Sinexcel SVG Application in Press Machine

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We know press machine can damage the capacitor bank.

1. During the press machine working, the loads reactive power changes so fast that capacitor banks couldn't catch up with the speed and changing rate. From this tendency chart of reactive power and current, you can found they change so many times in 2 seconds. We have to use Fluke or AI to catch up these data and record, import them into table and chart.
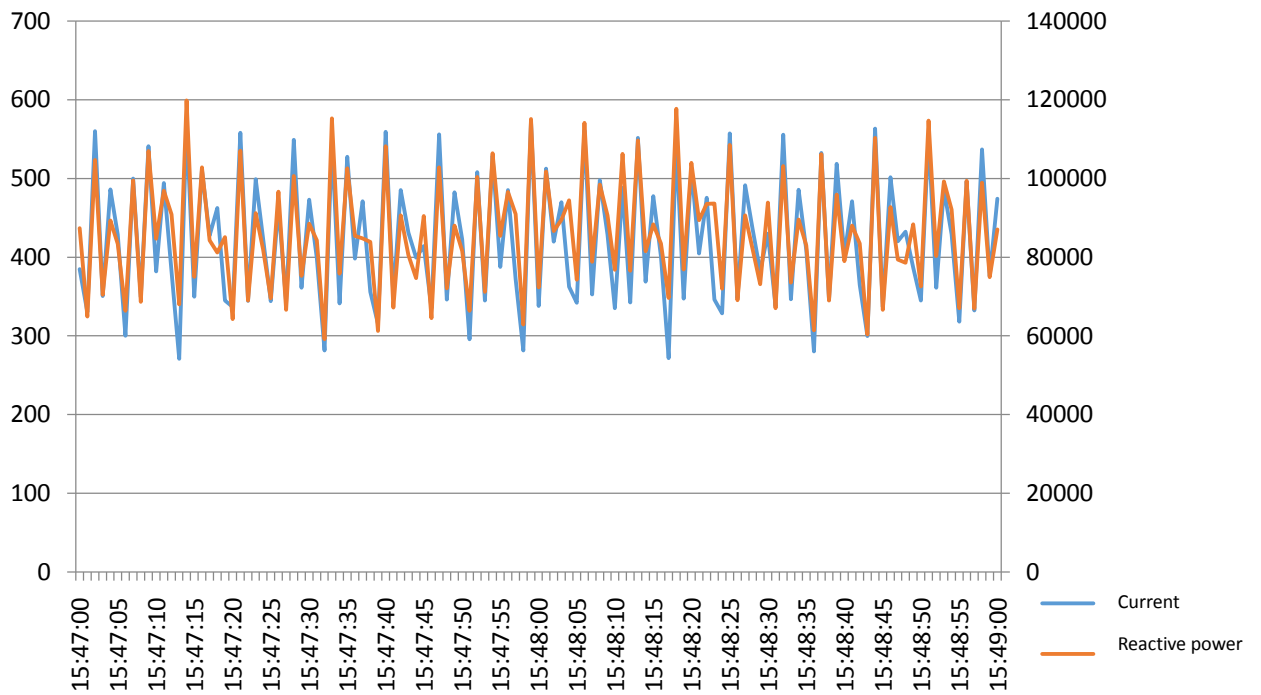

