

edgeSV
NTEK SYSTEM

USE CASE

Chillers

SV500 by NTEK SYSTEM | ESA-based Motor & VFD Predictive Maintenance

OVERVIEW

Chillers anchor the cooling plant, the largest non-IT load in a data center. SV500 applies Electrical Signature Analysis (ESA) to motor and compressor signals to screen for rising load at the same cooling demand and for motor or VFD (inverter) issues.

PROBLEM

If cooling stops, the services that depend on it are affected too.

Key challenges:

- **High risk when stopped** — Cooling is the largest non-IT load, and a stop affects connected processes and services.
- **Late-found degradation** — Compressor and motor wear develops gradually, and early changes can appear in current and load patterns first.

EXPECTED OUTCOMES

Gain time for planned maintenance and set inspection priorities.

Expected benefits:

- **Cooling continuity** — Inspect units with worsening condition first to gain time to act.
- **Overhaul timing support** — Read load trends with cooling conditions and maintenance history to judge review timing.
- **Data-driven priorities** — Compares status grades and trends on one scale so scarce maintenance staff go to the highest-risk assets first.

TARGET EQUIPMENT

Chiller compressor | Drive motor / VFD | CHW/CW pumps

SOLUTION

01 VFD Status Diagnostics

Analyzes the VFD's voltage output and current waveforms to diagnose faults in rectifier diodes, DC-link capacitors, and switching semiconductors (SCRs or IGBTs). Also analyzes the condition of power supply and power quality of the VFD.

02 Motor Status Diagnostics

Without installing additional sensors on the equipment, analyzes the voltage and current waveforms supplied to the motor to diagnose mechanical faults (Cavitation, Soft Foot, Bearing, Vibration, etc.), electrical faults (Stator, Cable connection, Heat, Noise, etc.) and Load fluctuation fault.

03 Power Quality Status Diagnostics

For power quality diagnosis, saves power quality indicators such as voltage, current, interruptions, sags, harmonics, etc. in trend data.

04 Edge AI Server

Performs all diagnostic analysis directly on the edge device. Built-in memory and storage—2GB DDR, 8GB eMMC, and SD card support up to 256GB—enable long-term storage of diagnostic data and waveforms without transmitting them to a server. The built-in web-based UI/UX provides access to real-time data, diagnostic result of the equipment, diagnostic data of the power quality, alarm events, reports and etc. without a separate server.

Operational Impact of edgeSV

Continuous monitoring and early detection support availability, maintenance and energy efficiency.

20~40%	10~25%	5~15%	10~20%
Reduction in unplanned downtime	**Maintenance cost savings**	**Energy savings**	**Longer equipment life**

Illustrative ranges, not verified SV500 results. Actual outcomes depend on site conditions and corrective actions; PoC validation is required.

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