

# **OG Series Generator compatibility Application Note**



# OG Series Generator compatibility

When installing a Kodak OG series inverter. There might be cases where the inverter is installed in an area with no grid connection or such a poor grid connection that it is not even viable. This application note is to assist with choosing the correct generator for your installation.

A compatible generator will have to follow the below specifications:

- The generator must be 150% larger than inverter.
- Must have an AVR.
- Generator waveform THD: < 10%
- Generator Vrms range: 110 ~ 270Vac
- Generator voltage crest factor ( $V_{peak}/V_{rms}$ ): < 1.6
- Generator peak voltage: <380V (for 3 phase system)
- Frequency range: 45Hz ~ 63Hz
- Frequency slew rate: <0.3Hz/sec

If you find that the inverter does not accept the generator it is best to ensure your settings on the inverter is correct:

- Program 03 = APL

The above specifications will need to be followed for the inverter to allow the generator to connect. It is always useful to have a power analyser to analyse the power from the generator to make sure it is compatible.

## Troubleshooting

The following points might resolve the inverter not accepting the generator.

### Cable

Ensure the cable used between the inverter and generator is large enough to carry the current being pulled by the inverter.

Keep the cable as short as possible – this will reduce the voltage drop from generator to inverter.

### Earthing

It is very important to ensure that your generator and inverter shares the same earth. The systems need to be earthed according to the SANS standard.

### Low frequency

The generator should ideally have a frequency of 50-52hz when there is no load. If it is lower or higher than this then the governor will need to be adjusted. To adjust it you will require, usually, a Phillips screwdriver. The screw will need to be turned clockwise or anti-clockwise depending on if you want to increase or decrease the frequency of the generator. The governor typically looks like the image below.

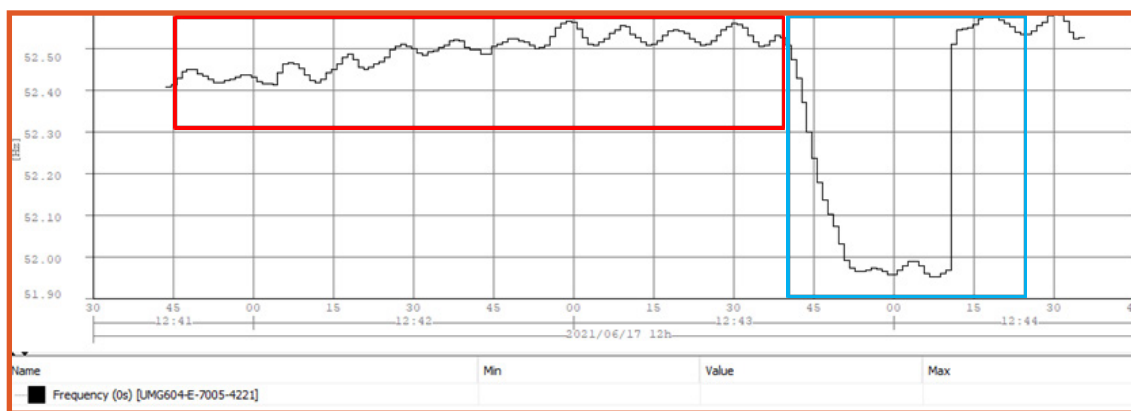
## Load

Ensure that the power being pulled is less than that of what the generator can supply. The Kodak OG-PLUS5.48 can at max load use up to 7880W of power, if loaded to a 100% (5000W on the output side as inverter is rated + 2880 which is the max charging power the inverter can supply to the battery bank). If the generator cannot power the load, reduce the load on the output side of the inverter, or alternatively reduce the charging current from utility in program 11.

## Maintenance

The generator must always be serviced and maintain as instructed by the service manual of the generator. Failure to do so will lead to the generator underperforming and possibly not connecting to the inverter.

## Frequency on a working AVR



Graph 1

The red square represents no load conditions. We can see that the frequency shifts from 0.01hz up to 0.02hz per second. This is in line with the specifications of the inverter.

In the blue square we can see a load has been applied to the generator. We see a drop in frequency of up to 0.5hz, however the AVR quickly stabilizes after the load has been applied and stays stable again only shifting up to 0.02hz. When the load is switched off, we can see the frequency jump back up and stabilizes again.

