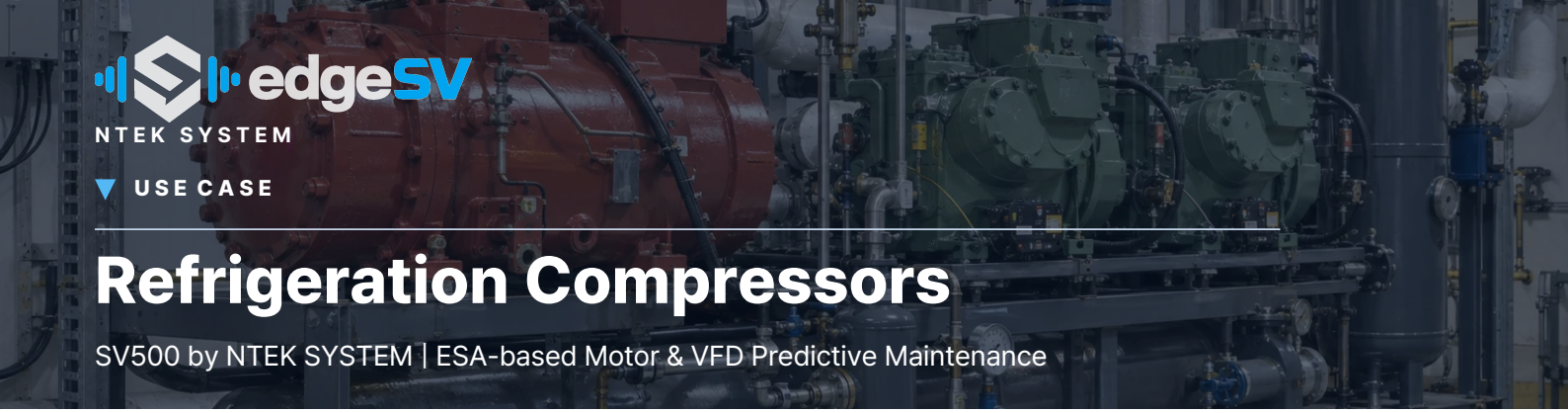


edgeSV
NTEK SYSTEM

USE CASE

Refrigeration Compressors

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

OVERVIEW

Refrigeration compressors are the core load of the cold chain and run around the clock. SV500 uses Electrical Signature Analysis (ESA) on the drive motor to track current and power patterns and screen for anomaly candidates before temperature excursions.

PROBLEM

A compressor failure can lead to lost cold-chain inventory.

Key challenges:

- **Cold-chain inventory loss** — Compressor failure puts stored goods at risk, and reacting after a temperature excursion raises that risk further.
- **Scarce maintenance windows** — Always-on equipment is hard to shut down for service, so the periods when condition indicators shift must be found early.

EXPECTED OUTCOMES

Set inspection order and gain time to act before cooling capacity drops.

Expected benefits:

- **Protect cold-chain stock** — Condition trends set the inspection order and buy time to act.
- **Overhaul timing support** — Read load trends with maintenance history to judge when to review an overhaul.
- **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 | Compressor drive motor | VFD / chiller feeder

SOLUTION

01 VFD Status Diagnostics

Analyzes the VFD input/output voltage and current waveforms to identify faults in rectifier diodes, DC-link capacitors and switching devices (SCRs or IGBTs). Also monitors power-supply condition and power quality.

02 Motor Status Diagnostics

Analyzes motor voltage and current without additional equipment-mounted sensors. Screens mechanical issues (cavitation, soft foot, bearings and vibration), electrical issues (stator, connections, heat and noise), and load fluctuations.

03 Power Quality Status Diagnostics

Learns normal power-quality patterns and evaluates real-time deviations. Tracks voltage, current, interruptions, sags and harmonics to identify abnormal conditions.

04 Edge AI Server

Performs diagnostic analysis directly on SV500. Built-in storage (8GB eMMC and up to 256GB SD) retains waveforms and diagnostic data. Its web interface shows real-time values, equipment status, power quality, alarms, events and reports.

Operational Impact of edgeSV

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

20–40%	10–25%	5–15%	10–20%
Unplanned downtime	Maintenance cost	Energy savings	Equipment life

Illustrative ranges only; not verified SV500 performance. Actual results depend on equipment, site conditions and corrective actions.