SPECulations

A Periodic Newsletter for Design Professionals
About Innovative Products and Ideas Worthy of Specification Consideration

February
2001
(E2)

This Issue

TRIATEK®

Do You Know Your Room Pressure? If You Don't, How Do You Know You Are Safe?

OVERVIEW

In hospitals, *isolation rooms and isolation anterooms with appropriate ventilation-pressure relationships are the primary means used to prevent the spread of airborne viruses in the health care environment.* (ASHRAE Handbook, 1999 HVAC Applications, 7.2)

For the laboratory to act as a secondary confinement barrier, the air pressure in the laboratory must be maintained slightly negative with respect to adjoining areas. (ASHRAE Handbook, 1999 HVAC Applications, 13.12)

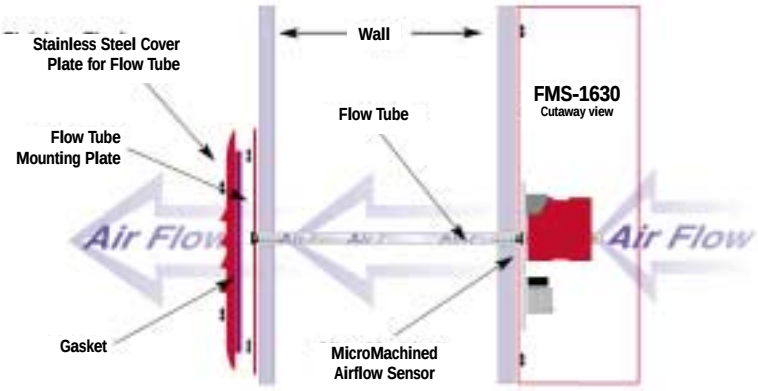
Until recently, pressure controls could only measure large differentials between two areas. Volumetric offset was devised to simulate room pressure control. This design fixed the exhaust air greater than the supply air by some amount, usually 10%. Later it was automated so the supply would track the exhaust, particularly in laboratories with chemical fume hoods with moveable sashes.

There are two serious problems with volumetric offset. First, the error in the control devices is +/- 5%, so the offset is cancelled by the error in the controls. Second, *Volumetric control . . . does not recognize or compensate for unquantified disturbances such as stack effects, infiltration and influences of other systems in the building.* Therefore, *volumetric control may not guarantee directional airflow.* (ASHRAE Handbook, 1999 HVAC Applications, 13.12)

Only direct pressure monitoring recognizes disturbances in the pressure relationship between two spaces. TRIATEK's sensitive and reliable FMS-1600 series controls effectively monitor and control room pressure under all conditions.

Room Pressure – Monitor / Alarm / Controller

The TRIATEK FMS-1630 Room Pressure System monitors and controls airflow to pressurize laboratories, clean rooms and isolation rooms. The FMS-1630 provides closed loop control feedback to users by measuring ultra low airflow into a selected space with reference to the external space. It can then adjust airflow in response to events outside the pressurized space that affect pressure in the space. If a door is left open, the FMS-1630 has audible and visual alarms. An optional door switch feature locks the PID control output to prevent 'hunting' and maintain stable, safe airflow settings into the room even if the door is left open.



The FMS-1630 has three control modes: Neutral, Negative or Positive. Room conditions are easily observed using the LCD digital display and LED status indicators. The digital display converts room flow readings to inches of water column or metric equivalent units. The versatile display can also display airflow in feet per minute (FPM) or cubic centimeters per minute (CCPM). The FMS-1630 provides a linear proportional current or voltage output signal for remote monitor applications. It may also be set to control a venturi valve by programming PID constants.

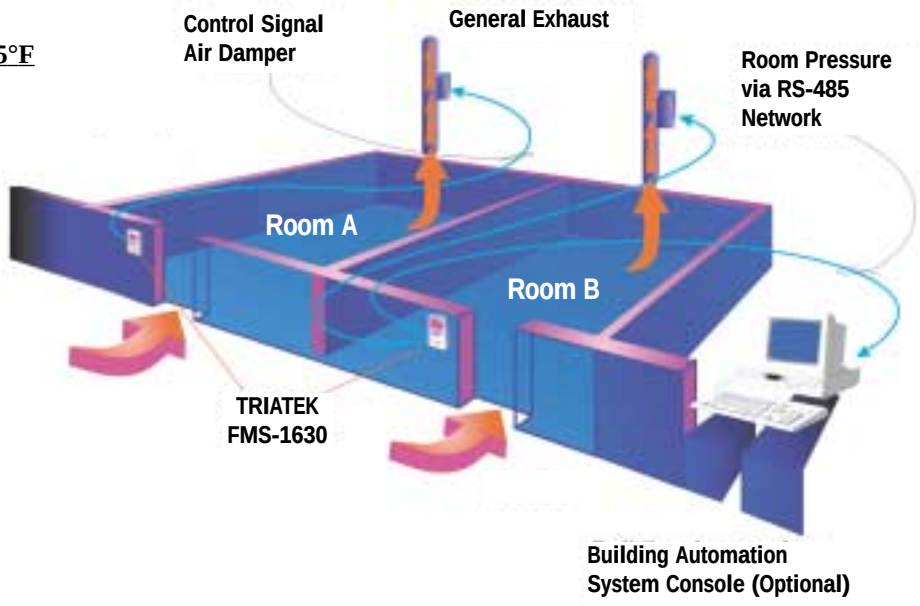
Specifications:

