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Stationary use at weatherprotected locations

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Contents

Intellectual Property Rights 4
Foreword 4
1 Scope 5
2 References 5
2.1 Normative references 5
2.2 Informative references 5
3 Definitions and abbreviations 5
3.1 Definitions 5
3.2 Abbreviations 6
4 Environmental classes 6
4.1 Class 3.1: Temperature-controlled locations 6
4.2 Class 3.2: Partly temperature-controlled locations 8
4.3 Class 3.3: Not temperature-controlled locations 9
4.4 Class 3.4: Sites with heat-trap 10
4.5 Class 3.5: Sheltered locations 11
4.6 Class 3.6: Telecommunication control room locations 12
5 Environmental conditions 14
5.1 Climatic conditions 14
5.2 Biological conditions 15
5.3 Chemically active substances 15
5.4 Mechanically active substances 16
5.5 Mechanical conditions 17
5.6 Earthquake conditions 17
Annex A (informative): Bibliography 20
History 21

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Foreword

This draft European Standard (EN) has been produced by ETSI Technical Committee Environmental Engineering (EE), and is now submitted for the combined Public Enquiry and Vote phase of the ETSI standards EN Approval Procedure.

The present document is part 1, sub-part 3 of a multi-part deliverable covering the environmental conditions for telecommunications equipment, as identified below:

Part 1: "Classification of environmental conditions": (see note 1)

Sub-part 0: "Introduction";

Sub-part 1: "Storage";

Sub-part 2: "Transportation";

Sub-part 3: "Stationary use at weatherprotected locations";

Sub-part 4: "Stationary use at non-weatherprotected locations";

Sub-part 5: "Ground vehicle installations";

Sub-part 6: "Ship environments";

Sub-part 7: "Portable and non-stationary use";

Sub-part 8: "Stationary use at underground locations";

Part 2: "Specification of environmental tests" (see note 2).

NOTE 1: Specifies different standardized environmental classes covering climatic and biological conditions, chemically and mechanically active substances and mechanical conditions during storage, transportation and in use. Sub-part 1-0 forms a general overview of part 1.

NOTE 2: Specifies the recommended test severities and test methods for the different environmental classes.

Proposed national transposition dates	
Date of latest announcement of this EN (doa):	3 months after ETSI publication
Date of latest publication of new National Standard or endorsement of this EN (dop/e):	6 months after doa
Date of withdrawal of any conflicting National Standard (dow):	6 months after doa

1 Scope

The present document defines classes of environmental conditions and their severities to which telecommunication equipment may be exposed. The severities specified are those which will have a low probability of being exceeded; generally less than 1 %.

The present document applies to equipment mounted for stationary use including periods of erection work, down time, maintenance and repair at weatherprotected locations defined in clause 5.

2 References

References are either specific (identified by date of publication and/or edition number or version number) or non-specific. For specific references, only the cited version applies. For non-specific references, the latest version of the reference document (including any amendments) applies.

Referenced documents which are not found to be publicly available in the expected location might be found at http://docbox.etsi.org/Reference.

NOTE: While any hyperlinks included in this clause were valid at the time of publication, ETSI cannot guarantee their long term validity.

2.1 Normative references

The following referenced documents are necessary for the application of the present document.

[1] IEC 60721-2-6:1990: "Classification of environmental conditions. Part 2: Environmental conditions appearing in nature. Earthquake vibration and shock".

2.2 Informative references

The following referenced documents are not necessary for the application of the present document but they assist the user with regard to a particular subject area.

[i.1] Void.

[i.2] IEC 60721-3-3:2002: "Classification of environmental conditions - Part 3-3: Classification of groups of environmental parameters and their severities - Stationary use at weatherprotected locations".

[i.3] IEC 60068-3-3:1991: "Environmental testing - Part 3: Guidance. Seismic test methods for equipment".

[i.4] ETSI EN 300 019-2-3 (2013): "Environmental Engineering (EE); Environmental conditions and environmental tests for telecommunications equipment; Part 2-3: Specification of environmental tests; Stationary use at weatherprotected locations".

[i.5] IEC 60068-2-27:2008: "Environmental Testing, Part 2-27: Test Ea and guidance: Shock".

