IEC 62642-2-71

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INTERNATIONAL STANDARD

NORME INTERNATIONALE

Alarm systems – Intrusion and hold-up systems – Part 2-71: Intrusion detectors – Glass break detectors (acoustic)

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Systèmes d'alarme – Systèmes d'alarme contre l'intrusion et les hold-up – Partie 2-71: Détecteurs d'intrusion – Détecteurs de bris de glace (acoustiques)

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ALARM SYSTEMS – INTRUSION AND HOLD-UP SYSTEMS –

Part 2-71: Intrusion detectors – Glass break detectors (acoustic)

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International Standard IEC 62642-2-71 has been prepared by IEC technical committee 79: Alarm and electronic security systems.

This standard is based on EN 50131-2-7-1 (2012) and its IS1 (2014).

The text of this standard is based on the following documents:

FDIS	Report on voting
79/511/FDIS	79/527/RVD

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 62642 series, published under the general title *Alarm systems – Intrusion and hold-up systems*, can be found on the IEC website.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC website under "http://webstore.iec.ch" in the data related to the specific publication. At this date, the publication will be

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INTRODUCTION

This part 2-71 of the IEC 62642 series concerns of intrusion and hold-up alarm systems (I&HAS) installed in buildings. It includes devices that are installed inside or outside of the supervised premises and mounted in indoor or outdoor environments. The other parts of this series of standards are as follows:

Part 1	System requirements
Part 2-2	Intrusion detectors – Passive infrared detectors
Part 2-3	Intrusion detectors – Microwave detectors
Part 2-4	Intrusion detectors – Combined passive infrared / Microwave detectors
Part 2-5	Intrusion detectors – Combined passive infrared / Ultrasonic detectors
Part 2-6	Intrusion detectors – Opening contacts (magnetic)
Part 2-71	Intrusion detectors – Glass break detectors (acoustic)
Part 2-72	Intrusion detectors – Glass break detectors (passive)
Part 2-73	Intrusion detectors – Glass break detectors (active)
Part 3	Control and indicating equipment
Part 4	Warning devices
Part 5-3	Interconnections – Requirements for equipment using radio frequency techniques
Part 6	Power supplies
Part 7	Application guidelines
Part 8	Security fog devices/systems

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ALARM SYSTEMS – INTRUSION AND HOLD-UP SYSTEMS –

Part 2-71: Intrusion detectors – Glass break detectors (acoustic)

1 Scope

This part of IEC 62642 defines passive acoustic glass break detectors installed in buildings and provides for security grades 1 to 4 (see IEC 62642-1), specific or non-specific wired or wire-free detectors, and uses environmental classes I to IV (see IEC 62599-1). This International Standard does not include requirements for passive acoustic glass break detectors intended for use outdoors.

A detector complies with all the requirements of the specified grade.

Functions additional to the mandatory functions specified in this standard may be included in the detector, providing they do not adversely influence the correct operation of the mandatory functions.

This International Standard does not apply to system interconnections.

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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.

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IEC 60068-2-52:1984, *Basic environmental testing procedures – Part 2: Tests – Test Kb: Salt mist, cyclic (sodium, chloride solution)*[1]

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*

IEC 62642-1, *Alarm systems – Intrusion and hold-up systems – Part 1: System requirements*

3 Terms, definitions and abbreviations

For the purposes of this document, the terms, definitions and abbreviations given in IEC 62642-1, as well as the following apply.

3.1 Terms and definitions

3.1.1
glass breakage
physical destruction of a glass pane, which allows intrusion to the monitored area, for example in doors, windows or enclosures

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[1] First edition. This edition has been replaced in 1996 by IEC 60068-2-52:1996, *Environmental testing – Part 2: Tests – Test Kb: Salt mist, cyclic (sodium, chloride solution)*.

