



حجت فناور پژوه
HOJJAT FANAVAR PAJOOCH

DPM-6000 Ambient Particulate Matter Detector — β ray attenuation



Focusing on
Environmental & Industrial Analysis

HOJJAT FANAVAR PAJOOCH

Features

Unique design of gas path keeps filter paper, active source and detector immovable during enrichment and measurement, ensuring good low detection limit

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US EPA standard beta ray absorption method which spares the complicated operations of TEOM, such as manually replace filter paper and weight. Compared to light scattering method, it has higher measurement accuracy

Simulated identification and aerodynamics based cutting head, providing various selection of accurate particle sizes: PM1, PM2.5, Pm10, TSP

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Sampling flow is measured by mass flow sensor and corrected with collected ambient temperature and pressure to get the sampling flow of the field condition

Use C¹⁴ source which is of low-density, low activity and long half-life to realize stable measurement. No special protection is needed. Reliable and safe. No radioactive contamination will be caused

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Flexible paper-pressing structure. Mechanical driving design is simple and reliable; greatly reduce paper breaking and paper jam and avoid the error caused by the moving of filter paper

Pipeline heating system is used to eliminate interference from ambient humidity and make the detector fit into sudden change of the weather

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Flow control system with precise closed loop feedback; stable sampling flow and small error

Various external ports, such as RS232/RS485, 4-20mA and etc

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Low maintenance frequency, only once needed per year

Applications



Urban area



Agriculture



Industrial construction



Coal stockyard



Stockyard



Building construction



Roads



Residential area

- 1 Real time monitoring of respirable particulate matter in industrial, building construction, residential area and etc
- 2 Environment assessment, permission and pollution forecast and pre-warning
- 3 Ambient air quality monitor and mobile ambient monitoring station
- 4 Occupational disease research institute, and long-term background environment study
- 5 Secondary emission monitoring (coal storage, wharf, etc.)

Overview

DPM-6000 ambient particulate matter detector is using β ray attenuation counting principle. On the basis of products accuracy, stability, reliability and economy, a new generation of ambient particulate matter detector is introduced to measure PM2.5, PM10 and dust particles of other cutting size. It can be widely used in air quality monitoring, mobile ambient monitoring station and real-time respirable particles monitoring in industry, building, residential area, occupational disease research institute, indoor environment monitor, heavy metal analysis and etc.

- US EPA and national standard design
- Enrichment technology adopted
- EPA standard cutting head
- TSP, PM10, PM2.5
- Simple but reliable mechanical driving structure and modularized design which ensure accurate and reliable measurement and long service life.




Principle introduction

The main principle of this analyzer mainly uses enrichment technology of ambient particulate matter and β -ray attenuation method. The particulate matter smaller than $2.5 \mu\text{m}$ is automatically concentrated on rolling type filter film. The β ray produced by irradiator C14 passes through the filter film and is received by detector. The detector consists of photomultiplier, plastic scintillator and counter. As per the energy of received β ray, it can realize quantitative analysis of enrichment thickness and work out the PM2.5 concentration.

Specification

Principle		β -ray attenuation method
Parameters	Range	0-1mg/m ³ or 0-10mg/m ³
	Radiation source	C14, activity <100 μCi
	Accuracy	$\leq 5\%$
	Resolution	0.001mg/m ³
	Lower detection limit	0.005mg/m ³
	Flow error	$\leq \pm 2\%$ (general setting 16.67L/min)
	Flow stability of sampling	$\leq \pm 2\%$ flow of working point/24h
	Sampling period	$\leq 1\text{h}$ (time settable)
	Sampling flow	0-20L/min (settable)
	Parallelism	$\leq 10\%$
Filter paper	Filter paper	glass fibre, width: 40mm, service time 1.5 month (work period 1 hour)
Ports	Communication	RS232, RS485, 4-20mA, GPRS optional
	Data storage	Data of one year at least
Work condition	Cutting head	Ambient temp. (-40-50) $^{\circ}\text{C}$ Ambient pressure (80-106)kPa
	Detector	Ambient temp. (5-40) $^{\circ}\text{C}$ Ambient pressure (80-106)kPa Humidity ($\leq 90\%$)
Power supply	AC (220 \pm 22)V, (50 \pm 1)Hz	
Dimension & weight	479x520x396 (LxWxH)	Detector 30kg Pump 8kg



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