



SLOVENSKI STANDARD
oSIST prEN IEC 61298-2:2024
01-november-2024

Naprave za merjenje in nadzor procesa - Splošne metode in postopki za ocenjevanje lastnosti - 2. del: Preskusi pri referenčnih pogojih

Process measurement and control devices - General methods and procedures for evaluating performance - Part 2: Tests under reference conditions

Prozessmess-, -steuer- und -regelgeräte – Allgemeine Methoden und Verfahren für die Bewertung des Betriebsverhaltens – Teil 2: Prüfungen unter Referenzbedingungen

Dispositifs de mesure et de commande de processus - Méthodes et procédures générales d'évaluation des performances - Partie 2: Essais dans les conditions de référence

Ta slovenski standard je istoveten z: prEN IEC 61298-2:2024

<https://standards.iteh.ai/catalog/standards/sist/8bd17e2d-5892-4c12-8e6c-0e4b53cee8eb/osist-pr-en-iec-61298-2-2024>

ICS:

25.040.40	Merjenje in krmiljenje industrijskih postopkov	Industrial process measurement and control
-----------	--	--

oSIST prEN IEC 61298-2:2024

en,fr,de



65B/1270/CDV

COMMITTEE DRAFT FOR VOTE (CDV)

PROJECT NUMBER: IEC 61298-2 ED3	
DATE OF CIRCULATION: 2024-09-06	CLOSING DATE FOR VOTING: 2024-11-29
SUPERSEDES DOCUMENTS: 65B/1246/CD, 65B/1259/CC	

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:	
<input checked="" type="checkbox"/> SUBMITTED FOR CENELEC PARALLEL VOTING	<input type="checkbox"/> NOT SUBMITTED FOR CENELEC PARALLEL VOTING
<p>Attention IEC-CENELEC parallel voting</p> <p>The attention of IEC National Committees, members of CENELEC, is drawn to the fact that this Committee Draft for Vote (CDV) is submitted for parallel voting.</p> <p>The CENELEC members are invited to vote through the CENELEC online voting system.</p>	

This document is still under study and subject to change. It should not be used for reference purposes.

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 relevant "In Some Countries" clauses to be included should this proposal proceed. Recipients are reminded that the CDV stage is the final stage for submitting ISC clauses. (SEE [AC/22/2007](#) OR [NEW GUIDANCE DOC](#)).

TITLE:

Process measurement and control devices - General methods and procedures for evaluating performance - Part 2: Tests under reference conditions

PROPOSED STABILITY DATE: 2028

NOTE FROM TC/SC OFFICERS:

Copyright © 2024 International Electrotechnical Commission, IEC. All rights reserved. It is permitted to download this electronic file, to make a copy and to print out the content for the sole purpose of preparing National Committee positions. You may not copy or "mirror" the file or printed version of the document, or any part of it, for any other purpose without permission in writing from IEC.

1	CONTENTS		
2	FOREWORD.....		4
3	INTRODUCTION.....		6
4	1 Scope.....		7
5	2 Normative references		7
6	3 Terms and definitions		7
7	4 Accuracy related factors		8
8	4.1 Test procedures and precautions		8
9	4.1.1 Selection of ranges for test.....		8
10	4.1.2 Preconditioning cycles.....		9
11	4.1.3 Number of measurement cycles and test points		9
12	4.1.4 Additional tests where digital inputs and outputs are provided		10
13	4.1.5 Measurement procedure		10
14	4.1.6 Processing of the measured values		10
15	4.1.7 Determination of accuracy related factors		11
16	4.1.8 Presentation of the results		14
17	4.2 Specific testing procedures and precautions for the determination of dead		
18	band.....		14
19	4.2.1 Selection of ranges for test and preconditioning		14
20	4.2.2 Measurement procedure		14
21	4.2.3 Presentation of the results		15
22	5 Dynamic behavior		15
23	5.1 General considerations.....		15
24	5.2 General testing procedures and precautions.....		15
25	5.3 Frequency response.....		15
26	5.4 Step response		17
27	6 Functional characteristic.....		18
28	6.1 General		18
29	6.2 Input resistance of an electrical device		18
30	6.3 Insulation of electrical devices.....		19
31	6.3.1 General considerations.....		19
32	6.3.2 Insulation resistance.....		19
33	6.3.3 Dielectric strength		20
34	6.4 Power consumption		20
35	6.4.1 Electrical power consumption		20
36	6.4.2 Air consumption.....		20
37	6.5 Output ripple of a device with an electrical d.c. output		21
38	6.6 Air flow characteristics of a pneumatic device		21
39	6.6.1 Initial setting up		21
40	6.6.2 Delivered flow Q_1		21
41	6.6.3 Exhausted flow Q_2		22
42	6.6.4 Data presentation		22
43	6.7 Limits of adjustments of lower range value and span		23
44	6.8 Switching differential		23
45	7 Drift.....		23
46	7.1 Start-up drift.....		23
47	7.2 Long-term drift.....		23

