SVENSK STANDARD SS-EN IEC 62053-24

Fastställd	Utgåva	Sida	Ansvarig kommitté
2021-05-19	2	1 (1+24)	SEK TK 13

Elmätare – Del 24: Fordringar på elektroniska mätare för reaktiv energi vid grundfrekvens (noggrannhetsklass 0,5 S, 1 S, 1, 2 och 3)

Electricity metering equipment –
Particular requirements –
Part 24: Static meters for fundamental component reactive energy (classes 0,5 S, 1 S, 1, 2 and 3)

Som svensk standard gäller europastandarden EN IEC 62053-24:2021. Den svenska standarden innehåller den officiella engelska språkversionen av EN IEC 62053-24:2021.

Nationellt förord

Europastandarden EN IEC 62053-24:2021

består av:

– **europastandardens ikraftsättningsdokument,** utarbetat inom CENELEC
– **IEC 62053-24, Second edition, 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)**

utarbetad inom International Electrotechnical Commission, IEC.

Standarden ska användas tillsammans med SS-EN IEC 62052-11, utgåva 2, 2021 och SS-EN 62052-31, utgåva 1, 2017.

Tidigare fastställd svensk standard SS-EN 62053-24, utgåva 1, 2015, SS-EN 62053-24/A1, utgåva 1, 2017 och SS-EN 62053-24/A1 AC1, utg 1, 2018, gäller ej fr o m 2024-04-02.

ICS 91.140.50; 17.220.20

Denna standard är fastställd av SEK Svensk Elstandard,
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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN IEC 62053-24

April 2021

ICS 17.220.20; 91.140.50

Supersedes EN 62053-24:2015 and all of its amendments and corrigenda (if any)

English Version

Electricity metering equipment - Particular requirements - Part 24: Static meters for fundamental component reactive energy (classes 0,5S, 1S, 1, 2 and 3) (IEC 62053-24:2020)

Équipement de comptage de l'électricité - Exigences particulières - Partie 24: Compteurs statiques d'énergie réactive de composante fondamentale (classes 0,5S, 1S, 1, 2 et 3) (IEC 62053-24:2020)

Elektrizitätszähler - Besondere Anforderungen - Teil 24: Elektronische Grundschwingungs-Blindverbrauchszähler der Genauigkeitsklassen 0,5 S, 1 S, 1, 2 und 3 (IEC 62053-24:2020)

This European Standard was approved by CENELEC on 2020-07-22. 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.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

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

Ref. No. EN IEC 62053-24:2021 E

European foreword

The text of document 13/1804/FDIS, future edition 2 of IEC 62053-24, 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 62053-24:2021.

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

This document supersedes EN 62053-24:2015 and all of its amendments and corrigenda (if any).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC 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.

Endorsement notice

The text of the International Standard IEC 62053-24:2020 was approved by CENELEC as a European Standard without any modification.

Annex ZA
(normative)

Normative references to international publications with their corresponding European publications

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.

NOTE 1 Where 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.

Publication	Year	Title	EN/HD	Year
IEC 60375	2018	Conventions concerning electric circuits	EN IEC 60375	2018
IEC 62052-11	2020	Electricity metering equipment - General requirements, tests and test conditions - Part 11: Metering equipment	EN IEC 62052-11	2021

CONTENTS

INTERNATIONAL ELECTROTECHNICAL COMMISSION

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ELECTRICITY METERING EQUIPMENT – PARTICULAR REQUIREMENTS –

Part 24: Static meters for fundamental component reactive energy (classes 0,5 S, 1 S, 1, 2 and 3)

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 62053-24 has been prepared by IEC technical committee 13: Electrical energy measurement and control.

This second edition cancels and replaces the first edition published in 2014 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 E.

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

FDIS	Report on voting
13/1804/FDIS 13/1804(F)/FDIS	13/1811/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 62053-23:2020,	*Electricity metering equipment – Particular requirements – Part 23: Static meters for reactive energy (classes 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 24: Static meters for fundamental component reactive energy (classes 0,5 S, 1 S, 1, 2 and 3)

1 Scope

This part of IEC 62053 applies only to static var-hour meters of accuracy classes 0,5 S, 1 S, 1, 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.

This document uses a conventional definition of reactive energy where the reactive power and energy is calculated from the fundamental frequency components of the currents and voltages only (see Clause 3).

NOTE 1 This differs from IEC 62053-23, where reactive power and energy is only defined for sinusoidal signals. In this document reactive power and energy is defined for all periodic signals. Reactive power and energy is defined in this way to achieve proper reproducibility of measurements with meters of different designs. With this definition, reactive power and energy reflects the generally unnecessary current possible to compensate with capacitors rather than the total unnecessary current.

NOTE 2 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 AC;

NOTE 3 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 4 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 5 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 the IEC 62052-11:2020 and one or more relevant IEC 62053-xx accuracy class standards.

NOTE 6 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 AC;
- 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 7 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 8 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 9 Specifying requirements and test methods for fraud detection and prevention would be counterproductive, as such specifications would provide guidance for potential fraudsters.

NOTE 10 There are many methods of tampering with meters reported from various markets; designing meters to detect and prevent all kinds of tampering would lead to unjustified increase in costs of meter design, verification and validation.

NOTE 11 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 12 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 1, 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 this document;
– combinations of standard CTs and meters of class 0,5 S and 1 S are subject to an agreement between manufacturers and purchasers.

NOTE 13 This document does not specify emission requirements, these are specified in IEC 62052-11:2020, 9.3.14.

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 60375:2018, *Conventions concerning electric circuits*

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