



Airflow Measurement System Case Study Major University Healthcare System



A TRF-5901CE-AFMS (controller with inclinometer) is a core component of the TrueFit Airflow Measurement System.

Executive Summary

This case study demonstrates how healthcare facilities can achieve sustainable airflow management solutions with advanced technology. A major university healthcare system faced significant challenges in maintaining proper room pressurization and ventilation, critical for their surgery centers. The existing airflow measurement systems were inaccurate and costly to maintain. Partnering with Klutch Controls and KMC Controls, the healthcare system implemented the TrueFit Airflow Measurement System (AFMS), resulting in accurate airflow measurement, reduced maintenance costs, and increased operational efficiency.

About the Customer

The customer is a prestigious medical institution. It operates numerous research facilities, including those used by the CDC, and provides comprehensive medical care through a network of hospitals and clinics across the region.

The Challenge

The customer faced critical challenges in maintaining proper room pressurization and ventilation levels, particularly in their surgery centers. Key issues included:

Inaccurate Airflow Measurements: Existing AHU systems used competitors' devices that provided inaccurate readings, risking non-compliance with ASHRAE Standard 170.

Compliance Issues with ASHRAE Standard 111: The duct configuration after the supply fan did not meet ASHRAE 111 standards, leading to further inaccuracies.

High Maintenance Costs: The current systems required costly annual maintenance nearly equivalent to installing new systems yearly, causing budget strain and operational downtime.

System Drift: Independent AMDs for outside, supply, and return airflows exhibited significant accuracy drift over time, requiring frequent recalibrations and adjustments.

Strict Environmental Controls: The customer needed to maintain strict environmental conditions in facilities like surgery centers and CDC research labs to ensure safety and regulatory compliance.

Complexity of Existing Systems: The facilities used three different building automation systems and required a solution that could seamlessly integrate with their existing SCADA front-end systems and support open platforms.

With those issues in mind, the customer sought a long-term, low-maintenance solution to provide reliable airflow measurements without frequent recalibration.



To read ASHRAE Standards 170 and 111, visit the American Society of Heating, Refrigerating and Air-Conditioning Engineers' [library of standards](#) (in read-only format).

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Engagement and Expertise

Klutch Controls was engaged for this project. Their expertise in standardizing front-end PLC systems made them an ideal partner. KMC Controls was chosen for their innovative Characterized Airflow Performance® technology, which provided a comprehensive solution to the customer's airflow measurement challenges.

The Solution

Klutch Controls, in collaboration with KMC Controls, implemented the AFMS. Key steps included:

Mechanical installation: Inclinometers were mounted to the outside air dampers, and airflow measurement probes were installed on the supply and return fans.

Data integration: Existing temperature sensor data from the Building Automation System (BAS) was integrated with the AFMS via BACnet/IP over Ethernet.

Characterized Airflow Performance®: This automated calibration routine ensured accurate airflow measurement and compliance with ASHRAE standards.

Advanced Fault Detection and Diagnostics (AFDD): Embedded in the AFMS, providing the foundation for routines aligned with ASHRAE Guideline 36.

The implementation was completed in approximately 20 labor hours.

Immediate Results

- Accurate measurement data for outside, return, and supply airflow rates.
- Successful test case for migrating to BACnet/IP devices from the existing RS-485 network.
- Real-time monitoring of damper blade condition, actuator linkage performance, and other metrics through inclinometer feedback.

Long-Term Benefits

- Significant reduction in maintenance requirements and costs, avoiding frequent recalibration.
- Increased operational uptime for critical areas such as operating rooms.
- Enhanced confidence in maintaining ideal environmental conditions.
- Improved troubleshooting and diagnostics through AFDD, displayed locally or via the BAS.
- Virtually zero maintenance over the life of the installation.

Conclusion

The successful implementation of the TrueFit AFMS demonstrates the system's capability to provide accurate, reliable, and low-maintenance airflow measurement. Facilities managers in healthcare and education sectors facing similar challenges can benefit from the sustainable solutions offered by KMC Controls, enhancing operational efficiency and compliance with industry standards.

For more information about the TrueFit Airflow Measurement System, please visit the [AFMS solutions page](#) or [contact](#) the KMC Controls sales team.

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