

INTERNATIONAL STANDARD

NORME INTERNATIONALE



**Building intercom systems –
Part 1-1: System requirements – General**

**Systèmes d'interphone de bâtiment –
Partie 1-1: Exigences du système – Généralités**

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**Systèmes d'interphone de bâtiment –
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Full information on the voting for the approval of this standard can be found in the report on voting indicated in the above table.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of all parts in the IEC 62820 series, published under the general title *Building intercom systems*, can be found on the IEC website.

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INTRODUCTION

This part of IEC 62820 specifies the technical requirements for building intercom systems and equipment used for building entry. Building intercom systems can function independently and may be extendable to support building security management functions, e.g. extendable with security management unit (SMU) operated by security staff (door-man, concierge, security-guard, porter, etc.), or in conjunction with other systems as per the security requirements of the building. It may consist of: Visitor call unit (VCU), user receiver unit (URU), SMU, power supply, auxiliary device as well as interface-unit to other security-systems.

The IEC 62820 series of standards set out the technical requirements for the composition, functions, performance, test methods of building intercom systems for building entry and application guidelines and consist of five parts:

Part 1-1: System requirements – General

Part 1-2: System requirements – IP building intercom systems

Part 2: Requirements for advanced security building intercom systems

Part 3-1: Application guidelines – General

Part 3-2: Application guidelines – Advanced security building intercom systems

The Part 1-1 of IEC 62820 is based on Chinese standard GB/T 31070.1-2014 and European standard EN 50486:2008.

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BUILDING INTERCOM SYSTEMS –

Part 1-1: System requirements – General

1 Scope

This Part of IEC 62820 specifies the technical requirements for the composition, functions, performance, and test methods of general building intercom systems.

This part is applicable to the general intercom systems for building entry in residential or commercial buildings.

Door-Entry-System (DES) is a simple kind of convenient Building-Intercom-System (BIS) mainly for user's comfort. This document has classified the general building intercom systems into two grades in Part 1-1. Grade 1 adopts lower requirements to cover DES not used for relevant security applications while grade 2 adopts higher requirements for building intercom systems for security applications. Each grade may adopt different functional and performance requirements, test methods and normative references.

NOTE The different requirements between grade 1 and grade 2 are summarized in Table C.1.

2 Normative references

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

IEC 60065:2014, *Audio, video and similar electronic apparatus – Safety requirements*

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

IEC 60529:1989/AMD1:1999

IEC 60529:1989/AMD2:2013

IEC 60950-1:2005, *Information technology equipment – Safety – Part 1: General requirements*

IEC 61000-6-1, *Electromagnetic compatibility (EMC) – Part 6-1: Generic standards – Immunity for residential, commercial and light-industrial environments*

IEC 61000-6-3, *Electromagnetic compatibility (EMC) – Part 6-3: Generic standards – Emission standard for residential, commercial and light-industrial environments*

IEC 62262, *Degrees of protection provided by enclosures for electrical equipment against external mechanical impacts (IK code)*

IEC 62599-1, *Alarm systems – Part 1: Environmental test methods*

IEC 62599-2, *Alarm systems – Part 2: Electromagnetic compatibility – Immunity requirements for components of fire and security alarm systems*

ISO 12233:2014, *Photography – Electronic still picture imaging – Resolution and spatial frequency responses*

ITU-T P.50, *Artificial voices*

ITU-T P.51-1996, *Artificial mouth*

ITU-T P.79-2007, *Calculation of loudness ratings for telephone sets*

ITU-T P.501, *Test signals for use in telephonometry*

3 Terms, definitions and abbreviations

3.1 Terms and definitions

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

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <http://www.iso.org/obp>

3.1.1

2-way speech

speech between any two units (VCU, URU or SMU) in each direction which may be simultaneous or non-simultaneous

3.1.2

acoustic distortion

distortion of signals at the receiving terminal of the system as a result of system transmission non-linearity and ground noise, expressed as a ratio percentage of the harmonic signal and ground noise at the receiving terminal in proportion to the overall sound pressure

3.1.3

acoustic pressure level

measurement of the acoustic pressure level generated by the equipment under test (EUT) in normal conditions

3.1.4

artificial ear

device used to calibrate the receiver and containing an acoustic coupler and a calibrated microphone used to measure sound pressure

Note 1 to entry: Its overall acoustic impedance within a given frequency band is similar to that of the average human ear, and its characteristics comply with the requirements of type 1 or type 3.2 provided by Article 5 of ITU-T P.57-2011.

