IEC 61298-3

Edition 3.0 2026-06

INTERNATIONAL STANDARD

REDLINE VERSION

Process measurement and control devices - General methods and procedures for evaluating performance -
Part 3: Tests for the effects of influence quantities

ICS 25.040.40

ISBN 978-2-8327-1318-1

IEC 61298-3:2026-06 RLV(en)

THIS PUBLICATION IS COPYRIGHT PROTECTED
Copyright © 2026 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.

IEC Secretariat
3, rue de Varembé
CH-1211 Geneva 20
Switzerland

Tel.: +41 22 919 02 11
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 corrigendum or an amendment might have been published.

IEC publications search - webstore.iec.ch/advsearchform
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 It also gives information on projects, replaced and withdrawn publications.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 once a month by email.

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: sales@iec.ch.

IEC Products & Services Portal - products.iec.ch
Discover our powerful search engine and read freely all the publications previews, graphical symbols and the glossary. With a subscription you will always have access to up to date content tailored to your needs.

Electropedia - www.electropedia.org
The world's leading online dictionary on electrotechnology, containing more than 22 500 terminological entries in English and French, with equivalent terms in 25 additional languages. Also known as the International Electrotechnical Vocabulary (IEV) online.

Warning! Make sure that you obtained this publication from an authorized distributor.

CONTENTS

FOREWORD 3
INTRODUCTION 5
1 Scope 6
2 Normative references 6
3 Terms and definitions 7
4 General considerations 8
4.1 Criteria 8
4.2 General procedures 9
4.3 General EMC requirements 9
5 Ambient temperature effects 10
5.1 Criteria 10
5.2 Test procedure 10
6 Ambient relative humidity effects 11
7 Vibration 12
7.1 General considerations 12
7.2 Initial resonance search 13
7.3 Endurance conditioning by sweeping 13
7.4 Final resonance search 13
7.5 Final measurements 13
8 Shock, drop and topple 13
9 Mounting position 14
10 Over-range 14
11 Output load effects 15
11.1 General 15
11.2 Electrical output 15
11.3 Pneumatic output 15
12 Power supply 15
12.1 Supply voltage and frequency variations 15
12.2 Transient supply voltage effects 16
12.3 Supply voltage depression 16
12.4 Short-term supply voltage interruptions 17
12.5 Fast transient/burst immunity requirements 18
12.6 Surge immunity requirements 18
12.7 Reverse supply voltage protection (DC devices) 19
12.8 Supply pressure variations 19
12.9 Supply pressure interruptions 19
12.10 Conducted radio frequency requirements 20
13 Superimposed voltages 20
13.1 Line to earth voltages 20
13.2 Line to line voltages (series mode) 20
13.3 Earthing 20
14 Harmonic distortion effects 20
15 Magnetic field effects 21
16 Electromagnetic field immunity test 22
17 Electrostatic discharge 23

18 Effect of open-circuited and short-circuited input 24
19 Effect of open-circuited and short-circuited output 24
20 Effects of process medium conditions 25
20.1 Temperature of process fluid 25
20.2 Flow of process fluid through the device 25
20.3 Static line pressure effect 25
21 Atmospheric pressure effects 26
22 Flow of purge gas through the device 26
23 Accelerated operational life test 27
24 Operational long-term drift test (optional) 27
Bibliography 29

Figure 1 – Arrangement for supply voltage depression or interruption tests 17
Figure 2 – Arrangement for harmonic distortion effects test 21
~~Figure 3 – Examples of application of the test field .....~~
Figure 3 – Test set-up of the effects of static pressure 26
Figure 4 – Time schedule of input changes and changes of ambient temperature 27

Table 1 – Ambient temperature test ranges 10
Table 2 – Vibration test levels 12
Table 3 – Power supply classes (IEC 60654-2) 16
Table 4 – Power supply commutations-interruptions (IEC 60654-2) 17
~~Table 5 – Burst characteristics (IEC 61326-1) .....~~
~~Table 6 – Surge characteristics (IEC 61326-1) .....~~
~~Table 7 – Conducted RF characteristics (IEC 61326-1) .....~~

INTERNATIONAL ELECTROTECHNICAL COMMISSION

_____

Process measurement and control devices - General methods and procedures for evaluating performance - Part 3: Tests for the effects of influence quantities

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) IEC draws attention to the possibility that the implementation of this document may involve the use of (a) patent(s). IEC takes no position concerning the evidence, validity or applicability of any claimed patent rights in respect thereof. As of the date of publication of this document, IEC had not received notice of (a) patent(s), which may be required to implement this document. However, implementers are cautioned that this may not represent the latest information, which may be obtained from the patent database available at https://patents.iec.ch. IEC shall not be held responsible for identifying any or all such patent rights.

This redline version of the official IEC Standard allows the user to identify the changes made to the previous edition IEC 61298-3:2008. A vertical bar appears in the margin wherever a change has been made. Additions are in green text, deletions are in strikethrough red text.

IEC 61298-3 has been prepared by sub-committee 65B: Devices and process analysis, of IEC technical committee 65: Industrial-process measurement, control and automation. It is an International Standard.

This third edition cancels and replaces the second edition published in 2008. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

a) process measurement transmitters (PMT) have been removed from the scope of this document;
b) contents of subclauses referring to EMC and electrical safety have been deleted, only leaving reference to the IEC standards.

