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INTERNATIONAL STANDARD

NORME INTERNATIONALE

Alarm systems – Intrusion and hold-up systems – Part 2-73: Intrusion detectors – Glass break detectors (active)

Systèmes d'alarme – Systèmes d'alarme contre l'intrusion et les hold-up – Partie 2-73: Détecteurs d'intrusion – Détecteurs de bris de glace (actifs)

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CONTENTS

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ALARM SYSTEMS – INTRUSION AND HOLD-UP SYSTEMS –

Part 2-73: Intrusion detectors – Glass break detectors (active)

FOREWORD

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International Standard IEC 62642-2-73 has been prepared by IEC technical committee 79: Alarm and electronic security systems.

This standard is based on EN 50131-2-7-3 (2012) and its IS1 (2014).

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

FDIS	Report on voting
79/513/FDIS	79/529/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

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

INTRODUCTION

This part 2-73 of the IEC 62642 series concerns 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

ALARM SYSTEMS – INTRUSION AND HOLD-UP SYSTEMS –

Part 2-73: Intrusion detectors – Glass break detectors (active)

1 Scope

This part of IEC 62642 defines active surface mounted 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 active surface mounted 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.

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.

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
active surface mounted glass break detector
detector that detects changes to the integrity of a glass surface it is mounted on by sending, receiving and processing signals

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)

3.1.7
standard immunity glass pane

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

3.1.8
simultaneous installation
installation of more then one detector or sensor pair of one detector type (e.g. sender and receiver) for one or more detector´s processing units

3.2 Abbreviations

BTS Basic test source

EMC Electromagnetic compatibility

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 – wire free devices	M	M	M	M
Low supply voltage – wired devices	Op	Op	Op	M
Total loss of power supply [b]	Op	M	M	M
Local self test [c]	Op	Op	M	M
Remote self test	Op	Op	Op	M

Key

M = Mandatory

Op = Optional

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

[b] Mandatory for wire-free at all grades. Only required if power is for normal local operation, e.g. purely switch based solutions do not fall under this requirement; however if signal processing (except if it is the CIE itself) is required to process the output of the sensor, such an event shall be generated alternatively no generation of a message or signal is required when the condition is detected by the CIE due to system design.

[c] Mandatory for all grade 4 devices. For grade 3 devices only required in case of MCU based solutions based on Software / Firmware sensor input analysis and signal processing.

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 this table.

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

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.

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 for sensitivity and a break through the glass according to the supported conditions claimed by the manufacturer. It will verify the maximum covering range (sensitivity performance test) and the break through detection (breakage performance test), according to Annex A 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 A. 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 A. 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

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.

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

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 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 static pressure

The detector shall not generate an intrusion signal or message when permanent pressure changes applied to the monitored glass. The tests are described in 6.7.5.

4.4.6 Immunity to dynamic pressure

The detector shall not generate an intrusion signal or message when dynamic pressure changes (due to wind, etc.) applied to the monitored glass. The tests are described in chapter 6.7.6.

4.4.7 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 6.7.7 and 6.7.8.

4.5 Tamper security

4.5.1 General

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