

Components of automatic fire detection systems —

Part 8: Specification for high temperature heat detectors

UDC 614.8.42.435:654.924.52 – 977:620.1

Cooperating organizations

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National foreword

This Part of BS 5445 has been prepared under the direction of the Fire Standards Committee and is the English language version of European Standard EN 54 “*Components of automatic fire detection systems*” Part 8:1982 “*High temperature heat detectors*” of the European Committee for Standardization (CEN).

This Part of BS 5445 specifies the requirements, methods of test and performance criteria for point-type high temperature heat detectors. Point-type heat detectors which have lower response temperatures are specified in Part 5 and point-type smoke detectors are specified in Part 7; the components of automatic fire detection systems to be specified in other Parts are described in Part 1. The tests are in the nature of “type tests” and are not intended as manufacturers' tests to maintain uniformity of quality in production. While they are intended to assess the most important features of the design of automatic fire alarm systems, they cannot remove the necessity for regular inspection and maintenance, as described in clause 29 of BS 5839-1:1980, which are essential for reliable operation.

It should be noted that the comma has been used as a decimal marker. In British Standards it is current practice to use a full point on the baseline as a decimal marker.

Cross-references. Aluminium alloy conforming to material 2014A condition TF as specified in BS 1470:1972 “Specification for wrought aluminium and aluminium alloys for general engineering purposes — plate, sheet and strip”, is equivalent to aluminium alloy Al-Cu4SiMg to ISO 209:1971 “Composition of wrought products of aluminium and aluminium alloys — Chemical composition (percent)”, solution treated and precipitation treated condition (see Annex F).

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, the EN title page, pages 2 to 20, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

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English version

Components of automatic fire detection systems Part 8: High temperature heat detectors

(include amendment A1:1988)

Organes constitutifs des systèmes de détection
automatique d'incendie; Partie 8: Détecteurs
de chaleur à seuil de température élevée
(incult l'amendment A1:1988)

Bestandteile automatischer
Brandmeldeanlagen;
Teil 8: Wärmemelder mit hohen
Ansprechtemperaturen
(enthält Änderungan A1:1988)

This European Standard was accepted by CEN on 1982-07-30. CEN members are bound to comply with the requirements of CEN 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 CEN 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 CEN Central Secretariat has the same status as the official versions.

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CEN

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Brief history

This Amendment 1 to the European Standard EN 54-8 was drawn up by the Technical Committee CEN/TC 72 (the EN has been voted in 1982) “Automatic fire detection systems”, the Secretariat of which is held by BSI. This amendment clarifies the procedures for certain tests.

In accordance with the Common CEN/CENELEC Rules, following countries are bound to implement this Amendment:

Austria, Belgium, Finland, Germany, Greece, Ireland, Italy, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom.

1 Object and field of application

This European Standard specifies requirements, tests and performance criteria for point-type heat-sensitive detectors that:

- a) have high response temperatures;
- b) contain at least one element having a static response threshold;
- c) have heat-sensitive elements (excluding elements having auxiliary functions, e.g. characteristic correctors) that are not closer than 15 mm to the mounting surface of the detector.

2 Methods of test and test schedules

2.1 General requirements for testing

Where applicable in each test, the detector(s) under test shall be connected to supply and indicating equipment in accordance with the data supplied by the manufacturer. If the supply and indicating equipment affects the response behaviour of a detector a special note shall be provided in the test report.

If the requirements of any one of the clauses in this Part are not met, then the type of detector does not comply with this Part 8 of the standard EN 54.

2.2 General tolerance for methods of test

Where tolerances are not specified in the methods of test given in the annexes, a general tolerance of $\pm 5\%$ shall be assumed.

2.3 Resettable detectors

Resettable detectors shall be tested according to the testing schedule of Annex A.

2.4 Non-resettable detectors

Non-resettable detectors shall be tested according to the testing schedule of Annex B.

3 Marking

3.1 The manufacturer shall ensure that any type of detector purporting to comply with this Part of EN 54 is capable of passing all the tests and other requirements given herein. Detectors which are intended for marketing as separate units for installation in different systems shall be marked with sufficient operational data to ensure their performance in accordance with this standard, or alternatively such data shall be provided separately.

