

Application Note No. 002

Why should we increase the invert frequency

Version History

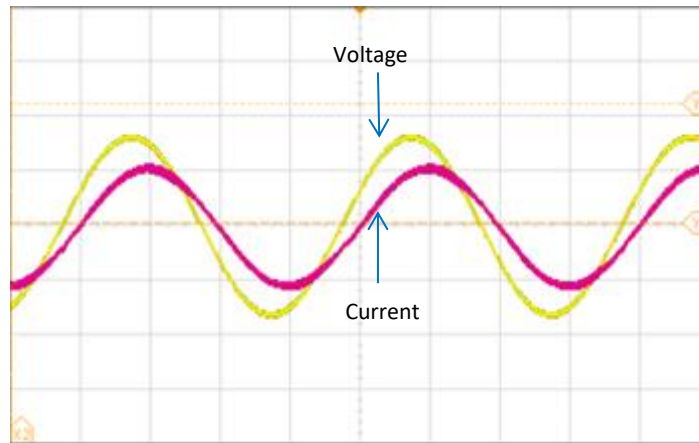
- Version 01(2020-04-17)
Initial Release

Why should we increase the inverted switching frequency?

The greatest effect of high invert frequency:



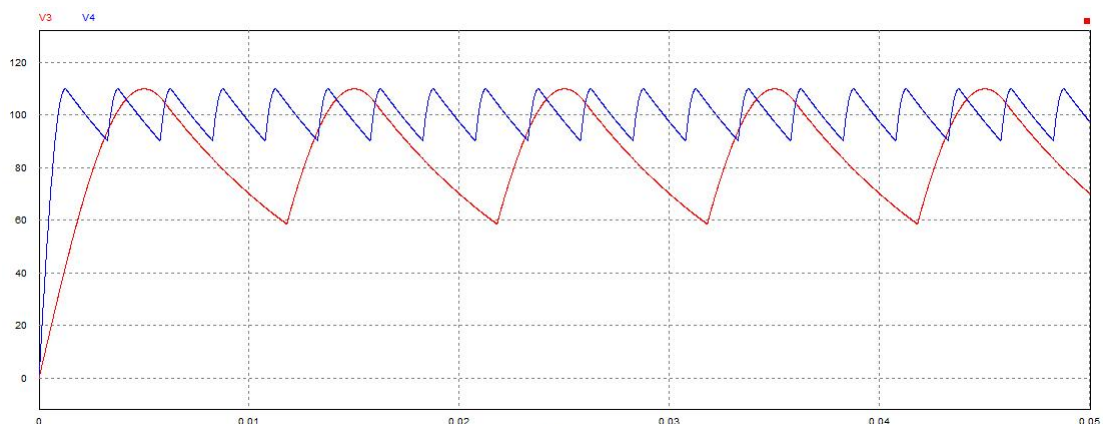
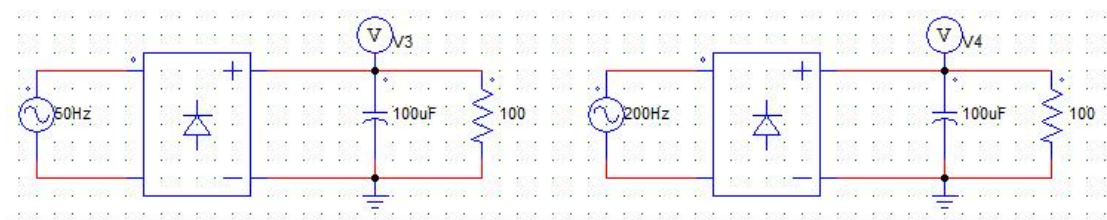
- With the increase of the invert switching frequency, the volume and weight of the inverter are also reduced, and the power density is greatly improved, which can effectively reduce the storage, transportation, installation, operation, and maintenance costs.
- The higher inverted switching frequency can get a better dynamic response and stronger Grid adaptability.
- Cooperate with Renac Power's unique invert control algorithm and dead zone compensation technology to achieve a very small harmonic distortion of output current.



