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Emergency voice communication (EVC) systems – Components – Specification

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Foreword

Publishing information

This British Standard is published by BSI Standards Limited, under licence from The British Standards Institution, and came into effect on 31 March 2024. It was prepared by Subcommittee FSH/12/5, *Alarm devices, voice alarm evacuation sub-systems and emergency voice communications*, under the authority of Technical Committee FSH/12, *Fire detection and alarm systems*. A list of organizations represented on these committees can be obtained on request to the committee manager.

Relationship with other publications

This is a new product specification for components of emergency voice communication (EVC) systems. Recommendations for the design, installation, commissioning and maintenance of such systems are given in [BS 5839-9](#), which is expected to be revised in due course to remove the product-specific recommendations that now appear in BS 8893 as requirements.

Information about this document

The requirements in this British Standard are derived from the product recommendations for emergency voice communication systems in [BS 5839-9:2021](#), with the environmental tests taken from the [BS EN 54](#) series.

It is not intended to introduce additional functional requirements in this first edition of the new specification, although they might be introduced in future.

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Where websites and webpages have been cited, they are provided for ease of reference and are correct at the time of publication. The location of a webpage or website, or its contents, cannot be guaranteed.

Use of this document

It has been assumed in the preparation of this British Standard that the execution of its provisions will be entrusted to appropriately qualified and experienced people, for whose use it has been produced.

Presentational conventions

The provisions of this document are presented in roman (i.e. upright) type. Its requirements are expressed in sentences in which the principal auxiliary verb is “shall”.

Commentary, explanation and general informative material is presented in smaller italic type, and does not constitute a normative element.

Requirements in this document are drafted in accordance with the *Rules for the structure and drafting of UK standards:2022*, subclause **G.1.1**, which states, “Requirements shall be expressed using wording such as: ‘When tested as described in Annex A, the product shall ...’”. This means that only those products that are capable of passing the specified test will be deemed to conform to this standard.

Where words have alternative spellings, the preferred spelling of the *Shorter Oxford English Dictionary* is used (e.g. “organization” rather than “organisation”).

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1 Scope

This British Standard specifies requirements and gives test methods for components of emergency voice communication (EVC) systems.

This British Standard does not cover design, installation, commissioning or maintenance of EVC systems.

NOTE These aspects are covered in [BS 5839-9](#).

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes provisions, or limits the application, of this document¹⁾. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

[BS EN 54-4](#), *Fire detection and fire alarm systems – Part 4: Power supply equipment*²⁾

[BS EN 50130-4:2011+A1:2014](#), *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*

[BS EN 60068-1](#), *Environmental testing – Part 1: General and guidance*

[BS EN 60068-2-1:2007](#), *Environmental testing – Part 2-1: Tests – Tests A: Cold*

[BS EN 60068-2-2:2007](#), *Environmental testing – Part 2-2: Tests – Test B: Dry heat*

[BS EN 60068-2-6](#), *Environmental testing – Part 2-6: Tests – Test Fc: Vibration (sinusoidal)*

[BS EN 60068-2-27](#), *Environmental testing – Part 2-27: Tests – Test Ea and guidance: Shock*

[BS EN 60068-2-30:2005](#), *Environmental testing – Part 2-30: Tests – Test Db: Damp heat, cyclic (12 h + 12 h cycle)*

[BS EN 60068-2-42](#), *Environmental testing – Part 2-42: Tests – Test Kc: Sulphur dioxide test for contacts and connections*

[BS EN 60068-2-47](#), *Environmental testing – Part 2-47: Tests – Mounting of specimens for vibration, impact and similar dynamic tests*

[BS EN 60068-2-75:1997](#), *Environmental testing – Part 2-75: Tests – Test Eh: Hammer tests*

[BS EN 60068-2-78](#), *Environmental testing – Part 2-78: Tests – Test Cab: Damp heat, steady state*

[BS EN 60268-7:2011+A1:2020](#), *Sound system equipment – Part 7: Headphones and earphones*

[BS EN 60529:1992+A2:2013](#), *Degrees of protection provided by enclosures (IP code)*

[BS EN 61672-1:2013](#), *Electroacoustics – Sound level meters – Part 1: Specifications*

[BS EN IEC 60118-4](#), *Electroacoustics – Hearing aids – Part 4: Induction-loop systems for hearing aid purposes – System performance requirements*

[BS EN IEC 60268-4:2018](#), *Sound system equipment – Part 4: Microphones*

[BS ISO 3864-4](#), *Graphical symbols – Safety colours and safety signs – Part 4: Colorimetric and photometric properties of safety sign materials*

¹⁾ Documents that are referred to solely in an informative manner are listed in the Bibliography.

