

SAFEhouse

STANDARDS & REGULATIONS



1. OVERVIEW

The Occupational Health and Safety Act, 1993 The Act (Act No. 85 of 1993) (OHS Act), which is administered by the Chief Inspector of Occupational Health and Safety of the Department of Labour, requires that all electrical installations comply with the requirements of SANS 10142-1. It also requires that an accredited person, as defined (master installation electrician, installation electrician or electrical tester for single phase), will issue a Certificate of Compliance (CoC) for an electrical installation and that the certificate should be in the form of the Certificate of Compliance published in SANS 10142 (see a specimen of this certificate in this section).

Inspection

Normally, inspection precedes testing and should be done with the installation isolated. Inspect the installation to confirm that equipment has been selected and installed in accordance with SANS 10142 (SABS 0142) and that equipment it is not so damaged as to impair safety.

Compulsory standards

- Compulsory specification for circuit-breakers, as published by Government Notice No. 1090 (Government Gazette 20461) of 17 September 1999. (VC 8036);
- Compulsory specification for earth leakage protection units, as published by Government Notice No. 2286 (Government Gazette 10987) of 16 October 1987. (VC 8035);
- Compulsory specification for manually operated switches for fixed installations, as published by Government Notice No. R438 (Government Gazette 18779) of 3 April 1998. (VC 8003);
- Compulsory specification for plugs, socket-outlets and socket outlet adaptors, as published by Government Notice No. R442 (Government Gazette 18779) of 3 April 1998. (VC 8008);
- Compulsory specification for the safety of electric cables with extruded solid dielectric insulation for fixed installations (300/500 V to 1 900/3 300 V), as published by Government Notice No. R1169 (Government Gazette 21759) of 24 November 2000. (VC 8075);
- Compulsory specification for the safety of flexible cords for electrical appliances, as published by Government Notice No. 1212 (Government Gazette 16598) of 11 August 1995. (VC 8006)

SANS 10142 (SABS 0142) is concerned with ensuring the basic safety of electrical installations and to ensure the protection of people, animals and property and the proper functioning of an installation.

The designer of an electrical installation should be aware of:

- the characteristics of the power supply,
- the nature of the demand, and
- the operating environment of each part of the installation.

It is especially important to be aware of the activities of occupants of a building. For example, the occupants might be engaged in wet processes or in the handling of flammable or explosive materials. These activities will influence the design of the installation. If a client wants more safety features for the installation than those prescribed in SANS 10142 (SABS 0142), such features have to be included in the contract documentation.

The provisions of SANS 10142 (SABS 0142) apply only to the selection and application of electrical equipment, appliances and accessories, which are part of the fixed electrical installation. They do not apply to the construction and safety of the equipment, appliances and accessories; those aspects are dealt with in other standards.

Annexure 1
DEPARTMENT OF LABOUR
OCCUPATIONAL HEALTH AND SAFETY ACT, 1993
CERTIFICATE OF COMPLIANCE



Certificate of compliance in accordance with regulation 7(1) of the Electrical Installation Regulations 2009.	CERTIFICATE NO. B 9000001	Certificate type (tick appropriate block) Initial Certificate <input type="checkbox"/> Supplementary Certificate <input type="checkbox"/>
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Supplement No.: to Initial Certificate No.: as issued on:

Identification of the relevant installation
 (Address or other unique reference, where applicable)

Physical address:

Name of building: GPS Coordinates:

Suburb / Township: Pole number:

District / Town / City: Erf / Lot No:

Declaration by registered person

I, (ID No.:)
 a registered person declare that I have personally carried out the inspection and testing of the electrical installation described in the attached test report as per the requirements of:

(Tick appropriate box)

a) electrical installation regulations 9(2) (a); (new electrical installation); or

b) electrical installation regulations 9(2) (b); (existing electrical installation); or

c) electrical installation regulations 9(2) (c); (new part to existing installation) and deem the installation to be reasonably safe when properly used.

I have entered the number of this certificate on the attached test report(s).

