# THE LEADER IN PERFORMANCE INDOOR AIR QUALITY MEASUREMENTS

INDOOR AIR QUALITY INSTRUMENTS







# 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, 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.

### PROFESSIONAL MEASUREMENT SOLUTIONS THAT HELP YOU SAVE ENERGY, INCREASE OCCUPANT COMFORT AND ASSURE A HEALTHY ENVIRONMENT

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 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.



⊢	VIRONMENT (	CONDITION			٦[,	MODEL			9545-A				
-	ATIVE HUMIDI	TV	72.0 (22.2)	°F (°C) %RH	_	╫			_				
_	ROMETRIC PRES		29.24 (990.2)	inHg (hPa)	11	SERIAL NUMBER			9545A0713014				
⊠AS LEFT ⊠IN TOLIFANCE  □AS FOUND □OUT OF TOLIFANCE													
— CALIBRATION VERIFICATION RESULTS—													
TEMPERATURE VERIFICATION SYSTEM T-100 Unit: °F (*)													
1	32.0 (0.0)	32.1 (0.0)	ALLOWAB 31.5~32.5			2	STANDARD 140.0 (60.0)	MEASURED 140.1 (60.0)					
н	MIDITY VER	IFICATION				SYS	TEM H-100		Unit: %RE				
1	STANDARD 10.0	MEASURED 10.5		ABLE RANGE 0~13.0	1	4		MEASURE 68.5	D ALLOWABLE RANGE 67.0–73.0				
2	30.0	28.1	27.	.0-33.0		5		89.3		87.0-93.0			
3	50.1	48.3	47.	.1~53.1	_	_							
# I	STANDARD	MEASURED	ALLOWABLE	E RANGE	SY I		M BENCH_11 STANDARD	MEASURED	_	Unit: ft/min ( m/s ALLOWABLE RANGE			
1	0 (0.00)	0 (0.00)	-5~5 (-0.0	3~0.03)	7		666 (3.38)	662 (3.36)		633~699 (3.21~3.55)			
2	36 (0.18) 67 (0.34)	36 (0.18)	31~41 (0.10		8		1010 (5.13)	1007 (5.11)		960~1061 (4.87~5.39)			
4	102 (0.52)	67 (0.34) 101 (0.51)	62~72 (0.3) 97~107 (0.4)		9 16		1489 (7.56) 2527 (12.84)	1495 (7.60) 2519 (12.80)		1414~1563 (7.18~7.94) 2401~2654 (12.20~13.48)			
5	161 (0.82)	161 (0.82)	153~169 (0.		ï		4537 (23.05)	4543 (23.08)	+	4310-4763 (21.89-24.20)			
6	345 (1.75)	343 (1.74)	327~362 (1.	327~362 (1.66~1.84) 12				5913 (30.04)		5633~6226 (28.62~31.63)			
fata Tech of pi	Measurement V Temperature Humidity	s. 131 3 Cunovano	ID Last Ca 14 02-12-0	L Cal. Du 7 05-12-0	10 u 12		ble to the United se accuracy is to eets the requires Measurement V: Temperature	nents of 15O TO	m ID 105	Last Cal. Cal. Due 02-12-07 05-12-07			
		CALIBR	ATED						DATE	2007			

## TSI MEETS YOUR MEASUREMENT NEEDS



#### **General Comfort**

Indoor air quality monitors provide accurate measurement and data logging of VOC,  $CO_2$ , 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.

## WE SET THE STANDARD FOR FAST, ACCURATE AND RELIABLE IAQ TEST RESULTS

#### 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.

Parameter	Limit/Ran	ge	Reference	TSI Instrument			
Temperature	Winter 68	to 79°F 8 to 26°C) 6 to 74.5°F 10 to 23.6°C)	ASHRAE Standard 55-1992	Q-Trak IAQ-Calc TH-Calc VelociCalc			
Relative Humidity	30% to 65%	ó	ASHRAE Standard 55-1992 ISO 7730	Q-Trak IAQ-Calc TH-Calc VelociCalc			
Air Movement	0.8 ft/s (0.25	5 m/s)	WH0 ISO 7730	VelociCalc DP-Calc AccuBalance			
Ventilation (outdoor air)	Recommend person mini depending of space and a	mum on type of	ASHRAE Standard 62-2003 (Table 2)	Q-Trak IAQ-Calc TH-Calc			
Ventilation (CO <sub>2</sub> )	No more that		ASHRAE Standard 62-2003	Q-Trak IAQ-Calc			
	8 hr. TWA	1 hr. TWA		Q-Trak IAQ-Calc			
	50 ppm	+	OSHA				
	35 ppm	+	NIOSH				
Carbon Monoxide	9 ppm	35 ppm	EPA				
	9 ppm (peak)	+	ASHRAE ACGIH				
	25 ppm	+	WHO				
	9 ppm	26 ppm					
Particulates (Dust)	Total PM PM10 Respirable ( PM2.5	4µm)	OSHA NIOSH EPA ASHRAE ACGIH WAO	DustTrak II DustTrak DRX SidePak AM510			



