



SLOVENSKI STANDARD SIST EN IEC 62828-4:2020

01-december-2020

Referenčni pogoji in postopki za preskušanje industrijskih in procesnih merilnih oddajnikov - 4. del: Posebni postopki za oddajnike nivoja (IEC 62828-4:2020)

Reference conditions and procedures for testing industrial and process measurement transmitters - Part 4: Specific procedures for level transmitters (IEC 62828-4:2020)

Referenzbedingungen und Testmethoden für Industrie- und Prozessmessgrößenumformer - Teil 4: Spezielle Testmethoden für Füllstandmessumformer (IEC 62828-4:2020)

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Conditions de référence et procédures pour l'essai des transmetteurs de mesure industriels et de processus - Partie 4: Procédures spécifiques pour les transmetteurs de niveau (IEC 62828-4:2020)

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Ta slovenski standard je istoveten z: EN IEC 62828-4:2020

ICS:

25.040.40	Merjenje in krmiljenje industrijskih postopkov	Industrial process measurement and control
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EUROPEAN STANDARD

EN IEC 62828-4

NORME EUROPÉENNE

EUROPÄISCHE NORM

September 2020

ICS 17.200.20; 25.040.40

English Version

Reference conditions and procedures for testing industrial and
process measurement transmitters - Part 4: Specific procedures
for level transmitters
(IEC 62828-4:2020)

Conditions de référence et procédures pour l'essai des
transmetteurs de mesure industriels et de processus -
Partie 4: Procédures spécifiques pour les transmetteurs de
niveau
(IEC 62828-4:2020)

Referenzbedingungen und Testmethoden für Industrie- und
Prozessmessgrößenumformer - Teil 4: Spezielle
Testmethoden für Füllstandmessumformer
(IEC 62828-4:2020)

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Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CENELEC member.

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

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

EN IEC 62828-4:2020 (E)**European foreword**

The text of document 65B/1178(F)/FDIS, future edition 1 of IEC 62828-4, prepared by SC 65B “Measurement and control devices” of IEC/TC 65 “Industrial-process measurement, control and automation” was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN IEC 62828-4:2020.

The following dates are fixed:

- latest date by which the document has to be implemented at national (dop) 2021-06-22 level by publication of an identical national standard or by endorsement
- latest date by which the national standards conflicting with the (dow) 2023-09-22 document have to be withdrawn

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

Endorsement notice

The text of the International Standard IEC 62828-4:2020 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following notes have to be added for the standards indicated:

<u>SIST EN IEC 62828-4:2020</u>	
IEC 60529:1989	NOTE Harmonized as EN 60529:1991 (not modified)
IEC 60947-5-6:1999	NOTE Harmonized as EN 60947-5-6:2000 (not modified)
IEC 61140:2016	NOTE Harmonized as EN 61140:2016 (not modified)
IEC 61298-1:2008	NOTE Harmonized as EN 61298-1:2008 (not modified)
IEC 61298-2:2008	NOTE Harmonized as EN 61298-2:2008 (not modified)
IEC 61298-3:2008	NOTE Harmonized as EN 61298-3:2008 (not modified)
IEC 61987-1:2006	NOTE Harmonized as EN 61987-1:2007 (not modified)
IEC 61987-11:2016	NOTE Harmonized as EN 61987-11:2017 (not modified)
IEC 61987-15	NOTE Harmonized as EN 61987-15
IEC 62683-1:2017	NOTE Harmonized as EN 62683-1:2017 (not modified)

Annex ZA (normative)

Normative references to international publications with their corresponding European publications

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.

NOTE 1 Where an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: www.cenelec.eu.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60068-2-6	2007	Environmental testing - Part 2-6: Tests -EN 60068-2-6 Test Fc: Vibration (sinusoidal)	-EN 60068-2-6	2008
IEC 60068-2-27	2008	Environmental testing - Part 2-27: Tests -EN 60068-2-27 Test Ea and guidance: Shock	-EN 60068-2-27	2009
IEC 60068-2-64	2008	Environmental testing - Part 2-64: Tests -EN 60068-2-64 Test Fh: Vibration, broadband random and guidance	-EN 60068-2-64	2008
IEC 61326-2-3	2012	Electrical equipment for measurement, control and laboratory use - EMC requirements - Part 2-3: Particular requirements - Test configuration, operational conditions and performance criteria for transducers with integrated or remote signal conditioning	EN 61326-2-3	2013
IEC 62828-1	2017	Reference conditions and procedures for testing industrial and process measurement transmitters - Part 1: General procedures for all types of transmitters	EN IEC 62828-1	2018
IEC 62828-2	2017	Reference conditions and procedures for testing industrial and process measurement transmitters - Part 2: Specific procedures for pressure transmitters	EN IEC 62828-2	2018