²⁾ This document also gives an informative reference to [BS EN 54-4:1998](#) (incorporating Amendments Nos. 1 and 2).

3 Terms and definitions

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

3.1 access level

one of several states of a EVCIE in which selected:

- a) controls can be operated;
- b) manual operations can be performed;
- c) indications are visible; and/or
- d) information can be obtained

NOTE Further information on access levels is given in [Annex A](#).

3.2 emergency voice communication (EVC) system

system that allows voice communication in either direction between a central control point and a number of other points throughout a building or building complex, for use particularly in a fire emergency

3.3 emergency voice communication, control and indicating equipment (EVCIE)

component or components of an EVC system through which outstations are connected and powered, and which optionally has controls and a handset for communicating with outstations

NOTE In large buildings or building complexes, there might be several EVCIEs communicating with each other.

3.4 EVC mode

status of a system whereby communication is taking place between Type A, Type B or Type C outstations and a master station

3.5 group call

call made from a master station to more than one outstation simultaneously

3.6 handset

part of a telephone, combining receiver and transmitter, one at each end of a handle

3.7 master station

control unit located at a central control point which controls an EVC system

NOTE In large buildings or building complexes, there might be several master stations that can communicate with each other.

3.8 non-EVC mode

status of a system whereby communication can take place between devices other than Type A, Type B or Type C outstations and the master station

NOTE Non-EVC functions typically include help points, lift intercoms and accessible toilet alarms.

3.9 off-hook

status of a handset when removed from its normal rest position to initiate an outgoing call or receive an incoming call

3.10 on-hook

status of a handset when in its normal rest position, terminating a call or permitting notification of an incoming call

3.11 on hold

<off-hook outstation> no longer connected to speech, but receiving a confidence tone to reassure that the outstation is still operational, and the call is registered at a master station

3.12 outstation

unit, located at a strategic point in a building or building complex, that allows two-way voice conversation with a master station

NOTE There are three types of outstation:

- a) Type A, which incorporates a telephone style handset;
- b) Type B, which is hands-free with a fixed microphone and adjacent loudspeaker; and
- c) Type C, which is a combined Type A and Type B outstation.

3.13 voltage standing wave ratio

measure of how efficiently radio-frequency power is transferred to an antenna system

4 Requirements

COMMENTARY ON CLAUSE 4

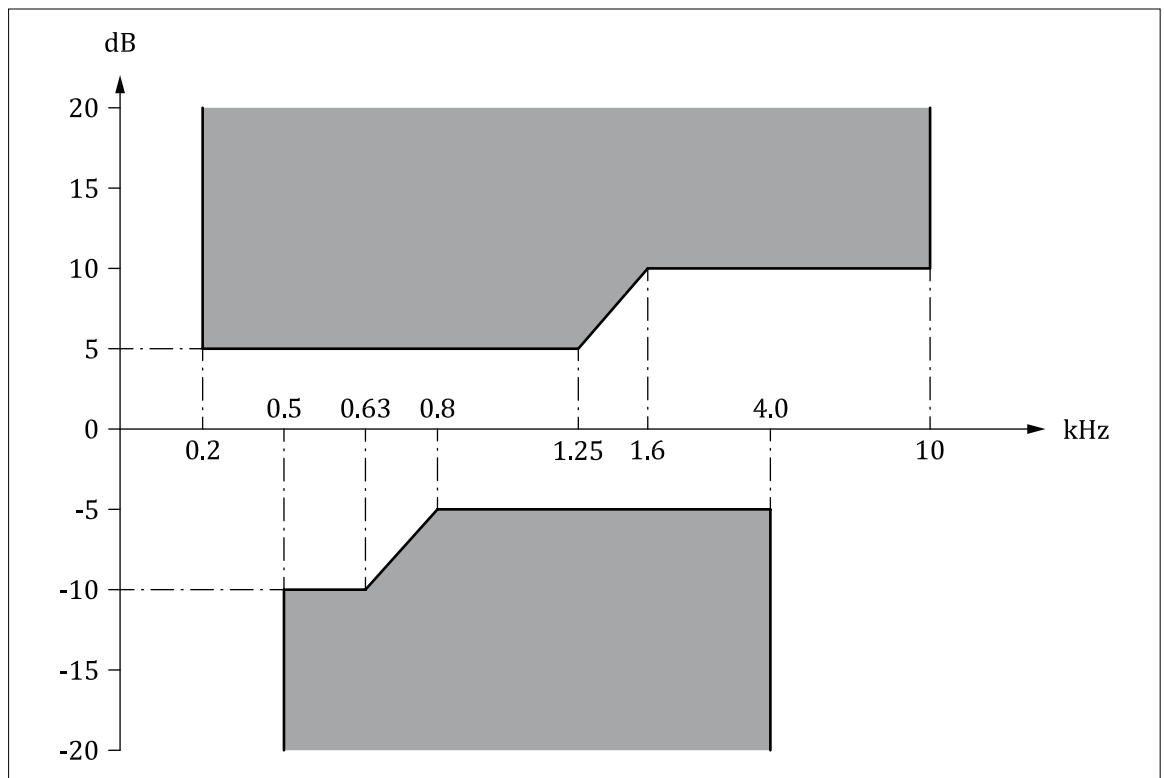
Some of the functions covered in this clause are required for all EVC systems, and some are optional. Where an optional function is selected, the corresponding requirements are applicable. [Annex B](#) gives an overview of the optional functions and their subclause references.

