

INTERNATIONAL STANDARD

NORME INTERNATIONALE

**Alarm systems – Intrusion and hold-up systems –
Part 2-6: Intrusion detectors – Opening contacts (magnetic)**

**Systèmes d'alarme – Systèmes d'alarme contre l'intrusion et les hold-up –
Partie 2-6: Détecteurs d'intrusion – Détecteurs d'ouverture à contacts
(magnétiques)**



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ALARM SYSTEMS – INTRUSION AND HOLD-UP SYSTEMS –

Part 2-6: Intrusion detectors – Opening contacts (magnetic)

FOREWORD

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International Standard IEC 62642-2-6 has been prepared by IEC technical committee 79: Alarm and electronic security systems.

This standard is based on EN 50131-2-6 (2008).

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

FDIS	Report on voting
79/325/FDIS	79/331/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 of the IEC 62642 series can be found, under the general title *Alarm systems – Intrusion and hold-up systems*, on the IEC website.

The committee has decided that the contents of this publication will remain unchanged until the stability result date indicated on the IEC web site 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 2-6 of the IEC 62642 series of standards gives requirements for intrusion detectors with opening contacts (magnetic) used in intrusion and hold-up alarm systems. 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 Requirements for interconnections equipment using radio frequency techniques
- Part 6 Power supplies
- Part 7 Application guidelines
- Part 8 Security fog devices/systems

This International Standard is for opening contacts (magnetic) used as part of intrusion and hold-up alarm systems (I&HAS) installed in buildings. It includes four security grades and four environmental classes.

The purpose of an opening contact (magnetic) is to detect a displacement of a door or window from the defined closed position. The opening contact comprises two separate parts, the active connection between which is at least one magnetic field. Separating the two parts disturbs the connection and produces an intruder signal or message.

The number and scope of these signals or messages will be more comprehensive for systems that are specified at the higher grades.

This International Standard is only concerned with the requirements and tests for opening contacts (magnetic). Other types of detectors are covered by other documents identified IEC 62642-2 series.

ALARM SYSTEMS – INTRUSION AND HOLD-UP SYSTEMS –

Part 2-6: Intrusion detectors – Opening contacts (magnetic)

1 Scope

This part of the IEC 62642 provides for security grades 1 to 4, (see IEC 62642-1) specific or non-specific wired or wirefree opening contacts (magnetic), and includes the requirements for four environmental classes covering applications in internal and outdoor locations as specified in IEC 62599-1.

A detector fulfils all the requirements of the specified grade.

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

The two separate parts of the opening contact (magnetic) are referred to in the body of this International Standard as the detector.

This International Standard does not apply to system interconnections.

2 Normative references

[IEC 62642-2-6:2010](https://standards.iteh.ai/catalog/standards/sist/f0cac1ad-31c4-4b5c-9237-688ecd593529/iec-62642-2-6-2010)

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The following referenced documents are indispensable for the application 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 60068-1:1988, *Environmental testing – Part 1: General and guidance*

IEC 60068-2-52, *Environmental testing – Part 2-52: Tests – Test Kb: Salt mist, cyclic (sodium chloride solution)*

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

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*

EN 10130:1991, *Cold rolled low carbon steel flat products for cold forming – Technical delivery conditions*
Amendment 1 (1998)

3 Terms, definitions and abbreviations

3.1 Terms and definitions

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

3.1.1

prohibited area

mounting arrangement, as stated by the manufacturer, of the two components of the detector in which the detector no longer meets the requirements of this International Standard

3.1.2

incorrect operation

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

3.1.3

wirefree detector

detector connected to the control and indicating equipment by non-physical means such as radio frequency signals

3.1.4

approach distance

make distance

separation distance between the two components of a detector that are being brought together at which an intrusion signal or message is reversed.