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the following terms and definitions apply:

absolute humidity: mass of water vapour in grams which is associated with one cubic metre of dry air in an air/water vapour mixture

air conditioning system: system that fully and automatically controls the climatic parameters air temperature and humidity by heating, cooling, humidifying and dehumidifying

climate-controlling system: system that controls or influences climate, acting at least on one climatic parameter in one direction

cooling system: system that controls or influences climate by decreasing the air temperature only

NOTE: This can decrease the absolute humidity.

data centre: all buildings, facilities, offices and rooms which contain enterprise servers, server communication equipment, cooling equipment and power equipment, and provide some form of data service

NOTE: E.g. large scale mission critical facilities all the way down to small server rooms located in office buildings.

forced ventilation system: system that controls or influences climate by introducing outdoor air into the room or expelling air out of the room

heating system: system that controls or influences climate by increasing the air temperature only

NOTE: This can decrease the relative humidity.

relative humidity: ratio of the partial pressure of the water vapour in moist air at a given temperature, to the partial pressure of the water vapour in saturated air at the same temperature

stationary use: use of equipment which is mounted firmly on a structure, or on mounting devices, or permanently placed at a certain site

NOTE: It is not intended for portable use, but short periods of handling during erection works and for which down time, maintenance and repair at the location are included.

weatherprotected location: location at which the equipment is protected from direct weather influences

EXAMPLE 1: Totally weatherprotected location (enclosed location): direct weather influences are totally excluded.

EXAMPLE 2: Partly weatherprotected location (sheltered location): direct weather influences are not completely excluded.

3.2 Abbreviations

For the purposes of the present document, the following abbreviations apply:

RS	Response Spectrum
ZPA	Zero Period Acceleration

4 Environmental classes

The classes shown in parentheses, e.g. (3C1), may be selected for special applications.

4.1 Class 3.1: Temperature-controlled locations

Class 3.1 is a combination of classes 3K3/3Z2/3Z4/3B1/3C2(3C1)/3S2/3M1 in IEC 60721-3-3 [i.2].

The climatogram is shown in figure 1.

Seismic environment: **zone 4** as defined in IEC 60721-2-6 [1]. Option zone 4 (modified Mercalli scale ≥ 9): if earthquake conditions are specified by the customer, the conditions stated in clause 5.6 apply.

This class shall apply to a permanently temperature controlled enclosed location. Humidity is usually not controlled. The climatogram is shown in figure 1.

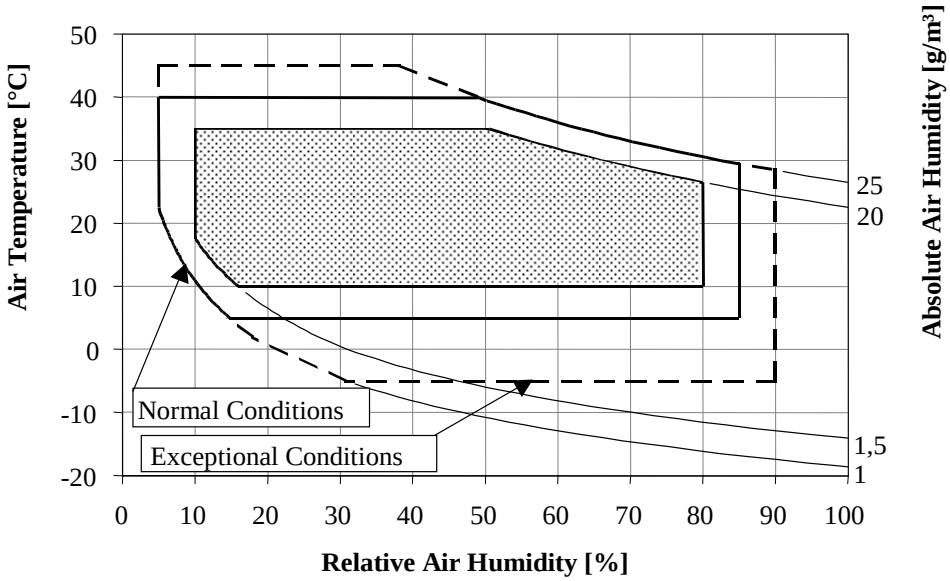
Heating, cooling, forced ventilation and humidification are used as necessary to maintain the required conditions - especially where there is a significant difference between the room environment and the external ambient. The climate-controlling systems could be periodically switched on or off but extremely high or low temperatures are prevented.

