

## The multifunction Fluke 975 AirMeter™ tool is money in the bank for busy HVAC technicians

### Application Note



### Building Operations Case Study

Time is money for Kevin Klockow, and a trip to the bank is his everyday job.

As an HVAC technician for Building Technology Engineers, an EMCOR company, Klockow travels the Puget Sound area to maintain and troubleshoot HVAC systems in more than 40 branches of one of the largest U.S. banks. His wide territory puts a premium on moving fast and quickly diagnosing system performance.

So when Klockow tested the groundbreaking new Fluke 975 AirMeter™ multifunction air diagnostic tool, he immediately saw the value. In one compact tool, the Fluke 975 gave him the power to measure a whole range of air quality parameters:

- Temperature
- Air velocity
- Volume flow rate
- CO<sub>2</sub>
- CO
- Relative humidity
- Dew point and wet bulb temperature
- Percent outside air

It was like having an entire toolbox in one hand.

The bank branches Klockow watches over vary widely in age and architecture. Most are served by rooftop HVAC package units. He makes four maintenance visits to each branch annually, and responds to occupant calls on comfort issues. On windswept rooftops and in hushed bank lobbies,



the Fluke 975 traveled everywhere Klockow went as he tested its performance.

When occupants complained about air comfort, the Fluke 975 helped move the discussion from what the air felt like to the actual conditions in the building.

“One of the things I really liked,” says Klockow, “was being able to set it down and let it read what was in the air, the air temperature and humidity and everything, right in that particular space.” With its ability to take instant readings as well as log the data over

**Tool:** Fluke 975 AirMeter™

**Profile:** Kevin Klockow, Building Technology Engineers, an EMCOR company

**Measurements:** Air temperature, humidity and percent outside air

time, the Fluke 975 gathered accurate and comprehensive information on air conditions that he could then share with building tenants.

"I can ask if it's too hot or too cold in an area, and the occupants will tell me," Klockow says, "but with the Fluke 975 I was able to establish a good baseline."

### A breath of fresh air

Another key feature was the Fluke 975's calculation of percent outside air. The Fluke 975 AirMeter™ tester calculates the portion of outside air included in the ventilation mix in two ways, using CO<sub>2</sub> or temperature.

"It's huge," Klockow says. "You have to have outside air, a 10 percent minimum in the new buildings. Buildings are all so tight now; they don't have air leaks, so you need to have that outside air coming in to help with the outgassing of carpets and furniture and with creature comfort. You've got to have that fresh air in there."

For most field techs, estimating the percentage of outside air entering the ventilation system involves a visual inspection of the air intake, followed by a best guess. But the Fluke 975 enabled Klockow to sample air conditions, and then calculate the percentage of outside air actually entering the system.

"That's one of the things that was great for me," Klockow says. "I was able to make sure that I've got an adequate amount of outside air coming in, and feel confident that I knew we've got outside air coming in."

### Big capability, small package

The Fluke 975 AirMeter™ tester delivers multiple measurement capabilities in a compact package. It's designed to be easy and intuitive to use, yet it packs enough power and sophistication to satisfy the most advanced power users.

A rechargeable lithium battery powers the Fluke 975 and will operate the meter for 11 hours on a full charge. Three AA batteries may be installed for an additional seven hours of backup. The power adapter recharges the lithium battery and will operate the meter continually.

The Fluke 975 stores readings of all measured air quality parameters in its internal memory. Users can download the stored data to a PC using the tester's integrated USB interface. They can then use FlukeView® Forms software, which is included with the Fluke 975, to analyze and display the data and create custom reports. When the meter is left at a site for data logging, a Kensington lock (not included) can be used to secure it.

When powered on, the Fluke 975 performs a 35 second startup and self test and determines absolute barometric pressure, which the meter uses for automatic compensation for such functions as air velocity and psychrometrics (the interrelationship of air, density, moisture, temperature and heat).

The Fluke 975 features field calibration capability to help maintain accuracy while eliminating the need to send the instrument out for recommended routine calibration of the CO sensor (monthly) or the CO<sub>2</sub> sensor (annually).



### CO-CO<sub>2</sub>-temperature-relative humidity

After the meter completes its startup test, the main screen simultaneously displays temperature (°F or °C), relative humidity (% RH), CO ppm (parts per million), and CO<sub>2</sub> ppm. Soft keys let the user toggle between wet bulb temperature (WBT) and dew point temperature (DPT). When the "MIN MAX" button is pressed, the meter will begin to record the minimum, maximum, and average of all available readings, including air velocity if the detachable air velocity probe is connected.



