



SWAN TECHNICAL SERVICES
EXPERT SOLUTIONS

AMBIENT AIR QUALITY MONITORING INSTRUMENTS

CONTINUOUS • PORTABLE • IAQ

OUR GLOBAL PARTNERS



Continuous Ambient Air Quality Monitoring Station (CAAQMS)

- Turnkey solution: Design and detailed engineering, system integration, supply, installation, commissioning and data upload to PCB and company servers.
- Measures SO₂, NO_x, CO, CO₂, O₃, PM₁₀, PM_{2.5} etc. continuously in the ambient air.
- Optional Removable 4GB data storage (>8 years of 5-minute avg).
- Data upload to Cloud server / PCB server.
- TUV, CPCB approved. USEPA compliant.
- Online calibration from remote location.
- RS232, RS485, USB Ports, and TCP/IP Network Ports



CAAQMS Station



CAAQMS in Mobile Van

Porta Cabin / Shelter can feature: Rack Cabinet with Analyzers, Tube Lights, ACs, Electrical Accessories, UPS, Telephone Socket, Ethernet Socket, Automatic Fire-Fighting System, Video Surveillance System, Guard-rail on Roof, Lightning Protection System, Stepladder, Water-proof Structure, Furniture (table, chair, cupboard), Zero Gas / Hydrogen Gas Generator, Sampling Tube, Standard Gas Cylinder, Display Board etc.

SO₂ Analyzer

- Based on the Ultraviolet Fluorescence Principle.
- Measuring range: 0~500ppb (Optional: 0~20,000ppb).
- Limit of detection: 0.4ppb.
- High efficiency hydrocarbon remover and special optical design, strong anti-interference ability.
- Timed dark current compensation for high stability.
- With self-check function of light intensity attenuation.
- Adaptive signal filtering technology optimizes response time.
- Large capacity memory stores historical data automatically.



O₃ Analyzer

- Based on the Ultraviolet Spectrophotometry Principle.
- Measurement range: 0~500ppb (Optional: 0~20ppm).
- Microprocessor realizes multifunctional operations.
- Modular structure design for easy replacement / maintenance.
- High sensitivity, high repeatability, simple operation.
- Timed dark current compensation for high stability.
- Adaptive signal filtering technology optimizes response time.
- Large capacity memory stores historical data automatically.



NO_x Analyzer

- Based on the Chemiluminescence Principle.
- Measuring range: 0~2,000ppb (Optional: 0~20,000ppb).
- Limit of detection: 0.4ppb.
- Measure NO, NO₂, NO_x independently.
- Installed with permeable drying tank on ozonator.
- Timed dark current compensation for high stability.
- Adaptive signal filtering technology optimizes response time.
- Large capacity memory store historical data automatically.



NH₃ Analyzer

- Based on the Chemiluminescence Principle.
- Measuring range: 0~1,000 ppb (Optional: 0~2,000 ppb).
- Limit of detection: ≤1ppb.
- Both analyzer and converter uses standard 19-inch 4U chassis.
- Color touch screen.
- RS232/RS485 communication port.
- Supports remote control.
- With independent NO, NO₂, NH₃ and NO_x output module.



CO Analyzer

- Based on the Non-Dispersive InfraRed (NDIR) Principle.
- Measuring range: 0~100ppm (Optional: 0~1,000ppm).
- Limit of detection: 0.1ppm.
- High sensitivity, high repeatability, simple operation.
- Supports remote calibration and diagnosis.
- With self-check function of light intensity attenuation.
- Adaptive signal filtering technology optimizes response time.
- Large capacity memory stores historical data automatically.



H₂S Analyzer

- Based on the Ultraviolet Fluorescence Principle.
- Measuring range: 0~500 ppb (Optional: 0~20 ppm).
- Limit of detection: 2 ppb.
- Color touch screen
- Supports remote control
- With independent SO₂ and H₂S analog output
- Sample gas first passes through cleaner to remove SO₂ and then converter will turn H₂S into SO₂. At last, SO₂ concentration can be measured under fluorescence.