I declare that the persons responsible for the design, specification, procurement, construction commissioning and inspection and test have completed the relevant sections of the test report.

Registered person registration number: Date of registration:

Type of registration: **(Tick appropriate box)**

Tester for Single Phase Installation Electrician Master Installation Electrician

Signature: Date:

Contact details of registered person: Name:

Address:

Tel. No.: Fax No.:

Cell No.: Email:

NOTE: 1. This certificate is not valid unless all the sections have been completed correctly and the test report in the format approved by the chief inspector is attached.
 2. This certificate will be invalid if any corrections have been made.

Declaration by electrical contractor

I, (ID No.:)
 declare that the electrical installation has been carried out in accordance with the requirements of the Occupational Health and Safety Act, 1993, and regulations made thereunder.

Electrical contractor registration number: Date of registration:

Signature: Date:

Contact details of electrical contractor: Name:

Address:

Tel. No.: Fax No.:

Cell No.: Email:

Recipient Name: Signature: Date:

ECB FAX No. 086 584 5771 1

Figure 13.5 - Example of an electrical compliance certificate

The Electrical Contractors' Association of South Africa – ECA (SA) - is a employer organisation registered in terms of the Labour Relations Act. Established in 1950, the ECA (SA) represents members and their interests in the labour Relations arena and in the technical and regulatory mechanisms governing the Electrical Industry.

On the ECA (SA) web site members of the public can search for and find Electrical Contractors registered with and approved by the ECA (SA), get answers to questions, contact the ECA (SA), browse classified and job adverts placed by ECA (SA) members and read the latest news from the association **Visit the ECASA website: <http://ecasa.co.za>**

2. COMPULSORY STANDARDS APPLICABLE TO ELECTRICAL PRODUCTS

September 2012

2.1 Introduction

The Sale and Installation of electrical products in SA is controlled by the following two ACTS:

- The National Regulator for Compulsory Specifications Act; 2008 And
- The Occupational Health and Safety Act; 1993.

These two acts cover separate aspects; the NRCS Act covers the sale of products and components, whilst the OHS Act covers their use in electrical installations.

Both of these acts are compulsory and non-compliance is deemed a criminal act punishable by prescribed fines and penalties, which in the case of the NRCS Act, may include from 1 to 4 years imprisonment.

Furthermore, under Section 15 of the Act, the Regulator may confiscate and destroy products that are not compliant with the requirements of the Compulsory Specifications.

2.2 NRCS Background

For many years prior to 2008, the National Regulator was part of the South African Bureau of Standards (SABS) and carried out its functions within that organization, this is where the mind-set 'SABS approved' meant that the product also automatically fulfilled the Regulatory requirements and indeed any product that fell under the compulsory specifications, that carried the SABS mark, was deemed to comply.

However as a result of the National SQAM review in the 90's The DTI was tasked to rationalize the regulatory technical infrastructure in the SA industry. This lengthy process, which involved several consultations with industry, culminated in 2008 with the promulgation of the new Standards Act and the NRCS act.

This effectively separated the NRCS from SABS where both organizations operate independently and their management boards report directly to the Minister of Trade and Industry (DTI).

Thus in today's terms, electrically speaking:

SABS approval no longer means NRCS approval.

The Compulsory Safety Specifications applicable to the Electrical Industry are tabled below:

VC Nr.	Title	Referred Standard
VC 8003	Switches for Fixed Installations	SANS 60669-1
VC 8006	Flexible Cords for Electrical Appliances	SANS 60227-5
		SANS 1574
VC	Plugs, Sockets Outlets and Adaptors	SANS 60884-1 SANS 164-0
VC 8011	Lamp holders	SANS 60238 SANS 61184 SANS 145
VC 8012	Appliance Couplers	SANS 60320-1
VC 8029	Cord Sets and Cord Extensions Sets	SANS 1661
VC 8035	Earth Leakage Protection Units	SANS 60947-1 SANS 767
VC 8036	Circuit Breakers	SANS 60947-1/2 SANS 556-1
VC 8039	Tubular Fluorescent Lamp starters	Specified in full
VC 8043	incandescent Lamps	SANS 60432-1
VC 8052	Manually Operated Switched for Appliances	SANS 61058-1
VC	Electrical and Electronic Apparatus	SANS 60335 series Many More

