

## Case Study

# The Dual Benefits of Reducing kVA and Improving Power Factor during the Transition from kW to kVA Demand Charges for Commercial Buildings



More and more commercial buildings choose to replace kW Demand charges with kVA Demand ones. These buildings recognize the benefits of a more accurate assessment of power consumption, the opportunity to improve power factor, and the ability to implement effective load management strategies. By transitioning to kVA Demand charges, these buildings aim to optimize their energy usage, reduce costs, and align with evolving industry practices. However, this transition may create challenges.

## Customer Situation

industry, A large campus in the Southeastern US consisting of several large, commercially constructed buildings experienced an increase in their utility bills following the replacement of kW Demand charges with kVA Demand charges. In order to mitigate these expenses, the campus acknowledged the necessity of implementing a power factor correction system. Given the campus's schedule and significant fluctuations in load changes, an automated system was deemed essential for efficient operation. With a large quantity of audio/video equipment that was frequently utilized, there were concerns that a conventional power factor

correction system could potentially cause interference due to the transients induced by the utilization of electro-mechanical switches.

## Solution

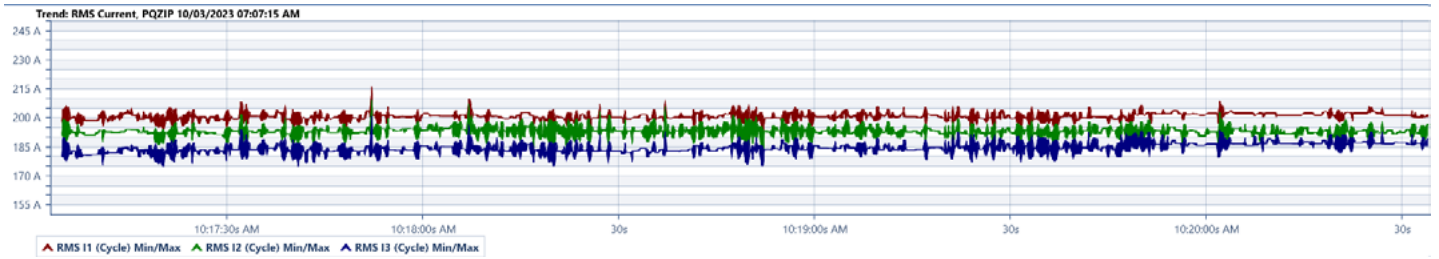
Elspec's [Activar Plus systems](#) were installed at three of the largest transformers on the campus. These systems utilize electronic switching to prevent transients from being induced on the network. Additionally, the Activar Plus systems compensate within 5 network cycles, or 80 milliseconds, effectively eliminating voltage drops caused by motor startups like chillers or compressors. The systems also include 7% reactors for further enhancement.



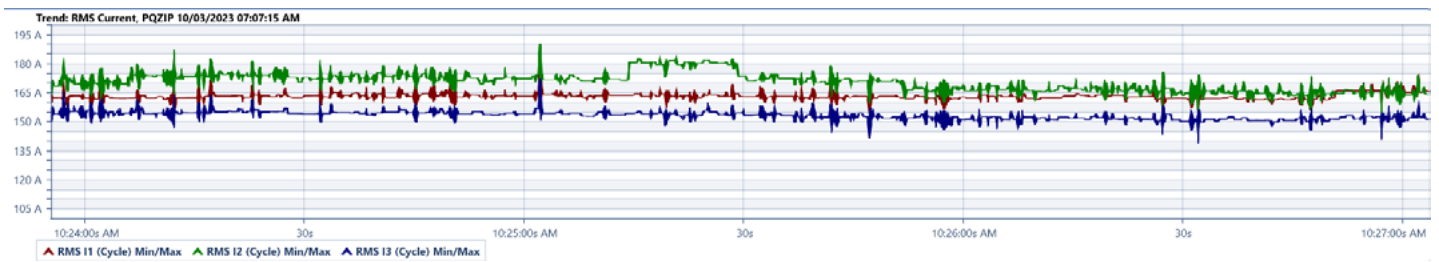
# Results

Before and After data on one of the systems showed the following results:

**Current:** The current levels were reduced with the Activar Plus system. Voltage levels remain between 185V to 200V

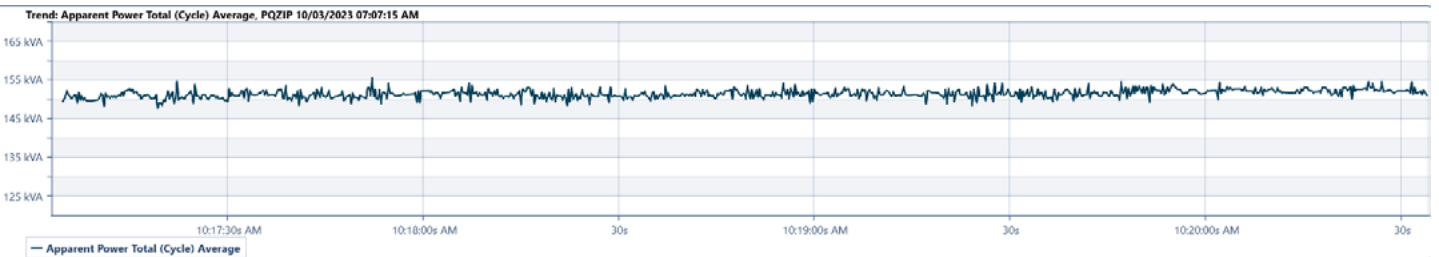


## Without Activar Plus

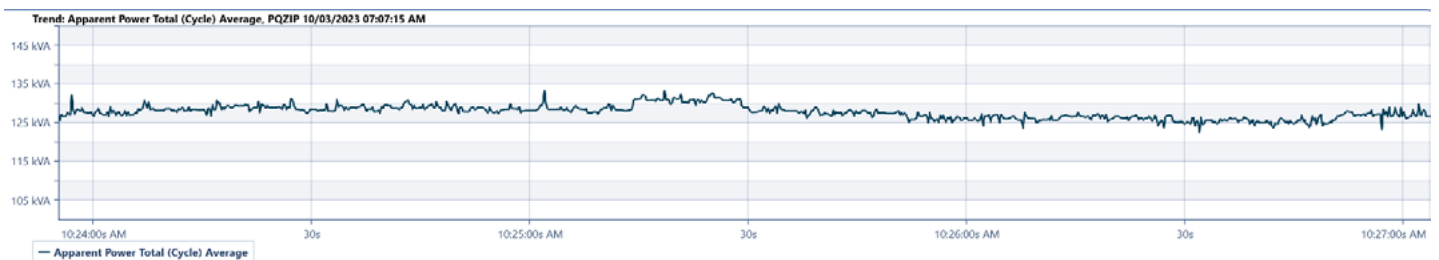


## Current with Activar Plus

**kVA:** a significant reduction of kVA by 18%



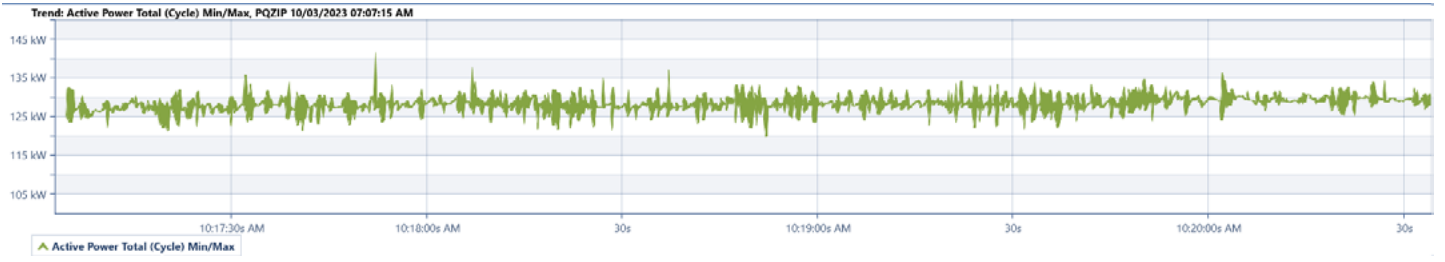
## kVA Without Activar Plus



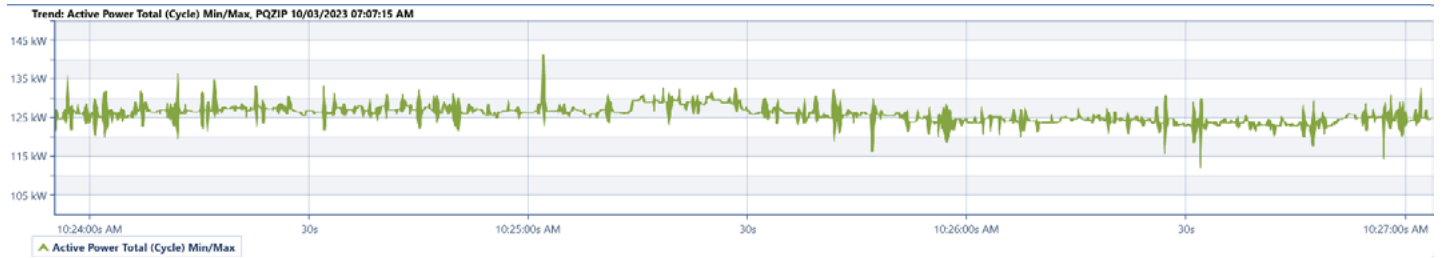
## kVA With Activar Plus

In addition, kilowatts were reduced by 5% and all the reactive power demand was supplied by the system.