3.1.2
passive acoustic glass break detector
detector that is mounted in the area to be monitored, which detects an airborne acoustic event created by a glass breakage

3.1.3
basic test source
signal simulator designed to verify the basic function of the detector

3.1.4
incorrect operation
physical condition that causes an inappropriate signal or message from a detector

3.1.5
basic detection test
test whose purpose is to verify the operation of a detector after conditioning

3.1.6
masking
interference with the detector input capability such as an introduction of a physical barrier (e.g. metal, plastic, paper or sprayed paints or lacquers in close proximity to the detector) or changing the characteristics of the monitored area (e.g. placing wet newspapers on the outside of the monitored glass pane)

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3.1.7
standard immunity glass pane
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glass pane to be used for all immunity tests, where a glass pane is needed, according to Annex B

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3.1.8
reverberation time 60
time taken for the volume of a single sound to decrease by 60 dB

Note 1 to entry: Reverberation time (RT60) at a frequency of 4 kHz shall not be less than 0,5 s and no more than 1 s. If required, reverberation time may be adjusted by installing absorbent panels or surfaces in the room.

3.2 Abbreviations

BTS basic test source

EMC electromagnetic compatibility

RT60 reverberation time 60

4 Functional requirements

4.1 Event processing

Detectors shall process the events shown in Table 1. Detectors shall generate signals or messages as shown in Table 2.

Table 1 – Events to be processed by grade

Event	Grade			
	1	2	3	4
Intrusion	M	M	M	M
No stimulus [a]	M	M	M	M
Masking	Op	Op	M	M
Tamper	Op	M	M	M
Low supply voltage	Op	Op	M	M
Total loss of power supply	Op	M	M	M
Local self test	Op	Op	M	M
Remote self test	Op	Op	Op	M

M = Mandatory

Op = Optional

[a] 'No Stimulus' is considered to be the quite condition, while no alarm generating stimulus for a detector at that time applies to the detector input capabilities.

Table 2 – Generation of indication signals or messages

Event	Signals or messages		
	Intrusion	Tamper	Fault
Intrusion	M	NP	NP
No Stimulus	NP	NP	NP
Masking[a]	M	Op	M
Tamper	NP	M	NP
Low supply voltage	Op	Op	M
Total loss of power supply[b]	M	Op	Op
Local self test pass	NP	NP	NP
Local self test fail	NP	NP	M
Remote self test pass	M	NP	NP
Remote self test fail	NP	NP	M

M = Mandatory

NP = Not permitted

Op = Optional

[a] An independent masking signal or message may be provided instead.

[b] Alternatively total loss of power supply shall be determined by loss of communication with the detector.

This permits two methods of signalling a masking event: either by the intrusion signal and fault signal, or by a dedicated output. Use of the intrusion signal and fault signal is preferable, as this requires fewer connections between CIE and detector. If multiple events overlap there will be some signal combinations that may be ambiguous. To overcome this ambiguity it is suggested that detectors should not signal 'intrusion' and 'fault' at the same time except to indicate masking. This implies that the detector should prioritise signals, e.g. 1. Intrusion, 2 Fault, 3 Masking.

When, in Table 1, an event may optionally generate signals or messages, they shall be as shown in Table 2.

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4.2 Operational requirements

4.2.1 Time interval between intrusion signals or messages

Wired detectors shall be able to provide an intrusion signal or message not more than 15 s after the end of the preceding intrusion signal or message.

Wire free detectors shall be able to provide an intrusion signal or message after the end of the preceding intrusion signal or message within the following times:

Grade 1	300 s
Grade 2	180 s
Grade 3	30 s
Grade 4	15 s

4.2.2 Switch on delay

The detector shall meet all functional requirements within 180 s of the power supply reaching its nominal voltage as specified by the manufacturer.

4.2.3 Self tests

4.2.3.1 Local self test

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The detector shall automatically test itself at least once every 24 h according to the requirements of Tables 1 and 2. If normal operation of the detector is inhibited during a local self-test, the detector inhibition time shall be limited to a maximum of 30 s in any period of 2 h.

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4.2.3.2 Remote self test

A detector shall process remote self tests and generate signals or messages in accordance with Tables 1 and 2 within 10 s of the remote self test signal being received, and shall return to normal operation within 30 s of the remote test signal being received.

4.3 Detection

4.3.1 Detection performance

4.3.1.1 General

The detector shall generate an intrusion signal or message when a simulated or real glass breakage according to the corresponding requirements of Table 3 is performed.