3.1.5

removal distance

break distance

separation distance between the two components of a detector that are being moved apart at which an intrusion signal or message is generated

3.1.6

opening contact (magnetic)

detector in usually two separate parts. The active connection between the two parts is at least one magnetic field. Separating the two parts disturbs the connection and produces an intrusion signal or message

3.1.7

corresponding magnet

activating part of the detector, comprising of one or more components, to generate at least one magnetic field

3.1.8

switch component

reacting part of the detector, comprising one or more components to detect the magnetic field(s) of the corresponding magnet and generate an appropriate signal or message

3.1.9

surface mount contact

opening contact (magnetic), where both parts (switch component and corresponding magnet) are mounted on the surface of two parts of the monitored object (fixed and moving part)

3.1.10

flush mount contact

opening contact (magnetic), where both parts (switch component and corresponding magnet) are mounted within two parts of the monitored object (fixed and moving part)

3.1.11**sealed contact**

type of detector construction, whereby there is no direct access to the internal components or connections e.g. a “potted” unit usually supplied with integral connecting cable

3.1.12**reverse signal**

signal or message generated by a detector to indicate that there is no longer an intrusion event e.g. change of state or cancellation of an intrusion signal or message

3.1.13**intrusion event**

abnormal condition indicating the presence of a hazard

3.1.14**low supply voltage**

supply voltage level below which the operation of the detector can no longer be guaranteed

3.1.15**interference test magnets**

magnets used for verifying the behaviour of the detector in the presence of an external magnetic field at least one of which is identical to the corresponding magnet supplied with the detector

3.1.16**external magnetic field**

deliberately induced magnetic field generated by a source other than the corresponding magnet e.g. sabotage magnet

3.1.17**immunity**

characteristic of a detector such that only a limited reduction in its detection performance is permitted in the presence of one of the interference test magnets

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3.2 Abbreviations

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

EMC electromagnetic compatibility

BTD basic test of detection capability

4 Functional requirements**4.1 Events**

The detector shall respond to events in accordance with Table 1 and as defined in this Clause 4.

Table 1 – Events to be processed by grade

Event	Grade			
	1	2	3	4
Break distance exceeded	M	M	M	M
Inside make distance	M	M	M	M
Remote enable of detection indication ^a	Op	Op	M	M
Magnetic interference	Op	Op	M	M
Resistance to access to the inside of the detector	Op	M	M	M
Detection of access to the inside of the detector	Op ^b	M ^c	M ^c	M ^c
Interconnection integrity	M	M	M	M
Removal from the mounting surface ^d	Op	M	M	M
Low supply voltage ^e	Op	Op	M	M
Total loss of external power ^f	M	M	M	M
Matched coded pairs ^g	Op	Op	Op	M
Key M = Mandatory Op = Optional				
^a Only required if detection indicator present. ^b Generation of a tamper signal for opening by normal means is not required. ^c Not required for sealed contacts. ^d Mandatory for wirefree at grades 2, 3 and 4; mandatory for all surface mounted grade 4 types, optional for surface mounted grades 1, 2 and 3. ^e See 4.6.7. ^f See 4.6.6. ^g The code shall have a minimum of 8 differs.				

4.2 Signals or messages

The response to the signals or messages generated by the detector is determined by the I&HAS. The detector shall generate signals or messages in accordance with Table 2, based on the events listed in Table 1. Signals or messages shall be generated within 10 s of the event occurring. The response of a detector to events defined as optional in Table 1 shall be in accordance with Table 2.

Table 2 – Generation of signals or messages

Event	Signals or messages		
	Intrusion	Tamper	Fault
Break distance exceeded	M	NP	NP
Inside make distance	NP	NP	NP
Magnetic interference grade 3 ^a	Op	Op	Op
Magnetic interference grade 4 ^b	M	Op	M
Detection of access to the inside of the detector	NP	M	NP
Removal from the mounting surface	NP	M	NP
Low power supply voltage ^c	Op	Op	M
Total loss of external power ^d	M	Op	Op
Key M = Mandatory NP = Not Permitted Op = Optional			
^a Required only if the approach and removal distances are greater than twice the distances specified by the manufacturer (see 6.6.4); at least one of these signals or messages (Intrusion or/and Tamper or/and Fault) shall be generated or an independent signal or message shall be generated. ^b Required only if the approach and removal distances are greater than twice the distances specified by the manufacturer (see 6.6.4); either intrusion AND fault signals or messages, OR an independent signal or message shall be generated. ^c See 4.6.7. ^d See 4.6.6.			

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4.3 Detection <https://standards.iteh.ai/catalog/standards/sist/f0cac1ad-31c4-4b5c-9237-688ecd593529/iec-62642-2-6-2010>

4.3.1 Detection performance

4.3.1.1 General

The operating parameters of the detector shall be verified as specified by the manufacturer for the axes of movement shown in Annex D.

