

# The Leader in Performance Indoor Air Quality Measurements



ENERGY AND COMFORT

Indoor Air Quality Instruments



TRUST. SCIENCE. INNOVATION.



## Breathe a Little Easier with TSI

Indoor air quality is a growing concern. With the increasing amount of time we spend indoors—over 90% according to a U.S. Environmental Protection Agency study—the problems associated with tighter building construction in the interest of conserving energy are exacerbated. In response, building owners, facility personnel, industrial hygienists and others are increasingly focused on IAQ for both comfort and health.

### Comfort

Measures of comfort typically include temperature, humidity, ventilation and draft. TSI offers several instruments that help you quickly and accurately assess basic IAQ parameters. Maintaining comfort levels can significantly improve occupant satisfaction, as shown through increased concentration and productivity, and help reduce absenteeism.

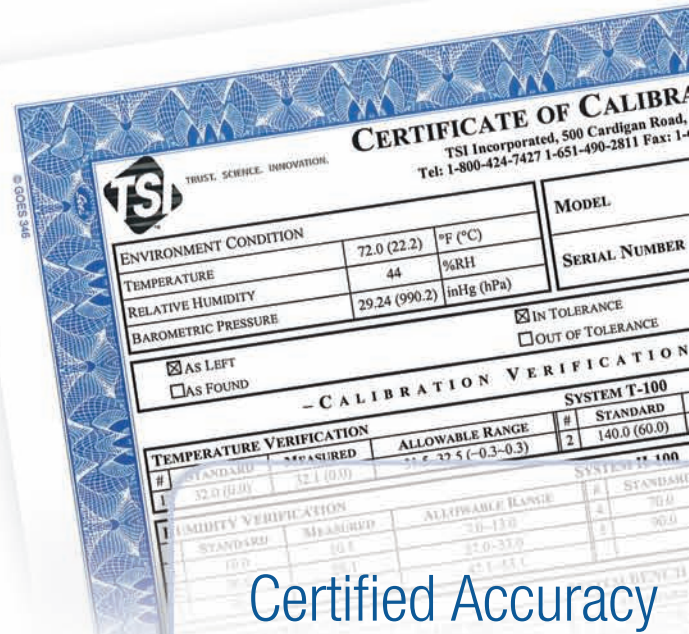
### Health Matters

Health and safety concerns are a growing part of air quality assessment. Airborne biological substances, gases, vapors and particles can cause adverse reactions in certain individuals, depending on their sensitivity to particular substances and concentrations. Some of these ever-present unwanted contaminants are potentially toxic, infectious, allergenic, irritating or otherwise harmful. Poor IAQ is listed as a top five health concern by most major associations and agencies worldwide. Recent studies claim that over one-third of the buildings in the United States have air quality problems. Now more than ever, it is increasingly important to be proactive, identify and resolve potential problems before they get out of control. TSI Indoor Air Quality instruments are designed to help you identify and manage these tough problems.

# Professional Measurement Solutions that Help You Save Energy, Increase Occupant Comfort and Assure a Healthy Environment

## Be Proactive in Assessing Indoor Air Quality

Features	Benefits
TRAKPRO™ Data Analysis software helps to easily create graphs and reports to document results	Improved performance on critical applications results in reliable information to reduce typical operating costs
Real-time measurement of key IAQ parameters	Seeing results on the spot allows you to make fast decisions on IAQ and necessary changes
Fast turn around calibration and repair service and exceptional customer support	Efficiency: The faster you get your instrument back the greater your effectiveness
Certified Excellence: A Calibration Certificate is included with each instrument	Peace of mind: our promise that each instrument we manufacture meets the highest standard and is guaranteed accurate



## Certified Accuracy with Reliable Results

Your TSI calibration certificate ensures that you are reading and obtaining the most accurate and reliable data for a range of indoor air quality needs.