Table 3 – Performance test requirements

Requirement	Grade 1	Grade 2	Grade 3	Grade 4
Verification of detection performance	M	M	M	M
Performance test: hole drilling with diamond hole saw	Op	Op	Op	M
Performance test: glass cutting	Op	Op	Op	M
M = Mandatory Op = Optional				

4.3.1.2 Verification of detection performance

This test will verify the detection performance of a glass breakage according to the supported conditions claimed by the manufacturer. It will verify the covering range including the maximum and minimum range as well as the performance of randomly chosen mounting locations of the detector, according to Annex B for different glass types and sizes claimed to be supported (types and dimensions) by the manufacturer. A number of standard glass types and sizes need to be passed by this test according to the corresponding test section.

4.3.1.3 Performance test for hole drilling with a diamond hole saw

This test will verify the detection performance by drilling a hole using a diamond hole saw on different glass types and dimensions according to the supported conditions claimed by the manufacturer and Annex B. It will verify if the detector is able to identify and signal the change of the integrity of the monitored side of the glass pane.

4.3.1.4 Performance test for glass cutting

This test will verify the detection performance by cutting the glass using a standard glass cutter on different glass types and dimensions according to the supported conditions claimed by the manufacturer and Annex B. It will verify if the detector is able to identify and signal the change of the integrity of the monitored side of the glass pane.

4.3.2 Indication of detection

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Powered detectors at grades 3 and 4 that include processing capabilities shall provide an indicator at the detector to indicate when an intrusion signal or message has been generated.

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At grades 3 and 4 this indicator shall be capable of being enabled and disabled remotely at access level 2.

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4.4 Immunity to false alarm sources

4.4.1 General

The detector shall have sufficient immunity to false alarm sources if the following requirements have been met. No intrusion signal or message shall be generated as a result of the false alarm sources according to each individual test clause.

The tests for this clause will be performed on the standard immunity test glass pane as defined in section 3.1.7, wherever a glass pane is required.

4.4.2 Immunity to small objects hitting the glass

The detector shall not generate an intrusion signal or message when small objects such as hail, sand, gravel etc. hit the outside of the monitored glass. The tests are described in 6.7.2.

4.4.3 Immunity to soft objects hitting the glass

The detector shall not generate an intrusion signal or message when soft objects (e.g. a human fist) hit the outside of the monitored glass. The tests are described in 6.7.3.

4.4.4 Immunity to hard objects hitting the glass

The detector shall not generate an intrusion signal or message when hard objects (e.g. handlebars of a bicycle) hit the outside of the monitored glass. The tests are described in 6.7.4.

4.4.5 Immunity to single frequency sound sources

The detector shall not generate an intrusion signal or message when various frequencies and levels of noise (like brakes of a lorry, etc.) are applied to the detector. The tests are described in 6.7.5.

4.4.6 Immunity to wide band noise

The detector shall not generate an intrusion signal or message when a wide band of frequencies at the same time, which are close to the frequency of a glass breakage (e.g. branches of a tree moving against the window) are applied to the detector. The tests are described in 6.7.6 and 6.7.7.

4.5 Tamper security

4.5.1 General

Tamper security requirements for each grade of a detector are shown in Table 4.

Table 4 – Tamper security requirements

Requirement	Grade 1	Grade 2	Grade 3	Grade 4
Resistance to access to the inside of the detector	M	M	M	M
Detection of access to the inside of the detector	Op	M	M	M
Removal from the mounting surface	Op	M[a]	M	M
Detection of masking	Op	Op	M	M
Magnetic field immunity	Op	M	M	M
Magnet type defined in Annex D		Type 1	Type 2	Type 2
Resistance to or detection of re-orientation [b]	Op	M	M	M
Applied torque		2 Nm	5 Nm	10 Nm
M = Mandatory Op = Optional				
[a] Required for wire free detectors only [b] Required for detectors mounted on brackets only				

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4.5.2 Resistance to and detection of unauthorised access to the inside of the detector through covers and existing holes

All components and means of adjustment and access to mounting screws, which, when interfered with, could adversely affect the operation of the detector, shall be located within the detector housing. Such access shall require the use of an appropriate tool and depending on the grade as specified in Table 4 shall generate a tamper signal or message before access can be gained.

It shall not be possible to gain access without generating a tamper signal or message or causing visible damage.

4.5.3 Detection of removal from the mounting surface

A tamper signal or message shall be generated if the detector is removed from its mounting surface, in accordance with Table 4.