

Sinexcel SVG application in welding machine

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We know welding machines are natural enemy for capacitor banks.

1. During welding period, the loads reactive power changes so fast that capacitor banks could never catch up with the speed and changing rate.
2. Welding machines will generate a lot of harmonic which will seriously impact capacitor banks.
3. Welding machines are normally single phase and two phase which will cause the system three phase unbalance.

Not affecting by harmonic, Sinexcel SVG could conquer all these problems to perform perfect PFC correction and three phase balance. Here is the sharing for an application Sinexcel SVG used in the welding system.

There are many spot welders for manufacturing cars in the factory. The work speed and frequency of spot welders are both very high and they switch very fast, which will cause very 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 500kvar in SS1-XT1, 500kvar in SS1-XT2, 500kvar in SS1-XT2 in the factory. After installation, power quality is conspicuously improved. All the devices in the factory operates well.

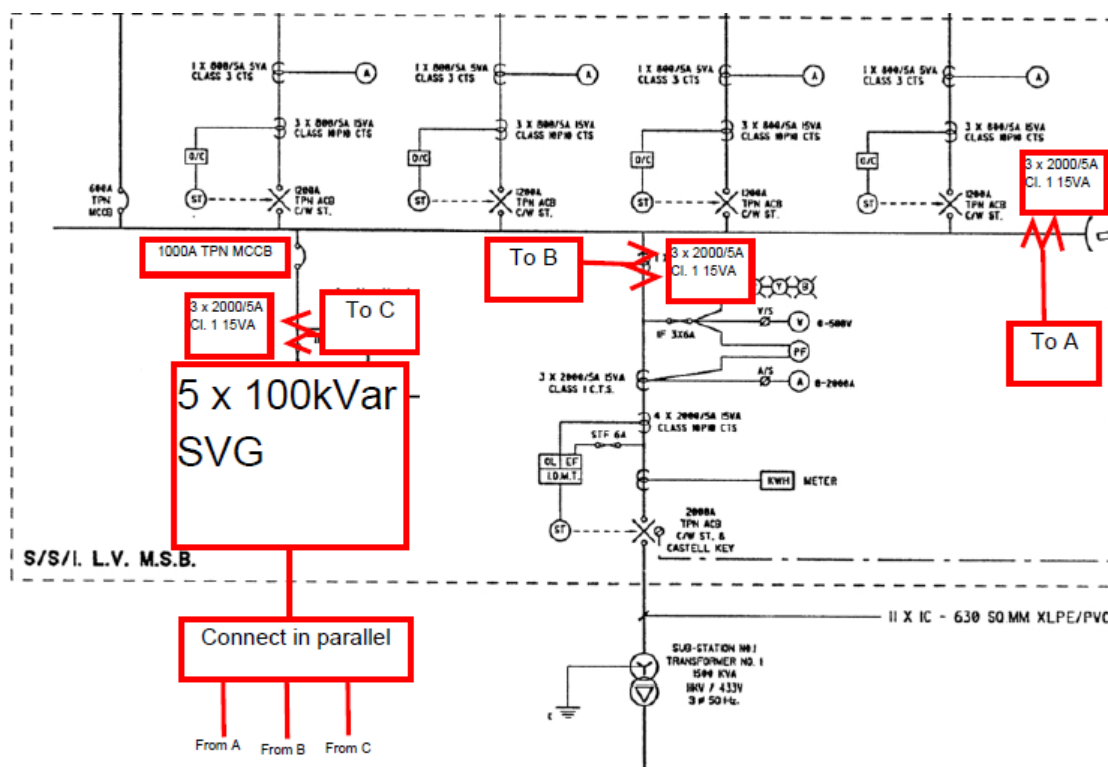
Site picture:



We tested and collected the data on 15 May 2015(without SVG) and 11 June 2015(with SVG) to test the performance of SVG.

