

Dangers of using the Schuko electrical plug in Indonesia.



While you live in Indonesia, you have to adapt to many new things. One thing that is apparent is your inability to run small appliances and electrical/electronic devices that you might have brought from USA (or other locations that use 110 VAC) since the standard household voltage is 220 VAC 50 Hz. You should be able to operate some of your North American devices by using power converters. (some caveats involved) Many of the AC adapters that power small electronic devices (cell phones, tablets, laptops etc), are designed for both 110 and 220 VAC operation, so there should be no issue using these items in 220 volt receptacles.

Most of the power converters that you buy are rather inexpensive and have a transformer in them that converts the voltage from 220 to 110 VAC. The line frequency of 50 Hz remains the same. The higher the power capability of the power converter, there's usually an exponentially higher cost for the converter. (Many of these power converters can operate in the opposite direction as well, converting 110 to 220 volts, if you happen to move back to USA and you want to operate an electrical device that was designed to operate on 220 volts).

A danger that you may not be aware of when using any electrical device in Indonesia, is related to the type of electrical plug that is used. The Schuko electrical plug and receptacle is non-polarized, meaning the **plug can be inserted into the receptacle in either direction**. An electrical connection in Indonesia is no different than what is in North America, other than the voltage and line frequency being different. An electrical connection typically consists of a three conductor wire system, one wire is considered **Hot**, the other **Neutral**, and the last **Ground**. (Some appliances and low power electrical items use only two conductors, omitting the ground conductor.) In Indonesia, there is a voltage potential of 220 volts

between the hot and neutral. The same is present between hot and ground, 220 volts. There should be no voltage between neutral and ground.

The danger arises when a Schuko electrical plug is inserted into the receptacle upside down; there's a 50% chance of this occurring. The **Hot** and **Neutral** on the electrical connection are reversed when the plug is inserted upside down. You might be wondering what the big deal is, and may have lived with this without incident for some time. A simple task like changing a light bulb in a lamp could expose you to an electrical shock, if the hot and neutral were to be reversed.

When using a power converter to go from 220 to 110 VAC, if the Schuko plug for the power converter is inserted correctly, there would be 110 volts present between the hot and neutral, on the output of the converter. There should be no voltage between neutral and ground. If the converter plug is inserted into the power receptacle upside down, **220 volts will be present between neutral and ground in most cases**. This could potentially damage sensitive electronics and could be a shocking hazard.

A potential hazard could occur if you were to plug a power bar, with built in surge protection, into the 110 volt output of a power converter. There is a danger of the electronic components used for the surge protection, to either fry or overheat, and possibly cause a fire. This would only occur if the power plug to the input of the power converter were to be plugged into the 220 volt receptacle upside down.

What to do from here ...

Be careful when using a power converter, that you plug it into the power receptacle correctly. Use power strips preferably without surge protection, and with caution when connecting them to a power converter.

Unplug lamps before you change out light bulbs, to be on the safe side. Unplug your toaster before you attempt to get that stuck piece of toast out with that knife! If your toaster happened to be plugged in upside down, the hot and neutral would be reversed and you could get a good shock.

Don't allow your children (or yourselves) to plug electric/electronic devices that are designed for only 110 volts, into 220 volt receptacles. (an exploding lava lamp, plugged in by our son, was our experience!)