



BSI Standards Publication

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

National foreword

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TECHNICAL REPORT

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

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

ICS 25.040.40

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CONTENTS

FOREWORD.....	6
INTRODUCTION.....	8
1 Scope.....	9
2 Normative references	9
3 Terms and definitions	9
3.1 Basic terms.....	10
3.1.3 Input terms	10
3.1.4 Output terms.....	10
3.2 Static calibration characteristics.....	11
3.3 Definitions of static performance indicators.....	11
4 Methods for calculating individual static performance indicators	15
4.1 Establishment of static calibration characteristics	15
4.1.1 General requirements for static calibration.....	15
4.1.2 The calculation of static calibration characteristics	15
4.2 Span (x_{FS})	16
4.3 Full-span output (YFS).....	16
4.4 Resolution (R_x).....	16
4.5 Sensitivity (S_i).....	17
4.6 Hysteresis (ξ_H)	17
4.7 Repeatability (ξ_R)	17
4.7.1 Calculating methods	17
4.7.2 Determination of coverage factor	18
4.7.3 Calculation of sample standard deviations	18
4.8 Linearity (ξ_L).....	18
4.8.1 The general formula for calculating linearity.....	18
4.8.2 Absolute linearity ($\xi_{L,ab}$)	19
4.8.3 Terminal-based Linearity ($\xi_{L,te}$)	19
4.8.4 Shifted-terminal-based Linearity ($\xi_{L,s,te}$).....	20
4.8.5 Zero-based linearity ($\xi_{L,ze}$)	20
4.8.6 Front-terminal-based Linearity ($\xi_{L,f,te}$)	21
4.8.7 Independent Linearity ($\xi_{L,in}$)	21
4.8.8 Least-squares Linearity ($\xi_{L,ls}$).....	22
4.9 Conformity (ξ_C).....	23
4.9.1 The general formula for calculating conformity.....	23
4.9.2 Absolute conformity ($\xi_{C,ab}$).....	23
4.9.3 Terminal-based conformity ($\xi_{C,te}$)	24
4.9.4 Zero-based conformity ($\xi_{C,ze}$).....	24
4.9.5 Front-terminal-based conformity ($\xi_{C,f,te}$).....	24
4.9.6 Independent conformity ($\xi_{C,in}$)	24
4.9.7 Least-squares conformity ($\xi_{C,ls}$).....	25
4.10 Drift and shift	25
4.10.1 Zero drift (D_0).....	25
4.10.2 Drift of upper-range-value output (D_u)	26
4.10.3 Thermal zero shift (γ).....	26
4.10.4 Thermal shift of upper-range-value output (β)	26
5 Methods for calculating combined static performance indicators	27

5.1	Combined linearity and hysteresis (Linearity plus hysteresis) ξ_{LH}	27
5.1.1	The general form of calculating formula	27
5.1.2	The calculation of reference line	27
5.2	Combined linearity, hysteresis and repeatability(ξ_{LHR})	27
5.2.1	The general form of calculating formula	28
5.2.2	The alternative forms of the calculating formulas	28
5.2.3	The method for calculating the working characteristics	29
Annex A (informative)	Methods and examples for calculating linearities	31
A.1	Numerical examples for calculating zero-based linearity	31
A.1.1	The general principle of calculation	31
A.1.2	Solving for the first approximating straight line	31
A.1.3	Solving for the second approximating straight line	31
A.2	Numerical examples for calculating independent linearity	32
A.2.1	The principle of a precise method	32
A.2.2	The principle of the makeshift methods	35
A.3	A comparison of the results of all kinds of linearities	35
Annex B (informative)	Methods and Examples for Calculating Conformities	36
B.1	The general principle for calculating conformities	36
B.1.1	Determining the degree of the fitting curves	36
B.1.2	Choosing the number of the alternating points	36
B.1.3	Determining the locations of the alternating points	36
B.1.4	Finding the finally-successful alternating points	36
B.2	Numerical examples for calculating conformities	37
B.2.1	Solving for the terminal-based curve of the second degree and the terminal-based conformity of the second degree	37
B.2.2	Solving for the zero-based curve of the second degree and the zero-based conformity of the second degree	39
B.2.3	Solving for the front-terminal-based curve of the second degree and the front-terminal-based conformity of the second degree	40
B.2.4	Solving for the best curve of the second degree and the independent conformity of the second degree	41
B.2.5	Solving for the least-squares curve of the second degree and the least-squares conformity of the second degree	42
B.2.6	A rough principle guiding the choice of the theoretical curve	43
Annex C (informative)	Examples for calculating transducer individual and combined performance indicators	44
C.1	General principles of calculation	44
C.2	Numerical examples	44
C.2.1	Numerical example 1	44
C.2.1.4.7	Total uncertainty (linearity plus hysteresis plus repeatability)	48
C.2.2	Numerical example 2	50
C.2.3	Numerical example 3	51
Annex D (informative)	Examples for calculating transmitter individual and combined performance indicators	53
D.1	General principles of calculation	53
D.2	Numerical example	53
D.3	Calculation results	53
Annex E (informative)	The Pre-treatment of the Original Data	56
E.1	The discovery of suspect and unreasonable data points	56
E.2	The detection of suspect data points	56

