IEC 60051-8

Edition 5.0 2017-12

INTERNATIONAL STANDARD

NORME INTERNATIONALE

Direct acting indicating analogue electrical measuring instruments and their accessories –
Part 8: Special requirements for accessories

Appareils mesureurs électriques indicateurs analogiques à action directe et leurs accessoires –
Partie 8: Exigences particulières pour les accessoires

IEC 60051-8:2017-12(en-fr)

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INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

COMMISSION
ELECTROTECHNIQUE
INTERNATIONALE

ICS 17.220.20

ISBN 978-2-8322-5192-8

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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DIRECT ACTING INDICATING ANALOGUE ELECTRICAL MEASURING INSTRUMENTS AND THEIR ACCESSORIES –

Part 8: Special requirements for accessories

FOREWORD

International Standard IEC 60051-8 has been prepared by IEC technical committee 85: Measuring equipment for electrical and electromagnetic quantities.

This fifth edition cancels and replaces the fourth edition published in 1984. This edition constitutes a technical revision.

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

a) updating content in line with new editions of IEC 60051-1 and IEC 60051-9;

b) addition of Annex A to specify the nonconformity classification of test items.

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

CDV	Report on voting
85/561/CDV	85/584A/RVC

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

This document 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 document will remain unchanged until the stability date indicated on the IEC website under "http://webstore.iec.ch" in the data related to the specific document. At this date, the document will be

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- withdrawn,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

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

IEC 60051-8 is not complete in itself and is read in conjunction with IEC 60051-1.

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

DIRECT ACTING INDICATING ANALOGUE ELECTRICAL MEASURING INSTRUMENTS AND THEIR ACCESSORIES –

Part 8: Special requirements for accessories

1 Scope

This part of IEC 60051 applies to accessories as defined in 3.1.20 of IEC 60051-1:2016.

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

3 Terms and definitions

See IEC 60051-1:2016.

4 Description, classification and compliance

4.1 Description

See IEC 60051-1:2016.

4.2 Classification

Interchangeable accessories and accessories of limited interchangeability shall be classified in one of the accuracy classes denoted by the following class indices:

0,02, 0,05, 0,1, 0,2, 0,3, 0,5, 1, 2 *, 5 *, 10 *

NOTE The class indices marked with a star (*) are only for use with high voltage series resistors and impedances.

4.3 Compliance with the requirements of this standard

4.3.1 General

See IEC 60051-1:2016.

4.3.2 Interchangeable accessories of limited interchangeability

4.3.2.1 General

The uncertainty shall not exceed the amount specified in IEC 60051-1:2016 at all values of the measured quantity up to and including the rated value.

Shunts and series resistors shall be tested using direct current unless a frequency is stated.

4.3.2.2 Interchangeable shunts

When the current taken by the associated measuring instrument is smaller than the rated current multiplied by the class index of the shunt and divided by 300, the current taken by the associated measuring instrument may be neglected.

4.3.3 Non interchangeable accessories

The accessory is tested in combination with its own instrument. There are no requirements relating to limits of uncertainty for either component alone and the class index relates to the combination.

5 Requirements

5.1 Reference conditions

See IEC 60051-1:2016.

5.2 Limits of intrinsic uncertainty, fiducial value

See IEC 60051-1:2016.

5.2.1 Limits of intrinsic uncertainty

See IEC 60051-1:2016.

5.2.2 Correspondence between intrinsic uncertainty and accuracy class

See IEC 60051-1:2016.

5.2.3 Fiducial value

The fiducial value for an interchangeable accessory or an accessory of limited interchangeability corresponds to the rated value. The class index is marked using symbol E-1 given in Table 6 of IEC 60051-1:2016 (see Clause 6 of IEC 60051-1:2016).

5.3 Nominal range of use and variations

5.3.1 Nominal range of use

See IEC 60051-1:2016.

See Table 3 of IEC 60051-1:2016 and Table 1.

Table 1 – Limits of the nominal range of use and permissible variations

Influence quantity	Limits of the nominal range of use unless otherwise marked	Permissible variation expressed as a percentage of the class index
Ripple of DC measured quantity	20 %	50 %
Distortion of AC measured quantity	20 % (with a peak factor less than 3)	100 %
Frequency of AC measured quantity	Reference frequency ±10 %	100 %
Magnetic field of external origin	400 A/m	100 %

5.3.2 Limits of variations

5.3.2.1 General

See IEC 60051-1:2016.

5.3.2.2 Variation due to a magnetic field of external origin

See IEC 60051-1:2016.

Subclause 5.3.2.2 applies when relevant (e.g. to reactor boxes).

5.3.2.3 Variation due to an electric field of external origin (electrostatic instruments only)

See IEC 60051-1:2016.

Subclause 5.3.2.3 applies when relevant (e.g. to reactor boxes).

5.3.2.4 Variation due to ferromagnetic supports

Subclause 5.3.2.4 of IEC 60051-1:2016 does not apply to accessories.

5.3.2.5 Variation due to conductive supports

See IEC 60051-1:2016. However, 5.3.2.5 does not apply to an accessory that is intended to be supported by its associated wiring or supported by a bus bar.

5.3.3 Conditions for the determination of variations

See IEC 60051-1:2016.

5.4 Operating uncertainty, overall system uncertainty and variations

See IEC 60051-1:2016.

5.5 Electrical requirements

5.5.1 Electrical safety requirements

See IEC 60051-1:2016.

5.5.2 Self-heating

See IEC 60051-1:2016.

5.5.3 Permissible overloads

5.5.3.1 Continuous overload

For the recommended test, see IEC 60051-9.

Accessories, except those provided with a non-locking switch, shall be subjected to a continuous overload of 120 % of the rated value for a period of 2 h.

After having cooled to the reference temperature, the accessory shall comply with the requirements relating to its accuracy class.

This test shall be carried out under reference conditions.

5.5.3.2 Overloads of short duration

For the recommended tests, see IEC 60051-9.

Accessories, except those provided with a non-locking switch, shall be subjected to overloads of short duration.

The currents and voltages for the overloads of short duration shall be the product of the relevant factor given in Table 2 and the rated value of the shunt or the series resistor (impedance), unless other values are stated by the manufacturer.

Table 2 – Overloads of short duration

Rated value	Current factor	Voltage factor	Number of overloads	Duration of each overload (s)	Interval between any two overloads (s)
Shunts of class indices 0,3 and smaller					
$I \leq 10$ kA	2	–	1	0,5	–
$I > 10$ kA	Subject to special agreement				
Shunts of class indices 0,5 and greater					
$I \leq 250$ A	10	–	1	5	–
250 A < $I \leq 2$ kA	5	–	1	5	–
2 kA < $I \leq 10$ kA	2	–	1	5	–
$I > 10$ kA	Subject to special agreement				
Series resistors (impedances) of class indices 0,3 and smaller					
$U \leq 2$ kV	–	2	5	0,5	15
$U > 2$ kV	Subject to special agreement				
Series resistors (impedances) of class indices 0,5 and 1					
$U \leq 2$ kV	– –	2 2	9 1	0,5 5	60 –
$U > 2$ kV	Subject to special agreement				
Series resistors (impedances) of class indices 2 and greater					
$U \leq 2$ kV	– –	2 2	9 1	0,5 5	60 –
$U > 2$ kV	Subject to special agreement				
When two series of tests are specified, they should be both carried out in the order given.					