TSI® Knowledge Beyond Measure.

Driving Safety Through Efficient Lab Design

High Containment Laboratory

Features & Benefits

Increased Safety

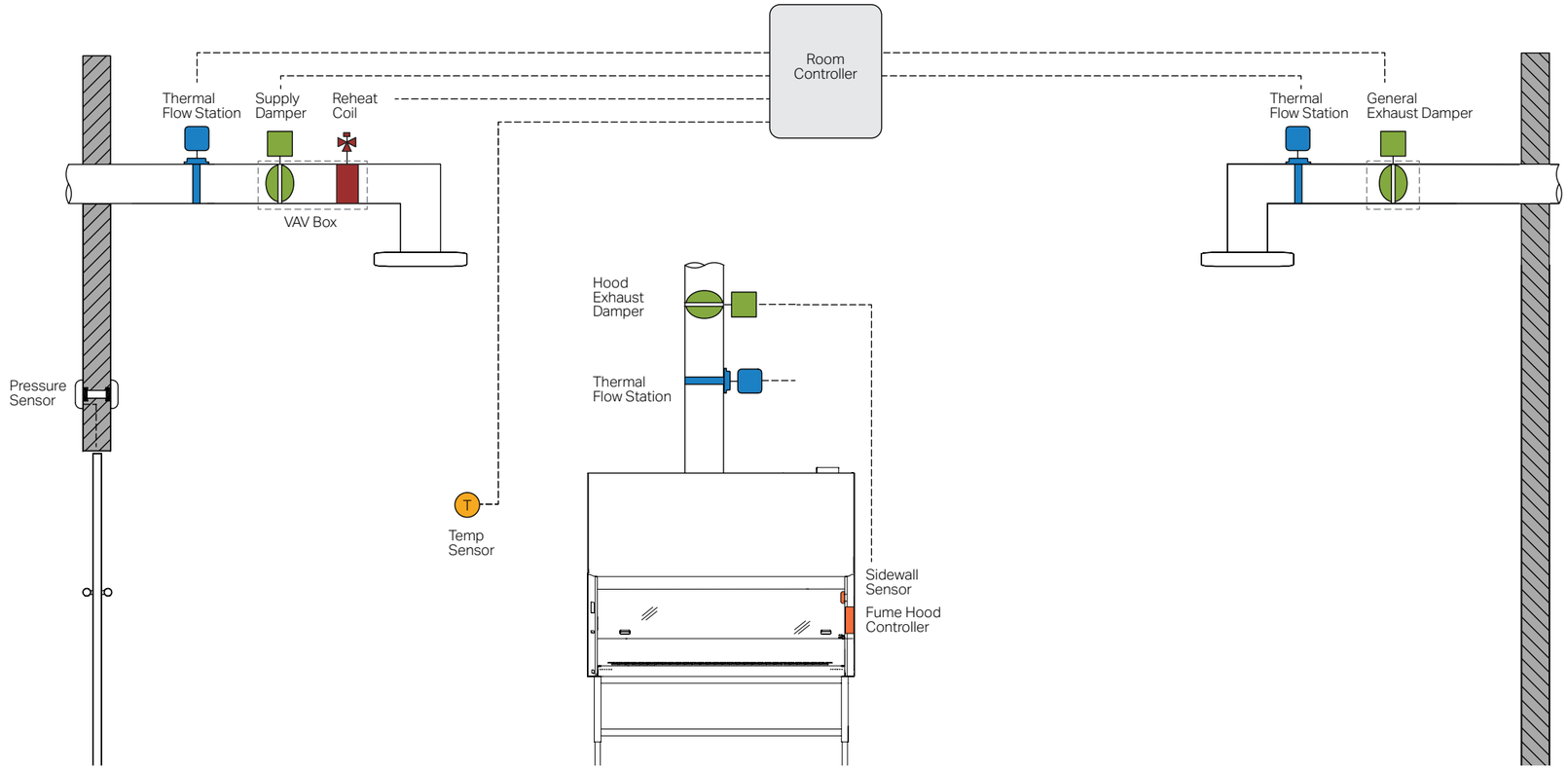
- Flow measurements with best in class +/- 3% accuracy
- Room pressure measurements with best in class accuracy and stability
- Closed Loop Control of fume hood face velocity, room air flows and room pressure differential
  - Sidewall sensor actually measures fume hood face velocity for user safety
  - Direct pressure room control for the tightest control of room pressure to ensure containment
- UL listed pressure sensor for 2-hour fire wall

Energy Savings

- VAV control reduces airflow
- Low-pressure drop dampers, as recommended by US EPA, reduce fan energy

Initial Cost Savings

- Lower capital cost
- Decreased installation costs
- Reduced system pressure drop allows down-sizing of fans, air handlers and other HVAC equipment
- Less mechanical equipment required compared to offset control



High Containment Labs

- Door is normally closed
- VAV reduces airflow to save energy
- Fume hoods, snorkels, and biosafety cabinets provide primary containment
- Negative room pressure differential provides secondary containment
- General exhaust required to maintain minimum ventilation (ACH)
- Space temperature maintained for occupant comfort and experiment integrity

General Sequence of Operation

The room controller simultaneously controls room pressure, ventilation and temperature in the laboratory.

