

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

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

See Eesti standard EVS-EN IEC 62828-2:2018 sisaldab Euroopa standardi EN IEC 62828-2:2018 ingliskeelset teksti.	This Estonian standard EVS-EN IEC 62828-2:2018 consists of the English text of the European standard EN IEC 62828-2:2018.
Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas	This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation.
Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 09.02.2018.	Date of Availability of the European standard is 09.02.2018.
Standard on kättesaadav Eesti Standardikeskusest.	The standard is available from the Estonian Centre for Standardisation.

Tagasisidet standardi sisu kohta on võimalik edastada, kasutades EVS-i veebilehel asuvat tagasiside vormi või saates e-kirja meiliaadressile standardiosakond@evs.ee.

ICS 17.100, 25.040.40

Standardite reprodutseerimise ja levitamise õigus kuulub Eesti Standardikeskusele

Andmete paljundamine, taastekitamine, kopeerimine, salvestamine elektroonsesse süsteemi või edastamine ükskõik millises vormis või millisel teel ilma Eesti Standardikeskuse kirjaliku loata on keelatud.

Kui Teil on küsimusi standardite autorikaitse kohta, võtke palun ühendust Eesti Standardikeskusega:

Koduleht www.evs.ee; telefon 605 5050; e-post info@evs.ee

The right to reproduce and distribute standards belongs to the Estonian Centre for Standardisation

No part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying, without a written permission from the Estonian Centre for Standardisation.

If you have any questions about copyright, please contact Estonian Centre for Standardisation:

Homepage www.evs.ee; phone +372 605 5050; e-mail info@evs.ee

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

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 (dop) 2018-09-12
implemented at national level by
publication of an identical national
standard or by endorsement
- latest date by which the national (dow) 2020-12-12
standards conflicting with the
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 62828-2:2017 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	-

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

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.