

AS IEC 62053.41:2023
IEC 62053-41:2021



STANDARDS
Australia



Electricity metering equipment — Particular requirements

Part 41: Static meters for DC energy (classes 0.5 and 1)



AS IEC 62053.41:2023

This Australian Standard ® was prepared by EL-011, Electricity Metering Equipment. It was approved on behalf of the Council of Standards Australia on 04 May 2023.

This Standard was published on 26 May 2023.

The following are represented on Committee EL-011:

- Australian Chamber of Commerce and Industry
- Australian Energy Council
- Australian Energy Market Operator
- Australian Industry Group
- Consumers Federation of Australia
- Electrical Regulatory Authorities Council, Australia
- Energy Networks Australia
- Master Electricians Australia
- National Measurement Institute

This Standard was issued in draft form for comment as DR AS IEC 62053.41:2023.

Keeping Standards up-to-date

Ensure you have the latest versions of our publications and keep up-to-date about Amendments, Rulings, Withdrawals, and new projects by visiting:

www.standards.org.au

ISBN 978 1 76139 191 0

Electricity metering equipment — Particular requirements

Part 41: Static meters for DC energy (classes 0.5 and 1)

First published as AS IEC 62053.41:2023.



© IEC Geneva Switzerland 2023 — All rights reserved
© Standards Australia Limited 2023

All rights are reserved. No part of this work may be reproduced or copied in any form or by any means, electronic or mechanical, including photocopying, without the written permission of either the IEC or the publisher, unless otherwise permitted under the Copyright Act 1968 (Cth). If you have any questions about IEC copyright or have an enquiry about obtaining additional rights to this publication, please see the contact details on the back cover or the contact us page of the website for further information.

Preface

This Standard was prepared by the Standards Australia Committee EL-011, Electricity Metering Equipment.

The objective of this document is to provide requirements for type testing static watt-hour meters of accuracy classes 0.5 and 1 for the measurement of DC electrical energy in DC systems.

This document applies to electricity metering equipment designed to —

- (a) measure and control electrical energy on electrical networks with two poles where one of the poles is connected to earth and with voltage up to 1 500 V DC;
- (b) have all functional elements, including add-on modules, enclosed in, or forming a single meter case with the exception of indicating displays;
- (c) operate with integrated or detached indicating displays, or without an indicating display;
- (d) be installed in a specified matching socket or rack; and
- (e) 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 AS 61869 series, may be tested for conformance to this document only if such meters and their LPITs are tested together and meet the requirements for directly connected meters.

This document does not apply to —

- (i) meters for which the voltage between the two poles, where one of the poles is connected to earth, exceeds 1 500 V DC;
- (ii) meters to be used in networks other than with two poles in which one of the poles is connected to earth;
- (iii) meters intended for connection with low power instrument transformers (LPITs as defined in the AS 61869 series) when tested without such transformers;
- (iv) metering systems comprising multiple devices physically (except LPITs) remote from one another;
- (v) portable meters;
- (vi) meters used in rolling stock, vehicles, ships and airplanes;
- (vii) laboratory and meter test equipment;
- (viii) reference standard meters;
- (ix) data interfaces to the register of the meter;
- (x) matching sockets or racks used for installation of electricity metering equipment; and
- (xi) any additional functions provided in electrical energy meters.

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

A list of all parts in the AS 61869 series can be found in the Standards Australia online catalogue.

This document is identical with, and has been reproduced from, IEC 62053-41:2021, *Electricity metering equipment – Particular requirements – Part 41: Static meters for DC energy (classes 0,5 and 1)*.

As this document has been reproduced from an International document, the following apply:

- (A) In the source text “this part of IEC 62053” should read “this document”.
- (B) A full point substitutes for a comma when referring to a decimal marker.

Australian or Australian/New Zealand Standards that are identical adoptions of international normative references may be used interchangeably. Refer to the online catalogue for information on specific Standards.

The terms “normative” and “informative” are used in Standards to define the application of the appendices or annexes to which they apply. A “normative” appendix or annex is an integral part of a Standard, whereas an “informative” appendix or annex is only for information and guidance.

CONTENTS

FOREWORD.....	3
INTRODUCTION.....	5
1 Scope.....	7
2 Normative references	8
3 Terms and definitions	9
4 Standard electrical values.....	10
4.1 Voltages	10
4.1.1 Nominal voltages	10
4.1.2 Voltage ranges	10
4.2 Currents.....	10
4.2.1 Nominal current	10
4.2.2 Starting current.....	10
4.2.3 Minimum current.....	10
4.2.4 Maximum current.....	10
4.3 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	12
7.8 Repeatability test	12
7.9 Limits of error due to variation of the current.....	12
7.10 Limits of error due to influence quantities.....	12
7.11 Time-keeping accuracy	13
8 Climatic requirements.....	13
9 Effects of external influences	14
9.1 General.....	14
9.2 Conducted differential mode current disturbances for DC meters	14
10 Type test	14
Annex A (informative) Differential mode current disturbance test	15
Bibliography.....	16
Table 1 – Starting current	10
Table 2 – Minimum current.....	10
Table 3 – Power consumption	11
Table 4 – Acceptable percentage error limits	12
Table 5 – Acceptable limits of variation in percentage error due to influence quantities.....	13
Table A.1 – Overview of differential mode current disturbances in different IEC standards.....	15

INTERNATIONAL ELECTROTECHNICAL COMMISSION

**ELECTRICITY METERING EQUIPMENT –
PARTICULAR REQUIREMENTS –****Part 41: Static meters for DC energy (classes 0,5 and 1)**

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.

International Standard IEC 62053-41 has been prepared by IEC technical committee 13: Electrical energy measurement and control.

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

FDIS	Report on voting
13/1831/FDIS	13/1842/RVD

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

The language used for the development of this International Standard is English.