This class shall apply to locations:

- where installed equipment may be exposed to solar radiation and to heat radiation. It may also be exposed to movements of the surrounding air due to draughts in buildings. They are not subjected to condensed water, precipitation, water from sources other than rain or icing;
- without particular risks of biological attacks. This includes protective measures, e.g. special product design, or installations at locations of such construction that mould growth and attacks by animals, etc. are not probable;
- with normal levels of contaminants experienced in urban areas with industrial activities scattered over the whole area and/or with heavy traffic;
- without special precautions to minimize the presence of sand or dust, but which are not situated in proximity to sources of sand or dust;
- with insignificant vibration and shock.

The conditions of this class may be found in:

- normal living or working areas, e.g. living rooms, rooms for general use (theatres, restaurants);
- offices;
- shops;
- workshops for electronic assemblies and other electrotechnical products;
- telecommunication centres;
- storage rooms for valuable and sensitive products;
- data centres;
- computer halls.



Values outside this field have a probability of occurrence of less than 10 % (see IEC 60721-3-0).

Exceptional climatic limits.

Normal climatic limits: Values outside these limits have a probability of occurrence of less than 1 % .

NOTE: Exceptional conditions may occur following the failure of the temperature controlling system. This is described as 3.1E in the tables but it should be noted that there is no separate class 3.1E.

Figure 1: Climatogram for Class 3.1: Temperature-controlled locations

4.2 Class 3.2: Partly temperature-controlled locations

This class is a combination of classes 3K5/3Z2/3Z4/3B2/3C2(3C1)/3S3/3M2 in IEC 60721-3-3 [i.2].

Seismic environment: **zone 4** as defined in IEC 60721-2-6 [1]. Option zone 4 (modified Mercalli scale ≥ 9): if earthquake conditions are specified by the customer, the conditions stated in clause 5.6 apply.

This class applies to an enclosed location having neither temperature nor humidity control. The climatogram is shown in figure 2.

Heating may be used to raise low temperatures especially where there is a significant difference between the conditions of this class and the open-air climate. Building construction is designed to avoid extremely high temperatures.

This class shall apply to locations:

- where installed equipment may be exposed to solar radiation and heat radiation. They may also be exposed to movements of the surrounding air due to draughts in buildings, e.g. through open windows. They may be subjected to condensed water. They are not subjected to precipitation;
- where mould growth or attacks by animals, except termites, may occur;
- with normal levels of contaminants experienced in urban areas with industrial activities scattered over the whole area and/or with heavy traffic;
- in close proximity to sources of sand or dust;
- with vibration of low significance, e.g. for products fastened to light supporting structures subjected to negligible vibrations.

The conditions of this class may be found in:

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

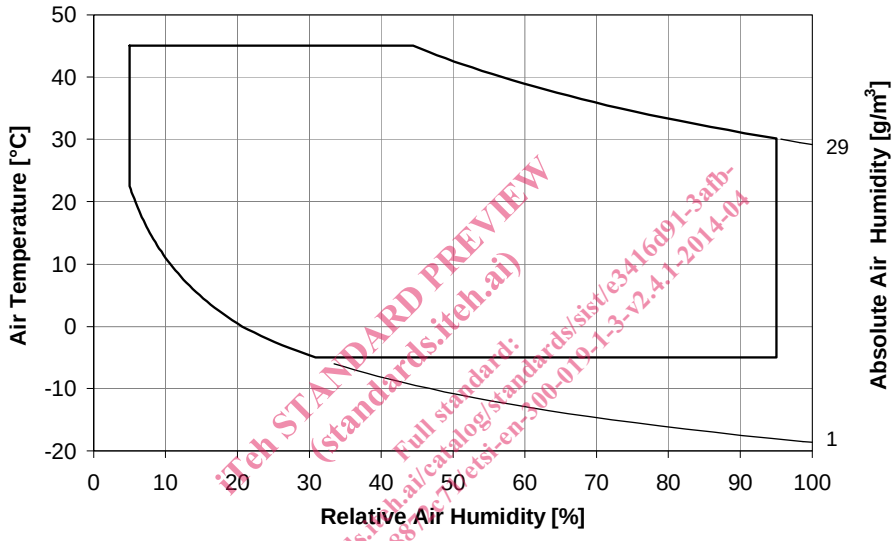


Figure 2: Climatogram for class 3.2: Partly temperature-controlled locations

4.3 Class 3.3: Not temperature-controlled locations

This class is a combination of classes 3K6/3Z2/3Z4/3Z7/3B2/3C2(3C1)/3S3/3M2 in IEC 60721-3-3 [i.2].

