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Electricity metering equipment - Particular requirements - Part 23: Static meters for reactive energy (classes 2 and 3) (IEC 62053-23:2020)

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

See Eesti standard EVS-EN IEC 62053-23:2021 +A11:2021 sisaldab Euroopa standardi EN IEC 62053-23:2021 ja selle muudatuse A11:2021 ingliskeelset teksti.	This Estonian standard EVS-EN IEC 62053-23 :2021+A11:2021 consists of the English text of the European standard EN IEC 62053-23:2021 and its amendment A11:2021.
Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas. Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 02.04.2021, muudatus A11 23.07.2021.	This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation and Accreditation. Date of Availability of the European standard is 02.04.2021, for A11 23.07.2021.
Muudatusega A11 lisatud või muudetud teksti algus ja lõpp on tekstis tähistatud sümbolitega ⟦A11⟩ ⟨A11⟩. Standard on kättesaadav Eesti Standardimis-ja Akrediteerimiskeskusest.	The start and finish of text introduced or altered by amendment A11 is indicated in the text by tags ⟦A11⟩ ⟨A11⟩. The standard is available from the Estonian Centre for Standardisation and Accreditation.

Tagasisidet standardi sisu kohta on võimalik edastada, kasutades EVS-i veebilehel asuvat tagasiside vormi või saates e-kirja meiliaadressile standardiosakond@evs.ee.

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EUROPEAN STANDARD

NORME EUROPÉENNE

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EN IEC 62053-23 + A11

April 2021, July 2021

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Electricity metering equipment - Particular requirements - Part 23: Static meters for reactive energy (classes 2 and 3) (IEC 62053-23:2020)

Équipement de comptage de l'électricité - Exigences particulières - Partie 23: Compteurs statiques d'énergie réactive (classes 2 et 3) (IEC 62053-23:2020)

Elektrizitätszähler - Besondere Anforderungen - Teil 23: Elektronische Blindverbrauchszähler der Genauigkeitsklassen 2 und 3 (IEC 62053-23:2020)

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

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

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European foreword

The text of document 13/1807A/FDIS, future edition 2 of IEC 62053-23, prepared by IEC/TC 13 "Electrical energy measurement and control" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN IEC 62053-23:2021.

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) 2021-10-02
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2024-04-02

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

Endorsement notice

The text of the International Standard IEC 62053-23:2020 was approved by CENELEC as a European Standard without any modification.

A11 Amendment A11 European foreword

This document EN IEC 62053-23:2021/A11:2021 has been prepared by CLC/TC 13 "Electrical energy measurement and control".

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• latest date by which the national standards conflicting with this document have to be withdrawn	(dow)	2024-05-19

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For relationship with EU Directive(s) / Regulation(s), see informative Annex ZZ, which is an integral part of this document.

Any feedback and questions on this document should be directed to the users' national committee. A complete listing of these bodies can be found on the CENELEC website. A11

IEC 62053-23

Edition 2.0 2020-06

INTERNATIONAL STANDARD

NORME INTERNATIONALE

Electricity metering equipment – Particular requirements – Part 23: Static meters for reactive energy (classes 2 and 3)

Équipement de comptage de l'électricité – Exigences particulières – Partie 23: Compteurs statiques d'énergie réactive (classes 2 et 3)

IEC 62053-23:2020-06(en-fr)

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INTERNATIONAL STANDARD

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Équipement de comptage de l'électricité – Exigences particulières – Partie 23: Compteurs statiques d'énergie réactive (classes 2 et 3)

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CONTENTS

FOREWORD 4
INTRODUCTION 6
1 Scope 8
2 Normative references 9
3 Terms and definitions 9
4 Standard electrical values 10
4.1 Voltages 10
4.2 Currents 10
4.2.1 General 10
4.2.2 Starting current (see Table 1) 10
4.2.3 Minimum current (see Table 2) 10
4.2.4 Maximum current 10
4.3 Frequencies 10
4.4 Power consumption 10
5 Construction requirements 11
6 Meter marking and documentation 11
7 Accuracy requirements 11
7.1 General test conditions 11
7.2 Methods of accuracy verification 11
7.3 Measurement uncertainty 11
7.4 Meter constant 11
7.5 Initial start-up of the meter 11
7.6 Test of no-load condition 11
7.7 Starting current test 11
7.8 Repeatability test 11
7.9 Limits of error due to variation of the current 11
7.10 Limits of error due to influence quantities 12
7.11 Time-keeping accuracy 14
8 Climatic requirements 14
9 The effects of external influences 15
10 Type test 15
Annex A (informative) Geometric representation of active and reactive power 16
Annex B (informative) Summary of changes 18
Annex ZA (normative) Normative references to international publications with their corresponding European publications 19
A11 Annex ZZ (informative) Relationship between this European standard and the essential requirements of Directive 2014/30/EU [2014 OJ L96] aimed to be covered A11 20

