SABS EMC/CoC
Product Guideline

Standards and products under scope
Electrical Components that Emit Noise

Electronic equipment which contain the following components have electromagnetic emissions and therefore must receive Conformance Assessment.

1) **Electronic Circuit Board** – If a product, including the IC (Integrated Circuit), uses DC to control the product, electromagnetic waves are generated. DC products also emit noise, therefore it requires conformance assessment.

2) **Motor** – A motor that uses an Electrical Motor Coil generates electromagnetic waves while operating. Any kind of motor generates electromagnetic waves.

3) **Driver/Rectifier** – Simple lighting (Bulb) do not generate electromagnetic waves, however if it uses a driver or a rectifier to operate it, it generates noise, therefore it requires conformance assessment.

4) **Commutator Motor** – If a product has a Commutator Motor, it generates noise, therefore it requires conformance assessment.

5) **Oscillator Clock** – If a product has a Oscillator Clock, it generates noise, therefore it requires conformance assessment.
Electrical Components that Emit Noise

- Electric Circuit Board
- Motor
- LED Driver
- Commutator Motor
- Oscillator Clock
### Measurement Method

<table>
<thead>
<tr>
<th>Method</th>
<th>Description</th>
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<tbody>
<tr>
<td>CISPR 22:2008</td>
<td>Information technology equipment - Radio disturbance characteristics - Limits and methods of measurement specifies the requirements that apply to the generation of electromagnetic energy in the frequency range 9 kHz to 400 GHz from information technology equipment for both class A and class B equipment.</td>
</tr>
</tbody>
</table>

### Applicable Products


CISPR 22:2008 applies to information technology equipment (ITE). Procedures are given for the measurement of the levels of spurious signals generated by the ITE and limits are specified for the frequency range 9 kHz to 400 GHz for both class A and class B equipment. No measurements need be performed at frequencies where no limits are specified. The intention of this publication is to establish uniform requirements for the radio disturbance level of the equipment contained in the scope, to fix limits of disturbance, to describe methods of measurement and to standardize operating conditions and interpretation of results. This sixth edition of CISPR 22 cancels and replaces the fifth edition published in 2005, its Amendment 1 (2005) and Amendment 2 (2006). This edition constitutes a minor revision. The contents of the interpretation sheets 1 of October 2009, 2 of April 2010 and 3 of April 2012 have been included in this copy.

This standard is applicable to all mains-powered information technology equipment, including electrical business equipment and associated equipment, inclusive of the following:

- Equipment designed for use as telecommunication terminal equipment
- Equipment designed and intended to be connected directly to, or used as infrastructure equipment in, a cable distribution system

**Class B:** Equipment used in the domestic environment

**Class A:** Equipment used in environments other than domestic
SANS 222 (CISPR 22) Information Technology Equipment (ITE)
SANS 222 (CISPR 22) Information Technology Equipment (ITE)
### Measurement Method

Electromagnetic compatibility - Requirements for household appliances, electric tools and similar apparatus - Part 1: Emission.

### Applicable products

CISPR 14-1:2016 specifies the requirements that apply to the emission of radio-frequency disturbances in the frequency range 9 kHz to 400 GHz from appliances, electric tools and similar apparatus, whether powered by AC or DC (including a battery). Also included in the scope of this standard are separate parts of the above mentioned equipment such as motors and switching devices (e.g. power or protective relays); however, no emission requirements apply to such separate parts, unless otherwise stated in this standard. This sixth edition cancels and replaces the fifth edition published in 2005, Amendment 1:2008 and Amendment 2:2011. This edition constitutes a technical revision. The contents of the corrigendum of October 2016 have been included in this copy.

This standard is applicable to all household electrical appliances and are inclusive of the following:

- Equipment which main functions are performed by motors and switching or regulating devices.
- Equipment with electrical circuit
- Equipment powered by AC/AC
SANS 214-1 (CISPR 14-1 : 2016)

- Household refrigerators
- Motor Compressor
- Electric iron
- Air-conditioner
- Vacuum cleaner
- Water suction cleaner
- Electric fan
- Washing machine
- Food freezers
- Dryer
- Dehumidifier
- Electrical floor cleaner
- Steam Cleaner
- Microwave oven
- Cooking range
- Electric hob
- Oven
- Electric installation grill
- Range hoods
- Ice Maker
- Dispensing Machines
- Thermostats
Switching devices

