IEC TS 63164-1

Edition 1.0 2020-02

TECHNICAL SPECIFICATION

colour inside

Reliability of industrial automation devices and systems – Part 1: Assurance of automation devices reliability data and specification of their source

INTERNATIONAL ELECTROTECHNICAL COMMISSION

ICS 25.040

ISBN 978-2-8322-7809-3

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Part 1: Assurance of automation devices reliability data and specification of their source

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Technical Specifications are subject to review within three years of publication to decide whether they can be transformed into International Standards.

Technical Specification IEC TS 63164-1 has been prepared by IEC technical committee 65: Industrial-process measurement, control and automation.

The text of this technical specification is based on the following documents:

DTS	Report on voting
65/744/DTS	65/767/RVDTS

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

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of all parts of the IEC 63164 series, published under the general title, *Reliability of industrial automation devices and systems*, can be found on the IEC website.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC web site under "http://webstore.iec.ch" in the data related to the specific publication. At this date, the publication will be

- transformed into an International standard,
- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

IMPORTANT – The 'colour inside' logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

INTRODUCTION

Reliability data of automation devices is often used by assessors and system integrators to predict the properties of a complete system. The assessors and system integrators need to know how this data was acquired. This specification gives guidance to device manufacturers on how to present the reliability data of their devices and how to indicate the source of the reliability data in a manner that assessors and system integrators can make best use of. This includes the specification of reference conditions.

Three methods of data acquisition are distinguished:

1) Calculation. This is the preferred method for electronic devices.
2) Observation of devices in the field. This is the preferred method if no relevant data is available to make a forecast by calculation.
3) Laboratory tests. This is the preferred method for mechanical and electromechanical devices. Laboratory durability tests are, however, not deemed to be suitable if said devices will operate in the low demand mode (in the sense of IEC 61508-4:2010, 3.5.16).

NOTE Burn-in and break-in are not considered in this specification and will be addressed in future documents.

This specification is the first part of the series. This part of IEC 63164 concentrates on reliability data, including assurance of reliability data and methods of field reliability data collection. How to get data from calculation and laboratory tests is described in other documents. Therefore, this part will concentrate on random hardware failures, but it is recognized that it is difficult to distinguish between random hardware failures and systematic failures when collecting field data.

Future parts can include following subjects:

– reliability at system level;
– monitoring the automation device in the field;
– user guide.

RELIABILITY OF INDUSTRIAL AUTOMATION DEVICES AND SYSTEMS –

Part 1: Assurance of automation devices reliability data and specification of their source

1 Scope

This part of IEC 63164 provides guidance on the assurance of reliability data of automation devices. If the source of this data is calculation, guidance is given on how to specify the methods used for this calculation. If the source is from observation of devices in the field, guidance is given on how to describe these observations and their evaluations. If the source is the outcome of laboratory tests, guidance is given on how to specify these tests and the conditions under which they have been carried out.

This document defines the form to present the data.

The components considered in this document are assumed not to need any break-in phase before full range usage.

When devices are used for functional safety application, the requirements of IEC 61508 (all parts) and related standards are considered.

2 Normative references

The following documents are referenced in the text in such a way that some or all of their content constitutes requirements for this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60300-3-2:2004, *Dependability management – Part 3-2: Application guide – Collection of dependability data from the field*

IEC 60300-3-5:2001, *Dependability management – Part 3-5: Application guide – Reliability test conditions and statistical test principles*

IEC 61649:2008, *Weibull analysis*