



BSI Standards Publication

## Renewable energy and hybrid systems for rural electrification

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

## National foreword

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# TECHNICAL SPECIFICATION



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





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

INTERNATIONAL  
ELECTROTECHNICAL  
COMMISSION

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## CONTENTS

FOREWORD.....	6
INTRODUCTION.....	8
1 Scope.....	9
2 Normative references .....	10
3 Terms and definitions .....	10
4 Symbols and abbreviated terms.....	15
4.1 Abbreviated terms.....	15
4.2 Symbols.....	16
5 Wind turbine (WT) .....	16
5.1 Types of wind turbines .....	16
5.1.1 Horizontal axis wind turbine (HAWT).....	16
5.1.2 Vertical axis wind turbine (VAWT).....	17
5.1.3 SWT classes.....	18
5.2 General characteristics of SWT.....	18
5.2.1 Basic technical characteristics .....	18
5.2.2 Most important technical characteristics .....	19
5.3 Working conditions of SWT .....	20
6 Off-grid Small Wind Power Systems (SWPS).....	20
6.1 General.....	20
6.2 Major components in SWPS.....	20
6.2.1 SWT .....	20
6.2.2 Tower .....	21
6.2.3 Controller .....	22
6.2.4 Brake.....	22
6.2.5 Inverter.....	23
6.2.6 Storage system.....	23
6.2.7 Dump load .....	23
6.3 Design Procedure of SWPS .....	23
6.3.1 General .....	23
6.3.2 Wind resource assessment.....	23
6.3.3 Site assessment .....	24
6.3.4 Determine the capacity of the SWPS .....	24
6.3.5 Select SWT .....	24
6.4 Configuration of SWPS .....	24
6.4.1 General .....	24
6.4.2 Layout SWT(s) on site .....	28
7 Selection of SWPS .....	28
7.1 General.....	28
7.2 Selection criteria.....	29
7.2.1 General factors in selection of SWT.....	29
7.2.2 Rule of thumb .....	29
7.2.3 Wind turbine height.....	29
7.2.4 Turbulence .....	30
7.3 Design of a microgrid or Isolated Microgrid with SWT .....	30
7.3.1 Meet national rural grid standards.....	30
7.3.2 Design microgrid and wiring into households .....	30

8	Safety issues .....	30
8.1	General.....	30
8.2	General.....	30
8.3	Personal safety .....	31
8.3.1	Safety training and regulation following .....	31
8.3.2	Basic safety guidelines .....	31
8.4	Equipment safety .....	32
8.4.1	SWT .....	32
8.4.2	System current and voltage .....	32
8.4.3	Wiring and disconnection requirements .....	32
8.4.4	Grounding.....	32
8.4.5	Other safety issues and anti-theft .....	33
8.5	SWPS safety for isolated microgrid .....	33
8.5.1	System safety.....	33
8.5.2	Extreme climate proof.....	34
8.5.3	High elevation for electronics.....	34
8.6	Protection against electric shock and fire .....	34
9	SWT and SWPS installation.....	34
9.1	General.....	34
9.1.1	Overview .....	34
9.1.2	General installation methods .....	35
9.1.3	Rooftop installation .....	35
9.1.4	Verticality .....	35
9.2	Installation of SWPS of isolated microgrid.....	36
9.2.1	Transportation .....	36
9.2.2	Preparations .....	36
9.2.3	Infrastructure .....	36
9.2.4	Civil works .....	37
9.2.5	Installation of equipment.....	38
10	Tests and acceptance.....	40
10.1	General.....	40
10.2	Individual equipment test .....	40
10.3	System self-test .....	40
10.4	Acceptance test .....	40
10.4.1	General .....	40
10.4.2	Preparation.....	41
10.4.3	Documentation .....	41
10.4.4	Commissioning .....	41
10.4.5	Agreement.....	42
11	Operation and maintenance.....	42
11.1	General.....	42
11.2	Safety .....	42
11.3	Operation and maintenance procedures.....	42
11.4	General inspection, routine and troubleshooting.....	43
11.4.1	Inspection.....	43
11.4.2	Check list .....	43
11.5	Troubleshooting .....	43
12	Marking and documentation.....	44