48		
49	Figure 1 – Error curves	13
50	Figure 2 – Two examples of frequency response	16
51	Figure 3 – Two examples of responses to a step input	17
52	Figure 3 – Two examples of responses to a step input	18
53	Figure 4 – Test set-up for input resistance	19
54	Figure 5 – Test arrangement for measurement of airflow characteristics	21
55	Figure 6 – Typical air flow characteristics	22
56		
57	Table 1 – Settings of span and lower range value adjustments	9
58	Table 2 – Number of measurement cycles and number and location of test points	10
59	Table 3 – Typical table of device errors	12
60	Table 4 – Dielectric strength test voltages	20
61		
62		
63		

iTeh Standards
(<https://standards.iteh.ai>)
Document Preview

[oSIST prEN IEC 61298-2:2024](https://standards.iteh.ai/catalog/standards/sist/8bd17e2d-5892-4c12-8e6c-0e4b53cee8eb/osist-pren-iec-61298-2-2024)

<https://standards.iteh.ai/catalog/standards/sist/8bd17e2d-5892-4c12-8e6c-0e4b53cee8eb/osist-pren-iec-61298-2-2024>

INTERNATIONAL ELECTROTECHNICAL COMMISSION

**PROCESS MEASUREMENT AND CONTROL DEVICES –
GENERAL METHODS AND PROCEDURES
FOR EVALUATING PERFORMANCE –****Part 2: Tests under reference conditions**

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 provides no marking procedure to indicate its approval and cannot be rendered responsible for any equipment declared to be in conformity with an IEC Publication.
- 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 61298-2 has been prepared by subcommittee 65B: Devices and process analysis, of IEC technical committee 65: Industrial-process measurement, control and automation.

This second edition cancels and replaces the first edition published in 1995 and constitutes a technical revision.

This edition is a general revision with respect to the previous edition and does not include any significant changes (see Introduction).

116 The text of this standard is based on the following documents:

FDIS	Report on voting
65B/686/FDIS	65B/694/RVD

117

118 Full information on the voting for the approval of this standard can be found in the report on
119 voting indicated in the above table.

120 This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

121 A list of all parts of the IEC 61298 series, under the general title *Process measurement and*
122 *control devices – General methods and procedures for evaluating performance*, can be found
123 on the IEC website.

124 The committee has decided that the contents of this publication will remain unchanged until
125 the maintenance result date indicated on the IEC web site under "http://webstore.iec.ch" in
126 the data related to the specific publication. At this date, the publication will be

- 127 • reconfirmed,
- 128 • withdrawn,
- 129 • replaced by a revised edition, or
- 130 • amended.

131

132

iTeh Standards
(<https://standards.iteh.ai>)
Document Preview

[oSIST prEN IEC 61298-2:2024](https://standards.iteh.ai/catalog/standards/sist/8bd17e2d-5892-4c12-8e6c-0e4b53cee8eb/osist-pren-iec-61298-2-2024)

<https://standards.iteh.ai/catalog/standards/sist/8bd17e2d-5892-4c12-8e6c-0e4b53cee8eb/osist-pren-iec-61298-2-2024>

133

INTRODUCTION

134 This standard is not intended as a substitute for existing standards, but is rather intended as a
135 reference document for any future standards developed within the IEC or other standards
136 organizations, concerning the evaluation of process instrumentation, except the Process
137 Measurement Transmitters (PMT) which are standardized by IEC series 62828. ..

138 This common standardized basis should be utilized for the preparation of future relevant
139 standards, as follows:

- 140 – any test method or procedure, already treated in this standard, should be specified and
141 described in the new standard by referring to the corresponding clause of this standard.
142 Consequently new editions of this standard are revised without any change in numbering
143 and scope of each clause;
- 144 – any particular method or procedure, not covered by this standard, should be developed
145 and specified in the new standard in accordance with the criteria, as far as they are
146 applicable, stated in this standard;
- 147 – any conceptual or significant deviation from the content of this standard, should be clearly
148 identified and justified if introduced in a new standard.

