

| | | |
|------------|--|--|
| STN | Referenčné podmienky a postupy na skúšanie meracích prevodníkov pre priemyselné procesy Časť 2: Špecifické postupy pre meracie prevodníky tlaku | STN EN IEC 62828-2 18 1078 |
|------------|--|--|

Reference conditions and procedures for testing industrial and process measurement transmitters - Part 2: Specific procedures for pressure transmitters

Táto norma obsahuje anglickú verziu európskej normy.
This standard includes the English version of the European Standard.

Táto norma bola oznámená vo Vestníku ÚNMS SR č. 01/19

Obsahuje: EN IEC 62828-2:2018, IEC 62828-2:2017

127770

EUROPEAN STANDARD

EN IEC 62828-2

NORME EUROPÉENNE

EUROPÄISCHE NORM

February 2018

ICS 17.100; 25.040.40

English Version

Reference conditions and procedures for testing industrial and
process measurement transmitters - Part 2: Specific procedures
for pressure transmitters
(IEC 62828-2:2017)

Conditions de référence et procédures pour l'essai des
transmetteurs de mesure industrielle et de processus -
Partie 2: Procédures spécifiques pour les transmetteurs de
pression
(IEC 62828-2:2017)

Referenzbedingungen und Testmethoden für Industrie- und
Prozessmessgrößenumformer - Teil 2: Spezielle
Testmethoden für Druckmessumformer
(IEC 62828-2:2017)

This European Standard was approved by CENELEC on 2017-12-12. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

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.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.



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 62828-2:2018 (E)**European foreword**

The text of document 65B/1098/FDIS, future edition 1 of IEC 62828-2, prepared by IEC/SC 65B "Measurement and control devices, of IEC technical committee 65: Industrial-process measurement, control and automation" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN IEC 62828-2:2018.

The following dates are fixed:

- latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2018-09-12
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2020-12-12

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 62828-2:2017 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:

| | | |
|-----------------------|------|--|
| IEC 60770 (all parts) | NOTE | Harmonized as EN 60770 (all parts). |
| IEC 61298 (all parts) | NOTE | Harmonized as EN 61298 (all parts). |
| IEC 61518:2000 | NOTE | Harmonized as EN 61518:2001(not modified). corrigendum Feb. 2002. |
| IEC 61987-13:2016 | NOTE | Harmonized as EN 61987-13:2016 (not modified). |
| IEC 62828 (all parts) | NOTE | Harmonized as EN 62828 (all parts). |

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 62828-1 | - | Reference conditions and procedures for testing industrial and process measurement transmitters - Part 1: General procedures for all types of transmitters | EN IEC 62828-1 | - |



IEC 62828-2

Edition 1.0 2017-11

INTERNATIONAL STANDARD

NORME INTERNATIONALE



Reference conditions and procedures for testing industrial and process measurement transmitters –

Part 2: Specific procedures for pressure transmitters

Conditions de référence et procédures pour l'essai des transmetteurs de mesure industrielle et de processus –

Partie 2: Procédures spécifiques pour les transmetteurs de pression



THIS PUBLICATION IS COPYRIGHT PROTECTED
Copyright © 2017 IEC, Geneva, Switzerland

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either IEC or IEC's member National Committee in the country of the requester. If you have any questions about IEC copyright or have an enquiry about obtaining additional rights to this publication, please contact the address below or your local IEC member National Committee for further information.

Droits de reproduction réservés. Sauf indication contraire, aucune partie de cette publication ne peut être reproduite ni utilisée sous quelque forme que ce soit et par aucun procédé, électronique ou mécanique, y compris la photocopie et les microfilms, sans l'accord écrit de l'IEC ou du Comité national de l'IEC du pays du demandeur. Si vous avez des questions sur le copyright de l'IEC ou si vous désirez obtenir des droits supplémentaires sur cette publication, utilisez les coordonnées ci-après ou contactez le Comité national de l'IEC de votre pays de résidence.

IEC Central Office
 3, rue de Varembe
 CH-1211 Geneva 20
 Switzerland

Tel.: +41 22 919 02 11
 Fax: +41 22 919 03 00
info@iec.ch
www.iec.ch

About the IEC

The International Electrotechnical Commission (IEC) is the leading global organization that prepares and publishes International Standards for all electrical, electronic and related technologies.

About IEC publications

The technical content of IEC publications is kept under constant review by the IEC. Please make sure that you have the latest edition, a corrigenda or an amendment might have been published.

IEC Catalogue - webstore.iec.ch/catalogue

The stand-alone application for consulting the entire bibliographical information on IEC International Standards, Technical Specifications, Technical Reports and other documents. Available for PC, Mac OS, Android Tablets and iPad.