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IEC 62828-4

Edition 1.0 2020-08

INTERNATIONAL STANDARD

NORME INTERNATIONALE



**Reference conditions and procedures for testing industrial and process
measurement transmitters –
Part 4: Specific procedures for level transmitters**

**Conditions de référence et procédures pour l'essai des transmetteurs
de mesure industriels et de processus –
Partie 4: Procédures spécifiques pour les transmetteurs de niveau**

INTERNATIONAL
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INTERNATIONALE

ICS 17.200.20; 25.040.40

ISBN 978-2-8322-8757-6

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CONTENTS

FOREWORD.....	5
INTRODUCTION.....	7
1 Scope.....	8
2 Normative references	8
3 Terms and definitions	8
3.1 Basic definitions.....	9
3.2 Level transmitter definitions	11
3.2.2 Pressure-based level transmitter definitions.....	11
3.2.4 Float level transmitter definitions	12
3.2.6 Microwave/Radar level transmitter definitions	12
3.2.7 Optical based level transmitter definitions.....	12
3.2.9 Capacitance and admittance level transmitter definitions	13
3.2.10 Mechanical level transmitter definitions	13
3.2.11 Electrical resistance level transmitter definitions.....	14
3.3 Measurement parameters	14
3.4 Influence quantity definitions.....	14
3.5 Reference to the IEC common data dictionary (CDD).....	15
4 General description of main types of level transmitters	16
4.1 General.....	16
4.2 Pressure-based level transmitters	16
4.3 Microwave/radar level transmitter	18
4.3.1 General	18
4.3.2 Free-space radar level transmitter.....	18
4.3.3 Guided-wave radar level transmitter	19
5 Reference test conditions	20
5.1 General.....	20
5.2 Standard reference test conditions.....	20
5.2.1 General	20
5.2.2 Environmental test conditions	20
5.2.3 Power supply conditions	21
5.2.4 Load conditions	21
5.2.5 Mounting positions for testing	21
5.3 Reference test conditions for ambient and process quantities influencing operation	21
5.3.1 General	21
5.3.2 Process conditions	22
5.3.3 Environmental atmospheric conditions	22
5.3.4 Mechanical vibration.....	23
5.3.5 Shock, drop and topple.....	23
5.3.6 Power supply.....	23
5.3.7 Electromagnetic compatibility (EMC)	23
5.4 Reference design criteria	23
5.4.1 General	23
5.4.2 Enclosure protection against solid, liquid (IP) and impact (IK).....	23
5.4.3 Enclosure protection against corrosive and erosive influences.....	23
5.4.4 Electrical safety (insulation resistance, dielectric strength)	24
5.4.5 Hazardous environment (for application in explosive atmosphere).....	24

5.4.6	Functional safety	24
6	Test procedures	24
6.1	General.....	24
6.1.1	Overview	24
6.1.2	Specific test setups and procedures	25
6.2	Type tests at standard reference conditions	28
6.2.1	General	28
6.2.2	Accuracy and related factors	29
6.2.3	Static behaviour.....	30
6.2.4	Dynamic behaviour	31
6.3	Type tests at operating reference test conditions	31
6.3.1	General	31
6.3.2	Ambient temperature effects	31
6.3.3	Ambient relative humidity effects	32
6.3.4	Vibration effects	32
6.3.5	Shock, drop and topple	32
6.3.6	Accelerated operational life test.....	32
6.3.7	EMC tests.....	32
6.3.8	Further test procedures	32
6.3.9	Additional test for digital transmitters.....	32
6.4	Routine tests.....	32
6.5	Acceptance, integration, periodic and maintenance tests	32
6.5.1	General	32
6.5.2	Periodical verification.....	32
6.5.3	Periodical calibration.....	32
7	Test report and technical documentation.....	32
7.1	Test report.....	32
7.2	Technical documentation	33
7.3	Total probable error TPE.....	33
7.3.1	General	33
7.3.2	Specific errors	33
Annex A	(informative) Main characteristics for level transmitters	34
A.1	Properties of level transmitter classes.....	34
A.1.1	General	34
A.1.2	Pressure-based level transmitter	34
A.1.3	Microwave/Radar level transmitter	36
A.2	Product properties	42
A.2.1	Library of properties used in the device classes.....	42
A.2.2	Value lists of properties	46
Annex B	(informative) Example for the calculation of the TPE based on 7.3 and the MRU and MRE.....	48
B.1	Overview of the parameters used for the error calculation.....	48
B.2	Example test report pressure-based level transmitter.....	48
B.2.1	General	48
B.2.2	Test protocol	48
B.2.3	DUT characteristics	48
B.2.4	TPE calculation	49
B.2.5	MRU calculation	50