Particulate Analyzers

- Based on β -ray Attenuation Method.
- Monitors PM_{10} using PM_{10} sampling head, monitors smaller particulate matter with $PM_{2.5}$ sampling port.
- Measuring range: $0\sim1,000\mu g/m^3$ (Optional: $0\sim10mg/m^3$)
- Detection limit: $<4.8\mu g/m^3$ (1h)
- Can also be set to monitor total suspended particulate matter (TSP)
- Pre-calibration, auto zeroing, auto fault diagnosis.
- Touch LCD to facilitate on-site operation.



BTEX Analyzer

- A GC/PID for automatic monitoring of BTEX in air, water and soils
- Range : 0.45 to $45\mu g/m^3 = 0.1$ to 14.5 ppb.
- Min. detection level as low as 10 ppt for application Benzene or 1,3-Butadiene in ambient air.
- Approved and installed by US EPA. MCERTS certified analyzer for benzene measurement following EN 14662-3 norms
- Miniature, sensitive, mobile and flexible.
- Self-cleaning of the lamp ensures high stability.
- Bi-directional RS-232 C to transfer data & results to PC.



Continuous Mercury Monitor

- Ultra-sensitive measurements of background Mercury (Hg) concentrations.
- EN 15852 Compliant.
- Requires no argon cylinders for operation and no consumables.
- RS232, Modbus, analogue outputs
- Low detection limit and wide range of measurement
- Stable calibration
- Automatic zero drift and span drift correction
- Automatic recalculation to standard conditions
- Auto control and preventive maintenance functions



NMTHC Analyzer

- Based on GC-FID technology.
- Each time after completing sampling, the analyzer purges sample loop and back blows column automatically, to shorten analysis cycle time efficiently.
- Use Silcosteel® processing gas lines to greatly reduce the adsorption and residual of the sample gas within the tube wall.
- FID detector has automatic ignition and alarm function after flameout, effective security management and control of the hydrogen flame gas path.
- LCD Touch Screen. TCP/IP network remote control
- Flameproof enclosure (Optional)



HCI Analyzer

- Based on TDLAS and multiple reflection long optical path technology.
- ppm to ppb range.
- Strong anti-interference capability, high precision, small drift.
- Low detection limit, high sensitivity, Excellent adaptability.
- Compact structure, easy integration, 19" chassis, modular.



Continuous HF Monitor

- Based on combining ultra sensitive cantilever enhanced photoacoustic detection technology with a TDLAS source operating at a fundamental spectral absorption line of hydrogen fluoride (HF).
- High dynamic range and stable operation, 0.5 ppb detection limit, Low sample volume (few ml).
- No consumables. Built-in gas exchange system, Configurable response time : from 15 seconds to few minutes.



Dynamic Dilution Calibrator

- High precise mass flow controller
- Large dilution ratio and fast response
- Quartz GPT chamber, multi interfaces for calibration gas
- Continuous self-checking with alarm function
- Colorful display and touch screen operation
- Large memory and history data saved automatically
- Ozone generator and ozone photometer are optional
- Bidirection RS232 port for remote control
- USB and Ethernet interface



Data Acquisition System

- The control function meets all the requirements of data collection, control and communication.
- Data acquisition industrial computer: CPU frequency $\geq 3GHz$, memory size $\geq 2GB$, hard disk capacity $\geq 500GB$, RS 232 Serial port ≥ 6 . Equipped with keyboard, mouse, 17" monitor.



