SLOVENSKI STANDARD
SIST EN 54-5:2017+A1:2018

01-november-2018

Nadomešča:
SIST EN 54-5:2017

Sistemi za odkrivanje in javljanje požara ter alarmiranje - 5. del: Toplotni javljalniki - Točkovni javljalniki

Fire detection and fire alarm systems - Part 5: Heat detectors - Point heat detectors

Brandmeldeanlagen - Teil 5: Wärmemelder - Punktförmige Melder

Systèmes de détection et d'alarme incendie - Partie 5: Détecteurs de chaleur - Détecteurs ponctuels

Ta slovenski standard je istoveten z: EN 54-5:2017+A1:2018

ICS:

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

SIST EN 54-5:2017+A1:2018 **en,fr,de**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 54-5:2017+A1

August 2018

ICS 13.220.20

Supersedes EN 54-5:2017

English Version

Fire detection and fire alarm systems - Part 5: Heat detectors - Point heat detectors

Systèmes de détection et d'alarme incendie - Partie 5 : Détecteurs de chaleur - Détecteurs ponctuels

Brandmeldeanlagen - Teil 5: Wärmemelder - Punktförmige Melder

This European Standard was approved by CEN on 23 October 2016 and includes Amendment 1 approved by CEN on 10 April 2018.

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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 CEN-CENELEC Management Centre has the same status as the official versions.

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Ref. No. EN 54-5:2017+A1:2018 E

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European foreword

This document (EN 54-5:2017+A1:2018) has been prepared by Technical Committee CEN/TC 72 “Fire detection and fire alarm 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of an identical text or by endorsement, at the latest by February 2019, and conflicting national standards shall be withdrawn at the latest by August 2022.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights."

This document includes Amendment 1 approved by CEN on 2018-04-10.

This document supersedes ⟦A1⟩ EN 54-5:2017 ⟨A1⟧.

The start and finish of text introduced or altered by amendment is indicated in the text by tags ⟦A1⟩ ⟨A1⟧.

EN 54-5 has been revised as follows:

Inclusion of new clauses and annexes:

— Clause 6 Assessment and verification of constancy of performance (AVCP)

— Clause 7 Classification and designation

— Clause 8 Marking, labelling and packaging

— Annex E (informative) Data supplied with point heat detectors

The main technical changes are as follows:

— Applying the latest EN 50130-4:2011 EMC for immunity tests.

The editorial changes are as follows:

— Changes from classes to Categories

— Editorial changes in a number of clauses, such as software and General, in order to conform to the regulation.

This document has been prepared under a standardization request given to CEN/CENELEC by the European Commission and the European Free Trade Association, and supports the basic requirements of Regulation (EU) 305/2011.

For relationship with EU Regulation, 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

— Part 3: Fire alarm devices – Sounders

— Part 4: Power supply equipment

— Part 5: Heat detectors – Point heat detectors

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

— Part 10: Flame detector – Point detectors

— 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 (CEN/TS)

— 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

— Part 24: Components of voice alarm systems – Loudspeakers

— Part 25: Components using radio links and system requirements

— Part 26: Carbon monoxide detectors – Point detectors

— 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 detectors using a combination of smoke, carbon monoxide and optionally heat sensors

— Part 32: Guidelines for the planning, design, installation, commissioning, use and maintenance of voice alarm systems (CEN/TS)

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.

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

1 Scope

This European Standard specifies the requirements, test methods and performance criteria for point heat detectors intended for use in fire detection and fire alarm systems installed in and around buildings (see EN 54-1:2011).

This European Standard provides for the assessment of verification of constancy of performance (AVCP) of point heat detectors to this EN.

For other types of heat detector, or for detectors intended for use in other environments, this standard should only be used for guidance.

Heat detectors with special characteristics and developed for specific risks are not covered by this standard.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 54-1:2011, *Fire detection and fire alarm systems - Part 1: Introduction*

EN 50130-4:2011, *Alarm systems - Part 4: Electromagnetic compatibility - Product family standard: Immunity requirements for components of fire, intruder, hold up, CCTV, access control and social alarm systems*

EN 60068-1:1994, *Environmental testing - Part 1: General and guidance (IEC 60068-1:1988)*

EN 60068-2-1:2007, *Environmental testing - Part 2-1: Tests - Test 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 - Test Fc: Vibration (sinusoidal) (IEC 60068-2-6:2008)*

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

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 60068-2-78:2013, *Environmental testing - Part 2-78: Tests - Test Cab: Damp heat, steady state (IEC 60068-2-78:2012)*

ISO 209:2007, *Aluminium and aluminium alloys — Chemical composition*

3 Terms, definitions and abbreviations

3.1 Terms and Definitions

For the purposes of this document, the following terms and definitions and those given in EN 54-1:2011 apply.