Water dispenser

Electric rice cooker

Hot plate

Electromagnetic cookers

Instantaneous water heater

Water Heater

Portable electric grill

Electric heater

Electric beef grill

Waffle maker

Electric toaster

Steam iron

Iron press

Electric drying iron

Electric dish dryer

Warming plate

Hair dryer

Trouser press

Roasters

Electric hair iron

Hair roller

Electric Dishwasher

Electric flying pan

SANS 214-1 (CISPR 14-1 : 2016)
SANS 214-1 (CISPR 14-1 : 2016)
Electric cushion
Electric mattress pad
Thermoplastic pipe welder
Warm Bottle Machine
Yogurt machine
Warm foot machine
Electric mattress pad
Freezer
Coffee maker
Hot milk machine
Electric floor-mat
Electric Bed
Electric board
Heater
Electric clock
Sewing machine for household
Electric medicine maker
Pump
Electric fan heater
Thermal storage room heater
Electric radiator
Ice-cream freezer

SANS 214-1 (CISPR 14-1 : 2016)
SANS 214-1 (CISPR 14-1 : 2016)
SANS 214-1 (CISPR 14-1 : 2016)
SANS 214-1 (CISPR 14-1 : 2016)
Electric grinder
Polisher
Electric sander
Electric round-shaped saw
Electric nail gun
Electric chain saw
Electric reciprocating saw
Oral cleaner
Electric hammer
Electric drill
Electric taper
Electric steel scissors
Other Power tools including trimmer
SANS 214-1 (CISPR 14-1 : 2016)
Sound and television broadcast receivers and associated equipment, terrestrial and/or satellite

<table>
<thead>
<tr>
<th>Measurement Method</th>
<th>Sound and television broadcast receivers and associated equipment - Radio disturbance characteristics - Limits and methods of measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CISPR 13:2009+A1:2015 specifies the requirements that apply to the generation of electromagnetic energy in the frequency range 9 kHz to 400 GHz from sound and television receivers for the reception of broadcast and similar transmissions and from associated equipment.</td>
</tr>
</tbody>
</table>

| Applicable products | CISPR 13:2009 applies to the generation of electromagnetic energy from sound and television receivers for the reception of broadcast and similar transmissions and from associated equipment. CISPR 13:2009 describes the methods of measurement applicable to sound and television receivers or associated equipment and specifies limits for the control of disturbance from such equipment. The frequency range covered extends from 9 kHz to 400 GHz. This fifth edition of CISPR 13 cancels and replaces the fourth edition published in 2001, its Amendment 1 (2003) and Amendment 2 (2006). This edition constitutes the introduction of the RMS-average detector as an alternative to quasi-peak and average detector for conducted and radiated emission measurements. |
|                    | This standard is applicable to sound and television receivers for the reception of broadcast and similar services for terrestrial, cable and satellite transmissions and associated equipment inclusive of the following:  
- All audio/video equipment  
- Powered by AC/DC |
SANS 213 (CISPR 13) (*2)
SANS 213 (CISPR 13) (*2)
SANS 213 (CISPR 13) (*2)

- Image processor
- Image receiver and converter
- Video game machines
- Image recorder
- CCTV camera
- Editing machine
- Video recorder
- Receiver for A/V signal
- Turntable
- Compressor gate
- AD/DC converter
- Receiver for CATV
CISPR 15:2013+A1:2015 specifies the requirements that apply to the generation of electromagnetic energy in the frequency range 9 kHz to 400 GHz from lighting equipment.

**Applicable products**

CISPR 15:2013 applies to the emission (radiated and conducted) of radiofrequency disturbances from:
- all lighting equipment with a primary function of generating and/or distributing light intended for illumination purposes, and intended either for connection to the low voltage electricity supply or for battery operation;
- the lighting part of multi-function equipment where one of the primary functions of this is illumination;
- independent auxiliaries exclusively for use with lighting equipment;
- UV and IR radiation equipment;
- neon advertising signs; and street/flood lighting intended for outdoor use;
- and transport lighting (installed in buses and trains). Excluded from the scope of this standard are:
- lighting equipment operating in the ISM frequency bands (as defined in Resolution 63 (1979) of the ITU Radio Regulation);
- lighting equipment for aircraft and airports;
- and apparatus for which the electromagnetic compatibility requirements in the radio-frequency range are explicitly formulated in other CISPR standards. The frequency range covered is 9 kHz to 400 GHz. This eighth edition cancels and replaces the seventh edition published in 2005, its Amendment 1 (2006) and Amendment 2 (2008). It is a technical revision. This edition includes the following significant technical changes with respect to the previous edition:
- inclusion of LED light sources and luminaires, clarification of test supply voltage and frequency, and improvements to clause 5 relating to the application of limits to the various types of lighting equipment covered under the scope of CISPR 15;
- introduction of requirements for flashing type emergency lighting luminaires utilizing xenon lamps;
- introduction of requirements for neon and other advertising signs;
- and clarification of the requirement for radiated disturbances between 30 MHz and 300 MHz in case the operating frequency of the light source is below 100 Hz. The contents of the interpretation sheet 1 and 2 of June 2013 have been including in this copy.
SANS 215 (CISPR 15)