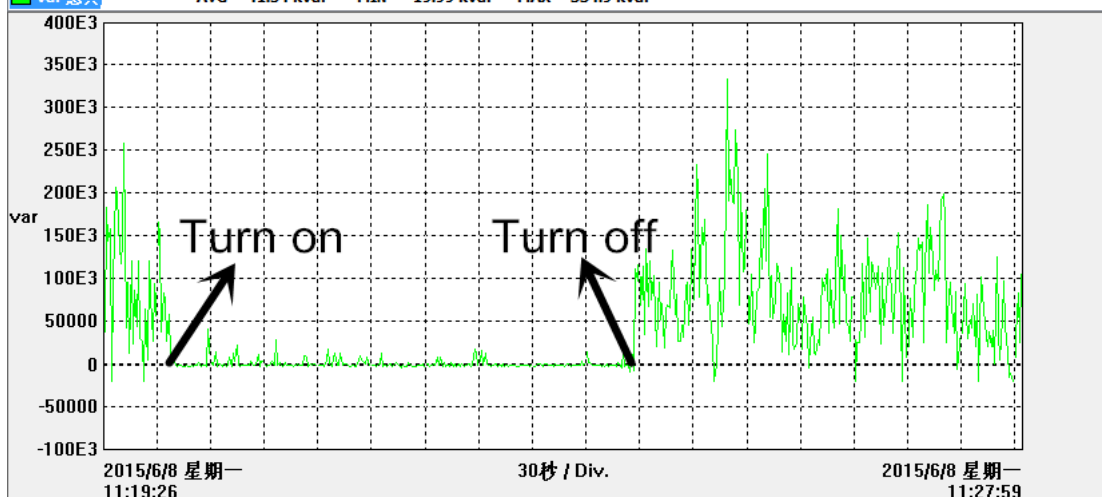
SS1-TX1(500Kvar):

Schematic drawing:



Reactive power Comparison:

var1	AVG = 10.18 kvar	MIN = -6.962 kvar	MAX = 108.7 kvar
var2	AVG = 13.93 kvar	MIN = -44.84 kvar	MAX = 162.4 kvar
var3	AVG = 17.42 kvar	MIN = -10.03 kvar	MAX = 109.9 kvar
var 总共	AVG = 41.54 kvar	MIN = -19.99 kvar	MAX = 334.9 kvar

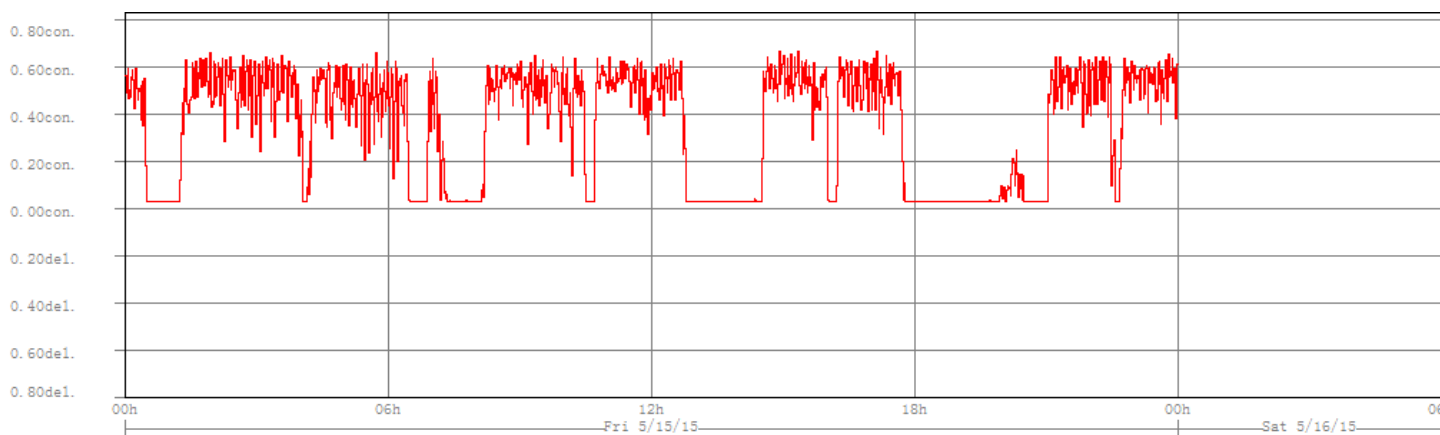


Before we turn on the SVG, the reactive power can reach to 250kvar (max). We can see that reactive power dropped very fast when we turn on the SVG and it went back again when we turn off the SVG. The SVG work and respond very fast.

