SLOVENSKI STANDARD
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Odkrivanje in javljanje požara ter alarmiranje - 10. del: Plamenski javljalniki - Točkovni javljalniki

Fire detection and fire alarm systems - Part 10: Flame detectors - Point detectors

Brandmeldeanlagen - Teil 10: Flammenmelder - Punktförmige Melder

Systèmes de détection et d'alarme incendie - Partie 10: Détecteurs de flamme - Détecteurs ponctuels

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Ta slovenski standard je istoveten z: **prEN 54-10 rev**

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ICS:

13.220.20	Požarna zaščita	Fire protection
13.320	Alarmni in opozorilni sistemi	Alarm and warning systems

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2003-01.Slovenski inštitut za standardizacijo. Razmnoževanje celote ali delov tega standarda ni dovoljeno.

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EUROPEAN STANDARD

NORME EUROPÉENNE

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ICS 13.220.20

Will supersede EN 54-10:2002

English Version

Fire detection and fire alarm systems - Part 10: Flame detectors - Point detectors

Systèmes de détection et d'alarme incendie - Partie 10: Détecteurs de flamme - Détecteurs ponctuels

Brandmeldeanlagen - Teil 10: Flammenmelder - Punktförmige Melder

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 72.

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.

This draft European Standard was established by CEN 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 CEN-CENELEC Management Centre has the same status as the official versions.

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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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Foreword

This document (prEN 54-10:2012) has been prepared by Technical Committee CEN/TC 72 “Fire Detection and fire alarm systems”, the secretariat of which is held by BSI.

This document is currently submitted to the CEN Enquiry.

This document will supersede EN 54-10:2002.

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.

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

EN 54 "Fire detection and fire alarm systems": consists of the following parts:

Part 1: Introduction

Part 2: Control and indicating equipment

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Part 3: Fire alarm devices – Sounders

Part 4: Power supply equipment

Part 5: Heat detectors – Point detectors

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Part 7: Smoke detectors – Point detectors using scattered light, transmitted light or ionization

Part 11: Manual call points

Part 12: Smoke detectors – Line detector using an optical light beam

Part 13: Compatibility assessment of system components

Part 14: Guidelines for planning, design, installation, commissioning, use and maintenance

Part 15: Point detectors using a combination of detected phenomena

Part 16: Voice alarm control and indicating equipment

Part 17: Short circuit isolators

Part 18: Input/output devices

Part 20: Aspirating smoke detectors

Part 21: Alarm transmission and fault warning routine equipment

Part 22: Line-type heat detectors

Part 23: Fire alarm devices – Visual alarms

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Part 24: Components of voice alarm systems – Loudspeakers

Part 25: Components using radio links and system requirements

Part 26: Point fire detectors using carbon monoxide sensors

Part 27: Duct smoke detectors

Part 28: Non-resettable (digital) line type heat detectors

Part 29: Multi-sensor fire detectors - Point detectors using a combination of smoke and heat sensors

Part 30: Multi-sensor fire detectors - Point detectors using a combination of carbon monoxide and heat sensors

Part 31: Multi-sensor detector – Point detector using

Part 32:Guidelines for the planning, design, installation, commissioning, use and maintenance of voice alarm systems

NOTE This list includes standards that are in preparation and other standards may be added. For current status of published standards refer to www.cen.eu.

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Introduction

The purpose of a flame detector is to warn person(s) within or in the vicinity of a building of the occurrence of a fire emergency in order to enable such person(s) to take appropriate measures. Flame detectors respond to the flickering ultra-violet or infra-red signal produced from burning hydrocarbons. Flame detectors might be better suited to applications where heat and smoke sources are present e.g. aircraft hangars or oil rigs.

This European Standard allows manufacturers to specify the range of the flame detector in terms of the distance over which it can detect a flaming fire. Four ranges are defined and these are tested by measuring the response of the flame detector to test fires at a fixed minimum and at the maximum range as declared by the manufacturer. As contaminants on the window(s) could inhibit the transmission of the radiation from a flame to the sensor(s) a window monitoring facility test has been introduced, as an option with requirements, in order to check whether the function operates.

This European Standard gives common requirements for the construction and robustness of flame detectors as well as for their performance under climatic, mechanical and electrical interference conditions which are likely to occur in the service environment. Flame detectors are classified in one of two application environment types, i.e. Type A and Type B. More severe climatic conditions are applied to devices that are primarily intended for outdoor applications (Type B) than those primarily intended for indoor applications (Type A).

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1 Scope

This European Standard specifies requirements, test methods and performance criteria for point-type, flame detectors that operate using radiation from a hydrocarbon flame for use in fire detection systems installed in and around buildings.

