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Vgrajene naprave za gašenje - Sestavni deli sistemov za gašenje s plinom - 13. del: Značilnosti za kontrolne ventile in nepovratne ventile

Fixed firefighting systems - Components for gas extinguishing systems - Part 13: Characteristics for check valves and non-return valves

Ortsfeste Brandbekämpfungsanlagen - Bauteile für Löschanlagen mit gasförmigen Löschmitteln - Teil 13: Eigenschaften für Rückflussverhinderer und Rückschlagventile

Installations fixes de lutte contre l'incendie - Éléments constitutifs des installations d'extinction à gaz - Partie 13 : Caractéristiques des clapets anti-retour de circuit d'émission et de circuit de pilotage

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Fixed firefighting systems - Components for gas extinguishing systems - Part 13: Characteristics for check valves and non-return valves

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This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 191.

If this draft becomes a European Standard, 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.

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Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

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

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European foreword

This document (prEN 12094-13:2022) has been prepared by Technical Committee CEN/TC 191 “Fixed firefighting systems”, the secretariat of which is held by BSI.

This document is currently submitted to the CEN Enquiry.

This document will supersede EN 12094-13:2001.

In comparison with the previous edition, the following technical modifications have been made:

a) The whole structure of the document has been adapted to Regulation (EU) No. 305/2011 on construction products (CPR);

b) Clause 4 Requirements has been renamed to Characteristics;

c) Clause 4.1 General design: Material specification for metal has been deleted;

d) Clause 4.2 Connection threads has been deleted;

e) Clause 4.5 flow way in combination with 5.3 Compliance has been deleted;

f) Clause 6 Marking has been deleted;

g) Clause 7 Evaluation and conformity has been renamed and restructured;

h) Annex ZA has been adopted according to the requirements of the CPR;

i) Bibliography has been deleted.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of Regulation (EU) No. 305/2011.

For relationship with Regulation (EU) No. 305/2011, see informative Annex ZA, which is an integral part of this document.

This document is part of the series of standards EN 12094, Fixed firefighting systems — Components for gas extinguishing systems, which consist of the following parts:

— Part 1: Requirements and test methods for electrical automatic control and delay devices;

— Part 2: Requirements and test methods for non-electrical automatic control and delay devices;

— Part 3: Requirements and test methods for manual triggering and stop devices;

— Part 4: Requirements and test methods for container valve assemblies and their actuators;

— Part 5: Requirements and test methods for high and low pressure selector valves and their actuators;

— Part 6: Requirements and test methods for non-electrical disable devices;

— Part 7: Requirements and test methods for nozzles for CO_2 systems;

— Part 8: Characteristics for connectors;

— Part 9: Requirements and test methods for special fire detectors;

— Part 10: Requirements and test methods for pressure gauges and pressure switches;

— Part 11: Requirements and test methods for mechanical weighing devices;

— Part 12: Requirements and test methods for pneumatic alarm devices;

— Part 13: Characteristics for check valves and non-return valves;

— Part 16: Requirements and test methods for odorizing devices for CO_2 low pressure systems.

1 Scope

This document specifies the characteristics and describes test methods for check and non-return valves for CO_2, inert gas or halocarbon gas fire extinguishing systems.

Non-return and check valves allow the passage in the direction of flow and they prevent flow in the reverse direction.

This document is applicable to check valves installed between container valve and manifold and non-return valves installed in pilot lines, except those valves which are tested in combination with non-electrical control devices.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

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

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— IEC Electropedia: available at https://www.electropedia.org/

— ISO Online browsing platform: available at https://www.iso.org/obp

3.1
check valve
component intended for installation between container valve and manifold, which permits flow only in one direction

3.2
CO_2-high-pressure installation
fire extinguishing installation in which the CO_2 is stored at ambient temperature, e.g. the pressure of the CO_2 in storage is p_{abs} = 58,6 bar at 21 °C

3.3
CO_2-low-pressure installation
fire extinguishing installation in which the CO_2 is stored at low temperature, normally at a temperature of –19 °C to 21 °C

3.4
fill ratio
mass of extinguishing medium related to the net capacity of a container expressed as kilograms per litre (kg/l)

3.5
gas extinguishing installation
system installed to provide fire protection

3.6
halocarbon gas
extinguishing agent that contains as primary components one or more organic compounds containing one or more of the elements fluorine, chlorine, bromine or iodine

3.7
halocarbon gas installation
fire extinguishing installation in which the halocarbon gas is stored at ambient temperature

