

SLOVENSKI STANDARD
oSIST prEN 60051-9:2018
01-april-2018

**Neposredni kazalni analogni električni merilni instrumenti in njihov pribor - 9. del:
Priporočene preskusne metode**

Direct acting indicating analogue electrical-measuring instruments and their accessories
- Part 9: Recommended test methods

Direkt wirkende anzeigende elektrische Meßgeräte und ihr Zubehör - Meßgeräte mit
Skalenanzeige - Teil 9: Empfohlene Prüfverfahren

Appareils mesureurs électriques indicateurs analogiques à action directe et leurs
accessoires - Partie 9: Méthodes d'essai recommandées

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Ta slovenski standard je istoveten z: prEN 60051-9:2018

ICS:

17.220.20	Merjenje električnih in magnetnih veličin	Measurement of electrical and magnetic quantities
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COMMITTEE DRAFT FOR VOTE (CDV)

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IEC TC 85 : MEASURING EQUIPMENT FOR ELECTRICAL AND ELECTROMAGNETIC QUANTITIES	
SECRETARIAT: China	SECRETARY: Mr Bo Chen
OF INTEREST TO THE FOLLOWING COMMITTEES:	PROPOSED HORIZONTAL STANDARD: <input type="checkbox"/> Other TC/SCs are requested to indicate their interest, if any, in this CDV to the secretary.
FUNCTIONS CONCERNED: <input type="checkbox"/> EMC <input type="checkbox"/> ENVIRONMENT <input type="checkbox"/> QUALITY ASSURANCE <input type="checkbox"/> SAFETY	
<input checked="" type="checkbox"/> SUBMITTED FOR CENELEC PARALLEL VOTING <input type="checkbox"/> NOT SUBMITTED FOR CENELEC PARALLEL VOTING Attention IEC-CENELEC parallel voting 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. The CENELEC members are invited to vote through the CENELEC online voting system.	

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TITLE:

Direct acting indicating analogue electrical measuring instruments and their accessories. Part 9: Recommended test methods

PROPOSED STABILITY DATE: 2020

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**DIRECT ACTING INDICATING ANALOGUE ELECTRICAL MEASURING
INSTRUMENTS AND THEIR ACCESSORIES –****Part 9: Recommended test methods****FOREWORD**

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International Standard IEC 60051-9 has been prepared by IEC technical committee 85: Measuring equipment for electromagnetic quantities.

This fifth edition cancels and replaces the fourth edition published in 1988, Amendment 1:1994 and Amendment 2:1995. This edition constitutes a technical revision.

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

- adding performance requirements for test equipment;
- updating the references to applicable standards of test methods.

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

FDIS	Report on voting
85/XX/FDIS	85/XX/RVD

77

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

80 This International Standard is to be used in conjunction with IEC 60051-1:2016.

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

82 A list of all parts in the IEC 60051 series, published under the general title *Direct acting indicating*
83 *analogue electrical measuring instruments and their accessories*, can be found on the IEC website.

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

- 87 • reconfirmed,
- 88 • withdrawn,
- 89 • replaced by a revised edition, or
- 90 • amended.

91

92 The National Committees are requested to note that for this publication the stability date is 2020

93 THIS TEXT IS INCLUDED FOR THE INFORMATION OF THE NATIONAL COMMITTEES AND WILL BE DELETED AT THE
94 PUBLICATION STAGE.

95

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INTRODUCTION

97 IEC 60051 is published in separate parts according to the following structure and under the general
98 title *Direct acting indicating analogue electrical measuring instruments and their accessories*.