## Active Power

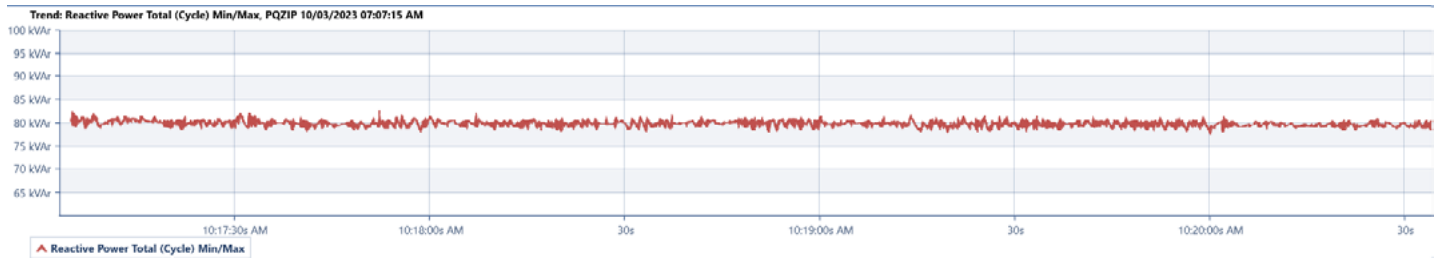


## Active Power Without Activar Plus

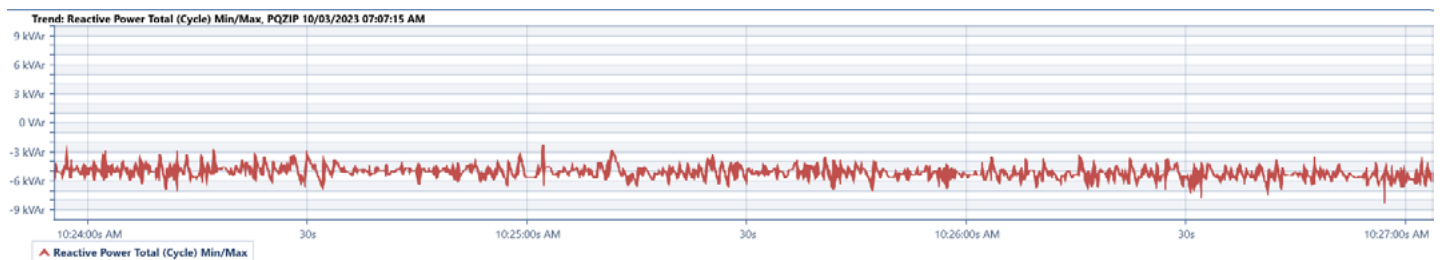


## Active Power With Activar Plus

## Reactive Power



## Reactive Power Without Activar Plus

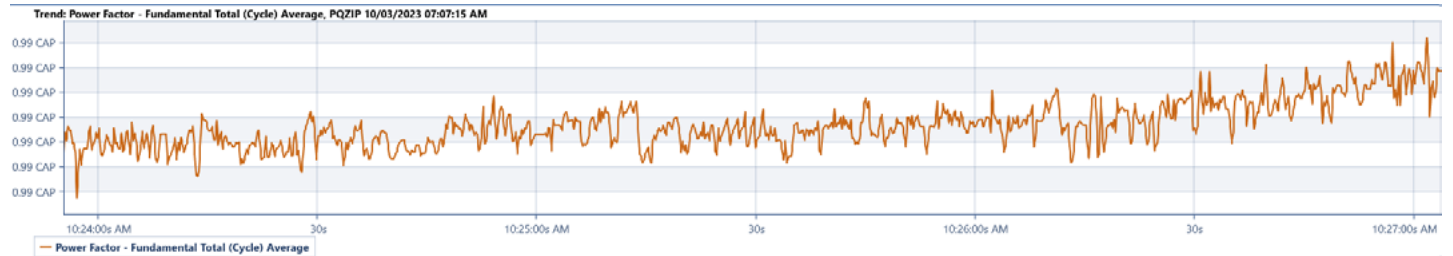


## Reactive Power With Activar Plus

**Power Factor:** The Power Factor improved from an average of 0.86IND to 0.99IND.



### Power Factor Without the Equalizer



### Power Factor With the Equalizer

## Conclusions

As commercial companies move from KW demand charges to KVA demand charges, they need to find a way to reduce KVA, and improve their power factor. Installing Elspec's [power quality solutions](#) is the way to achieve these goals.



Ask us about our complete line of Power Quality Solutions [www.quality-energy.com](http://www.quality-energy.com)



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