



Edition 1.0 2018-02

TECHNICAL SPECIFICATION



Solar thermal electric plants – Part 1-1: Terminology

INTERNATIONAL ELECTROTECHNICAL COMMISSION

ICS 27.160

ISBN 978-2-8322-5352-6

Warning! Make sure that you obtained this publication from an authorized distributor.

CONTENTS

FOREWORD					
1	Scop	Scope			
2	Norm	ative references	5		
3	Term	Terms and definitions			
	3.1	SECTION 01: DESCRIPTION OF SYSTEMS, SUB-SYSTEMS AND			
		COMPONENTS	5		
	3.2	SECTION 02: ANGLE DEFINITIONS	9		
	3.3	SECTION 03: AREA DEFINITIONS	.16		
	3.4	SECTION 04: OPTICAL PROPERTIES	.18		
	3.5	SECTION 05: SOLAR IRRADIANCE	.24		
	3.6	SECTION 06: ENERGIES DEFINITION (SOLAR FIELD PART)	.25		
	3.7	SECTION 07: ENERGIES DEFINITION (POWER BLOCK PART)			
	3.8	SECTION 08: EFFICIENCY NUMBERS	.28		
	3.9	SECTION 09: THERMAL STORAGE SYSTEM	.30		
	3.10	SECTION 10: FINANCIAL FIGURES	.32		
	3.11	SECTION 11: MISCELLANEOUS	.32		
Figure 1 – Angle of acceptance of specular reflectance, ψ					
Fig	Figure 2 – Angles of incidence in <i>linear Fresnel collectors</i>				
Figure 3 – Collector axis azimuth angle and collector normal azimuth angle (example					
for northern hemisphere)12					
Figure 4 – Rim angle of a parabolic-trough collector14					
Figure 5 – Illustration of solar azimuth angle definition in the northern hemisphere15					
Figure 6 – Illustration of solar azimuth angle definition in the southern hemisphere15					
Figure 7 – Typical interconnection of the power generation (G), the auxiliary power transformer and the main power transformer in a solar thermal electricity plant27					
Tal	ole 1 –	Optical terms and symbols.	. 18		

INTERNATIONAL ELECTROTECHNICAL COMMISSION

SOLAR THERMAL ELECTRIC PLANTS -

Part 1-1: Terminology

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.
- 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 62862-1-1, which is a technical specification, has been prepared by IEC technical committee 117: Solar thermal electric plants.

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

Enquiry draft	Report on voting
117/75/DTS	117/85/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.

In this document, the following print types are used:

• terms listed in Clause 3: in italic type.

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.

A bilingual version of this publication may be issued at a later date.

IMPORTANT – The 'colour inside' logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

SOLAR THERMAL ELECTRIC PLANTS –

Part 1-1: Terminology

1 Scope

This part of IEC 62862 contains the main terms and definitions used by the solar thermal electric (STE) industry and intends to be a reference for users of industry documents.

Since the components and configurations of STE plants depend on the concentrating solar thermal technology used (i.e., central *receiver*, *parabolic-trough collector*, parabolic-dish or linear Fresnel *concentrator*), some terms are not applicable to all types of STE plants and notes have been introduced in their definitions for clarification.

The reference STE plant configuration assumed is composed of three main subsystems: *solar field*, *power block* and (eventually) *thermal storage system*.

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.

ISO 9488:1999, Solar energy – Vocabulary