3.1.5

artificial mouth

analogue device the sound characteristics of which are similar to the directivity and radiation pattern of the average human mouth

Note 1 to entry: It conforms to the requirements set forth in Article 5 of ITU-T P.51-1996.

3.1.6

auxiliary device

device which extends or facilitates additional functions and interfaces of a building intercom system, such as communications, remote control, 3rd party devices interfaces etc.

3.1.7

building intercom system

BIS

system designed for entry communication in residential or commercial buildings which provides addressing calls, speech and optional video function and is equipped with an electronic unlocking device

3.1.8

channel S/N

sound pressure ratio between signal and ground noise at the receiving terminal under excitation of the nominal sound pressure at the transmitting terminal, expressed in dB

3.1.9

handset unit

device typically coupled to the ear by hand as can be a handset URU or handset SMU

3.1.10

hands-free unit

device that does not need to use the hand during the communication as can be a VCU, hands-free URU or hands-free SMU

3.1.11

idle channel noise

noise expressed in dB(A) which is received in the terminal after the channel connection is established when no signal is transferred

3.1.12

loudness rating guard-ring position

LRGP

fixed position in which the handset of the URU or SMU is used to measure the rating of system loudness

[SOURCE: adapted from ITU-T P.64:2007]

3.1.13

overall loudness rating

OLR

measurement of the loudness in the entire channel from the reference point of the mouth at the transmitting terminal to the ear reference point (ERP) at the receiving terminal, expressed in dB

[SOURCE: adapted from ITU-T P.79:2007]

3.1.14

overall sensitivity

gain of the sound pressure at the reference point of the ear at the reception terminal relative to the excitation sound pressure at the mouth reference point (MRP) at the transmitting terminal, expressed in dB

Note 1 to entry: It is a function of frequency.

3.1.15

security management unit

SMU

device which can be addressed from the call unit (VCU, URU or SMU), provides the means of addressing the calling signal to the desired receiver unit(s) which can be URU or SMU, 2-way speech, the activation of the audio and/or video connection with the VCU and the means to initiate remote unlocking of the controlled entrance

3.1.16**sidetone masking rating****STMR**

measurement of sidetone loudness after factoring in the masking effects of the human head on sidetone, expressed in dB

[SOURCE: adapted from ITU-T P.79:2007]

3.1.17**user receiver unit****URU**

addressable user device which provides 2-way speech with optional video, and a means to initiate remote unlocking of the controlled entrance

3.1.18**visitor call unit****VCU**

device installed outside a controlled entrance which provides the means of addressing the calling signal to the desired URU or SMU and 2-way speech with optional video capture

Note 1 to entry: The device can also provide the means of unlocking the controlled entrance and other function(s) or these function(s) can be contained within a separate associated device normally located within the controlled premises and which can also contain the system power supply.

3.2 Abbreviations

BIS	building intercom system
DES	door entry system
ERP	ear reference point
EUT	equipment under test
Lpm	level (sound) pressure mean
LRGP	loudness rating guard-ring position
MRP	mouth reference point
OLR	overall loudness rating
PIN	personal identification number
SMU	security management unit
STMR	sidetone masking rating
URU	user receiver unit
VCU	visitor call unit

4 Functional requirements**4.1 Basic functional requirements****4.1.1 General**

A building intercom system shall meet the following requirements:

a) Call function

The VCU shall be able to address the desired URU. The VCU shall be able to produce a visible and/or audible call alert signal. The URU shall be able to produce a response prompt signal that can be visible, audible, etc.

b) Speech function

2-way speech shall be provided, which can be either non-simultaneous or simultaneous. It may be of limited duration controlled by a system timer such that the speech channel cannot be accidentally occupied for an unlimited time.

c) Unlocking function

The unlocking function shall be provided with an electric or electronic signal to an electric or electronic locking device for securing a building entrance. This function shall be controlled by URU at the user's discretion. In grade 2 the URU shall be in communication with the VCU to perform the unlocking function.

