Automaatne tulekahjusignalisatsioonisüsteem. Osa 3: Tuletõrjehäire seadmed. Helisignaali seadmed

Fire detection and fire alarm systems - Part 3: Fire alarm devices - Sounders

This document is a preview generated by EVS

EESTI STANDARDIKESKUS
ESTONIAN CENTRE FOR STANDARDISATION

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

See Eesti standard EVS-EN 54-3:2014 sisaldab Euroopa standardi EN 54-3:2014 inglisekeelset teksti.	This Estonian standard EVS-EN 54-3:2014 consists of the English text of the European standard EN 54-3:2014.
Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas.	This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation.
Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 23.07.2014.	Date of Availability of the European standard is 23.07.2014.
Standard on kättesaadav Eesti Standardikeskusest.	The standard is available from the Estonian Centre for Standardisation.

This document is a preview generated by EVS

Tagasisidet standardi sisu kohta on võimalik edastada, kasutades EVS-i veebilehel asuvat tagasiside vormi või saates e-kirja meiliaadressile standardiosakond@evs.ee.

ICS 13.220.20

Standardite reprodutseerimise ja levitamise õigus kuulub Eesti Standardikeskusele

Andmete paljundamine, taastekitamine, kopeerimine, salvestamine elektroonsesse süsteemi või edastamine ükskõik millises vormis või millisel teel ilma Eesti Standardikeskuse kirjaliku loata on keelatud.

Kui Teil on küsimusi standardite autorikaitse kohta, võtke palun ühendust Eesti Standardikeskusega:
Aru 10, 10317 Tallinn, Eesti; www.evs.ee; telefon 605 5050; e-post info@evs.ee

The right to reproduce and distribute standards belongs to the Estonian Centre for Standardisation

No part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying, without a written permission from the Estonian Centre for Standardisation.

If you have any questions about copyright, please contact Estonian Centre for Standardisation:
Aru 10, 10317 Tallinn, Estonia; www.evs.ee; phone 605 5050; e-mail info@evs.ee

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 54-3

July 2014

ICS 13.220.20

Supersedes EN 54-3:2001

English Version

Fire detection and fire alarm systems - Part 3: Fire alarm devices - Sounders

Systèmes de détection et d'alarme incendie - Partie 3: Dispositifs sonores d'alarme feu

Brandmeldeanlagen - Teil 3: Feueralarmeinrichtungen Akustische Signalgeber

This European Standard was approved by CEN on 8 May 2014.

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

CEN members are the national standards bodies of 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 United Kingdom.

This document is a preview generated by EVS

EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

© 2014 CEN All rights of exploitation in any form and by any means reserved worldwide for CEN national Members.

Ref. No. EN 54-3:2014 E

Contents

Page

Foreword 5

Introduction 7

1 Scope 8

2 Normative references 8

3 Terms, definitions and abbreviations 9
3.1 Definitions 9
3.2 Abbreviations 11

4 Requirements 11
4.1 Compliance 11
4.2 Operational reliability 11
4.2.1 Duration of operation 11
4.2.2 Provision for external conductors 11
4.2.3 Flammability of materials 11
4.2.4 Enclosure protection 12
4.2.5 Access 12
4.2.6 Manufacturer's adjustment 12
4.2.7 On-site adjustment of the operation mode 12
4.2.8 Software controlled sounders 13
4.3 Performance parameters under fire conditions 14
4.3.1 Sound pressure level 14
4.3.2 Frequencies and sound pattern 14
4.3.3 Synchronisation 14
4.3.4 Performance of voice sounders 15
4.3.5 Voice sounders sequence timing 15
4.4 Durability of performance parameters under fire conditions 15
4.4.1 Temperature resistance 15
4.4.2 Humidity resistance 15
4.4.3 Shock and vibration resistance 16
4.4.4 Corrosion resistance 16
4.4.5 Electrical stability 16

5 Testing, assessment and sampling methods 16
5.1 General 16
5.1.1 Atmospheric conditions for tests 16
5.1.2 Operating conditions for tests 17
5.1.3 Mounting arrangements 17
5.1.4 Tolerances 17
5.1.5 Provision for tests 17
5.1.6 Test schedule 18
5.1.7 Reproducibility 19
5.2 Operational reliability 20
5.2.1 Duration of operation 20
5.2.2 Provision for external conductors 20
5.2.3 Flammability of materials 20
5.2.4 Enclosure protection 21
5.2.5 Access 22
5.2.6 Manufacturer’s adjustments 22
5.2.7 On site adjustments of the operating mode 22
5.2.8 Requirements for software controlled devices 22

