

ISBN 978-0-626-37283-5

SANS 1019:2014

Edition 2.6

SOUTH AFRICAN NATIONAL STANDARD

Standard voltages, currents and insulation levels for electricity supply

WARNING

**This standard references other
documents normatively.**

Published by the South African Bureau of Standards
1 Dr Lategan Road Groenkloof ☒ Private Bag X191 Pretoria 0001
Tel: +27 12 428 7911 Fax: +27 12 344 1568

www.sabs.co.za

© SABS

SABS

This page has been left blank intentionally



COPYRIGHT PROTECTED DOCUMENT

© SABS

In terms of the Standards Act 8 of 2008, the copyright in all South African National Standards or any other publications published by the SABS Standards Division, vests in the SABS. Any use of South African National Standards is limited to use specifically prescribed by the SABS. In the case of a South African National Standard based on an international standard, ownership of the copyright vests in the organization from which the SABS adopted the standard, whether it be under licence or membership agreement. The SABS is obliged to protect such copyright and is authorized to make the relevant international organization aware of any misuse thereof. Unless exemption has been granted, no extract or full text of any South African National Standard may be copied, reproduced, stored in a retrieval system or transmitted in any form or by any means without prior written permission from the SABS Standards Division. This does not preclude the free use, in the course of implementing the standard, of necessary details such as symbols, and size, type or grade designations. If these details are to be used for any purpose other than implementation, prior written permission must be obtained.

Details, advice and limitations of use can be obtained from the Manager: Standards Sales and Information Services. Tel: +27 (0) 12 428 6883 email: sales@sabs.co.za

SABS – Standards Division

The objective of the SABS Standards Division is to develop, promote and maintain South African National Standards. This objective is incorporated in the Standards Act, 2008 (Act No. 8 of 2008).

The SABS continuously strives to improve the quality of its products and services and would therefore be grateful if anyone finding an inaccuracy or ambiguity while using this standard would inform the secretary of the technical committee responsible, the identity of which can be found in the foreword.

Buying Standards

Contact the Sales Office for South African and international standards, which are available in both electronic and hard copy format. Tel: +27 (0) 12 428 6883 email: sales@sabs.co.za

South African National Standards are also available online from the SABS Webstore www.store.sabs.co.za

Information on Standards

SABS Customer Services provide comprehensive standards-related information on national, regional and international standards. Tel: +27 (0) 12 428 7911 / 0861 27 7227 email: info@sabs.co.za

SANS 1019:2014
Edition 2.6

Table of changes

Change No.	Date	Scope
Amdt 1	1992	Amended to update and expand the requirements for limits of voltage variations, and to change certain requirements concerning standard voltages not exceeding 1 100 V.
Amdt 2	1993	Amended to add certain definitions.
Amdt 3	1997	Amended to bring the voltage tolerance in line with new legislation.
Amdt 4	2001	Amended to update referenced standards and to include an editorial correction.
Amdt 5	2008	Amended to change the designation of SABS standards to SANS standards, and to move references to legislation to the foreword.
Amdt 6	2014	Amended to add the definition of "impulse" and update applicable standards.

Acknowledgement

The South African Bureau of Standards wishes to acknowledge the valuable assistance derived from publications of the International Electrotechnical Commission.

Foreword

This South African standard was approved by National Committee SABS/TC 067/SC 05, *Electricity distribution systems and components – Electricity distribution*, in accordance with procedures of the South African Bureau of Standards, in compliance with annex 3 of the WTO/TBT agreement.

This document was published in March 2013.

This document supersedes SANS 1019:2008 (edition 2.5).

A vertical line in the margin shows where the test has been technically modified by amendment No.6.

A reference is made in the last paragraph of the Preface to "legislation". In South Africa this is the Occupational Health and Safety Act, 1993 (Act No. 85 of 1993) (as amended from time to time).

Amdt 5

A reference is made in table 1 to "Regulations to legislation". In South Africa this is the Electricity Act, 1987 (Act No. 41 of 1987) (as amended from time to time) and the Regulations promulgated in terms of the Act.

Amdt 5

This document is referenced in the Local Government Municipality Systems Act, 2000 (Act No. 32 of 2000).

Compliance with this document cannot confer immunity from legal obligations.

**Reaffirmed and reprinted in March 2019.
This document will be reviewed every five years
and be reaffirmed, amended, revised or withdrawn.**

Preface

This specification was revised in 1985 in order to bring it into line with IEC 60038:1983.

Amdt 4

IEC 60071-1 specifies a range of standard insulation levels which have found general acceptance in South Africa. On the basis of experience and applications in the South African electricity supply industry, agreement has been reached regarding IEC insulation levels which shall be accepted for South Africa. The following comments cover the major aspects of the revision of this specification:

Amdt 4

- a) **Standard voltages.** The ideal of a single international standard voltage in low voltage distribution systems has always been an attractive proposition to ensure rationalization of distribution networks and associated equipment and to assist international trade.

SANS 780, *Distribution transformers*, specifies a standard no-load voltage of 230/400 V and requires the transformer to operate continuously, without deleterious effect, at a primary voltage of 105 % of rated voltage.

Amdt 4

Therefore, with adequate design, the supply voltage at the consumer terminals under light load conditions would be within the 230 V +6 % limit recommended in IEC 60038. At the other end of the range, under full load conditions with rated voltage on the primary, the supply voltage could drop without it being less than the lower limit of 230 V –10 %, thereby achieving compliance with the international standard voltage of 230/400 V.

Amdt 4

- b) **Standard insulation levels.** Standard insulation levels for nominal voltages exceeding 1 100 V have now been included in this specification. The list 2 insulation levels for the medium voltage range (range A) have been taken from IEC 60071-1, table 1 but, because of a high altitude of up to 1 800 m and ground flash densities commonly reaching values of 8 flashes/km²/year or more in large areas of South Africa, it has been considered necessary to introduce a list 3 of insulation levels based on the standard values given in IEC 60071-1, table 2.

Amdt 4

List 1 values have not been included in this specification.

The derating effect on voltage withstand values at altitudes greater than 1 000 m affects external insulation only. By the application of the recommendations in IEC 60071-2 and the correct choice of protective levels of surge arresters, it has generally been found possible to adopt the same values for external insulation as for internal insulation.

Amdt 4

- c) **Test procedures.** Because many test laboratories are situated at a high altitude, it was considered necessary to give guidance on the following:

- 1) testing at altitudes above 1 000 m with reference to insulation levels specified for altitudes up to 1 000 m; and
- 2) testing at altitudes up to 1 000 m in those cases where it has been found necessary to specify a higher insulation level for external insulation than the corresponding level for internal insulation.

The test procedures for the simultaneous testing of internal and external insulation are covered in an appendix.

- d) **Clearances and creepage distances.** The committee charged with the revision of SANS 1019:1975 did not consider it necessary to include clearances and creepage distances in this revision.

Clearances are covered in legislation (see foreword) and creepage distances in SANS 60137, *Insulated bushings for alternating voltages above 1 000 V*.

Amdt 4; amdt 5