Data \ Date	15 May 2015(without SVG)	11 June 2015(with SVG)
COS θ (value)	0.49	0.99

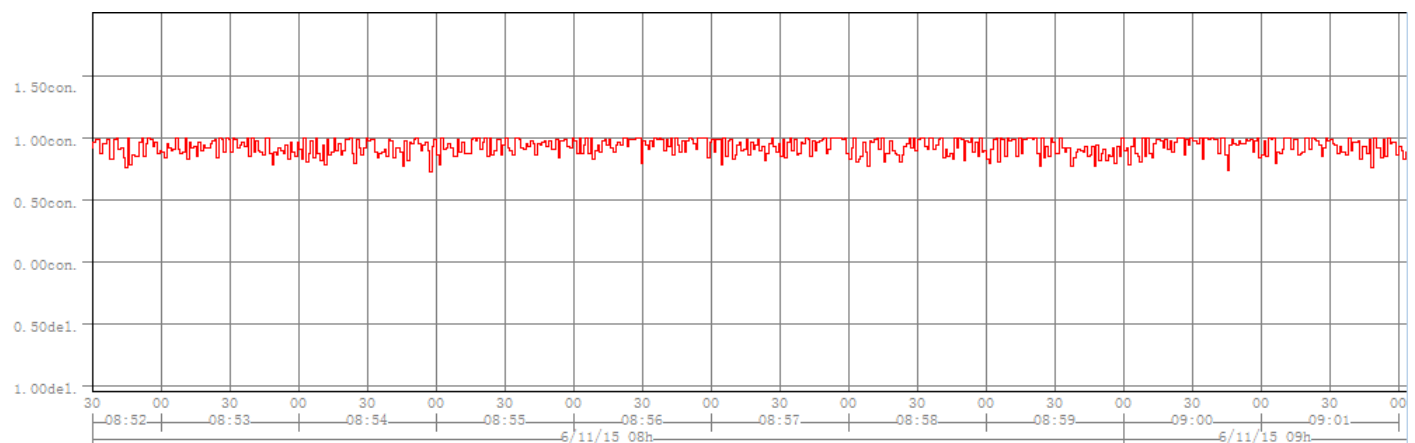
COS θ Comparison:

Before installation:



Name	Min	Value	Max
cos phi(math.) Sum L1-L3 (1m) [SS1 Tx. No. 1]	0.01 con.	0.49 con.	1.00 con.

After installation:

