



# SLOVENSKI STANDARD

## SIST EN 54-16:2008

01-julij-2008

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**Sistemi za odkrivanje in javljanje požara ter alarmiranje - 16. del: Centrala za zvočno alarmiranje in prikazovalna oprema**

Fire detection and fire alarm systems - Part 16: Voice alarm control and indicating equipment

Brandmeldeanlagen - Teil 16: Sprachalarmzentralen

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Systèmes de détection et d'alarme incendie - Partie 16: Élément central du système d'alarme incendie vocale

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## Fire detection and fire alarm systems - Part 16: Voice alarm control and indicating equipment

Systèmes de détection et d'alarme incendie - Partie 16:  
Élément central du système d'alarme incendie vocale

Brandmeldeanlagen - Teil 16: Sprachalarmzentralen

This European Standard was approved by CEN on 20 January 2008.

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**EN 54-16:2008 (E)****Foreword**

This document (EN 54-16:2008) 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of an identical text or by endorsement, at the latest by September 2008, and conflicting national standards shall be withdrawn at the latest by March 2011.

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 essential requirements of EU Directive(s).

For relationship with EU Directive, 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*
- *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*

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- *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*
- *Part 26: Point fire detectors using carbon monoxide sensors<sup>1)</sup>*
- *Part 27: Duct smoke detectors<sup>1)</sup>*

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, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

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1) Under preparation.

**EN 54-16:2008 (E)****Introduction**

A voice alarm system used in a fire detection and fire alarm system provides, manually and/or automatically, an audible fire alarm signal within the building.

Such a fire alarm voice alarm system will require voice alarm control and indicating equipment (VACIE) (see 3.1.1) to control the alarm signal(s) and the fire alarm voice message(s). The voice alarm control and indicating equipment may be a separate unit or may be physically combined with the fire detection and fire alarm control and indicating equipment (CIE as referenced in EN 54-2).

This part of EN 54 follows closely the format and requirements of EN 54-2 and is drafted on the basis of mandatory functions which are to be provided on all voice alarm control and indicating equipment, and optional functions (with requirements) which may be provided. It is intended that the options be used for specific applications, as recommended in application guidelines.

This European Standard does not specify requirements for components of the VACIE as separate parts; they are tested as part of the voice alarm control and indicating equipment as a whole.

Each optional function is included as a separate entity, with its own set of associated requirements, in order to permit voice alarm control and indicating equipment with many different combinations of functions to comply with this European Standard. Other functions associated with fire detection and fire alarm may also be provided, even if not specified in this European Standard.

Although this European Standard does not cover emergency alarm systems for non-fire applications, it may be used as a basis for the assessment of the control and indication equipment for such systems.

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## 1 Scope

This European Standard specifies requirements, methods of test and performance criteria for voice alarm control and indicating equipment for use in fire detection and fire alarm systems installed in buildings, where the alarm signal is in the form of tone(s) or voice message(s), or both.

It also provides for the evaluation of conformity of the equipment to the requirements of this European Standard.

**NOTE** The overall requirements of a voice alarm system, especially concerning audibility and intelligibility, are not covered in this part of EN 54. The manufacturer should consider requirements of an overall system that may affect the equipment design. Such system requirements may be specified in another part of EN 54, in national legislation, codes and standards or in contractual documents.

## 2 Normative references

The following referenced documents are indispensable for the application of this standard. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

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

EN 54-2:1997, *Fire detection and fire alarm systems — Part 2: Control and indicating equipment*

EN 54-2:1997/A1:2006, *Fire detection and fire alarm systems — Part 2: Control and indicating equipment*

EN 54-4:1997, *Fire detection and fire alarm systems — Part 4: Power supply equipment*

EN 54-4:1997/A1:2002, *Fire detection and fire alarm systems — Part 4: Power supply equipment*

EN 54-4:1997/A2:2006, *Fire detection and fire alarm systems — Part 4: Power supply equipment*

<https://standards.iteh.ai/catalog/standards/sist/78599084-bcfe-4934-a118-805567f6b075m-cp-54-16-2008>  
EN 50130-4:1995, *Alarm systems — Part 4: Electromagnetic compatibility — Product family standard: Immunity requirements for components of fire, intruder and social alarm systems*

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

EN 50130-4:1995/A2:2003, *Alarm systems — Part 4: Electromagnetic compatibility — Product family standard: immunity requirements for components of fire, intruder 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 60068-2-6:1995, *Environmental testing — Part 2-6: Tests — Test Fc: Vibration (sinusoidal) (IEC 60068-2-6:1995 + Corrigendum 1995)*

EN 60068-2-47:2005, *Environmental testing — Part 2-47: Tests — Mounting of specimens for vibration, impact and similar dynamic tests (IEC 60068-2-47:2005)*

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)*

EN 60268-4:2004, *Sound system equipment — Part 4: Microphones (IEC 60268-4:2004)*

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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) – Amendment A1 (IEC 60529:1989/A1:1999)*

EN 60721-3-3:1995, *Classification of environmental conditions — Part 3: Classification of groups of environmental parameters and their severities — Section 3: Stationary use at wheatherprotected locations (IEC 60721-3-3:1994)*

