



SLOVENSKI STANDARD

SIST-TS CLC/TS 50131-2-9:2016

01-oktober-2016

Alarmni sistemi - Sistemi za javljanje vloma in ropa - 2-9. del: Javljalniki vloma - Aktivni detektorji z infrardečim žarkom

Alarm systems - Intrusion and hold-up systems - Part 2-9: Intrusion detectors - Active infrared beam detectors

Alarmanlagen - Einbruch- und Überfallmeldeanlagen - Teil 2-9: Einbruchmelder - Aktive Infrarot-Lichtschranken

Systèmes d'alarme - Systèmes d'alarme contre l'intrusion et les hold-up - Partie 2-9: Détecteurs à faisceaux infrarouges actifs

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ICS:

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13.320	Alarmni in opozorilni sistemi	Alarm and warning systems

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**Alarm systems - Intrusion and hold-up systems - Part 2-9:
Intrusion detectors - Active infrared beam detectors**

Systèmes d'alarme - Systèmes d'alarme contre l'intrusion et
les hold-up - Partie 2-9: Détecteurs à faisceaux infrarouges
actifs

Alarmanlagen - Einbruch- und Überfallmeldeanlagen - Teil
2-9: Einbruchmelder - Aktive Infrarot-Lichtschranken

This Technical Specification was approved by CENELEC on 2016-08-01.

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European Committee for Electrotechnical Standardization
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Europäisches Komitee für Elektrotechnische Normung

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European foreword

This document (CLC/TS 50131-2-9:2016) has been prepared by CLC/TC 79 "Alarm systems".

The following dates are fixed:

- latest date by which the existence of (doa) 2016-02-01
this document has to be announced
at national level

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC shall not be held responsible for identifying any or all such patent rights.

The EN 50131 series consists of the following parts:

- EN 50131-1, *Alarm systems — Intrusion and hold-up systems — Part 1: System requirements*;
- EN 50131-2-2, *Alarm systems — Intrusion and hold-up systems — Part 2-2: Intrusion detectors — Passive infrared detectors*;
- EN 50131-2-3, *Alarm systems — Intrusion and hold-up systems — Part 2-3: Intrusion detectors — Requirements for microwave detectors*;
- EN 50131-2-4, *Alarm systems — Intrusion and hold-up systems — Part 2-4: Requirements for combined passive infrared and microwave detectors*;
- EN 50131-2-5, *Alarm systems — Intrusion and hold-up systems — Part 2-5: Requirements for combined passive infrared and ultrasonic detectors*;
- EN 50131-2-6, *Alarm systems — Intrusion and hold-up systems — Part 2-6: Opening contacts (magnetic)*;
- EN 50131-2-7-1, *Alarm systems — Intrusion and hold-up systems — Part 2-7-1: Intrusion detectors — Glass break detectors (acoustic)*;
- EN 50131-2-7-2, *Alarm systems — Intrusion and hold-up systems — Part 2-7-2: Intrusion detectors — Glass break detectors (passive)*;
- EN 50131-2-7-3, *Alarm systems — Intrusion and hold-up systems — Part 2-7-3: Intrusion detectors — Glass break detectors (active)*;
- EN 50131-2-8, *Alarm systems — Intrusion and hold-up systems — Part 2-8: Intrusion detectors — Shock detectors¹*;
- CLC/TS 50131-2-9, *Alarm systems — Intrusion and hold-up systems — Part 2-9: Intrusion detectors — Active infrared beam detectors* (the present document);
- EN 50131-3, *Alarm systems — Intrusion and hold-up systems — Part 3: Control and indicating equipment*;
- EN 50131-4, *Alarm systems — Intrusion and hold-up systems — Part 4: Warning devices*;

¹ In preparation.

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- EN 50131-5-3, *Alarm systems — Intrusion systems — Part 5-3: Requirements for interconnections equipment using radio frequency techniques*;
- EN 50131-6, *Alarm systems — Intrusion and hold-up systems — Part 6: Power supplies*;
- CLC/TS 50131-7, *Alarm systems — Intrusion and hold-up systems — Part 7: Application guidelines*;
- EN 50131-8, *Alarm systems — Intrusion and hold-up systems — Part 8: Security fog device/systems*;
- CLC/TS 50131-9, *Alarm systems — Intrusion and hold-up systems — Part 9: Alarm verification — Methods and principles*;
- EN 50131-10, *Alarm systems — Intrusion and hold-up systems — Part 10: Application specific requirements for Supervised Premises Transceiver (SPT)*;
- CLC/TS 50131-11, *Alarm systems — Intrusion and hold-up systems — Part 11: Hold-up devices*.