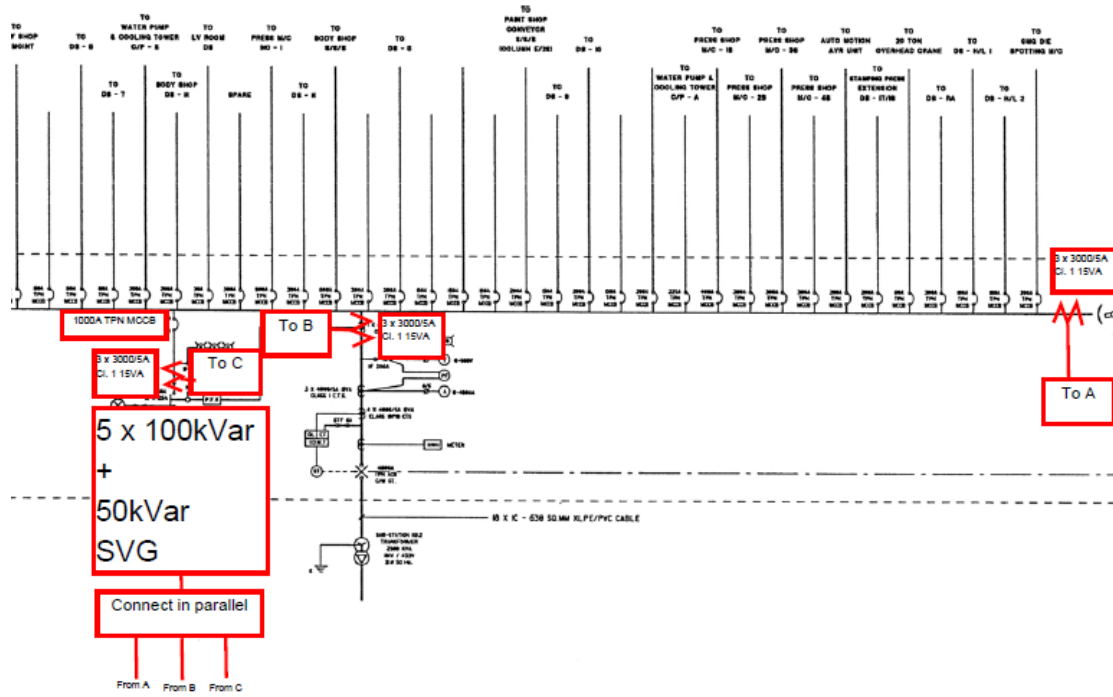


Name	Min	Value	Max
cos phi(math.) Sum L1-L3 (1s) [SS1 Tx. No. 1]	0.99 con.	0.99 con.	1.00 con.

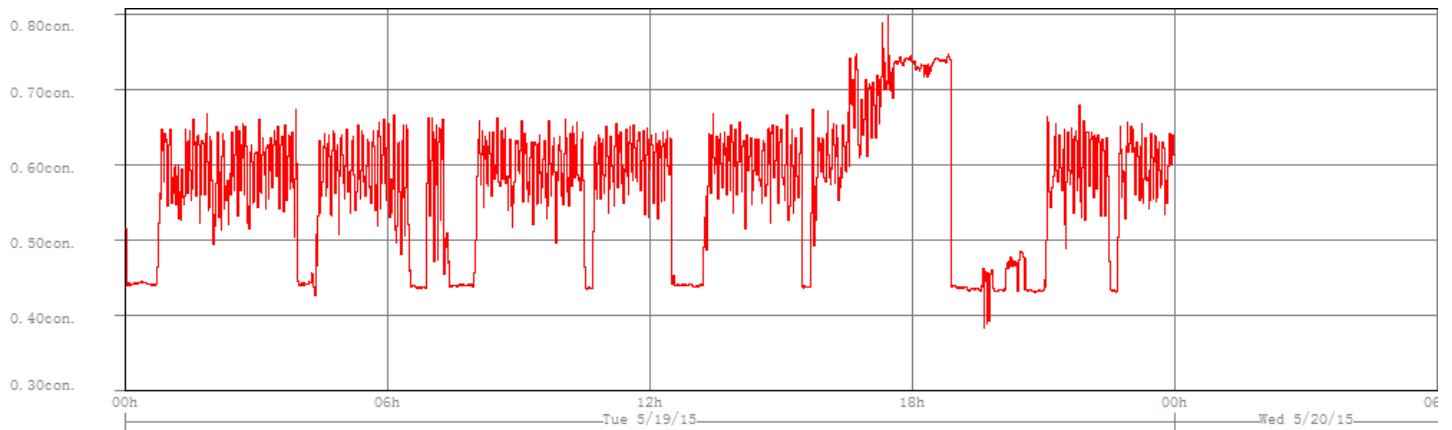
Due to the decrease of reactive power, COS θ performs much better.

SS1-XT2(500kvar):

