

edgeSV
NTEK SYSTEM

USE CASE

Fans and Blowers

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

OVERVIEW

When impellers, belts or bearings degrade, fans and blowers need more load for the same airflow. SV500 uses Electrical Signature Analysis (ESA) to screen fan drive motors and variable frequency drives (VFDs) for early changes.

PROBLEM

Fan degradation leads to airflow problems and higher power use.

Key challenges:

- **Airflow and energy** — Imbalance or belt faults can reduce airflow and raise energy use.
- **Hard-to-reach units** — Many units sit in ceilings or on roofs, so rounds alone are limited.

EXPECTED OUTCOMES

Narrow down likely causes of lower airflow and higher power early.

Expected benefits:

- **Airflow check support** — If changes persist, inspect belts and impellers.
- **Power-rise causes** — Basis to review filter replacement and damper operation.
- **Data-based priority** — Compare many fans on the same basis.

TARGET EQUIPMENT

Supply/exhaust fans | AHU fans | Blowers | Drive motor / VFD

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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