This document is a preview generated by EVS

5.3 Performance parameters under fire conditions 22
5.3.1 Sound pressure level 22
5.3.2 Frequencies and sound patterns 23
5.3.3 Synchronisation 23
5.3.4 Performance of voice sounders 24
5.3.5 Voice sounder sequence timing 25
5.4 Durability of performance parameters under fire conditions 26
5.4.1 Heat resistance 26
5.4.2 Humidity resistance 29
5.4.3 Shock and vibration resistance 31
5.4.4 Corrosion resistance, SO_2 corrosion (endurance) 35
5.4.5 Electrical stability 36

6 Assessment and verification of constancy of performance (AVCP) 37
6.1 General 37
6.2 Type testing 37
6.2.1 General 37
6.2.2 Test samples, testing and compliance criteria 38
6.2.3 Test reports 38
6.3 Factory production control (FPC) 38
6.3.1 General 38
6.3.2 Requirements 39
6.3.3 Product specific requirements 41
6.3.4 Initial inspection of factory and FPC 42
6.3.5 Continuous surveillance of FPC 42
6.3.6 Procedure for modifications 43
6.3.7 One-off products, pre-production products, (e.g. prototypes) and products produced in very low quantities 43

7 Classification and designation 44

8 Marking, labelling and packaging 44

Annex A (normative) Sound pressure level for fire alarm sounders 45

A.1 General 45

A.2 Mounting arrangements 45

A.3 Instrumentation 45

A.4 Background noise level 45

A.5 Measurement of sound pressure level 45

Annex B (normative) Comparative sound pressure level test during environmental conditioning 49

B.1 General 49

B.2 Test chamber 49

B.2.1 Size 49

B.2.2 Shape 49

B.2.3 Rigidity 50

B.2.4 Surface treatment 50

B.3 Mounting arrangements 50

B.4 Instrumentation 50

B.5 Background noise level 50

B.6 Test procedure 50

This document is a preview generated by EVS

B.6.1 Number and positioning of microphones 50
B.6.2 Measurement of sound pressure level 51
Annex C (informative) Data supplied with sounders 54
Annex D (informative) Sound patterns used in some European countries 55
D.1 Introduction 55
D.2 Standards references 55
D.3 Information on sound patterns 56
D.3.1 Introduction 56
D.3.2 ISO 8201 Evacuate signal 56
D.3.3 DIN 33404-3 Unified emergency signal 56
D.3.4 BS 5839-1 Evacuate signal 57
D.3.5 BS 5839-1 Alert signal 57
D.3.6 NF S32-001 Evacuate signal 57
D.3.7 NEN 2575 Evacuate signal 58
Annex E (informative) Comparison of flammability test requirements in various standards 59
E.1 Introduction 59
E.2 Relevant standards 59
E.3 Vertical burning tests 59
E.4 Horizontal burning tests 60
E.4.1 ISO 1210, IEC 60695-11-10 and UL 94 60
E.4.2 ISO 10351, IEC 60695-11-20 and UL 94 61
Annex ZA (informative) Clauses of this European Standard addressing the provisions of the EU Construction Products Regulation 62
ZA.1 Scope and relevant characteristics 62
ZA.2 Procedure for assessment and verification of constancy of performance (AVCP) of sounders 63
ZA.2.1 System of AVCP 63
ZA.2.2 Declaration of performance (DoP) 64
ZA.2.2.1 General 64
ZA.2.2.2 Content 64
ZA.2.2.3 Example of DoP 65
ZA.3 CE marking and labelling 68
Bibliography 72

This document is a preview generated by EVS

Foreword

This document (EN 54-3:2014) 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 January 2015, and conflicting national standards shall be withdrawn at the latest by April 2016.

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 supersedes EN 54-3:2001.

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(s).

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

EN 54-3 has been revised so as to align with the second answer of CEN/TC 72 to Mandate M/109. EN 54-3 includes new clauses and annexes as follows:

— Requirements for software controlled devices (5.2.8);

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

— Clause 7 Classification and designation;

— Clause 8 Marking, labelling and packaging;

— Annex C Data supplied with sounders;

— Annex D (informative) Sound patterns used in some European countries;

— Annex E (informative) Comparison of flammability test requirements in various standards.

The previous Annex C dealt with the requirements and test methods for voice sounders. The content of this annex has been integrated in the main body of the standard, specifically under 4.3.3, 4.3.4, 4.3.5, 5.3.3. 5.3.4 and 5.3.5. In addition, Annex ZA has been revised to align with the Construction Products Regulation (CPR).

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 detector – Point detectors*

This document is a preview generated by EVS

— *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*

— *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*

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.

