

BS EN 50131-2-5:2008

Incorporating corrigendum May 2014



BSI Standards Publication

Alarm systems – Intrusion and hold-up systems —

Part 2-5: Requirements for
combined passive infrared and
ultrasonic detectors

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National foreword

This British Standard is the UK implementation of EN 50131-2-5:2008. It supersedes DD CLC/TS 50131-2-5:2004 which is withdrawn.

The UK participation in its preparation was entrusted by Technical Committee GW/1, Electronic security systems, to Subcommittee GW/1/1, Alarm components.

A list of organizations represented on this subcommittee can be obtained on request to its secretary.

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31 May 2014	Implementation of CENELEC Interpretation sheet February 2014 in National Annex NA

National Annex NA
(Informative)
Text of IS1 to EN 50131-2-5:2008

Clause:

Annex A and Figure A.1

Question:

Would it be allowed for test purposes (for test houses and manufacturers) to use the NeoDym magnet listed below instead of the AlNiCo version described in Annex A and Figure A.1 for reproducible tests ?

Interpretation:

Yes, because this will allow stable and reproducible test results, which is not guaranteed while using the AlNiCo magnet due to the nature of the magnet material. Furthermore, the test magnet described below allows a high-level degree of backward compatibility for already tested products, while it gives the stability required.

Therefore, when the NeoDym magnet is used for test purposes (for test houses and manufacturers), the text below may be used in place of Annex A.

Validity:

This interpretation remains valid until an amendment or updated standard dealing with this issue is published by CENELEC.

Annex A (normative)

Dimensions & requirements of the standardised test magnets

A.1 Normative references

The interference test magnets shall comprise a magnet identical to the corresponding magnet supplied with the detector and one of the following specified independent test magnets according to whether the detector is surface or flush mounted.

The following standards will form the base for the selection of the independent test magnet:

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

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)*

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

A.2 Requirements

The field strength of the magnet determined by the magnetic material, by remanence (B_r) in mT and the product of energy $(BH)_{\max}$ in kJ/m³, which are material dependent as the values describe the full saturation of that material should be measured before any calibration took place.

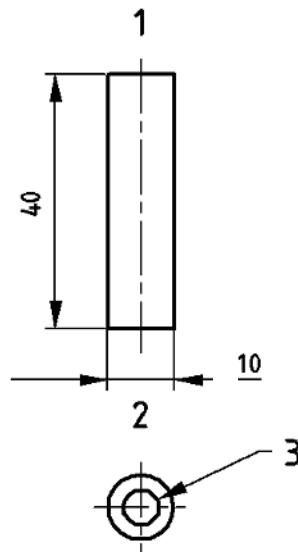
The field strength of the test magnet needs to be adjusted at the polarization of the working point in mT as defined.

The relevant value, dimensions and measurement point for the test magnet can be found in the following drawings and tables. For calculations, measurements and calibration of the test magnets, the norms cited above shall be used.

The independent test magnet for Test Magnet Type 1 is described in Figure A.1.

To get the magnets in question adjusted to the proper values and calibrated (e.g. polarization in working point), it is strongly suggested to perform adjustments of the magnetic values for ordered magnets performed by an accredited test house for magnetic fields. One potential source could be the following:

MAGNET-PHYSIK
Dr. Steingroever GmbH
Emil-Hoffmann-Strasse 3
50966 Cologne, Germany
www.magnet-physik.de

**Key**

- 1 North pole
- 2 South pole
- 3 North pole

Material	NdFeB N40 (REFeB 310/130 - Code number R5-1-11)
Remanence B_r min	1 275 mT $\pm$ 2 %
Product of energy $(BH)_{max}$	310 kJ/m ³ $\pm$ 3 %
Polarization of working point	0,835 T $\pm$ 2 %

Figure A.1 – Test magnet – Magnet Type 1

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English version

**Alarm systems -
Intrusion and hold-up systems -
Part 2-5: Requirements for combined passive infrared
and ultrasonic detectors**

Systèmes d'alarme -
Systèmes d'alarme contre l'intrusion
et les hold-up -
Partie 2-5: Exigences pour détecteurs
combinés à infrarouges passifs
et ultrasoniques

Alarmanlagen -
Einbruch- und Überfallmeldeanlagen -
Teil 2-5: Anforderungen an kombinierte
Passiv-Infrarot- und Ultraschallmelder

This European Standard was approved by CENELEC on 2008-05-01. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the Central Secretariat has the same status as the official versions.

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CENELEC

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

Central Secretariat: rue de Stassart 35, B - 1050 Brussels

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Foreword

This European Standard was prepared by the Technical Committee CENELEC TC 79, Alarm systems.

The text of the draft was submitted to the Unique Acceptance Procedure and was approved by CENELEC as EN 50131-2-5 on 2008-05-01.

This European Standard supersedes CLC/TS 50131-2-5:2004.

