



**Reduce
building
management
costs with
state-of-the-art
flow
control**

**Achieve better
indoor air quality
and cut energy
consumption
through superior
air flow
management**

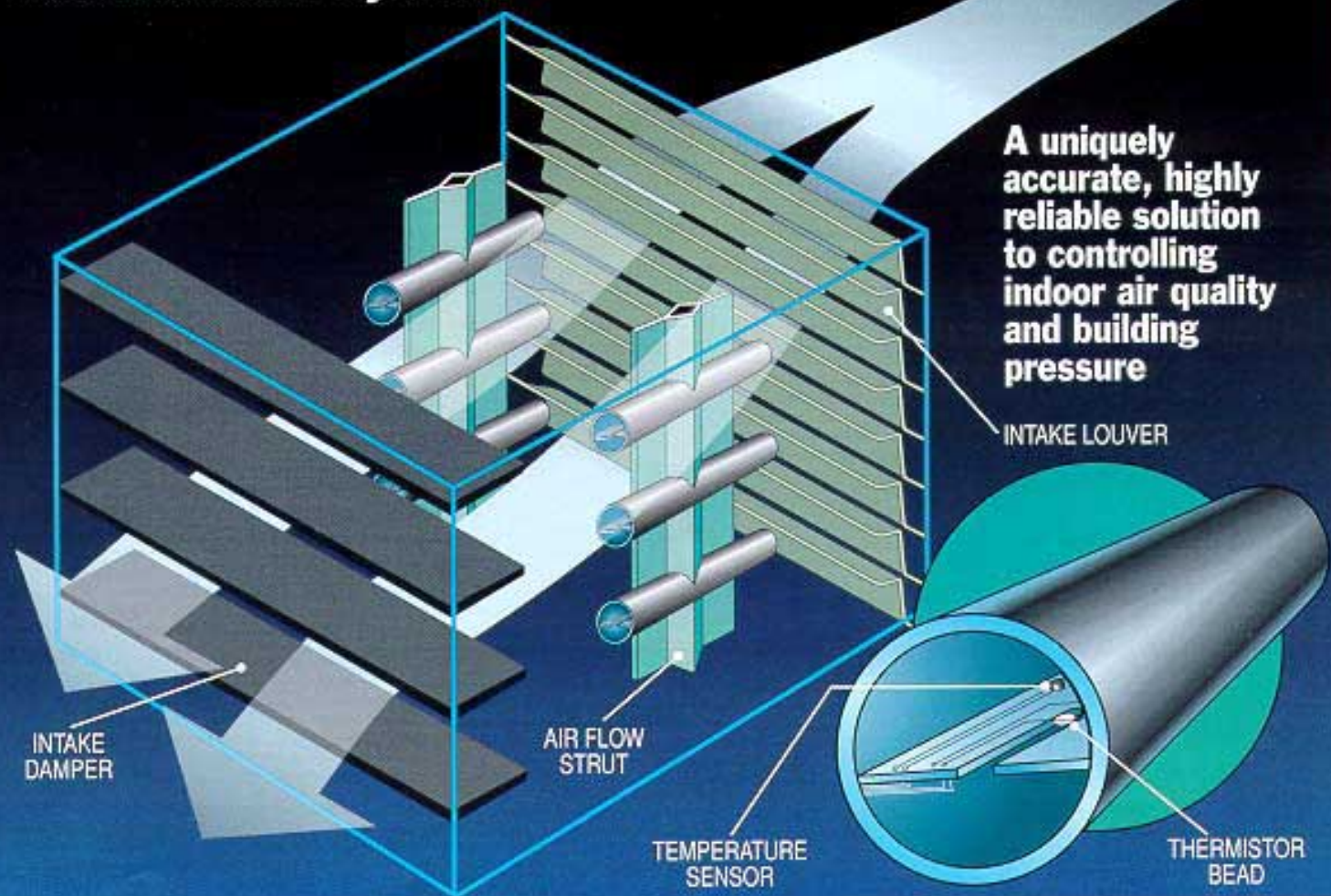
- Minimize operating costs at flow rates normally encountered in outside air inlet ducts, flow rates at which pitot tubes are no longer reliable.
- Record air flows to document compliance with make-up air requirements. Eliminate costly sick building syndrome disputes.
- Utilize Dybec's state of the art thermal anemometers and patented algorithms for measurement, control and accurate read-out at air flows from 0 to 6000 fpm.



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A breath of fresh air for the HVAC industry

Introducing the Dybec Digital Mass Air-flow Measurement System



The savings generated from accurate air flow control far outweigh the cost of installation by significantly reducing guesstimated factors of safety that require excess air flow. And the total cost of ownership is extremely competitive with conventional air flow measurement technologies.

The Dybec Air-Flow Measurement System (AMS) helps maintain optimum building temperature and pressure for a cleaner, healthier and more comfortable workplace with fewer occupant complaints. Building air flow measurements can be recorded and documented to demonstrate compliance with make-up air requirements.

