ASHRAE Dif-Kit

AHRAE 110 Diffuser Kit

Ideal tool for performing the Tracer Gas Test in accordance with ANSI/ASHREA Standard 110-1995

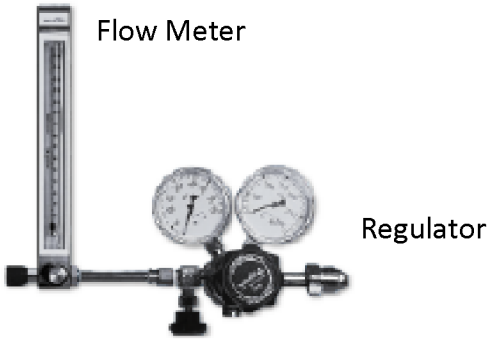
Dif-Kit Tracer Gas Hardware

Specifications

- Critical Orifice : 4 or 8 liter per minute (4 lpm Standard)
- Regulator: Dual Stage, Specialty Gas
- Flow Meter : Calibrated 150 mm/200 psi, Glass Tube
- Pressure Gage: 0 to 60 psi

Advantage

- Ideal for use in performing the Tracer Gas test in accordance with ANSI/AHSRAE Standard 110-1995.
- Diffuser is made to the design and specifications of Standard drawing #110-83M



ASHRE 110-1995 Ejector

Dust Monitoring Products

Associated with Human Health Effect

Inhalable (100-µm 50% cut-point), hazardous when deposited anywhere in the respiratory tract

Thoracic (10-µm 50% cut-point), hazardous when deposited in the lung airways and the gas exchange regions

Respirable (4-µm 50% cut-point), hazardous when deposited in the gas exchange regions of the lungs

Fraction	Size Range
PM10 (thoracic fraction)	<=10 µm
PM2.5 (respirable fraction)	<=2.5 µm
PM1	<=1.0 µm
Ultrafine (UFP or UP)	<=0.1 µm
PM10–PM2.5 (coarse fraction)	2.5 to 10 µm

Associated with Human Health Effect

National Ambient Air Quality Standards

Particle Matter	Level	Averaging Time
PM 10	0.15mg/m^3	24 hours
PM 2.5	0.015mg/m^3	Annual
PM 2.5	0.35mg/m^3	24 hours

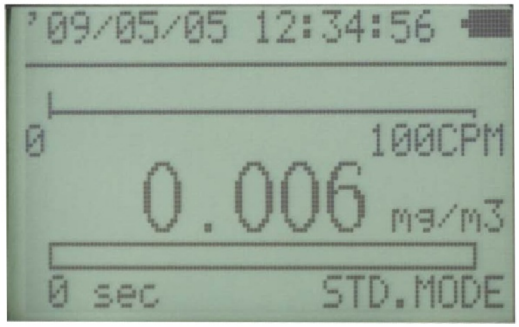
Exposure Limits

- OSHA PEL/TWA 8 hour: 15mg/m^3
- OSHA Ceiling Value: 10mg/m^3 (Silica)
- OSHA IDLH: 25mg/m^3 (Silica)