3.1.1
typical application temperature
temperature that an installed point heat detector can be expected to experience for long periods of time in the absence of a fire condition

Note 1 to entry: This temperature is deemed to be 29 °C below the minimum static response temperature, according to the category marked on the point heat detector, as specified in Table 1.

3.1.2
maximum application temperature
maximum temperature that an installed point heat detector can be expected to experience, even for short periods of time, in the absence of a fire condition

Note 1 to entry: This temperature is deemed to be 4 °C below the minimum static response temperature, according to the category marked on the point heat detector, as specified in Table 1.

3.1.3
static response temperature
temperature at which the point heat detector would produce an alarm signal if subjected to a vanishingly small rate of rise of temperature

Note 1 to entry: Rates of rise of temperature of approximately 0,2 K min^{-1} are normally found to be suitable for measuring this, however lower rates can be required in some instances (see 5.3).

3.2 Abbreviations

RT Response time

T Temperature

4 Product characteristics

4.1 General

4.1.1 Heat Response Categories

Detectors are categorized by one or more of the following heat response categories: A1, A2, B, C, D, E, F or G according to the requirements of the tests specified in Clause 5 (see Table 1).

Table 1 — Detector categorization temperatures

Detector Category	Typical Application Temperature °C	Maximum Application Temperature °C	Minimum Static Response Temperature °C	Maximum Static Response Temperature °C
A1	25	50	54	65
A2	25	50	54	70
B	40	65	69	85
C	55	80	84	100
D	70	95	99	115
E	85	110	114	130
F	100	125	129	145
G	115	140	144	160

Manufacturers may optionally give additional information concerning the type of response exhibited by the detector, by adding the suffix S or R to the above categories[1)]. Detectors, which are marked with the letter S or R as a suffix to the category marking, shall be tested in accordance with the applicable test, specified in 5.4.1 or 5.4.2, and shall meet the requirements of that test, in addition to the tests of Clause 5. Addition of a suffix shall be regarded as creating a new category.

4.2 Operational reliability

4.2.1 Position of heat sensitive elements

The heat sensitive element(s) or at least part of it, except elements with auxiliary functions (e.g. characteristic correctors), shall be at a distance ≥ 15 mm from the mounting surface of the point heat detector. To confirm this, the point heat detector shall be tested in accordance with 5.2.1.

4.2.2 Individual alarm indication

4.2.2.1 Category A1, A2, B, C or D point heat detectors shall be provided with an integral red visual indicator, by which the individual point heat detector, which released an alarm, can be identified, until the alarm condition is reset. Where other conditions of the point heat detector can be visually indicated, they shall be clearly distinguishable from the alarm indication, except when the point heat detector is switched into a service mode. For detachable point heat detectors the indicator may be integral with the base or the point heat detector head. The visual indicator shall be visible from a distance of 6 m directly below the point heat detector, in an

[1)] Detectors, with a suffix **S** to their category, do not respond below the minimum static response temperature, applicable to their categories (see Table 1), even at high rates of rise of air temperature. Detectors with a suffix **R** to their category, incorporate a *rate-of-rise* characteristic, which meets the response time requirements (see Table 4) for high rates of rise of air temperature even when starting at air temperatures substantially below the typical application temperature.

ambient light intensity up to 500 lx. To confirm this, the point heat detector shall be assessed in accordance with 5.2.2.1

4.2.2.2 Category E, F or G point heat detectors shall be provided with either an integral red indicator, or with another means for locally indicating the alarm status of the point heat detector. To confirm this, the point heat detector shall be assessed in accordance with 5.2.2.2

NOTE The alarm condition is reset manually at the control and indicating equipment (see EN 54–2).

4.2.3 Connection of ancillary devices

Where the point heat detector provides for connections to ancillary devices (e.g. remote indicators, control relays), open- or short-circuit failures of these connections shall not prevent the correct operation of the point heat detector. To confirm this, the point heat detector shall be assessed in accordance with 5.2.3.

4.2.4 Monitoring of detachable detectors

For detachable point heat 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. To confirm this, the point heat detector shall be assessed in accordance with 5.2.4.

4.2.5 Manufacturer's adjustments

It shall not be possible to change the manufacturer's settings except by special means (e.g. a special code or tool, or by breaking or removing a seal). To confirm this, the point heat detector shall be assessed in accordance with 5.2.5.