Figure A.1 – Recommended geometric representation 16
Figure A.2 – Alternative geometric representation 17

Table 1 – Starting current 10
Table 2 – Minimum current 10

Table 3 – Acceptable percentage error limits (single-phase meters and poly-phase meters with balanced loads or single-phase loads) 12
Table 4 – Acceptable limits of variation in percentage error due to influence quantities 13
Table ZZ.1 — Correspondence between this European standard and Annex I of Directive 2014/30/EU [2014 OJ L96] 20

INTERNATIONAL ELECTROTECHNICAL COMMISSION

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ELECTRICITY METERING EQUIPMENT – PARTICULAR REQUIREMENTS –

Part 23: Static meters for reactive energy (classes 2 and 3)

FOREWORD

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International Standard IEC 62053-23 has been prepared by IEC technical committee 13: Electrical energy measurement and control.

This second edition cancels and replaces the first edition published in 2003 and its amendment 1:2016. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition: see Annex B.

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

FDIS	Report on voting
13/1807A/FDIS	13/1815/RVD

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

A list of all parts in the IEC 62053 series, published under the general title *Electricity metering equipment – Particular requirements*, 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.

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 relevant parts of the IEC 62052, IEC 62058 and IEC 62059 series, *Electricity metering equipment*, and with the IEC 62055 series, *Electricity metering – Payment systems*:

IEC 62052-11:2020,	*Electricity metering equipment – General requirements, tests and test conditions – Part 11: Metering equipment*
IEC 62052-31:2015,	*Electricity metering equipment (AC) – General requirements, tests and test conditions – Part 31: Product safety requirements and tests*
IEC 62053-11:2003,	*Electricity metering equipment (AC) – Particular requirements – Part 11: Electromechanical meters for active energy (classes 0,5, 1 and 2)*
IEC 62053-21:2020,	*Electricity metering equipment – Particular requirements – Part 21: Static meters for AC active energy (classes 0,5, 1 and 2)*
IEC 62053-22:2020,	*Electricity metering equipment – Particular requirements – Part 22: Static meters for AC active energy (classes 0,1 S, 0,2S and 0,5 S)*
IEC 62053-24:2020,	*Electricity metering equipment – Particular requirements – Part 24: Static meters for fundamental component reactive energy (classes 0,5 S, 1 S, 1, 2 and 3)*
IEC 62055-31:2005,	*Electricity metering – Payment systems – Part 31: Particular requirements – Static payment meters for active energy (classes 1 and 2)*
IEC 62057-1: –	*Test equipment, techniques and procedures for electrical energy meters – Part 1: Stationary Meter Test Units (MTU)*
IEC 62058-11:2008,	*Electricity metering equipment (AC) – Acceptance inspection - –Part 11: General acceptance inspection methods*
IEC 62058-21:2008,	*Electricity metering equipment (AC) – Acceptance inspection – Part 21: Particular requirements for electromechanical meters for active energy (classes 0,5, 1 and 2)*
IEC 62058-31:2008,	*Electricity metering equipment (AC) – Acceptance inspection – Part 31: Particular requirements for static meters for active energy (classes 0,2 S, 0,5 S, 1 and 2)*
IEC 62059-11:2002,	*Electricity metering equipment – Dependability – Part 11: General concepts*
IEC 62059-21:2002,	*Electricity metering equipment – Dependability – Part 21: Collection of meter dependability data from the field*
IEC 62059-32-1:2011,	*Electricity metering equipment – Dependability – Part 32-1: Durability – Testing of the stability of metrological characteristics by applying elevated temperature*

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 worldwide. It does not deal with special implementations (such as metering-part and/or displays in separate housings).

This document is intended to be used in conjunction with IEC 62052-11:2020 and with IEC 62052-31:2015. When any requirement in this document concerns an item already covered in IEC 62052-11:2020 or in IEC 62052-31:2015, the requirements of this document take precedence over the requirements of IEC 62052-11:2020 or of IEC 62052-31:2015.

The test levels are regarded as minimum values that provide for the proper functioning of the meter under normal working conditions. For special applications, additional test levels might be necessary and are subject to an agreement between the manufacturer and the purchaser.