The following dates were fixed:

- latest date by which the EN has to be implemented
at national level by publication of an identical
national standard or by endorsement (dop) 2009-05-01
- latest date by which the national standards conflicting
with the EN have to be withdrawn (dow) 2011-05-01

EN 50131 will consist of the following parts, under the general title *Alarm systems – Intrusion and hold-up systems*:

- Part 1 System requirements
- Part 2-2 Intrusion detectors – Passive infrared detectors
- Part 2-3 Requirements for microwave detectors
- Part 2-4 Requirements for combined passive infrared and microwave detectors
- Part 2-5 Requirements for combined passive infrared and ultrasonic detectors
- Part 2-6 Intrusion detectors – Opening contacts (magnetic)
- Part 2-7-1 Intrusion detectors – Glass break detectors – Acoustic
- Part 2-7-2 Intrusion detectors – Glass break detectors – Passive
- Part 2-7-3 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

Contents

	Page
Introduction.....	5
1 Scope.....	6
2 Normative references	6
3 Definitions and abbreviations.....	6
3.1 Definitions	6
3.2 Abbreviations	7
4 Functional requirements	7
4.1 Event processing.....	7
4.2 Detection.....	9
4.3 Operational requirements	10
4.4 Immunity of the individual technologies to incorrect operation	10
4.5 Tamper security	11
4.6 Electrical requirements	12
4.7 Environmental classification and conditions.....	13
5 Marking, identification and documentation	13
5.1 Marking and/or identification.....	13
5.2 Documentation	13
6 Testing	14
6.1 Generalities.....	14
6.2 General test conditions.....	14
6.3 Basic detection test.....	15
6.4 Walk testing	16
6.5 Switch-on delay, time interval between signals and indication of detection	19
6.6 Self tests	19
6.7 Immunity of individual technologies to incorrect operation	20
6.8 Tamper security	21
6.9 Electrical tests.....	23
6.10 Environmental classification and conditions.....	25
6.11 Marking, identification and documentation	26
Annex A (normative) Dimensions & requirements of the standardised test magnets	27
Annex B (normative) General testing matrix	30
Annex C (informative) Walk test diagrams.....	31
Annex D (normative) Procedure for calculation of average temperature difference	34
Annex E (informative) Basic detection target for the basic test of detection capability	35
Annex F (informative) Equipment for walk test velocity control.....	36
Annex G (informative) Immunity to visible and near infrared radiation – Notes on calibration of the light source.....	37
Annex H (informative) Example list of small tools	38
Annex I (informative) Test for resistance to re-orientation of adjustable mountings	39
Bibliography.....	40

Figures

Figure A.1 – Test magnet - Magnet Type 1	28
Figure A.2 – Test magnet - Magnet Type 2	29
Figure C.1 – Detection across the boundary	31
Figure C.2 – Detection within the boundary.....	31
Figure C.3 – High velocity and intermittent movement.....	32
Figure C.4 – Close-in detection.....	32
Figure C.5 – Significant range reduction	33
Figure I.1 – Re-orientation test	39

Tables

Table 1 – Events to be processed by grade	8
Table 2 – Generation of signals or messages	8
Table 3 – General walk test velocity and attitude requirements	9
Table 4 – Tamper security requirements	12
Table 5 – Grade dependencies for electrical requirements.....	12
Table 6 – Range of materials for masking tests.....	23
Table 7 – Operational tests.....	25
Table 8 – Endurance tests	26
Table D.1 – Measurement and calculation of the real average temperature difference between the SWT and the background	34

Introduction

This European Standard is for combined passive infrared and ultrasonic detectors (to be referred to as the detector) used as part of intrusion alarm systems installed in buildings. It includes four security grades and four environmental classes.

The purpose of a detector is to detect the broad spectrum infrared radiation emitted by an intruder and, at the same time, to emit ultrasonic radiation over the area being protected, and analyse signals that are returned, to provide the necessary range of signals or messages to be used by the rest of the intrusion alarm system.

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

This European Standard is only concerned with the requirements and tests for the detector. Other types of detector are covered by other documents identified as EN 50131-2 series.

1 Scope

This European Standard is for combined passive infrared and ultrasonic detectors installed in buildings and provides for security grades 1 to 4 (see EN 50131-1), specific or non-specific wired or wire-free detectors, and uses environmental classes I to IV (see EN 50130-5). This standard does not include requirements for combined passive infra red and ultrasonic detectors intended for use outdoors.

A detector shall fulfil 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 influence the correct operation of the mandatory functions.

The European Standard does not apply to system interconnections.

2 Normative references

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.

