

# FINAL VERSION

# VERSION FINALE

---

**Electricity metering equipment (a.c.) – Particular requirements –  
Part 11: Electromechanical meters for active energy (classes 0,5, 1 and 2)**

**Équipement de comptage de l'électricité (c.a.) – Prescriptions particulières –  
Partie 11: Compteurs électromécaniques d'énergie active (classes 0,5, 1 et 2)**



## CONTENTS

FOREWORD.....	4
INTRODUCTION.....	6
INTRODUCTION TO AMENDMENT 1 .....	7
1 Scope.....	8
2 Normative references .....	8
3 Terms and definitions .....	8
4 Standard electrical values .....	9
5 Mechanical requirements.....	9
5.1 General.....	9
5.2 Register (counting mechanism) .....	9
5.3 Direction of rotation and marking of the rotor.....	9
6 Climatic conditions .....	9
7 Electrical requirements.....	9
7.1 Power consumption.....	9
7.1.1 Voltage circuits.....	10
7.1.2 Current circuits.....	10
7.2 Influence of short-time overcurrents .....	10
7.3 Influence of self-heating .....	11
7.4 AC voltage test.....	11
8 Accuracy requirements .....	11
8.1 Limits of error due to variation of the current .....	11
8.2 Limits of error due to influence quantities .....	12
8.3 Test of starting and no-load condition.....	14
8.3.1 Test of no-load condition .....	14
8.3.2 Starting .....	14
8.4 Meter constant .....	14
8.5 Accuracy test conditions.....	14
8.6 Interpretation of test results.....	16
9 Adjustment .....	16
Bibliography.....	18
Table 1 – Power consumption in voltage circuits.....	10
Table 2 – Power consumption in current circuits .....	10
Table 3 – Variations due to short-time overcurrents .....	11
Table 4 – Variations due to self-heating.....	11
Table 6 – Percentage error limits (single-phase meters and polyphase meters with balanced loads) .....	12
Table 7 – Percentage error limits (polyphase meters carrying a single-phase load, but with balanced polyphase voltages applied to voltage circuits) .....	12
Table 8 – Influence quantities .....	13
Table 9 – Starting current .....	14
Table 10 – Voltage and current balance.....	15
Table 11 – Reference conditions.....	15
Table 12 – Interpretation of test results.....	16

Table 13 – Minimum range of adjustment..... 17

## INTERNATIONAL ELECTROTECHNICAL COMMISSION

**ELECTRICITY METERING EQUIPMENT (AC) –  
PARTICULAR REQUIREMENTS –****Part 11: Electromechanical meters for active energy  
(classes 0,5, 1 and 2)**

## 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) 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.

**DISCLAIMER**

**This Consolidated version is not an official IEC Standard and has been prepared for user convenience. Only the current versions of the standard and its amendment(s) are to be considered the official documents.**

**This Consolidated version of IEC 62053-11 bears the edition number 1.1. It consists of the first edition (2003-01) [documents 13/1287/FDIS and 13/1293/RVD] and its amendment 1 (2016-11) [documents 13/1698/FDIS and 13/1712/RVD]. The technical content is identical to the base edition and its amendment.**

**This Final version does not show where the technical content is modified by amendment 1. A separate Redline version with all changes highlighted is available in this publication.**

International Standard IEC 62053-11 has been prepared by IEC technical committee 13: Equipment for electrical energy measurement and load control.

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

The committee has decided that the contents of the base publication and its amendment will remain unchanged until the stability date indicated on the IEC web site 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.

NOTE The attention of National Committees is drawn to the fact that equipment manufacturers and testing organizations may need a transitional period following publication of a new, amended or revised IEC publication in which to make products in accordance with the new requirements and to equip themselves for conducting new or revised tests.

It is the recommendation of the committee that the content of this publication be adopted for implementation nationally not earlier than 2 years from the date of publication.