Accurate air flow measurement continuously controls ventilation air within specified design limits and prevents wasteful energy loss thus allowing lower safety factors. Installing the Dybec AMS in HVAC ducts can significantly reduce energy

consumption, lowering heating and cooling costs up to 50% or more.

Meet the codes...or else

According to ASHRAE Regulation 1989.2:

"Provision for air flow measurement must be included when mechanical ventilation is used."

ASHRAE leaves you no choice. And neither do your clients, who are increasingly pressured to provide the highest levels of Indoor Air Quality (IAQ) in their buildings.

The answer? The Dybec AMS...a cost-effective, easy to install solution for complying with ASHRAE codes and permanently recording that compliance. The digital output and/or local displays give instant accurate verification of ventilation airflow.

When you specify "Dybec AMS" in your drawings, you *protect* yourself—and your

clients—against costly sick-building law suits. Dybec can provide continuous graphical documentation that your system operated within code limits. Help your building remain IAQ code compliant...without extra cost or special effort for the owner, builder, or tenant.

Install it...and forget about it. There's nothing else to do.

The Dybec AMS can be installed in minutes in almost any duct, with no special tools or training required. No on-site calibration is required.

Factory-calibrated for accurate measurement, the AMS thermistor control loop maintains the temperature drift to within a *tenth of a degree* in five years. Since the velocity measurement is dependent on a standard thermistor temperature, there is never any need to recalibrate the unit. Since dirt does not collect on the thermistor beads, periodic cleaning is not required. This virtually

eliminates maintenance and human error.

Precise measurement over a wide range of flow rates

The Dybec AMS maintains accuracy in flows ranging from 0 to 6,000 feet per minute, enabling use in virtually any HVAC system. Pitot tubes cannot accurately measure air flow below 400 feet per minute and are severely limited for IAQ applications.

Each AMS can measure flow in up to four air streams simultaneously, allowing outside, return, supply, and exhaust streams to be cost-effectively monitored by a single system.

The thermistors are protected by flow sensor tubes both upstream and downstream to prevent false readings from backwash and cross currents.

Unrivaled reliability

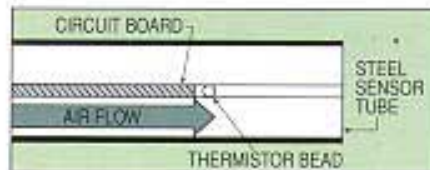
Of the more than 500 units installed since 1985, the Dybec AMS has demonstrated a field failure rate of less than 0.5%.

Many factors contribute to the Dybec AMS's extraordinarily reliable performance:

- The Dybec AMS has no moving parts, bridge circuits, control circuits, or amplifiers.
- Thermistors are connected in parallel, so even if one does fail, operation of the sensor array continues

uninterrupted. The monitoring loop in the microprocessor continuously monitors each individual point. Only expensive industrial control units are comparable.

- The flow sensor tube straightens air flow, eliminating the need for expensive upstream flow straightening devices that can cause unwanted pressure drops.
- Mechanically stable, the small, lightweight thermistor beads are not affected by duct vibrations.
- Unlike pitot devices, thermistor beads, positioned in the flow sensor tubes, are protected by the circuit board from contaminants that might otherwise impinge on them.



- The device is fully protected by our multi-year warranty.

A technology breakthrough provides unparalleled accuracy

A unique patented *thermistor-based* sensor achieves reliability, accuracy, and ease of operation unduplicated by any other air flow measurement technology.

Dybec engineers pioneered the use of thermistors to measure air flow. These

mil-spec solid state devices have virtually zero temperature drift over time, ensuring accurate, repeatable results for every velocity measurement.

The Dybec AMS has been ETL (Environmental Testing Laboratory) certified with accuracy of $\pm 1\%$ under controlled conditions. Our customers report field accuracy of better than $\pm 5\%$ over the entire velocity range. Pitot tubes may have variations of $\pm 100\%$ at low air flows.

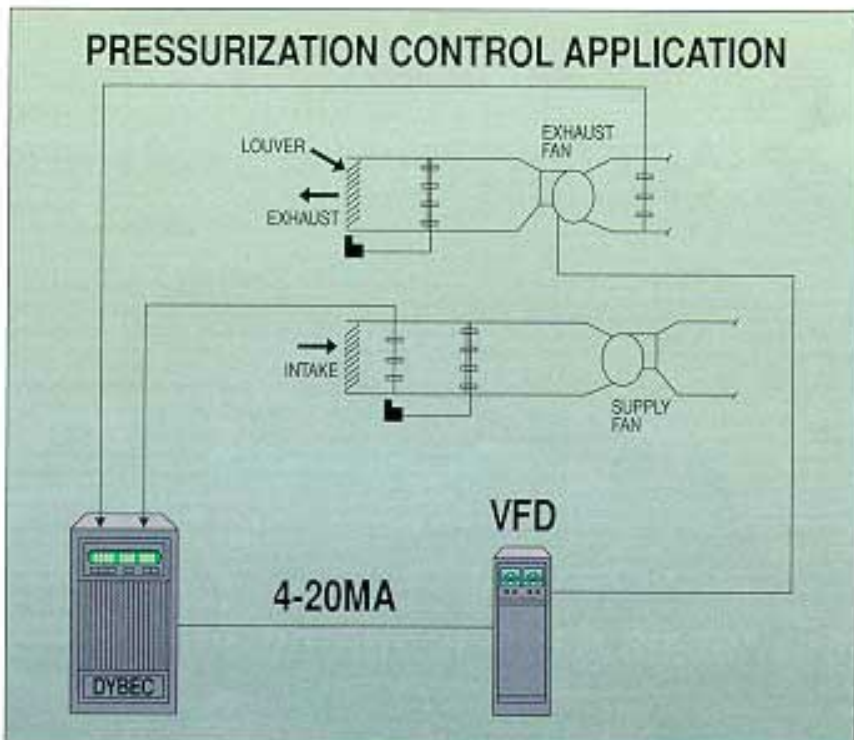
A patented algorithm ensures consistent, repeatable results

