



SLOVENSKI STANDARD

SIST EN 12094-9:2003

01-maj-2003

Vgrajeni gasilni sistemi - Sestavni deli sistemov za gašenje s plinom - 9. del: Zahteve in preskusne metode za posebne požarne javljalnike

Fixed firefighting systems - Components for gas extinguishing systems - Part 9:
Requirements and test methods for special fire detectors

Ortsfeste Brandbekämpfungsanlagen - Bauteile für Löschanlagen mit gasförmigen
Löschmitteln - Teil 9: Anforderungen und Prüfverfahren für spezielle
Branderkennungselemente

Installations fixes de lutte contre l'incendie - Éléments constitutifs pour installations
d'extinction a gaz - Partie 9: Exigences et méthodes d'essai pour détecteurs spéciaux

Ta slovenski standard je istoveten z: **EN 12094-9:2003**

ICS:

13.220.10 Gašenje požara Fire-fighting

SIST EN 12094-9:2003 en

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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 12094-9

March 2003

ICS 13.220.20

English version

Fixed firefighting systems - Components for gas extinguishing systems - Part 9: Requirements and test methods for special fire detectors

Installations fixes de lutte contre l'incendie - Eléments constitutifs pour installations d'extinction à gaz - Partie 9: Exigences et méthodes d'essai pour détecteurs spéciaux

Ortsfeste Brandbekämpfungsanlagen - Bauteile für Löschanlagen mit gasförmigen Löschmitteln - Teil 9: Anforderungen und Prüfverfahren für spezielle Branderkennungselemente

This European Standard was approved by CEN on 10 August 2002.

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 Management Centre 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 Management Centre 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, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Slovakia, Spain, Sweden, Switzerland and United Kingdom.



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Foreword

This document (EN 12094-9:2003) has been prepared by Technical Committee CEN/TC 191 "Fixed firefighting systems", the secretariat of which is held by BSI.

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 2003, and conflicting national standards shall be withdrawn at the latest by September 2005.

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 EU Directive 89/106/EEC.

For relationship with EU Directive(s), see informative Annex ZA, which is an integral part of this document.

This part of EN 12094 is one of a number of European Standards prepared by CEN/TC 191 covering components for gas extinguishing systems.

They are included in a series of European Standards planned to cover:

- gas extinguishing systems (EN 12094)
- sprinkler systems (EN 12259:1999+A1 and EN 12845)
- powder systems (EN 12416)
- explosion protection systems (EN 26184)
- foam systems (EN 13565)
- hose systems (EN 671)
- smoke and heat control systems (EN 12101)
- water spray systems¹⁾

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This European Standard has the general title "*Fixed firefighting systems – Components for gas extinguishing systems*" and will 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 high-pressure container valve assemblies and their actuators*
- Part 5: *Requirements and test methods for high and low pressure selector valves and their actuators for CO₂ systems*
- Part 6: *Requirements and test methods for non-electrical disable devices for CO₂ systems*

¹⁾ Under preparation.

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- Part 7: *Requirements and test methods for nozzles for CO₂ systems*
- Part 8: *Requirements and test methods for flexible connectors for CO₂ systems*
- 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: *Requirements and test methods for check valves and non-return valves*
- Part 16: *Requirements and test methods for odorizing devices for CO₂ low pressure systems*
- Part 17: *Pipe hangers*
- Part 20: *Requirements and test methods for the compatibility of components*

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

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Introduction

It has been assumed in the preparation of this European Standard that the execution of its provisions is entrusted to appropriately qualified and experienced people.

All pressure data in this European Standard are given as gauge pressures in bar, unless otherwise stated.

NOTE 1 bar = 10^5 N m⁻² = 100 kPa.

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EN 12094-9:2003 (E)**1 Scope**

This European Standard specifies requirements and test methods for special fire detectors, other than fire detectors covered by EN 54-1, used in CO₂-, Inert gas- or Halocarbon gas and other fire extinguishing systems.

This European Standard covers special fire detectors, which react

- by bursting of a glass bulb or
- by melting of a fusible element.

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 edition of the publication referred to applies (including amendments).

EN 54-1, *Fire detection and fire alarm systems - Part 1: Introduction.*

EN 12259-1:1999+A1, *Fixed firefighting systems - Components for sprinkler and water spray systems - Part 1: Sprinklers.*

EN 60068-2-6, *Environmental testing - Part 2: Tests - Tests Fc: Vibration (sinusoidal) (IEC 60068-2-6:1995 + Corrigendum 1995).*

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3 Terms and definitions

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

3.1**CO₂-high-pressure installation**

fire extinguishing installation in which the CO₂ is stored at ambient temperature

NOTE The pressure of the CO₂ in storage is $p_{abs} = 58,6$ bar at 21 °C.

3.2**CO₂-low-pressure installation**

fire extinguishing installation in which the CO₂ is stored at low temperature, normally – 19 °C to – 21 °C

3.3**fire detector**

component as defined in EN 54-1

3.4**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

3.5**halocarbon gas installation**

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

3.6**inert gas**

non liquefied gas or mixture of gases which extinguish the fire mainly by reducing the oxygen-concentration in the protected zone, like argon, nitrogen or CO₂ or mixtures of these gases

3.7**inert gas installation**

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

3.8**release element**

part of a special fire detector, which operates at a predetermined temperature

3.9**RTI (response time index)**

measure of the thermal sensitivity of a special fire detector expressed in (m s)^{1/2}

3.10**series of special fire detectors**

several special fire detectors of identical design but with different nominal operating temperatures

NOTE The different nominal operating temperatures are realised in case of glass bulbs by variation of the fill factor in the glass bulb and in case of fusible elements by variation of the fusible material.