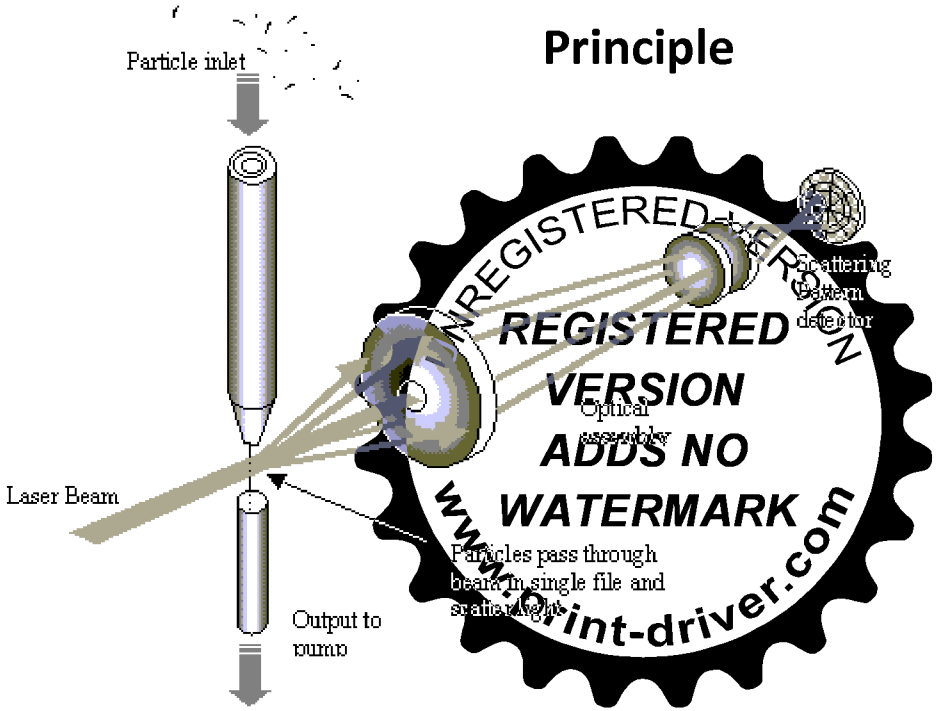
*Permissible Exposure Limit/Level
*IDLH (Immediately dangerous to life or health)

Light Scattering Dust Monitor

- Common in the Industry
- Easy to operate
- Suitable for long time monitoring
- Requires gravimetric analysis



Principle

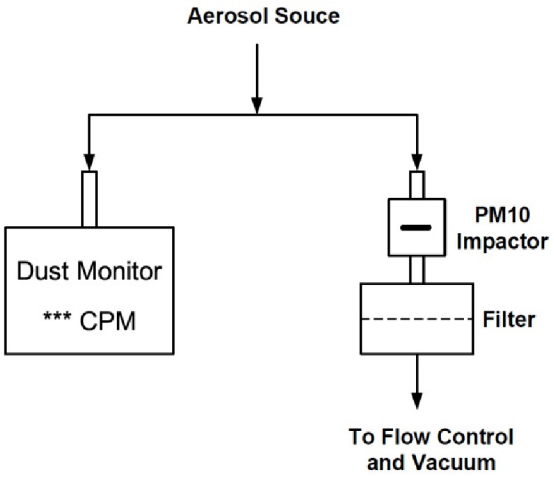


Light Scattering Dust Monitor

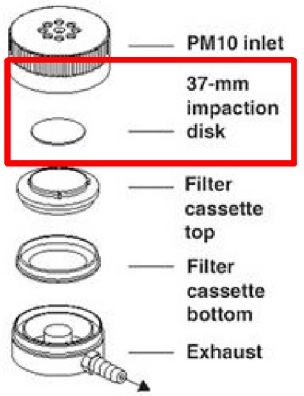
Gravimetric Sampling

To obtain K-factor (aka the calibration factor), user needs to implement the gravimetric sampling of dust.