EN 60721-3-3:1995/A2:1997, *Classification of environmental conditions — Part 3: Classification of groups of environmental parameters and their severities — Section 3: Stationary use at wheatherprotected locations – Amendment A2 (IEC 60721-3-3:1994/A2:1996)*

EN ISO 9001:2000, *Quality management systems — Requirements (ISO 9001:2000)*

IEC 60268-1, *Sound system equipment — Part 1: General*

**3 Terms, definitions and abbreviations****3.1 Terms and definitions**

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

**3.1.1****access level**

one of several states of a VACIE in which selected:

- controls can be operated,
- manual operations can be carried out,
- indications are visible and/or
- information can be obtained

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NOTE Further information on access level is given in Annex A.

**3.1.2****alphanumeric display**

indicator that is capable of giving information by displaying messages consisting of text and/or numeric characters

**3.1.3****cabinet**

housing which affords the degree of protection and robustness required by this standard to its constituent parts and sub-assemblies (see 13.3)

**3.1.4****earth fault**

unwanted connection between earth potential and any part of the VACIE, transmission paths to the VACIE, or transmission paths between parts of the VACIE

**3.1.5****emergency microphone**

microphone for use by the fire service or other responsible persons as part of a voice alarm system

**3.1.6****emergency microphone control**

manual control which activates an emergency microphone

NOTE Often called a "push to talk" control (PTT).

### 3.1.7

#### field

sub-division of a window of an alphanumeric display

### 3.1.8

#### functional condition

condition of the VACIE characterized by its indication at the VACIE

NOTE The functional conditions recognized in this European Standard are:

- the voice alarm condition (see 3.1.25),
- the fault warning condition, when a fault is indicated,
- the disabled condition, when the disablement of functions is indicated,
- the quiescent condition, when the VACIE is powered by a power supply conforming to EN 54-4 and no other functional condition is indicated.

### 3.1.9

#### indicator

device which can change its state to give information

### 3.1.10

#### mandatory

adjective used to describe:

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- functions which shall be provided on all VACIEs and the requirements of these functions and
- the requirements of optional functions with requirements, if these are provided

### 3.1.11

#### non-volatile memory

memory elements that do not require the presence of an energy source for the retention of their contents

### 3.1.12

#### octave

frequency band as defined in EN 61260

### 3.1.13

#### output power

maximum squared RMS output voltage divided by the minimum load resistance that can be maintained for a 1 kHz sinusoidal signal of specified duration, for a specified THD

### 3.1.14

#### program

software necessary for a VACIE to comply with at least the requirements of this European Standard, including initialising data, reset and interrupt vectors, operating code and variables

### 3.1.15

#### reset

operation capable of terminating the voice alarm condition and/or the fault warning condition

### 3.1.16

#### running data

alterable data subject to temporary modification during operation, either automatically or by manual controls

**EN 54-16:2008 (E)****3.1.17****silencing**

switching off an audible signal of a sounding device that is capable of being re-sounded by a new event

**3.1.18****site specific data**

alterable data required for the VACIE to operate in a defined system configuration

**3.1.19****voice alarm transmission path**

physical connection, external to the cabinet of the VACIE, for the transmission of information and/or power between parts of a VACIE contained in different cabinets and between the VACIE and other components of a voice alarm system, as defined in EN 54-1

**3.1.20****voice alarm condition**

when any fire alarm signal, recorded or live, is broadcast in at least one voice alarm zone

**3.1.21****voice alarm output control**

manual control which can be used to cause a voice alarm zone or group of voice alarm zones to sound an audible voice alarm signal

**3.1.22****voice alarm control and indicating equipment**

component of a voice alarm system that generates and transmits voice alarm signals to loudspeaker circuit(s) when it receives alarm signal(s) from a fire detection and alarm system and/or manual controls

NOTE See Annex D for further information.

**3.1.23****voice alarm signal**

audible fire alarm signal within the building, comprising a tone and/or a voice message

**3.1.24****voice alarm zone**

distinct geographic area containing a group of voice alarm loudspeakers intended to give the same voice alarm signal

**3.1.25****volatile memory**

memory elements that require the presence of an energy source for the retention of their contents

**3.1.26****window**

area of the alphanumeric display used for information relating to one functional condition at a given time

**3.2 Abbreviations**

For the purpose of this document, the following abbreviations apply.

CIE	control and indicating equipment (item B of Figure 1 in EN 54-1:1996)
PSE	power supply equipment (item L of Figure 1 in EN 54-1:1996)
RMS	root mean square (e.g. of a signal)
S/N	signal-to-noise ratio

THD	total harmonic distortion
VACIE	voice alarm control and indicating equipment

## 4 General requirements

### 4.1 General

**4.1.1** If an optional function with requirements is included in the VACIE, then all the corresponding requirements shall be met. Annex B gives an overview of these optional functions with requirements.

**4.1.2** If functions other than those specified in this European Standard are provided for the VACIE, they shall not jeopardize compliance with any requirements of this European Standard.