Seismic environment: **zone 4** as defined in IEC 60721-2-6 [1], Option zone 4 (modified Mercalli scale ≥ 9): if earthquake conditions are specified by the customer, the conditions stated in clause 5.6 apply.

This class shall apply to a weatherprotected location having neither temperature nor humidity control. The location may have openings directly to the open air, i.e. may be only partially-weather protected. The climatogram is shown in figure 3.

The climatic conditions of this class may be affected to a varying extent by the conditions of the open-air climate and the construction of the building.

This class shall apply to locations:

- where installed equipment may be exposed to solar radiation and temporarily to heat radiation. It may also be exposed to movements of the surrounding air due to draughts e.g. through doors, windows or other openings. It may be subjected to condensed water, to water from sources other than rain and to icing. It may temporarily be subjected to limited wind-driven precipitation, including snow;
- where mould growth, or attacks by animals, except termites, may occur;
- with normal levels of contaminants experienced in urban areas with industrial activities scattered over the whole area and/or with heavy traffic;
- in close proximity to sources of sand or dust;
- with vibration of low significance, e.g. for products fastened to light supporting structures subjected to negligible vibrations.

The conditions of this class may be found in:

- some entrances to buildings;
- some garages;
- some shacks;
- unattended buildings, etc.

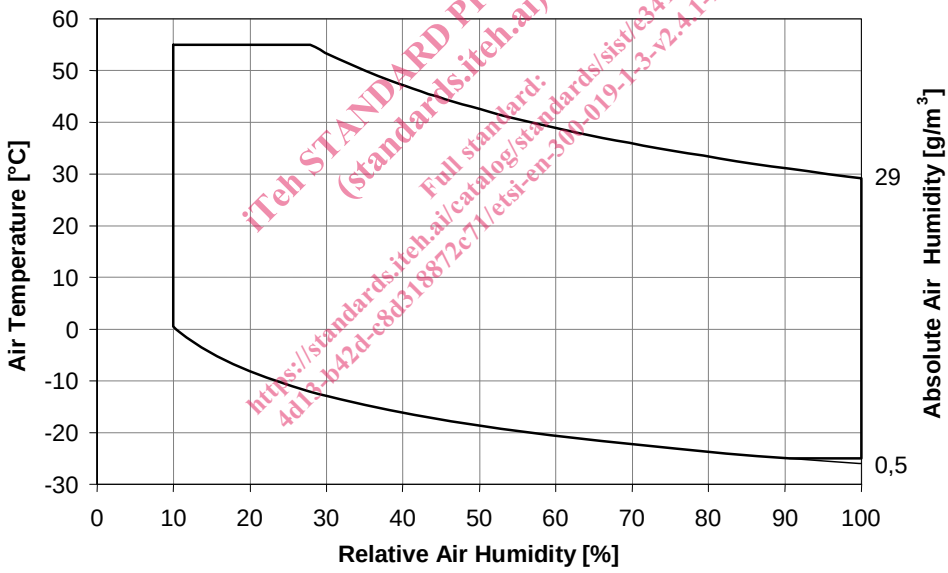


Figure 3: Climatogram for class 3.3: Not temperature controlled locations

4.4 Class 3.4: Sites with heat-trap

This class is a combination of classes 3K7/3Z2/3Z4/3Z7/3Z8/3B2/3C2(3C3)/3S3/3M5(3M3) in IEC 60721-3-3 [i.2].

Seismic environment: **zone 4** as defined in IEC 60721-2-6 [1]. Option zone 4 (modified Mercalli scale ≥ 9): if earthquake conditions are specified by the customer, the conditions stated in clause 5.6 apply.

This class shall apply to a weather protected location having neither temperature nor humidity control. The location may have openings directly to the open air, i.e. may be only partially weather protected. The effect of direct solar radiation and heat trap conditions exist. The climatogram is shown in figure 4.