

FAQs: Switches, sockets, sub-DBs and cabtyre

By Anthony Schewitz, ECA(SA) Regional Director, Highveld

Technical enquiries received by the ECA Highveld over past few weeks have mainly been about switches, sockets, where to list sub DBs on the new CoC, cabtyre and Schuko sockets. We've compiled these frequently asked questions with the answers and guidance for the benefit of the electrical contracting industry.

Q: Are plugs with no switches allowed?

A: Yes. The SANS 10142-1 and SANS 164 series of standards only make a switch compulsory on DC sockets (yes, including USBs, but the application thereof is crucial here as there will be sockets that were sold before the implementation of the standards). Socket outlet switches are also compulsory for a small selection of special applications like medical locations and so forth, but there are no requirements to have a switch on sockets for general use (figure 1).



Figure 1 - example of a Crabtree Cyclops socket which incorporates two SANS 164-1 and one SANS 164-2 socket.

But, where there is a switch, it must operate correctly. Figure 2 illustrates the limitations on what needs to be switched and the operation thereof.

Fortunately, the requirements around switchless sockets in SANS 164-2 have become common practise but the questions we've received indicate that there are still some misconceptions and that some electricians are still not familiar with SANS 164-2.

Quoting directly from SANS 164-0:

4.1.1 Plugs, socket-outlets and socket-outlet adaptors shall comply with the appropriate requirements of SANS 60884-1, and the relevant of SANS 60884-2-2, SANS 60884-2-3, SANS 60884-2-4, SANS 60884-2-5, and SANS 60884-2-6. Switches incorporated into socket outlets, socket-outlet adaptors or plugs shall comply with the requirements of SANS 60669-1. Amdt 4

Where switches are incorporated into multiple socket-outlets on one wall plate for fixed installations, the switch shall disconnect the live connection to all socket-outlets, alternatively each socket-outlet shall be disconnected by its own switch as specified in figure 1. Amdt 6

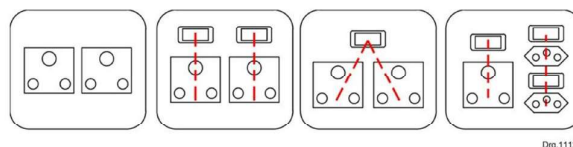


Figure 2 - SANS 164-0 drawing indicating the new switching rules. (Figure 1 in SANS 164-0).

Q: Can a socket be placed near to a basin?

A: Yes. A basin or sink (in a kitchen, for example) does not have 'zones' like a bathroom as you are presumed not to have a total body resistance drop. When there are no zones, we have to look at two basic safety provisions to establish the likelihood of water collecting and the suitability of the ingress protection when exposed to the weather; and the protection of the persons operating the device either by means of earth leakage protection or a safety supply such as shaver sockets, etc.

Unless the sockets are in a special location such as a bathroom or next to a swimming pool and have their own additional limitations, then the typical references are:

6.15.6.1 A socket-outlet that is exposed to the weather (or to the condensation, dripping, splashing or accumulation of water) shall have a rating of at least IP44 in accordance with SANS 60529. The rating applies whether a plug is in or out.

NOTE The IP ratings are explained in annex G

6.15.6.3 A socket-outlet shall not be installed within a radius of 2 m of a water tap (in the same room) unless the socket-outlet

- has earth leakage protection, or
- is connected to a safety supply.