The manufacturer shall clearly state in the product documentation any special limitation concerning installation e.g. a prohibited area between a surface on the detector and the minimum make distance.

4.3.1.2 Removal/break distance

The detector shall generate an intrusion signal or message at the removal distance specified by the manufacturer. This distance shall be specified for all normal operating axes. If the detector is designed for installation on ferromagnetic surfaces or in ferromagnetic material, the removal/break distance shall also be specified for all normal operating axes when the detector is mounted using the material as specified in Annex E.

4.3.1.3 Approach/make distance

The detector shall generate a reverse signal or message at the minimum separation distance(s) specified by the manufacturer. This distance shall be specified for all normal operating axes. If the detector is designed for installation on ferromagnetic surfaces or in ferromagnetic material, the approach/make distance shall be specified for all normal operating axes when the detector is mounted using the material as specified in Annex E.

4.3.2 Indication of detection

When a detection indicator is provided to show when an intrusion signal or message is generated, this indicator shall be capable of being enabled and disabled.

The adjustment to enable or disable this indication locally within the detector shall only be accessible when the detector is opened by normal means.

A detector at grade 3 or grade 4 shall be capable of receiving indication enable and disable commands from the CIE when such an indicator is present.

4.4 Operational requirements

4.4.1 Time interval between intrusion signals or messages

Detectors using wired interconnections 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.

Detectors using wirefree interconnections 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.

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4.4.2 Switch on delay

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Where a detector requires an internal or external power supply in accordance with 4.6, the detector shall meet all functional requirements within 180 s of the power supply reaching its nominal voltage.

4.4.3 Fault condition signals

A detector shall generate a fault signal or message in accordance with the manufacturer's specification and the provisions of Table 2 in the presence of a fault condition, according to Table 1, or as a result of an internal self-test if this feature is provided.

4.5 Tamper security

4.5.1 Tamper security requirements

All terminals and means of mechanical and electronic adjustments shall be located within the detector's housings.

The tamper security requirements for each grade of detector are shown in Table 1.

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

Access holes shall not allow interference with the operation of the detector by probing with commonly available tools. Damage shall not be caused that would prevent normal operation.

If the detector can be opened, a tool shall be required to open the unit. For grades 2, 3 and 4 detectors, all covers giving access to components that could adversely affect the operation of the detector shall be fitted with a tamper detection device that shall generate signals or messages in accordance with Table 2. It shall not be possible to gain such access without

generating a tamper signal or message or causing visible damage. Sealed contacts do not require the means to detect access to the inside of the detector.

4.5.3 Detection of removal from the mounting surface

A detection device shall be fitted that generates a tamper signal or message in accordance with Table 2 if the detector is removed from the mounting surface. Operation of the tamper device shall not be compromised by external means. This device shall activate before access can be gained to it.

4.5.4 Magnetic field interference

When the detector is mounted in accordance with the manufacturer's instructions and is subject to the presence of an external magnetic field generated by the interference test magnets specified in Annex A and applied to the faces of the detector according to Annex F, the detector shall either:

be immune to any influence by the interference test magnets and continue to operate normally with the make and break distances not exceeding twice those specified in accordance with 4.3.1,

or

generate an intrusion, and/or tamper, and/or fault, and/or other independent signal or message in accordance with Table 2 when the make or break distances exceed twice those specified in accordance with 4.3.1. These signals or messages may be generated either on application of the interference test magnet or when the corresponding magnet has returned to its original installed position.

NOTE The signals or messages generated by a grade 4 detector are intended to be used by the I&HAS to positively identify an attempt to sabotage the detector through magnetic interference.

4.5.5 Matched coded pairs

A grade 4 detector shall consist of a matched pair of switch component and corresponding magnet. The means of matching shall have a minimum of 8 differs. It shall not be possible to determine the specific pair identity by visual inspection of the detector.

The probability of the use of each code shall be equal.

4.6 Electrical requirements

4.6.1 Grade dependencies

The requirements of 4.6.2 to 4.6.6 only apply to detectors having external power to operate the components of the detector.

Table 3 – Electrical requirements

Test	Grade 1	Grade 2	Grade 3	Grade 4
Detector current consumption	Required	Required	Required	Required
Input voltage range	Required	Required	Required	Required
Slow input voltage rise	Not required	Required	Required	Required
Input voltage ripple	Not required	Required	Required	Required
Input voltage step change	Not required	Required	Required	Required