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Flame detectors having special characteristics suitable for the detection of specific fire risks are not covered by this standard (although the standard may be used as guidance in assessing such products). The performance requirements for any additional functions are beyond the scope of this standard (e.g. additional features or enhanced functionality for which this standard does not define a test or assessment method).

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.

ISO 209-1:1989, *Wrought aluminium and aluminium alloys — Chemical composition and forms of products — Part 1: Chemical composition.*

IEC 60064:2005, *Tungsten filament lamps for domestic and similar general lighting purposes — Performance requirements*

EN 54-1:1996, *Fire detection and fire alarm systems — Part 1: Introduction*

EN 50130-4:1995, *Alarm systems — Part 4: Electromagnetic compatibility — Product family standard: Immunity requirements for components of fire, intruder and social alarm systems* (including EN 50130-4:1995/A1:1998 and EN 50130-4:1995/A2:2003)

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EN 60068-1:1994, *Environmental testing — Part 1: General and guidance (IEC 60068-1:1988 + Corrigendum 1988 +A1:1992)*

EN 60068-2-1:2007, *Environmental testing — Part 2-1: Tests — Tests A: Cold (IEC 60068-2-1:2007)*

EN 60068-2-2:2007, *Environmental testing — Part 2-2: Tests — Test B: Dry heat (IEC 60068-2-2:2007)*

EN 60068-2-6:2008, *Environmental testing — Part 2-6: Tests — Tests Fc: Vibration, (sinusoidal) (IEC 60068-2-6:2007)*

EN 60068-2-27:2009, *Environmental testing — Part 2-27: Tests — Test Ea and guidance: Shock (IEC 60068-2-27:2008)*

EN 60068-2-30:2005, *Environmental testing — Part 2-30: Tests — Test Db: Damp heat, cyclic (12 h + 12 h cycle) (IEC 60068-2-30:2005)*

EN 60068-2-42:2003, *Environmental testing — Part 2-42: Tests; Test Kc: Sulphur dioxide test for contacts and connections (IEC 60068-2-42:2003)*

EN 60068-2-75:1997, *Environmental testing — Part 2-75: Tests — Test Eh: Hammer tests (IEC 60068-2-75:1997)*

EN 60068-2-78:2001, *Environmental testing — Part 2-78: Tests; Test Cab: Damp heat, steady state (IEC 60068-2-78:2001)*

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EN 60529:1991, *Degrees of protection provided by enclosures (IP code) (IEC 60529:1989)* (including EN 60529:1991/A1:2000)

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EN ISO 9001:2008, *Quality management systems — Requirements (ISO 9001:2008)*

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3 Terms, definitions and abbreviations

3.1 Definitions

For the purposes of this European standard, the terms and definitions in EN 54-1:1996 and the following apply.

3.1.1

classification distance

distance *d*, measured in accordance with 5.5, at which the detector classification is determined

3.1.2

response point
distance D, measured in accordance with 5.1.5, at which the individual flame detector under test gives an alarm signal

3.1.3

type A flame detector
detector primarily intended for indoor applications

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NOTE Type A flame detectors may be suitable for some protected outdoor situations.

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3.1.4

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type B flame detector
detector primarily intended for outdoor applications

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NOTE Type B flame detectors may be more suitable than type A flame detectors for some indoor situations where high temperature and/or humidity are present.

3.2 Abbreviations

DC Direct current

EMC Electromagnetic compatibility

IR Infra-red

RMS Root mean square

UV Ultra-violet

4 Requirements

4.1 General

In order to comply with this standard, flame detectors shall meet the requirements of Clause 4, which shall be verified by visual inspection or engineering assessment, shall be tested as described in Clause 5 and shall meet the requirements of the tests.

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4.2 Operational reliability

4.2.1 Classification

Detector settings, at which the manufacturer claims compliance with this standard, shall conform to one of the following classes: X, 1, 2 or 3 (see Table 1) according to the requirements of the tests specified in clauses 5.5.1 Fire Sensitivity.

Table 1 — Detector Classifications

Class	Classification distance (m)
X	> 25
1	25
2	17
3	12

NOTE: If the detector has provision for multiple classification settings then it may be referred to as “Class P” (see 4.8.1)

4.2.2 Connection of ancillary devices

Where the detector provides for connections to ancillary devices (e.g. remote indicators, control relays etc.), open- or short-circuit failures of these connections shall not prevent the correct operation of the detector.

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4.2.3 Monitoring of detachable detectors

For detachable detectors, a means shall be provided for a remote monitoring system (e.g. the control and indicating equipment) to detect the removal of the head from the base, in order to give a fault signal.

