



BSI Standards Publication

Renewable energy and hybrid systems for rural electrification

Part 7-2: Generator set — Off-grid wind turbines

National foreword

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TECHNICAL SPECIFICATION



**Recommendations for renewable energy and hybrid systems for rural
electrification –
Part 7-2: Generator set – Off-grid wind turbines**



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IEC Secretariat
3, rue de Varembe
CH-1211 Geneva 20
Switzerland

Tel.: +41 22 919 02 11
info@iec.ch
www.iec.ch

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INTERNATIONAL
ELECTROTECHNICAL
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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**RECOMMENDATIONS FOR RENEWABLE ENERGY AND
HYBRID SYSTEMS FOR RURAL ELECTRIFICATION –****Part 7-2: Generator set – Off-grid wind turbines**

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IEC TS 62257-7-2 has been prepared by IEC technical committee 82: Solar photovoltaic energy systems. It is a Technical Specification.

The text of this Technical Specification is based on the following documents:

Draft	Report on voting
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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 Technical Specification is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/standardsdev/publications.

A list of all parts in the IEC 62257 series, published under the general title, *Recommendations for renewable energy and hybrid systems for rural electrification* 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 webstore.iec.ch in the data related to the specific document. At this date, the document will be

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- replaced by a revised edition, or
- amended.

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INTRODUCTION

The IEC 62257 series of publications intends to provide to different players involved in rural electrification projects (such as project implementers, project contractors, project supervisors, installers, etc.) documents for the setting-up of renewable energy and hybrid systems with AC voltage below 500 V, DC voltage below 750 V and power below 100 kW.

These publications provide recommendations for:

- choosing the right system for the right place;
- designing the system;
- operating and maintaining the system.

These publications are focused only on rural electrification concentrated in, but not specific to, developing countries. They are not considered as all-inclusive of rural electrification. The publications try to promote the use of renewable energies in rural electrification. They do not deal with clean mechanism developments at this time (CO₂ emission, carbon credit, etc.). Further developments in this field could be introduced in future steps.

This consistent set of publications is best considered as a whole, with different parts corresponding to items for the safety and sustainability of systems at the lowest possible life-cycle cost. One of the main objectives of the series is to provide the minimum sufficient requirements relevant to the field of application, i.e. for small renewable energy and hybrid off-grid systems.

The purpose of this document is to provide guidance for the deployment of small wind turbines (a wind turbine with a rotor swept area smaller than or equal to 200 m², see IEC 61400-2: 2013) used in off-grid hybrid power system in rural electrification.

This document is a general introduction followed by more specific documents dedicated to the generation technologies which are the most currently used in rural electrification projects.

RECOMMENDATIONS FOR RENEWABLE ENERGY AND HYBRID SYSTEMS FOR RURAL ELECTRIFICATION –

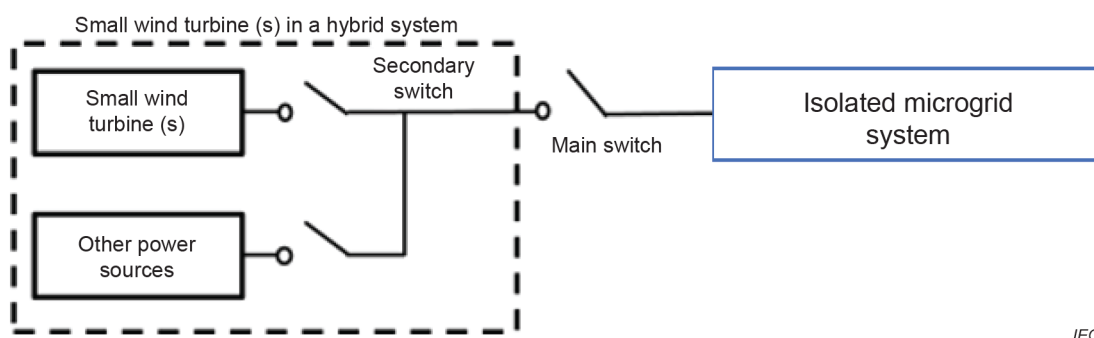
Part 7-2: Generator set – Off-grid wind turbines

1 Scope

This document applies to all small wind turbines (SWTs) with a swept area smaller than or equal to 200 m², and designed for supplying electrical power to isolated sites used in systems as described in IEC TS 62257-2.

This document is not an exhaustive resource for the design, installation, operation or maintenance of small wind turbines and wind power systems, but is more focused on recommendations to provide strategies on selection and criteria which may affect the use of a small wind power system (SWPS) in a rural electrification project.

Only the hybrid collective electrification system (microgrid, isolated microgrid) including SWT(s) is considered in this document. SWT in an isolated microgrid can be a single wind turbine or multiple wind turbines. Isolated microgrid using only wind power generation is not discussed in this document. General functional configuration of SWT(s) in an off-grid hybrid power system is shown in Figure 1.



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**Figure 1 – General functional configuration of SWT(s)
in an off-grid hybrid power system**

The aim of this document is to provide users with the appropriate levels of reliability and safety of the equipment during its estimated service lifespan.

It describes the minimum safety requirements and does not claim to be an exhaustive instruction manual or design specification.

Compliance with this document does not exempt any person, organization, or corporation from the responsibility to comply with all other relevant regulations.

This document gives recommendations for the single SWT with a swept area smaller than or equal to 200 m², or multiple SWTs with other power sources of total capacity up to 100 kW in an off-grid hybrid power system.

The design life of a good quality modern wind turbine is 20 years. The real lifetime of a SWT is subjected to quite extreme loads throughout its life. This mostly depends on its designed