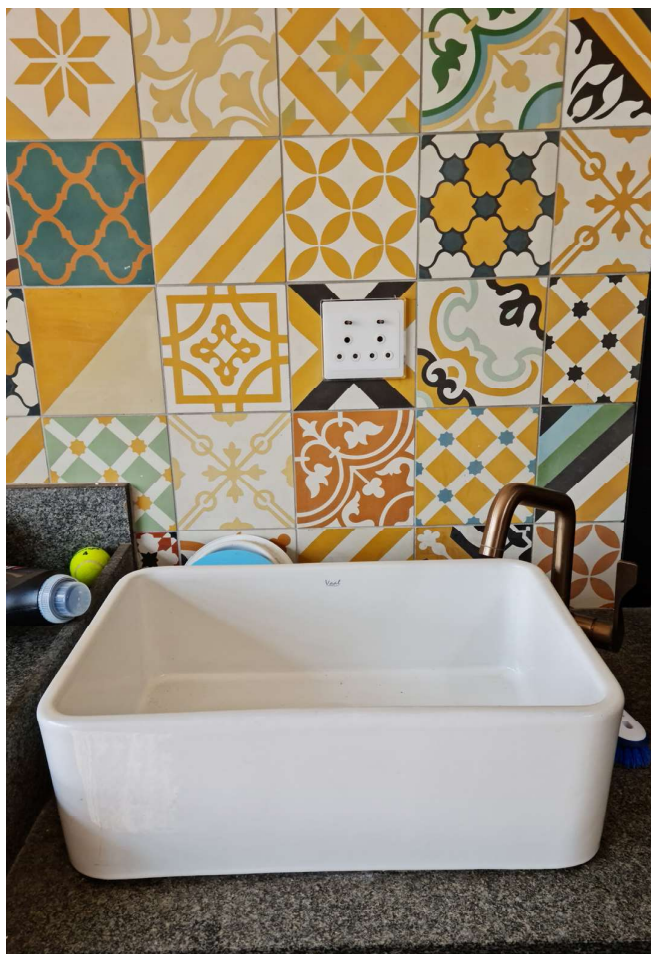
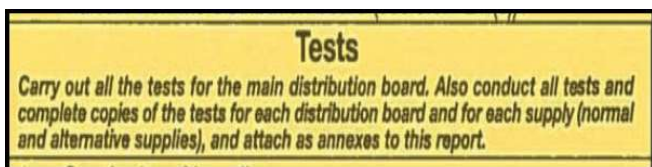


Figure 3 - a socket installed above a basin.

Q: The new two-page CoC and test report doesn't have space for sub-DBs – what do I do?

A: When dealing with sub-DBs one needs to attach a test report for each DB and supply. It has always been a requirement to attach tests for sub DBs as per the below from the Edition 1 and Edition 2 Test Report and clause 8.6.1.



SANS 10142-1 (Ed 1 and Ed 2)

8.6.1 General

NOTE Conduct all tests and complete a copy of the test report for each distribution board and supply (normal and alternative supplies). Amdt 1

it is evident that although it has always been a requirement, it is rarely done hence the new test report enforces the completion of documentation for all the tests on DBs and supplies.

Although you can make your own test reports or make copies of a test report for completion, the ECA(SA) supplies booklets of additional test reports (figure 4) for members and non-members who want their documents to look consistent or who may not have the luxury of a printer nearby.

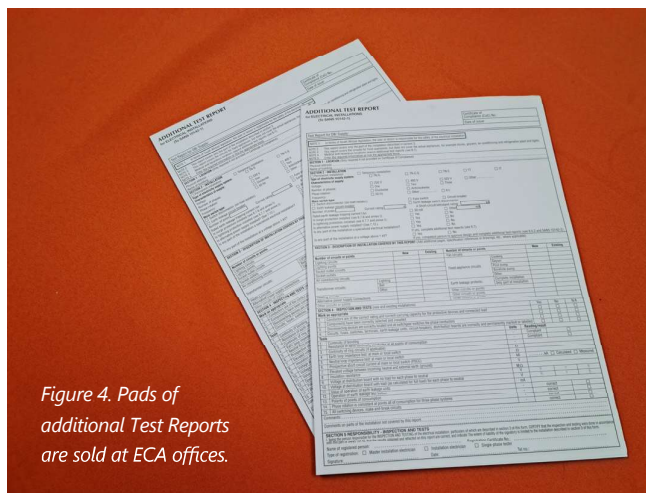


Figure 4. Pads of additional Test Reports are sold at ECA offices.

Q: Is it true that cabtyre can now be used in an installation?

A: Yes. As can be read in the changes in SANS 10142-1 Ed 3.1 2021, clause 6.1.11 states that you can use cabtyre also known as 'flexible cord' with provisions. This change was implemented in SANS 10142-1 ED3:2020. You would have to check the cable ratings, colour coding and installation method very carefully as certain cables would not have sufficient insulation and methods of installation and over current protection would have to be double checked.

