

# SLOVENSKI STANDARD

## SIST EN 60051-1:2017

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Nadomešča:

SIST EN 60051-1:2000

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### Neposredni kazalni analogni električni merilni instrumenti in njihov pribor - 1. del: Definicije in splošne zahteve, skupne vsem delom (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 60051-1:2016)

Direkt anzeigende analoge elektrische Messgeräte und ihr Zubehör - Teil 1: Definitionen  
und allgemeine Anforderungen für alle Teile (IEC 60051-1:2016)

Appareils de mesure électriques indicateurs analogiques à action directe et leurs  
accessoires - Partie 1: Définitions et exigences générales communes à toutes les parties  
(IEC 60051-1:2016)

**Ta slovenski standard je istoveten z: EN 60051-1:2017**

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EUROPEAN STANDARD

**EN 60051-1**

NORME EUROPÉENNE

EUROPÄISCHE NORM

April 2017

ICS 17.220.20

Supersedes EN 60051-1:1998

English Version

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

Appareils de mesure électriques indicateurs analogiques à  
action directe et leurs accessoires - Partie 1: Définitions et  
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Direkt anzeigende analoge elektrische Messgeräte und ihr  
Zubehör - Teil 1: Definitionen und allgemeine  
Anforderungen für alle Teile  
(IEC 60051-1:2016)

This European Standard was approved by CENELEC on 2016-03-09. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

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European Committee for Electrotechnical Standardization  
Comité Européen de Normalisation Electrotechnique  
Europäisches Komitee für Elektrotechnische Normung

**CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels**

**EN 60051-1:2017****European foreword**

The text of document 85/521/FDIS, future edition 6 of IEC 60051-1, prepared by IEC/TC 85 "Measuring equipment for electrical and electromagnetic quantities" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 60051-1:2017.

The following dates are fixed:

- latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2017-10-28
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2020-04-28

This document supersedes EN 60051-1:1998.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC [and/or CEN] shall not be held responsible for identifying any or all such patent rights.

This document has been prepared under a mandate given to CENELEC by the European Commission and the European Free Trade Association.

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The text of the International Standard IEC 60051-1:2016 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following notes have to be added for the standard indicated :

IEC 60359:2001	NOTE	Harmonized as EN 60359:2002.
IEC 61557-12:2007	NOTE	Harmonized as EN 61557-12:2008.
IEC 62052-11:2003	NOTE	Harmonized as EN 62052-11:2003.
IEC 62586-1:2013	NOTE	Harmonized as EN 62586-1:2014.

## Annex ZA (normative)

### Normative references to international publications with their corresponding European publications

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.

NOTE 1 When an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: [www.cenelec.eu](http://www.cenelec.eu).

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60051-9	-	Direct acting indicating analogue electrical measuring instruments and their accessories -- Part 9: Recommended test methods	EN 60051-9	-
IEC 60359	2001	Electrical and electronic measurement equipment - Expression of performance	EN 60359	2002
IEC 60529	2013	Degrees of protection provided by enclosures (IP Code)	-	-
+ A1	1995	-	-	-
IEC 60721-3-3	1994	Classification of environmental conditions - Part 3: Classification of groups of environmental parameters and their severities -- Section 3: Stationary use at weatherprotected locations	EN 60721-3-3	1995
+ A2	1996	-	+ A2	1997
IEC 60721-3-7	1995	Classification of environmental conditions - Part 3: Classification of groups of environmental parameters and their severities -- Section 7: Portable and non-stationary use	EN 60721-3-7	1995
+ A1	1996	-	+ A1	1997
IEC 61010-1	2010	Safety requirements for electrical equipment for measurement, control and laboratory use -- Part 1: General requirements	EN 61010-1	2010
IEC 61010-2-030	2010	Safety requirements for electrical equipment for measurement, control and laboratory use -- Part 2-030: Particular requirements for testing and measuring circuits	EN 61010-2-030	2010
IEC 61326-1	2012	Electrical equipment for measurement, control and laboratory use - EMC requirements -- Part 1: General requirements	EN 61326-1	2013

**EN 60051-1:2017**

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	EN 61326-2-1	-
ISO 780	-	Packaging - Pictorial marking for handling of goods	EN ISO 780	-

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IEC 60051-1

Edition 6.0 2016-02

# INTERNATIONAL STANDARD

# NORME INTERNATIONALE

**Direct acting indicating analogue electrical measuring instruments and their accessories –**

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

**Appareils de mesure électriques indicateurs analogiques à action directe et leurs accessoires –**

**Partie 1: Définitions et exigences générales communes à toutes les parties**

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ELECTROTECHNICAL  
COMMISSION

