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

EESTI STANDARDIKESKUS
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NATIONAL FOREWORD

Käesolev Eesti standard EVS-EN 60770-2:2010 sisaldab Euroopa standardi EN 60770-2:2010 ingliskeelset teksti.	This Estonian standard EVS-EN 60770-2:2010 consists of the English text of the European standard EN 60770-2:2010.
Standard on kinnitatud Eesti Standardikeskuse 31.12.2010 käskkirjaga ja jõustub sellekohase teate avaldamisel EVS Teatajas.	This standard is ratified with the order of Estonian Centre for Standardisation dated 31.12.2010 and is endorsed with the notification published in the official bulletin of the Estonian national standardisation organisation.
Euroopa standardimisorganisatsioonide poolt rahvuslikele liikmetele Euroopa standardi teksti kättesaadavaks tegemise kuupäev on 10.12.2010.	Date of Availability of the European standard text 10.12.2010.
Standard on kättesaadav Eesti standardiorganisatsioonist.	The standard is available from Estonian standardisation organisation.

ICS 25.040.40

EUROPEAN STANDARD

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English version

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

(IEC 60770-2:2010)

Transmetteurs utilisés dans les systèmes de conduite des processus industriels - Partie 2: Méthodes pour l'inspection et les essais individuels de série
(CEI 60770-2:2010)

Messumformer für industrielle Prozessleittechnik - Teil 2: Verfahren für Abnahme und Stückprüfung
(IEC 60770-2:2010)

CENELEC

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

Management Centre: Avenue Marnix 17, B - 1000 Brussels

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Foreword

The text of document 65B/760/FDIS, future edition 3 of IEC 60770-2, prepared by SC 65B, Devices & process analysis, of IEC TC 65, Industrial-process measurement, control and automation, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 60770-2 on 2010-12-01.

This European Standard supersedes EN 60770-2:2003.

The significant technical change with respect to EN 60770-2:2003 is as follows:

– the sequence in content has been reordered in Clause 5.

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

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN and CENELEC shall not be held responsible for identifying any or all such patent rights.

The following dates were fixed:

– latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement	(dop)	2011-09-01
– latest date by which the national standards conflicting with the EN have to be withdrawn	(dow)	2013-12-01

Annex ZA has been added by CENELEC.

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Endorsement notice

The text of the International Standard IEC 60770-2:2010 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following note has to be added for the standard indicated:

IEC 61326-1:2005 NOTE Harmonized as EN 61326-1:2006 (not modified).

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Annex ZA
(normative)

Normative references to international publications with their corresponding European publications

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.

NOTE When an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

Publication	Year	Title	EN/HD	Year
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	HD 452.1 S1	1984
IEC 60382	1991	Analogue pneumatic signal for process control systems	EN 60382	1993
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	EN 60770-1	1999
IEC 60770-3	2006	Transmitters for use in industrial-process control systems - Part 3: Methods for performance evaluation of intelligent transmitters	EN 60770-3	2006
IEC 61298-1	2008	Process measurement and control devices - General methods and procedures for evaluating performance - Part 1: General considerations	EN 61298-1	2008
IEC 61298-2	2008	Process measurement and control devices - General methods and procedures for evaluating performance - Part 2: Tests under reference conditions	EN 61298-2	2008
IEC 61298-3	2008	Process measurement and control devices - General methods and procedures for evaluating performance - Part 3: Tests for the effects of influence quantitites	EN 61298-3	2008

Publication	Year	Title	EN/HD	Year
IEC 61298-4	2008	Process measurement and control devices - General methods and procedures for evaluating performance - Part 4: Evaluation report content	EN 61298-4	2008
IEC/TS 62098	2000	Evaluation methods for microprocessor-based instruments	-	-

CONTENTS

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