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Interested committees:

Title: BS EN IEC 62828-3 Reference conditions and procedures for testing industrial and process measurement transmitters

Part 3: Specific procedures for temperature transmitters

Please notify the secretary if you are aware of any keywords that might assist in classifying or identifying the standard or if the content of this standard

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- ii) affects other national standard(s)
- iii) requires additional national guidance or information

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Introduction

This draft standard is based on national and international discussions. Your comments on this draft are invited and will assist in the preparation of the consequent standard.

For international standards, comments will be reviewed by the relevant UK national committee before sending the consensus UK vote and comments to the international committee, which will then decide appropriate action. If the international standard is approved, it is usual for the text to be published as a British Standard.

For national standards, comments will be reviewed by the relevant UK national committee and the resulting standards published as a British Standard.

UK Vote

Please indicate whether you consider the UK should submit a negative (with supporting technical reasons) or positive vote on this draft. Please indicate if you are aware of any reason why this draft standard should not be published as a British Standard.

Submission of Comments

- **Annotated drafts are not acceptable and will be rejected.**
- All comments should be submitted online at <https://standardsdevelopment.bsigroup.com/>. You will need to register in order to comment.

Template for comments and secretariat observations

Date: xx/xx/20xx	Document: ISO/DIS xxxx
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1	2	(3)	4	5	(6)	7
MB	Clause No./ Subclause No./Annex (e.g. 3.1)	Paragraph/Figure/ Table/Note	Type of comment	Commend (justification for change) by the MB	Proposed change by the MB	Secretariat observations on each comment submitted
	3.1	Definition 1	ed	Definition is ambiguous and needs clarifying.	Amend to read '...so that the mains connector to which no connection...'	
	6.4	Paragraph 2	te	The use of the UV photometer as an alternative cannot be supported as serious problems have been encountered in its use in the UK.	Delete reference to UV photometer.	



65B/1268/CD

COMMITTEE DRAFT (CD)

PROJECT NUMBER: IEC 62828-3 ED2	
DATE OF CIRCULATION: 2024-07-19	CLOSING DATE FOR COMMENTS: 2024-09-13
SUPERSEDES DOCUMENTS: 65B/1262/RR	

IEC SC 65B : MEASUREMENT AND CONTROL DEVICES	
SECRETARIAT: United States of America	SECRETARY: Mr Wallie Zoller
OF INTEREST TO THE FOLLOWING COMMITTEES:	HORIZONTAL FUNCTION(S):
ASPECTS CONCERNED:	

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Recipients of this document are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

Recipients of this document are invited to submit, with their comments, notification of any local regulations or technical reasons that may exist and should be considered should this proposal proceed, recognizing that failure to address such requirements could result in the need for new or existing "In Some Countries" clauses. (SEE [AC/22/2007](#) OR [NEW GUIDANCE DOC](#)).

TITLE: Reference conditions and procedures for testing industrial and process measurement transmitters - Part 3: Specific procedures for temperature transmitters

NOTE FROM TC/SC OFFICERS: There will be a meeting on September 9. NCs are encouraged to submit their comments prior to this.



CONTENTS

FOREWORD	5
INTRODUCTION	7
1 Scope	9
2 Normative references	9
3 Terms and definitions and abbreviated terms	9
3.1 Terms and definitions	9
3.1.1 Cold junction compensation (CJC)	10
3.1.2 International Temperature Scale of 1990 (ITS-90)	10
3.1.3 Resistance temperature detector (RTD)	10
3.1.4 Thermocouple (TC)	10
3.1.5 Radiation temperature transmitter	10
3.1.6 Noise equivalent temperature difference	10
3.1.7 Measuring distance	11
3.1.8 Field-of-view	11
3.1.9 Size-of-source effect	11
3.1.10 Emissivity setting	11
3.1.11 Spectral range	11
3.1.12 Short-term stability	11
3.1.13 Exposure time	11
3.1.14 Warm-up time	12
3.2 Abbreviated terms	12
4 General description of the device	12
5 Reference test conditions	12
6 Test procedures	12
6.1 General	12
6.1.1 Temperature Process Measurement Transmitter (PMT) for TC and RTD	12
6.1.2 Process Measurement Transmitter for Radiation temperature measurement	13
6.2 Tests at standard and operating reference test conditions	14
6.2.1 General	14
6.2.2 Suitable methods for accuracy verification in acceptance and routine tests	14