Software

- Open protocol for multi client deployments
- High integrity data transfer with digital signature
- Real Time alerts & alarms (SMS and Email)
- Live consolidated industry dashboards
- Remote calibration & configuration of analyzers
- Integrated analytics & predictive models for effective pollution control
- Real Time Event Stream processing triggering real time actions



Porta Cabin

- **Main Shell:** The main fabrication of the structural frame work shall be integral & all welded type to comprise of the bottom frame, overall frame work, internal, external cladding with insulation and other peripherals. Sloping self-draining roof and desired door-window, A/C openings etc.
- **Base Frame:** The main bottom (Base) frame is fabricated and welded MS 2mm thick bending profiles, and all the inter connecting cross members shall also be of steel box duly welded length wise & breadth wise and conveniently equi-spaced.
- **Flooring:** Bottom flooring with MS Box sections 60 x 40 framing, 600 x 600 grid and on top 16 mm thick cement boards with 1.5mm thick vinyl floor mat.
- **Side Walls:** 50mm thick PUF/Rockwool panels.
- **Roof Framing:** Roof sloping self drain with suitable pipes using 40 x 80, 50 x 25 etc..
- **Roof:** 2mm Thick Plain GI Sheets
- **Inner Roof:** PVC Profile false ceiling with suitable insulation.
- **Door:** 30 mm thick PUF/Rockwool panel shutter.
- **Window:** Aluminum Sliding Windows with MS Grills.
- **Painting:** One Coat Epoxy primer and one coat Epoxy Finish Paint.



High Purity Zero Gas Generator

- Zero Air Generator produces a continuous flow of high purity Zero Air at selected pressure.
- It consists of Compressor, Moisture Trap, Activated Charcoal and Oxitrap.
- Compressor provides oil free air from atmosphere. It has buffer storage tank and moisture formed is automatically drained by drain solenoid valve. The air is then passed through pressure regulator which is used to set output pressure.
- Then air is passed through Moisture trap where any moisture content in air is trapped.
- Then air is passed through activated charcoal and Oxitrap where O_2 , CO , CO_2 , THC and other unwanted components in the air are adsorbed, leaving Zero Air Gas of required purity.



Sampling Tube

- Sampling device: vertical laminar flow sampling manifold.
- Sampling head: Prevent rainwater and coarse particles from falling into the main pipe, and at the same time prevent birds, small animals and large insects from entering the main pipe. The design of the sampling head ensures that the sampling airflow is not affected by the wind direction and enters the main pipe stably.
- Sampling main pipe: Airflow in the sampling main pipe maintains laminar flow. The residence time of the sampling gas in the main pipe is less than 20s, and the distance between branch pipe joints is greater than 8cm.
- The outer wall of the pipeline is equipped with an insulation jacket or heater, and the heating temperature is controlled at $30^{\circ}C \sim 100^{\circ}C$.



High Purity Hydrogen Gas Generator (Optional)

- It is easy to operate, safe and reliable, adding alkali at one time.
- Add distilled water, and power on to produce hydrogen.
- Electrolytic polishing, Ultrasonic cleaning, over-voltage protection and two-stage purification.
- With unique anti-liquid return device
- Electrolysis material is made of imported special precious metals, which effectively improves the electrolysis efficiency and keeps the cell temperature constant,
- Stable output flow, automatic tracking, purity does not decay, and can be used continuously



Standard Gas Cylinder

- It is used for calibration of the analyzers.
- Standard gases will be supplied.



Display Board

- It is used for displaying the parameters and measured values continuously on realtime basis.



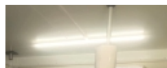
Rack Cabinet

- Single / Dual racks can be supplied as per the number of analyzers required for the CAAQMS System.
- Can fit 19" analyzers, pumps etc.
- Mesh design for air circulation to keep the system cool.
- Fitted with door for easy ergonomics.



Three 40W LED Lights

- Three 40W LED lights are installed for Lighting.



Two Indoor Air Conditioning Units

- Two Indoor Air Conditioning Units are kept to maintain a stable ambient environment for the station.



Electrical Accessories

- Specifically, there are 3 one-phase regulated sockets (for instruments), 3 one-phase unregulated sockets (for sampling pump and temporary electricity), and 1 one phase socket for air conditioning.



UPS

- It is used for uninterrupted power supply during power outages so that the analyzers can work continuously.