Procedure



Send to Lab

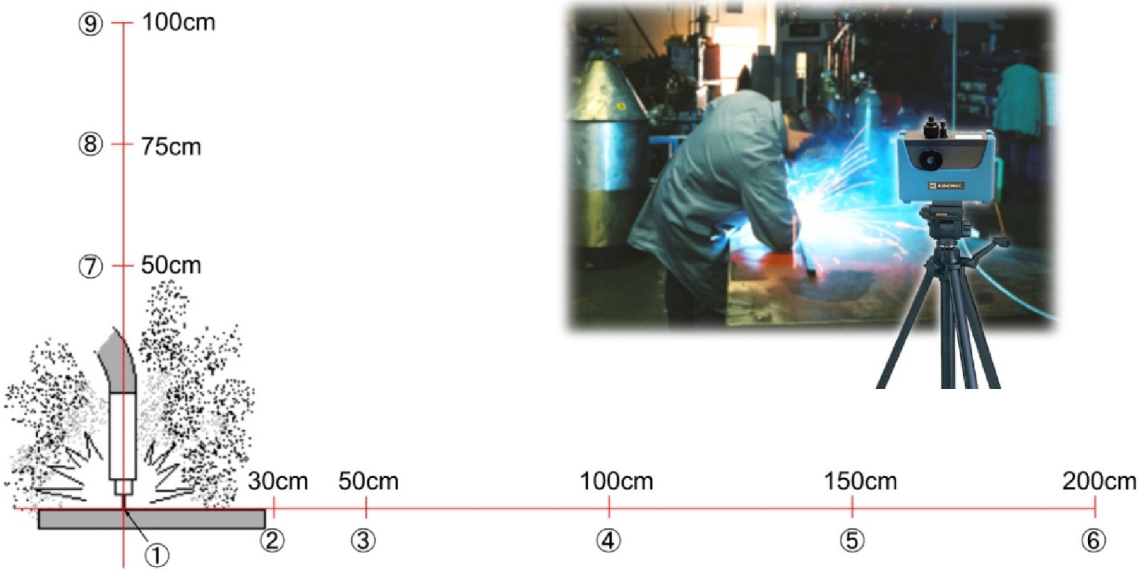


Analytical balance

- Pump
- Filter Cassette (sampler)

C: Mass Concentration from lab analysis
R: CPM (count per minute) of Dust monitor
K: 0.0001 to 0.0099

Light Scattering Dust Monitor



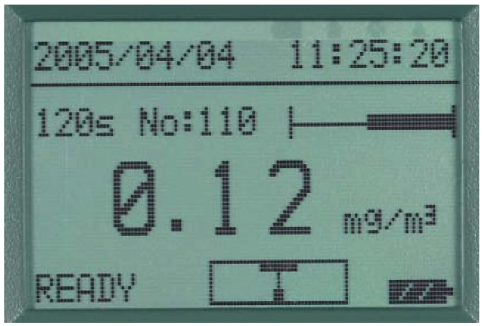
K-factor (Particle density) changes the dust "Mass" concentration

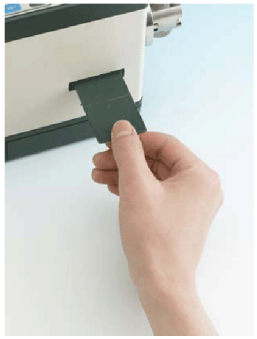
Measurement of calibration factor (K-Factor) for welding fumes

Sampling point	Dust concentration [mg/m^3]	Dust concentration [cpm]	K-factor ($\times 10^{-3}$)
①	0.168	5,362	31.02
②	0.186	10,590	17.13
③	0.089	8,996	9.8
④	0.047	5,656	8.6
⑤	0.041	5,705	7.1
⑥	0.022	3,169	6.8
⑦	0.158	8,868	17.81
⑧	0.111	9,124	12.15
⑨	0.099	8,814	11.20

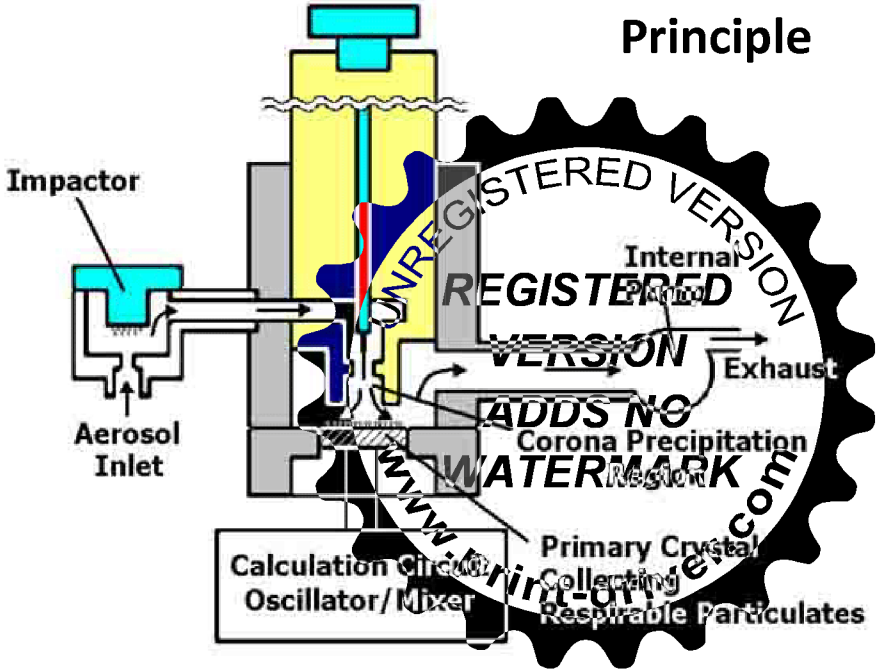
Piezobalance Dust Monitor

- Direct mass concentration measurement
- Kanomax is the only one manufacturer
- Requires cleaning crystal every hour