**Percent outside air**

The Fluke 975 can calculate percentage of outside air using either temperature or CO<sub>2</sub> differences between the return air, mixed air, and outside air. The Fluke 975 user selects “% OUTSIDE AIR” and is prompted for “CO<sub>2</sub>” or “Temp” calculations. The outside air value can be measured by the AirMeter™, or manually entered by the user.

The greater the differential between indoor and outdoor temperature and CO<sub>2</sub> values, the greater the accuracy achieved. If the outdoor to indoor temperature differential is less than 20 °F, then a calculation based on CO<sub>2</sub> is likely to be more accurate. ASHRAE ventilation requirements for most spaces at full occupancy will result in a 700 ppm CO<sub>2</sub> differential between outdoors and indoor occupied spaces. (See ASHRAE standard 62.1 for commercial ventilation, or AHSRAE standard 62.2 for residential ventilation.)

**Air velocity and volume**

The Fluke 975 AirMeter™ tester’s velocity probe enables the technician to measure air speed and calculate the volume of airflow. Air velocity and volume are both key factors that determine our ability to condition, clean, heat, cool, humidify, dehumidify, move and otherwise handle and control air quality.

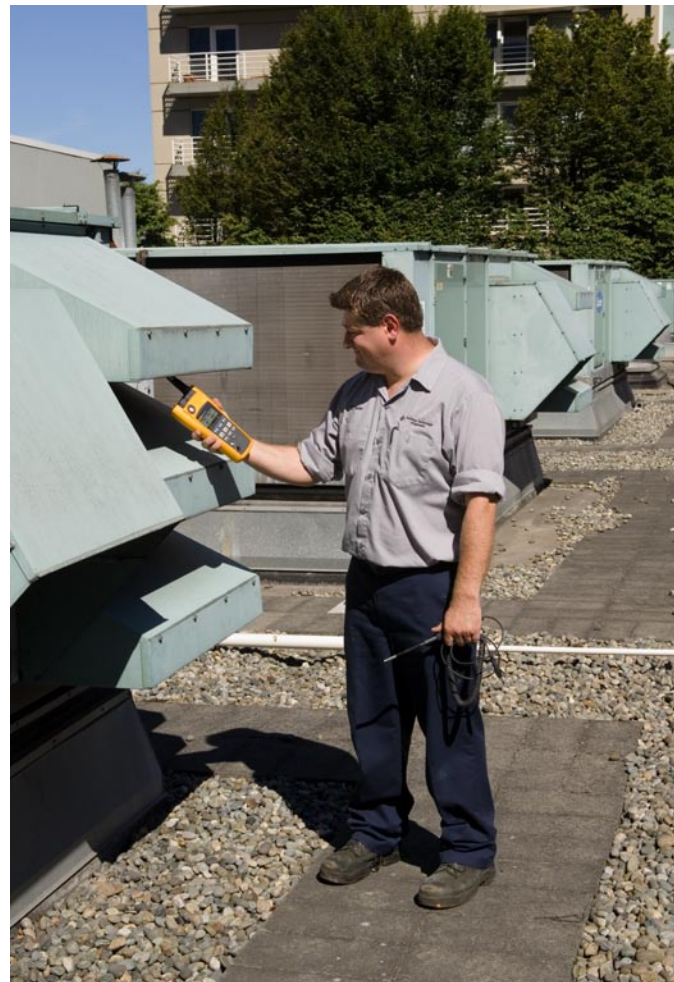
The velocity probe contains a thermal anemometer and a compensating temperature sensor that will telescope for readings 33 inches beyond the handle. Hot wire anemometers are accurate through a wide range of velocities, and are especially preferred for low velocity readings. The velocity range of the Fluke 975 AirMeter™ is 50 to 3000 fpm (feet per minute) or 0.25 to 15 m/sec (meters per second). The temperature sensor and the absolute pressure determined at meter startup compensate the readings to actual conditions.

**“In a class of its own”**

Added together, the capabilities of the Fluke 975 AirMeter™ have placed the tool firmly on Kevin Klockow’s must-have list.

“It’s kind of in a class of its own,” says Klockow. “It reads multiple things that no other product out there really does. Pricewise, you’re going to be spending several thousand dollars to duplicate those capabilities, and you’re going to have a bunch of tools to carry around. This is one of those tools that could take the place of a lot of what you have.”

“Rest assured, I’ll be begging for it. I would really like to have one.”



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Printed in U.S.A. 10/2006 2788393 A-EN-N Rev A