SLOVENSKI STANDARD
SIST EN 54-26:2015

01-junij-2015

Sistemi za odkrivanje in javljanje požara ter alarmiranje - 26. del: Javljalniki ogljikovega monoksida - Točkovni javljalniki

Fire detection and fire alarm systems - Part 26: Carbon monoxide detectors - Point detectors

Brandmeldeanlagen - Teil 26: Kohlenmonoxidmelder - Punktfoermige Melder

Système de détection et d'alarme incendie - Partie 26: Détecteurs de monoxide de carbone - Détecteurs ponctuels

Ta slovenski standard je istoveten z: **EN 54-26:2015**

ICS:

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

SIST EN 54-26:2015 **en,fr,de**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 54-26

April 2015

ICS 13.220.20

English Version

Fire detection and fire alarm systems - Part 26: Carbon monoxide detectors - Point detectors

Système de détection et d'alarme incendie - Partie 26: Détecteurs de monoxide de carbone - Détecteurs ponctuels

Brandmeldeanlagen - Teil 26: Kohlenmonoxidmelder - Punktfoermige Melder

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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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Foreword

This document (EN 54-26:2015) 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of an identical text or by endorsement, at the latest by October 2015, and conflicting national standards shall be withdrawn at the latest by April 2019.

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

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

For relationship with EU Regulations, 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 detectors*;

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

— *Part 10: Flame detectors — Point detectors*;

— *Part 11: Manual call points*;

— *Part 12: Smoke detectors — Line detectors using an optical light beam*;

— *Part 13: Compatibility assessment of system components*;

— *Part 14: Guidelines for planning, design, installation, commissioning, use and maintenance* [CEN Technical Specification];

— *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 routing equipment*;

— *Part 22: Resettable line-type heat detectors* [currently at acceptance stage];

— *Part 23: Fire alarm devices — Visual alarms devices*;

— *Part 24: Components of voice alarm systems — Loudspeakers*;

— *Part 25: Components using radio links*;

— *Part 26: Carbon monoxide detectors — Point detectors* [the present document];

— *Part 27: Duct smoke detectors*;

— *Part 28: Non-resettable line type heat detectors* [currently at drafting stage];

— *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 fire detectors — Point detectors using a combination of smoke, carbon monoxide and optionally heat sensors*;

— *Part 32: Planning, design, installation, commissioning, use and maintenance of voice alarm systems* [currently at acceptance stage].

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 organizations 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, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Introduction

Carbon monoxide (CO) is a product of the incomplete combustion of carbon-based materials. CO fire detectors can react promptly to smouldering fires involving carbonaceous materials because CO does not depend solely on convection, but also moves by diffusion. CO fire detectors might be better suited to applications where other fire detection techniques are prone to false alarms, i.e. due to dust, steam and cooking vapours.

The purpose of this standard is to ensure that carbon monoxide (CO) fire detectors have adequate sensitivity and reliability for use in fire detection and fire alarm systems for residential commercial and industrial premises. CO may not be produced in detectable quantities where pyrolysis of material rather than self-sustained combustion occurs (e.g. overheating cables) or in the early stages of rapidly burning flaming fires (e.g. liquid fuel fires). It is important that carbon monoxide fire detectors are only used where a risk assessment indicates that they are appropriate for detecting the types of fires that may occur. CO fire detectors should not be considered as a direct replacement for smoke detectors. CO fire detectors detect carbon monoxide gas rather than the smoke particulates detected by optical and ionization smoke detectors.

A number of different methods for sensing CO are suitable. However, most sensors will also be influenced by other gases and phenomena. Tests have therefore been included in the test schedule to assess cross-sensitivity to substances normally present in the service environment that may affect the performance of the detector.

As CO detectors are specifically well suited for the detection of incipient fires rather than flaming fires this standard only includes tests to verify performance in smouldering fires. For this purpose, test fires TF2 and TF3 from EN 54-7 have been included in the test schedule. An additional validity criterion has been added to each of these tests to make them suitable for evaluating CO fire detectors.

1 Scope

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

This European Standard provides for the assessment and verification of consistency of performance (AVCP) of carbon monoxide point detectors to this EN.

This European Standard does not apply to fire detectors incorporating at least one CO sensing element in combination with other elements sensing different fire phenomena.

CO detectors having special characteristics suitable for the detection of specific fire risks are not covered by this European Standard. The performance requirements for any additional functions are beyond the scope of this European 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 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 54-7:2000[1], *Fire detection and fire alarm systems — Part 7: Smoke detectors — Point detectors using scattered light, transmitted light or ionization*

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 60068-1:2014, *Environmental testing — Part 1: General and guidance (IEC 60068-1:2013)*

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 60068-2-6:2007)*

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

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1) This document is currently impacted by the stand-alone amendments EN 54-7:2000/A1:2002 and EN 54-7:2000/A2:2006.