Each thermistor in the sensor strut assembly is connected by its own wire to a central microprocessor containing Dybec's patented algorithm.

Air flow causes thermal dissipation in the thermistors, which can be measured as voltage changes. The microprocessor takes these voltage drops, and—along with the temperature measurement provided by a sensor and a separate integrated circuit—calculates the mass air flow within the duct.

The algorithm produces an output signal that is truly linear over the velocity range. Precision is the same at high or low velocities, even at velocities well below the cut-off point where pitot devices are no longer useful. The algorithm uses temperature readings to assure that the output is truly at standard conditions and is completely independent of the air flow temperature. No charts or graphs are needed to interpret results.

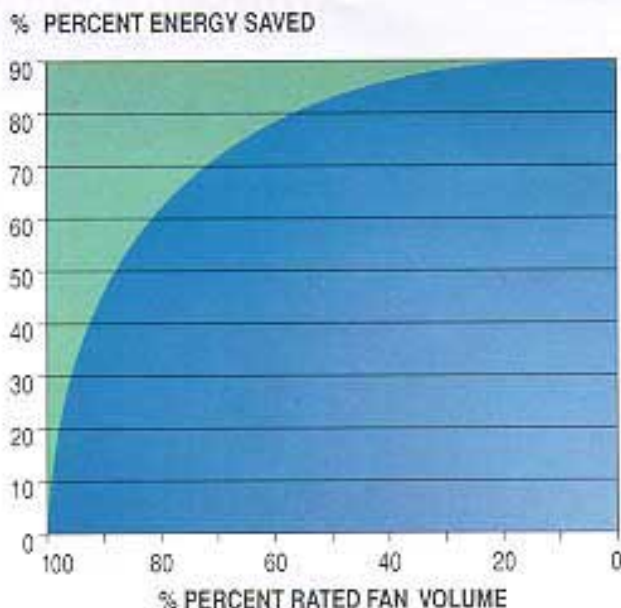
An optional LED displays temperature, air flow and other calculated values if desired.



There are many different applications in which the Dybec microprocessor output can control operating conditions. Pressurization control shown here is one example. The Dybec AMS monitors both intake and exhaust flow volumes, it then issues a 4-20 ma control signal to a variable speed drive unit. The exhaust fan maintains an increased or decreased flow volume which results in a decreased or increased pressure in the space. Dybec can be used in many other types of control applications. Contact your local Dybec representative for details.

Energy Savings vs Flow Volume

Any air flow system design assumes worst case conditions (normally closed doors left open, wind direction away from air intake, temperature variations causing adverse stack effect, etc.). the system is designed to operate adequately under these adverse conditions—which may occur less than 1% of the time. With Dybec AMS, actual instantaneous air flows are measured and operating components are controlled so that design conditions are maintained despite adverse conditions. Thus, fan volume will be significantly less than full rated capacity most of the time. The energy savings, for the fan drive and for thermal exchanges, will be significant when compared to non-controlled systems or systems where there is poor accuracy at normal IAQ flow rates.



Dybec AMS features at a glance...

Microprocessor	80C52-BASIC, 8-bit, 11 MHz CMOS	LCD Display Option	Flow, temperature, output voltage, and calculated values
Thermistor	Mil-spec, medical grade, hermetically sealed bead	Microprocessor Output	0 - 5 volts dc; 4-20 ma optional
Flow Range	0 to 6,000 feet per minute	Wiring	CSA recognized, UL VW-1 plenum grade, OSHA acceptable cable
Operating Temperature Range	-20 to 120°F	Input Power Required	24 volts AC, 2.6 amps
Drift	0.1°F in 5 years at 140°F; less drift at lower temperatures	Interfaces	Compatible with all major brands of control systems
Accuracy	ETL certified to ±1% (reference: report #471486, available upon request)	Sales, Service and Support	Available worldwide



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For more information on how the Dybec AMS can improve air quality, lower energy costs, and save money in the buildings you design, call or write us today.