Automatic Fire-Fighting System (Optional)

- A Suspended pressure storage automatic fire-fighting system is installed for the monitoring station.
- When a fire occurs in the protection area, the thermal line quickly transmits the fire signal, activates the fire extinguishing device, and automatically sprays fire extinguishing agent to extinguish the fire.
- Also when a fire occurs in the protection area, the ambient temperature rises to the nominal operating temperature set by the fire extinguishing device, and regardless of whether the thermal line is action, the fire extinguishing device automatically starts to spray fire extinguishing agent to extinguish the fire.
- Alarm is also sounded for alerting the engineer.



Telephone Socket

- One telephone socket for connection with the telephone line is installed.



Ethernet Socket

- One Ethernet socket for connection with the network line is installed.



Video Surveillance System (Optional)

- The video monitoring system uses high definition cameras with 360 degree rotation mounted on a pole.
- The pole has a lightning protection grounding system.
- The video storage time is not less than 1 month.



Guard-rail (Optional)

- Two layered stainless steel guardrail pipe is installed on the roof.
- The pipe is connected and fixed at the top.
- The safety and convenience of the engineer are fully considered.



Lightning Protection System (Optional)

- The external direct lightning protection facilities will meet the protection radius of the protected object.
- Three level lightning protection for power supply and lightning protection for telephone signal are also facilitated.
- In order to prevent damage caused by the potential difference between the equipment, a reliable and effective equipotential connection between the main equipment is to be maintained.
- Lightning protection test report issued by a professional testing organization can also be obtained.



Step-ladder

- Equipped with a 2-meter stepladder (4-meter after opening), which fully considers the safety and convenience for the engineer.



Water-proof Structure

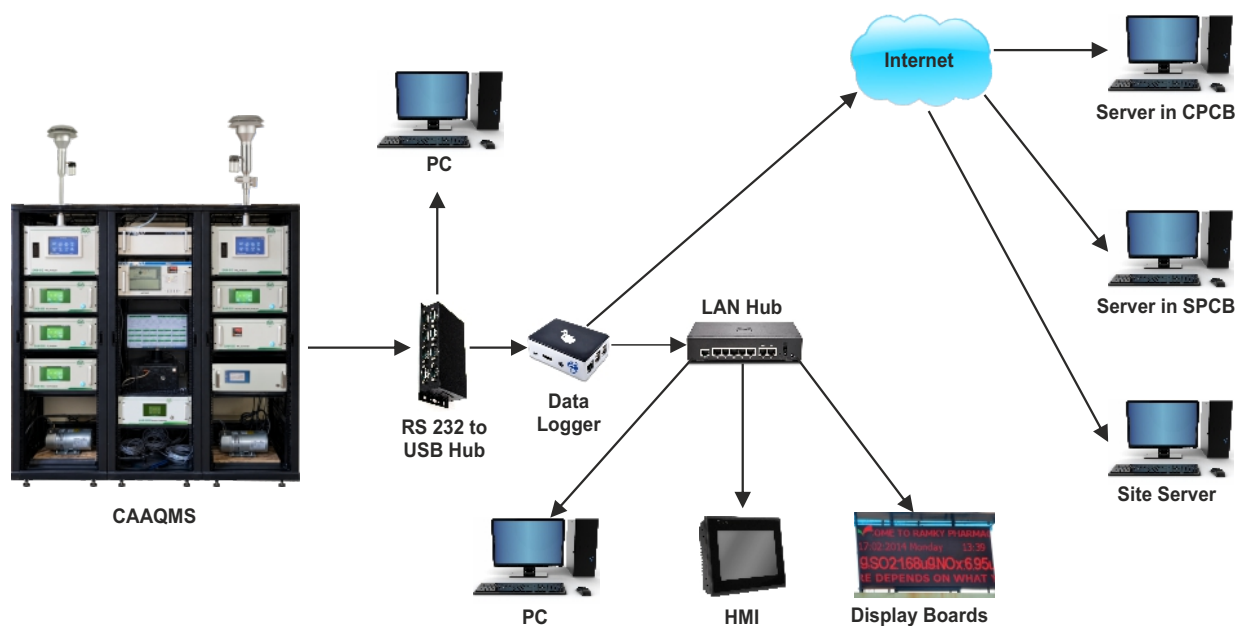
- The waterproof structure is adopted to completely prevent rain from leaking and avoid the drawbacks of leak-proof sealant.
- The roof is sloped from the front to the back (the front is high and the back is low).
- After the construction of the monitoring station is completed, leak-proof sealant is applied on the joint of the two sandwich panels.
- Light steel keel waterproof buckle grooves are installed at the joint of the two color steel plates on the roof.
- The joints between the steel plate and the beam, the buckle groove and the roof of the station are all sealed with weather-resistant silicone to completely prevent rain and avoid the drawbacks of sealing glue.
- It is also equipped with drainage eaves to prevent rainwater accumulation and protect the walls.