IEC publications search - www.iec.ch/searchpub

The advanced search enables to find IEC publications by a variety of criteria (reference number, text, technical committee,...). It also gives information on projects, replaced and withdrawn publications.

IEC Just Published - webstore.iec.ch/justpublished

Stay up to date on all new IEC publications. Just Published details all new publications released. Available online and also once a month by email.

Electropedia - www.electropedia.org

The world's leading online dictionary of electronic and electrical terms containing 20 000 terms and definitions in English and French, with equivalent terms in 16 additional languages. Also known as the International Electrotechnical Vocabulary (IEV) online.

IEC Glossary - std.iec.ch/glossary

65 000 electrotechnical terminology entries in English and French extracted from the Terms and Definitions clause of IEC publications issued since 2002. Some entries have been collected from earlier publications of IEC TC 37, 77, 86 and CISPR.

IEC Customer Service Centre - webstore.iec.ch/csc

If you wish to give us your feedback on this publication or need further assistance, please contact the Customer Service Centre: csc@iec.ch.

A propos de l'IEC

La Commission Electrotechnique Internationale (IEC) est la première organisation mondiale qui élabore et publie des Normes internationales pour tout ce qui a trait à l'électricité, à l'électronique et aux technologies apparentées.

A propos des publications IEC

Le contenu technique des publications IEC est constamment revu. Veuillez vous assurer que vous possédez l'édition la plus récente, un corrigendum ou amendement peut avoir été publié.

Catalogue IEC - webstore.iec.ch/catalogue

Application autonome pour consulter tous les renseignements bibliographiques sur les Normes internationales, Spécifications techniques, Rapports techniques et autres documents de l'IEC. Disponible pour PC, Mac OS, tablettes Android et iPad.

Recherche de publications IEC - www.iec.ch/searchpub

La recherche avancée permet de trouver des publications IEC en utilisant différents critères (numéro de référence, texte, comité d'études,...). Elle donne aussi des informations sur les projets et les publications remplacées ou retirées.

IEC Just Published - webstore.iec.ch/justpublished

Restez informé sur les nouvelles publications IEC. Just Published détaille les nouvelles publications parues. Disponible en ligne et aussi une fois par mois par email.

Electropedia - www.electropedia.org

Le premier dictionnaire en ligne de termes électroniques et électriques. Il contient 20 000 termes et définitions en anglais et en français, ainsi que les termes équivalents dans 16 langues additionnelles. Egalement appelé Vocabulaire Electrotechnique International (IEV) en ligne.

Glossaire IEC - std.iec.ch/glossary

65 000 entrées terminologiques électrotechniques, en anglais et en français, extraites des articles Termes et Définitions des publications IEC parues depuis 2002. Plus certaines entrées antérieures extraites des publications des CE 37, 77, 86 et CISPR de l'IEC.

Service Clients - webstore.iec.ch/csc

Si vous désirez nous donner des commentaires sur cette publication ou si vous avez des questions contactez-nous: csc@iec.ch.



IEC 62828-2

Edition 1.0 2017-11

INTERNATIONAL STANDARD

NORME INTERNATIONALE



**Reference conditions and procedures for testing industrial and process
measurement transmitters –
Part 2: Specific procedures for pressure transmitters**

**Conditions de référence et procédures pour l'essai des transmetteurs de
mesure industrielle et de processus –
Partie 2: Procédures spécifiques pour les transmetteurs de pression**

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

COMMISSION
ELECTROTECHNIQUE
INTERNATIONALE

ICS 17.100; 25.040.40

ISBN 978-2-8322-4850-8

**Warning! Make sure that you obtained this publication from an authorized distributor.
Attention! Veuillez vous assurer que vous avez obtenu cette publication via un distributeur agréé.**

