



CASE STORY

Harmonic mitigation for chiller systems at a European data center with Comsys ADF

BACKGROUND

As part of a large-scale data center development in Europe, a critical requirement emerged: mitigate harmonic distortion generated by high-capacity chillers serving the cooling infrastructure. The chillers, equipped with multiple compressor systems and pump-mounted drives, posed a considerable power quality challenge due to their nonlinear load profile.

Harmonic mitigation was identified as a key requirement in the electrical design to ensure stable operation and meet the site's distortion limits.

CHALLENGE

The chiller systems generated significant harmonic distortion, with THDi exceeding 40%. In addition, the network already showed elevated background distortion -especially in the higher-order harmonics, making it more challenging to maintain stable power quality.

The site required a power quality solution that could handle nonlinear loads, adapt to changing operating conditions, and effectively mitigate harmonic distortion produced by the chillers.

SOLUTION

To address the power quality challenges, the site was equipped with three ADF P300-240A units, each built with two 120A modules. These were configured to mitigate only the harmonics produced by the chillers -ensuring focused, efficient filtering without affecting the rest of the system.

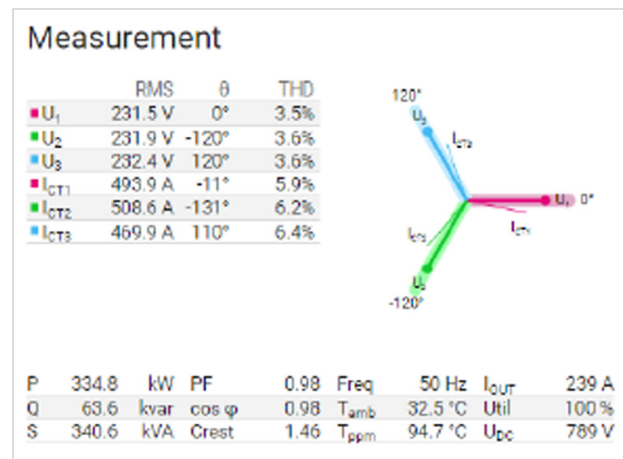
Commissioning was carried out on-site by John Mitchell from CP Automation, under varying load conditions. As the chillers ramped from 200A to 750A, the ADFs responded in real time -reaching full utilization where needed and significantly reducing THDi at each step.



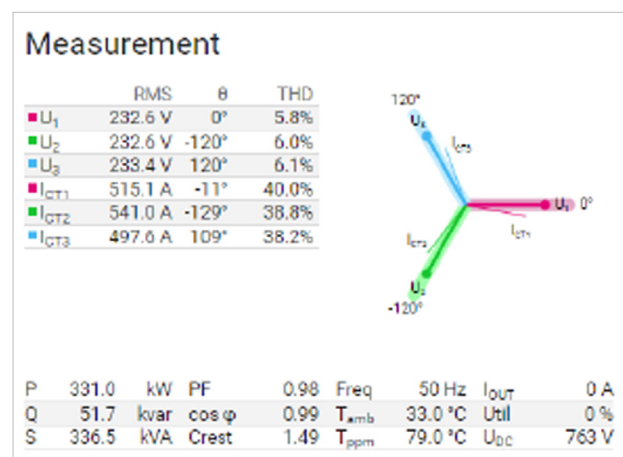
RESULTS

With commissioning complete, the ADF systems are now actively supporting the site's chiller operation. Measurements taken under varying load conditions confirmed that the filters are correctly sized and effectively keeping harmonic levels within the 5% TDD target.

The system is now running as intended, maintaining power quality and meeting compliance targets under real operating conditions.



Measurements with ADF ON



Measurements with ADF OFF



PRODUCT USED IN THIS CASE

ADF P300

- » HARMONIC ELIMINATION
- » DYNAMIC VAR COMPENSATION
- » LOAD BALANCING
- » MODULAR & SCALABLE DESIGN
- » FLICKER COMPENSATION
- » 208-690V NOMINAL VOLTAGE
- » CLOSED LOOP, OPEN LOOP & SENSORLESS CONTROL