

INTERNATIONAL STANDARD

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**Transmitters for use in industrial-process control systems –
Part 2: Methods for inspection and routine testing**

**Transmetteurs utilisés dans les systèmes de conduite des processus
industriels –
Partie 2: Méthodes pour l'inspection et les essais individuels de série**



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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**TRANSMITTERS FOR USE IN INDUSTRIAL-PROCESS
CONTROL SYSTEMS –****Part 2: Methods for inspection and routine testing**

FOREWORD

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International Standard IEC 60770-2 has been prepared by subcommittee 65B: Devices & process analysis, of IEC technical committee 65: Industrial-process measurement, control and automation.

This third edition cancels and replaces the second edition published in 2003. This edition constitutes a technical revision.

The significant technical change with respect to the previous edition is as follows:

- The sequence in content has been reordered in Clause 5.

This standard should be read in conjunction with IEC 61298-1, IEC 61298-2, IEC 61298-3 and IEC 61298-4.

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

| | |
|--------------|------------------|
| FDIS | Report on voting |
| 65B/760/FDIS | 65B/773/RVD |

Full information on the voting for the approval of this standard 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 IEC 60770 series, under the general title *Transmitters for use in industrial-process control 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

- 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- withdrawn,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

The methods of inspection and routine testing specified in this standard are intended for use in acceptance tests or after repair to verify the fulfilment of the performance specifications as established by the user. The methods given in this standard are primarily intended for the testing of conventional analogue transmitters. For setting up test procedures for microprocessor-based instruments IEC 60770-3 and IEC/TS 62098 should be consulted.

TRANSMITTERS FOR USE IN INDUSTRIAL-PROCESS CONTROL SYSTEMS –

Part 2: Methods for inspection and routine testing

1 Scope and object

This part of IEC 60770 is applicable to transmitters, which have either a standard analogue electric current output signal or a standard pneumatic output analogue signal in accordance with IEC 60381-1 or IEC 60382. The tests detailed herein may be applied to transmitters which have other output signals, provided that due allowance is made for such differences.

For the method of inspection and routine testing of the intelligent transmitters see IEC 60770-3.

For certain types of transmitters, where the sensor is an integral part, other specific IEC or ISO standards may need to be consulted (e.g. for chemical analyzers, flow-meters, etc.)

This standard is intended to provide technical methods for inspection and routine testing of transmitters, for instance, for acceptance tests or after repair. For a full evaluation, IEC 60770-1 and/or IEC 60770-3, respectively for analogue or intelligent transmitters shall be used.

Quantitative criteria for acceptable performance should be established by agreement between manufacturer and user.

By agreement the tests need not be carried out by an accredited laboratory.

2 Normative references

The following referenced documents are indispensable for the application 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 60381-1:1982, *Analogue signals for process control systems – Part 1: Direct current signals*

IEC 60382:1991, *Analogue pneumatic signal for process control systems*

IEC 60410:1973, *Sampling plans and procedures for inspection by attributes*

IEC 60770-1:1999, *Transmitters for use in industrial-process control systems – Part 1: Methods for performance evaluation*

IEC 60770-3:2006, *Transmitters for use in industrial-process control systems – Part 3: Methods for performance evaluation of intelligent transmitters*

IEC 61298-1:2008, *Process measurement and control devices. – General methods and procedures for evaluating performance – Part 1: General considerations*

IEC 61298-2:2008, *Process measurement and control devices – General methods and procedures for evaluation performance – Part 2: Tests under reference conditions*

IEC 61298-3:2008, *Process measurement and control devices – General methods and procedures for evaluating performance – Part 3: Tests for the effects of influence quantities*

IEC 61298-4:2008, *Process measurement and control devices – General methods and procedures for evaluating performance – Part 4: Evaluation report content*

IEC/TS 62098:2000, *Evaluation methods for microprocessor-based instruments*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 60050-300, in the IEC 61298 series and the following apply.

3.1

acceptance test

test proving to the user that the device complies with the performance specifications as they appear in the contract

3.2

variable

quantity or condition whose value is subject to change and can usually be measured

EXAMPLE temperature, flow rate, speed, signal, etc.

3.3

signal

physical variable of which one or more parameters carry information about one or more variables represented by the signal

3.4

range

region of the values between the lower and upper limits of the quantity under consideration

3.5

span

algebraic difference between the upper and lower limit values of a given range

3.6

test procedure

statement of the tests to be carried out and the conditions for each test, agreed between the manufacturer, the test laboratory and the purchaser/user before the evaluation starts

3.7

maximum measured error

largest positive or negative value of error of the upscale or downscale value of each point of measurement