

personalDataRAM™ - Series

pDR-1000AN

pDR-1200

pDR-PU

pDR-BP



Applications

- Indoor air quality monitoring
- Walk-through surveys
- Personal exposure monitoring
- Time & motion Studies
- Workplace & plant monitoring
- Fixed-point continuous monitoring
- Remediation personal surveillance
- Remote alarming
- Mobile monitoring in vehicles & aircraft
- Toxicology & epidemiology studies
- Emergency response
- Testing air filtration efficiency



The world's smallest, most versatile, real-time aerosol monitor.

pDR-1000AN

Hand-held and fixed-point, real-time aerosol monitor/data logger



Measure airborne particulate concentration in real-time

The *personalDataRAM* (pDR-1000AN) measures mass concentrations of dust, smoke, mists, and fumes in real time, and sounds an audible alarm whenever the user-defined level is exceeded. With conventional air quality monitoring methods, the indication that you have reached dangerous levels or are out of compliance is not available in real-time. In contrast, the pDR-1000AN alerts you to a problem within seconds, allowing you to take immediate action. With the logging enabled, this instrument automatically tags and time stamps the data collected, then stores it for subsequent retrieval/printout/graphing through a computer.

Highest performance of any real-time personal particulate monitor

With a measurement range from 0.001 to 400 mg/m³ (auto-ranging), an optically feedback-stabilized sensing system, ultra-low power consumption, the pDR-1000AN sets the standard for sensitivity, long-term stability, and reliability. Air surrounding the monitor circulates freely through the open sensing chamber by natural convection, diffusion, and background air motion.

Rugged and extremely compact

The palm-sized pDR-1000AN weighs only 18 oz (0.5 kilogram) and can be attached to a belt or a shoulder strap, hand held, operated on a table top, or mounted on a tripod. The absence of any moving parts (pumps, motors, valves, etc.) and the use of low-power semiconductors and a ruggedized case ensures long life and dependable operation.

High correlation with gravimetric measurement

The pDR-1000AN is a light-scattering photometer (i.e. nephelometer), which incorporates a pulsed, high output, near-infrared light emitting diode source, a silicon detector/hybrid preamplifier, collimating optics, and a source reference feedback PIN silicon detector. The intensity of the light scattered over the forward angle of 45° to 95° by airborne particles passing through the sensing chamber is linearly proportional to their concentration. This optical configuration produces optimal response to particles in the size range of 0.1-10 µm, achieving high correlation with standard gravimetric measurements of the respirable and thoracic fractions.

Simple zeroing and calibration

The pDR-1000AN comes gravimetrically calibrated (NIST traceable) in mg/m³ using standard SAE Fine (ISO Fine) test dust. Zeroing with particle-free air is accomplished quickly and effectively under field conditions using the zeroing kit included with the instrument. Internal firmware controls an automatic calibration check referenced to the optical background which is factory set. Gravimetric field calibration can be performed by comparison with a filter sampler and by programming of the calibration constant.

Safety Approvals and Certifications

The pDR-1000AN complies with US FCC rules (Part 15) and has received CE certification. It also has intrinsic safety approval from the US Mine Safety and Health Administration (MSHA) for use in coal mining environments containing methane gas. The MSHA Type 2G approval closely resembles the standard intrinsic safety rating as defined by Class 1, Division 1, Groups D. In addition, it meets US FCC and European CE rules.

Standard Accessories

- Universal voltage power supply
- PC communications software disk
- Zeroing kit
- Belt clip kit
- Instruction manual
- Carrying case
- Analog signal output cable

Optional accessories

- Rechargeable (NiMH) battery pack
- Active sampling kit (converts pDR-1000AN to pDR-1200)
- Portable pump unit
- Shoulder strap
- Remote alarm unit
- Wall mounting bracket

pDR-1200

Active aerosol monitor/data logger,
plus aerodynamic sizing

Designed for active particulate monitoring applications

The personalDataRam™, the world's smallest, most versatile, real-time aerosol monitor, is now available for active sampling applications and aerosol sizing. The pDR-1200 uses a pump module (pDR- PU) or other sampling pump to perform particle size selective measurements under field conditions with this filter. With optional inlet accessories, the pDR-1200 is excellent for ambient air measurements under variable wind and high humidity conditions. Compact, lightweight, and easy to use, it is ideal for respirable, thoracic, and PM2.5 monitoring, as well as continuous emission and test chamber monitoring. With an Isokinetic Sampling Set, the pDR-1200 can be used for stack and duct extractive sampling/monitoring. Use membrant filters to capture particles for chemical analysis.

