



CASE STORY

Ensuring Data Center Reliability with Comsys ADFs

» LOCATION

Europe

» INDUSTRY

Data Center

» INSTALLATION DATE

2025

BACKGROUND

A newly built data center was equipped with multiple chillers operating on a single transformer. To comply with strict power quality (PQ) requirements, the site was initially fitted with active harmonic filters to keep Total Harmonic Distortion of Current (THDi) within 5% limits during both transformer and generator operation.

Despite this precaution, the site soon experienced power quality disturbances. Resonance at higher harmonic orders led to voltage monitoring relay trips and chiller shutdowns, creating serious risks for cooling operations and uptime.

CHALLENGE

The key challenge was to find a solution that could reduce harmonics while at the same time addressing resonances. The existing active harmonic filters were unable to provide this balance, and the operator faced costly

interruptions whenever equipment tripped. With the growing demand for reliability in mission-critical facilities, the customer needed a solution that ensured compliance, prevented downtime, and supported long-term stability.

SOLUTION

To resolve the issue, the operator turned to Comsys and its Active Dynamic Filter (ADF) technology. Unlike conventional filters, ADFs offer advanced control features that allow operators to combine compensation methods within the same system.

For this installation, Comsys configured the ADFs in a mixed-control mode. Lower-order harmonics such as the 5th and 7th were managed using CT-based control, while impedance control was applied to higher-order frequencies where resonance was occurring. This approach not only reduced THDi but also stabilized voltage by mitigating resonances, restoring balance to the network.

The Comsys team worked closely with the operator throughout the project to commission and fine-tune the solution. Phase 1 included



the installation of 8 ADF P300 active harmonic filters, and Phase 2 will add 10 more filters. This collaboration provided the assurance that the system would perform reliably under both grid and generator conditions.

RESULTS

Following the installation, the site achieved THDi consistently below 5% at both the chiller input and point of common coupling (PCC). THDu was significantly below 5%, and the resonance

problems that had triggered chiller trips were eliminated. The facility now operates without interruption, maintaining stable conditions even when switching to backup generation.



PRODUCT USED IN THIS CASE

ADF P300

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