6.1.11 Where flexible cords are used as part of the electrical installation, the selection, installation and colour identification (see 6.3.3) shall be done in accordance with this part of the standard. Flexible cords with cross sectional area less than 1 mm² shall not be permitted.

6.1.12 Where flexible cords are used, the strands of the conductors shall be mechanically protected with ferrules to prevent the strands from being cut off in terminations.

Q: Does a ceiling fan/ extractor fan really need an isolator?

A: There are specific requirements for ceiling fans and extractor fans, so the answer would be yes and no. In a previous article, *Isolators and common misconceptions... with a focus on motors (SA Electrical Contractor, Sep-Oct 2021, issue 24)*, we discussed the applicable clauses as well as the concepts of disconnectors relating to motors and the appropriate requirements.

The article also discusses the special requirements pertaining to motors, which would include a fan, but as we will further see there are specific addition requirements when dealing with motors used as extractor fans and when luminaires are incorporated.

The general requirements for fans would normally follow the requirements for motors - that the device must have a disconnector in line of sight at the device or in the distribution board – but in the case of extractor fans and ceiling fans that incorporate luminaires, there are two specific requirements that would apply.

Extractor fans would need a disconnector and can be part of a mixed circuit with the lights if switched with the lights. This was one of the new requirements from the revisions made in SANS 10142-1 Ed 3.

Going hand in hand with the requirements stipulated for motors (except when specified that it can be a mixed circuit with a disconnector) the following applies:



6.16.4.3 Extraction fans

Where an extraction fan supply is switched with a luminaire, it shall be connected to the switched portion of the light circuit, provided that the fan circuit is connected by means of a SANS 164-3 or SANS 164-2-1 or SANS 164-2-2 socket-outlet or a switch disconnector.



Specific requirements for ceiling fans with lights have been in the code for over a decade. Basically, if the fan is a part of a light, then you have the option of installing either a disconnector or an earth leakage protection device in lieu of a disconnector.

6.16.1.3 Where a fan or heater is included in a luminaire, the luminaire is regarded as a fixed appliance. If the luminaire circuit is protected by an earth leakage protection device that has a rated earth leakage tripping current (rated residual current) $I_{\Delta n}$ not exceeding 30 mA, a disconnector is not required (see 6.9.3.1).



The best confirmation would be to establish whether the fan includes a light or not, and whether it is an extraction fan to ascertain the specific requirements.

Q: Is the round or 'Schuko' socket legal?

A: The answer is yes and no! I have seen many people confused with the requirement when it comes to these sockets, as the unearthed type is legal, but the earthed type is not accepted in this country.

Wikipedia describes 'Schuko' as "a short form of the German term *Schutzkontakt* (literally: protective contact), which indicates that plug and socket are equipped with protective-earth contacts (in the form of clips rather than pins). Schuko connectors are normally used on circuits with 230 V, 50 Hz, for currents up to 16 A."

To clarify, the round unearthed socket in figure 6 is acceptable as long as it is installed together with an earthed SANS 164-1 or 164-2 socket, and the combination in figure 5 would be acceptable in an installation.



Figure 5 – A combination that would comply with clause 6.15.1.1.6 of SANS 10142-1.



Figure 6 –an unearthed SANS 164-6 socket.

It is important to note that the dimensions of the unearthed version are well-documented in SANS 164-6, which is the standard to which it must conform.

6.15.1.1.6 A two-pole socket-outlet without earthing contact that has dimensions complying with SANS 164-2 or SANS 164-6 shall only be installed in a fixed installation when it is integrated with a socket-outlet complying with SANS 164-1 or SANS 164-2 with earthing contact in a multiple socket-outlet.

The earthed Schuko conforms to CEE 7/3 and originated in Germany. Unfortunately, the earthed type identified by the exposed male earth pins or clips is not acceptable in South Africa, however they are manufactured locally for the export market where it is acceptable.

An example of which is below:



Should you have any questions that you'd like answered or if you need clarity on electrical issues, call the Highveld office on (011) 392 0000 or email Anthony Schewitz at anthony@ecasa.co.za or the ECA's Technical Adviser, Johnny Cuniff at johnny@ecasa.co.za