

# TECHNICAL REPORT

**iTeh STANDARD**  
Home and Building Electronic Systems (HBES) and Building Automation and  
Control Systems (BACS) – **PREVIEW**  
Part 2: Environmental conditions  
(standards.iteh.ai)

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INTERNATIONAL  
ELECTROTECHNICAL  
COMMISSION

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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

**HOME AND BUILDING ELECTRONIC SYSTEMS (HBES)  
AND BUILDING AUTOMATION AND CONTROL SYSTEMS (BACS) –**

**Part 2: Environmental conditions**

**FOREWORD**

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IEC TR 63044-2 has been prepared by IEC technical committee 23: Electrical accessories. It is a Technical Report.

The text of this Technical Report is based on the following documents:

Draft	Report on voting
23/983/DTR	23/999/RVDTR

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this Technical Report is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at [www.iec.ch/members\\_experts/refdocs](http://www.iec.ch/members_experts/refdocs). The main document types developed by IEC are described in greater detail at [www.iec.ch/standardsdev/publications](http://www.iec.ch/standardsdev/publications).

A list of all parts in the IEC 63044 series, published under the general title *Home and Building Electronic Systems (HBES) and Building Automation and Control Systems (BACS)*, can be found on the IEC website.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under [webstore.iec.ch](http://webstore.iec.ch) in the data related to the specific document. At this date, the document will be

- reconfirmed,
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## INTRODUCTION

The IEC 63044 series deals with developing and testing home and building electronic systems (HBES) and building automation and control systems (BACS).

The expression HBES/BACS covers any combination of HBES and/or BACS devices including their separate connected/detachable devices linked together via one or more networks.

This document applies to HBES/BACS devices and defines the environmental conditions in which these devices are to be used when so declared by the manufacturer.

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# HOME AND BUILDING ELECTRONIC SYSTEMS (HBES) AND BUILDING AUTOMATION AND CONTROL SYSTEMS (BACS) –

## Part 2: Environmental conditions

### 1 Scope

This part of IEC 63044 provides the environmental conditions for HBES/BACS devices, when declared in the manufacturer's documentation for use in one or more of the environment classes as defined in Clause 6 of this document.

This document focuses on the following environmental conditions:

- climatic environmental conditions,
- chemical environmental conditions,
- mechanical environmental conditions,
- biological environmental conditions.

This document does not supersede the relevant product standard, if any, and applies only in addition to the relevant products standard when it is referred to in the manufacturer's documentation. It is intended to support the particular manufacturer's declaration or any agreement on environmental conditions between customer and manufacturer.

This document is not intended to give guidance on requirements and tests for the drafting of product standards.

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The document provides an overview of environmental conditions for devices operating in weather-protected and non-weather-protected locations, ship environments, portable use and also for storage and transport.

### 2 Normative references

There are no normative references in this document.

### 3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <http://www.iso.org/obp>

#### 3.1

##### product documentation

set of documents that may contain any of the following:

- the manufacturer's installation and operations literature which accompanies the product;
- the product information contained in the manufacturer's catalogue and other product marketing material/information;



- the description, definitions, product literature and usage as presented in electronic format on the manufacturer's (or supplier's) website on the World Wide Web/Internet

### 3.2

#### **weather-protected controlled location**

location that is enclosed, and where direct weather influences are totally excluded

Note 1 to entry: In addition, temperature is controlled by heating or cooling to maintain the required conditions, especially where these are very different from those of the open-air climate. Humidity is not controlled. Vibration and shock are insignificant. These locations may be in rural and some urban areas with low industrial activities and moderate traffic. There is no particular risk of biological attack due to mould growth, animals, etc.

EXAMPLES:

- normal living or working areas, for example living rooms, and rooms for general use such as theatres, restaurants, offices, shops, workshops for electronic assembly and products;
- telecommunication centres;
- storage rooms for valuable and sensitive products.

### 3.3

#### **weather-protected uncontrolled location**

location that is enclosed, but where direct weather influences are not completely excluded

Note 1 to entry: In addition, neither temperature nor humidity is controlled, although heating may be used to raise low temperatures where there is a large difference between the conditions of this location and those of the open-air climate. Vibration is of low significance.

EXAMPLES:

- entrances and staircases of buildings, garages, cellars, and certain workshops;
- buildings in factories and industrial process plants;
- unattended equipment stations, certain telecommunication buildings, ordinary storage;
- rooms for frost-resistant products, farm buildings, etc.

