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BSI Standards Publication

Methods for calculating the main static performance indicators of transducers and transmitters

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National foreword

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Methods for calculating the main static performance indicators of transducers and transmitters

INTERNATIONAL
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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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METHODS FOR CALCULATING THE MAIN STATIC PERFORMANCE INDICATORS OF TRANSDUCERS AND TRANSMITTERS

FOREWORD

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IEC TR 62967, which is a technical report, has been prepared by subcommittee 65B: Measurement and control devices of IEC technical committee 65: Industrial-process measurement, control and automation.

The text of this International Standard is based on the following documents:

Enquiry draft	Report on voting
65B/961/DTR	65B/1016/RVC

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

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

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

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

A bilingual version of this publication may be issued at a later date.

INTRODUCTION

This technical report provides a comprehensive illustration of the methods for calculating the main static performance indicators of transducers, transmitters and similar measuring devices. First of all, in order to avoid any misunderstanding, we would like to review the commonly-accepted definition of transducers and transmitters. Generally speaking, in a measurement field, a transducer is a measuring device which converts the non-electrical quantity to be measured into corresponding electrical quantity, while a transmitter is a kind of transducer which is required to provide a previously-given linear output.

The common-in-use standards [01]-[06][1] listed in the relevant documents to be considered in this report, are useful in evaluating the main static performance indicators of measuring instruments and other similar devices. But the relevant descriptions of calculation methods in standards [01]-[05] are not complete and adequate in many ways. This fact was clearly stated in the Introduction of IEC 61298 [03].

On the whole, these publications [01]-[05] mainly contain relevant technical terms and definitions. Since in essence, they are not standards which are dedicated solely to the calculation of performance indicators, so they contain no or only very simple and inadequate illustrations of the calculation methods. Moreover, as these contents have existed for about tens of years, probably now is the time to make an all-round revision and improvement of them. Since there are many static performance indicators that should be calculated and the calculation methods can form a rather complete system. So it is better to create a separate report or a separate standard.

For the main static performance indicators, the existing relevant IEC standards have only theoretical definitions, but have no specific calculation methods. This does not mean that these methods are too simple to mention. But on the contrary, some of them are too difficult to be used in industry. Therefore, this report puts forward, improves and simplifies the existing relevant calculation methods, may probably serve as a good basis on which to create a new calculation-oriented IEC standard.

The report is intended for use by manufacturers to work out their factory-level test standards, by users to make rigorous acceptance tests and wise applications, and by authorized metrological establishments to verify the measuring device performance indicators of the manufacturers or of the users.

[1] Numbers in square brackets refer to the Bibliography.

METHODS FOR CALCULATING THE MAIN STATIC PERFORMANCE INDICATORS OF TRANSDUCERS AND TRANSMITTERS

1 Scope

This Technical Report 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 through observations, 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.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of 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 60050-300, *International Electrotechnical Vocabulary – Electrical and electronic measurements and measuring instruments*

Part 311: General terms relating to measurements

Part 312: General terms relating to electrical measurements

Part 313: Types of electrical measuring instruments

Part 314: Specific terms according to the type of instrument

IEC 60050-351, *International Electrotechnical Vocabulary – Part 351: Control technology*

IEC 60770-1:1999 *Transmitters for Use in Industrial-process Control Systems – Part 1: Methods for Performance Evaluation*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 60050-300, IEC 60050-351 and IEC 60770-1:1999, as well as the following 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