ELECTRICITY METERING EQUIPMENT – PARTICULAR REQUIREMENTS –

Part 23: Static meters for reactive energy (classes 2 and 3)

Scope

This part of IEC 62053 applies only to static var-hour meters of accuracy classes 2 and 3 for the measurement of alternating current electrical reactive energy in 50 Hz or 60 Hz networks and it applies to their type tests only.

For practical reasons, this document is based on a conventional definition of reactive energy for sinusoidal currents and voltages containing the fundamental frequency only.

NOTE 1 For other general requirements, such as safety, dependability, etc., see the relevant IEC 62052 or IEC 62059 standards.

This document applies to electricity metering equipment designed to:

- measure and control electrical energy on electrical networks (mains) with voltage up to 1 000 V;

NOTE 2 For AC electricity meters, the voltage mentioned above is the line-to-neutral voltage derived from nominal voltages. See IEC 62052-31:2015, Table 7.

- have all functional elements, including add-on modules, enclosed in, or forming a single meter case with exception of indicating displays;
- operate with integrated or detached indicating displays, or without an indicating display;
- be installed in a specified matching socket or rack;
- optionally, provide additional functions other than those for measurement of electrical energy.

Meters designed for operation with low power instrument transformers (LPITs as defined in the IEC 61869 series) may be considered as compliant with this document only if such meters and their LPITs are tested together and meet the requirements for directly connected meters.

NOTE 3 Modern electricity meters typically contain additional functions such as measurement of voltage magnitude, current magnitude, power, frequency, power factor, etc.; measurement of power quality parameters; load control functions; delivery, time, test, accounting, recording functions; data communication interfaces and associated data security functions. The relevant standards for these functions may apply in addition to the requirements of this document. However, the requirements for such functions are outside the scope of this document.

NOTE 4 Product requirements for power metering and monitoring devices (PMDs) and measurement functions such as voltage magnitude, current magnitude, power, frequency, etc., are covered in IEC 61557-12. However, devices compliant with IEC 61557-12 are not intended to be used as billing meters unless they are also compliant with IEC 62052-11:2020 and one or more relevant IEC 62053-xx accuracy class standards.

NOTE 5 Product requirements for power quality instruments (PQIs) are covered in IEC 62586-1. Requirements for power quality measurement techniques (functions) are covered in IEC 61000-4-30. Requirements for testing of the power quality measurement functions are covered in IEC 62586-2.

This document does not apply to:

- meters for which the voltage line-to-neutral derived from nominal voltages exceeds 1 000 V;
- meters intended for connection with low power instrument transformers (LPITs as defined in the IEC 61869 series) when tested without such transformers;
- metering systems comprising multiple devices (except LPITs) physically remote from one another;

- portable meters;

NOTE 6 Portable meters are meters that are not permanently connected.

- meters used in rolling stock, vehicles, ships and airplanes;
- laboratory and meter test equipment;
- reference standard meters;
- data interfaces to the register of the meter;
- matching sockets or racks used for installation of electricity metering equipment;
- any additional functions provided in electrical energy meters.

This document does not cover measures for the detection and prevention of fraudulent attempts to compromise a meter's performance (tampering).

NOTE 7 Nevertheless, specific tampering detection and prevention requirements, and test methods, as relevant for a particular market are subject to the agreement between the manufacturer and the purchaser.

NOTE 8 Specifying requirements and test methods for fraud detection and prevention would be counterproductive, as such specifications would provide guidance for potential fraudsters.

NOTE 9 There are many types of meter tampering reported from various markets; therefore, designing meters to detect and prevent all types of tampering could lead to unjustified increase in costs of meter design, verification and validation.

NOTE 10 Billing systems, such as, smart metering systems, are capable of detecting irregular consumption patterns and irregular network losses which enable discovery of suspected meter tampering.

NOTE 11 For transformer operated meters paired with current transformers (CTs) according to IEC 61869-2:

– the standard CT measuring range is specified from 0,05 I_n to I_{max} for accuracy classes 0,1, 0,2, 0,5 and 1 and these CTs are used for meters of class 2 and 3 according to this document;
– the special CT measuring range is specified from 0,01 I_n to I_{max} for accuracy classes 0,2S and 0,5 S and these CTs are used for meters of class 0,5 S and 1 S according to IEC 62053-24;
– combinations of standard CTs and meters of class 0,5 S and 1 S are subject to an agreement between manufacturers and purchasers.

NOTE 12 This document does not specify emission requirements, these are specified in IEC 62052-11:2020, 9.3.14.

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 60375:2018, *Conventions concerning electric circuits*

IEC 62052-11:2020, *Electricity metering equipment – General requirements, tests and test conditions – Part 11: Metering equipment*

Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 62052-11:2020 apply.