ISO 209:2007, *Wrought aluminium and aluminium alloys — Chemical composition and forms of products — Part 1: Chemical composition*

3 Terms, definitions and abbreviations

3.1 Terms and definitions

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

3.1.1
CO response value
CO concentration in the proximity of the specimen at the moment that it generates an alarm signal, when tested as described in 5.1.5

Note 1 to entry: The response value may depend on signal processing in the detector and in the control and indicating equipment.

3.1.2
rate-sensitive
behaviour of a detector that depends on the rate of change of CO concentration

3.2 Abbreviations

EMC Electromagnetic compatibility

4 Requirements

4.1 General

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

4.2 Nominal activation conditions/sensitivity

4.2.1 Individual alarm indication

The detector shall be provided with an integral red visual indicator, by which the individual detector that released an alarm, can be identified, until the alarm condition is reset. Where other conditions of the detector can be visually indicated, they shall be clearly distinguishable from the alarm indication, except when the detector is switched into a service mode. For detachable detectors, the indicator may be integral with the base or the detector head. The visual indicator shall be visible from a distance of 6 m directly below the detector, in an ambient light intensity up to 500 lux when assessed as described in 5.2.1.

4.2.2 Rate sensitive CO response

The CO response value of the detector may depend on the rate of change of CO concentration in the vicinity of the detector. Such behaviour may be incorporated in the detector design to improve the discrimination between ambient CO levels and those generated by a fire. If such rate sensitive behaviour is included then it shall not lead to a significant reduction in the detector's sensitivity to fires, nor to a significant increase in the probability of false alarm when assessed as specified in 5.2.2.

4.2.3 Response to slowly developing fires

Point carbon monoxide detectors may incorporate provision for "drift compensation", for example to compensate for sensor drift due ageing of the CO sensor or the build-up of contaminants in the detector, If

such drift compensation is included, then it shall not lead to a significant change in the detector's sensitivity to slowly developing fires when assessed as specified in 5.2.3.

4.2.4 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 5.2.4.

4.2.5 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 5.2.5.

4.2.6 Reproducibility

The sensitivity of the detector shall not vary unduly from specimen to specimen and shall meet the requirements specified in 5.2.6.

4.2.7 Air movement

The sensitivity of the detector shall not be unduly affected by the rate of the airflow and shall meet the requirements specified in 5.2.7.

4.3 Operational reliability

4.3.1 Connection of ancillary devices

Where the 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 detector.

4.3.2 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.

4.3.3 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.

4.3.4 On-site adjustment of behaviour

If there is provision for on-site adjustment of the response behaviour 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 access to the adjustment means shall only be possible by the use of a code or special tool or by removing the detector from its base or mounting;

b) 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.

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

4.3.5 Software controlled detectors

4.3.5.1 General

For detectors which rely on software control in order to fulfil the requirements of this standard, the requirements of 4.3.5.2, 4.3.5.3 and 4.3.5.4 shall be met.

4.3.5.2 Software documentation

4.3.5.2.1 Design overview

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:

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 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.

4.3.5.2.2 Design detail

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 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).

4.3.5.3 Software design

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

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.

4.3.5.4 The storage of programs and data

The program necessary to comply with this standard and any pre-set 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 h of power being restored.

4.3.6 Long term stability

The detectors shall be stable over long periods of time as specified in 5.3.6.

4.4 Tolerance to supply voltage — 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 — Fire sensitivity

The detector shall have adequate sensitivity to incipient type fires that may occur in buildings as specified in 5.5.1.

4.6 Durability of nominal activation conditions/sensitivity

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)

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

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 steady-state (operational)

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.

4.6.2.4 Low humidity, steady-state (operational)

The detector shall function correctly at low relative humidity as specified in 5.6.2.4.

4.6.3 Corrosion resistance — SO_2 corrosion (endurance)

The detector shall be capable of withstanding the corrosive effects of sulphur dioxide as an atmospheric pollutant as specified in 5.6.3.

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.

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.

4.6.5 Electrical stability — EMC, immunity (operational)

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

4.6.6 Resistance to chemical agents

4.6.6.1 Exposure to high level of carbon monoxide

The detector shall be capable to withstand exposure to high levels of CO which may be encountered during a fire condition as specified in 5.6.6.1.

4.6.6.2 Exposure to chemical agents at environmental concentrations

The detector shall be capable of withstanding the effects of exposure to atmospheric pollutants or chemicals which may be encountered in the service environment as specified in 5.6.6.2.