VC Nr.	Title	Referred Standard
VC 8075	Low Voltage Electric Cables	SANS 1507
VC	Medium Voltage Electric Cables	SANS 97 SANS 1339
VC 8079	Gaming Devices and related Apparatus	SANS 1718
VC 8087	Lamp holder Control gear	SANS 61437-1
VC	Single capped fluorescent lamps	SANS 61199 SANS 60960 SANS 60901 SANS 60969

Note: All VC Specifications are available on the NRCS website: www.nrcs.org.za

2.3 Regulations R924 15 Oct 2010

In terms of Section 36 of the NRCS Act of 2008, the Minister then published this document, which effectively changed the modus operandi of the NRCS by adding new administrative requirements and the change in the VC Specifications by adding certain “conformity” requirements. The main headings were as follows:

- Payment of Levies
- Fees for Services:

Important to note that for products covered by a Compulsory Specification that carry the SABS mark (Type 5 certification) a discount of 10% is applied to the levy.

- Exemptions
- Sales Permits:

Important to note here that since pre-existing approval schemes (RCC and AC) were dropped, the Sales permit was extended to apply to “products that do not fully comply with the Compulsory Specification, or for products for an “experimental type approval commodity” where a Compulsory Specification applies (NRCS Act 14(5)). In other words; where products are essentially compliant with the Specification but there are minor differences but do not compromise the product safety in the hands of the user. In addition application for a Sales Permit may be made and granted by NRCS, for products covered by a Compulsory Specification, but sold exclusively in the export market.

- Directives
- Acceptability of Evidence of Conformity
- Consultation process:

A series of meetings with Stakeholders (which includes Industry Associations such as EEAIA, ERIC ECA, EMASA and ESASA) is laid out in the regulation, to ensure consensus in the structure and implementation of the VC specifications and their amendments.

- Records
- Registration of Manufacturers and providers
- Commencement: 1 January 2011

2.4 VC Specifications

The NRCS Act of 2008, refers to the future issue of Regulations and the amendment thereof. The pre-existing VC Specifications required that the manufacturer present a test report for the commodity and on a bi-annual basis pay levies according to a list of fees pertaining to each commodity type.

The VC specification generally followed the SANS format, setting out the requirements in accordance with a SANS standard and, where necessary, added certain requirements such as additional tests or product exclusions, for example the Earthed DIN socket (Schuko).

In certain cases, the VC Specification was a complete one, specifying the requirements in full.

To date only 8 of the 17 VC Specifications have been issued in the new format, and are highlighted in blue on the VC list above. The significance of this is that:

- Each supplier of all these commodities has to register with the NRCS.
- Each of the highlighted commodities have to comply with the new Letter Of Authority (LOA) requirements, these are summarized as:
- To satisfy “Proof of Conformity”, each product shall have a full test report to the prescribed Standard, and such test report shall not be older than 3 years. This type of test report will record each clause of the standard, the measurement results and describe the product fully.
- To satisfy “Conformity of Production” Each manufacturer of the commodity shall do so in the format acceptable to NRCS, this is generally ISO9000 certification for the Manufacturer (Note: NOT the re-seller).
- Proof of acceptable accreditation for the above requirements.
- The LOA (once issued) is valid for 3 years and may be extended on application, under certain provisions, for a further 2 years.

In so far as the other VC specifications are concerned, i.e. those that are not yet covered by a LOA process, the supplier shall:

- Have registered (as above) and
- Possess a valid test report as proof of conformity, however there is no strict requirement as to the age of the test report, providing the applicable Standard has not been amended since the report issue date.

