



SLOVENSKI STANDARD
oSIST prEN IEC 62828-2:2024
01-maj-2024

Referenčni pogoji in postopki za preskušanje industrijskih in procesnih merilnih oddajnikov - 2. del: Posebni postopki za dajalnike tlaka

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

Referenzbedingungen und Testmethoden für Industrie- und Prozessmessgrößenumformer - Teil 2: Spezielle Testmethoden für Druckmessumformer

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

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TITLE:

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

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NOTE FROM TC/SC OFFICERS:

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**REFERENCE CONDITIONS AND PROCEDURES FOR TESTING INDUSTRIAL
AND PROCESS MEASUREMENT TRANSMITTERS –**
Part 2: Specific procedures for pressure transmitters**FOREWORD**

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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.

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

98 The committee has decided that the contents of this document will remain unchanged until the
99 stability date indicated on the IEC website under "http://webstore.iec.ch" in the data related to
100 the specific document. At this date, the document will be

- 101 • reconfirmed,
- 102 • withdrawn,
- 103 • replaced by a revised edition, or
- 104 • amended.

105

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108

INTRODUCTION

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

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

121 To help manufacturers and users, it was decided to review, complete and reorganize the
122 relevant IEC standards and to create a more suitable, effective and comprehensive standard
123 series that provides in a systematic way all the necessary specifications and tests required for
124 different industrial and process measurement transmitters.

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

- 128 • applicable normative references;
- 129 • specific terms and definitions;
- 130 • typical configurations and architectures for the various types of industrial and process
131 measurement transmitters;
- 132 • hardware and software aspects;
- 133 • interfaces (to the process, to the operator, to the other measurement and control devices);
- 134 • physical, mechanical and electrical requirements and relevant tests; clear definition of the
135 test categories: type tests, acceptance tests and routine tests;
- 136 • performance (its specification, tests and verification);
- 137 • environmental protection, hazardous areas application, functional safety, etc.;
- 138 • structure of the technical documentation.

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

- 142 • IEC 62828-1: General procedures for all types of transmitters
- 143 • IEC 62828-2: Specific procedures for pressure transmitters
- 144 • IEC 62828-3: Specific procedures for temperature transmitters
- 145 • IEC 62828-4: Specific procedures for level transmitters
- 146 • IEC 62828-5: Specific procedures for flow transmitters

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

154

155

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.

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*

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>

In addition, the following standards, specific for pressure PMTs, also apply:

- IEC 61518:2000, Mating dimensions between differential pressure (type) measuring instruments and flanged-on shut-off devices up to 413 bar (41,3 MPa)

3.1

absolute pressure

p_{abs}

pressure using absolute vacuum as the datum point

Note 1 to entry: The CDD code of this entry for Electronic Data Exchange is ABB181.

198 **3.2**199 **ambient atmospheric pressure**200 p_{amb}

201 pressure exerted by the atmospheric air at a given altitude and temperature

202 Note 1 to entry: The atmospheric pressure decreases with the altitude by about 10 Pa/m (Pascal per metre).

203 **3.3**204 **differential pressure**205 Δp 206 $p_{1,2}$ 207 difference between the two (absolute) pressures that act simultaneously on opposite sides of a
208 membrane or a primary element

209 Note 1 to entry: The CDD code of this entry for Electronic Data Exchange is ABB995.

210 **3.4**211 **gauge pressure**212 p_{g}

213 pressure using atmospheric pressure as the datum point

214
$$p_{\text{g}} = p_{\text{abs}} - p_{\text{amb}}$$

215 Note 1 to entry: Gauge pressure assumes positive values when the absolute pressure is greater than the ambient
216 atmospheric pressure; it assumes negative values when the absolute pressure is less than the ambient atmospheric
217 pressure.

218 Note 2 to entry: In certain industrial environments, "gauge pressure" may be referred to as "pressure".

219 Note 3 to entry: The term "relative pressure" to indicate gauge pressure is obsolete and conceptually wrong, so it
220 should be avoided.