4.1 Overall system requirements

COMMENTARY ON 4.1

The purpose of an EVC system is to communicate between the EVCIE and outstations, not outstation to outstation, except where an EVCIE has performed a group call. Communication is normally initiated from the outstation.

- 4.1.1** When a call is initiated, either at an outstation or at an EVCIE, the incoming call warning indication at the receiving end shall operate within 3 s of the initiation.
- 4.1.2** If any outstation is in use, this shall not affect the operation of any other outstation on the system.
- 4.1.3** The path of audio through the EVCIE, either from incoming audio from an outstation to the earpiece of the EVCIE master or from the microphone to the loudspeaker on the outstations, shall have a variation of not more than ± 5 dB across the frequency range 500 Hz to 4 kHz. When tested in accordance with [5.2](#), the frequency response shall not fall into the shaded area shown in [Figure 1](#).

Figure 1 — *Frequency response requirements between a telephone handset and an outstation*

4.2 Transmission paths

4.2.1 General

4.2.1.1 An EVC system shall be interconnected by at least one of the following methods:

- a) radially connected (see 4.2.2);
- b) loop-connected (see 4.2.3); and
- c) wireless-linked (see 4.2.4).

4.2.1.2 A fault at any one outstation shall not affect the operation of any other outstation on the system.

4.2.1.3 All outstation faults shall be indicated within 100 s of occurrence.

4.2.1.4 Any interface which allows non-EVC equipment to connect to the EVC system shall not affect the operation of the EVC system.

4.2.2 Radially connected EVC systems

For radially connected systems, if a transmission path fault occurs, an individual fault indication shall be given at the EVCIE for that specific radial link.

4.2.3 Loop-connected EVC systems

For loop-connected systems, any single transmission path fault shall be identified at the EVCIE.

4.2.4 Wireless-linked EVC systems

For wireless-linked systems, if a transmission path fault occurs, an individual fault indication shall be given at the EVCIE for that specific wireless link.

4.3 EVCIE mandatory indicators

The EVCIE shall have the following indicators.

- a) General fault. This indicator shall light yellow on the occurrence of any fault on the EVC system.
- b) Fault audible warning within each EVCIE. The sound level shall be not less than 50 dB(A) at 1 m from the master station, when measured with an instrument conforming to [BS EN 61672-1:2013](#), any group, either Class 1 or Class 2, with time weighting (slow).
- c) Call from an outstation. This indicator shall light red on the occurrence of any call from an outstation to the EVCIE.

NOTE 1 This indication may be made by, for an example, an LED or a display.

- d) Primary power supply. This indicator shall light green to show that the primary power supply is healthy on the EVCIE.
- e) System fault (for program-controlled systems). In the event of a system fault, as defined in [4.9](#), the following requirements shall be met:
 - 1) the system fault shall be visibly indicated by means of the general fault warning indicator and a separate light emitting indicator on the EVCIE; and
 - 2) the system fault shall be audibly indicated.

