

INTERNATIONAL
STANDARD

IEC
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Second edition
1993-02

**Industrial-process measurement and
control equipment – Operating conditions –**

**Part 1:
Climatic conditions**

This English-language version is derived from the original bilingual publication by leaving out all French-language pages. Missing page numbers correspond to the French-language pages.



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Part 1: Climatic conditions

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**INDUSTRIAL-PROCESS MEASUREMENT AND CONTROL EQUIPMENT –
OPERATING CONDITIONS –****Part 1: Climatic conditions**

FOREWORD

- 1) The IEC (International Electrotechnical Commission) is a world-wide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of the IEC is to promote international cooperation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, the IEC publishes International Standards. Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. The IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
- 2) The formal decisions or agreements of the IEC on technical matters, prepared by technical committees on which all the National Committees having a special interest therein are represented, express, as nearly as possible, an international consensus of opinion on the subjects dealt with.
- 3) They have the form of recommendations for international use published in the form of standards, technical reports or guides and they are accepted by the National Committees in that sense.
- 4) In order to promote international unification, IEC National Committees undertake to apply IEC International Standards transparently to the maximum extent possible in their national and regional standards. Any divergence between the IEC Standard and the corresponding national or regional standard shall be clearly indicated in the latter.

This International Standard IEC 654-1 has been prepared by sub-committee 65A: System aspects, of IEC technical committee 65: Industrial-process measurement and control.

This second edition cancels and replaces the first edition published in 1979, which was in general in agreement with IEC 721. However some parameter values differed: these divergences created problems for users as well as manufacturers.

During the process of revision it was deemed advisable to keep the Classes A, B, C, described in the first edition of IEC 654-1, but to align the (limit) values of the environmental parameters with those of Classes (3K1, 3K2, 3K3, 3K4, 3K5, 3K6, 3K7, 4K2, 4K3) in IEC 721 (except for the low air pressure, where the more realistic value of 86 kPa, taken from IEC Guide 106, was used).

In addition in the first edition of IEC 654-1, for Classes A, B and C (corresponding to indoor locations) temperature was defined as the ambient air temperature, whereas for Class D (corresponding to outdoor locations) the high temperature was defined as the surface temperature of the equipment. This was not very consistent, the more so as for Class D, no reference to IEC 721-3 could then be made. This revised edition defines the high temperatures as air temperatures instead of surface temperatures of the equipment.

The text of this standard is based on the following documents:

DIS	Report on Voting
65A(CO)31	65A(CO)36

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

Annex A is for information only.

INDUSTRIAL-PROCESS MEASUREMENT AND CONTROL EQUIPMENT - OPERATING CONDITIONS -

Part 1: Climatic conditions

1 Scope

The purpose of this part of IEC 654 is to provide users and suppliers of industrial-process measurement and control systems and parts of such systems with a uniform listing of the selected environmental conditions to which equipment may be exposed in specified locations.

This part lists environmental climatic conditions e.g. air temperature, humidity and air pressure in specified locations to which land-based and offshore industrial-process measurement and control systems may be exposed during operation, during periods when they are installed but inactive and during storage or transportation. Maintenance and repair conditions are not considered.

Environmental conditions directly related to fire and explosion hazards and conditions related to ionized radiation are likewise not considered. Effects of the specific environmental conditions on personnel are not within the scope of this part.

The influence quantities considered in this part are limited to those which may directly affect the performance of process measurement and control systems. Only environmental conditions as such are considered.

This part establishes location classes with severity levels or sets of severity levels for the environmental conditions listed. Other environmental conditions are covered in other parts of the standard.

The limit values of this part are defined and specified in IEC 721-3-3 and IEC 721-3-4.

It is intended to serve as a basis for the preparation of comprehensive specifications for environmental conditions by the user and by the supplier.

One of the purposes of this part is to avoid problems which might result from neglecting considerations of specific environmental conditions affecting the performance of systems and parts of systems.

An additional purpose of this part is to aid in the choice of severity levels for use in the development of evaluation specifications of industrial-process measurement and control equipment.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this part of IEC 654. At the time of publication of this standard, the editions indicated were valid. All normative documents are subject to revision, and parties to agreements based on this part of IEC 654 are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

IEC 721-3-1: 1987, *Classification of environmental conditions – Part 3: Classification of groups of environmental parameters and their severities – Storage*
Amendment 1 (1991)

IEC 721-3-2: 1985, *Classification of environmental conditions – Part 3: Classification of groups of environmental parameters and their severities – Transportation*
Amendment 1 (1991)

IEC 721-3-3: 1987, *Classification of environmental conditions – Part 3: Classification of groups of environmental parameters and their severities – Stationary use at weather-protected location*
Amendment 1 (1991)

IEC 721-3-4: 1987, *Classification of environmental conditions – Part 3: Classification of groups of environmental parameters and their severities – Stationary use at non-weatherprotected locations*
Amendment 1 (1991)