



**SLOVENSKI STANDARD**  
**SIST EN 50849:2018**

**01-februar-2018**

**Nadomešča:**  
**SIST EN 60849:1999**

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**Elektroakustični sistemi za opozarjanje v nevarnosti**

Sound systems for emergency purposes

Elektroakustische Notfallwarnsysteme

Systemes électroacoustiques pour services de secours

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**Ta slovenski standard je istoveten z: ~~SIST EN 50849~~ EN 50849:2017**

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**ICS:**

13.320	Alarmni in opozorilni sistemi	Alarm and warning systems
33.160.30	Avdio sistemi	Audio systems

**SIST EN 50849:2018**

**en,fr,de**

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EUROPEAN STANDARD

**EN 50849**

NORME EUROPÉENNE

EUROPÄISCHE NORM

March 2017

ICS 13.320

Supersedes EN 60849:1998

English Version

## Sound systems for emergency purposes

Systèmes électroacoustiques pour situations d'urgence

Elektroakustische Notfallwarnsysteme

This European Standard was approved by CENELEC on 2016-11-07. CENELEC 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.

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European Committee for Electrotechnical Standardization  
Comité Européen de Normalisation Electrotechnique  
Europäisches Komitee für Elektrotechnische Normung

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

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**EN 50849:2017 (E)****European foreword**

This document (EN 50849:2017) has been prepared by CLC/BTTF 133-1 “Sound systems for emergency purposes which are not part of fire detection and alarm systems”.

The following dates are fixed:

- latest date by which this document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) [2018-03-03]
- latest date by which the national standards conflicting with this document have to be withdrawn (dow) [2020-03-03]

This document supersedes EN 60849:1998.

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

EN 50849:2017 includes the following significant technical changes with respect to EN 60849:1998:

- Annex A, Measurement of speech intelligibility, has been brought up to date in line with EN 60268-16;
- emergency sound systems for use in case of a fire emergency are excluded from the scope of this standard.

Emergency sound systems for use in case of fire emergency are covered by CEN/TS 54-32 [1], EN 54-16 and by national, regional or local regulations [2].

Components that have been certified to EN 54-16 [2] and EN 54-24 [3] can be expected to be suitable for use in a sound system for emergency purposes that complies with this standard.

CEN/TS 54-32 provides guidance for sound systems for emergency purposes which are to be used for evacuation in case of a fire emergency.

## Introduction

This European Standard introduces a new approach to the assessment of system intelligibility compared with EN 60849, the standard on which it is based.

Over recent years, the Speech Transmission Index STI has been the most commonly used method for determining intelligibility of emergency sound systems. Other methods have rarely been applied. For this reason, it was decided to express the required intelligibility score by using the STI scale. The intelligibility requirements in 5.1 and Annex A have been changed in line with this.

Furthermore, the RASTI measurement method has been removed from this standard because it does not give accurate results.

This residual standard based on EN 60849 is intended to remove any requirements that conflict with the EN 54 series of fire detection and fire alarm standards, including EN 54-16 for voice alarm systems control and indicating equipment and EN 54-24 for voice alarm systems loudspeakers.

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**EN 50849:2017 (E)****1 Scope**

This European Standard specifies the performance requirements for sound systems which are primarily intended to broadcast information for the protection of lives within one or more specified areas in an emergency. It also gives the characteristics and the methods of test necessary for the specification of the system.

This European Standard applies to sound reinforcement and distribution systems to be used to effect a rapid and orderly mobilization of occupants in an indoor or outdoor area in an emergency, including systems using loudspeakers to broadcast voice announcements for emergency purposes and attention-drawing or alarm tone signals.

This European Standard does not apply to emergency sound systems used for evacuation in case of fire emergency, whether connected to a fire detection and fire alarm system or not.

NOTE 1 The use of the system for normal sound reinforcement and distribution systems purposes under non-hazardous circumstances is not excluded.

It is recommended that the system, when used for emergency purposes, should form part of a complete facility (equipment, operating procedures and training programmes) for the control of emergencies.

NOTE 2 Sound systems for emergency purposes may be the subject of approval by relevant authorities.

**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 60065, *Audio, video and similar electronic apparatus - Safety requirements* (IEC 60065)

EN 60068-1, *Environmental testing - Part 1: General and guidance*

EN 60079 (all parts), *Explosive atmospheres* (IEC 60079 series)

EN 60268-16, *Sound system equipment - Part 16: Objective rating of speech intelligibility by speech transmission index*

IEC 60364 (all parts), *Low-voltage electrical installations*

**3 Terms and definitions**

For the purpose of this document, the following terms and definitions apply.

**3.1****alarm**

signal, or condition, warning of an emergency

**3.2****area of coverage**

area, inside and/or outside a building, where the system meets the requirements laid down in this standard

Note 1 to entry: Certain parts of an area of coverage may be excluded, see 5.1.



### 3.3

#### **audibility**

property of sound which allows it to be heard among other sounds

Note 1 to entry: At present for objective analysis, for example when using the STI equation (see EN 60268–16), the concept of audibility takes account of the relative loudness and frequency content of the sound in comparison with other sounds present at the same time.

### 3.4

#### **clarity**

property of a sound which allows its information-bearing components to be distinguished by a listener

Note 1 to entry: It is related to the freedom of the sound from distortion of all kinds. There are three kinds of distortion involved in the reduction of clarity of a speech signal in an electro acoustic system:

- a) amplitude distortion, due to nonlinearity in electronic equipment and transducers;
- b) frequency distortion, due to non-uniform frequency response of transducers and selective absorption of high frequencies in acoustic transmission;
- c) time domain distortion, due to reflection and reverberation in the acoustic domain.