## Air Quality Standards and Guidelines

Indoor air quality affects the comfort, safety and health of building occupants and directly impacts concentration and productivity. Maintaining a comfortable environment includes making measurements and taking corrective action for thermal comfort involving temperature, humidity, draft and ventilation. Providing a healthy and safe environment starts with locating and controlling sources of unwanted contamination from chemicals, biological substances and airborne particles. Be proactive in assessing air quality so that you are prepared for occupant concerns.

Parameter	Limit/Range	Reference	TSI Instrument	
Temperature	Summer 23 to 26°C (73 to 79°F) Winter 20 to 23.6°C (68 to 74.5°F)	ASHRAE Standard 55-1992 ISO 7730	Q-TRAK IAQ-CALC TH-CALC VELOCICALC	
Relative Humidity	30% to 65%	ASHRAE Standard 55-1992 ISO 7730	Q-TRAK IAQ-CALC VELOCICALC TH-CALC	
Air Movement	0.8 ft/s (0.25 m/s)	WHO ISO 7730	VELOCICALC DP-CALC ACCUBALANCE	
Ventilation (outdoor air)	Recommended volume/ person minimum depending on type of space and activity	ASHRAE Standard 62-2003 (Table 2)	Q-TRAK IAQ-CALC TH-CALC	
Ventilation (CO <sub>2</sub> )	No more than 700 ppm over outdoor ambient	ASHRAE Standard 62-2003	Q-TRAK IAQ-CALC	
Carbon Monoxide	<b>8 hr. TWA</b>	OSHA NIOSH EPA ASHRAE ACGIH WHO	Q-TRAK IAQ-CALC	
	50 ppm			—
	35 ppm			—
	9 ppm			35 ppm
	9 ppm (peak)			—
	25 ppm			—
9 ppm	26 ppm			

# Measurement Needs



## General Comfort

Indoor air quality monitors provide accurate measurement and data logging of CO<sub>2</sub>, temperature, humidity, and CO, as well as calculations of dew point, wet bulb and percentage of outside air. More than half of IAQ complaints can be attributed to comfort problems.

## Ventilation

Air movement or draft has a significant effect on how people perceive comfort. Too much and people sense that it is "drafty;" too little and it is "stuffy." To ensure that the proper volumes of air are being supplied to each individual occupied area, measurements should be taken at air diffusers.

## Aerosols and Gases

Inhalation of aerosols (particles) or gases can challenge the body's natural defenses by causing reactions ranging from relatively mild to severe. Respirable substances that need to be monitored include certain industrial processes like welding, grinding and cutting, construction, and other situations where dust, smoke, fumes and mist are produced.

## Pressure

Small airborne particles and gases are transported by air movement and also migrate from areas of relatively high to low pressure. Managing differential pressure between indoors and outdoors, and between different areas of the building by regulating supply and return air volumes is a key method of controlling the migration of unwanted contaminants. This is especially critical in health care facilities where infectious, contagious or toxic substances need to be contained and controlled.

## Ultrafine Particles

Unless air is specially filtered, any given air sample contains many airborne particles. Many of these are classified as ultrafine or less than one-tenth of a micron in diameter. A Condensation Particle Counter (CPC) allows a user to follow pathways of particles directly to their source where they can be controlled by repair, removal or replacement of the source.

We set the standard for Fast, Accurate and Reliable IAQ Test Results

5  
ENERGY AND COMFORT  
Indoor Air Quality Instruments





Model 7575

## Q-TRAK™ Indoor Air Quality Monitors

### Model 7575

- One instrument with multiple plug-in probe options including:
  - CO<sub>2</sub>, temperature, humidity, and CO
    - Calculate % outdoor air
    - Calculate dew point and wet bulb temperature
  - Thermal anemometers
  - Rotating vanes
  - Thermocouples
  - Draft
  - Volatile Organic Compounds (VOC)
- Displays up to five measurements simultaneously
- Data log and review statistics
- Downloads for analysis and reporting using TRAKPRO™ software