3.2 Each detector purporting to comply with the requirements of this Part of EN 54 shall be marked with:

- a) the number of this standard (i.e. EN 54-8);

- b) the name or trademark of the organization accepting liability for compliance of the detector with this Part of EN 54 (this organization may be the manufacturer or the supplier of the detector);

NOTE In some countries it is required that certification of compliance with the standard is carried out by an approved test house. Such requirements will normally be given in a national particularity to this standard.

- c) the type number of the detector;
- d) the temperature range of the detector (see 4.1).

4 Response time

4.1 It is necessary to classify heat detectors having high response temperatures into temperature ranges depending on the maximum anticipated ambient temperatures in a practical application.

Normal ambient temperature	Temperature range
up to 70 °C	1
up to 90 °C	2
up to 110 °C	3
up to 140 °C	4

4.2 The detectors specified in the appropriate testing schedule (Annex A or Annex B) shall be tested in accordance with Annex C. The detectors shall be deemed to comply with the requirements of this clause if:

- a) the response times of detectors tested as described in annexes C.2, C.3.1 and C.4 lie between the upper and lower limits of response time shown in Table 1;
- and
- b) the response times of detectors tested as described in annex C.3.2 exceed the lower limit of response time specified in Table 1 for the appropriate rate-of-rise of temperature;
- and
- c) the response temperatures of the detectors tested as described in annex C.5 lie between the maximum and minimum temperatures shown in Table 2.

Table 1— Permissible response times

Rate of rise of air temperature	Lower limit of response times		Upper limit of response times	
°C/min	min	s	min	s
1	29	0	45	40
3	7	13	15	40
5	4	9	9	40
10	2	0	5	10
20		59	2	55
30		39	2	8

Table 2 — Permissible static element response temperatures

Temperature range	Minimum response temperature	Maximum response temperature
1	74 °C	90 °C
2	94 °C	110 °C
3	114 °C	130 °C
4	144 °C	160 °C

5 Vibration

The detectors shall be tested in the manner described in Annex D.

The detectors shall be deemed to comply with the requirements of this clause if:

- a) no alarm or fault warning is indicated on the indicating equipment during the tests of **D.2**;
- b) no defect which might lead to subsequent failure of the detector is observed during the tests of **D.2**;
- and
- c) any change in the response times of the detectors tested in accordance with **D.3** when compared with the times obtained from the equivalent tests of Annex C, does not exceed 15 % or 10 s whichever is the greater.

6 Corrosion

The detectors shall be tested in the manner described in Annex E.

The detectors shall be deemed to comply with the requirements of this clause if they comply with the requirements of **6.1** and **6.2**, as appropriate.

6.1 Detectors tested for four days

The response time for each detector shall be between the limits specified in Table 1, with an additional tolerance of $\pm 15\%$ or ± 10 s, whichever is the greater.

6.2 Detectors tested for sixteen days

Each detector shall give either:

- a) a fault warning or alarm signal immediately and continuously when it is connected to its indicating equipment;
- or
- b) an alarm signal in a time that does not exceed the upper limit of the response time of Table 1 (with the additional tolerance in **6.1**).

7 Impact

The detectors shall be tested in the manner described in Annex F. The detectors shall be deemed to comply with the requirements of this clause if:

- a) a fault or alarm signal is emitted which cannot be reset,
- or if
- b) no signal is emitted and any change in the response times of the detectors tested in accordance with Annex F, when compared with the times obtained from the equivalent tests of Annex C, does not exceed 15 % or 10 s whichever is the greater.

8 Shock

The detectors shall be tested in the manner described in Annex G.

The detectors shall be deemed to comply with the requirements of this clause if:

- a) no alarm signal is given when they are subjected to the specified shock,
- and
- b) any change in the response times of the detectors tested in accordance with Annex G, when compared with the times obtained from the equivalent tests of Annex C, does not exceed 15 % or 10 s whichever is the greater.

9 Thermal shock and low ambient temperature

The detectors shall be tested in the manner described in Annex H.

The detectors shall be deemed to comply with the requirements of this clause if:

- a) no alarm signal is given during the lowering of the temperature and during the stabilization period at the depressed temperature
- and
- b) any change in the response times of the detectors tested in accordance with Annex H, when compared with the times obtained from the equivalent tests of Annex C, does not exceed 15 % or 10 s, whichever is the greater.

10 High ambient temperature

The detector shall be tested in the manner described in Annex J.

The detector shall be deemed to comply with the requirements of this clause if the response time lies between 46 s and 9 min 40 s.