12.1	Markings and signs .....	44
12.1.1	General .....	44
12.1.2	Equipment marking .....	44
12.1.3	Requirements for signs .....	44
12.2	Labelling .....	44
12.2.1	Labelling of SWT .....	44
12.2.2	Labelling of disconnection devices .....	44
12.3	Documentation .....	44
Annex A	(informative) Main characteristics of an off-grid wind turbine .....	45
A.1	Example of battery charging horizontal axis SWT's characteristics, see Table A.1 .....	45
A.2	Example of battery charging vertical axis SWT's characteristics, see Table A.2 .....	46
Annex B	(informative) Wind shear exponent, $\alpha$ .....	47
Annex C	(informative) Example of labelling .....	48
Annex D	(informative) Example of inspection and maintenance schedule .....	49
D.1	General .....	49
D.2	Example of inspection and maintenance schedule for a SWPS with HAWT .....	49
D.3	Checklist for inspections .....	49
Annex E	(informative) Example of troubleshooting for a SWPS with HAWT SWT .....	51
Annex F	(informative) Example of commissioning records sheet for SWT .....	53
Annex G	(informative) Case study of SWPS design .....	55
G.1	Basic information .....	55
G.2	Local renewable energy resource – Wind resource .....	55
G.3	Required wind power capacity in the HPS .....	55
G.4	Select wind turbine (s) .....	55
G.5	Calculate the power output of unit SWT based upon local wind resource and power curve of selected SWT .....	56
Annex H	(informative) Example of oscillation method to determine natural frequency and tension .....	57
H.1	General .....	57
H.2	Oscillation method for tensioning guy cables .....	57
Bibliography	.....	58
Figure 1	– General functional configuration of SWT(s) in an off-grid hybrid power system .....	9
Figure 2	– Example of wind turbine with active yaw system .....	17
Figure 3	– Rotors with different number of blades of a HAWT .....	17
Figure 4	– Four typical VAWTs .....	17
Figure 5	– Variety of tower options .....	22
Figure 6	– AC bus system .....	25
Figure 7	– DC bus system .....	25
Figure 8	– Obstruction of the wind by a building or a tree .....	30
Figure 9	– Pads for tilt-up tower .....	38
Figure 10	– Acceptance test procedure of SWPS .....	41
Figure C.1	– Sample label in English .....	48
Figure C.2	– Sample label, bilingual (English and French) .....	48

Figure G.1 – Annual monthly average wind speed pattern.....	55
Figure G.2 – Power curve of selected SWT.....	56
Figure G.3 – Power output from one 10 kW SWT.....	56
Table 1 – Basic parameters for SWT classes.....	18
Table 2 – Equipment having a nominal voltage below 750 V DC.....	26
Table 3 – Equipment having a nominal voltage below 750 V DC.....	27
Table 4 – AC systems having a nominal voltage between 100 V and 1 000 V inclusive and related equipment.....	28
Table 5 – Installation methods of different SWPSs.....	35
Table A.1 – Example of battery charging horizontal axis SWT's characteristics.....	45
Table A.2 – Example of battery charging vertical axis SWT's characteristics.....	46
Table B.1 – Surface roughness and lengths and the wind shear exponents $\alpha$ .....	47
Table E.1 – Example of troubleshooting guide for SWT.....	51
Table F.1 – Acceptance of wind generators.....	53
Table F.2 – Example of commissioning records sheet for SWT operation.....	54

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

Draft	Report on voting
82/1956/DTS	82/1995/RVDTS

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](http://www.iec.ch/members_experts/refdocs). The main document types developed by IEC are described in greater detail at [www.iec.ch/standardsdev/publications](http://www.iec.ch/standardsdev/publications).

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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 (CO<sub>2</sub> 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 m<sup>2</sup>, 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 –

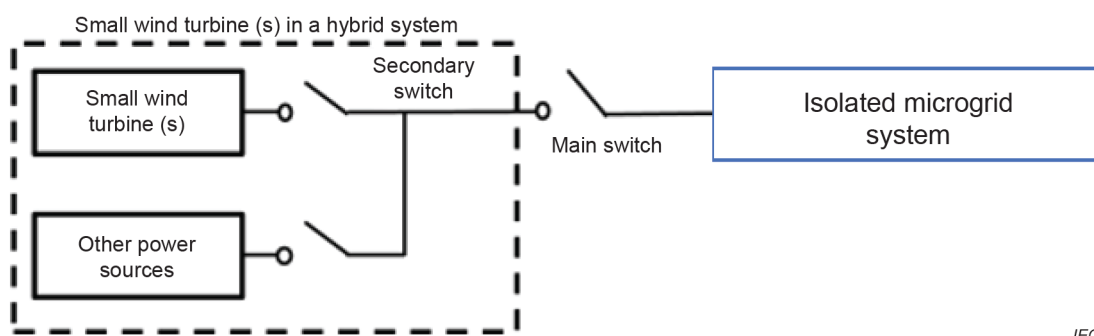
### Part 7-2: Generator set – Off-grid wind turbines

#### 1 Scope

This document applies to all small wind turbines (SWTs) with a swept area smaller than or equal to 200 m<sup>2</sup>, 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 m<sup>2</sup>, 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