- Neon transformer
- Electric transformer
- Chandelier
- Rechargeable lantern
- Self-ballasted lamp
- Emergency luminaires
- Sodium lamp
- Halogen lamp
- Fluorescent lamp holder
- Starter holder for fluorescent light
- Illuminating light
- Magnetic ballast for lamp
- High-voltage luminaire
- fluorescent luminaires
- PLS luminaires
CISPR 11:2015 specifies the requirements that apply to the generation of electromagnetic energy in the frequency range 9 kHz to 400 GHz from industrial, scientific and medical electrical equipment operating in the frequency range 0 Hz to 400 GHz and to domestic and similar appliances designed to generate and/or use locally radio-frequency energy.

| Measurement Method | This standard is applicable to apparatus and systems for use in residential and in industrial environments or in laboratories, and are classified into two groups: Group 1: • Equipment which are in direct contact with the human body or are utilized closely with the human body • Equipment which uses RF energy only for its internal function. Therefore, its RF emissions are very low and are not likely to cause any interference in nearby electronic equipment. Group 2: • All equipment not included in Group 1 • Equipment which must emit electromagnetic energy in order to perform its intended function. Nearby electronic equipment may be affected. |

Applicable products
SANS 211 (CISPR 11)

- Infant Incubator
- Magnetic Resonance
- Impedance Plethysmography Monitors
- Ventilating system
- Therapeutic X-Ray Systems
- Radiant Warmer
- High Frequency Welder
- Diagnostic X-Ray systems
- Dentistry Equipment
- Scientific Equipment
- Ultrasound Equipment for Therapy
- Hyperthermy Equipment
- Chemotherapy
- Semiconductor
- Pulse Oximeters
- EDM
- SANS 211 (CISPR 11)
SANS 211 (CISPR 11)

- Machine Tool Equipment
- PID Conductor
- Infusion Pumps
- Panel Meters
- Frequency converters
- Desktop Computer
- Electric Welding Machine
- Industrial microwave
# SANS 62040-2 (IEC 62040-2)

## Uninterruptible power systems (UPS)

<table>
<thead>
<tr>
<th>Measurement Method</th>
<th>IEC 62040-2:2016 applies to Uninterruptible power systems (UPS) and is tested under the standard CISPR 22 and CISPR 14-1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Applicable products</td>
<td>This standard is applicable to all movable, stationary, fixed or built-in, pluggable and permanently connected UPS for use in low-voltage distribution systems with an environment being either residential, commercial, light industrial or industrial, which deliver output voltage with port voltages not exceeding 1500 V DC or 1000 V AC and which include an energy storage device.</td>
</tr>
</tbody>
</table>
**SANS 212 (CISPR 12) (*1)**

**Vehicles, boats and internal combustion engine-driven devices**

Vehicles, boats and internal combustion engines - Radio disturbance characteristics - Limits and methods of measurement for the protection of off-board receivers

CISPR 12:2007+A1:2009 is designed to provide protection for broadcast receivers in the frequency range of 30 MHz to 1 000 MHz when used in the residential environment. Compliance with this standard may not provide adequate protection for new types of radio transmissions or receivers used in the residential environment nearer than 10 m to the vehicle or device.

| Applicable products | The limits in this International Standard are designed to provide protection for broadcast receivers in the frequency range of 30 MHz to 1 000 MHz when used in the residential environment. Compliance with this standard may not provide adequate protection for new types of radio transmissions or receivers used in the residential environment nearer than 10 m to the vehicle, boat or device. This standard applies to the emission of electromagnetic energy which may cause interference to radio reception and which is emitted from a) vehicles propelled by an internal combustion engine, electrical means or both; b) boats propelled by an internal combustion engine, electrical means or both. Boats are to be tested in the same manner as vehicles except where they have unique characteristics as explicitly stated in this standard; c) devices equipped with internal combustion engines. This sixth edition cancels and replaces the fifth edition published in 2001 and its Amendment 1 (2005). This edition constitutes a technical revision. The following changes were made with respect to the previous edition: - deletion of narrowband / broadband determination; - general improvement of wording.