Also it is important to note that any amendments to the prescribed National Standards are to be applied to the commodities, within the implementation period of the revision. Consequently re-testing of the products will become mandatory under the NRCS Act and Regulations.

2.5 Other Regulatory processes.

NRCS in its “Administrative processes” sets out two possible regulatory processes outside that of the LOA, for fixed installations i.e. In compliance with SANS 10142-1: The Wiring of Premises; these are:

- Regulatory Certificate of Compliance (RCC)

Application is made to NRCS on a prescribed form, in a similar fashion as the LOA process, for products that are intended for fixed installations and comply with the relevant Compulsory Specification, which means that there is a National Standard issued.

An example of this would be a Miniature Circuit Breaker that does not carry a type 5-certification mark.

- Authorization certificate (AC)

Applications are made as above, for products that although they fall within a Compulsory Specification, there is no National Standard issued or applicable to the product or wiring system, however one can demonstrate that the use of the product does not lower the safety of the installation. An example of this would be an innovative wiring system that can be classed as a “Home Automation System.”

A final word:

Remember, the price of conformity is high, but the price of non- conformity is even higher!

This contribution was provided by Mr. Gianfranco Campetti who is the SABS SC67C Mirror Committee Chairman to the IEC Sub Committee SC23B: Plugs, Socket-outlets and Switches and SC23C: Worldwide plug and socket-outlet systems.

INSTALLATION DIAGRAM WITH SANS REGULATORY REFERENCES:

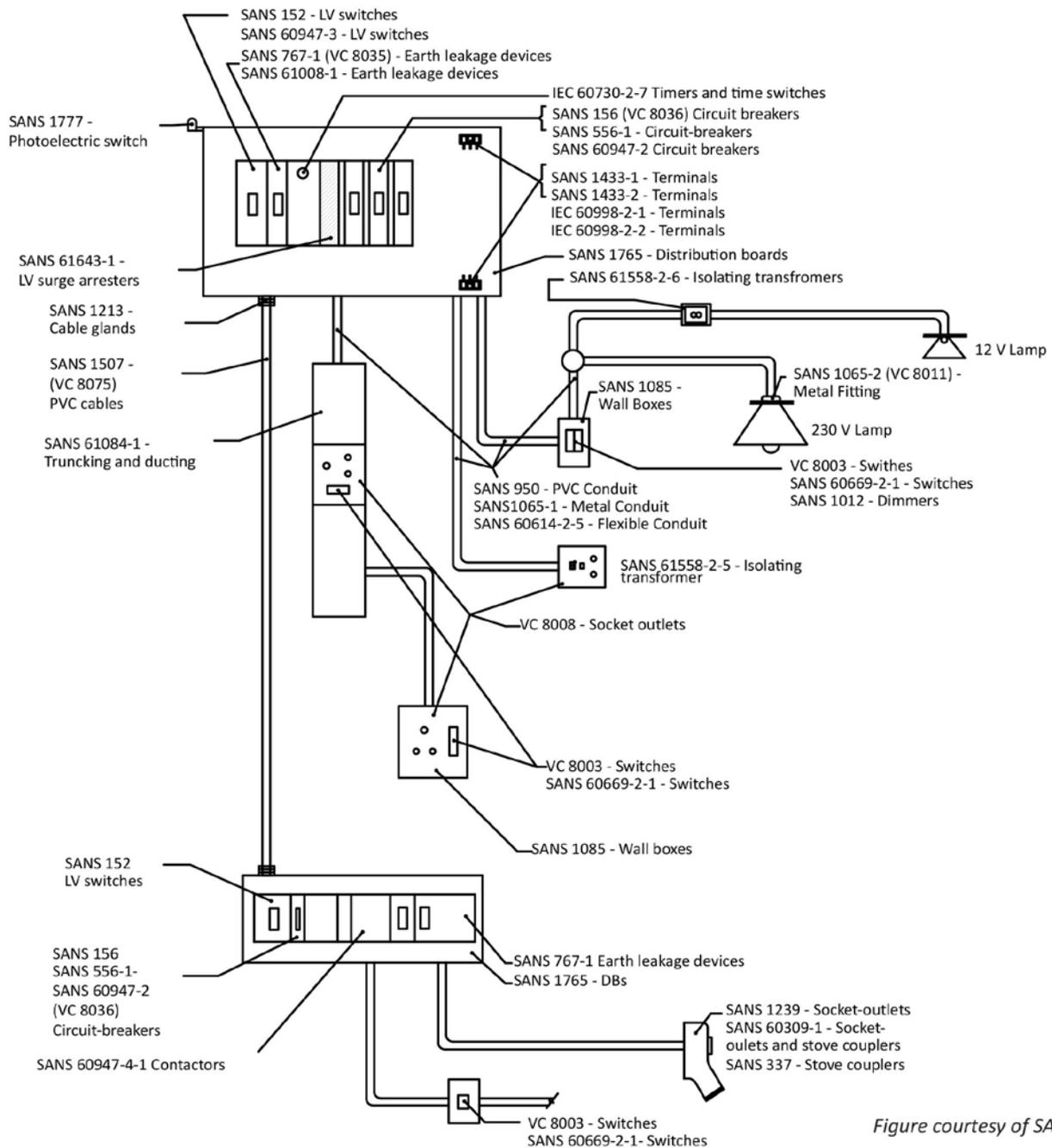


Figure courtesy of SABS

1. Introduction

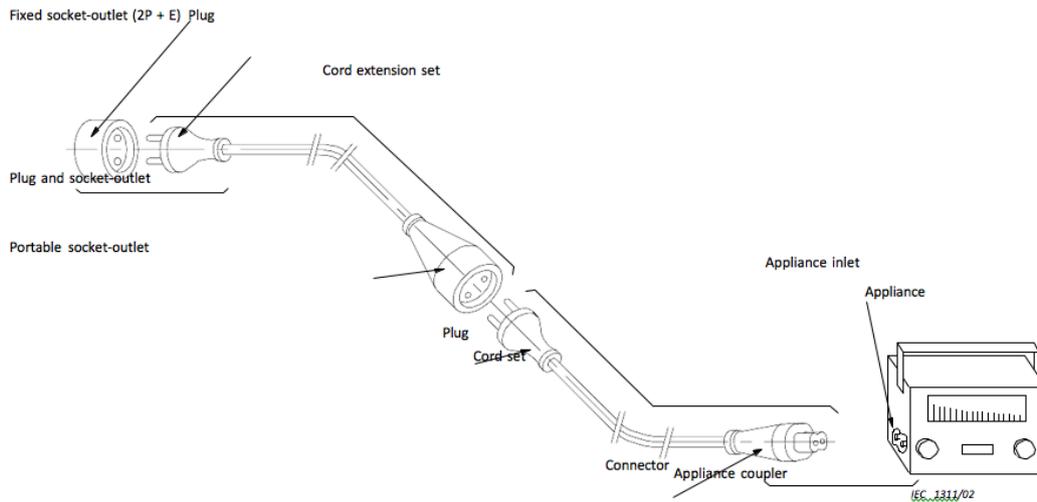
The D4 Power-sets are classified as Cord Extension Sets, which are covered by the following local and international Standards:

SANS 1661

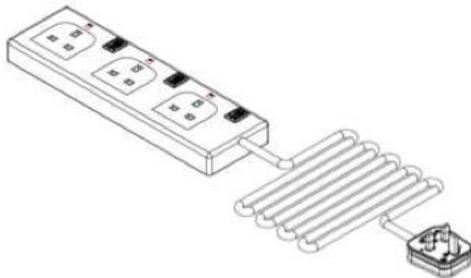
SANS (IEC) 60884-2-5 (New)

And the Compulsory Safety Specification: VC8029 Specification for Cord Sets, Interconnection Cord Sets and Cord Extension Sets (Recently Amended)

Examples of IEC and SANS Definitions:



Multiple Socket outlet Cord Extension set



In order to understand the application of these standards, it is important to explain the difference between the Compulsory and Voluntary aspects of the specifications.