B.3	Sub test processes	51
B.3.1	Inaccuracy test	51
B.3.2	Ambient temperature effect test	52
B.3.3	Process temperature effect test	53
B.3.4	Long-term stability test	54
	Bibliography	56
Figure 1	– Principle diagram of time values and their meanings	10
Figure 2	– Principles of pressure-based level transmitters	18
Figure 3	– Free-space radar level transmitter	19
Figure 4	– Guided-wave radar level transmitter	20
Figure 5	– Schematic example of a test set-up for pressure PMT	25
Figure 6	– Typical test set-up for radar level transmitter	26
Figure 7	– Test setup simulated targets and simulated environment	27
Figure 8	– Example of test setup for wet test	28
Table 1	– Environmental test conditions	21
Table 2	– Influence quantities for the various level measurement principles	22
Table 3	– Number of measurement cycles and number and position of test points	24
Table 4	– Example of statement of maximum error	29
Table A.1	– Pressure-based level transmitter	34
Table A.2	– Free-space radar level transmitter	37
Table A.3	– Guided-wave radar level transmitter	39
Table A.4	– Library of properties used in the device classes	42
Table A.5	– Value lists of properties	47
Table B.1	– Abbreviated terms	48
Table B.2	– DUT characteristics	49
Table B.3	– TPE calculation	49
Table B.4	– MRU calculation	50
Table B.5	– Reference test devices	51
Table B.6	– Reference test conditions	51
Table B.7	– Test results	52
Table B.8	– Reference test equipment	52
Table B.9	– Reference test conditions	53
Table B.10	– Test results	53
Table B.11	– Reference test equipment	53
Table B.12	– Reference test conditions	54
Table B.13	– Test results	54
Table B.14	– Reference test equipment	55
Table B.15	– Reference test conditions	55
Table B.16	– Test results	55

INTERNATIONAL ELECTROTECHNICAL COMMISSION

REFERENCE CONDITIONS AND PROCEDURES FOR TESTING INDUSTRIAL AND PROCESS MEASUREMENT TRANSMITTERS –

Part 4: Specific procedures for level transmitters

FOREWORD

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
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International Standard IEC 62828-4 has been prepared by subcommittee 65B: Measurement and control devices, of IEC technical committee 65: Industrial-process measurement, control and automation.

The IEC 62828 series cancels and replaces the IEC 60770 series and proposes revisions for the IEC 61298 series.

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

FDIS	Report on voting
65B/1178/FDIS	65B/1182/RVD

Full information on the voting for the approval of this International Standard 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.

This International Standard is to be used in conjunction with IEC 62828-1:2017.

A list of all parts in the IEC 62828 series, published under the general title *Reference conditions and procedures for testing industrial and process measurement transmitters*, can be found on the IEC website.

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.

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INTRODUCTION

Most of the current IEC standards on industrial measurement transmitters are rather old and were developed having in mind devices based on analogue technologies. Today's digital industrial and process measurement transmitters are quite different from those analogue transmitters: they include more functions and newer interfaces, both towards the computing section (mostly digital) and towards the measuring section (mostly mechanical). Even if some standards dealing with digital transmitters already exist, they are not sufficient, since some aspects of the performance are not covered by appropriate test methods.

In addition, the existing IEC test standards for industrial and process measurement transmitters are spread over many documents, so that for manufacturers and users it was difficult, impractical and time-consuming to identify and select all the standards to be applied to a device measuring a specific process quantity (pressure, temperature, level, flow, etc.).