## VELOCICALC® Air Velocity Meters

### Models 9535, 9545, 9565

- Accurate air velocity measurements
- Easy recording of multiple measuring points
- Calculates valuable statistics—average, maximum and minimum values, and records the number of samples
- Flow rate calculated automatically
- Durable telescoping probe with etched length marks
- Humidity measurement (Model 9545, 9555)
- Available with optional articulating probe

Model 9545



## IAQ-CALC™ Indoor Air Quality Meters

### Models 7515, 7525, 7535, 7545

- Fast, accurate measurements in a single probe
- Model 7515 measures carbon dioxide (CO<sub>2</sub>) only
- Model 7535 adds data logging of CO<sub>2</sub>
- Models 7525 and 7545 simultaneously measure and data log CO<sub>2</sub>, temperature, and humidity and calculate % outside air
- Model 7545 also measures carbon monoxide (CO)
- LogDat2 downloading software included (except Model 7515)



Model 8375

## ACCUBALANCE® Air Capture Hoods

### Models 8371, 8375

- Accurate direct air flow readings from a vent, diffuser or grille
- Balancing mode makes it easy to adjust dampers
- Light weight
- Variety of hood sizes available

# Solutions from TSI



Model 8710

## DP-CALC™ Micromanometers

### Models 5815, 5825, 8710

- Accurately measures differential and static pressure
- Wide measurement range of -15 to +15 in. H<sub>2</sub>O (-3,735 - 3,735 Pa)
- Automatic conversion of actual and standard flows (Model 5825, 8710)
- Flow rate automatically calculated (Model 5825, 8710)
- Measures velocity with Pitot tube in high temperature and contaminated areas
- Auto-zeroing (8710)

## DUSTTRAK™ Aerosol Monitor

### Model 8530, 8532

- Measures aerosol mass concentrations in real time
- PM<sub>10</sub>, PM<sub>2.5</sub>, PM<sub>1.0</sub> and respirable size fractions
- Portable, battery operated
- Long-term unattended sampling
- Data logs and downloads to a PC for analysis and reporting



Model 8530

Model 8532

## P-TRAK™ Ultrafine Particle Counters (CPC)

### Model 8525

- Counts ultrafine particles less than 1 micron diameter in real time
- Tracks particles to the source
- Portable, battery operated
- Data logs to document results



Model 8525

## AEROTRAK™ Handheld Particle Counters

### Model 9303

- Measures up to 3 size channels from 0.3 - 10 μm
- 0.1 CFM (2.83 LPM) flow rate
- 1,500 sample record storage
- 999 location labels
- USB serial output
- Large 3.6-inch display for easy on-screen data review
- Weighs only 1.3 lbs (0.58 kg)



Model 9303

## AEROTRAK™ Handheld Particle Counters

### Model 9306

- Measures up to 6 size channels from 0.3 - 10 μm
- 0.1 CFM (2.83 LPM) flow rate
- 10,000 sample record storage
- 250 alphanumeric location labels
- USB output
- Easily configurable with Microsoft® Windows® CE interface
- 3.7-inch color touch screen for easy on-screen report viewing



Model 9306



# Parameters and Features Chart

The chart below is a guide for selecting an instrument to best fit your measurement needs.