Principle

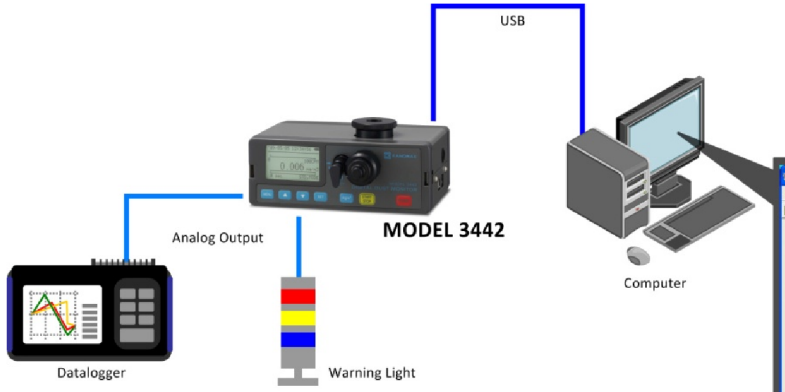


Applications

Light Scattering Dust Monitors

- Indoor air quality investigation
- Point source monitoring
- Personal exposure monitoring

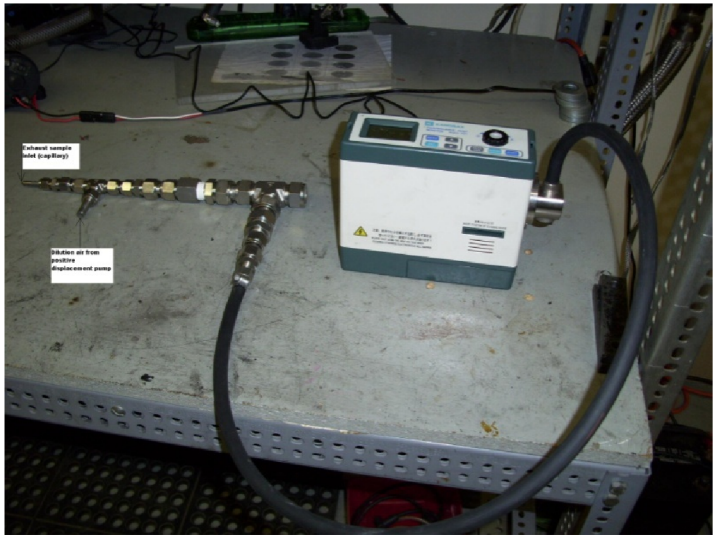
- Welding operation
- Mining operation
- Office environment monitoring



Piezobalance Dust Monitors

- Point source monitoring
- Personal exposure monitoring
- Aerosol Research applications
- Suitable product for measuring oil mist

- Milling operation
- Honing operation
- Process Control in the automotive factory



Example of Aerosol Research

- Customer uses 3521 to measure diesel engine exhaust
- Dilutes exhaust gas and measures particle concentration

Dust Monitor Products

Light Scattering Dust Monitor

Digital Aerosol Monitor Model 3431

Specifications

- Particle size range: 0.01 – 10µm
- Measuring range: 0.001 – 3.999mg/m³
- Output: Analog (option)

Advantage

- Compact and light weight unit

Discontinued

Digital Aerosol Monitor Model 3443

Specifications

- Particle size range: 0.01 – 10µm
- Measuring range: 0.001 – 10mg/m³
- Output: Analog (Standard)
- USB interface
- Data processing software

Advantage

- Long time monitoring, data logging (up to 100,000 measurements)
- Compact and light weight unit

Piezobalance Dust Monitor

Piezobalance Dust Monitor Model 3521 / 3522

Specifications

- Particle size range: 0.01 – 10µm
- Measuring range: 0.001 – 10mg/m3
- PM10 (Model 3521)
- PM2.5 (Model 3522)
- Output: RS232C
- Data logging (500 measurements)

