technical documents

6.1 Marking

Devices shall be marked permanently and visibly on housings, or on a fixed identification plate. In the case of cartridge check valves marking shall be on the cartridge itself.

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) letter indicating family and type of the device;

d) nominal size (DN);

e) nominal pressure (PN);

f) maximum operating temperature in degrees Celsius (°C);

g) acoustic group (up to DN 32 inclusive only);

h) manufacturer’s reference;

i) reference to the present standard;

j) dezincification resistance.

In the 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, are allowed to 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>>.

For all devices marking a), b), c) and d) are obligatory. For flanged devices e) is also obligatory.

In case there is no marking for g), the device has to be considered as not classified acoustically. Where space permits the other information shall be marked in the following order: f) to j).

Cartridge check valve shall be marked with a), b) and d). Other markings are optional.

6.2 Technical documents

Each package and/or each batch and/or each catalogue of the supplier/manufacturer should contain Technical Product Information (TPI) which shall be written in a commonly spoken language of the country in which the product is sold. If the TPI is not supplied it shall be available on request.

TPI shall provide the following information:

— designation and purpose of the product;

— installation instructions;

— (brand) name and address of supplier / manufacturer;

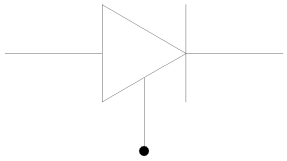
— instructions for maintenance, if any;

— spare part list, if any;

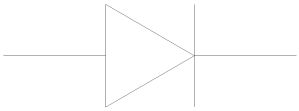
— nature of materials.

7 Symbolization

The graphic representation of the device is as follows (see Figures 1 and 2):



EA
with test port



EB
without test port

NOTE Applies also for cartridge check valves.

Figure 1 — Check valve symbols

EC
with test port

ED
without test port

NOTE Applies also for Cartridge Double Check Valves.

Figure 2 — Double check valve symbols

8 General design characteristics

8.1 Overall length and diameters of check valves

8.1.1 General

Where necessary, the overall lengths and diameters of check valves are specified for each type in 8.1.2 to 8.1.5.

8.1.2 Check valves with threaded ends or compression ends

The overall lengths of check valve housings with threaded ends or compression ends or with ends suitable for connection with capillary unions shall be determined by the manufacturer.