Furniture

Furniture is also supplied as part of CAAQMS system accessories and utilities for organizing the items and facilitate comfort to the engineer. Local make below items will be supplied:

- Table - 1 No.
- Chair - 1 No.
- OH Cupboard - 1 No.

Schematic Diagram



Other Ambient Air Monitoring Solutions

Mini Ambient Air Quality Monitoring System (Mini AAQMS)

- Monitors the quality of inhaled air in Smart Homes & Offices, Smart cities on Smart Phones.
- Measures SO_2 , NO_2 , CO , CO_2 , O_3 , $PM_{2.5}$, PM_{10} , Temp., RH, Noise, Light, UV, Pressure.
- TUV Approved.
- Housed inside a shell and can be pole-mount.
- 8 GB internal memory.
- Communicates to cloud via Wi-Fi / GSM(3G/4G).
- Real Time hot spot analytics. Advance Analytics & Trends. Mobile & Email Alerts.
- Solar powered battery (Optional).



Real Time Noise Level Monitoring System

- Complies with IEC 61672-1:2013, ANSI S1.4-1983 and ANSI S1.43-1997
- 1/1 & 1/3 Octave in accordance with IEC 61260-1:2014 and ANSI S1.11-2004
- Linearity range: 25dBA~136dBA
- Frequency weighting: A/B/C/Z.
- Time weighting: Fast/Slow/Impulse
- Profile calculation in parallel with different frequency / time weighting.
- Calculate SPL, LEQ, Max, Min, Peak



Continuous Particulate Monitor

- Laser scattering principle.
- $PM_{1.0}$, $PM_{2.5}$, PM_{10} , and TSP concentration measurement.
- API (Automatic Particle Identification) technology to ensure accuracy.
- Real-time flow monitoring and constant flow control.
- Built-in constant temperature pretreatment
- Built-in sample conditioning system



Continuous VOC Monitor

- Ranges: 0.01 to 100 / 0.1 to 1000 / 1 to 1000 ppm
- Pre-programmed correction factors for more than 200 compounds
- Graphic display and LED status indicator for fault and alarm conditions
- Configurable low, high, and fault relays can trigger alarms or process controls
- Humidity compensation. Explosion-proof enclosure.
- Digital PID module can be easily removed in hazardous locations for calibration or maintenance.



Weather Station

- Measurable parameter options: Wind speed, Wind Direction, Temp., Relative Humidity, Rainfall, Pressure, Solar Radiation.
- Easy to use, integrate and install.
- No moving parts achieve maintenance-free
- Integrated heater that can be switched on if there is danger of freeze.
- Low power consumption. Works with Solar panels also.
- Outputs: USB, 4-20mA.
- Built-in data pre-processing. Configuration Tool for PC.