	Model	CO <sub>2</sub> (Carbon Dioxide)	Temperature	Humidity, Wet Bulb, Dew Point	CO (Carbon Monoxide)	% Outside Air	VOC (Volatile Organic Compounds)	Air Velocity	Flow Rate	Differential Pressure	Particles	Data Logging/ Downloading	Review Data	Statistics	Field Calibration Adjustment	Optional Plug-In Probes
Q-TRAK	7575	•	•	•	•	•	0	0	0			•	•	•	•	•
IAQ-CALC	7515	•												•	•	
	7525	•	•	•		•						•	•	•	•	
	7535	•										•	•	•	•	
	7545	•	•	•	•	•						•	•	•	•	
	7545	•	•	•	•	•						•	•	•	•	
DUSTTRAK	8530										•	•	•	•	•	
	8532										•	•	•	•	•	
P-TRAK	8525										•	•	•	•		
AEROTRAK	9303										•	•	•	•		
	9306										•	•	•	•		
TH-CALC	7415		•	H, WB												
	7425		•	•		•						•	•	•	•	
VELOCI-CALC	9515		•					T								
	9525 <sup>1</sup>							T								
VELOCI-CALC	9535		•					T	T			•	•	•	•	
	9535-A <sup>2</sup>		•					T	T			•	•	•	•	
	9545		•	•				T	T			•	•	•	•	
	9545-A <sup>2</sup>		•	•				T	T			•	•	•	•	
VELOCI-CALC	9565	0	•	•	0	0	0	T, P	T, P, Δ	•		•	•	•	•	•
	9565-A <sup>2</sup>	0	•	•	0	0	0	T, P	T, P, Δ	•		•	•	•	•	•
VELOCI-CALC Rotating Vane	5725		•					V	•		•	•	•	•	•	
ACCU-BALANCE	8371								D						•	
	8375 <sup>3</sup>		0	0				P	D	•		•	•	•	•	•
DP-CALC	8710		0	0				P	P, Δ	•		•	•	•	•	•
	5815							P		•						
	5825							P	P	•		•	•	•	•	•

All instruments include a free NIST or EAL Certificate of Calibration. <sup>1</sup>Intrinsically Safe <sup>2</sup>Articulating Probe <sup>3</sup>Back Pressure Compensated

<ul style="list-style-type: none"> <li>• = Feature of Instrument</li> <li>T = Thermal Anemometer</li> <li>P = Pitot Tube Reading</li> <li>Δ = Calculated from Differential Pressure</li> <li>V = Rotating Vane Anemometer</li> <li>WB = Wet Bulb</li> <li>H = Humidity</li> <li>O = Optional</li> <li>D = Direct Reading</li> </ul>	<p>Optional Probes for VELOCI-CALC 9565 Series and Q-TRAK 7575</p> <p><b>Model Probe Description</b></p> <p>960 - Air Velocity and Temperature, straight probe</p> <p>962 - Air Velocity and Temperature, articulating probe</p> <p>964 - Air Velocity, Temperature, and Humidity, straight probe</p> <p>966 - Air Velocity, Temperature, and Humidity, articulating probe</p> <p>995 - 100 mm Rotating Vane probe</p> <p>496 - 35 mm Rotating Vane probe</p> <p>792 - Surface Temperature probe</p> <p>794 - Air Temperature probe</p> <p>980 - Indoor Air Quality probe, CO<sub>2</sub>, Temperature, Humidity</p> <p>982 - Indoor Air Quality probe, CO<sub>2</sub>, Temperature, Humidity, CO</p> <p>984 - Low Concentration (ppb) VOC and Temperature</p> <p>985 - High Concentration (ppm) VOC and Temperature</p> <p>986 - Low Concentration (ppb) VOC, Temperature, CO<sub>2</sub>, and Humidity</p> <p>987 - High Concentration (ppm) VOC, Temperature, CO<sub>2</sub>, and Humidity</p>
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TSI Incorporated serves a global market by investigating, identifying and solving measurement problems. As an industry leader in the design and production of precision instruments, TSI partners with research institutions and customers around the world to set the standard for measurements relating to aerosol science, air flow, health and safety, indoor air quality, fluid dynamics and biohazard detection. With headquarters based in the U.S. and field offices throughout Europe and Asia, TSI has established a worldwide presence in the markets we serve. Every day, our dedicated employees turn research into reality.

To have the free Indoor Air Quality Handbook mailed to you, email a request with your contact information to [answers@TSI.com](mailto:answers@TSI.com).

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