To help the manufacturers and users, it was decided to review, complete and reorganize the existing IEC standards on the industrial and process measurement transmitters and to create a more suitable, effective and comprehensive standard series that provides, in a systematic way, all the needed specifications and tests for the different industrial and process measurement transmitters.

To solve the issues mentioned above and to provide an added value for the stakeholders, the new standard series on industrial and process measurement transmitters covers the following main aspects:

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- applicable normative references;
 - specific terms and definitions;
 - typical configurations and architectures for the various types of industrial and measurement transmitters;
 - hardware and software aspects;
 - interfaces (to the process, to the operator, to the other measurement and control devices);
 - physical, mechanical and electrical requirements and relevant tests; clear definition of the test categories: type tests, acceptance tests and routine tests;
 - performances (their specification, tests and verification);
 - environmental protection, hazardous areas application, functional safety, etc.;
 - structure of the technical documentation.

To cover in a systematic way all the topics to be addressed, the standard series is organized in several parts. At the time of publication of this document IEC 62828 consists of the following parts:

- IEC 62828-1: *General procedures for all types of transmitters*
- IEC 62828-2: *Specific procedures for pressure transmitters*
- IEC 62828-3: *Specific procedures for temperature transmitters*
- IEC 62828-4: *Specific procedures for level transmitters*
- IEC 62828-5: *Specific procedures for flow transmitters*

In preparing the IEC 62828 series (all parts), many test procedures were taken, with the necessary improvements, from the IEC 61298 series. As the IEC 61298 series is currently applicable to all process measurement and control devices, when the IEC 62828 series is completed, the IEC 61298 series will be revised to harmonize it with the IEC 62828 series, taking out from its scope the industrial and process measurement transmitters. During the time when the scope of the IEC 61298 series is being updated, the new IEC 62828 series takes precedence for industrial and process measurement transmitters.

When the IEC 62828 series is published, the IEC 60770 series will be withdrawn.

REFERENCE CONDITIONS AND PROCEDURES FOR TESTING INDUSTRIAL AND PROCESS MEASUREMENT TRANSMITTERS –

Part 4: Specific procedures for level transmitters

1 Scope

This part of IEC 62828 establishes specific procedures for testing level transmitters used in measuring and control systems for industrial process and machinery control systems. For general test procedures, reference is to be made to IEC 62828-1:2017, applicable to all types of transmitters.

Throughout this document, the term "industrial transmitters" covers all types of transmitters used in measuring and control systems for industrial processes and for machinery.

The requirements of this document are applicable to all level measurement principles.

Detailed description of transmitters is given for two main principles for improved clarity.

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.

- SIST EN IEC 62828-4:2020
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- IEC 60068-2-6:2007, *Environmental testing – Part 2-6: Tests – Test Fc: Vibration (sinusoidal)*
- IEC 60068-2-27:2008, *Environmental testing – Part 2-27: Tests – Test Ea and guidance: Shock*
- IEC 60068-2-64:2008, *Environmental testing – Part 2-64: Tests – Test Fh: Vibration, broadband random and guidance*
- IEC 61326-2-3:2012, *Electrical equipment for measurement, control and laboratory use – EMC requirements – Part 2-3: Particular requirements – Test configuration, operational conditions and performance criteria for transducers with integrated or remote signal conditioning*
- IEC 62828-1:2017, *Reference conditions and procedures for testing industrial and process measurement transmitters – Part 1: General procedures for all types of transmitters*
- IEC 62828-2:2017, *Reference conditions and procedures for testing industrial and process measurement transmitters – Part 2: Specific procedures for pressure transmitters*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 62828-1 and 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>

3.1 Basic definitions

3.1.1

warm-up time

duration between the instant when the power supply is energized and the instant when the instrument can be used, as specified by the manufacturer

SEE: Figure 1.

[SOURCE: Identifier ABB026 in the IEC common data dictionary.]

3.1.2

settling time

time interval between the step change of an input signal and the instant when the resulting variation of the output of the signal does not deviate more than 1 % from its final steady state value

SEE: Figure 1.

[SOURCE: Identifier ABA999 in the IEC common data dictionary.]

3.1.3

output signal

analogue or digital representation of the measurand produced by a transducer

Note 1 to entry: A transmitter is a transducer with standardized output, see IEC 60050-351:2013, 351-56-29.

[SOURCE: IEC 60050-314:2001, 314-04-06, modified – Note 1 to entry has been added.]

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