- User programmable LCD Display, 4 line x 16 characters per line
- Internal or remote room pressure sensor
- Stainless steel cover plate for flow tube
- Surface or flush mounting
- Remote sensor up to 4000 feet from the monitor
- Spare analog input, selectable 4–20 ma, 0–5 VDC or 0–10 VDC
- Two alarm relay outputs
- Analog output, linear proportional or PID floating point
- Optional door switch input with PID lock

Pressure Range	Accuracy @ 72°F ± 5°F
- 0.0100 to + 0.0100	± .0001" WC
- 0.0500 to + 0.0500	± .0005" WC
- 0.1000 to + 0.1000	± .0010" WC
- 0.2000 to + 0.2000	± .0020" WC

Features:

- NIST traceable / individual certification available on request
- Flow / Pressure input, up to 0.2" WC
- Low flow calibrated in FPM or CCPM
- Local alarm status by audible and visual alarms
- 4 line x 16 character user programmable LCD display
- Built-in RS-485 serial communications
- Integrates to most Building Automation Systems through N2, BACnet, or Modbus



Network Ready:

- Johnson Metasys
- BACnet
- Modbus

Another perSPECtive...

By Dave McIntyre

Imagine what the world would be like without measuring instruments that inform us about things like our weight, cholesterol level, blood pressure or heart rate; speed, distance, tire pressure or fuel level; airflow, temperature, enthalpy or ventilation rate... In such a world, it would be the "blind leading the blind." Or maybe it would be "ignorance is bliss." Everyone would determine, on his or her own, what is 'healthy', 'safe' or 'permissible'. What a world this would be! Now imagine a laboratory or hospital without dependable instrumentation to measure fume hood face velocity, or even worse, isolation room pressure levels. I, for one, would not want to visit such a place.

Yet amazingly, this is how some people try to ensure safety in their laboratory or hospital isolation room – without measuring the key variables that are absolutely essential to ensuring safety – airflow and pressure. In a laboratory or hospital isolation room, there is no substitute for direct measurement of airflow or pressure. Direct measurement (i.e. "closed loop control") is the key to containment and safety. Without direct measurement you have no way to validate room pressure or verify that your airflow control system remains responsive to continual pressure changes caused by opening doors or windows, elevator usage, leaks, or other variables that affect pressure within the critical space.

In short, if your airflow control system is not measuring airflow into or out of the room, the occupants have no way to tell if they are safe, and neither do you.

Many factors will affect pressure in your lab or hospital room. The ability to "see" those changes, "react" to those changes quickly, and "restore" the required pressure is the key to safety. Clearly, in labs and isolation rooms, "ignorance is NOT bliss". TRIATEK's state-of-the-art airflow control system provides unequaled safety and containment, yet remains competitive with first-generation systems that only "guess" at airflow or pressure. Call us for a TRIATEK demonstration today!

Constant Volume Air Valve

The TRIATEK Venturi Valve is an integral part of the room pressure control system. It is available in spun aluminum (with or without Heresite coating) or fabricated entirely of 304 or 316 stainless steel. A stainless steel shaft with composite Teflon bushings is standard on all valves. The internal spring of the valve reacts instantly to changes in static pressure to maintain a constant volume by moving the inner cone to increase or decrease the annular area between the cone and the valve body. The TRIATEK Venturi Valve maintains linear air volume control over 90% of its control range. The addition of a fast-acting electric actuator repositions the valve to a new volume setting in response to the FMS-1630. The actuator can be programmed to fail open or closed on power failure.

Partial List of California Laboratory/Medical Installations

UC Davis Medical Center Davis, CA
55 FMS, 56 Venturi Valves

Mt Sinai GMP Laboratories Carson, CA
44 ACT-FA actuators used for Laboratory

VA Medical Center Los Angeles, CA
TB Isolation, AIDS Isolation Rooms

Pacific Environmental Technologies Yorba Linda, CA
Manufacturer of Fume Hoods

Sierra Vista Hospital Paso Robles, CA
12 Isolation Rooms

RFK Medical Center Santa Fe Springs, CA

VA Medical Center Fresno, CA

California Youth Authority Sacramento, CA

Western Medical Center Anaheim, CA
5 Isolation Rooms

St. Francis Medical Center Rancho Dominguez, CA
Sullivan Wing – 5 FMS

Heart Hospital Fresno, CA

Garfield Medical Center Monterrey Park, CA

VA Ambulatory San Diego, CA
6 FMS

St. Elizabeth Hospital Los Angeles, CA

VA Hospital West LA, CA

SPEC*ulations* is published by: Toro-Aire, 1708 Mahalo Place, Dominguez Hills, CA 90220 • Phone (310) 632-6000 • Fax: (310) 632-8919
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