# SOLUTIONS FROM TSI

#### **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



#### **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

#### 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



#### BALOMETER® AIR CAPTURE HOOD

#### Model EBT731

- + 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



#### SIDEPAK™ PERSONAL **AEROSOL MONITOR**

#### Model AM510

- + Measure aerosol mass concentrations in real-time
- + Small, lightweight and quiet
- + PM10, PM2.5, PM1.0 and respirable fractions
- + Belt mounted
- + Battery operated
- + Data logs and downloads to a PC for analysis and reporting



### 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 9303**

+ Measures up to 3 size channels from 0.3 - 10  $\mu m$ 

PARTICLE COUNTERS

- + 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)



#### AEROTRAK™ HANDHELD PARTICLE COUNTERS

#### **Model 9306**

- + Measures up to 6 size channels from 0.3 -10  $\mu m$
- +  $0.1\,\text{CFM}$  (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



#### Q-TRAK™ INDOOR AIR QUALITY MONITORS

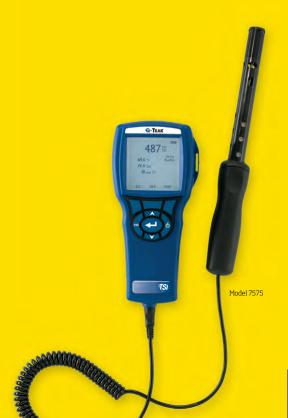
#### **Model 7575**

- + 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		CO (Carbon Monoxide)	% Outside Air	VOC (Volatile Organic Com- pounds)	Air Velocity	Flow Rate	Differential Pressure	Particles (Dust)	Data Logging/ Downloading	Review Data	Statistics	Field Calibration	Optional Plug-In Probes
Q-Trak	7575	+	+	+	+	+	0	0	0			+	+	+	+	+
	7515	+													+	
IAQ-Calc	7525	+	+	+		+						+	+	+	+	
	7545	+	+	+	+	+						+	+	+	+	
	8530										+	+	+	+	+	
DustTrak	8532										+	+	+	+	+	
SidePak	AM5101										+	+	+	+	+	
											+	+	+	+	· ·	
P-Trak	8525												<u> </u>	-		
AeroTrak	9303										+	+	+	+		
	9306										+	+	+	+		
VelociCalc	9515		+					T								
	9535		+					T	T			+	+	+	+	
	9535- A²		+					Т	Т			+	+	+	+	
	9545		+	+				Т	Т			+	+	+	+	
	9545- A <sup>2</sup>		+	+				Т	Т			+	+	+	+	
	9565	0	+	+	0	0	0	T, P	T, P, C	+		+	+	+	+	+
	9565- A <sup>2</sup>	0	+	+	0	0	0	T, P	T, P, C	+		+	+	+	+	+
VelociCalc Rotating Vane	5725		+					V	V			+	+	+	+	
AccuBalance	8380		+	0				Р	D, P, C	+		+	+	+	+	+
Micro- manometer	8715		0	0				Р	P, C	+		+	+	+	+	+
All instrumer	its includ	le a free	NIST or EA	L Certific	ate of Ca	libratio	n.	1	Intrinsio	ally Safe		<sup>2</sup> Articul	ating Pr	obe		
					Optiona	l Probe	s for Ve	lociCal	9565 S	eries and	Q-Trak	7575				
	Model Probe Description															
+ = Standard Feature						Air Velocity and Temperature, straight probe										
962					962		Air Velocity and Temperature, articulating probe									
966					964		Air Velocity, Temperature, and Humidity, straight probe  Air Velocity, Temperature, and Humidity, articulating probe									
P = PITOL TUDE REAGING					995		100 mm Rotating Vane probe									
C = Ca							Surface Temperature probe									
R = Ro	R = Rotating Vane Anemometer													-		
V - Votatilië varie Vileilionierei				794 Air Temperature probe  980 Indoor Air Quality probe CQ. Temperature Humidity												

Indoor Air Quality probe, CO<sub>2</sub>, Temperature, Humidity

Low Concentration (ppb) VOC and Temperature

High Concentration (ppm) VOC and Temperature

Indoor Air Quality probe, CO<sub>2</sub>, Temperature, Humidity, CO

Low Concentration (ppb) VOC, Temperature,  $CO_2$ , and Humidity High Concentration (ppm) VOC, Temperature,  $CO_2$ , and Humidity

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980

982

984

985

986 987



O = Optional

D = Direct Reading

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