This document is a preview generated by EVS

Introduction

The purpose of a fire alarm sounder is to warn person(s) within, or in the vicinity of, a building of the occurrence of a fire emergency situation in order to enable such a person(s) to take appropriate measures.

This European Standard recognizes that the exact nature of the sound requirements, i.e. its frequency range, temporal pattern and output level will vary according to the nature of the installation, the type of risk present and appropriate measures to be taken, the type of signals used by other non-emergency alarms (see, for example, EN ISO 7731) and national differences in custom and practice. The resulting standard specifies, therefore, a common method for the testing of the operational performance of sounders against the specification declared by the manufacturer rather than imposing common requirements.

In some European countries, specific frequencies of sound and sound patterns are used. These may be given in national codes or standards (see Annex D). Attention is drawn to national safety regulations which may specify maximum safe sound pressure level received by occupants of a building.

Attention is also drawn to ISO 8201:1987, *Acoustics – Audible emergency evacuation signal*, the international standard which specifies the temporal pattern and the required sound pressure level of an audible emergency evacuation signal.

This European Standard gives common requirements for sounders as well as for their performance under climatic, mechanical and electrical interference conditions which are likely to occur in the service environment. This European Standard covers sounders for either an indoor or an outdoor application environment category.

In fire detection and fire alarm systems, voice sounders are used as alarm devices for warning the occupants of a building of the occurrence of a fire risk, using a combination of an attention-drawing signal and dedicated voice message(s). The requirements, test methods and performance criteria specified in this standard for sounders are also applicable to voice sounders. Additional requirements, test methods and performance criteria specific to voice sounders are also incorporated.

This document is a preview generated by EVS

1 Scope

This European Standard specifies the requirements, test methods and performance criteria for fire alarm sounders, including voice sounders, in a fixed installation intended to signal an audible warning between the fire detection and fire alarm systems and the occupants of a building (see EN 54-1:2011).

This European Standard provides for the assessment and verification of constancy of performance (AVCP) of fire alarm sounders to this EN.

This European Standard is not intended to cover:

a) loudspeaker type devices primarily intended for emitting emergency voice messages that are generated from an external audio source;

b) supervisory sounders, for example, within the control and indicating equipment.

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 + Corrigendum 1988 + A1:1992)*

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

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

EN 60529:1991, *Degrees of protection provided by enclosures (IP Code)(IEC 60529:1989)*

EN 60529:1991/A1:2000, *Degrees of protection provided by enclosures (IP Code) (IEC 60529:1989/A1:1999)*

This document is a preview generated by EVS

EN 60695-11-10:2013, *Fire hazard testing - Part 11-10: Test flames - 50 W horizontal and vertical flame test methods (IEC 60695-11-10:2013)*

EN 60695-11-20:1999, *Fire hazard testing - Part 11-20: Test flames - 500 W flame test methods (IEC 60695-11-20:1999)*

EN 60695-11-20:1999/A1:2003, *Fire hazard testing - Part 11-20: Test flames - 500 W flame test methods (IEC 60695-11- 20:1999/A1:2003)*

EN 61672-1:2003, *Electroacoustics - Sound level meters - Part 1: Specifications (IEC 61672-1:2002)*

3 Terms, definitions and abbreviations

For the purposes of this European Standard, the following terms, definitions and abbreviations and those given in EN 54-1 apply.

3.1 Definitions

3.1.1
A-weighted sound pressure level
L_{pA}
sound pressure level, expressed in dB(A), which is 20 times the logarithm to base ten of the ratio of the A-weighted sound pressure level to the reference pressure of 20 µPa at 1 kHz

Note 1 to entry: The A-weighting characteristics are given in EN 61672–1:2003.

3.1.2
delta sound pressure level
$\Delta(L_{pA})$
decrease in the mean A-weighted sound pressure level between measurements on the same specimen (Annex B)

Note 1 to entry: In this standard $\Delta(L_{pA})$ is used to compare the sound pressure level measured during environmental tests with that first measured on the same specimen during the reproducibility test.

3.1.3
equivalent sound pressure level
$L_{Aeq,T}$
the value of the sound pressure level, in dB(A), of continuous sound that, within a specified time interval, T, has the same mean-square sound pressure as a sound that varies with time

3.1.4
fire alarm sounder
sound generating device intended to signal an audible warning of fire between a fire detection and fire alarm system and the occupants of a building

3.1.5
maximum sound pressure level
$L_{AFmax,T}$
the maximum value of the sound pressure level, in dB(A), measured within a specified time interval, T and with a specified time weighting

Note 1 to entry: For application within the framework of this standard the time weighting Fast applies. Refer to EN 61672–1:2003.

This document is a preview generated by EVS