Aerodynamic particle sizing

The pDR-1200 incorporates an optimally designed metal cyclone (BGI Model GK 2.05) with sharp, well defined particle separation characteristics. By operating the pump at specific sampling flow rates, the pDR-1200 cyclone preseparator provides precisely defined particle size cuts. (See chart on right)

Primary calibration and particle samples by filter collection

An integral filter holder directly downstream of the photometric sensing stage accepts 37mm filters. The calibration constant of the pDR-1200 is simply adjusted to coincide with the filter-determined concentration. Primary gravimetric calibration of the instrument concentration readout is easily accomplished under actual field conditions by means of this integral filter. Use membrane filters for chemical analysis or concurrent gravimetric measurements.

pDR-PU Attachable pump module

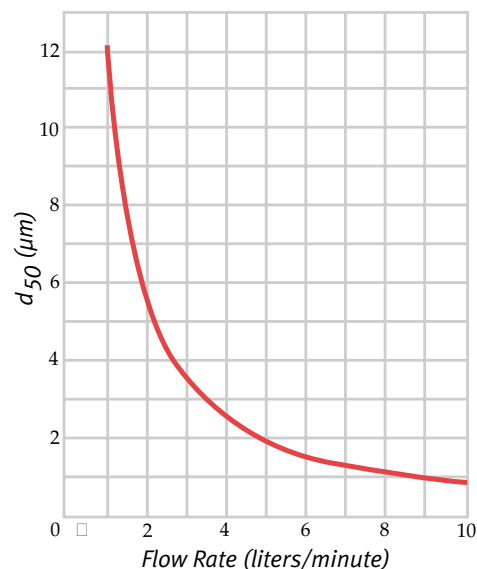
This optional accessory is designed for use with the *personalDataRAM* Series. It incorporates a dual-chamber diaphragm pump, a volumetric flow sensing and control unit. The pump module operates from either an optional, rechargeable NiMH battery pack or from AC line current using the power supply/charger supplied with the *personalDataRAM*. The pDR-PU is designed as a modular unit which can be used in various combinations.

- Flow rate (user adjustable): 1 to 5 liters/min.
- Maximum pressure drop: 10 in H₂O (25 mbar)
- Precision of constant flow rate control: ± 2%
- Power: 9 VDC, 200 mA @ 4 liters/min. (approximate)
- Dimensions: 4 in. (100 mm) H x 3.6 in. (90 mm) W x 1.8 in. (45 mm) D
- Weight: 1 lb. (0.45 kg)

pDR-BP Rechargeable battery pack

This rechargeable nickel-metal-hydride (NiMH) battery is designed to provide d.c. power to the pDR-1000AN, and/or pDR-PU, allowing it to operate for extended periods of time without requiring line power or battery replacement. It is recharged by means of the AC power supply provided as standard accessory with the pDR-1000AN.

- Rated capacity @ 68°F (20° C): 1.9 ampere-hrs.
- Full charging time: 2 hrs.
- Operating time to power the pDR-1000AN @ 68°F (20°C): 70 hrs. (typical)
- Operating time to power the pDR-1200 & pDR-PU@ 68°F (20°C): 36 hrs. (typical)
- Weight: 1 lb. (0.45 kg)



GK2.05 Cyclone Cut Point (50%)
as a Function of Flow Rate

pDR-1000AN/pDR-1200

Hand-held and fixed-point, real-time aerosol monitor/data logger

Specifications

Concentration measurement range (*auto-ranging*):

Referred to gravimetric calibration with SAE Fine test dust
(*mmd* = 2 to 3 μm , *sg* = 2.5, as aerosolized)
0.001 to 400 mg/m^3

Scattering coefficient range:

1.1 $\times 10^{-6}$ to 0.6 m^{-1} (approximately) @ $\lambda=880 \text{ nm}$

Precision/repeatability (*2-sigma at constant temperature*):

$\pm 5 \mu\text{g}/\text{m}^3$ for 1-sec. averaging
 $\pm 1.5 \mu\text{g}/\text{m}^3$ for 10-sec. averaging

Accuracy:

Referred to gravimetric calibration with SAE Fine test dust
(*mmd* = 2 to 3 μm , *sg* = 2.5, as aerosolized)
 $\pm 5\%$ of reading \pm precision

Resolution:

0.1% of reading or 0.001 mg/m^3 , whichever is larger

Particle size range of maximum response:

0.1 to 10 μm

Concentration display updating interval:

1 sec.

Alarm level adjustment range (*user selectable*):

selectable over entire measurement range

Alarm averaging time (*user selectable*):

real-time (1 to 60 sec.) or STEL (15 min.)

Data logging averaging periods (*user selectable*):

1 sec. to 4 hrs.

Total number of data points in memory:

13,000

Number of data tags:

99

Readout display:

LCD 16 characters (4 mm height) x 2 lines

Serial interface:

RS232, 4800 baud

Analog signal output:

0 to 5V and 4 to 20 mA, with selectable full scale ranges between 0.1 and 400 mg/m^3

Computer requirements:

IBM-compatible PC, 286 or higher; Windows™ 3.1, 3.11, or '95; 2 MB memory or more; hard drive; 3.5" or 5.25" floppy drive; VGA or higher resolution monitor

Power:

- Internal battery: 9V alkaline, 20-hr run time (typical)
9V lithium, 40-hr run time (typical)
- AC source: universal voltage adapter (included)
100-250 volts, 50-60 Hz (CE marked)
- Optional battery pack: rechargeable NiMH, 70-hr run time (typical)

Operating environment:

14°F to 122°F (-10°C to 50°C), 10 to 95% RH, non-condensing

Storage environment:

-4°F to 158°F (-20°C to 70°C)

Dimensions:

6.0 in. (153 mm) H x 3.6 in. (92 mm) W x 2.5 in. (63 mm) D

Weight:

18 oz. (0.5 kg)



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