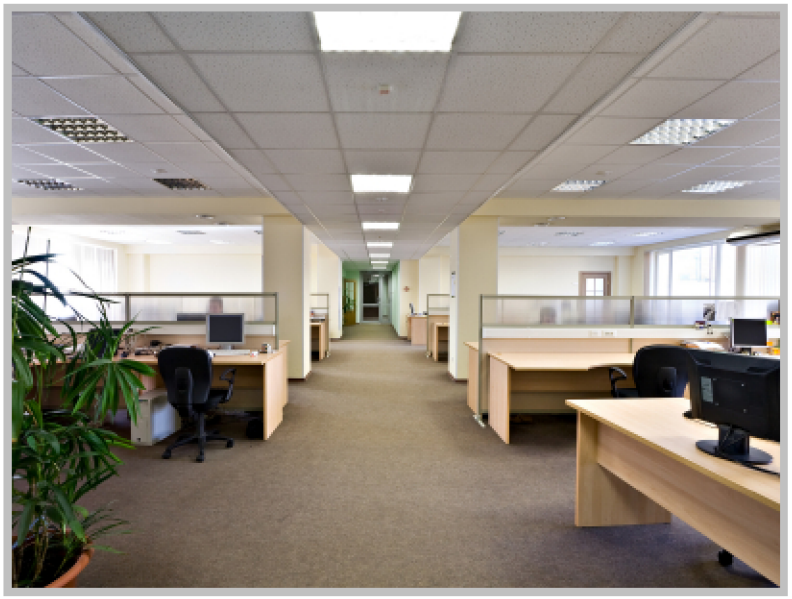
Advantage

- Precise mass measurement
- Backlight display is easy to read in low ambient light conditions

IAQ Monitoring Product

General IAQ Investigation

- Measuring and controlling air comfort for home and office
- Measure airflow, temperature, humidity, etc.



Anemometer

IAQ Monitor

Thermohygrometer

Target User :

- Quality Control Manager
- Government Agencies

Air Quality Testing in Occupational Areas

- Finding toxic gases or materials which causes the sick building syndrome
- Specifying the origin of the toxic materials by measuring CO, CO_2, ozone, VOC and dust etc.

IAQ Monitor

Gas Monitor

Target User :

- Certifier
- Environment Management
- Consultant
- Insurance Company

Gas Monitor

Light weigh handheld unit with multiple gas measurement options

Gas Monitor Aeroqual Series

Specifications

- Output: Digital (RS232C) / Analog (0 – 5V)
- Power supply: 12VDC or Ni-MH battery

Advantages

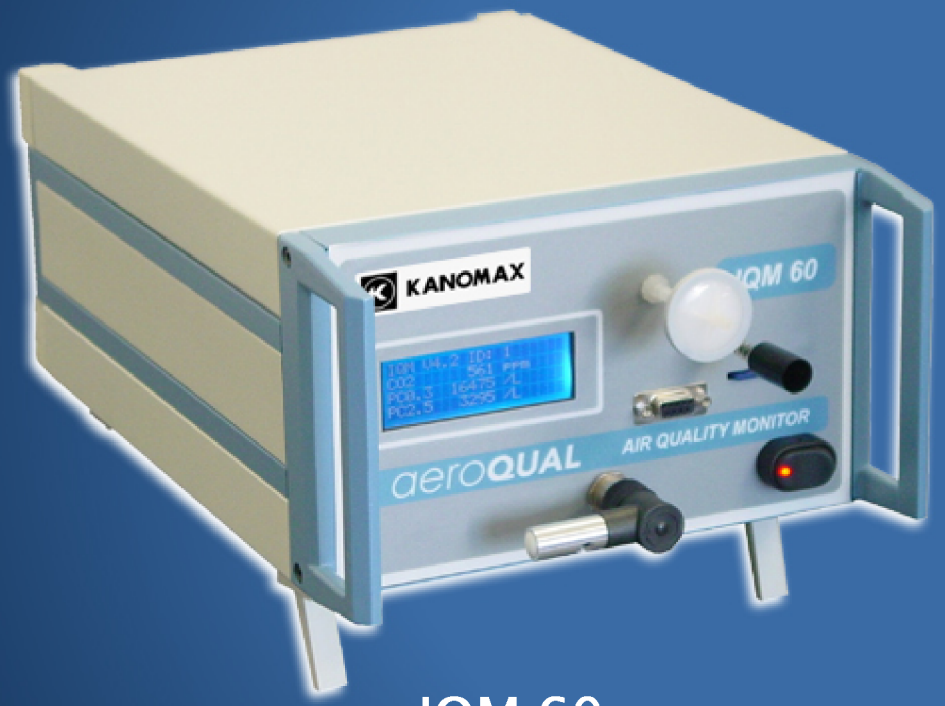
- Interchangeable sensor head
- Remote sensor capability
- Data logging and communication with PC (S500)