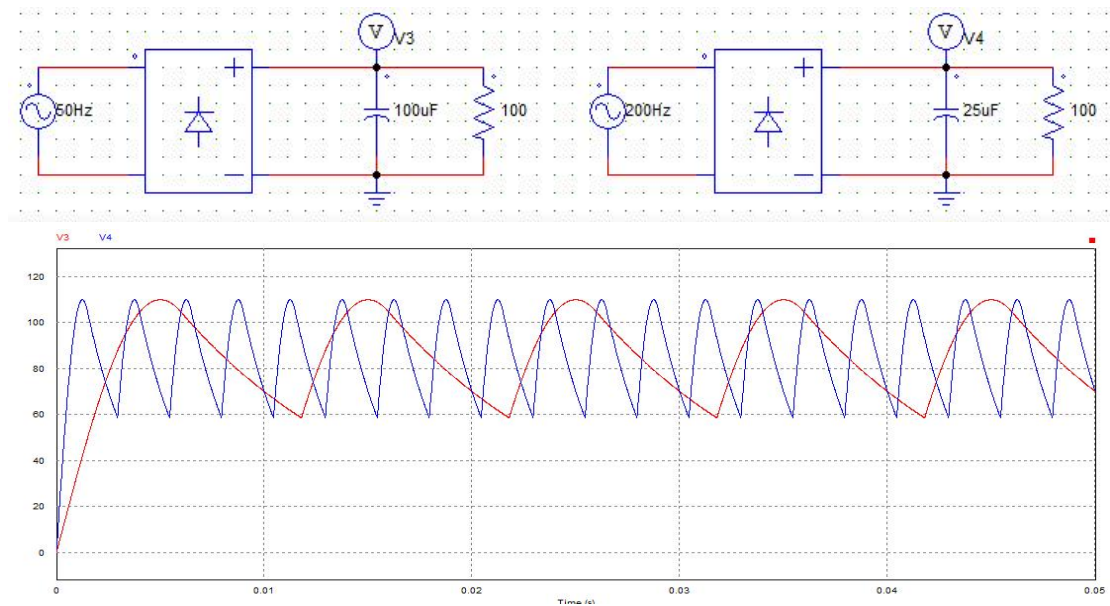
- Under the same conditions, selecting the appropriate switching component and increasing the invert switching frequency can reduce the system ripple voltage and ripple current, the AC loss is smaller, and the efficiency is higher.
- Equivalently, increasing the invert switching frequency under the same conditions can reduce the capacitance and Inductor volume.

1. The detailed knowledge:

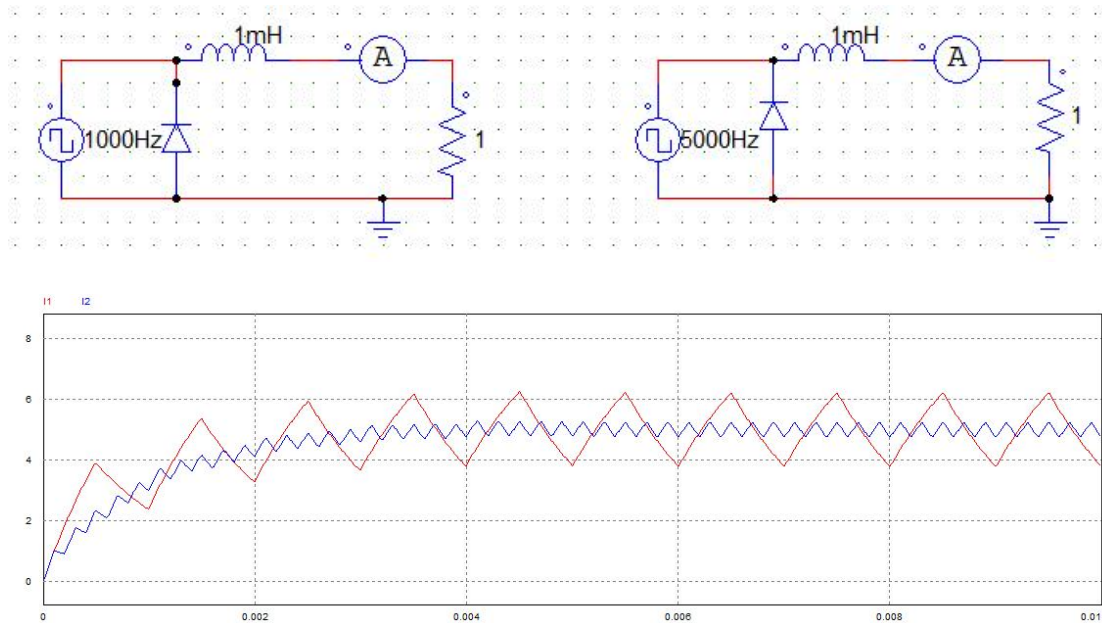
Increase the invert frequency under the same conditions and reduce the capacitor ripple voltage.