4.2.6 On-site adjustment of response behaviour

If there is provision for on-site adjustment of the response behaviour of the point heat detector then:

— for each setting, at which the manufacturer is stating a corresponding category, access to the adjustment means shall only be possible by the use of a code or special tool or by removing the point heat detector from its base or mounting;

— any other setting(s) which the manufacturer is not stating a corresponding category in accordance to this standard, shall only be accessible by the use of a code or special tool, and it shall be clearly marked on the point heat detector or in the associated data.

To confirm this, the point heat detector shall be assessed in accordance with 5.2.6.

NOTE These adjustments can be carried out at the point heat detector or at the control and indicating equipment.

4.2.7 Software controlled detector (when provided)

4.2.7.1 General

For point heat detectors which rely on software control the requirements of 4.2.7.2, 4.2.7.3 and 4.2.7.4 are applicable.

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 and shall include at least the following:

a) 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 point heat detector;

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

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

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

4.2.7.2.2 The manufacturer shall have available detailed design documentation. It shall comprise at least the following:

a) an overview of the whole system configuration, 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

The software design shall have:

a) a modular structure;

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

c) provisions to avoid the occurrence of deadlock of the programme flow.

4.2.7.4 The storage of programs and data

The program 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 point heat detector.

Site-specific data shall be held in memory which will retain data for at least 2 weeks without external power to the point heat detector, unless provision is made for the automatic renewal of such data, following loss of power, within 1 h of power being restored.

To confirm this, the point heat detector shall be assessed in accordance with 5.2.7.

4.3 Nominal activation conditions/sensitivity

4.3.1 Directional dependence

The response time of the point heat detector shall not be unduly dependent on the direction of airflow around the point heat detector. To confirm this, the point heat detector shall be tested in accordance with 5.3.1.

4.3.2 Static response temperature

The point heat detector shall respond correctly to a slow rate of rise of air temperature. To confirm this, the point heat detector shall be tested in accordance with 5.3.2.

4.3.3 Response times from typical application temperature

The point heat detector shall respond correctly over a range of rates of rise of air temperature. To confirm this, the point heat detector shall be tested in accordance with 5.3.3.

4.3.4 Response times from 25 °C

Point heat detectors in a category with a typical application temperature above 25 °C (see Table 1) shall not exhibit an abnormally fast response to normal increases in temperature.

To confirm this, the point heat detector shall be tested in accordance with 5.3.4.

NOTE The requirement for response time from 25 °C for category A1 or A2 point heat detectors is already covered in 4.3.3.

4.3.5 Response times from high ambient temperature

The point heat detector shall function correctly at high ambient temperatures appropriate to the anticipated service temperatures. To confirm this, the point heat detector shall be tested in accordance with 5.3.5.

4.3.6 Reproducibility

The response times of the point heat detectors shall be within the given limits. To confirm this, the point heat detector shall be tested in accordance with 5.3.6.

4.4 Response delay (response time)

4.4.1 Additional tests for suffix S detectors

Suffix S point heat detector shall not respond below the minimum static response temperature applicable to the category of the point heat detector. To confirm this, the point heat detector shall be tested in accordance with 5.4.1.

4.4.2 Additional tests for suffix R detectors

Suffix R point heat detector shall maintain the response requirements of its category for high rates of rise of temperature starting from an initial temperature below the typical application temperature applicable to the category marked on the point heat detector. To confirm this, the point heat detector shall be tested in accordance with 5.4.2.

4.5 Tolerance to supply voltage - Variation in supply parameters

Within the specified range(s) of the supply parameters (e.g. voltage), the response time of the point heat detector shall not be unduly dependent on these parameters. To confirm this, the point heat detector shall be tested in accordance with 5.5.1.

4.6 Durability of Nominal activation conditions/sensitivity

4.6.1 Temperature resistance

4.6.1.1 Cold (operational)

The point heat detector shall function correctly at low ambient temperatures appropriate to the anticipated service temperature. To confirm this, the point heat detector shall be tested in accordance with 5.6.1.1

4.6.1.2 Dry heat (endurance)

The point heat detector shall withstand a high ambient temperature appropriate to its category. To confirm this, the point heat detector shall be tested in accordance with 5.6.1.2.

This requirement is not applicable to category A1, A2 and B point heat detectors.

4.6.2 Humidity resistance

4.6.2.1 Damp heat, cyclic (operational)

The point heat detector shall function correctly at high relative humidities (with condensation), which can occur for short periods in the anticipated service environment. To confirm this, the point heat detector shall be tested in accordance with 5.6.2.1.

4.6.2.2 Damp heat, steady-state (endurance)

The point heat detector shall withstand the long term effects of humidity in the service environment (e.g. changes in electrical properties of materials, chemical reactions involving moisture, galvanic corrosion etc.). To confirm this, the point heat detector shall be tested in accordance with 5.6.2.2.