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4.2.4 Manufacturer's adjustments

It shall not be possible to change the manufacturer's settings except by special means (e.g. the use of a special code or tool) or by breaking or removing a seal.

4.2.5 On-site sensitivity adjustment

If there is provision for on-site sensitivity adjustment of the detector then:

a) for each setting, at which the manufacturer claims compliance with this standard, the detector shall comply with the requirements of this standard and shall achieve a classification corresponding to that marked on the detector for that setting;

b) for each setting in a), access to the adjustment means shall only be possible by the use of a code or special tool;

c) any setting(s), at which the manufacturer does not claim compliance with this standard, shall only be accessible by the use of a code or special tool, and it shall be clearly marked on the detector or in the associated data, that if these setting(s) are used, the detector does not comply with the standard.

NOTE These adjustments may be carried out at the detector or at the control and indicating equipment.

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4.2.6 Marking and data

4.2.6.1 Marking

Each detector shall be clearly marked with the following information:

a) the number of this standard (i.e. EN 54-10:2010);

b) the name or trademark of the manufacturer or supplier;

c) the model designation (type or number);

d) the class(es) of the detector (i.e. Class 1, Class 2, Class 3 or Class X (*d* in metres)), for Class X the distance shall be specified in brackets e.g. Class X (50);

NOTE If the detector has provision for on-site adjustment of the classes (see 4.7), then the marking of all the classes may be replaced by "Class P" in which case the information must be supplied in the accompanying data;

e) some mark(s) or code(s), (e.g. a serial number or batch code) by which the manufacturer can identify, at least, the date or batch and place of manufacture and the version number(s) of any software, contained within the detector;

If the detector has a detachable base then the base shall be marked with the following information:

f) the model designation (type or number);

g) the wiring terminal designations;

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Where any marking on the device uses symbols or abbreviations not in common use then these shall be explained in the data supplied with the device. The marking shall be visible during installation of the detector and shall be accessible during maintenance. The markings shall not be placed on screws or other easily removable parts.

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4.2.6.2 Data

The information required in 4.8 together with the following shall be supplied with the device, or shall be given in a data sheet or technical manual identified on, or with each device:

a) operating voltage range(s);

b) IP Code to EN60529:1991 as amended by EN60529:1991/A1:2000;

c) the angle of reception α_{max} for each β angle as determined in 5.4;

d) the operating wavelength band(s) e.g. UV, IR;

e) any other information necessary to allow correct installation, operation and maintenance of the device.

NOTE Additional information may be required by organisations certifying that detectors produced by a manufacturer conform to the requirements of this standard.

To enable correct operation of the detectors, these data should describe the requirements for the correct processing of the signals from the detector. This may be in the form of a full technical specification of these signals, a reference to the appropriate signalling protocol or a reference to suitable types of control and indicating equipment etc.

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4.2.7 Software controlled detectors

4.2.7.1 General

For detectors which rely on software control in order to fulfil the requirements of this standard, the requirements of 4.2.7.2.2 to 4.2.7.2.4 shall be met.

4.2.7.2 Software documentation

4.2.7.2.1 The manufacturer shall submit documentation which gives an overview of the software design. This documentation shall be in sufficient detail for the design to be inspected for compliance with this standard and shall include at least the following:

f) a functional description of the main program flow (e.g. as a flow diagram or structogram) including:

1) a brief description of the modules and the functions that they perform;

2) the way in which the modules interact;

3) the overall hierarchy of the program;

4) the way in which the software interacts with the hardware of the detector;

5) the way in which the modules are called, including any interrupt processing.

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g) a description of which areas of memory are used for the various purposes (e.g. the program, site specific data and running data);

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h) a designation, by which the software and its version can be uniquely identified.

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4.2.7.2.2 The manufacturer shall have available detailed design documentation, which only needs to be provided if required by the testing authority. It shall comprise at least the following:

a) an overview of the complete configuration of the product, including all software and hardware components;

b) a description of each module of the program, containing at least:

1) the name of the module;

2) a description of the tasks performed;

3) a description of the interfaces, including the type of data transfer, the valid data range and the checking for valid data.

c) full source code listings, as hard copy or in machine-readable form (e.g. ASCII-code), including all global and local variables, constants and labels used, and sufficient comment for the program flow to be recognized;

d) details of any software tools used in the design and implementation phase (e.g. CASE-tools, compilers).

4.2.7.3 Software design

In order to ensure the reliability of the detector, the following requirements for software design shall apply:

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a) the software shall have a modular structure;

b) the design of the interfaces for manually and automatically generated data shall not permit invalid data to cause error in the program operation;

c) the software shall be designed to avoid the occurrence of deadlock of the program flow.