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Introduction

The purpose of an Active Infrared Beam Detector (AIBD) is to detect an intruder interrupting one or more infrared beam(s) and to provide the necessary range of signals or messages to be used by the rest of the intrusion alarm system. The AIBD consists of a transmitter, sending out infrared radiation, and a receiver, which detects the interruption of the received radiation. The infrared radiation sent out by the transmitter can reach the receiver over a reflector.

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

This Technical Specification is only concerned with the requirements and tests for the AIBDs. Other types of detectors are covered by other documents identified as in the EN 50131-2 series.

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CLC/TS 50131-2-9:2016**1 Scope**

This Technical Specification is applicable to Active Infrared Beam Detectors (AIBDs) installed inside buildings and used as part of intrusion alarm systems.

It specifies four security Grades 1 to 4 (in accordance with EN 50131-1) and uses environmental Classes I to IV (in accordance with EN 50130-5).

This standard covers only AIBDs using interruption based technology. Other technologies i.e. Doppler based technology are not covered by this document.

Functions additional to the mandatory functions specified in this document can be included in the AIBD, providing they do not adversely influence the correct operation of the mandatory functions.

This document 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.

EN 50130-4, *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*

EN 50130-5, *Alarm systems - Part 5: Environmental test methods*

EN 50131-1, *Alarm systems - Intrusion and hold-up systems - Part 1: System requirements*

EN 50131-6, *Alarm systems - Intrusion and hold-up systems - Part 6: Power supplies*

EN 60404-5, *Magnetic materials – Part 5: Permanent magnet (magnetically hard) materials – Methods of measurement of magnetic properties (IEC 60404-5)*

EN 60404-8-1, *Magnetic materials - Part 8-1: Specifications for individual materials - Magnetically hard materials (IEC 60404-8-1)*

EN 60404-14, *Magnetic materials - Part 14: Methods of measurement of the magnetic dipole moment of a ferromagnetic material specimen by the withdrawal or rotation method (IEC 60404-14)*

3 Terms, definitions and abbreviated terms

For the purposes of this document, the terms, definitions and abbreviations given in EN 50131-1 and the following apply.

3.1 Terms and definitions**3.1.1****two way single beam**

detector consisting of one transmitter and one receiver in the same housing at one side of the supervised area and a reflector at the other side of the supervised area

Note 1 to entry: An illustration of a two way single beam is given in Figure A.1.

3.1.2**two way multiple beam**

detector consisting of more than one transmitter and more than one receiver in the same housing at one side of the supervised area and a reflector at the other side of the supervised area, including multiple stacked sets

Note1 to entry: An illustration of a two way multiple beam is given in Figure A.2

3.1.3**one way single beam**

detector consisting of one transmitter at one side of the supervised area and one receiver at the other side of the supervised area

Note1 to entry: An illustration of a one way single beam is given in Figure A.3.

3.1.4**one way multiple beam**

detector consisting of more than one transmitter at one side of the supervised area and more than one receiver at the other side of the supervised area, including multiple stacked sets

Note1 to entry: An illustration of a one way multiple beam is given in Figure A.4.

3.1.5**incorrect operation**

physical condition that causes an inappropriate signal or message from an AIBD

3.1.6**standard detection test target**

target with defined size used to interrupt the infrared beam(s) for testing purposes

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3.1.7**detection test**

operational test during which an AIBD is interrupted by the standard detection test targets in a controlled environment

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3.1.8**detection test upright**

test with a test target simulating a person interrupting the beam(s) in a vertical position

3.1.9**detection test diving into**

test with a test target simulating a person interrupting the beam(s) in a horizontal position

3.1.10**detection test reach into**

test with a test target simulating a person's hand interrupting the beam(s)

3.1.11**adding of AIBD-components**

attempt to avoid detection of an AIBD by adding other infrared components using the same IR wavelength (e.g. other AIBD components)

Note1 to entry: Additional detector components could include transmitters.

3.1.12**substitution of AIBD-components**

attempt to avoid detection of an AIBD by replacement of AIBD-components

CLC/TS 50131-2-9:2016**3.1.13****response probability**

value in percentage of number of interruptions (stimulus) which have been detected compared to the total number of interruptions (stimulus) presented to an AIBD

Note1 to entry: An AIBD tested 10 times with nine interruptions detected would result in a response probability of 90 %.