Figure 1-1 reactive power and current tendency chart

2. Press machines can generate a lot of harmonic which can seriously impact capacitor banks. There have high harmonic current with 5/7/11/13/17 orders and the THDi up to 45.3% and THDu 5.8% in the system.
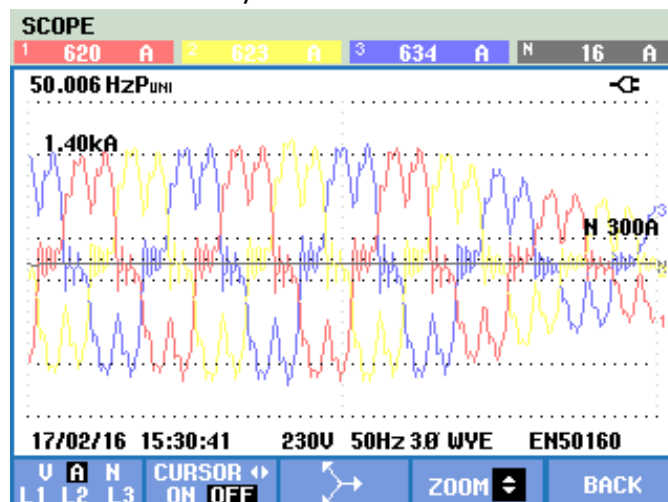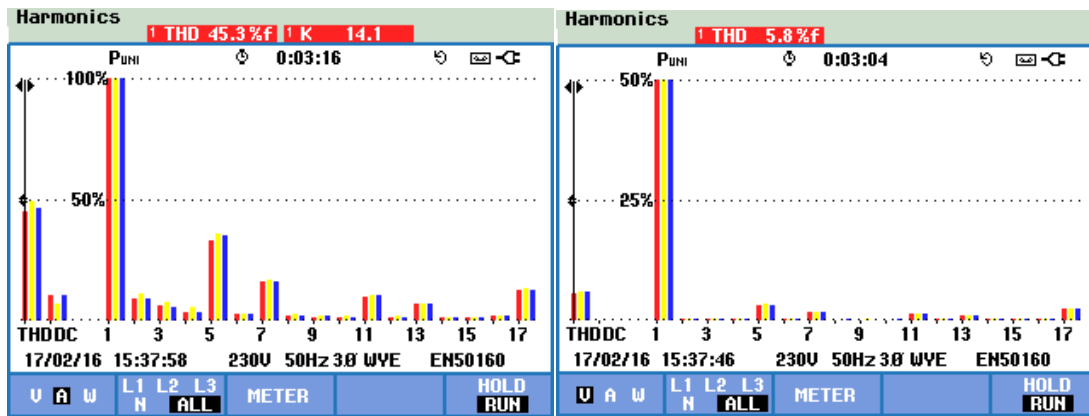

Figure 2-1 current waveform

Figure 2-2 Harmonic voltage spectrum

Figure 2-3 Harmonic current spectrum

3. Press machine have poor PF, one hand is own can generate reactive power, another hand is the harmonic current also as reactive power can occupy the whole system apparent power.
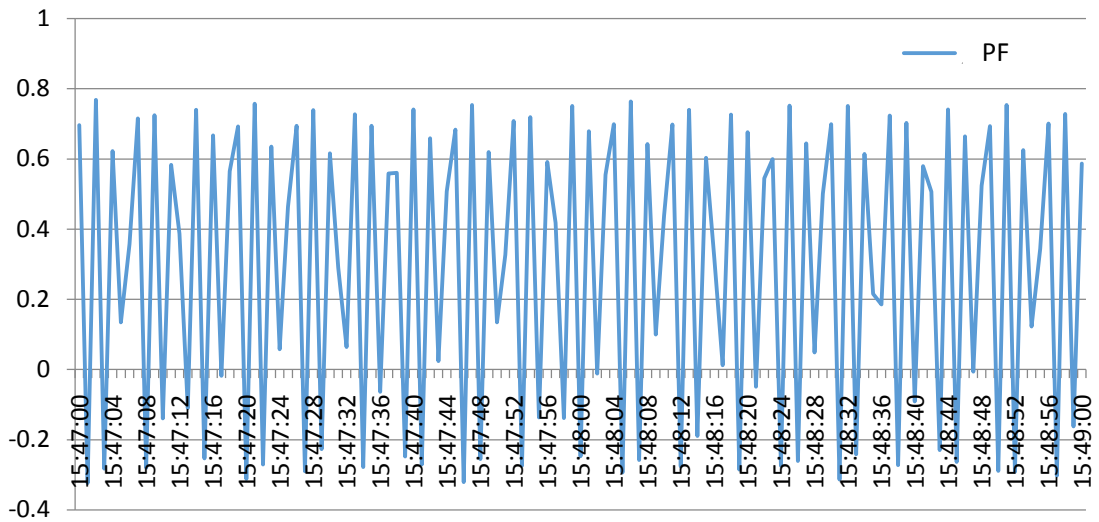

Figure 3-1 System PF

Not affecting by harmonic, Sinexcel SVG could conquer all these problems to perform perfect PFC correction. Here is the sharing for an application Sinexcel SVG used in the press machine.

There are many press machines for manufacturing car parts in the factory. The working speed and frequency are both very high, so the high changing speed of reactive power with the high THDi will cause bad power quality problem. There is large content of reactive power in the power system, which leads to that the normal manufacture can't proceed and will be charged by the grid company.