CONTENTS

| | |
|---|----|
| FOREWORD..... | 4 |
| INTRODUCTION..... | 6 |
| 1 Scope..... | 7 |
| 2 Normative references | 7 |
| 3 Terms and definitions | 7 |
| 3.1 General..... | 7 |
| 3.2 Terms related the process conditions..... | 9 |
| 4 General description of the device and overview | 9 |
| 5 Reference test conditions | 9 |
| 6 Test procedures | 10 |
| 6.1 General..... | 10 |
| 6.2 Tests at standard and operating reference test conditions..... | 10 |
| 6.2.1 General | 10 |
| 6.2.2 Accuracy test suitable for routine and acceptance tests | 10 |
| 6.2.3 Overpressure..... | 11 |
| 6.2.4 Influence of static pressure..... | 13 |
| 6.2.5 Long-term drift..... | 15 |
| 6.2.6 Leakage test..... | 16 |
| 6.2.7 Additional tests for diaphragm/remote seals – Influence of process temperature (long term)..... | 16 |
| 7 Test report and technical documentation | 16 |
| 7.1 General..... | 16 |
| 7.2 Total probable error | 17 |
| Annex A (informative) Relationship between the SI unit and other pressure related units | 18 |
| Annex B (informative) Pressure process measurement transmitter (PMT) | 19 |
| B.1 General description of a pressure PMT | 19 |
| B.2 Typical PMTs | 19 |
| Annex C (informative) Example of signal current range for a 4 to 20 mA PMT | 21 |
| C.1 Signal current range of a 4 mA to 20 mA transmitter (before adjustment) | 21 |
| C.2 Proportional range | 21 |
| C.3 Normal range | 21 |
| C.4 Underrange..... | 21 |
| C.5 Overrange..... | 22 |
| C.6 Low alarm | 22 |
| C.7 High alarm | 22 |
| Bibliography..... | 23 |
| Figure 1 – Measuring range and associated properties of a pressure PMT..... | 8 |
| Figure 2 – Schematic example of a test set-up for pressure PMT | 10 |
| Figure 3 – Example of measured error plot | 11 |
| Figure 4 – Procedure for the determination of the unilateral overpressure error | 12 |
| Figure 5 – Schematic example of test set-up for determine the effect of the static pressure | 13 |
| Figure 6 – Procedure for the determination of the zero point error with static pressure | 14 |

| | |
|--|----|
| Figure 7 – Procedure for the determination of the span error for static pressure | 15 |
| Figure B.1 – Schematic example of intelligent PMT model | 20 |
| Figure C.1 – Signal current range of a 4 mA – 20 mA transmitter (before adjustment)..... | 21 |
| Table 1 – Example of measured errors..... | 11 |
| Table A.1 – Relationship between the SI unit and other pressure related units..... | 18 |

INTERNATIONAL ELECTROTECHNICAL COMMISSION

REFERENCE CONDITIONS AND PROCEDURES FOR TESTING INDUSTRIAL AND PROCESS MEASUREMENT TRANSMITTERS –**Part 2: Specific procedures for pressure 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.
- 2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
- 3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
- 4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
- 5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
- 6) All users should ensure that they have the latest edition of this publication.
- 7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
- 8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
- 9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 62828-2 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:

| | |
|---------------|------------------|
| FDIS | Report on voting |
| 65B/1098/FDIS | 65B/1101/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.

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

Most of the current IEC standards on industrial and process 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 electronic) and towards the measuring section (mostly mechanical). Even if some standards dealing with digital process measurement transmitters already exist, they are not sufficient, since some aspects of the performance are not covered by appropriate test methods.

In addition, existing IEC test standards for industrial and process measurement transmitters are spread over many documents, so that for manufacturers and users it is 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, flow, level, etc.).

To help manufacturers and users, it was decided to review, complete and reorganize the relevant IEC standards and to create a more suitable, effective and comprehensive standard series that provides in a systematic way all the necessary specifications and tests required for 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:

- applicable normative references;
- specific terms and definitions;
- typical configurations and architectures for the various types of industrial and process 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;
- performance (its 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 moment of the publication of this document, the IEC 62828 series 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 IEC 62828 (all parts), many test procedures were taken, with the necessary improvements, from IEC 61298 (all parts). As IEC 61298 (all parts) is currently applicable to all process measurement and control devices, when IEC 62828 (all parts) is completed, IEC 61298 (all parts) will be revised to harmonise it with IEC 62828 (all parts), taking out from its scope the industrial and process measurement transmitters. During the time when the scope of IEC 61298 (all parts) is being updated, the new IEC 62828 series takes precedence for industrial and process measurement transmitters.

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

Part 2: Specific procedures for pressure transmitters

1 Scope

This part of IEC 62828 establishes specific procedures for testing pressure process measurement transmitters (PMT) used in measuring and control systems for industrial processes and for machinery control systems.

A pressure PMT can feature a remote seal to bring the process variable to the sensing element in the PMT. When the remote seal cannot be separated from the PMT, the complete device is tested.

For general test procedures, reference is made to IEC 62828-1, which is applicable to all types of process measurement transmitters.

NOTE In industrial and process applications, to indicate the process measurement transmitters, it is common also to use the terms "industrial transmitters", or "process transmitters".

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 62828-1, *Reference conditions and procedures for testing industrial and process measurement transmitters – Part 1: General procedures for all types of transmitters*

koniec náhľadu – text ďalej pokračuje v platenej verzii STN