36	6.2.3	Specific test procedures for radiation temperature transmitter	16
37	7	Technical documentation.....	19
38	7.1	General	19
39	7.2	Total probable error (TPE)	20
40	Annex A.....		21
41	A.1	Temperature PMT (Contact thermometers)	21
42	A.2	Temperature PMT (Radiation temperature transmitter)	21
43	Annex B.....		23
44	B.1	Properties of temperature transmitter classes	23
45	B.1.1	Contact temperature transmitter.....	23
46	B.1.2	Radiation (Non-contact) temperature transmitter	25
47	Annex C.....		27
48	C.1	Verification of the Accuracy.....	27
49	C.2	Determination of the Noise equivalent temperature difference (NETD)	27
50	C.3	Field-of-view (target size)	28
51	C.4	Determination of the Size-of-Source-Effect (SSE).....	28
52	C.5	Influence of the internal instrument or ambient temperature	
53		(temperature parameter)	29
54	C.6	Short-term stability	30
55	C.7	Exposure time	31
56	C.8	Warm-Up time.....	32
57	Annex D		34
58	Bibliography		36
59			
60	Figure 1	Schematic example of test set-up for temperature measurement	
61		transmitters	12
62	Figure 2	Examples of terminals connection for RTD and TC	13
63	Figure 3	Schematic example of a test set-up for radiation temperature	
64		transmitters	14
65	Figure 4	Example of measured error plot	16
66	Figure 5	Relative signal to a signal at a defined aperture size (source size) of	
67		100 mm in diameter for two infrared radiation temperature transmitters A and	
68		B versus the source diameter	17
69	Figure 6	Demonstration of the exposure time	19

70	Figure 7 Possible arrangement for determining the exposure time with two	
71	reference sources.....	32
72	Figure 8 Example of warm-up time.....	33
73		
74		

INTERNATIONAL ELECTROTECHNICAL COMMISSION

**REFERENCE CONDITIONS AND PROCEDURES FOR TESTING
INDUSTRIAL AND PROCESS MEASUREMENT TRANSMITTERS
Part 3: Specific procedures for temperature transmitters**

FOREWORD

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IEC 62828-3 has been prepared by subcommittee 65B: Measurement and control devices, of IEC Technical Committee 65: Industrial-process measurement, control and automation. It is an International Standard.

This 62828-3 edition cancels and replaces the 62828-3 edition published in 2018.

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

In IEC 61298, all parts related to PMT's will be deleted, leaving all the requirements regarding all devices but PMT's.

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

Draft	Report on voting
65B/1110A/FDIS	65B/1114/RVD

123
124 Full information on the voting for its approval can be found in the report on voting indicated in the
125 above table.

126 The language used for the development of this International Standard is English.

127 This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance
128 with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at
129 www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in
130 greater detail at www.iec.ch/publications.

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

134 The committee has decided that the contents of this document will remain unchanged until the stability
135 date indicated on the IEC website under webstore.iec.ch in the data related to the specific document.
136 At this date, the document will be

- 137 • reconfirmed,
- 138 • withdrawn,
- 139 • replaced by a revised edition, or
- 140 • amended.

141

INTRODUCTION

The introduction is an optional/conditional element of the text.

For rules on the drafting of the introduction, refer to the ISO/IEC Directives, Part 2:2021, [Clause 13](#).

If patent rights have been identified, register the relevant declarations in the IEC patents database (<https://patents.iec.ch>) and include the notice below in the introduction. If the document is not affected by patent declarations, delete the text below.

