



SLOVENSKI STANDARD

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Alarm systems - Part 5: Environmental test methods

Alarm systems -- Part 5: Environmental test methods

Alarmanlagen -- Teil 5: Methoden für Umweltprüfungen

Systèmes d'alarme -- Partie 5: Méthodes d'essai d'environnement

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English version

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Part 5: Environmental test methods

Systemes d'alarme
Partie 5: Méthodes d'essai
d'environnement

Alarmanlagen
Teil 5: Methoden für Umweltprüfungen

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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

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Foreword

This European Standard was prepared by the CENELEC Technical Committee TC79, Alarm Systems.

The text of the draft was submitted to the formal vote and was approved by CENELEC as EN 50130-5 on 1998-08-01.

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) 1999-08-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 2001-08-01

This standard is part of the EN 50130 series of standards. This series of standards is intended to give the requirements applicable to alarm systems in general (e.g. the environmental test methods, in this case, and EMC immunity requirements in the case of EN 50130-4). The following associated series of European standards are intended to give the other requirements (e.g. performance requirements), which are applicable to the specific types of alarm systems:

- EN 50131 Alarm systems - Intrusion alarm systems;
- EN 50132 Alarm systems - CCTV surveillance systems;
- EN 50133 Alarm systems - Access control systems;
- EN 50134 Alarm systems - Social alarm systems;
- EN 50135 Alarm systems - Hold-up alarm systems;
- EN 50136 Alarm systems - Alarm transmission systems;
- EN 50137 Alarm systems - Combined or integrated alarm systems.

Introduction

The purpose of environmental testing is to demonstrate that the equipment can operate correctly in its service environment and that it will continue to do so for a reasonable time. Alarm system equipment is however installed in many very different environments but it would be impractical to test every aspect of the most extreme conceivable environmental conditions.

The tests and severities listed in this standard are, therefore, intended to provide a practical series of tests to determine the ability of the equipment to withstand the failure mechanisms most likely to be produced by the environment, in which that type of equipment can be expected to be installed. (i.e. the normal service environment). This standard includes only service environments, which relate to equipment installed in general industrial/commercial premises. Hence it should be noted that, additional precautions may be necessary, in particular installations, where some aspects of the environment can be identified as being unusually severe. A special additional severity has been added to the cold test, to cater for the especially cold conditions found in the very north of Europe.

The tests are intended to demonstrate failures due to realistic service environments, however, some significant failure mechanisms are brought about by changes which occur slowly under these realistic service conditions. In order to make tests in a practical and economic time, it is sometimes necessary to accelerate these changes by intensifying the conditions (e.g. by increasing the level of an environmental parameter or by increasing the time or frequency of its application).

The tests in this standard are therefore divided into:

Operational tests:

In these tests the specimen is subjected to test conditions, which correspond to the service environment. The object of these tests is to demonstrate the ability of the equipment to withstand and operate correctly in the normal service environment and/or to demonstrate the equipment's immunity to certain aspects of that environment. The specimen is therefore operational, its condition is monitored and it may be functionally tested during the conditioning for these tests.

Endurance tests:

In these tests the specimen may be subjected to conditions more severe than the normal service environment in order to accelerate the effects of the normal service environment. The object of these tests is to demonstrate the equipment's ability to withstand the long-term effects of the service environment. Since the test is intended to study the residual rather than the immediate effects of the test conditioning the specimen is not normally supplied with power or monitored during the conditioning period.

This standard is intended to act as a source document for environmental tests, which can be referred to in product specific standards for components of alarm systems which fall within its scope. In order to obtain consistency between these standards the working groups drafting the product specific standards should select the tests and severities recommended for the appropriate Equipment and Environmental classes, unless there are good technical reasons to do otherwise.

1 Scope

This standard specifies environmental test methods to be used for testing the system components of the following alarm systems, intended for use in and around buildings:

- Intruder alarm systems;
- Hold-up alarm systems;
- Social alarm systems;
- CCTV systems, for security applications;
- Access control systems, for security applications;
- Alarm transmission systems¹.

This standard specifies three equipment classes (Fixed, Movable & Portable equipment) and four environmental classes.

The environmental classes only include the general service environments envisaged for equipment installed in typical residential, commercial and industrial environments. It may be necessary for the product standard to require additional or different environmental tests or severities where

- a) there could be specific environmental problems (e.g. some different severities may be required for break glass detectors stuck to glass windows, due to the local extremes of temperature and humidity);
- b) the test exposure falls within the intended detection phenomenon of the detector (e.g. during a vibration test on a seismic detector).

In order to provide reproducible test methods and to avoid the proliferation of technically similar test methods, the test procedures have been chosen, where possible, from internationally accepted standards. (e.g. IEC Publications). For specific guidance on these tests, reference should be made to the appropriate document, which is indicated in the relevant sub-section. For more general guidance and background information on environmental testing reference should be made to IEC-Publications 60068-1 and 60068-3.

