

Highlighting innovative design features  
and useful applications information for  
**Thermo Scientific Biological Safety Cabinets.**

**Thermo**  
S C I E N T I F I C

# smart notes

► **design and innovation**



LAMINAR AIRFLOW PRODUCTS

SMARTNOTE 2

## Q Why are airflow alarms an important consideration for Biological Safety Cabinets (BSCs)?

# A

**Airflow alarms will alert the user if there is a problem with containment or product protection.**

Fluctuations in inflow or downflow velocities can disrupt the fragile air balance at the front opening of a BSC. Disruption of the airflow balance can result in sample contamination or inadvertent exposure to hazardous materials. Therefore, it is critical for the BSC user be alerted to these safety risks.

Unlike traditional BSCs, the Thermo Scientific BSC design combines independent DC motors and pressure sensor-based airflow alarms — DAVE (Digital Airflow Verification) — to provide the utmost in product protection and worker safety.



# Why Thermo Scientific Biological Safety Cabinets?

## Yesterday's Outdated Approach



Many BSC manufacturers monitor airflow using a **"Magnehelic" or "Minihelic" pressure gauge.** Difficult to interpret, these devices provide no notification of unstable airflow or specification fallout, with high potential for undetected error.



Airflow can also be measured by **DC motors** that monitor the rpm of the fan and the torque required to achieve the rpm. Though they can be programmed to adjust torque to maintain specifications, they do not provide any alarm if airflow specifications are not maintained.



A **thermal or "hot-wire" anemometer** may also be used to independently measure airflow. Anemometers use a heated wire to measure airspeed, the more air crossing it, the more it's cooled, changing its electrical resistance. While these devices can trigger an audible or visual alarm for airflow specification deviation, they are limited to taking a reading at a single point in the airstream.

## Today's Thermo Scientific DAVE Approach

All Thermo Scientific Class II (Type A2) BSCs incorporate a **pressure sensor-based independent airflow monitoring system** called Digital Airflow Verification (DAVe). Separate sensors measure pressure change across the downflow and exhaust HEPA filters, ensuring accurate overall measurement of both airflows. These measurements are converted into an audible and visual alarm alerting the user to an airflow restriction or excessive airflow variation greater than 20%.



As the first to market with an **ebm-papst Inc. DC motor-based BSC** in 2002, the Thermo Scientific BSC design resolves many deficiencies in traditional cabinets. Our BSCs automatically adjust and maintain airflow specification. The fan control and power supply are independent from the motor and can be replaced without an expensive or disruptive decontamination procedure. World renowned for reliability, these motors are estimated for >100,000 hours (>11 years) of use – double the lifespan of other DC motor designs.



- ▶ Thermo Scientific BSC's combined approach of superior airflow control by **independent DC motors** (see SmartNote 1 on SmartFlow™), plus **independent pressure sensor-based airflow alarms** – DAVE – ensures the highest levels of worker safety and product protection!

See how the Thermo Scientific SmartFlow dual motor design optimally controls airflow velocities.

Learn more at [www.thermoscientific.com/bsc](http://www.thermoscientific.com/bsc)

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