Ultrasonic Anemometer

- Designed with compact size and offers wind speed measurement up to 45m/s.
- Can be made of metal or high strength plastic
- IP66
- Cost effective
- Low power consumption
- No moving parts and maintenance-free
- High accuracy
- Optional to remove heating function
- Optional to remove analog output



Handheld Ambient Air Quality Monitor

- Can measure gases and particles.
- High-precision laser scattering technology for particulate measurement.
- 3.5-inch TFT color display
- Wireless configuration
- Rugged industrial design. IP66 rating
- Rechargeable 5000 mAh Li battery.
- Stores over 1 million records.
- Applications: Industrial & Manufacturing, Mining & Quarry Operations, Environmental Monitoring, Workplace Safety (EHS), Emergency Response, Construction Sites



Portable Piezobalance Dust Monitor

- Measures the actual mass concentration of particulates.
- Measures PM₁₀, Respirable, or PM_{2.5} particulate matters, such as dust, oil mist, fume & soot.
- Data logging upto 500 measurements.
- PC interface with RS232C & software for downloading data.
- Ideal oil mist detection tool. Useful for Oil Mist Monitoring, Automotive Engineering Area Monitoring, IAQ Investigations, Industrial Hygiene, Occupational Health & Safety, Product Quality Control, Laboratory Research.



Deployable Particulate Sampler (DPS) System

- Ideal for ambient and indoor air sampling for PM₁₀ or PM_{2.5} with Patented IMPACT sampling heads.
- Disposable ready-to-use impaction discs - no cleaning or greasing
- The Leland Legacy pump is quiet, fully programmable, and provides a constant 10 L/min flow rate for 24 hours, making it ideal for environmental monitoring or indoor air studies.



Handheld VOC Monitors

- Third-generation patented PID technology
- VOC detection range from 0 to 15,000 ppm
- Humidity compensation with built-in humidity and temperature sensors
- Available with 1 ppb sensitivity also.
- Correction factors for more than 200 compounds.
- IP 65/67 water-proof and dust-tight.
- Built-in man down alarm.



Portable μ airToxic BTEX Analyzer - PID

- A portable GC/PID for automatic monitoring of BTEX in air, water or soil
- Methods: BTEX, PAMS, TO15, EU.
- Uses a port valve with single absorbent trap, and capillary column.
- Minimum detection level: 10 ppt for Benzene or other VOC (C₆-C₁₂).
- Sensitivity : ppt
- Optional built in calibration.
- Cycle time: 15 / 30 / 60 min.



Sound Level Meters

To measure workplace noise levels & determine degree of hearing protection that is required.

- Sound Detector is a basic Integrating Sound Level Meter
- Sound Examiner is with Data Logging & PC interface by using powerful DMS Software
- Sound Professional is widely used for advanced research applications with 1/1 & 1/3 Octave Filter analysis.



Portable Environmental Monitor

- Measures upto 7 different parameters simultaneously viz., Particulates, VOC's, Toxic Gas, CO₂, RH, Temp. & Air Velocity.
- 90-degree light scattering laser photometer measures particulates in real-time and 37 mm Filter paper for Gravimetric sampling
- Displays instantaneous levels, Min, Max, AVG, STEL & TWA.
- Built in sampling pump, large display for gravimetric sampling.
- Particulates in 4 different sizes by rotary Impactor.



Portable Environmental Particulate Air Monitor

Interchangeable sampling heads for PM₁₀, PM_{2.5}, PM_{1.0} and TSP. Simultaneous direct reading and gravimetric sampling measurements. Clear display. Integral sample pump. Weatherproof case. 24h operation with battery. Software for data analysis.



Area Heat Stress Monitors

Calculates and displays Wet Bulb Globe Temperature (WBGT) Index. Considers the effects of Ambient Air Temperature, Humidity, Air Flow (which provides an evaporative cooling effect to the body) and radiant heat from sources such as the sun, furnaces, ovens, and boilers. Conventional / Waterless wet bulb sensor options. Determine work-rest ratios. IP 54 ingress rating.



Benzene Monitor

- One of the most advanced compound-specific monitor.
- PID technology.
- Accurate measurement of benzene from 10 ppb to 200 ppm and other VOC's up to 0.01-10,000 ppm.
- 60sec response for benzene measurement snapshot.
- Unique 15-minute benzene STEL measurement.
- Built in humidity sensor, Bluetooth, Large display.
- Excellent versatility for entry pre-screening, marine spill response, and refinery down-stream monitoring.