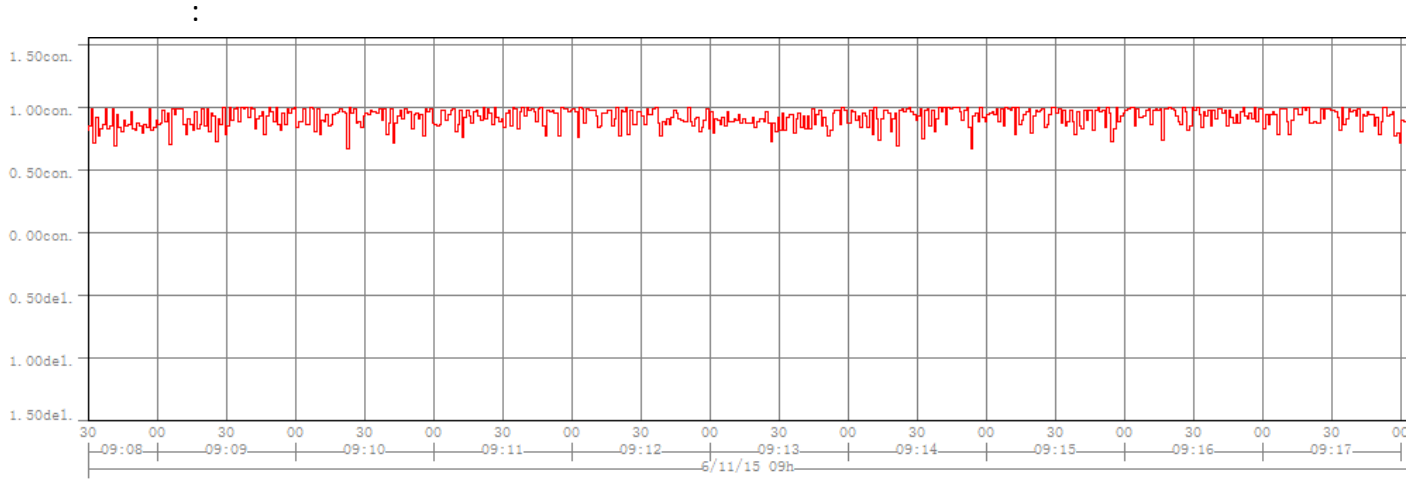
Schematic drawing:



Before installation:



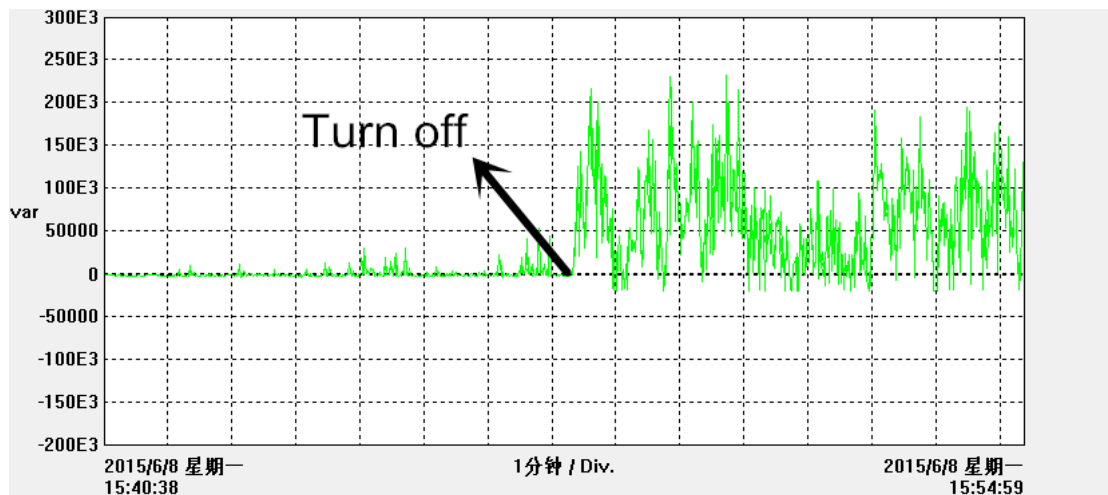
Name	Min	Value	Max
cos phi(math.) Sum L1-L3 (1m) [SS1 Tx. No.2]	0.00 con.	0.62 con.	1.00 con.



Name	Min	Value	Max
cos phi(math.) Sum L1-L3 (1s) [SS1 Tx. No.2]	0.96 con.	0.99 con.	1.00 con.

Data \ Date	15 May 2015(without SVG)	11 June 2015(with SVG)
COSθ(value)	0.62	0.99

Turn off Point:



When we turn off the SVG, the reactive power suddenly arose to 232.6kvar (max).

From the above data, the SVG compensate reactive power very well so that it can ensure the power quality and make devices in the factory work better.

