ISBN 978-0-626-33211-2

SANS 959-1:2016

Edition 1.2
Amdt 2

SOUTH AFRICAN NATIONAL STANDARD

Photovoltaic systems for use in individual homes, schools and clinics

Part 1: Standardized requirements applicable to off-grid individual homes, schools and clinics

WARNING
This document references other documents normatively.

Published by SABS Standards Division
1 Dr Lategan Road Groenkloof ✉ Private Bag X191 Pretoria 0001
Tel: +27 12 428 7911 Fax: +27 12 344 1568
www.sabs.co.za

Table of changes

Change No.	Date	Scope
Amdt 1	2014	Amended to update referenced standards.
Amdt 2	2016	Amended to change the designation "SANS 959-1/NRS 052-1" to read "SANS 959-1", to update table on descriptions of systems, applicable standards and comments, to update referenced standards, to update terms and definitions, to delete the footnote on the preservation of wooden planks and to renumber a footnote accordingly, and to update the annex on system descriptions.

Foreword

This South African standard was approved by National Committee SABS/TC 069, *Power electronics and alternative energy conversion*, in accordance with procedures of the SABS Standards Division, in compliance with annex 3 of the WTO/TBT agreement.

This document was approved for publication in September 2016.

This document supersedes SANS 959-1:2014 (edition 1.1).

A vertical line in the margin shows where the text has been technically modified by amendment No. 2.

Reference is made in table 1 to the "relevant national legislation". In South Africa, this means the Electrical Installation Regulations (2009) of the Occupational Health and Safety Act, 1993 (Act No. 85 of 1993). **Amdt 2**

SANS 959 consists of the following parts and sections, under the general title *Photovoltaic systems for use in individual homes, schools and clinics.*

Part 1: Standardized requirements applicable to off-grid individual homes, schools and clinics.

Part 2-1: Test procedures for main components – Photovoltaic modules.

Part 2-2: Test procedures for main components – Batteries.

Part 2-3: Test procedures for main components – Regulators, charge controllers and maximum power point trackers (MPPTs).

Part 2-4: Test procedures for main components – Inverters.

Part 2-5: Test procedures for main components – Luminaires.

Part 3: Standardized requirements applicable to the installation and maintenance of off-grid systems in individual homes, schools and clinics.

Annexes A and F form an integral part of this part of SANS 959-1. Annexes B, C, D, and E are for information only.

Compliance with this document cannot confer immunity from legal obligations.

Introduction

This part of SANS 959 was developed to standardize requirements for photovoltaic components and systems as applicable to the solar home systems programme and the school and clinic systems electrification programmes. These programmes apply particularly to systems (up to a maximum power of 200 W) that are envisaged for a national programme to provide solar power to individual homes which would ordinarily be remote from the electricity grid. The school and clinic programmes apply to systems designed to provide selected functions in schools and clinics and are based on modules of about 900 W maximum power. These schools and clinics would ordinarily be remote from the electricity grid. **Amdt 2**

In order to facilitate the placing of separate contracts for supply and installation, the requirements for the installation, including the electrical installation, are contained in SANS 959-3. **Amdt 2**

An annex in SANS 959-3, *Maintenance to be performed by a contracted maintenance service for photovoltaic systems,* provides guidance to both home-owners and contracted maintenance service providers on those items that need to be considered. **Amdt 2**

In the case of solar home systems, a number of recommended system sizes are set out in A.1. The scope for each system set out in annex A is intended to provide a framework for application. (These are all systems of type T_2I as given in ARP 062-2.). Circumstances might, however, require that the scope be varied provided that the parties to any agreement based on this part of SANS 959 concur. Guidelines on the sizing approach and methods to be used are also provided in annex A. **Amdt 2**

The solar home systems are purpose-designed primarily for remote locations and were designed for lowest initial capital cost consistent with a life expectancy of the order of 20 years for the photovoltaic array and at least 7 to 10 years for the regulator and inverter. Other components such as batteries and lamps, should be considered as consumable items with a much shorter life expectancy. The systems are based on a d.c. power source of 12 V, which is inherently safer than for example an a.c. grid system of 230 V, and does not require to be earthed. Where conversion to an a.c. grid supply of 230 V within the envisaged life span is highly possible, it could be more appropriate to provide a more readily upgraded initial installation at higher initial cost. When a grid supply is considered, the design of the system would need to be reviewed in respect of wiring, earthing and protection against overvoltages.

In the case of schools and clinic systems, a number of recommended system sizes are set out in A.2 and A.3. The scope for each system set out in annex A is intended to provide a framework for application. (These are all systems of type T_2I as given in ARP 062-2.). Circumstances might, however, require that the scope be varied provided that the parties to any agreement based on this part of SANS 959 concur. Guidelines on the sizing approach and methods to use are also provided in annex A. **Amdt 2**

The schools and clinic systems are purpose-designed primarily for remote locations, to comply with certain requirement for powering end-user appliances such as lighting, audio-visual equipment, computers, vaccine refrigerators, medical equipment and even photocopiers. They were designed to be modular and scalable in design, and also with lowest initial capital cost consistent with a life expectancy of the order of 20 years for the photovoltaic array, and 7 to 10 years for the regulator, inverter and batteries. Other components such as lamps should be considered as consumable items with a much shorter life expectancy. The distribution systems are a.c. 230 V based, and comply with all the required norms and standards.

Contents

Content list *(continued)*

Page