NOTE 2 This indication may be capable of being silenced.

- f) Audible incoming call. A common audible warning of an incoming call shall be provided within the EVCIE master station. The sound level shall be not less than 50 dB(A) at 1 m from the master station, when measured with an instrument conforming to [BS EN 61672-1:2013](#), any group, either Class 1 or Class 2, with time weighting (slow). The type of sound from this audible fault warning device shall be different from that of the audible fault warning device recommended in [4.3b](#)).

4.4 EVCIE call indicators and controls

4.4.1 The following controls and indicators shall be provided on the EVCIE to control conversations with outstations.

- a) An “accept call” switch shall be provided to receive a call from each outstation individually or by another device fulfilling the same function, e.g. scrolling graphic or alphanumeric display and accept/make call switch.
- b) Where the EVC system has the facility to call outstations, additional controls shall be provided as follows:
 - 1) a “make call” switch, or similar device fulfilling the same function, to initiate a call to each outstation individually;
 - 2) a visual indicator at each “make call”, “all call” or “group call” switch. The appropriate indicator or display shall be red in colour, in pulsing mode (lighting for a minimum of 0.5 s every 5 s), when an outgoing call is initiated via the “make call” switch. An indication shall be given when the outstation(s) called becomes off-hook. Cancellation of the call at the master station shall cause each appropriate indication to revert to the previous state until the outstation called becomes on-hook, at which point it shall extinguish; and

NOTE 1 This indication is typically made by changing from red to green (pulsing).

3) when an outgoing call has been initiated, this shall be audibly indicated at the EVCIE.

NOTE 2 The following optional switches may also be provided:

- “group call” switches, to allow calls to be made from the master station to particular groups of outstations; and
- an “all call” switch, to allow a call to be made from the master station to all outstations connected to it.

NOTE 3 For Type A outstations, the handset might have to be lifted in order to hear what is being said.

NOTE 4 Each “make call” and “accept call” switch may be combined.

- c) An arrangement shall be provided for placing one or more outstations on hold, removing the conversation with the outstations, without placing the outstations in the on-hook or quiescent condition. A means shall be provided of informing outstation users that they have been placed on hold.
- d) Where the EVCIE has a method of broadcasting to the loudspeaker on an outstation(s), a green visual indicator shall be provided at the EVCIE to indicate which outstation(s) are being broadcast to. This indicator shall illuminate while the “broadcast” facility is operational.
- e) Where the EVCIE has a method of listening to the microphone on an outstation, a green visual indicator shall be provided at the EVCIE to indicate which outstation(s) are being listened to. This indicator shall illuminate while the “listen” facility is operational.

4.4.2 All the indications referred to in 4.4.1 shall be readily distinguishable as to their functions, e.g. “make call”, “accept call” or “outstation off-hook”.

NOTE Some or all of the indicators referred to in 4.4.1 may take the form of one or more graphic or alphanumeric displays, instead of, for example, individual LEDs. The graphic or alphanumeric display(s) may then indicate such functions by appropriate text and/or numerals.

4.5 EVCIE fault monitoring and indication

4.5.1 The following conditions shall be monitored and indicated by yellow visual fault indicators, and/or a graphic or alphanumeric display, within 100 s of occurrence of a fault, regardless of whether the EVC system is in EVC mode or non-EVC mode:

- a) EVCIE power supply fault indications as required by BS EN 54-4;
 - b) rupture of any fuses or operation of automatic circuit breaker, isolator or protective devices that could prevent voice communication in an emergency;
 - c) failure of any transmission path including any radio link or open-circuit or short-circuit fault;
 - d) open-circuit and short-circuit faults on interconnecting cabling linking any outstation to any EVCIE, including any cables between a handset and outstation enclosure;
 - e) open-circuit and short-circuit faults on interconnecting cabling or failure of any transmission path linking any EVCIE cabinet to any other EVCIE cabinet; and
- NOTE The faults in items d) and e) may be indicated by a common visual indicator.*
- f) any earth fault on interconnecting cabling linking any outstation to any EVCIE, where this fault would inhibit any mandatory function of the system.

4.5.2 Where a fault indication is suppressed during emergency use, the indication shall be reasserted within 100 s of cessation of emergency use.