2. NRCS Regulation R69 dated 2 Feb 2012.

The amended regulation, which was applied from the 3 August 2012, introduced the LOA scheme for cord extension sets, in very much the same format of the 8 previously amended; out of the total of 17 Compulsory Specifications dealing with electrical components. The amended LOA format specifies that:

- Manufacturers, importers and re-sellers are to register with NRCS.
- A Test report is required to demonstrate conformity of product – not older than 3 years.
- A Certificate of Conformity of production is to be submitted.
- A product sample(s) for the different configurations.
- NRCS Issues a Letter of Authority (LOA) valid for 3 years The Product technical requirements are:
- Cord Sets and Interconnection sets: **SANS 60799**
 - o Defined as an assembly consisting of one flexible cable or cord fitted with one non-rewireable plug and one non-rewireable connector, intended for the connection of an electrical appliance or equipment to the electrical supply.
- Cord Extension Sets: **SANS 1661**.
 - o Defined as an assembly consisting of a flexible cord fitted with a plug and one or more socket-outlets and that can incorporate a switch or switches, a circuit breaker, an earth leakage unit, or a thermal overcurrent unit, or any combination of these.

3. SABS and SANS 1661

In terms of the Standards Act 2008, SABS has set up a 'voluntary' certification scheme, commonly referred to as the **SABS Mark Scheme**. This Scheme is a **Type 5** Certification scheme, whereby the issuing authority (SABS) Applies regular audits to ensure both product and production compliance. These are held every 6 months each for both aspects separately.



The SABS Mark is issued on the successful implementation of the defined permit conditions; which form part of a contract between the manufacturer and SABS and is reviewed every 3 years. However it must be pointed out that although the Specification, or Standard is the same, a SABS mark **does not mean automatic compliance** with the VC

Specification and generally where manufacturers comply with both, the products are marked with both the SABS Mark and the VCxxxx as appropriate.

4. Standard South African Plugs & Sockets and their Nominal ratings

South Africa has 9 standard configurations that can be legally used in fixed wiring and portable applications such as adaptors and cord extension sets.

These are described in the following table:

Nominal Ratings	16A 250V~	16A 250V~	6A 250V~	16A 250V~	2.5A 250V~	10A/16A 250V~
Standard	SANS 164-1	SANS 164-2	SANS 164-3	SANS 164-4	SANS 164-5	SANS 164-6
Plug & Socket	Yes	Yes	Yes	Yes	Plug Only	Yes
Main Usage	General	New General	Lighting Outlets	Dedicated Systems	Small Appliances Cell phones	Power Tools and IT Equipment

5. Cable sizes and permissible lengths.

SANS 1661 limits the cable lengths that can be applied to cord extension sets. The reason for this is generally a safety issue and the permissible volt drop that can be tolerated at the end of a long cable that may be carrying its rated current. The cables sizes and lengths are specified in Clause 4.8 and according to the table below

Nominal Cross Sectional Area Of Cord (mm ²)	Maximum Length Of Cord (M)	
	Current Rating (A)	
	10A	16A
1	25	2
1.5	35	20
2.5	65	40
4	100	65

Important to note that for long cords, which may be coiled up, and carrying any current, an extra heating effect will be caused by the inductance of the coil, which may lead to damage, and possibly a danger of fire. Ensure that cords are fully un-coiled when supplying current.

6. Overcurrent and Earth Leakage protection.

According to the Wiring Code SANS 10142-1, every socket outlet is to be protected by a 20A Circuit Breaker and in addition, must also be protected by a 20mA Earth Leakage Protection Unit. However for exceptional circumstances, such as emergency and “clean power” supplies, the ELPU can be bypassed if the socket outlets are of the “dedicated” type; such as one of those described under SANS 164-4.

SANS 1661 also includes the requirement of a protective device, which is built into the cord extension set, this device offers limited overcurrent protection at the 16A current level, but with a time delay in excess of 15 minutes.

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