

Case Study:
Refrigeration Monitoring
for Life Science Laboratory

AUTOMATION

Protecting the Investment with Active Refrigeration Monitoring

Overview

Because scientific experiments may take years of work, any unexpected disruptions can be extremely costly. While working with a large international life sciences company, Atomation learned the customer had spent thousands of dollars building monitoring systems and back-up generators to ensure continuous operation of refrigeration units housing experiments. However, there were few tools in place to notify the lab manager when the temperature inside an old refrigerator started rising unexpectedly.

Goals

- Prevent loss due to refrigeration failure
- Protect investments in research and experimentation
- Improve maintenance efficiencies

Requirements

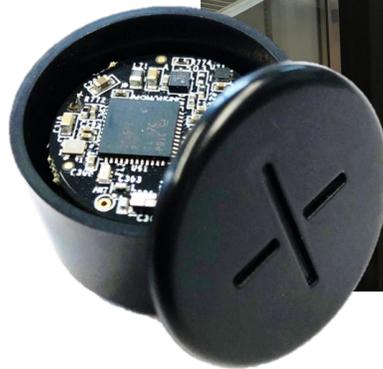
- Operate inside refrigerators, coolers and freezers
- Operate at room-temperature and high temperatures to monitor compressors
- Usable across a variety of units, regardless of age, brand or size
- No wires: must not break refrigeration seal
- No external power
- No custom programming / IT support

Atom Deployment

Tech Specs

AT-C 1.0

- **Computing Power:** CPU and Flash Memory
- **Sensors:** Vibration, Temperature, Humidity, Impact
- **Wireless Communication:** Bluetooth Low Energy
- **Battery Life:** 2 years under proper conditions
- **Installation:** Magnet
- **Size:** 28.5mm x 17.7mm



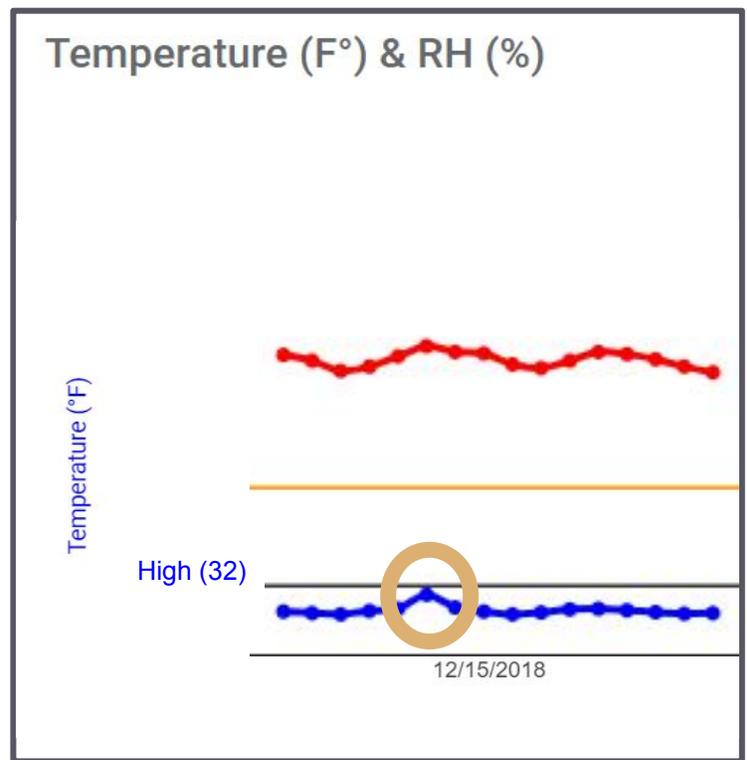
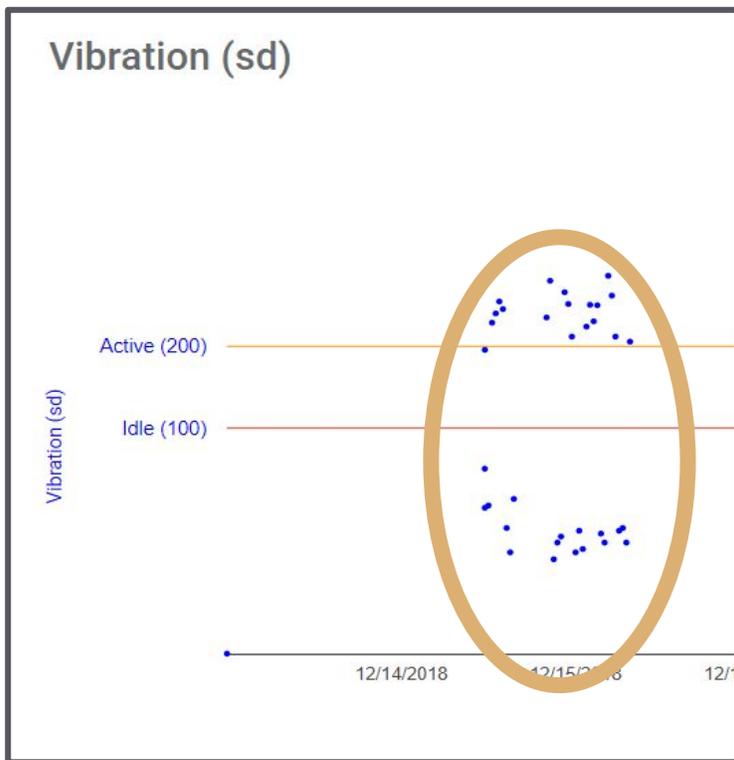
Execution

- **Equipment:** one cooler, one refrigerator and one freezer per lab
- **Installation:** Atoms were magnetically attached inside each unit and outside near the compressor, installation was completed in minutes without any additional tools
- **Gateway:** One Android device per lab used to transmit data to the cloud
- **Configuration:** Using Atomate It! Mobile App, Atom profiles were set for compressor vibration and specific temperature thresholds were set for each cooler, refrigerator and freezer Atom
- **Alerts:** Alerts were set up to notify lab managers of abnormal vibration or temperature changes

Results

Anomaly Detection

After only 2 weeks, the installed Atoms detected an anomaly. The Atom installed in the freezer detected periodic fluctuations in temperature, while the Atom attached to the compressor recorded vibrations indicating short cycling. Maintenance was dispatched and a problem with the seal on the freezer door was discovered. The simple repair was made before the internal temperature rose above critical levels, preserving the experiments housed within the freezer.



Compressor Short Cycle + Elevated Temperature = Freezer Door Seal Failure

The simple Atomation solution was installed in a few days and delivered positive ROI within weeks of the initial installation.



Simple

Atoms combine onboard sensors and computing with an individualized object profile to understand normal operational behavior and communicate only when necessary



Smart

Atoms easily attach to any object regardless of age or type and transmit information wirelessly to our cloud without additional customer IT infrastructure



Scalable

Flexible, cost-effective solution that is quick to deploy and configure

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