

# LOW-COST MEMS ULTRASONIC ANEMOMETERS

Tech ID: 29191 / UC Case 2018-102-0

## PATENT STATUS

| Country                  | Type          | Number     | Dated      | Case     |
|--------------------------|---------------|------------|------------|----------|
| United States Of America | Issued Patent | 11,994,532 | 05/28/2024 | 2018-102 |

## BRIEF DESCRIPTION

Two closely related sonic devices measure airflow characteristics by detecting differential times of flight between pairs of sensors. Developed by UC Berkeley researchers, this technology encompasses a room anemometer for measuring three-dimensional air velocity vectors and air speed, alongside a duct flow anemometer designed to measure volumetric air flow. The architecture leverages arrays of microelectromechanical systems sensor chips, which provide lower production costs, higher measurement accuracy, faster response times, and significantly lower power requirements compared to conventional airflow sensing technologies. The devices can incorporate integrated radios for wireless data transmission and are highly optimized for efficiency, allowing them to operate for multiple years on a single small battery. Furthermore, onboard signal processing algorithms enable precise flow and temperature analysis across both homogeneous and inhomogeneous flow fields, while an integrated compass and accelerometers continuously correct the room anemometer for physical orientation changes.

## SUGGESTED USES

- » Monitoring and optimizing heating, ventilation, and air conditioning systems within residential and commercial buildings
- » Tracking volumetric air flow within industrial ductwork to ensure proper ventilation safety and regulatory compliance
- » Measuring precise three-dimensional indoor air velocity distributions for architectural design and environmental comfort studies
- » Deployment in wireless sensor networks for continuous, long-term environmental monitoring of large enclosed facilities
- » Integrating into smart building management platforms to dynamically adjust climate controls based on real-time airflow data

## ADVANTAGES

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## CONTACT

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## INVENTORS

- » Arens, Edward A.

## OTHER INFORMATION

### CATEGORIZED AS

- » Sensors & Instrumentation
- » Environmental Sensors
- » Physical Measurement

### RELATED CASES

2018-102-0

Lowers manufacturing and deployment costs by utilizing microelectromechanical systems sensor chip arrays



Delivers significantly higher measurement accuracy and faster response times than conventional air velocity sensors



Operates for more than two years on a single small battery due to highly optimized ultra-low-power electronic components



Facilitates flexible installation and remote data collection through optional built-in wireless communication radios



Compensates automatically for physical shifts or movement using an onboard compass and accelerometer orientation correction system

RELATED MATERIALS

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

► [Two-Point And Multiple-Point Spot Heating And Cooling](#)



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