

edgeSV
NTEK SYSTEM

USE CASE

Water pump systems

SV500 by NTEK SYSTEM | ESA-based condition monitoring & predictive maintenance

OVERVIEW

Pumps are essential to a building's water supply and chilled- and hot-water circulation. In this scenario, SV500 analyzes voltage and current signals from the pump drive motor to diagnose the condition of both the pump and motor.

PROBLEM

Many pumps run continuously, allowing wear and mechanical problems to develop gradually.

- **Water-supply pump failures and outages** - At a 17-story apartment building in Atlanta, three of four supply pumps failed, causing low pressure for about a month before the water supply stopped. At an apartment complex in Seoul's Gangseo District, flooding in the pump room disabled the supply pumps and required emergency bottled water and temporary pumping equipment.
- **Unexpected pump failures** - A stopped pump can disrupt building operations, including the water supply and chilled- and hot-water circulation.
- **Limited visibility of distributed equipment** - It is difficult to monitor in real time the pumps installed across multiple mechanical rooms.

EXPECTED OUTCOMES

Teams can identify pump abnormalities early and plan maintenance more effectively.

- **Early detection of potential failures** - Detects developing faults early to minimize unexpected incidents and operational risk.
- **Optimized maintenance schedules** - You can predict and optimize maintenance schedule based on diagnostic data.
- **Reduce cost and downtime** - It helps reduce energy consumption, maintenance costs and downtime by increasing equipment driving efficiency.

TARGET EQUIPMENT

Water supply pumps | Pump drive motors | Chilled- and hot-water circulation pumps | Booster pumps

SOLUTION

SV500 uses ESA to analyze electrical signals from pump drive motors and diagnose flow abnormalities and faults in the motor and drive equipment.

- **Pump flow abnormality detection** - Detects flow turbulence, cavitation, and blade or vane damage in pumps.
- **Motor and drive equipment diagnosis** - Detects bearing problems, shaft misalignment, mechanical unbalance, soft foot, winding insulation degradation, ground leakage current, and load-related problems.
- **Adaptive thresholds** - Machine learning learns each asset's normal state and evaluates its condition using thresholds that adapt to load. This applies criteria suited to the specific asset and operating condition instead of a fixed threshold.
- **Web dashboard and data integration** - The built-in web dashboard shows each diagnostic parameter in real time, allowing remote condition checks. Data can be integrated with upper-level systems over Modbus RTU, Modbus TCP, MQTT, and RESTful API.

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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