3.8
inert gas
non-liquefied gas or mixture of gases which extinguish the fire mainly by reducing the oxygen concentration in the protected zone, e.g. argon, nitrogen or mixtures of these gases with CO_2

3.9
inert gas installation
fire extinguishing installation in which the inert gas is stored at ambient temperature

3.10
manifold
special pipe to collect the medium flow of two or more containers

3.11
non-return valve
component intended for installation in pilot lines, which permits flow only in one direction

3.12
resistance coefficient
value for the calculation of the pressure drop in a component under two-phase flow condition

3.13
two-phase flow
partitial change of phase of a fluid from liquid to vapour under flowing conditions

3.14
working pressure
pressure at which the component is used in the system

4 Characteristics

4.1 Operational reliability

4.1.1 Internal pressure

For establishing performance of the check valve and the non-return valve related to its working pressure, Table 1 shall be used, considering the gas used in extinguishing system. For the respective level of the working pressure (in bar), the procedure in accordance with 5.1 shall be carried out.

The following results shall be reported:

— the value of the decrease of the gas pressure, (in bar) rounded to the nearest whole bar, and

— the number of visible signs of deformation.

Table 1 — Check valve and non-return valve related working pressures

Type	Working pressure in bar for			
	CO_2-high-pressure component	CO_2-low-pressure component	Inert gas component	Halocarbon gas component
Check valve	140	not applicable	see [a]	see [a]
Non-return valve	As specified by the manufacturer			

[a] This value is given as the developed pressure in the container at 50°C with the highest fill ratio/superpressurization, where applicable.

4.1.2 Resistance to strength

The resistance to strength of non-return and check valves shall be determined in accordance with 5.3 and the result, as the number of visible signs of bursting, reported.

The result obtained shall show no visible sign of deterioration of the non-return and check valves.

If this is so, the performance shall be expressed with the indication “no deterioration”.

EXAMPLE no deterioration.

4.1.3 Resistance to leakage

The resistance to leakage of non-return and check valves shall be determined in accordance with 5.4 and the result, as the number of visible signs of leakage, shall be reported.

The result obtained shall show no visible signs of leakage of the non-return and check valves.

If this is so, the performance shall be expressed with the indication “no leakage”.

EXAMPLE no leakage.

4.1.4 Resistance to impact

The resistance to impact of non-return and check valves shall be determined in accordance with 5.5 and the result, as the number of visible signs of damage, shall be reported.

The result obtained shall show no visible signs of damage of the non-return and check valves.

If this is so, the performance shall be expressed with the indication “no damage”.

EXAMPLE no damage

4.1.5 Function at ambient temperatures

Non-return and check valves shall operate in an ambient temperature range encompassing −20 °C to +50 °C, when tested in accordance with 5.6 and 5.7.

Check valves shall have reached their fully open position at a differential pressure of 3 bar maximum.

Non-return valves shall have reached their fully open position at a differential pressure of not greater than 10 % of the minimum system pressure in the pilot system

The result obtained shall show the fully open position of non-return and check valves.

If this is so, the performance shall be expressed with the indication “fully open”.

EXAMPLE no impairment of the flow path

4.2 Durability against corrosion

4.2.1 Resistance to corrosion

The resistance to corrosion of non-return and check valves, when tested in accordance with 5.6, after being subjected to the corrosion test in accordance with 5.8.

The result obtained shall show the fully open position of non-return and check valves.

If this is so, the performance shall be expressed with the indication “fully open”.

EXAMPLE no impairment of the flow path

4.2.2 Resistance to stress corrosion

The resistance to stress corrosion of non-return and check valves with copper alloy part shall be determined in accordance with 5.9 and the result, as the number of cracks, shall be reported.

The result obtained shall show no cracks of the non-return and check valves.

If this is so, the performance shall be expressed with the indication “no cracks”.

EXAMPLE no cracks

4.3 Durability against vibration

The durability against vibration of non-return and check valves shall be determined in accordance with 5.10 and the result, as the number of visible signs of damage, shall be reported.

The result obtained shall show no visible signs of damage of the non-return and check valves.

If this is so, the performance shall be expressed with the indication “no damage”.

EXAMPLE no damage

5 Testing, assessment and sampling methods

5.1 General

The components shall be tested assembled as recommended for installation by the manufacturer. The tests shall be carried out at a temperature of (25 ± 10) °C, except when otherwise stated.

The tolerance for all test parameters is 5 %, unless otherwise stated.

Four samples shall be used for the tests. The order of tests shall be in accordance with Table 2.