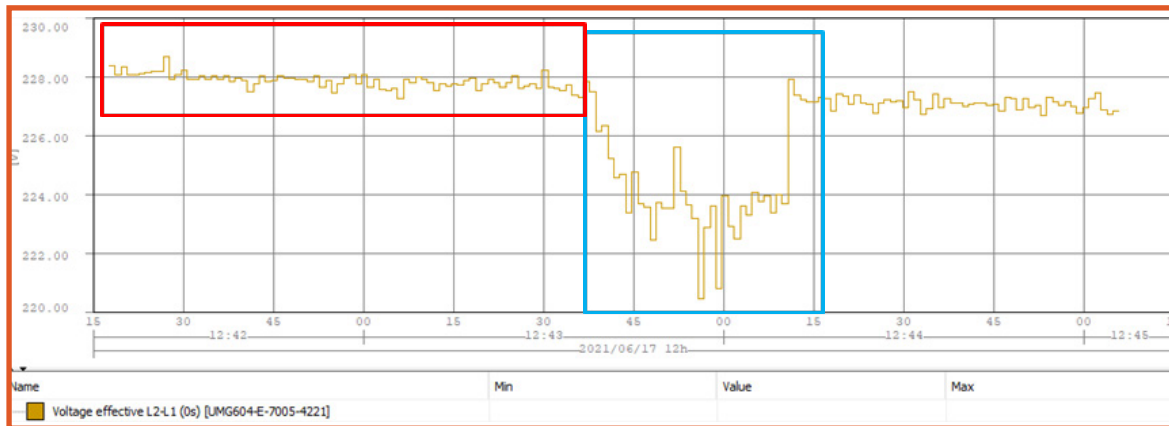
## Frequency on a faulty AVR



Graph 2

On graph 2 we can see that the frequency shifts from 0.01hz up to 0.12hz when under no load. This is not in line with the inverter specification and thus the inverter will not accept this generator and use it as a utility source.

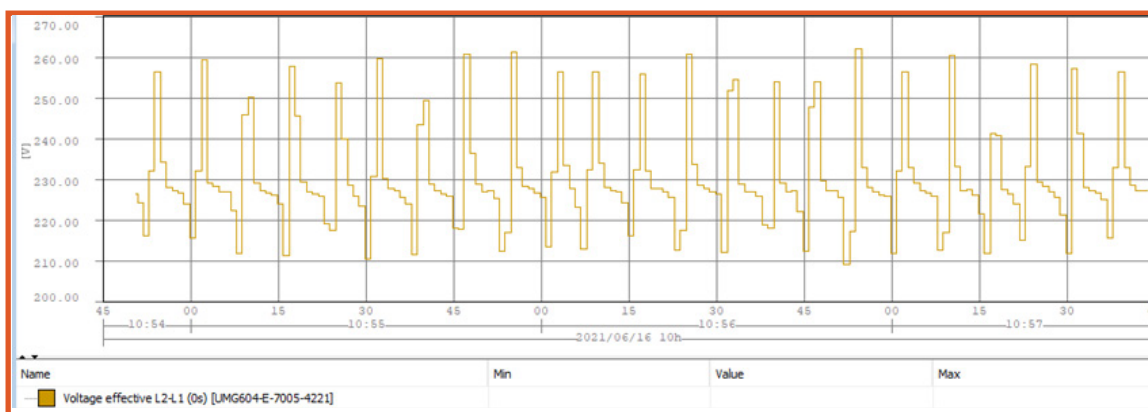
## Voltage



Graph 3

The red square represents no load conditions. We can see that the voltage is very stable and only shifts up to 0.8V per second. The Kodak OG range of inverters will accept a voltage range of 110 -270Vac. When a load is applied the voltage will fluctuate for roughly 15 seconds before the AVR stabilizes the voltage as show in the blue square. Once the load has been disabled the voltage jumps back and stabilizes quickly.

## Voltage on a faulty AVR



Graph 4

On the generator with the faulty AVR we can see that even at no-load the voltage constantly fluctuates. Even though the inverter might accept this voltage range, it is a clear indicator that the AVR cannot stabilize the voltage.