

Application of reactive power compensation device



- Any place where low-voltage transformers are installed and beside large electrical equipment should be equipped with reactive power compensation devices (this is the regulation of the national power sector), especially those industrial and mining, enterprises and residential areas with low power factor must be installed. It is especially required for large asynchronous motors, transformers, electric welding machines, punching machines, lathe groups, air compressors, presses, cranes, smelting, steel rolling, aluminum rolling, large switches, electric irrigation equipment, and electric locomotives. In addition to incandescent lighting in residential areas, air conditioners and refrigerators are also consumers of reactive power that cannot be ignored. The rural electricity situation is relatively bad, most areas have insufficient power supply, the voltage fluctuates greatly, and the power factor is particularly low. The installation of compensation equipment is an effective measure to improve the power supply situation and improve the utilization rate of electric energy.



APFC VS SVG

➤ 1. Compensation method

APFC uses capacitors for reactive power compensation, and the power factor after compensation is generally **around 0.8-0.9**.

SVG uses a power module for reactive power compensation, and the power factor after compensation is generally **above 0.98**. This is the most advanced power technology in the world, and this technology in China is very mature;



2. Compensation Time

- APFC can complete a compensation within 200 milliseconds at the fastest. SVG can complete a compensation within 5-20 milliseconds.

Reactive power compensation needs to be completed in an instant. If the compensation time is too long, it will cause the undesired situation that there is no reactive power when it is supposed to be reactive, and it will come when it should not be reactive;

3. Stepless or step-by-step

- APFC basically adopts the step-by-step compensation of 3-10 steps, each increase or decrease of one step is tens of thousands of methods, which cannot achieve accurate compensation.

SVG can perform stepless compensation from 0.1 kvar, fully realizing precise compensation;



4. Harmonic filtering

- ▶ APFC adopts capacitive type, the capacitor itself will amplify harmonics, so it cannot filter harmonics at all.
- SVG does not generate harmonics, nor does it amplify harmonics, and can filter more than 50% of harmonics.

5. Service Life

- ▶ APFC are generally controlled by contactors or thyristors, resulting in a short service life, usually about three years, with large losses and frequent maintenance.
- SVG is more than ten years, its own loss is very small and basically no maintenance is required.



Why use reactive power compensation device?

- Reactive power compensation technology is a very traditional power technology. It represents the level of a country's power level. In layman's terms, reactive power compensation is to convert the useless power transmitted by the low-voltage transformer into useful power.



1.Reduce line loss by more than 50%.

Nationally speaking, the line loss accounts for about 12%, of which the loss is mainly caused by the reactive component. If the reactive line loss is reduced by 50% to 60%, about 50 billion kWh of electricity can be saved a year, which is equivalent to half of the Three Gorges Project (largest power distribution in the world)of power generation. This kind of project that can increase power generation without consuming primary energy is an excellent green project. And the investment is very small, and the effect is quick.



2. Avoid fines

The Ministry of Electric Power and the Price Bureau of China stipulates that when the power factor is 0.94, the electricity fee will be reduced by 1.1%, and when the power factor is 0.6, the electricity fee will be increased. For example, for a 315KVA transformer, the power factor is increased from 0.6 to more than 0.94, and the annual reward and penalty difference is 30,000 to 40,000 RMB.



3. Expansion is possible without additional investment.

After the reactive power compensation, the load capacity of electricity can be improved, and the transformer can run at full load. For example, a 315KVA transformer, a transformer with a power factor of $\text{COS}\phi=0.6$ load can only provide 189KW of active power for high-quality services, and cannot withstand a capacity of about 300KW, so a 500KVA transformer needs to be replaced. The power factor is increased from 0.6 to 0.98, which is equivalent to an increase of 63%. The existing power is increased from 189KW to 309KW, which can basically meet the required capacity, so a 500KVA transformer is saved, and the cost is about 300,000 to 400,000 RMB.

4. Improve power quality, prolong electrical life and improve product quality.

Thank
you



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**Any Questions,
Please contact me freely !**

**YES WE ARE HERE ALWAYS
WITH YOU (SVE)**