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## CONTENTS

FOREWORD.....	5
INTRODUCTION.....	7
1 Scope.....	8
2 Normative references.....	8
3 Terms and definitions .....	9
3.1 General terms .....	9
3.2 Description of instruments according to their method of operation .....	13
3.3 Constructional features of instruments.....	14
3.4 Characteristic features of instruments.....	16
3.5 Characteristic values.....	17
3.6 Influence quantity, reference conditions, nominal range of use and preconditioning .....	17
3.7 Uncertainty and variations .....	19
3.8 Accuracy, accuracy class and class index.....	21
3.9 Test.....	21
4 Description, classification and compliance.....	22
4.1 Description.....	22
4.1.1 Description according to methods of operation or nature.....	22
4.1.2 Description according to environmental conditions .....	22
4.1.3 Description according to mechanical conditions .....	22
4.1.4 Description according to degrees of protection.....	22
4.2 Classification.....	22
4.3 Compliance with the requirements of this standard.....	23
5 Requirements .....	23
5.1 Reference conditions.....	23
5.2 Limits of intrinsic uncertainty, fiducial value .....	23
5.2.1 Limits of intrinsic uncertainty .....	23
5.2.2 Correspondence between intrinsic uncertainty and accuracy class .....	23
5.2.3 Fiducial value.....	23
5.3 Nominal range of use and variations .....	25
5.3.1 Nominal range of use .....	25
5.3.2 Limits of variations .....	27
5.3.3 Conditions for the determination of variations .....	28
5.4 Operating uncertainty, overall system uncertainty and variations.....	28
5.5 Electrical requirements.....	28
5.5.1 Electrical safety requirements .....	28
5.5.2 Self-heating .....	28
5.5.3 Permissible overloads .....	29
5.5.4 Limiting range of temperature.....	29
5.5.5 Deviation from zero.....	29
5.5.6 Electromagnetic compatibility (EMC) .....	29
5.6 Constructional requirements.....	30
5.6.1 General constructional requirements .....	30
5.6.2 Damping .....	30
5.6.3 Sealing to prevent access .....	30
5.6.4 Scales .....	31



5.6.5	Stopper.....	32
5.6.6	Preferred values .....	32
5.6.7	Adjusters, mechanical and/or electrical.....	32
5.6.8	Effects of vibration and shock.....	33
5.6.9	Degrees of protection provided by enclosure .....	33
5.6.10	Terminals.....	34
6	Information, markings and symbols .....	34
6.1	Information.....	34
6.2	Markings, symbols and their locations.....	35
6.3	Markings relating to the reference values and nominal ranges of use of influence quantities .....	36
6.4	The symbols for marking instruments and accessories .....	36
6.5	Markings and symbols for terminals.....	45
6.5.1	Requirements for markings.....	45
6.5.2	Earthing (grounding) terminals .....	45
6.5.3	Measuring circuit terminals.....	45
6.5.4	Special markings for terminals.....	45
6.6	Instructions for use.....	45
7	Package .....	46
8	Test rules .....	46
8.1	Type of test.....	46
8.2	Type tests .....	46
8.3	Routine tests.....	46
8.4	Recurrent tests .....	46
8.5	Nonconformity classification.....	47
8.6	Judgement of test results.....	47
	Annex A (normative) Limits of intrinsic uncertainty and variations .....	48
	Annex B (informative) Relationship between ambient temperature and relative humidity.....	51
	Annex C (informative) Estimation of uncertainties .....	52
C.1	Uncertainties in this standard .....	52
C.2	Operating uncertainty .....	52
C.2.1	General .....	52
C.2.2	Estimating absolute operating uncertainty according to type test results.....	52
C.2.3	Estimating absolute operating uncertainty according to limit of intrinsic uncertainty and limit of variations due to every influence specified by this standard.....	53
C.3	Overall system uncertainty .....	54
C.4	Fiducial operating uncertainty.....	54
	Annex D (normative) Routine Tests.....	55
	Bibliography .....	56
	Figure 1 – Measuring range 10 A to 50 A.....	31
	Figure 2 – Measuring range 80 V to 110 V.....	32
	Figure 3 – Measuring ranges 0,06 M $\Omega$ to 0,4 M $\Omega$ and 0,1 M $\Omega$ to 2 M $\Omega$ .....	32
	Figure A.1 – Effect of temperature.....	48
	Figure A.2 – Effect of temperature.....	49
	Figure B.1 – Relationship between ambient temperature and relative humidity .....	51

Figure C.1 – Different kinds of uncertainty .....	52
Table 1 – Minimum IP requirements .....	22
Table 2 – Reference conditions and tolerances for testing purposes relating to the influence quantities .....	24
Table 3 – Limits of the nominal range of use and permissible variations .....	26
Table 4 – The diameters of conductive screw and the diameters or the area of contact surface .....	34
Table 5 – Units, quantities and SI prefixes .....	37
Table 6 – Symbols for marking instruments and accessories .....	38

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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

**DIRECT ACTING INDICATING ANALOGUE ELECTRICAL  
MEASURING INSTRUMENTS AND THEIR ACCESSORIES –****Part 1: Definitions and general requirements common to all parts**

## 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.
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International Standard IEC 60051-1 has been prepared by IEC technical committee 85: Measuring equipment for electrical and electromagnetic quantities.

