PD IEC TS 62257-9-8:2020

BSI Standards Publication

Renewable energy and hybrid systems for rural electrification

Part 9-8: Integrated systems – Requirements for stand-alone renewable energy products with power ratings less than or equal to 350 W

bsi.

National foreword

This Published Document is the UK implementation of IEC TS 62257-9-8:2020.

The UK participation in its preparation was entrusted to Technical Committee GEL/82, Photovoltaic Energy Systems.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

Published by BSI Standards Limited 2020

ISBN 978 0 539 02445 6

ICS 27.160

Compliance with a British Standard cannot confer immunity from legal obligations.

This Published Document was published under the authority of the Standards Policy and Strategy Committee on 30 June 2020.

Amendments/corrigenda issued since publication

Date	Text affected

IEC TS 62257-9-8

Edition 1.0 2020-06

TECHNICAL SPECIFICATION

Renewable energy and hybrid systems for rural electrification – Part 9-8: Integrated systems – Requirements for stand-alone renewable energy products with power ratings less than or equal to 350 W

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

ICS 27.160

ISBN 978-2-8322-8239-7

CONTENTS

INTERNATIONAL ELECTROTECHNICAL COMMISSION

_____

RENEWABLE ENERGY AND HYBRID SYSTEMS FOR RURAL ELECTRIFICATION –

Part 9-8: Integrated systems – Requirements for stand-alone renewable energy products with power ratings less than or equal to 350 W

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.

The main task of IEC technical committees is to prepare International Standards. In exceptional circumstances, a technical committee may propose the publication of a technical specification when

- the required support cannot be obtained for the publication of an International Standard, despite repeated efforts, or
- the subject is still under technical development or where, for any other reason, there is the future but no immediate possibility of an agreement on an International Standard.

Technical specifications are subject to review within three years of publication to decide whether they can be transformed into International Standards.

IEC TS 62257-9-8, which is a Technical Specification, has been prepared by IEC technical committee 82: Solar photovoltaic energy systems.

The text of this technical specification is based on the following documents:

Enquiry draft	Report on voting
82/1643/DTS	82/1685/RVDTS 82/1685A/RVDTS

Full information on the voting for the approval of this technical specification 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.

This part of IEC 62257 is to be used in conjunction with IEC TS 62257-9-5.

A list of all parts in the IEC 62257 series, published under the general title *Renewable energy and hybrid systems for rural electrification*, can be found on the IEC website.

Future standards in this series will carry the new general title as cited above. Titles of existing standards in this series will be updated at the time of the next edition.

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 62257 (all parts) provides support and strategies for institutions involved in rural electrification projects. It documents technical approaches for designing, building, testing, and maintaining off-grid renewable energy and hybrid systems with AC nominal voltage below 500 V, DC nominal voltage below 750 V and nominal power below 100 kVA.

These documents are recommendations to support buyers who want to connect with good quality options in the market:

- to choose the right system for the right place,
- to design the system, and
- to operate and maintain the system.

These documents are focused only on technical aspects of rural off-grid electrification concentrating on, but not specific to, developing countries. They are not considered as all inclusive to rural electrification. The documents do not describe a range of factors that can determine project or product success: environmental, social, economic, service capabilities, and others. Further developments in this field could be introduced in future steps.

This consistent set of documents is best considered as a whole with different parts corresponding to items for safety, sustainability of systems, and costs. The main objectives are to support the capabilities of households and communities that use small renewable energy and hybrid off-grid systems and inform organizations and institutions in the off-grid power market.

The purpose of this document is to provide baseline standards for quality, durability and truth-in-advertising to protect consumers of stand-alone renewable energy products. This document is specifically related to renewable energy products that are packaged and made available to end-use consumers at the point of purchase as single, stand-alone products that do not require additional system components to function. This document applies to products with peak power ratings of 350 W or less. While most provisions apply to all products in this range, a few are applicable only to products with peak power ratings greater than 10 W and less than or equal to 350 W.

The term "stand-alone renewable energy product" is used in this document to describe this class of products. Other equivalent terms, including "off-grid solar" or "rechargeable," are often used by manufacturers, distributors, and other stakeholders to describe these products. Many of these systems meet the definition of type T_2I (individual electrification systems with energy storage) in IEC TS 62257-2.

The intended users of this document are:

- market support programmes that support the off-grid lighting market with financing, consumer education, awareness, and other services;
- manufacturers and distributors that need to verify the quality and performance of products;
- bulk procurement programmes that facilitate or place large orders of products; and,
- trade regulators such as government policymakers and officials who craft and implement trade and tax policy.

This document establishes minimum requirements for quality standards and warranty requirements. Products are compared to specifications based on test results from IEC TS 62257-9-5 and other information about the product. The requirements are designed to be widely applicable across different markets, countries, and regions.

RENEWABLE ENERGY AND HYBRID SYSTEMS FOR RURAL ELECTRIFICATION –

Part 9-8: Integrated systems – Requirements for stand-alone renewable energy products with power ratings less than or equal to 350 W

1 Scope

This part of IEC 62257 provides baseline requirements for quality, durability and truth in advertising to protect consumers of off-grid renewable energy products. Evaluation of these requirements is based on tests described in IEC TS 62257-9-5. This document can be used alone or in conjunction with other international standards that address the safety and durability of components of off-grid renewable energy products.

This document applies to stand-alone renewable energy products having the following characteristics:

- The products are powered by photovoltaic (PV) modules or electromechanical power generating devices (such as dynamos), or are designed to use grid electricity to charge a battery or other energy-storage device for off-grid use. The requirements may also be appropriate as guidance for evaluating the quality of devices with other power sources, such as thermoelectric generators.
- The peak power rating of the PV module or other power generating device is less than or equal to 350 W.
- All components required to provide basic energy services are sold/installed as a kit, included as a part of family of products as defined in 4.2.5, or integrated into a single component, including at a minimum:
  - a battery/batteries or other energy storage device(s);
  - power generating device, such as a solar panel, capable of charging the battery/batteries or other energy storage device(s);
  - cables, switches, wiring, connectors and protective devices sufficient to connect the power generating device, power control unit(s) and energy storage device(s).
- The system evaluated includes all the loads (lighting, television, radio, fan, etc.) and load adapter cables that are sold or included as part of the kit or integrated into kit components.
- The PV module maximum power point voltage and the working voltage of any other components in the kit do not exceed 35 V. Exceptions are made for AC-to-DC converters that meet appropriate safety standards. Systems that include PV modules (or combinations of PV modules) with ratings that exceed 240 W at peak power, 35 V at open circuit or 8 A at short circuit are subject to additional safety requirements beyond those assessed in IEC TS 62257-9-5.

NOTE This voltage limit corresponds to the definition of decisive voltage classification A (DVC-A) for wet locations in Table 6 of IEC 62109-1:2010. The limits of 240 W, 35 V and 8 A are consistent with the definition of Class III in IEC 61730-1.

- These requirements cover only DC outputs and loads. Products that include inverters, AC outputs/outlets, or AC appliances are not within the scope of this document. Products can have AC inputs.
- No design expertise is required to choose appropriate system components.
- All electrical connections, except for permanent connections made at the time of installation, can be made using plug-and-socket connectors without the use of any tools. All connections made in the field are straightforward to make and do not require technical expertise, such as wrapping wire in a specific direction, soldering, or crimping.