149

150

iTeh Standards
(<https://standards.iteh.ai>)
Document Preview

[oSIST prEN IEC 61298-2:2024](https://standards.iteh.ai/catalog/standards/sist/8bd17e2d-5892-4c12-8e6c-0e4b53cee8eb/osist-pren-iec-61298-2-2024)

<https://standards.iteh.ai/catalog/standards/sist/8bd17e2d-5892-4c12-8e6c-0e4b53cee8eb/osist-pren-iec-61298-2-2024>

151 **PROCESS MEASUREMENT AND CONTROL DEVICES –**
152 **GENERAL METHODS AND PROCEDURES**
153 **FOR EVALUATING PERFORMANCE –**

154
155 **Part 2: Tests under reference conditions**
156

157
158

159 **1 Scope**

160 This part of IEC 61298 specifies general methods and procedures for conducting tests and
161 reporting on the functional and performance characteristics of process instrumentation except
162 Process Measurement Transmitters (PMT) which are standardized by IEC series 62828. The
163 tests are applicable to any such devices characterized by their own specific input and output
164 variables, and by the specific relationship (transfer function) between the inputs and outputs,
165 and include analogue and digital devices. For devices that require special tests, this standard
166 should be used, together with any product specific standard specifying special tests.

167 This standard covers tests made under reference conditions.

168 **2 Normative references**

169 The following referenced documents are indispensable for the application of this document.
170 For dated references, only the edition cited applies. For undated references, the latest edition
171 of the referenced document (including any amendments) applies.

172 IEC 60050-300, *International Electrotechnical Vocabulary (IEV) – Electrical and electronic*
173 *measurements and measuring instruments (composed of Part 311, 312, 313 and 314)*

174 IEC 60050-351, *International Electrotechnical Vocabulary (IEV) – Part 351 : Control*
175 *technology*

176 IEC 61298-1, *Process measurement and control devices – General methods and procedures*
177 *for evaluating performance – Part 1: General considerations*

178 IEC 61010-1, *Safety requirements for electrical equipment for measurement, control, and*
179 *laboratory use – Part 1: General requirements*

180 **3 Terms and definitions**

181 For the purpose of this document, the following relevant terms and definitions, some of them
182 based main on IEC 60050(300) or IEC 60050(351), apply.

183 **3.1**

184 **non-conformity**

185 the closeness with which a calibration curve approximates to a specified characteristic curve
186 (which can be linear, logarithmic, parabolic, etc.)

187 NOTE Non-conformity does not include hysteresis.

188 **3.2**

189 **dead-time**

190 time interval between the instant when a variation of an input variable is produced, and the
191 instant when the subsequent variation of the output variable starts

192 [IEV351-50-30, modified]

193 **3.3**

194 **rise time**

195 for a step response, the duration of the time interval between the instant when the output
196 variable (starting from zero) reaches a small specified percentage (for instance 10 %) of the
197 final steady-state value, and the instant when it reaches for the first time a large specified
198 percentage (for instance 90 %) of the same difference

199 [IEV845-25-067, modified]

200 **3.4**

201 **settling time**

202 time interval between the instant of the step change of an input variable, and the instant when
203 the output variable does not deviate by more than a specified tolerance from its final steady
204 state value. For this standard, a tolerance of 1 % is adopted

205 [IEV351-45-37]

206 **3.5**

207 **step response time**

208 time interval between the instant of a step change in the input variable and the instant when
209 the output variable reaches for the first time a specified percentage of the difference between
210 the final and the initial steady state value. For this standard , a specified percentage of 90 %
211 is adopted

212 [IEV 351-45-36]

213 **3.6**

214 **time constant**

215 time required to complete 63,2 % of the total change of the output of a first-order linear
216 system, produced by a step variation of the input variable

217 [IEV351-45-32]

218 **3.7**

219 **performance evaluation**

220 a complete test to establish the performance of a device under any likely operating conditions
221 to permit comparison with the manufacturer's published or stated performance specification
222 for the device, or the user's requirements

223 **3.8**

224 **routine test**

225 a simplified test to which each individual instrument is subjected during or after manufacture
226 to ascertain whether it complies with certain criteria

227 **3.9**

228 **sample test**

229 a simplified test to check specific characteristics of a device

230 **4 Accuracy related factors**

231 **4.1 Test procedures and precautions**

232 **4.1.1 Selection of ranges for test**

233 Where there are switched ranges or dial settings (e.g., gain), the tests shall be repeated to
234 cover all ranges or settings. When the Device Under Test (DUT) is supplied calibrated for use,
235 the first set of tests shall be carried out without adjustment.