

Fidas® Fly 100



Ultra-light real-time dust monitor for battery operation



Fidas® Fly 100 was developed as a real-time dust monitor for battery operation capable of flying. Its application is possible with any desired drone. The Fidas® Fly 100 simultaneously measures PM₁, PM_{2.5}, PM₄, PM₁₀, and TSP environmental mass fractions or respirable, thoracic, and inhalable mass fractions as per DIN EN 481.

In addition, it measures the particle number and particle size distribution (upon request) in up to 64 size classes within the particle size range of 0.18 – 18 µm or 0.4 – 40 µm. The time resolution can be adjusted from one second to hours for continuous measurements.

Fidas® Fly 100 is equipped with a data logger with 4 GB Compact Flash storage and WLAN support. The firmware supports complete remote access with remote maintenance and optional data storage at www.palas.de/user. For longer quasi-stationary measurements in

indoor areas we recommend our Fidas® 100 with integrated filter holder and a volume flow of 5 l/min. For stationary measurements outdoors, we recommend Fidas® 200/200 S and Fidas® 300/300 S (please contact us for the relevant datasheets).



Typical use of Fidas® Fly 100

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Palas® is continuously setting standards in aerosol technology with more than 50 patents filed since 1983. Our innovations result in products of superior quality and long durability, which lead to unique technical and economic advantages for our customers.

On this account, Palas® could establish itself as a world-wide market leader in aerosol generation, aerosol dilution and aerosol particle measurement.

PALASCOUNTS

Fidas® Fly 100

Quality in detail



Measuring principle

Fidas® Fly 100 measures aerosol particles based on Lorenz-Mie scattered light analysis of single particles. The particles move individually through an optically defined measurement volume (see Fig. 1) that is homogeneously lit with polychromatic light.

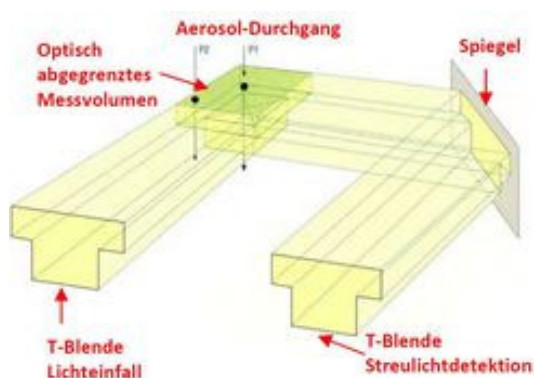


Fig. 1: Schematic diagram of scattered light detection with the patented T-aperture

The use of the patented T-aperture leads to an exactly defined optical measurement volume and allows particle measurement without border zone errors and therefore precise size determination. The new and fast digitalised signal processing electronics allow coincidence to be recognized and, if necessary, to be corrected.

Each particle generates a scattered light impulse that is detected at an angle of 85° to 95° degrees. The particle quantity is detected based on the number of scattered light pulses. The pulse amplitude is a measure of the particle diameter.

The use of a white light source and 90° scattered-light detection results in an

unambiguous calibration curve with none of the ambiguities as with laser light, which leads to an extremely high size resolution (see Fig. 2).

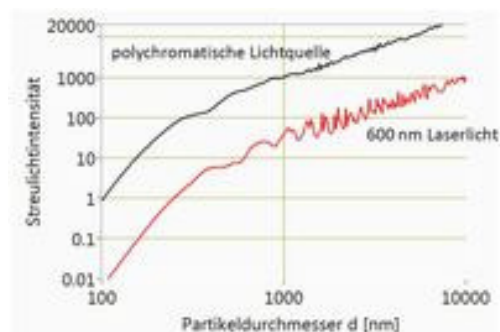


Fig. 2: Scattered light intensity of a white light source compared with a monochromatic light source (angle $85^\circ - 95^\circ$, respectively; $m = 1.59 + 0i$)

In order to convert the measured particle size distributions into mass distributions, each value is multiplied by a correlation factor, which reflects that the environmental aerosol is composed of particles of different material densities depending on the particle diameter.

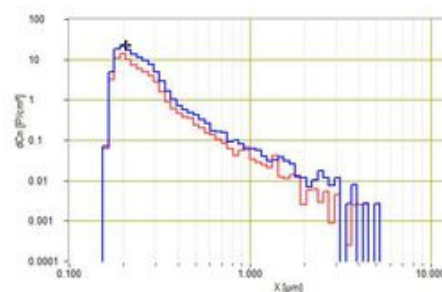


Fig. 3: Two typical particle size distributions measured at a 2-min. time interval. Measurement duration: 2 min.

In addition, the software provides data management with the integrated data logger, export capabilities, and network support. The



measured data can be displayed in many available modes.

Advantages:

- Online display of dust values and particle size distribution
- Counting measuring method, highest resolution
- Real-time measurement
- Light source: LED
- Up to four hours measuring time with battery operation
- Fidas® data analyzer software for individual analysis of your measurement data on an external PC

- Little maintenance required
- Easy to operate
- Reliable functioning
- Reduces your operating expenses!

Applications:

- Particle measurements: roadsides, quarries, coal tips, lignite opencast mining, etc.
- Indoor air quality studies in factories
- Exhaust gas characterization in high chimneys
- Immission / emission measurement

Datasheet:

Interfaces	USB, Wi-Fi
Measurement range (size)	0.18 – 40 µm (2 measuring ranges)
Size channels	64 (32/decade)
Measuring principle	Optical light-scattering
Measurement range (number concentration)	0 – 20000 particles/cm ³
Time resolution	1 s – 24 h
Volume flow	1.4 l/min
Dimensions	9 • 9 • 19 cm (H • W • D)
Weight	Approx. 1 kg (without battery)
Data logger storage	4 GB
Measurement range (mass)	0 – 10000 µg/m ³
Reported data	PM ₁ , PM _{2,5} , PM ₄ , PM ₁₀ , TSP, number distributions