This sixth edition cancels and replaces the fifth edition published in 1997. This edition constitutes a technical revision.

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

- adding the EMC requirements;
- updating the safety symbols and requirements according to new IEC 61010 series;
- replacing the concept of “error” to the concept of “uncertainty”;
- adding service environment classification and classification by method of operation, mechanical condition and the degrees of protection;

- adding the requirements for transport and storage of instruments and accessories according to IEC 60359;
- updating the Annexes to provide more information.

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

FDIS	Report on voting
85/521/FDIS	85/536/RVD

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

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

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

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

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

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## INTRODUCTION

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

- Part 1: Definitions and General Requirements Common to all Parts.
- Part 2: Special Requirements for Ammeters and Voltmeters.
- Part 3: Special Requirements for Wattmeters and Varmeters.
- Part 4: Special Requirements for Frequency Meters.
- Part 5: Special Requirements for Phase Meters, Power Factor Meters and Synchroscopes.
- Part 6: Special Requirements for Ohmmeters (Impedance Meters) and Conductance Meters.
- Part 7: Special Requirements for Multi-function Instruments.
- Part 8: Special Requirements for Accessories.
- Part 9: Recommended Test Methods.

Parts 2 to 9 are not complete in themselves and shall be read in conjunction with this Part 1.

All of these parts are arranged in the same format and a standard relationship between subject and clause number is maintained throughout. This re-arrangement will assist the reader of IEC 60051 to distinguish information relating to the different types of instruments.

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# DIRECT ACTING INDICATING ANALOGUE ELECTRICAL MEASURING INSTRUMENTS AND THEIR ACCESSORIES –

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

### 1 Scope

This part of IEC 60051 specifies definitions and general requirements for direct acting indicating analogue electrical measuring instruments and their accessories.

This part applies to direct acting indicating analogue electrical measuring instruments, such as:

- ammeters and voltmeters;
- wattmeters and varmeters;
- frequency meters of pointer and vibrating-reed types;
- phasemeters, power-factor meters and synchrosopes;
- ohmmeters(impedance meters) and conductance meters;
- multi-function instruments of the above types.

It also applies to:

- certain accessories used with these instruments, such as:
  - shunts; <https://standards.iteh.ai/catalog/standards/sist/e5ed5d93-6f8e-4e31-b502-808487619774/sist-en-60051-1-2017>
  - series resistors and impedance elements;
- combination of the instruments and the accessories provided that the adjustments have been made for the combination;
- direct acting indicating electrical measuring instrument whose scale marks do not correspond directly to its electrical input quantity, provided that the relationship between them is known;
- instruments and accessories having electronic devices in their measuring and/or auxiliary circuits.

These series standards do not apply to:

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

This standard does not specify requirements concerning dimensions of instruments or accessories (for the former, see IEC 60473).

### 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 60051-9, *Direct acting indicating analogue electrical measuring instruments and their accessories – Part 9: Recommended Test Methods*<sup>1</sup>

IEC 60359:2001, *Electrical and electronic measurement equipment – Expression of performance*

IEC 60529:2013, *Degrees of protection provided by enclosures (IP Code)*

IEC 60721-3-3:1994, *Classification of environmental conditions – Part 3: Classification of groups of environmental parameters and their severities – Section 3: Stationary use at weatherprotected locations*

IEC 60721-3-3/AMD1:1995

IEC 60721-3-3/AMD2:1996

IEC 60721-3-7:1995, *Classification of environmental conditions – Part 3: Classification of groups of environmental parameters and their severities – Section 7: Portable and non-stationary use*

IEC 60721-3-7/AMD1:1996

IEC 61010-1:2010, *Safety requirements for electrical equipment for measurement, control, and laboratory use – Part 1: General requirements*

IEC 61010-2-030:2010, *Safety requirements for electrical equipment for measurement, control, and laboratory use – Part 2-030: Particular requirements for testing and measuring circuits*

IEC 61326-1:2012, *Electrical equipment for measurement, control and laboratory use – EMC requirements – Part 1: General requirements*

IEC 61326-2-1:2012, *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*

ISO 780:1997, *Packaging – Pictorial marking for handling of goods*

### 3 Terms and definitions

For the purpose of this standard, the terms and definitions given in IEC 60359 as well as the following, apply.

#### 3.1 General terms

##### 3.1.1

##### **electrical measuring instrument**

measuring instrument intended to measure an electrical or non-electrical quantity using electrical or electronic means

[SOURCE: IEC 60359:2001, 3.2.4]

##### 3.1.2

##### **analogue display instrument**

measuring instrument intended to present or display the output information as a continuous function of the measured quantity

<sup>1</sup> To be published.