Room Pressure Control Sequence of Operation

The room controller continuously measures the room pressure differential. If the room pressure differential becomes less negative or positive, the room controller closes the supply damper until the supply airflow reaches its minimum ventilation or cooling flow upon which opens the general exhaust damper until room pressure differential achieves setpoint. If the room pressure differential becomes too negative, the room pressure controller closes the general exhaust before opening the supply damper to its maximum setpoint until the room pressure differential achieves setpoint. When a door switch is applied, and the door opens, the supply and exhaust will hold to maintain directional flow.

Ventilation Control Sequence of Operation

The room controller continuously measures and maintains the supply air volume at or above its minimum setpoint. During unoccupied mode, the room controller will maintain the user-defined unoccupied minimum ventilation rates.

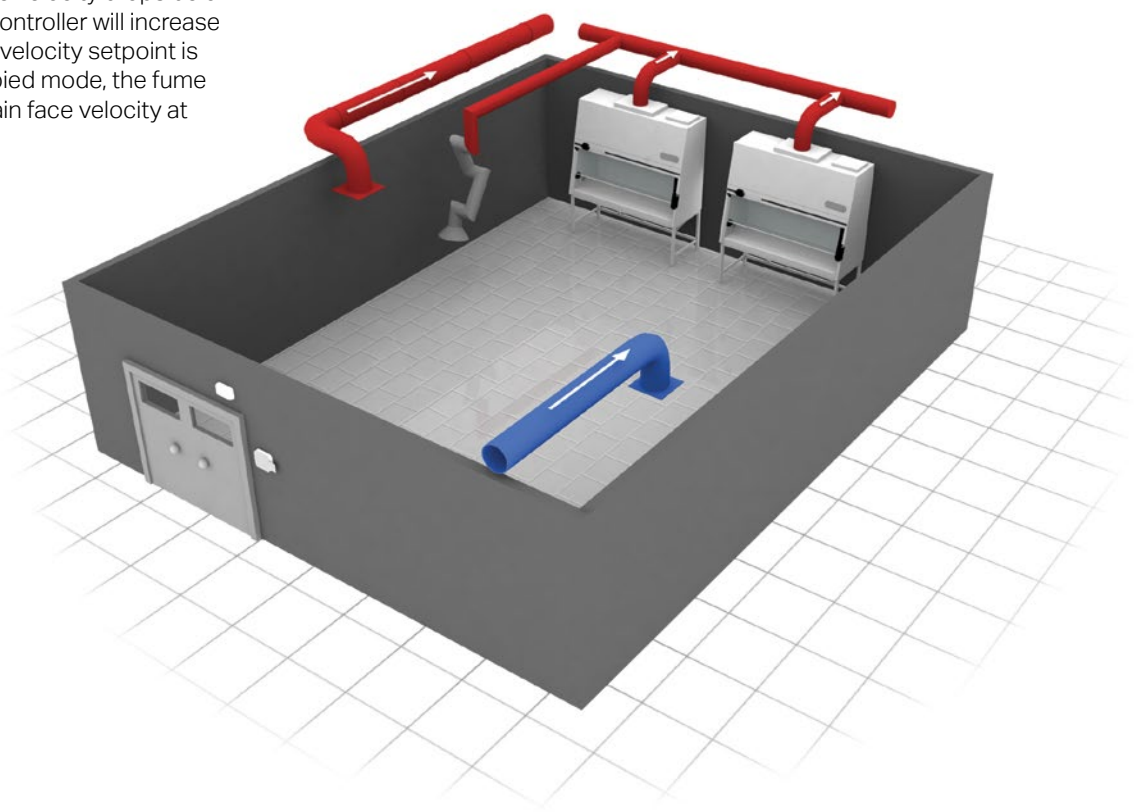
Temperature Control Sequence of Operation

The room controller continuously measures the room temperature. If the room temperature rises above setpoint, the room controller closes the reheat valve upon which opens the supply air damper until either the room temperature reaches setpoint or the supply air volume reaches its cooling maximum setpoint. If the room temperature falls below setpoint, the room controller reduces the supply air volume to its minimum ventilation or pressure-control flow upon which opens the reheat valve until room temperature achieves setpoint. During unoccupied mode, the room controller will maintain the user-defined unoccupied temperature setpoints.

High Containment Laboratory

Fume Hood Controller Sequence of Operation

The fume hood controller continuously measures average fume hood face velocity using a sidewall sensor. If average face velocity rises above setpoint, the fume hood controller will reduce the exhaust volume until face velocity setpoint is achieved. If average face velocity drops below setpoint, the fume hood controller will increase exhaust volume until face velocity setpoint is achieved. During unoccupied mode, the fume hood controller will maintain face velocity at setback setpoint.



Knowledge Beyond Measure.

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