FIDAS® SMART 100

Fidas® Smart 100 is the most advanced compact measuring instrument for ambient air quality. It continuously and reliably analyzes airborne fine dust particles in the size range of 0.18 – 18 μm. The Fidas® Smart is approved by TÜV for $PM_{2.5}$ and PM_{10} for official measurements.

In addition to the fine dust fraction relevant for regulatory immission control, Fidas® Smart 100 simultaneously calculates and stores PM_1, PM_4, total dust, particle number concentration, and their particle size distribution, including pressure, temperature, humidity, CO_2, and carbon-based PM fractions (PMx_CE).

MODEL VARIATIONS

Fidas® Smart 100 E

Fine dust measuring device for existing roof openings for measuring $PM_{2.5}$ and PM_{10} (EN 16450-certified) and other parameters such as PM_1, PM_4, TSP

OPERATION PRINCIPLE

COMPACT MEASURING INSTRUMENT FOR THE DETERMINATION OF FINE DUST

The system works on the 90-degree scattered light measurement principle on a single particle, considering signal duration and shape. Technology and algorithms were developed based on the EN 16450-certified Fidas ® 200[1] . Automatic calibration tracking of the measurement system allows operation for up to two years without recalibration. If necessary, the calibration status can be checked and corrected using a test dust calibrated by Palas.

Palas aerosol spectrometers are thus the only optical fine dust measuring instruments that can be calibrated against a traceable standard by the user at the point of operation.

Fidas® Smart 100 features Ethernet, WLAN, and mobile phone connectivity. All measured values are calculated and recorded directly and, if desired, can be transferred to Palas' own cloud MyAtmosphere[2] directly for visualization or further processing.

Comparison measurement

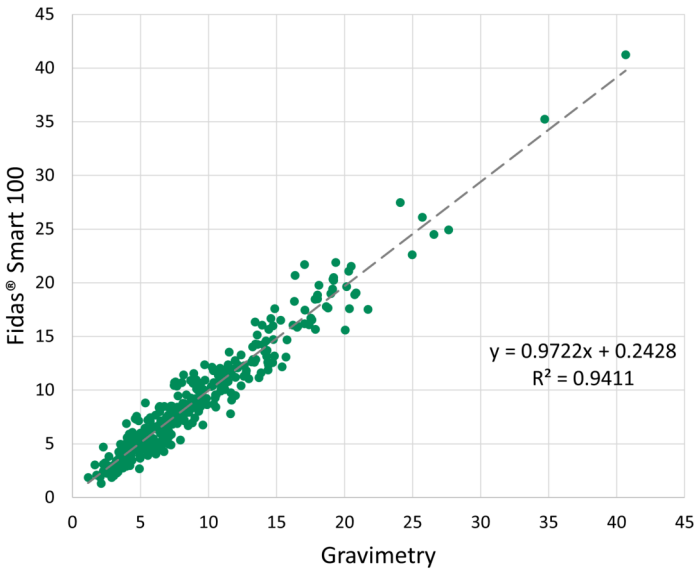

Fig. 1: Fidas® Smart 100 vs. Gravimetry $PM_{2.5}$

[1] Fidas® 200: https://www.palas.de/en//en/product/fidas200
[2] MyAtmosphere: https://my-atmosphere.net/

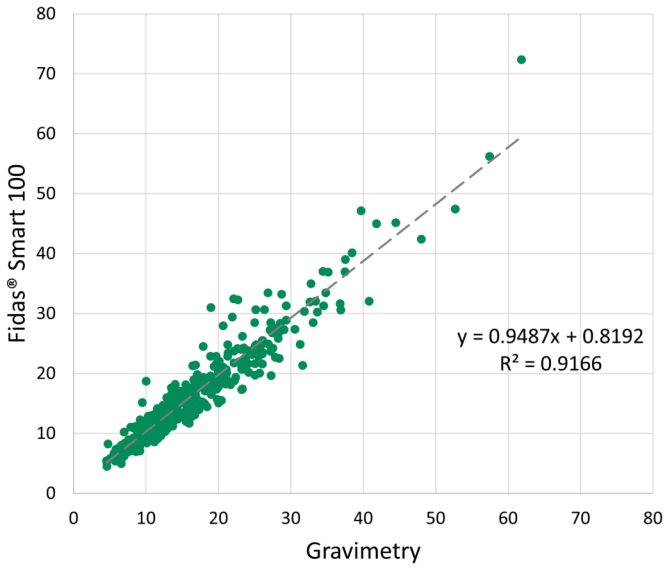

Fig. 2: Fidas® Smart 100 vs. Gravimetry PM_{10}

Extensions/Accessories

Fidas® Smart 100 is equipped with robust weather protection and can be combined with various commercially available mounting systems via a VESA mount.

BENEFITS

- Technology based on the certified Fidas® 200 series (EN16450 and MCERTS); simultaneous measurement of C_n, PM_1, $PM_{2.5}$, PM_4, PM_{10}
- High accuracy due to advanced algorithms
- Long-term stable: up to 2 years of operation without calibration possible.
- On-site calibration with test dust (NIST traceable) is possible
- Operation with AC or DC power source
- Long-life blower for sample airflow
- Regulated aerosol heating to avoid condensation

NORMS AND CERTIFICATES

ISO 21501-1

DATASHEET

Measuring principle	Optical light scattering at single particles
Reported data	PM_1, $PM_{2.5}$, PM_4, PM_{10}, TSP, C_N, particle size distribution, ambient pressure, ambient temperature, rel. ambient humidity, CO_2, Air Quality Index, source indication (depending on configuration)
Measurement range (number C_N)	0 – 20,000 particles/cm³
Measurement range (size)	0.18–18 µm (certified range, other measuring ranges on request)
Measurement range (mass)	0 – 20,000 µg/m³
Measurement uncertainty	9.0 % for $PM_{2.5}$, 9.7 % for PM_{10} (expanded measurement uncertainty according to EN 16450, TÜV Report)
Volume flow	1 l/min $\hat{=}$ 0.06 m³/h
Size channels	64 (32/decade)
Time resolution	1 s – 24 h
Interfaces	USB, Ethernet (LAN), Wi-Fi, 4G (optional via LTE stick)
User interface	Touchscreen 800 • 480 Pixel, 5″ (12,7 cm)
Protocols	UDP, ASCII, Modbus
Data logger storage	10 GB
Software	PDAnalyze
Data acquisition	Digital, 22 MHz processor, 256 raw data channels
Light source	Long term stable LED
Housing	Polymer housing with weather protection and tripod/wall/pole mount option
Operating system	Windows 10 IoT Enterprise
Power supply	115 – 230 V, 50/60 Hz
Power consumption	Normal operation: 15 W, max. 60 W
Installation conditions	-20 – +50 °C (weatherproof)
Response time	< 2 s
Dimensions	240 • 320 • 190 mm (H • W • D)
Weight	3.9 kg
Sampling system	Drying of the aerosol by compact IADS (Intelligent Aerosol Drying System) - Version E: extended inlet for installation in measuring containers
Noise emission	< 40 dB(A)
Resolution	0.1 µg/m³
Power consumption	Normal operation: 15 W, max. 60 W
Data Management	Prepared for connection to the Palas Cloud MyAtmosphere (“MyAtmosphere-ready”); Internet access and separate registration required. The MyAtmosphere terms of use apply.

APPLICATIONS

- Regulatory environmental monitoring
- Construction sites
- Networks with roads, railways, and ports
- Smart City
- Occupational safety
- Industry

Mehr Informationen:
https://www.palas.de/en/product/fidas-smart100