## INTRODUCTION

This part of IEC 62053 is to be used with the following relevant parts of the IEC 62052, IEC 62053 and IEC 62059 series, Electricity metering equipment:

IEC 62052-11:2003, *Electricity metering equipment (AC) – General requirements, tests and test conditions – Part 11: Metering equipment*  
Amendment 1 (2016)

IEC 62052-31:2015, *Electricity metering equipment (AC) – General requirements, tests and test conditions – Part 31: Product safety requirements and tests*

IEC 62053-21:2003, *Electricity metering equipment (a.c.) – Particular requirements – Part 21: Static meters for active energy (classes 1 and 2)* Replaces particular requirements of IEC 61036: 2000 (2<sup>nd</sup> edition)

IEC 62053-22:2003, *Electricity metering equipment (a.c.) – Particular requirements – Part 22: Static meters for active energy (classes 0,2 S and 0,5 S)* Replaces particular requirements of IEC 60687: 1992 (2<sup>nd</sup> edition)

IEC 62053-23:2002, *Electricity metering equipment (a.c.) – Particular requirements – Part 23: Static meters for reactive energy (classes 2 and 3)* Replaces particular requirements of IEC 61268: 1995 (1<sup>st</sup> edition)

IEC 62053-31:1998, *Electricity metering equipment (a.c.) – Particular requirements – Part 31: Pulse output devices for electromechanical and electronic meters (two wires only)*

IEC 62053-61:1998, *Electricity metering equipment (a.c.) – Particular requirements – Part 61: Power consumption and voltage requirements*

IEC 62059-11:2002, *Electricity metering equipment (a.c.) – Dependability – Part 11: General concepts*

IEC 62059-21:2002, *Electricity metering equipment (a.c.) – Dependability – Part 21: Collection of meter dependability data from the field*

This part is a standard for type testing electricity meters. It covers the particular requirements for meters, being used indoors and outdoors in large quantities world-wide. It does not deal with special implementations (such as metering-part and/or displays in separate housings).

This standard is intended to be used in conjunction with IEC 62052-11. When any requirement in this standard concerns an item already covered in IEC 62052-11, the requirements of this standard take precedence over the requirements of IEC 62052-11.

This standard distinguishes:

- between accuracy class index 0,5, accuracy class index 1 and accuracy class index 2 meters;
- between protective class I and protective class II meters;
- between meters for use in networks equipped with or without earth fault neutralizers.

The test levels are regarded as minimum values that provide for the proper functioning of the meter under normal working conditions. For special application, other test levels might be necessary and should be agreed on between the user and the manufacturer.

## INTRODUCTION TO AMENDMENT 1

The purpose of this amendment is to identify and remove all safety related requirements and tests of IEC 62053-11:2003 that are replaced and extended by the complete set of requirements and tests in IEC 62052-31:2015.

# ELECTRICITY METERING EQUIPMENT (AC) – PARTICULAR REQUIREMENTS –

## Part 11: Electromechanical meters for active energy (classes 0,5, 1 and 2)

### 1 Scope

This part of IEC 62053 applies only to newly manufactured electromechanical watt-hour meters of accuracy classes 0,5, 1 and 2, for the measurement of alternating current electrical active energy in 50 Hz or 60 Hz networks and it applies to their type tests only.

It applies only to electromechanical watt-hour meters for indoor and outdoor application consisting of a measuring element and register(s) enclosed together in a meter case. It also applies to operation indicator(s) and test output(s). If the meter has a measuring element for more than one type of energy (multi-energy meters), or when other functional elements, like maximum demand indicators, electronic tariff registers, time switches, ripple control receivers, data communication interfaces, etc. are enclosed in the meter case, then the relevant standards for these elements also apply.

It does not apply to:

- watt-hour meters where the voltage across the connection terminals exceeds 600 V (line-to-line voltage for meters for polyphase systems);
- portable meters;
- data interfaces to the register of the meter.

The safety aspect is covered by IEC 62052-31:2015.

Regarding acceptance tests, see IEC 62058-11:2008 and IEC 62058-21:2008.

The dependability aspect is covered by the documents of the IEC 62059 series.

### 2 Normative references

The following referenced documents are indispensable for the application 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 62052-11:2003, *Electricity metering equipment (AC) – General requirements, tests and test conditions – Part 11: Metering equipment*  
Amendment 1 (2016)

IEC 62052-31:2015, *Electricity metering equipment (AC) – General requirements, tests and test conditions – Part 31: Product safety requirements and tests*

### 3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 62052-11 apply.