The unlocking function could also be activated by other means:

- 1) The VCU may be provided with a means for authorized users to directly activate the unlocking function, such as by PIN code or secure proximity card or other security grade dependent means.
- 2) Request to exit button or switch located inside the controlled area and normally adjacent to the controlled entrance. According to the security requirements of the installation this button or switch may be a simple switch or require a PIN or other secure means of operation.
- 3) Other system signal such as an activated fire alarm signal, a building evacuation signal etc.

d) Nighttime operability

Grade 1: No requirement;

Grade 2: The VCU shall provide illumination or visible prompts to facilitate the visitor's operations at night.

e) Video and image recording and replaying function

When a URU is equipped with a video function it shall be able to display images captured by the VCU. The functions of storing, replaying the visitor's images are optional.

f) Operational indication

The system shall provide the operating and operational information to the visitor. The VCU should provide a comfort indication that the call is being processed, such as a low level audible tone and/ or visible indication. The VCU should also give audio and/or visible indication when the lock has been released and that entry to the premises is permitted.

NOTE The VCU can give clear indication or prompts to the visitor how to address the desired URU.

g) Anti listen-in

Grade 1: No requirement.

Grade 2: After connecting the VCU with the URU, the audio information shall not be monitored by other URU connected to the system.

4.1.2 Requirements for building intercom system with SMU

A building intercom system with SMU shall meet the following requirements:

- a) The SMU shall be able to address and initiate calls to selected URU. The VCU and the URU shall be able to initiate calls to the SMU. If multiple SMU are connected to the system, they shall be able to call each other. All the calls shall be able to produce call alert and response prompt signals. The signals can be visible, audible, etc..
- b) The SMU shall be capable of 2-way speech with the VCU or the URU. If multiple SMU are connected to the system, they shall be capable of 2-way speech with each other.
- c) The SMU shall be able to control the VCU to perform electrical or electronic unlocking.
- d) When a SMU is equipped with a video function it shall be able to display images captured by the VCU. The URU shall be able to display images captured by SMU equipped with a video camera.
- e) For grade 2: After connecting the SMU with the VCU or the URU, the audio and video information shall not be monitored by other URU connected to the system.

- f) For grade 2: The SMU shall be able to address and communicate to selected VCU.

4.2 Additional functions

A building intercom system can also provide the following functions:

- a) If the unsecured state of the controlled entrance lasts beyond the configured time, the SMU may be able to receive a warning message.

NOTE Unsecured state: the door opened for too long, the tamper switch triggered, etc.

- b) The system may have the possibility of transmitting images and texts to the URU.
- c) The SMU may have a timed and dated event log with security graded access and recording access events at the VCU.
- 1) URU's called and if unlocking function operated by the URU.
 - 2) VCU unlocking carried out directly at the VCU, identifying the authorized user.
 - 3) Programming events such as adding or subtracting users and URU's.
 - 4) Identification of the operator accessing the event log.
- d) SMU may intercept incoming calls from a VCU directed to an URU and then redirect the call to desired URU.
- e) If a SMU operator is not available, SMU may record details of URU which called the SMU in order to allow the operator to call back the URU.

5 Performance requirements

5.1 Audio characteristics

5.1.1 Acoustic pressure level

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Grade 1: Acoustic pressure level shall meet the following requirements:

- a) Acoustic pressure level value generated by hands-free unit:
- For discrete measurement shall be ≥ 70 dBSPL.
 - For continue measurement shall be ≥ 70 dB(A).
- b) Acoustic pressure level value generated by handset unit:
- For discrete measurement shall be ≥ 77 dBSPL.
 - For continue measurement shall be ≥ 77 dB(A).

Grade 2: No requirement.

5.1.2 Overall loudness rating (OLR)

Grade 1: No requirement.

Grade 2: The OLR shall meet the following requirements:

- a) At the VCU: 20^{+10}_{-5} dB.
- b) At the hands-free URU and hands-free SMU: 23^{+10}_{-5} dB.
- c) At the handset unit: (15 ± 5) dB.

5.1.3 Overall sensitivity

Grade 1: No requirement.