### 4.2 Combined VACIE and CIE

When the VACIE and CIE are combined they may share common indications, manual controls and outputs (see Annex F). In this case, the following shall apply:

- a) a single fault in the CIE shall not adversely affect the mandatory functions of the VACIE;
- b) indication(s) and manual control(s) of the voice alarm condition shall be clearly identifiable, with the exception of the optional audible warning.

### 4.3 Power supply

Power supply equipment, external or included in the VACIE, shall comply with the requirements of EN 54-4.

**NOTE** The power supply may be shared with that of the fire detection and fire alarm system.

## 5 General requirements for indications

### 5.1 Display and functional conditions

**5.1.1** The VACIE shall be capable of unambiguously indicating the following functional conditions, as described in Clauses 6 to 9:

- quiescent condition;
- voice alarm condition;
- fault warning condition;
- disablement condition (option with requirements).

**5.1.2** The VACIE shall be capable of being simultaneously in any combination of the following functional conditions on different voice alarm zones:

- voice alarm condition;
- fault warning condition;
- disablement condition (option with requirements).

**EN 54-16:2008 (E)****5.2 Indication display**

All mandatory indications shall be clearly identifiable, except where otherwise specified in this European Standard.

**5.3 Indication on alphanumeric displays**

Where an alphanumeric display is used to display indications relating to different functional conditions these may be displayed at the same time. However, for each functional condition there shall be only one window, in which all of the information relating to that functional condition is grouped.

**5.4 Indication of the supply of power**

**5.4.1** A visible indication shall be given by means of a separate discrete light emitting indicator while the VACIE is supplied with power.

**5.4.2** Where the VACIE is distributed in more than one cabinet, an indication of supply of power to the cabinet shall be given on each distributed cabinet.

**5.5 Additional indications**

Where additional indications are provided, they shall be clearly identifiable and shall not override the primary indication of the VACIE.

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**6 The quiescent condition**

Any kind of system information may be displayed during the quiescent condition. However, no indications shall be given which could be confused with indications Used in 54-16:2008

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- the voice alarm condition, or
- the fault warning condition, or
- the disablement condition (option with requirements).

**7 The voice alarm condition****7.1 Reception and processing of fire signals**

**7.1.1** The VACIE shall be capable of receiving and processing alarm signals from the CIE or from manual control on the VACIE or both, and causing the appropriate voice alarm outputs to be activated within 3 s or on expiry of any delay period (see 7.4).

NOTE See Annex E for additional information relating to the interface between the VACIE and the CIE.

**7.1.2** The mandatory indications and/or outputs shall not be falsified by multiple alarm signals received simultaneously from the CIE and/or manual controls.

**7.1.3** Where the VACIE and CIE are in separate cabinets, failure of the transmission path between the CIE and the VACIE shall not result in any loss of control or any change of state of the VACIE, unless option 8.3 is used.

## 7.2 Indication of the voice alarm condition

**7.2.1** The presence of a voice alarm condition shall be indicated on the VACIE, without prior manual intervention, by:

- a) a visible indication by means of a separate discrete light emitting indicator (the General Voice Alarm Activated indicator) and
- b) a visible indication for each activated voice alarm zone where manual controls are provided (see 10.2);

NOTE This may be by means of separate discrete indicators or an alphanumeric display as specified in 13.8.

- c) an optional audible indication, as specified in 7.3.

**7.2.2** The audible warning shall be capable of being silenced at access level 1 or 2.

## 7.3 Audible warning (option with requirements)

The audible warning of the voice alarm condition (see 7.2.1 c)) may be the same as that for the fault warning condition. If they are different, the voice alarm condition warning shall have priority.

## 7.4 Delays to entering the voice alarm condition (option with requirements)

The VACIE may be provided with a facility to introduce a delay before entering the voice alarm condition. In this case:

- a) the operation of the delay shall be selectable at access level 3;
- b) the operation of the delay shall be in increments not exceeding 1 min up to a maximum of 10 min;
- c) the delay to one output signal shall not affect the delay to other outputs;
- d) it shall be possible to override the delay by a manual operation at access level 1;
- e) there shall be provision to switch on and switch off delays by means of a manual operation at access level 2 (see Annex A for information on access levels);
- f) there may be provision to automatically switch on and/or switch off delays by means of a programmable timer which shall be configurable at access level 3;
- g) a separate discrete light emitting indicator and/or a field on the alphanumeric display shall be visible when a fire signal is received and the delay activated. This indication shall be suppressed when the VACIE enters the voice alarm condition.

## 7.5 Phased evacuation (option with requirements)

The VACIE may have a provision to phase the warning signals to the emergency loudspeaker zones. The facility shall be configurable at access level 3. There may be provision to switch on and switch off the phased evacuation sequence by means of a manual operation at access level 2 (see Annex A for information on access levels).

## 7.6 Silencing of the voice alarm condition

### 7.6.1 Silencing of the voice alarm condition from the CIE

**7.6.1.1** Where the voice alarm condition has been triggered from the CIE, the VACIE shall respond appropriately to a silence instruction from the CIE.