This standard is applicable to controller parts of a vehicle, inclusive of the following:
- Internal combustion engine, electrical means or both
- devices equipped with spark-ignited internal combustion engines
- Instrument panel/Gauge
- Automatic

This standard does not apply to aircraft, traction systems or incomplete vehicles.
SANS 212 (CISPR 12) (*1)
SANS 222 (CISPR 22)

Alarm systems - fire, intruder and social alarm systems

<table>
<thead>
<tr>
<th>Measurement Method</th>
<th>CISPR 22:2008 specifies the requirements that apply to the generation of electromagnetic energy in the frequency range 9 kHz to 400 GHz from alarm systems, fire, intruder and social alarm systems. It is tested according to CISPR 22</th>
</tr>
</thead>
</table>
| Applicable products | This standard is applicable to alarm systems - fire, intruder and social alarm systems and inclusive of the following:  
• All fire fighting related equipment  
• Detectors for smoke, intruder and similar equipment |
Detectors for Intruder Alarm System

Fire Sprinkler

Smoke Detector

Fire Alarm
# Measurement Method

The purpose of this standard is to harmonize as far as practicable all rules and requirements of a general nature applicable to low-voltage switchgear and control gear assemblies (ASSEMBLIES) in order to obtain uniformity of requirements and verification for ASSEMBLIES and to avoid the need for verification to other standards.

## Applicable products

This standard applies to low-voltage switchgear and control gear assemblies (ASSEMBLIES) only when required by the relevant ASSEMBLY standard as follows:

- ASSEMBLIES for which the rated voltage does not exceed 1 000 V in case of a.c. or 1 500 V in case of d.c.; stationary or movable ASSEMBLIES with or without enclosure;
- ASSEMBLIES intended for use in connection with the generation, transmission, distribution and conversion of electric energy, and for the control of electric energy consuming equipment;
- ASSEMBLIES designed for use under special service conditions, for example in ships and in rail vehicles provided that the other relevant specific requirements are complied with;

**NOTE 2** Supplementary requirements for ASSEMBLIES in ships are covered by IEC 60092-302.

- ASSEMBLIES designed for electrical equipment of machines provided that the other relevant specific requirements are complied with.

**NOTE 3** Supplementary requirements for ASSEMBLIES forming part of a machine are covered by the IEC 60204 series.

- This standard applies to all ASSEMBLIES whether they are designed, manufactured and verified on a one-off basis or fully standardised and manufactured in quantity.
SANS 61439-1 (IEC 61439-1)
### Measurement Method

IEC 61204-3:2016 specifies the electromagnetic compatibility (EMC) requirements for switch mode power supply (SMPS) units supplied by source voltages up to 1 000 V AC or 1 500 V DC providing AC and/or DC output(s), except inverter output(s) establishing AC mains. All products tested under standard CISPR 14-1.

### Applicable products

This product standard covers both stand alone and component power supply (PSU) units as defined in this document. It covers PSU units for use in or with IT equipment normally covered by IEC 60950-1 and IEC 62368-1; PSU units for use in or with measurement, control and laboratory equipment normally covered by IEC 61010-1; PSU units for use in or with medical equipment – normally covered by IEC 60601-1; PSU units for use in or with audio, video and similar electronic apparatus – normally covered by IEC 60065 and/or IEC 62368-1. It also covers DC power and distribution equipment and DC/DC converters.
SANS 61204-3 (IEC 61204-3)
### Measurement Method

IEC 61326-1:2012 specifies requirements for immunity and emissions regarding electro-magnetic compatibility (EMC) for electrical equipment, operating from a supply or battery of less than 1 000 V a.c. or 1 500 V d.c. or from the circuit being measured.

### Applicable products

Equipment intended for professional, industrial-process, industrial-manufacturing and educational use is covered by this part. It includes equipment and computing devices for:

- measurement and test;
- control;
- laboratory use;
- accessories intended for use with the above (such as sample handling equipment), intended to be used in industrial and non-industrial locations.

The following equipment is covered by this standard:

a) Electrical measurement and test equipment
b) Electrical control equipment
c) Electrical laboratory equipment
SANS 61326 (IEC 61326)

- Oscilloscope
- Field strength meter
- Spectrum analyzers
- Network analyzers
- Portable car diagnostic
This part of IEC 61800 specifies electromagnetic compatibility (EMC) requirements for power drive systems (PDSs). These are adjustable speed a.c. or d.c. motor drives. Requirements are stated for PDSs with converter input and/or output voltages (line-to-line voltage), up to 35 kV a.c. r.m.s.

PDSs covered by this standard are those installed in residential, commercial and industrial locations with the exception of traction applications, and electric vehicles. PDSs may be connected to either industrial or public power distribution networks. Industrial networks are supplied by a dedicated distribution transformer, which is usually adjacent to or inside the industrial location, and supplies only industrial customers.

Industrial networks can also be supplied by their own electric generating equipment. On the other hand, PDSs can be directly connected to low-voltage public mains networks which also supply domestic premises, and in which the neutral is generally earthed (grounded).
AVR

SANS 61800-3 (IEC 61800-3)