## 4 General explanation for all tests

The variety and the diversity of the devices within the scope of this document make it difficult to define precise criteria for the evaluation of the immunity test results.

If, as a result of the application of the tests defined in this document, the device becomes dangerous or unsafe, the device is deemed to have failed the test.

## 5 Environmental conditions

### 5.1 General test conditions

The HBES/BACS devices are designed for use in one or more of the environment classes according to the classification in the IEC 60721-3 series as indicated in Table 1 to Table 4.

All test procedures are described in the IEC 60068 series.

Environmental tests are applied in accordance with the test method in the relevant basic standard of the IEC 60068 series. In addition the following applies:

- the device is in operation during all tests except those for storage and transportation;
- the tests are carried out in the least favourable operating mode;
- it is not always possible to test every function of the devices, and in such cases the most onerous mode of operation is selected;
- the tests are carried out as single tests in sequence. The sequence of testing is optional;

- the description of the test, the test method and the test set-up are given in basic standards (IEC 60068-x-x) which are referred to in Table 1 to Table 4;
- the content of these basic standards is not repeated here. However, details of modifications and other information needed for the practical application of the tests are given in this document.

Annex A provides a description of the environmental classes and a summary of sets of environmental classes.

## 5.2 General performance criteria

A functional description and a definition of performance criteria, during or as a consequence of environmental testing, are provided by the manufacturer and noted in the test report, based on the following criteria:

- changes in stored data, such as communication error logs, and which are not directly related to the intended function of the equipment may be ignored;
- in addition, the device continues to operate according to its product documentation as intended during and after the test. No unintended change of state, unintended loss of stored data, unintended function or loss of function is allowed;
- during (except for storage and transportation) and after all tests the device is not blocking the transmission media or sending unintended telegrams.

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## 6 Environmental conditions

### 6.1 Climatic

Classification of climatic environmental conditions and tests are shown in Table 1.

Table 1 – Details of climatic tests

Location	Storage <sup>a</sup>	Transport <sup>a</sup>	Weather protected		Non-weather protected <sup>f</sup>	Ship	Portable and non-stationary
			Controlled <sup>d</sup>	Uncontrolled			
Environment class	IEC 60721-3-1	IEC 60721-3-2	IEC 60721-3-3	IEC 60721-3-3	IEC 60721-3-4	IEC 60721-3-6	IEC 60721-3-7
Tests	1K3 80d3-4264-8001-745c5116b03e	2K3 <a href="https://standards.iteh.ai/catalog/standards/sist/163b200f-3k4">https://standards.iteh.ai/catalog/standards/sist/163b200f-3k4</a>	3K4	3K5 Or 3K6	4K2 Or 4K1	6K3	7K2
Change of temperature IEC 60068-2-14 <sup>g</sup>							
min. temperature	-5	-25	5	-5 or -25	-33 or -20	-25	-5
max. temperature	45	70	40	45	40	55	45
Damp heat steady state	None	None	30 / 16 95	40 / 2 days 95	40 / 2 days 95 Or 35 / 2 days 95	30 / 10 days 93	None
Damp heat cyclic	25 / 40 1	25 / 55 2	None	25 / 30 2	25 / 40 2 (both)	None	25 / 40 2
IP rating <sup>e</sup>	IPXX	IPXX	IPXX	IPXX <sup>b</sup>	IPX4	IPX6 <sup>c</sup>	IPX3

<sup>a</sup> Tests on storage and transport conditions aim to verify the resistance of the packaging. The tests are carried out once per package (which may be used for more than one product). During these tests the device is not in operation. For all other tests the device is in operation.

<sup>b</sup> See HD 60364.7.701, HD 384.7.702 for installation requirements in bathrooms, swimming pools and similar environments.

<sup>c</sup> IP rating IP56 is for open deck.

<sup>d</sup> Covers also weather-protected controlled locations in vehicles, e.g., ships.

<sup>e</sup> X means that the IP rating is not set by the environmental requirements but may be specified by other requirements such as safety.

<sup>f</sup> The manufacturer chooses the climatic test according to the environment in which the products are installed.

<sup>g</sup> Temperature change rate: 1 °C/min, duration of constant temperature ( $t_1$  of Figure 2 in IEC 60068-2-14:2009): 10 min, number of cycles: 2.

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