EN 50130-4	Alarm systems – Part 4: Electromagnetic compatibility – Product family standard: Immunity requirements for components of fire, intruder 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 60068 series	Environmental testing (IEC 60068 series)
EN 60068-1	Environmental testing – Part 1: General and guidance (IEC 60068-1)
EN 60068-2-52	Environmental testing – Part 2: Tests – Test Kb: Salt mist, cyclic (sodium chloride solution) (IEC 60068-2-52)

3 Definitions and abbreviations

3.1 Definitions

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

3.1.1

basic detection target

heat source and/or ultrasonic reflector designed to verify the operation of a detector

3.1.2

combined passive infrared and ultrasonic detector

detector of the broad-spectrum infrared radiation emitted by a human being, with an active ultrasonic emitter and receiver installed in the same housing

3.1.3

incorrect operation

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

3.1.4

masking

interference with the detector input capability by the introduction of a physical barrier such as metal, plastics, paper or sprayed paints or lacquers in close proximity to the detector

3.1.5

simulated walk test target

non-human or synthetic heat source or ultrasonic reflector designed to simulate the standard walk test target

3.1.6

standard walk test target

human being of standard weight and height clothed in close fitting clothing appropriate to the simulation of an intruder

3.1.7

walk test

operational test during which a detector is stimulated by the standard walk test target in a controlled environment

3.1.8

walk test attitude, crawling

crawling attitude shall consist of the standard walk test target moving with hands and knees in contact with the floor

3.1.9

walk test attitude, upright

upright attitude shall consist of the standard walk test target standing and walking with arms held at the sides of the body. The standard walk test target begins and ends a traverse with feet together

3.2 Abbreviations

For the purposes of this document, the following abbreviations apply in addition to those given in EN 50131-1.

HDPE	High Density PolyEthylene
PIR	Passive InfraRed
EMC	ElectroMagnetic Compatibility
SWT	Standard Walk-test Target
BDT	Basic Detection Target
FOV	Field Of View

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 detection	M	M	M	M
Tamper detection	Op	M	M	M
Masking detection	Op	Op	M	M
Significant reduction of range	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
Key M = Mandatory Op = Optional				

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
Masking ^a	M	Op	M
Significant reduction of range ^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
Key M = Mandatory NP = Not Permitted Op = Optional			
NOTE 1 This permits two methods of signalling a masking or reduction of range event: either by the intrusion signal and fault signal, or by a dedicated masking or reduction of range signal or message. 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. NOTE 2 When, in Table 1, an event may optionally generate signals or messages, they shall be as shown in this table. NOTE 3 It is accepted that a bus system may send out dedicated signals or messages and does not necessarily have to follow the mapping of Table 2 provided that all of the required events are signalled. ^a An independent signal or message may be provided instead. ^b Alternatively total loss of power supply shall be determined by loss of communication with the detector.			

4.2 Detection

4.2.1 Detection performance

The detector shall generate an intrusion signal or message when the standard or simulated walk-test target moves at velocities and attitudes specified in Table 3. For detection across the boundary the walk-test distance shall be 1,5 m either side of the boundary. For detection within the boundary the walk-test distance shall be 3,0 m.

Table 3 – General walk test velocity and attitude requirements

Test	Grade 1	Grade 2	Grade 3	Grade 4
Detection across the boundary	Required	Required	Required	Required
Velocity	1,0 ms ⁻¹	1,0 ms ⁻¹	1,0 ms ⁻¹	1,0 ms ⁻¹
Attitude	Upright	Upright	Upright	Upright
Detection within the boundary	Required	Required	Required	Required
Velocity	0,3 ms ⁻¹	0,3 ms ⁻¹	0,2 ms ⁻¹	0,1 ms ⁻¹
Attitude	Upright	Upright	Upright	Upright
Detection at high velocity	Not required	Required	Required	Required
Velocity	N/A	2,0 ms ⁻¹	2,5 ms ⁻¹	3,0 ms ⁻¹
Attitude	N/A	Upright	Upright	Upright
Close-in detection performance	Required	Required	Required	Required
Distance	2,0 m	2,0 m	0,5 m	0,5 m
Velocity	0,5 ms ⁻¹	0,4 ms ⁻¹	0,3 ms ⁻¹	0,2 ms ⁻¹
Attitude	Upright	Upright	Crawling	Crawling
Intermittent movement detection performance^a	Not required	Not required	Required	Required
Velocity	N/A	N/A	1,0 ms ⁻¹	1,0 ms ⁻¹
Attitude	N/A	N/A	Upright	Upright
Significant reduction of specified range^b	Not required	Not required	Not required	Required
Velocity	N/A	N/A	N/A	1,0 ms ⁻¹
Attitude	N/A	N/A	N/A	Upright

^a For grades 3 and 4 detectors, the intermittent movement shall consist of the SWT walking 1 m at a velocity of 1,0 ms⁻¹ then pausing for 5 s before continuing. The sequence shall be maintained until the SWT has traversed through the entire detection area. This constitutes one walk test. The test shall be repeated in each of the directions shown in Figure C.3.

^b The means to detect a significant reduction in range may be met either by detectors having the appropriate function (4.2.3) or by suitable system design. Two or more devices (e.g. a detector in conjunction with a camera, active transmitter or additional detector), may cooperate and interconnect with the system to provide means to detect a significant reduction of range.

4.2.2 Indication of detection

An indicator shall be provided at the detector 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 a cover which provides tamper detection as described in Tables 1 and 4. At grades 3 and 4 this indicator shall be capable of being enabled and disabled remotely at Access Level 2.