E.2.1	The general principle of statistical detection	56
E.3	The Inspection of Unreasonable Data Points.....	59
E.3.1	The Unreasonable Data Points	59
E.3.2	Example 1 for Inspecting the Unreasonable Data Points.....	60
E.3.3	Example 2 for Inspecting the Unreasonable Data Points.....	60
Annex F (informative)	The fundamentals for calculating transducer uncertainty	62
F.1	Components of measurement uncertainty	62
F.2	Combined uncertainty	62
F.3	The combined uncertainty of a transducer.....	62
F.4	The total uncertainty of a transducer at the <i>i</i> th calibration point.....	62
F.5	The total uncertainty of a transducer.....	63
Bibliography	.....	64
Figure 1	– Terminal-based Linearity.....	21
Figure 2	– Zero-based Linearity	21
Figure 3	– Front-terminal-based Linearity.....	22
Figure 4	– Independent Linearity.....	22
Figure 5	– Terminal-based conformity.....	24
Figure 6	– Zero-based conformity	24
Figure 7	– Front-terminal-based conformity.....	25
Figure 8	– Independent conformity.....	25
Figure 9	– The method of L(C)HR extreme-point envelope.....	29
Figure A.1	– The transformed convex polygon	33
Figure B.1	– The curve roughly drawn from the given data.....	37
Figure C.1	– Deviation curves which are calculated relative to relevant best reference lines of the first degree	49
Figure C.2	– Deviation curves which are calculated relative to the working line of the first degree	49
Figure C.3	– Deviation curves which are calculated relative to relevant best reference lines of the second degree	51
Figure C.4	– Deviation curves which are calculated relative to the working line of the second degree	51
Figure D.1	– Deviation curves which are calculated relative to the given working straight line.....	54
Figure D.2	– Deviation curves which are calculated relative to the best reference straight line.....	55
Figure E.1	– Deviation curves which are calculated relative to the best working straight line.....	59
Figure E.2	– Deviation curves which are calculated relative to the best working straight line.....	61
Table 1	– Form to present reliability data with its data types	18
Table A.1	.....	31
Table A.2	.....	31
Table A.3	.....	32
Table A.4	.....	32
Table A.5	.....	34

Table B.1	37
Table B.2	38
Table B.3	39
Table B.4	40
Table B.5	40
Table B.6	42
Table B.7	43
Table C.1 – The original data obtained in the calibration	44
Table C.2 – The intermediate results of calculation	45
Table C.3 – Finding the extreme points $n = 5$ $c = t_{0.95} = 2.776$	46
Table C.4 – The deviations from the best working line	46
Table D.1 – The original data obtained in the calibration	53
Table E.1	57
Table E.2	57
Table E.3 – The original data obtained in the calibration	58
Table E.4 – A list of the computer-conducted inspection results for the unreasonable data points	60

INTERNATIONAL ELECTROTECHNICAL COMMISSION

**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>