Sensor Head

Gas Measurement

- Ammonia
- CO
- CO_2
- Hydrogen
- Methane, VOC
- Ozone
- Nitrogen dioxide
- Sulfur dioxide
- etc

Indoor Air Quality Monitoring System



IQM 60

- Simultaneous 6 Gases
- Temperature & Humidity
- Particle Measurements
- Long time monitoring
- PC Data logging
- Wireless Communication

Most IAQ parameters covered in this single unit

In order to accurately understand indoor air quality, it is necessary to simultaneously monitor multiple indoor air quality parameters

Gas Sensors

CO	HS
CO^2	NO^2
VOC	O^3
NMHC	

7 gas choices, 6 gases might be measured simultaneous

Technologies: GSS, PID, NIDR

Particle / Dust Monitoring

- Particle Counting

  0.3 to 10.0 µm

- Dust Concentration Measurement

  0 to 2 mg/m^3

  PM10 and PM 2.5

Simultaneous Display

Simultaneous display of

Gases

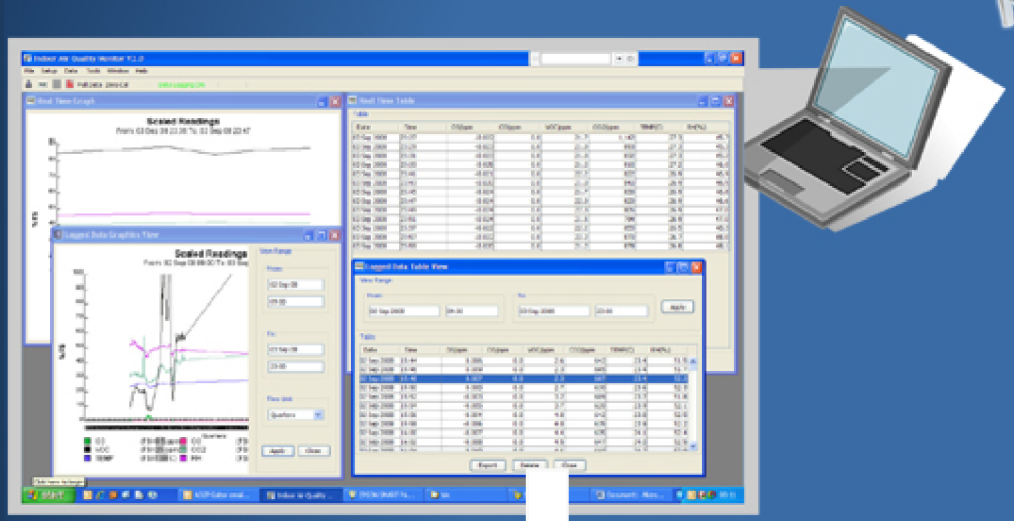
Temperature

Humidity

Particle counting

Dust concentration

Data Logging



Removable SD card

Remote PC

Data Processing Software

RS232, USB, or

Wireless communication

Output to Excel sheets

Applications

IAQ Complaint Investigation and Analysis

HVAC System Performance Monitoring

Odor Investigation and Mold Remediation

Testing the Efficiency of Air Purifiers

Residential and Commercial Buildings

Airport Lounges and Shopping Malls

Schools and Kindergartens

Hospitals and Elderly Care Facilities

- Base Unit: US$3,939
  - CO, CO2, Temp. & Humidity
  - Data Processing Software
- Options
  - Gas Sensor: $373
  - Particle Counter: $2,479
  - Dust Monitor: $3,750

Thank You

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