221 Note 4 to entry: the CDD code of this entry for Electronic Data Exchange is ABB182.

222 **3.5**223 **line pressure**224 **static pressure**

225 pressure applied on both sides of a differential pressure PMT

226 Note 1 to entry: For differential pressure PMTs, it is an influence factor that is bilateral and does not represent the
227 measurand.228 **3.6**229 **leakage rate**230 leakage, permeation and/or diffusion effects of the medium through the PMT and/or its mounting
231 devices over the testing period under static pressure conditions, expressed as normal volume
232 flow rate

233 Note 1 to entry: The CDD code of this entry for Electronic Data Exchange is ABD632.

234 **3.7**235 **measuring range**

236 <for pressure PMTs> range related to the measurement of absolute and gauge pressure PMTs

237 Note 1 to entry: For a pressure PMT with variable (adjustable or programmable) span, the measuring range and
238 associated terms are shown in Figure 1.

239 Note 2 to entry: See also Annex K in IEC 62828-1 for an example of signal current range of a 4 mA to 20 mA PMT

240 Note 3 to entry: maximum span indicates the measuring range defined by the difference between the upper and lower
241 range limit

242 .

243 **3.8**244 **set span**245 difference between the upper and lower range value of pressure to which a pressure
246 measurement instrument is adjusted

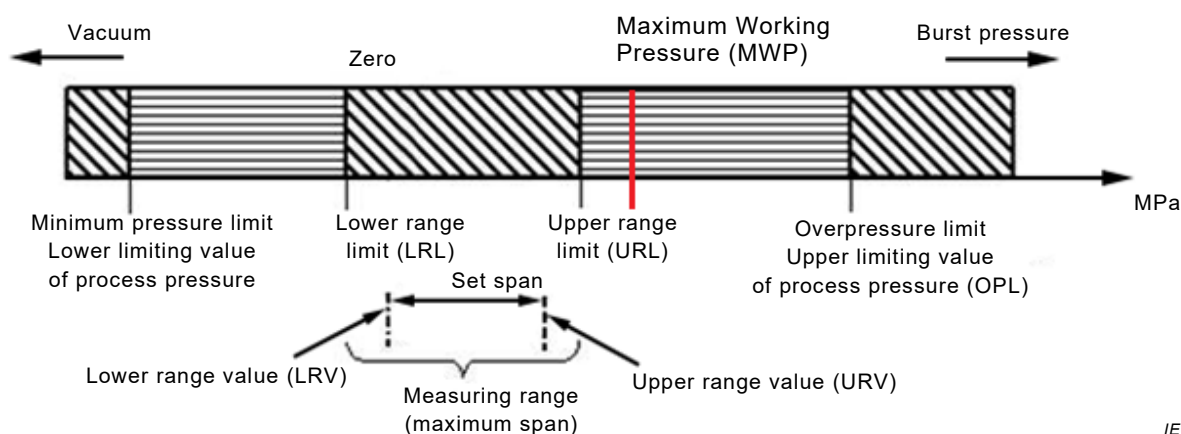
247 Note 14 to entry: The CDD code of this entry for Electronic Data Exchange is ABB570

248

249

250

251



252

253

254 **Figure 1 – Measuring range and associated properties of a pressure PMT**

255 3.9

256 **Maximum Working Pressure (MWP)**

257 The highest pressure a device can be continuously exposed to during operation

258 Note "Maximum working pressure (MWP) is equal to the upper range limit (URL), if not otherwise specified by the
259 manufacturer."

260 3.10

261 **overpressure limit (OPL)** 262 **proof pressure**

263 multiple of Maximum Working Pressure with which the device may be temporarily subjected to
264 pressure without permanent damage and without change of the guaranteed metrological properties
265 after returning to the measuring range

266 Note 1 to entry: The output signal at the overpressure limit is sometimes unreliable and/or not predictable.

267 Note 2 to entry: After returning to the measuring range, the guaranteed metrological properties shall remain
268 unchanged.

269 Note 3 to entry: The CDD code of this entry for Electronic Data Exchange is ABC027.

270

271 3.11

272 **minimum pressure limit**

273 pressure specified by the manufacturer the device may be subjected without permanent damage
274 and without change of the guaranteed metrological properties after returning to the measuring range

275

276 3.12

277 **pressure**

278 force per unit area applied in a direction perpendicular to a surface

279 Note 1 to entry: The SI unit for pressure is the Pascal (Pa), equal to one Newton per square metre (N/m^2 or
280 $\text{kg}\cdot\text{m}^{-1}\cdot\text{s}^{-2}$).