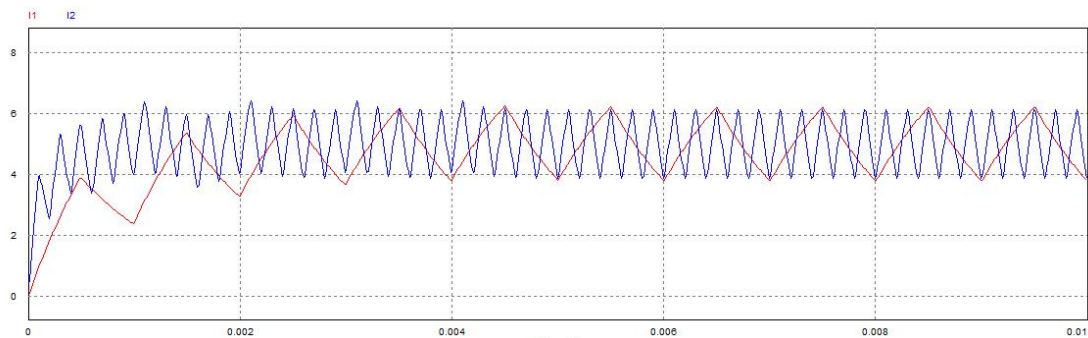
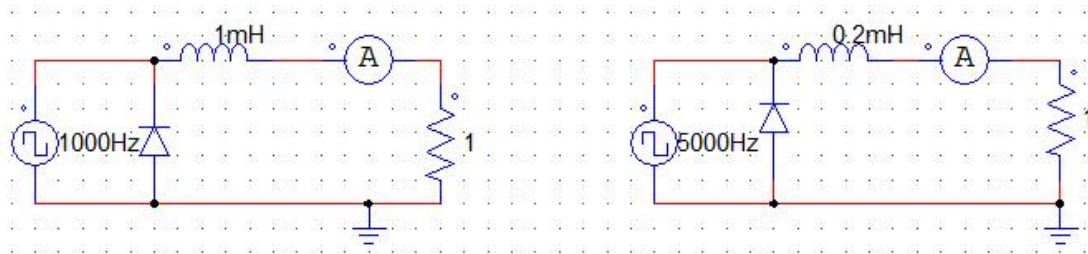
Increase the invert frequency in the same proportion and reduce the capacitance of the capacitor to obtain the ripple voltage of the same amplitude.



The same is true for inductors:
Under the same conditions, increasing the invert frequency reduces the ripple current.



Equally increasing the invert frequency and reducing the inductance value can obtain the same amplitude ripple current, and the high frequency can be stabilized faster.



2. Conclusion

High invert frequency design leads inverter so smart, Of course, do not blindly pursue high invert switching frequency.

Because excessively high invert switching frequency will lead to increased device loss, especially switching component loss and magnetic component AC loss.

At the same time, many parasitic parameters in the circuit cannot be ignored at high frequencies.

While increasing the switching frequency, EMI design, and PCB layout complexity will increase.

Therefore, the inverted switching frequency is not as high as possible.