This standard does not specify

- a) the requirements or performance criteria to be applied, which should be specified in the relevant product standard;
- b) special tests only applicable to a particular device (e.g. the effects of turbulent air draughts on ultrasonic movement detectors);
- c) basic safety requirements, such as protection against electrical shocks, unsafe operation, insulation coordination and related dielectric tests;
- d) tests relating to deliberate acts of damage or tampering.

¹ Apart from equipment which is part of the public switched telephone network.

2 Normative references

This European Standard incorporates, by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies:

<u>IEC</u> <u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
60068-1 + corr. Oct. + A1	1988 1988 1992	Environmental testing – Part 1: General and guidance	EN 60068-1	1994
60068-2-1 A1 A2	1990 1993 1994	Part 2: Tests: Tests A: Cold	EN 60068-2-1 A1 A2	1993 1993 1994
60068-2-2 +60068-2-2A A1 A2	1974 1976 1993 1994	Tests B: Dry heat	EN 60068-2-2 A1 A2	1993 1993 1994
60068-2-3 + A1	1969 1984	Test Ca: Damp heat, steady	HD 323.2.3 S2	1987
60068-2-5	1975	Test Sa: Simulated solar radiation at ground level	HD 323.2.5 S1	1988
60068-2-6 + corr. Mar.	1995 1995	Test Fc: Vibration, sinusoidal	EN 60068-2-6	1995
60068-2-14 + A1	1984 1986	Test N: Change in temperature	HD 323.2.14 S2	1987
60068-2-18 corr. May A1.	1989 1991 1993	Test R & Guidance: Water	-	-
60068-2-27	1987	Test Ea & Guidance: Shock (third edition).	EN 60068-2-27	1993
60068-2-30 + A1	1980 1985	Test Db & Guidance: Damp heat, cyclic (12 + 12 hour cycle)	HD 323.2.30 S3	1988
60068-2-32 + A1 + A2	1975 1982 1990	Test Ed: Free fall	EN 60068-2-32	1993
60068-2-42	1982	Test Kc: Sulphur dioxide test for contacts and connections	-	-
60068-2-52	1996	Test Kb: Salt mist, cyclic (sodium chloride solution)	EN 60068-2-52	1996
60068-2-56	1988	Test Cb: Damp heat steady state, primarily for equipment	HD 323.2.56 S1	1990
60068-2-75	1997	Test Eh: Hammer tests	EN 60068-2-75	1997
60529	1989	Degrees of protection provided by enclosures (IP code)	EN 60529 + corr. May	1991 1993
-	-	Alarm systems - Part 4: Electromagnetic compatibility - Product family standard: Immunity requirements for components of fire, intruder and social alarm systems	EN 50130-4 A1	1995 1998
-	-	Degrees of protection provided by enclosures for electrical equipment against external mechanical impacts (IK Code)	EN 50102	1995

3 Definitions and abbreviations

For the purposes of this standard the following definitions and abbreviations apply:

3.1 Definitions

3.1.1 intruder alarm system: An alarm system to detect and indicate the presence, entry or attempted entry of an intruder into supervised premises.

3.1.2 hold-up alarm system: An alarm system designed to permit the deliberate creation of an alarm condition in the case of a hold-up.

3.1.3 social alarm system: An alarm system, providing facilities to summon assistance, for use by persons, who can be considered to be living at risk.

3.1.4 fixed equipment: Equipment fastened to a support or otherwise secured in a specific location, or equipment not provided with a carrying handle and having such a mass that it cannot easily be moved. (e.g. an intruder alarm system control panel screwed to the wall).

3.1.5 movable equipment: Equipment which is not fixed equipment and which is not normally in operation while the location is changed. (e.g. A local unit or controller for a social alarm system, which is placed on a table top).

3.1.6 portable equipment: Equipment designed to be in operation while being carried. (e.g. Access control "Smart card" badge, electronic key, social alarm trigger device carried by the user).

3.1.7 preconditioning: The treatment of a specimen, before conditioning, with the object of removing or partly counteracting the effects of its previous history.

3.1.8 conditioning: The exposure of a specimen to environmental conditions in order to determine the effect of such conditions on the specimen.

3.1.9 recovery: The treatment of a specimen, after conditioning, in order that the properties of the specimen may be stabilised before measurement.

3.2 Abbreviations

3.2.1 EMC: Electromagnetic compatibility.

3.2.2 ppm: Parts per million.

4 Environmental classes

This standard specifies the tests and severities to be used for each of the following environmental classes:

- I Indoor but restricted to residential/office environment.** (e.g. living rooms and offices)
- II Indoor in general.** (e.g. sales floors, shops, restaurants, stairways, manufacturing and assembly areas, entrances and storage rooms)
- III Outdoor but sheltered from direct rain and sunshine, or indoor with extreme environmental conditions.** (e.g. garages, lofts, barns and loading bays)
- IV Outdoor in general**

Classes I, II, III and IV are progressively more severe, and therefore Class IV equipment may be used in Class III applications, etc.

A special suffix "A" can be added to classes III & IV, to cater for the especially cold conditions found in the very north of Europe. The environmental classes, IIIA & IVA, are identical to classes III & IV, respectively, apart from the conditioning temperature in the Cold (operational) and Temperature change (operational) tests. The testing for classes IIIA & IVA shall, therefore, be conducted as for classes III & IV, respectively, except for these tests, in which the lower conditioning temperature, indicated in the appropriate tables (see 10.3.4 & 11.3.4), shall be used.