3.1.14**backlink**

wired or wireless connection for communication between transmitter and receiver components of a AIBD, which can be used for administration and integrity monitoring

3.2 Abbreviations

AIBD	Active Infrared Beam Detector
BDDT	Basic Detection Test Target
EMC	Electro Magnetic Compatibility
SDTT	Standard Detection Test Target

4 Functional requirements**4.1 General**

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An AIBD shall fulfil all the requirements of the specified Grade.

4.2 Event processing

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AIBDs shall process the events in accordance with Table 1.

Table 1 — Events to be processed by Grade

Event	Grade			
	1	2	3	4
Intrusion detection	M	M	M	M
Tamper detection	Op	M	M	M
Adding of AIBD-components	Op	M ^a	M	M
Substitution of AIBD-components	Op	Op	Op	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 Mandatory only for two way single beam and two way multiple beam				

AIBDs shall generate signals or messages in accordance with Table 2.

Table 2 — Generation of signals or messages

Event	Signals or Messages		
	Intrusion	Tamper	Fault
No event	NP	NP	NP
Intrusion	M	NP	NP
Tamper	NP	M	NP
Adding of AIBD-components ^a	M	Op	M
Substitution of AIBD-components ^a	M	Op	M
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
<p>M = mandatory NP = not permitted Op = optional</p>			
<p>When an optional event from Table 1 is processed by the AIBD, it shall meet the requirements of this table</p> <p>^a An independent signal or message may be provided instead.</p> <p>NOTE This permits two methods of signalling an “Adding of AIBD-components” or “Substitution of AIBD-components” event: either by the intrusion signal and fault signal, or by a dedicated “Adding of AIBD-components” or “Substitution of AIBD-components” signal or message. Use of the intrusion signal and fault signal is preferable, as this requires no additional connections between CIE and AIBD.</p> <p>^b Alternatively Total loss of power supply may be determined by loss of communication with the AIBD.</p>			

4.3 Detection

4.3.1 Detection performance

The AIBD shall detect the interruption of the beam(s) within the time limits as described in Table 3.

The AIBD shall not generate an alarm signal or message if the interruption of the beam is equal to or less than the minimum detected interruption time given in Table 3, in accordance with the probability shown. The AIBD shall generate an alarm signal or message, in accordance with the probability shown, if the interruption of the beam is for more than the maximum undetected interruption time given in Table 3. The generation of an alarm signal or message is optional for interruptions of duration between the minimum and maximum interruption times.

Table 3 — Interruption time limits

Test	Grade 1	Grade 2	Grade 3	Grade 4
Minimum detected interruption time	10 ms	10 ms	10 ms	10 ms
Maximum undetected interruption time	75 ms	60 ms	50 ms	25 ms
Response probability	80 %	90 %	100 %	100 %

The manufacturer's documentation shall include a warning, if an adjustment of interruption times outside the limits, described in this document, is possible (see 5.2: d) and e)).

4.3.2 Indication of detection

An indicator, e.g. LED, shall be provided on the AIBD to indicate when an intrusion signal or message has been generated. At Grades 1 and 2 this indicator shall be capable of being enabled and disabled either remotely at Access Level 2 and/or locally after removal of cover which provides tamper detection as described in Tables 1 and 4. At Grades 3 and 4 where this indicator is available at Access Level 1, then this indicator shall be capable of being enabled and disabled remotely at Access Level 2.

4.3.3 Planar detection characteristic

This sub clause applies to one way multiple beam and two way multiple beam only.

With multiple beam devices it is possible to supervise planar areas. Depending on the type of detection a signal shall be generated, if the area under surveillance by the AIBD has been entered as follows:

- a) A Grade 3 and 4 AIBD shall support in addition to the upright detection characteristic the diving into detection:

Entering of the supervised area with a diameter of 300 mm;

- b) A Grade 4 AIBD shall support in addition to the upright detection and the diving into detection characteristic the reach into detection:

Entering of the supervised area with a diameter of 60 mm.

4.3.4 Substitution of AIBD-components

A Grade 4 AIBD shall detect attempts to substitute AIBD-components.

4.3.5 Detection of adding AIBD-components

Depending on the Grade (see Table 1) AIBDs shall be immune or generate an alarm signal or message, if additional components are introduced for the purpose of altering the detection area according to Table 2.

4.4 Operational requirements

4.4.1 Time interval between intrusion signals or messages

AIBDs 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.