Sinexcel installed 400kvar in the factory like Figure 4-1. After installation, power quality is conspicuously improved. All the devices in the factory are operating well.
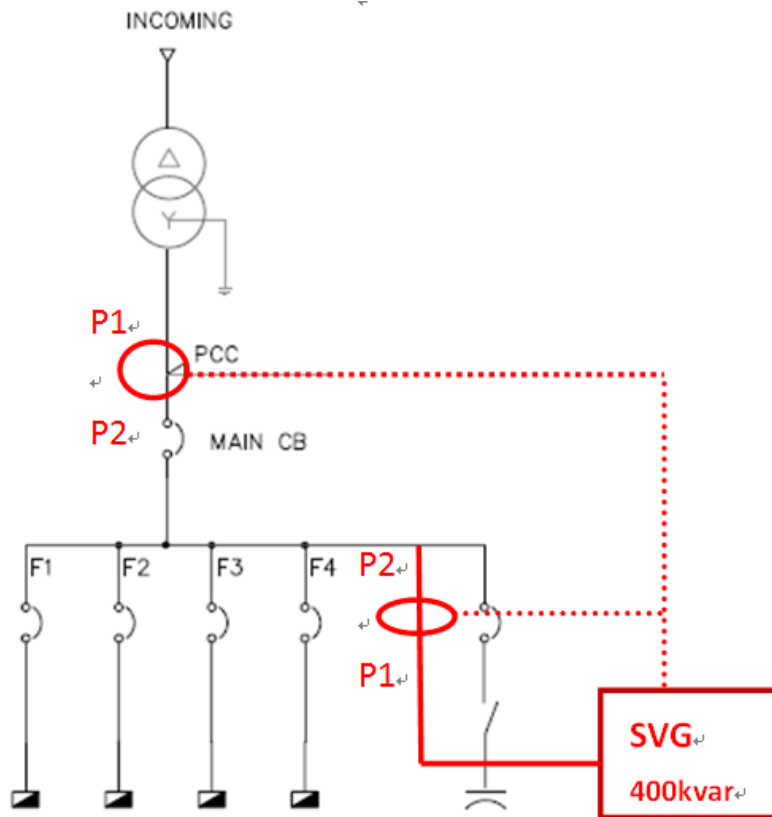

Figure 4-1 SVG installation site

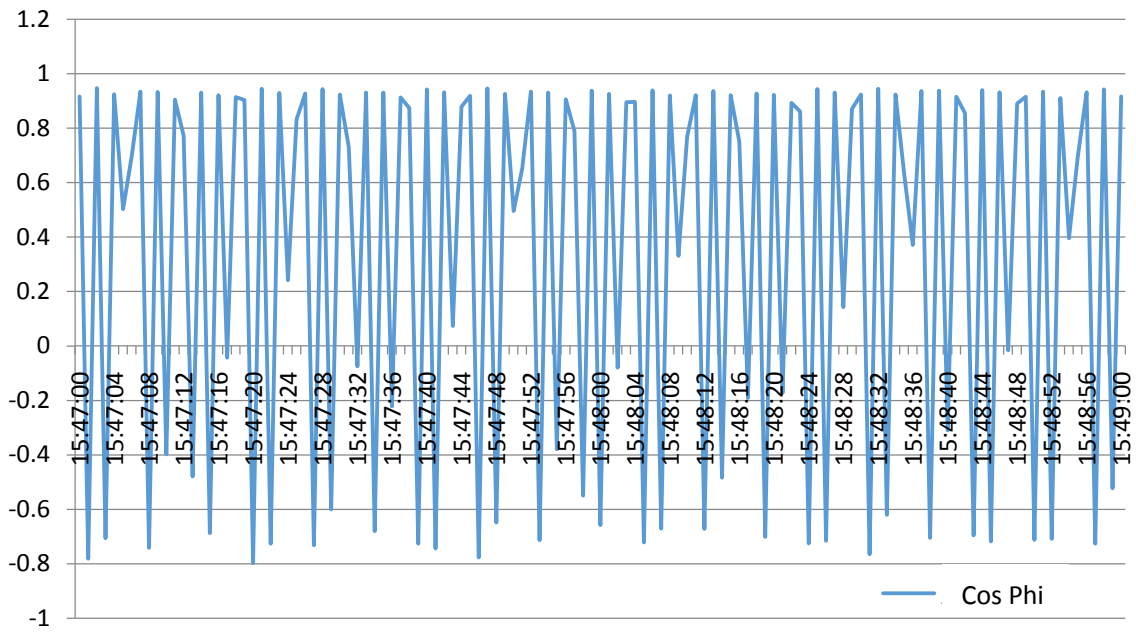Before installation, the Cos PHi has so many small gaps and a lot of low value which closed 0.