### 3.5

#### **critical signal path**

physical connection, external to the cabinet of the emergency sound system, for the transmission of information and/or power between parts of an emergency sound system contained in different cabinets

### 3.6

#### **danger**

risk of harm or damage

### 3.7

#### **emergency**

imminent risk or serious threat to persons or property

### 3.8

#### **emergency loudspeaker zone**

part of the area of coverage to which emergency information can be given separately

### 3.9

#### **information**

speech or intended audio signal

### 3.10

#### **intelligibility**

measure of the proportion of the content of a speech message that can be correctly understood

Note 1 to entry: Satisfactory intelligibility requires adequate audibility and adequate clarity.

### 3.11

#### **loudspeaker zone**

part of the area of coverage to which information can be given separately

### 3.12

#### **acoustically different area**

#### **ADA**

subdivision of an emergency loudspeaker zone, that may be an enclosed or otherwise physically defined space, characterised by an individual reverberation time and/or ambient noise level

**EN 50849:2017 (E)****3.13****warning**

important notice concerning any change of status which demands attention or activity

**3.14****attention–drawing-signal**

tone that is broadcasted to attract attention at the start of an emergency message

Note 1 to entry: The level of the attention-drawing-signal is measured using the A-weighted equivalent continuous sound pressure level method,  $L_{A,eqT}$ .

**4 General system requirements****4.1 Principal features**

A sound system for emergency purposes shall permit the broadcasting of intelligible information of measures to be taken for the protection of lives within one or more specified areas of coverage.

The following criteria shall be fulfilled:

- a) When any alarm occurs, the system shall immediately disable or override any functions not connected with its emergency role (such as paging, music or general pre-recorded announcements being broadcast to the loudspeaker zones requiring emergency broadcasts), except where specifically required, and agreed by the interested parties.
- b) Unless damaged as a result of the emergency or undergoing repair or maintenance, the system shall be available for operation at all times (or as required by the system specification). In the event of unavailability due to repair or maintenance, suitable provisions shall be made for alternative methods of communication under all prevailing circumstances until the system is restored to full functionality.
- c) The system shall be capable of broadcasting a first attention-drawing signal within 3 s of being placed in an emergency mode by the operator, or automatically on receipt of a signal from an emergency detection system. In the latter case, the period of 3 s does not include the reaction time of the detection system from the time the emergency is first detected, to commanding the alarm broadcast.
- d) The system shall be able to broadcast attention-drawing signals and speech messages to one or more areas simultaneously. There shall be at least one appropriate attention-drawing signal alternating with one or more speech messages for this purpose.
- e) At any time the system operator shall be able to receive, by means of a monitoring system, indications of the correct functioning or, otherwise, indications of failures in the critical signal path (see also 5.2 and 5.3). The monitoring system shall indicate the failure of an amplifier or of a loudspeaker circuit.
- f) Failure of a single amplifier or loudspeaker circuit shall not result in loss of coverage in more than one loudspeaker zone.
- g) An attention-drawing signal shall precede the first message for 4 s to 10 s. Successive signals and messages shall then continue until either changed in accordance with the evacuation procedure, or until manually silenced. The interval between successive messages shall not exceed 30 s and attention-drawing signals shall be broadcast whenever periods of silence might otherwise exceed 10 s. Where more than one attention-drawing signal is used, such as those used for different types of emergency, each signal shall be clearly distinguishable in character.

- h) All messages shall be clear, short, unambiguous and as far as practicable, pre-planned. Where pre-recorded messages are used, they shall be held in a non-volatile solid-state store, and be continuously monitored for availability. The system design shall make it inherently impossible for an external source to corrupt or derange the store or its contents.
- i) The content of all messages and the language(s) used shall be specified and/or approved by the purchaser or his representatives or the relevant authorities or both.
- j) The system shall be capable of being divided into emergency loudspeaker zones if required by the evacuation procedure.
- k) In determining loudspeaker zones, the following criteria shall apply:
  - 1) the intelligibility of messages broadcast in one zone shall not be reduced below the requirement of 5.1 by the broadcasting of messages in other zones or from more than one source;
  - 2) no emergency detection zone shall contain more than one emergency loudspeaker zone. For non-emergency use, a loudspeaker zone may be subdivided.
- l) A secondary power source shall be available (see 5.6).

## 4.2 Responsible person

The person or body having control of the premises shall nominate a "responsible person", identified by name or job title, who shall be responsible for ensuring that the system is properly maintained and repaired such that it continues to operate as specified.

The responsible person shall be appropriately trained and have the authority and resources to carry out the task effectively.

## 4.3 Priorities

### 4.3.1 Classification of priorities

It is necessary to decide upon an order of priority for the message distribution based upon:

- any automatic programmed response;
- the perceived risk to occupants, which may require manual override of the programmed response.

Events shall be given a level of priority according to their urgency. The following primary levels are recommended but there may be advantages in adding further subgroups, depending on the operational strategies of the site:

- a) evacuate – potentially life-threatening situation needing immediate evacuation;
- b) alert – dangerous situation nearby requiring warning of impending evacuation;
- c) non-emergency – operational messages, e.g. system test, etc.

The use of these levels in descending order of priority will ensure that appropriate alarm signals and messages are provided first to the zones immediately at risk.