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

Draft	Report on voting
65B/1314/FDIS	65B/1331/RVD

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

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

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

A list of all parts of the IEC 61298 series, under the general title *Process measurement and control devices - General methods and procedures for evaluating performance*, 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 webstore.iec.ch in the data related to the specific document. At this date, the document will be

– reconfirmed,
– withdrawn, or
– revised.

INTRODUCTION

This document is ~~not intended as a substitute for existing standards, but is rather~~ intended as a reference document for any future standard developed within the IEC, or other standards organizations, concerning the evaluation of process instrumentation~~. Any revision of existing standards should take this standard into account~~, except the Process Measurement Transmitters (PMT) which are standardized by IEC 62828 series.

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

– any test method or procedure, already treated in this document, ~~should~~ will be specified and described in the new standard by referring to the corresponding clause of this document. Consequently, new editions of this document are revised without any change in numbering and scope of each clause;

– any particular method or procedure, not covered by this document, ~~should~~ will be developed and specified in the new standard in accordance with the criteria, as far as they are applicable, stated in this document;

– any conceptual or significant deviation from the content of this document ~~should~~ will be clearly identified and justified if introduced in a new standard.

1 Scope

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

This document covers tests for the effects of influence quantities.

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 60050-300, *International Electrotechnical Vocabulary (IEV) - Part 300: Electrical and electronic measurements and measuring instruments - Part 311: General terms relating to measurements - Part 312: General terms relating to electrical measurements - Part 313: Types of electrical measuring instruments - Part 314: Specific terms according to the type of instrument,* available at https://www.electropedia.org/

IEC 60050-351, *International Electrotechnical Vocabulary (IEV) - Part 351: Control technology,* available at https://www.electropedia.org/

~~IEC 61298-1:1995, *Process measurement and control devices – General methods and procedures for evaluating performance – Part 1: General considerations*~~

~~IEC 61298-2:1995, *Process measurement and control devices – General methods and procedures for evaluating performance – Part 2: Tests under reference conditions*~~

~~IEC 61298-4:1995, *Process measurement and control devices – General methods and procedures for evaluating performance – Part 4: Evaluation report content*~~

IEC 60068-2-1, *Environmental testing - Part 2-1: Tests - Test A: Cold*

IEC 60068-2-2, *Environmental testing - Part 2-2: Tests - Test B: Dry heat*

IEC 60068-2-6, *Environmental testing - Part 2-6: Tests - Test Fc: Vibration (sinusoidal)*

IEC 60068-2-30, *Environmental testing - Part 2-30: Tests - Test Db: Damp heat, cyclic (12 + 12 h cycle)*

IEC 60068-2-31, *Environmental testing - Part 2-31: Tests - Test Ec: ~~Drop and topple~~ Rough handling shocks, primarily for equipment-type specimens*

IEC 60654-1~~:1993, *Operating conditions for*~~, *Industrial-process measurement and control equipment - Operating conditions - Part 1: Climatic conditions*

IEC 60654-2~~:1992~~, *Operating conditions for industrial-process measurement and control equipment - Part 2: Power*

IEC 60654-3~~:1983~~, *Operating conditions for industrial-process measurement and control equipment - Part 3: Mechanical influences*

IEC 61298-1:2026, *Process measurement and control devices - General methods and procedures for evaluating performance - Part 1: General considerations*

IEC 61298-2:2026, *Process measurement and control devices - General methods and procedures for evaluating performance - Part 2: Tests under reference conditions*

IEC 61298-4, *Process measurement and control devices - General methods and procedures for evaluating performance - Part 4: Evaluation report content*

~~IEC 61326 (all parts), *Electrical equipment for measurement, control and laboratory use – EMC requirements*~~

IEC 61326-1~~:2005~~, *Electrical equipment for measurement, control and laboratory use - EMC requirements - Part 1: General requirements*

~~IEC 61000-4-2:2001, *Electromagnetic compatibility (EMC) – Part 4-2: Testing and measurement techniques – Electrostatic discharge immunity test. Basic EMC publication*~~

~~IEC 61000-4-3:2002, *Electromagnetic compatibility (EMC) – Part 4-3: Testing and measurement techniques – Radiated, radio-frequency, electromagnetic field immunity test. Basic EMC publication*~~

~~IEC 61000-4-4:2004, *Electromagnetic compatibility (EMC) – Part 4-4: Testing and measurement techniques – Electrical fast transient/burst immunity test. Basic EMC publication*~~

~~IEC 61000-4-5:1995, *Electromagnetic compatibility (EMC) – Part 4-5: Testing and measurement techniques – Surge immunity test. Basic EMC publication*~~

~~IEC 61000-4-6:2006, *Electromagnetic compatibility (EMC) – Part 4-6: Testing and measurement techniques – Immunity to conducted disturbances, induced by radio-frequency fields*~~

~~IEC 61000-4-8:2001, *Electromagnetic compatibility (EMC) – Part 4-8: Testing and measurement techniques – Power frequency magnetic field immunity test. Basic EMC publication*~~

~~IEC 61000-4-11:2004, *Electromagnetic compatibility (EMC) – Part 4-11: Testing and measurement techniques – Voltage dips, short interruptions and voltage variations immunity tests . Basic EMC publication*~~

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 60050-300, IEC 60050-351 and the following 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