Figure 5-1 the system Cos Phi before compensation

After installation, every the Cos Phi closed with 1 like Figure 5-2, sometimes the PF could up to 0.99 when press machine working under low loads like Figure 5-3 and Figure 5-4.
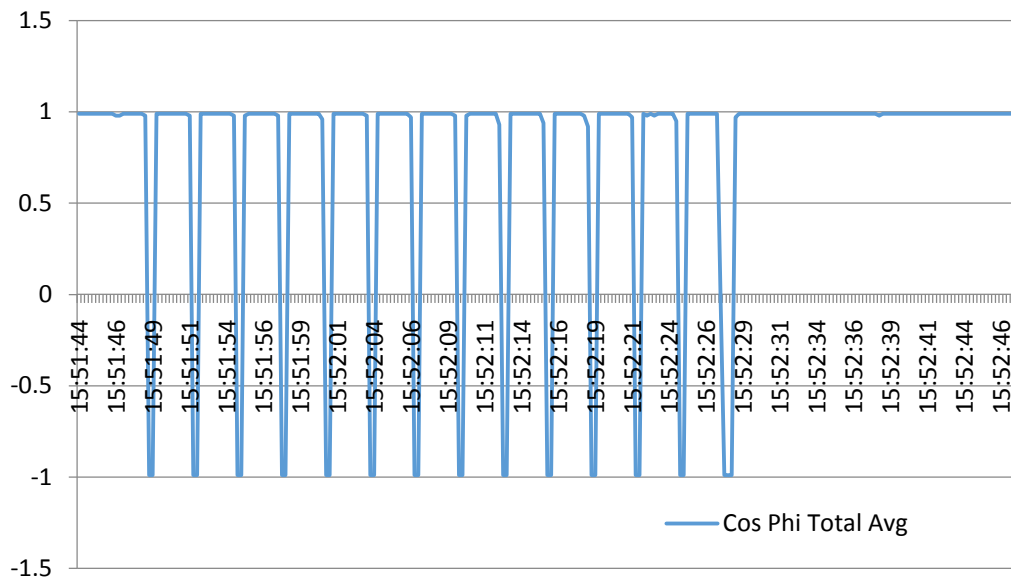
Cos Phi Total Avg

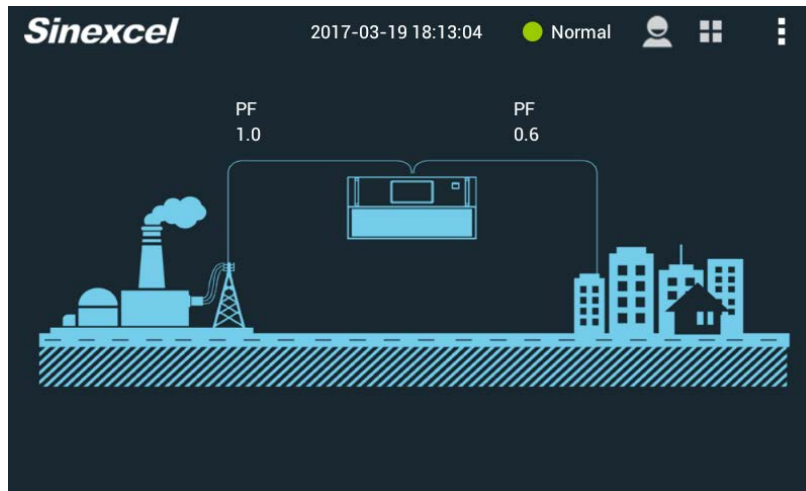Figure 5-2 the system Cos Phi after compensation

Figure 5-3 HMI interface

Figure 5-4 HMI power massage

Why happen Cos Phi appearing -1, it is because active power appear negative value.

$$\cos Phi = \frac{active\ power}{aparent\ power}$$ ------------------------(formula 6-1)