4.2.7.4 The storage of programs and data

The program necessary to comply with this standard and any preset data, such as manufacturer's settings, shall be held in non-volatile memory. Writing to areas of memory containing this program and data shall only be possible by the use of some special tool or code and shall not be possible during normal operation of the detector.

Site-specific data shall be held in memory which will retain data for at least two weeks without external power to the detector, unless provision is made for the automatic renewal of such data, following loss of power, within 1 hour of power being restored.

4.2.8 Enclosure Protection

No requirement shall apply to a type A flame detector.

Type B flame detector shall comply with Code IP54C of EN 60529:1991 as amended by EN60529:1991/A1:2000.

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4.2.9 Dazzling

Type A and type B flame detectors shall meet the requirements of 5.2.9.

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4.2.10 Window monitoring facilities (option with requirements)

If the flame detector has this feature then it shall meet the requirements of 5.2.10.

4.3 Nominal activation conditions/sensitivity

4.3.1 Individual alarm indication

The alarm indicator of the detector shall meet the requirements specified in 5.3.1.

4.3.2 Repeatability

The detector shall have stable behaviour with respect to its sensitivity after a number of alarm conditions and shall meet the requirements specified in 5.3.2.

4.3.3 Directional dependence

The sensitivity of the detector shall not be unduly dependent on the direction of airflow around it and shall meet the requirements specified in 5.3.3.

4.3.4 Reproducibility

The sensitivity of the detector shall not vary unduly from specimen to specimen and shall meet the requirements specified in 5.3.4.

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4.4 Tolerance to supply voltage

4.4.1 Variation in supply parameters

Within the specified range(s) of the supply parameters, the sensitivity of the detector shall not be unduly dependent on these parameters (e.g. voltage) and shall meet the requirements specified in 5.4.1.

4.5 Performance parameters under fire conditions

4.5.1 Fire sensitivity

The detector shall have adequate sensitivity to incipient type fires that may occur in buildings and meet the fire test requirements specified in 5.5.1.

4.6 Durability

4.6.1 Temperature resistance

4.6.1.1 Dry heat (operational)

The detector shall function correctly at high ambient temperatures as specified in 5.6.1.1.

4.6.1.2 Dry heat (endurance)

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The detector shall be capable of withstanding long term exposure to high temperature as specified in 5.6.1.2.

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4.6.1.3 Cold (operational)

The detector shall function correctly at low ambient temperatures, as specified in 5.6.1.3.

4.6.2 Humidity resistance

4.6.2.1 Damp heat, cyclic (operational)

The detector shall function correctly at a high level of relative humidity with short period of condensation, as specified in 5.6.2.1.

4.6.2.2 Damp heat, cyclic (endurance)

The detector shall function correctly at high relative humidity (without condensation) as specified in 5.6.2.2.

4.6.2.3 Damp heat, steady state (endurance)

The detector shall be capable of withstanding long term exposure to a high level of continuous humidity as specified in 5.6.2.3.

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4.6.3 Corrosion resistance

4.6.3.1 SO_2 corrosion (endurance)

The detector shall function correctly at a high level of relative humidity with short period of condensation, as specified in 5.6.3.1.

4.6.4 Shock and vibration resistance

4.6.4.1 Shock (operational)

The detector shall function correctly when submitted to mechanical shocks which are likely to occur in the service environment as specified in 5.6.4.1.

4.6.4.2 Impact (operational)

The detector shall function correctly when submitted to mechanical impacts which it may sustain in the normal service environment as specified in 5.6.4.2.

4.6.4.3 Vibration, sinusoidal (operational)

The detector shall function correctly when submitted to vibration at levels appropriate to its normal service environment as specified in 5.6.4.3.

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4.6.4.4 Vibration, sinusoidal (endurance)

The detector shall be capable of withstanding long exposure to vibration at levels appropriate to the service environment as specified in 5.6.4.4.

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4.6.5 Electrical stability

4.6.5.1 EMC, immunity (operational)

The detector shall operate shall operate correctly when submitted to electromagnetic interference as specified in 5.6.5.1.

5 Tests and evaluation methods

5.1 General

5.1.1 Atmospheric conditions for tests

Unless otherwise stated in a test procedure, the testing shall be carried out after the test specimen has been allowed to stabilize in the standard atmospheric conditions for testing as described in IEC 60068-1 as follows:

a) temperature : (15 to 35) °C

b) relative humidity : (25 to 75) %

c) air pressure : (86 to 106) kPa