Handheld Odour Meter

- Ideal for "before and after" applications, such as air purification and cleaning service
- Real-time display of odor change.
- 7h continuous usage .Up to 32732 data storage.
- Separate intake and exhaust ports.
- Indicates the relative strength and odor classification numerically by comparing odor gas and purified air.



Indoor Air Quality (IAQ)

Handheld IAQ Monitor (CO₂, RH, Temp.)

- Inexpensive multimeter that simultaneously measure and records CO₂, humidity and temperature.
- It also calculates dew point & wet bulb temperature.
- Data can be downloaded, saved and analyzed.
- Up to 40,000 data point memory
- Large display with backlight
- NDIR sensor with automatic calibration



Handheld IAQ Monitor (CO, CO₂, RH, Temp.)

- Measures CO, CO₂, temperature, and relative humidity simultaneously.
- Calculates: Dew Point, Wet Bulb Temp., Abs. Humidity, Humidity Ratio & % of Outside Air.
- ASHRAE Standard 62 compliant.
- Applications: IAQ Investigation, Building Commissioning, Thermal Comfort etc.



CO₂, RH & Temperature Display

- Simultaneously measures and records CO₂, Relative Humidity and Temperature.
- Large, easy-to-read display
- Can be configured directly with buttons and stored data can be exported to a USB
- **Applications:** IAQ of Classrooms, Meeting Rooms, Open-Plan Offices, Shopping Centres, Fitness Studios etc.



Fixed / Portable IAQ Monitor

- Detects: PM_{2.5} & PM₁₀, Temperature, Relative Humidity, CO₂, HCHO, TVOC's, CO, O₃, SO₂, NO, NO₂, NH₃, O₂, H₂S etc.
- It has a web server user interface.
- Easy to monitor all IAQ-Pro information at local area network via APP.
- Can connect to LCD display
- Supports cloud computing.



Anemometers

Can simultaneously measure Air Velocity, Air Flow, Static Pressure, Temperature and Humidity of the indoor environment. It is ideal for HVAC ventilation testing and balancing, laboratory control, fume hood performance testing, IAQ investigations, and industrial testing.



Handheld Manometer

- Compact, lightweight, portable and high-precision.
- Airflow velocity range: 0.2-60 m/s.
- Pressure range: -2500 to +2500 Pa.
- Data storage : 10,000 values.
- Applications: HVAC Testing, Adjusting, and Balancing ; Duct Traverse



Air Flow Capture Hood

- Lightweight & easy to handle balometer.
- Airflow range: 23 to 2531 CFM (40 to 4300 m³/h).
- Removable micromanometer with Bluetooth.
- Parameters: Air flow, DP, Temp. and Humidity.
- Touch screen user interface.
- Store up to 8,000 measurements.
- Available in six different hood sizes (adjustable).



Duct Air Leakage Tester

- Measures air flow, pressure, temp., abs. pressure.
- Capable of both positive & negative duct leakage testings (delivers ±10" water gauge pressure in the duct).
- Accuracy: ±2.5% of volume flow
- Small foot print, touch display, no orifice plates.
- Meets US (SMACNA) & EU standards.



Innovative Handheld Particle Monitor

- Displays 6 particle sizes simultaneously (0.3, 0.5, 1.0, 3.0, 5.0, 10.0µm) in cf or m³.
- Large, 4.3-inch full-color touchscreen.
- 0.3 micron minimum sensitivity.
- Stores up to 10,000 measurements.
- Control and monitor remotely through a PC.



Portable Particle Counter

- Simultaneously measures and displays up to 6 particle sizes (from 0.3 to 10microns)
- 28.3lpm, 50lpm or 100lpm flow rate
- Large 6.4-inch touch panel LCD
- Fully compliant with ISO 21501-4
- Build-in printer & datalogging (10,000records).



Multigas Ambient FTIR Analyzer - GT5000 Terra

- 5000 detectable gases (Reference library).
- 500 measurable gases with high accuracy.
- 50 gases simultaneously measured.
- 5-second / Real-time results
- Wireless Comm. Remote Operability.
- Splashproof - IP54 rated. Powerful and user-friendly software



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