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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. Many industrial and process measurement transmitters are meanwhile evolved and are quite different from those analogue transmitters: they are often digital and 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 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 test report and 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 the IEC 62828 series many test procedures were taken, with the necessary improvements, from the IEC 61298 series. As the actual IEC 61298 series is applicable to all process measurement and control devices, when the IEC 62828 series is completed the IEC 61298 series will be revised to harmonise it with the IEC 62828 series, taking out from its scope the industrial and process measurement transmitters. During the time when 61298 scope is being updated, the new series IEC 62828 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 3: Specific procedures for temperature transmitters

1 Scope

This part of IEC 62828 establishes specific procedures for testing temperature transmitters used in measuring and control systems for industrial process and for machinery control systems.

When the process measurement transmitter features the temperature transmitter separated from the sensing element (RTD, TC, etc.), the standard applies only to the temperature transmitter without the sensing element. In case of devices where the sensing element is fully integrated with the temperature transmitter, the standard applies to the complete device.

The sensing element itself (e.g., RTD, TC, etc.) is excluded from the scope of this document.

Radiation temperature transmitters are different in the type of measuring method and most often include the sensing element. Therefore, additional requirements and test procedures are defined for them within this standard.

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

Note 1: In the industrial and process applications, to indicate the process measurement transmitters, it is common also to use the terms “industrial transmitters”, or “process transmitters”.

Note 2: Infrared ear thermometers are not in the scope of this document

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 60584 (all parts), Thermocouples

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 TS 62492-1:2008, Industrial process control devices – Radiation temperature transmitters – Part 1: Technical data for radiation temperature transmitters

IEC TS 62492-2:2013, Industrial process control devices – Radiation temperature transmitters – Part 2: Determination of the technical data for radiation temperature transmitters

3 Terms and definitions and abbreviated terms

3.1 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

- IEC Electropedia: available at <https://www.electropedia.org/>

- ISO Online browsing platform: available at <https://www.iso.org/obp>

3.1.1 Cold junction compensation (CJC)

suitable automatic system to compensate the thermocouple EMF to 0 °C

3.1.2 International Temperature Scale of 1990 (ITS-90)

temperature scale adopted by the International Committee on Weights and Measures (CIPM) in 1989 for the purpose of practical measurements

Note 1 to entry: The quantities corresponding to thermodynamic temperature and Celsius temperature defined by this scale are denoted T_{90} and t_{90} , respectively, where $t_{90} = T_{90} - T_0$ with $T_0 = 273,15$ K.

Note 2 to entry: The units for T_{90} and t_{90} are the Kelvin, symbol K, and the degree Celsius, symbol °C, respectively.

[SOURCE: IEC 60050-113:2011, 113-04-18]

3.1.3 Resistance temperature detector (RTD)

temperature sensor containing a sensing element made of platinum or other metals whose resistance changes with temperature

Note 1 to entry: Resistance thermometers are often called RTDs.

Note 2 to entry: A platinum resistance thermometer (PRT) is an RTD that has a sensing element made of platinum; other common RTDs are nickel resistance thermometers (NRT) and copper resistance thermometers (CRT), with the sensing element made of nickel or copper respectively.

[SOURCE: IEC 62465:2010, 3.20, modified – The notes have been added.]

3.1.4 Thermocouple (TC)

pair of conductors of dissimilar materials joined at one end and forming part of an arrangement using the thermoelectric effect for temperature measurement

Note 1 to entry: The production of an electromotive force (EMF) due to a temperature gradient along a conductor is called thermoelectric effect (or Seebeck effect).

[SOURCE: IEC 60584-1:2013, 2.3, modified – The abbreviation and notes have been added.]

3.1.5 Radiation temperature transmitter

non-contact temperature transmitter that calculates the temperature based on the radiation emitted by an object over one or more given spectral ranges

[SOURCE: IEC 61987 #ABA836, modified - “infrared” deleted]

3.1.6 Noise equivalent temperature difference

Parameter which indicates the contribution of the measurement uncertainty in Kelvin, which is due to instrument noise

[SOURCE: IEC 61987 #ABF227 (modified)]