3.11**service load**

load which the release element sustains in its mounted position over its design lifetime

3.12**special fire detector**

heat sensitive device other than fire detectors covered by EN 54-1, including a release element designed to react at a predetermined temperature and a mounting device

3.13**working pressure**

pressure at which the component is used in the system

4 Requirements**4.1 General**

4.1.1 If the special fire detector is designed for use under permanent gaseous pressurisation or under permanent force, this shall be specified by the manufacturer.

For special fire detectors designed for use under permanent gaseous pressurisation the manufacturer shall specify the maximum and minimum working pressure and the minimum environmental temperature.

Special fire detectors for use under permanent gaseous pressurisation from a CO₂-low-pressure container shall be designed for a working pressure of at least 25 bar.

For special fire detectors designed for use under permanent force the manufacturer shall specify the maximum and minimum force.

4.1.2 If the service load depends on installation conditions, the manufacturer shall specify the conditions (pressure or force) giving the maximum service load.

4.1.3 The test sample shall conform to the technical description (drawings, parts lists, description of functions, operating and installation instructions) when assessed in accordance with 5.3.

EN 12094-9:2003 (E)**4.2 Nominal operating temperature**

Special fire detectors shall meet one of the nominal operating temperature requirements for sprinklers according to EN 12259-1:1999+A1.

4.3 Operating temperature

When tested in accordance with EN 12259-1:1999+A1 (operating temperature test), special fire detectors shall meet the operating temperature requirements, corresponding to the nominal operating temperature for sprinklers according to EN 12259-1:1999+A1.

4.4 Thermal response

Special fire detectors shall meet one of the RTI classes of the thermal response requirements for sprinklers according to EN 12259-1:1999+A1. The test shall be carried out in accordance with EN 12259-1:1999+A1 (measurement of RTI) without determination of C-value, which in the calculation of the RTI is set to zero.

NOTE RTI-formula with the C-value set to zero:

$$RTI = \frac{-t_r \sqrt{u}}{\ln \left(1 - \frac{\Delta T_{ea}}{\Delta T_g} \right)}$$

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where

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- t_r = response time of the test sample in seconds
- u = air velocity in the test section in m/s at the moment the test sample operates
- ΔT_{ea} = mean operating temperature of the component minus mount temperature
- The value of the mean operating temperature is given as the mean value of the measured operating temperatures of the test samples tested in the nominal operating temperature test.
- ΔT_g = air temperature in the test section at the moment the test sample operates minus mount temperature
- \ln = natural logarithm.

4.5 Pressure

4.5.1 A special fire detector designed for use under permanent gaseous pressurisation shall show no signs of deterioration and shall not leak when tested as described in 5.4.1, 5.4.2, 5.4.3 and 5.4.4.

Subsequently, a special fire detector shall operate correctly, when tested in accordance with 5.6.

4.5.2 A special fire detector designed for use under permanent gaseous pressurisation shall not burst when tested as described in 5.4.5.

4.6 Force

A special fire detector designed for use under permanent force shall show no signs of deterioration when tested as described in 5.5.

Subsequently, a special fire detector shall operate correctly, when tested in accordance with 5.6.

4.7 Function

A special fire detector shall operate correctly, when tested in accordance with 5.6.

4.8 Heat exposure

4.8.1 A special fire detector shall be exposed to increased ambient temperature in accordance with EN 12259 -1:1999+A1 (heat exposure test for uncoated sprinklers) with the following amendment:

The test sample shall be tested under the specified conditions (pressure or force) giving the maximum service load.

A special fire detector designed for use under permanent gaseous pressurisation shall show no signs of deterioration and shall not leak when tested as described in 5.4.2, after being exposed to increased ambient temperature as described above.

A special fire detector shall operate correctly, when tested in accordance with 5.6, after being exposed to increased ambient temperature as described above.

A special fire detector shall fulfil the requirements of 4.3, when tested in accordance with EN 12259-1:1999+A1 (operating temperature test), after being exposed to increased ambient temperature as described above.

4.8.2 When tested in accordance with EN 12259-1:1999+A1 (heat exposure test for glass bulb sprinklers), special fire detectors with glass bulb shall meet the heat exposure requirements for glass bulb sprinklers according to EN 12259-1:1999+A1.

4.9 Strength of release elements

When tested in accordance with EN 12259-1:1999+A1 (strength of release element test for sprinklers), special fire detectors shall meet the strength of release element requirements for sprinklers according to EN 12259-1:1999+A1.

4.10 Strength of the mounting support

When tested in accordance with EN 12259-1:1999+A1 (strength of sprinkler body test for sprinklers), special fire detectors shall meet the strength of sprinkler body requirements for sprinklers according to EN 12259-1:1999+A1.

4.11 Thermal shock

A special fire detector with glass bulb shall be tested in accordance with EN 12259-1:1999+A1 (thermal shock test) and meet the thermal shock requirements for sprinklers according to EN 12259-1:1999+A1 with the following amendment:

— the subsequent function tests shall be carried out in accordance with 5.6 of this European Standard.

4.12 Resistance to low temperature

A special fire detector shall be tested in accordance with EN 12259-1:1999+A1 (low temperature test) and meet the low temperature requirements for sprinklers according to EN 12259-1:1999+A1 with the following amendment:

— the subsequent function tests shall be carried out in accordance with 5.6 of this European Standard.