99 Part 1: Definitions and general requirements common to all parts

100 Part 2: Special requirements for ammeters and voltmeters

101 Part 3: Special requirements for wattmeters and varimeters

102 Part 4: Special requirements for frequency meters

103 Part 5: Special requirements for phase meters, power factor meters and synchrosopes

104 Part 6: Special requirements for ohmmeters (impedance meters) and conductance meters

105 Part 7: Special requirements for multi-function instruments

106 Part 8: Special requirements for accessories

107 Part 9: Recommended test methods

108 IEC 60051-9 is not complete in itself and is read in conjunction with IEC 60051-1.

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DIRECT ACTING INDICATING ANALOGUE ELECTRICAL MEASURING INSTRUMENTS AND THEIR ACCESSORIES –

Part 9: Recommended Test methods

1 Scope

This part of IEC 60051 applies to direct acting indicating analogue electrical measuring instruments and their accessories and, gives guidance for applicable test methods and for the performance of test equipment.

This document does not apply to:

- special purpose instruments that are covered by their own IEC standards;
- special purpose devices that are covered by their own IEC standards when they are used as accessories.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60051-1:2016, *Direct acting indicating analogue electrical measuring instruments and their accessories – Part 1: Definitions and general requirements common to all parts*

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

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

IEC 61010-2-030, *Safety requirements for electrical equipment for measurement, control, and laboratory use - Part 2-030: Particular requirements for testing and measuring circuits*

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

IEC 61326-2-1, *Electrical equipment for measurement, control and laboratory use - EMC requirements - Part 2-1: Particular requirements - Test configurations, operational conditions and performance criteria for sensitive test and measurement equipment for EMC unprotected applications*

IEC 61557-1, *Electrical safety in low voltage distribution systems up to 1 000 V a.c. and 1 500 V d.c. - Equipment for testing, measuring or monitoring of protective measures - Part 1: General requirements*

IEC 61557-12, *Electrical safety in low voltage distribution systems up to 1 000 V a.c. and 1 500 V d.c. - Equipment for testing, measuring or monitoring of protective measures - Part 12: Performance measuring and monitoring devices (PMD)*

3 Terms and definitions

See IEC 60051-1:2016.

146 4 Requirements for test equipment

147 4.1 General

148 Test equipment shall have sufficient accuracy and stability for determination of intrinsic uncertainty
149 of the measurand and its variations.

150 NOTE Calibration protocols can be used.

151 4.2 Test equipment for measuring the intrinsic uncertainty of the measurand and its 152 variations

153 The maximum instrumental uncertainty of reference instruments used to determine the intrinsic
154 uncertainty of the measurand and variations shall be 0,2 times the class index of the tested instrument.

155 4.3 Test equipment for overload tests, self-heating, damping, overshoot and response time

156 The maximum uncertainty of the settings of the electrical quantities that will be used to test overload,
157 self-heating, damping, overshoot and response time shall be $\pm 1\%$ of those settings.

158 4.4 Test equipment for phase shift

159 Test equipment for settings of phase shift for power meters shall have an uncertainty of $\pm 1^\circ$ or better.

160 The instrumental uncertainty of test equipment for phase meters and power factor meters shall comply
161 with 4.2.

162 4.5 Test equipment for temperatures

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163 Equipment for settings of temperatures shall have a maximum uncertainty in the temperature settings
164 of $\pm 1^\circ\text{C}$.

165 4.6 Test equipment for humidity

166 Equipment for settings of humidity shall have a maximum uncertainty in the humidity settings of $\pm 2\%$

167 5 Test methods for determination of intrinsic uncertainty

168 The intrinsic uncertainty at defined test points shall be checked with slowly increasing or decreasing
169 measuring values without any overshoot and without tapping. The test points for the type test can be
170 defined by the manufacturer. The routine tests should be carried out at full scale at all ranges and the
171 characteristic should be tested in one range at the minimum.

172 NOTE Tapping is only allowed for the determination of scale marks and for the determination of
173 variations.

174 6 Test methods for damping

175 Damping shall be tested at 75% of the scale length.

176 7 Test methods for humidity

177 Settings of relative humidity in relationship to temperatures shall follow the relevant requirements of
178 IEC 61557-12. The duration time for the determination of the variation shall be 1 h at the minimum.