



® Knowledge  
Beyond  
Measure.



# The Leader in High-Performance Indoor Air Quality Measurements



# Breathe a Little Easier with TSI®

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

Indoor air quality (IAQ) 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, to 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.




## Be Proactive in Assessing Indoor Air Quality

Features	Benefits
TrakPro™ Data Analysis Software easily creates graphs and reports to document results (available with certain models)	Improved performance on critical applications results in reliable information that reduces typical operating costs
Real-time measurement of key IAQ parameters	Seeing results on the spot allows you to make fast decisions on IAQ and corrective actions
Fast turnaround 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.

 <b>CERTIFICATE OF CALIBRATION AND TESTING</b> <small>TSI Incorporated, 560 Cambridge Road, Shoreville, MN 55126 USA                      Tel: 1-800-426-7477 Fax: 1-651-490-3814 Email: <a href="http://www.tsi.com">http://www.tsi.com</a></small>									
ENVIRONMENTAL CONDITION				MODEL: <b>9545-A</b>					
TEMPERATURE: 72.0 (22.2) °F (°C)				SERIAL NUMBER: <b>9545A0713014</b>					
RELATIVE HUMIDITY: 44 %RH									
BAROMETRIC PRESSURE: 29.24 (990.2) mmHg (kPa)									
<input checked="" type="checkbox"/> AS LEFT				<input checked="" type="checkbox"/> IN TOLERANCE					
<input type="checkbox"/> AS FOUND				<input type="checkbox"/> OUT OF TOLERANCE					
- CALIBRATION VERIFICATION RESULTS -									
TEMPERATURE VERIFICATION					SYSTEM T-100				
#	STANDARD	MEASURED	ALLOWABLE RANGE	#	STANDARD	MEASURED	ALLOWABLE RANGE	Units: °F (°C)	
1	52.0 (10.5)	52.1 (10.6)	51.8 - 52.5 (10.4 - 10.8)	2	95.0 (35.0)	100.1 (38.0)	94.0 (35.0) - 96.0 (35.5)		
HUMIDITY VERIFICATION					SYSTEM H-100				
#	STANDARD	MEASURED	ALLOWABLE RANGE	#	STANDARD	MEASURED	ALLOWABLE RANGE	Units: %RH	
1	10.0	10.5	7.0 - 13.0	4	70.0	68.5	67.0 - 73.0		
2	30.0	28.1	27.0 - 33.0	5	90.0	89.3	87.0 - 93.0		
3	50.0	48.3	47.0 - 53.0						
VELOCITY VERIFICATION					SYSTEM BENCH 115				
#	STANDARD	MEASURED	ALLOWABLE RANGE	#	STANDARD	MEASURED	ALLOWABLE RANGE	Units: ft/min (m/s)	
1	0 (0.00)	0 (0.00)	-0.3 (-0.10) - 0.3 (0.10)	7	600 (1.52)	562 (1.36)	633-699 (1.21-1.35)		
2	10 (0.30)	9 (0.19)	3.1-4.1 (0.14-0.20)	8	1015 (1.13)	1007 (1.11)	960-1041 (0.45-0.50)		
3	67 (0.34)	67 (0.34)	62-72 (0.32-0.37)	9	1489 (7.50)	1495 (7.40)	1414-1553 (7.18-7.94)		
4	102 (0.52)	101 (0.51)	97-107 (0.46-0.54)	10	2127 (12.84)	2119 (12.80)	2041-2254 (12.20-13.48)		
5	161 (0.82)	161 (0.82)	153-169 (0.71-0.80)	11	4137 (23.95)	4143 (23.98)	4110-4743 (21.89-24.70)		
6	343 (1.71)	343 (1.74)	327-362 (1.60-1.64)	12	9300 (300.2)	9113 (300.6)	8833-9223 (31.62-33.81)		
<small>CALIBRATION PROCEDURE USED: 9121130_A                      TSI does hereby certify that the above described instrument conforms to the original manufacturer's specification (not applicable to As Found data) and has been calibrated using standards whose accuracy are traceable to the United States National Institute of Standards and Technology (NIST) or has been calibrated with regard to measurement standards whose accuracy is traceable to NIST, or is derived from accepted values of physical constants. TSI's calibration systems meet ISO 9001:2000 and meet the requirements of ISO 10012:2003.</small>									
Measurement Variable	System ID	Last Cal.	Cal. Due	Measurement Variable	System ID	Last Cal.	Cal. Due		
Temperature	1003364	02-13-07	05-12-07	Temperature	1003305	02-12-07	05-12-07		
Humidity	1003296	11-09-06	11-09-07						
<b>J. Becker</b>				March 30, 2007					
CALIBRATOR				DATE					



# TSI® Meets Your Measurement Needs

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

### General Comfort

IAQ monitors provide accurate measurement and data logging of VOC, 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 of it 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 (dust, 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 emissions from certain industrial processes like welding, grinding and cutting, construction, and other situations where dust, smoke, fumes and mist are produced.

## 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.





**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 healthcare 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.