5 Standard laboratory conditions

Unless otherwise specified, the atmospheric conditions in the laboratory shall be the standard atmospheric conditions for measurements and tests, specified in IEC 60068-1:1988, Clause 5.3.1, as follows:

Temperature:	15 to 35 °C
Relative Humidity:	25 to 75 %
Air Pressure:	86 to 106 kPa

NOTE: If variations in these parameters have a significant effect on a measurement, then such variations should be kept to a minimum during a series of measurements carried out as part of one test on one specimen.

6 Tolerances

Unless otherwise stated, the tolerances for the environmental test parameters shall be as given in the basic reference standards for the test (e.g. the relevant part of IEC 60068-2).

7 Information to be included in the relevant product standard

The following information, which is required to conduct the environmental tests, shall be included in the relevant product standard making reference to this standard:

- a) the equipment class (Fixed, Movable or Portable - see clause 3);
- b) the mounting arrangements for the specimen;
- c) any deviations from the specified test procedure(s) or test severity(ies);
- d) any initial measurements or inspections, to be made before the conditioning (e.g. a functional test);
- e) the state of the specimen required during the conditioning (e.g. the configuration and operating conditions);
- f) any monitoring of the specimen and any measurements or inspections to be made during the conditioning (e.g. a functional test, where possible);
- g) any final measurements or inspections to be made after the conditioning (e.g. a functional test and a visual inspection) and any special recovery conditions required before these measurements;
- h) the pass / fail criteria;
- i) the test schedule, which gives the allocation of specimens to each test.

The following points should be taken into account during the drafting of the product standard making reference to this standard:

- The information, a) to h) above, may differ from test to test or between types of tests (e.g. between Operational & Endurance tests);
- For some types of equipment, it may not be possible to make the usual functional test during the conditioning of some of the tests, due to limitations imposed on the equipment (e.g. being placed inside an environmental chamber). It may therefore be necessary to conduct a reduced functional test or to omit the functional test during conditioning. In other tests, it is not possible to do a functional test during conditioning, due to the transitory or changing nature of the conditioning;
- The product standards should indicate whether any memory back up batteries should remain connected during endurance tests, and if so whether the memory contents should be retained.

8 Dry heat (operational)

8.1 Object of the test

To demonstrate the ability of the equipment to function correctly at high ambient temperatures, which may occur for short periods in the anticipated service environment.

8.2 Principle

The test consists of exposing the specimen to the high temperature for sufficient time to allow temperature stability to be reached, and for functional tests and/or monitoring to be conducted. 'Free air' conditions are simulated for heat-dissipating specimens to allow for self heating effects.

8.3 Test procedure

8.3.1 General

The test apparatus and procedure shall generally be as described in IEC 60068-2-2:1974+A1:1993+A2:1994.

The tests with gradual changes in temperature shall be used. Test Bd shall be used for heat-dissipating specimens (as defined in IEC 60068-2-2) and test Bb shall be used for non heat-dissipating specimens.

The dry heat operational test may be combined with the dry heat endurance test by omitting the recovery and the functional test in between.

8.3.2 Initial measurements

Before the conditioning, subject the specimen to the initial measurements required by the product standard.

8.3.3 State of specimen during conditioning

Mount the specimen and place it in the configuration and operating condition, as specified in the product standard.

8.3.4 Conditioning

Apply the appropriate severity of conditioning shown in Table 1:

Table 1

Equipment class:	Fixed, Movable & Portable		
Environmental class	I	II & III	IV
Temperature (°C)	40	55	70 ¹⁾
Duration (h)	16	16	16

1) The test at 70°C includes, by simple means, the effect of heat radiation from the sun. If this simple means is not considered suitable then the Simulated Solar Radiation Test, Temperature Rise (operational) (see clause 24) may be used instead.

8.3.5 Measurements during conditioning

Monitor the specimen during the conditioning period to detect any change in status. Any further measurements, which the product standard requires to be made during the conditioning, shall be made during the last half hour of the conditioning period.

8.3.6 Final measurements

After a recovery period of at least 1 hour at standard laboratory conditions, subject the specimen to the final measurements required by the product standard.

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9 Dry heat (endurance)

9.1 Object of the test

To demonstrate the ability of the equipment to withstand long term ageing effects.

9.2 Principle

The test consists of exposing the specimen to the high temperature for a long period to accelerate ageing effects.

9.3 Test procedure

9.3.1 General

The test apparatus and procedure shall generally be as described in IEC 60068-2-2:1974+A1:1993+A2:1994.

The tests for non heat-dissipating specimen (i.e. Tests Ba and Bb) will be applicable. Test Ba (with sudden change of temperature) may be used, to improve test economy, if it is known that sudden change in temperature will not be detrimental to the specimen.

The dry heat endurance test may be combined with the dry heat operational test by omitting the recovery and the functional test in between.

9.3.2 Initial measurements

Before the conditioning, subject the specimen to the initial measurements required by the product standard.