

Airflow Design VAV Control System for Laboratory

Lab airflow control design and VAV effectiveness are directly related to the safety and health of laboratory workers, energy conservation and environmental protection of lab operations, and the success of scientific experiments.



Design of laboratory airflow system

Basic principles:

1. Implement containment measures for local contamination and remove it intensively as quickly as possible.
2. The direction of air flow should be from clean areas to contaminated areas and from low to high contamination areas.
3. Minimize backflow and eddy currents in the room.
4. The outside air outlet should be near the worker, and the exhaust airflow should be as far away from the worker's work space as possible.
5. The air flow velocity 0.5 m below the air supply inlet should not exceed 0.4 m/s.

CFD Technology:

Computational fluid dynamics is the analysis of systems that contain relevant physical phenomena such as fluid flow and heat conduction through computer numerical calculation and image display. In laboratories with strict requirements for the design of airflow organization, CFD technology can be used for computer simulation analysis. By adjusting the design scheme and the ratio of ventilation temperature to exhaust temperature, the ventilation effect of each scheme is compared to determine the optimal airflow organization design scheme.

Variable air volume control system

Safe and comfortable

To ensure the safety of laboratory workers, it is necessary to accurately and quickly control the air flow of various experimental equipment to prevent toxic and harmful gases generated during experiments from leaking and endangering human safety. Proper and stable temperature, humidity and stable airflow provide a comfortable working environment for laboratory workers and improve work efficiency.

High efficiency and energy saving

Energy conservation is a major concern for laboratory managers. Under the premise of ensuring safety, reducing energy consumption as much as possible is an important goal of VAV system design. In practical use, laboratory ventilation systems must meet the following requirements: they must be able to effectively exhaust harmful gases, the system must operate normally with a noise level of less than 55dB, and the system must have high reliability.