**Air Quality Standards and Guidelines**

Parameter	Limit/Range	Reference	TSI Instrument
Temperature	Summer 73 to 79°F (23 to 26°C)	ASHRAE Standard 55-2010	Q-Trak IAQ-Calc TH-Calc VelociCalc
	Winter 68 to 74.5°F (20 to 23.6°C)		
Relative Humidity	30% to 65%	ASHRAE Standard 55-2010 ISO 7730	Q-Trak IAQ-Calc TH-Calc VelociCalc
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	8 hr. TWA 50 ppm 35 ppm 9 ppm 9 ppm (peak) 25 ppm 9 ppm	OSHA NIOSH EPA ASHRAE ACGIH WHO	Q-Trak IAQ-Calc
	1 hr. TWA ■ ■ 35 ppm ■ ■ 26 ppm		
Particulates (Dust)	Total PM PM10 Respirable (4µm) PM2.5	OSHA NIOSH EPA ASHRAE ACGIH WHO	DustTrak II DustTrak DRX SidePak AM520



# Indoor Air Quality Solutions From TSI®

## Micromanometer

### Model EBT730

- 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
- Flow rate automatically calculated
- Measures velocity with Pitot tube in high temperature and contaminated areas
- Auto-zeroing



## Balometer® Air Capture Hood

### Model EBT731

- Accurate direct air flow readings from a vent, diffuser or grille
- Automatically detects supply or return flows
- Lightweight
- Variety of hood sizes available



## 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, 9565)
- Available with optional articulating probe



## DustTrak™ Aerosol Monitor

### Model 8530, 8532

- Measures aerosol mass concentrations in real time
- PM10, PM2.5, PM1.0 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

## SIDEPAK™ Personal Aerosol Monitor

### Model AM520

- Measure aerosol mass concentrations in real time
- STEL alarms visual alerts
- PM10, PM2.5, PM1.0 respirable fractions and 0.8 µm DPM impactor
- Built for taking measurements at breathing zone
- 20 hour run time
- Data logs and downloads to a PC for analysis and reporting





## P-Trak™ Ultrafine Particle Counters

### 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



## 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 touchscreen for easy on-screen report viewing



## 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)



## 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)
- PID for ppm or ppb
- Displays up to five measurements simultaneously
- Data log and review statistics
- Downloads for analysis and reporting using TrakPro™ software



## IAQ-Calc™ Indoor Air Quality Meters

### Models 7515, 7525, 7545

- Fast, accurate measurements in a single probe
- Model 7515 measures Carbon Dioxide (CO<sub>2</sub>) only
- 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)



# 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 (Dust)	Data Logging/Downloading	Review Data	Statistics	Field Calibration	Optional Plug-In Probes
Q-Trak™	7575	■	■	■	■	■	□	□	□			■	■	■	■	■
IAQ-Calc™	7515	■													■	
	7525	■	■	■		■						■	■	■	■	
	7545	■	■	■	■	■						■	■	■	■	
DustTrak™	8530										■	■	■	■	■	
	8532										■	■	■	■	■	
SidePak™	AM520										■	■	■	■	■	
P-Trak™	8525										■	■	■	■		
AeroTrak®	9303										■	■	■	■		
	9306										■	■	■	■		
VelociCalc®	9515		■					T								
	9535		■					T	T			■	■	■	■	
	9535-A <sup>1</sup>		■					T	T			■	■	■	■	
	9545		■	■				T	T			■	■	■	■	
	9545-A <sup>1</sup>		■	■				T	T			■	■	■	■	
	9565	□	■	■	□	□	□	T, P	T, P, C	■		■	■	■	■	■
	9565-A <sup>1</sup>	□	■	■	□	□	□	T, P	T, P, C	■		■	■	■	■	■
VelociCalc® Rotating Vane	5725		■					V	V			■	■	■	■	
AccuBalance®	8380 <sup>2</sup>		■	□				P	D, P, C	■		■	■	■	■	■
Micro-manometer	8715		□	□				P	P, C	■		■	■	■	■	■

All instruments include a free NIST or EA traceable Certificate of Calibration. <sup>1</sup>Articulating Probe <sup>2</sup>Back Pressure Compensated

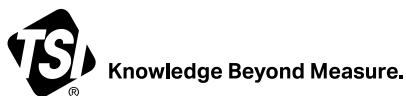
### Optional Probes for VelociCalc 9565 Series and Q-Trak 7575

- = Standard Feature
- T = Thermal Anemometer
- P = Pitot Tube Reading
- C = Calculated from Differential Pressure
- R = Rotating Vane Anemometer
- = Optional
- D = Direct Reading

Model	Probe Description
960	Air Velocity and Temperature, straight probe
962	Air Velocity and Temperature, articulating probe
964	Air Velocity, Temperature, and Humidity, straight probe
966	Air Velocity, Temperature, and Humidity, articulating probe
995	100 mm Rotating Vane probe
792	Surface Temperature probe
794	Air Temperature probe
980	Indoor Air Quality probe, CO <sub>2</sub> , Temperature, Humidity
982	Indoor Air Quality probe, CO <sub>2</sub> , Temperature, Humidity, CO
984	Low Concentration (ppb) VOC and Temperature
985	High Concentration (ppm) VOC and Temperature
986	Low Concentration (ppb) VOC, Temperature, CO <sub>2</sub> , and Humidity
987	High Concentration (ppm) VOC, Temperature, CO <sub>2</sub> , and Humidity

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