

The suitability-tested immission measurement system for online and simultaneous PM_{2.5} and PM₁₀ measurements

FIDAS® 200 S

The **world's only** certified optical fine dust measurement system for simultaneous determination of PM_{2.5} and PM₁₀ measurement data

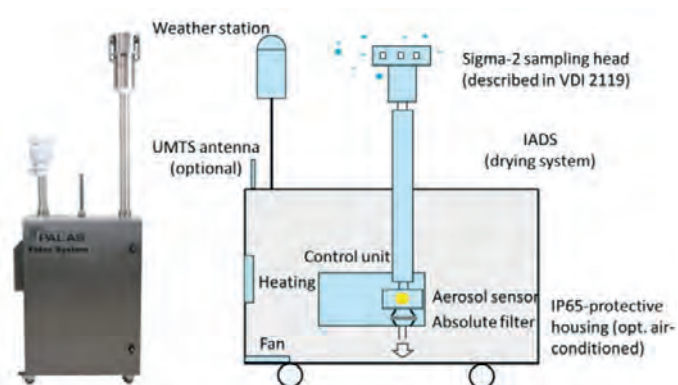
Additionally, you obtain the following parameter data:

- Number concentration
- Size distribution 0.18 – 18 µm
- PM₁, PM₄, TSP, pressure, temperature, relative humidity
- On-site calibration
- Remote calibration monitoring
- Very high data availability

Introduction to the product

Fidas® 200 S consists of a Sigma-2 sampling head (VDI 2119) that also enables representative sampling in strong wind. Particle size determination can be falsified by moisture (e.g. fog). An intelligent aerosol drying system (IADS) dries the aerosol dependent upon the outside temperature and relative humidity.

The control unit is integrated in an IP 65 weather protected housing and can be set up as a standalone instrument outdoors.



Setup of the Fidas® 200 S fine dust measurement system.

An absolute filter can also be inserted in the Fidas® system to chemically analyse particles at a later time, for instance, and to possibly identify a source of particles using this method.

- Measuring principle: optical light scattering from single particles
- Parameters (simultaneous measurement): PM₁, PM_{2.5}, PM₄, PM₁₀, TSP, number, temperature, pressure, relative humidity
- Size channels: 64
- Measuring range (particle size): 0.18 – 18 µm
- Measuring range (number): 1 – 20,000 particles/cm³
- Measuring range (mass): 0 – 10,000 µg/m³
- Volume flow: 4.8 l/min
- Interfaces: LAN, WiFi, RS-232/485, USB
- Communication protocols: "Bavaria/Hesse" [Bayern/Hessen], Modbus, ASCII
- On-site size calibration with CalDust 1100



Fidas® 200 S uses a counting measuring method – optical light scattering according to Lorenz-Mie from single particles – with the patented T-aperture to allow very precise measurement even at high concentrations without coincidence error.

Through the use of a bright and durable white light LED as a light source, smaller particles that are often present in high concentrations can be considered far more effectively.

Calibration of Fidas® 200 S:

All components of the Fidas® 200 S have to pass stringent quality assurance tests. Every measuring device is subjected to a test run lasting up to two weeks. After installation, calibration can be remotely monitored and may also be verified on-site.



Reduce your operating costs with the Fidas® system.

Report from TÜV-Rheinland 936/21218896/A

Two Fidas® 200 S systems were compared within the scope of suitability testing during the period May 2012 and July 2013 at three sites with two reference filter collectors. Furthermore, a lab test was carried out in which the following were tested (among others):

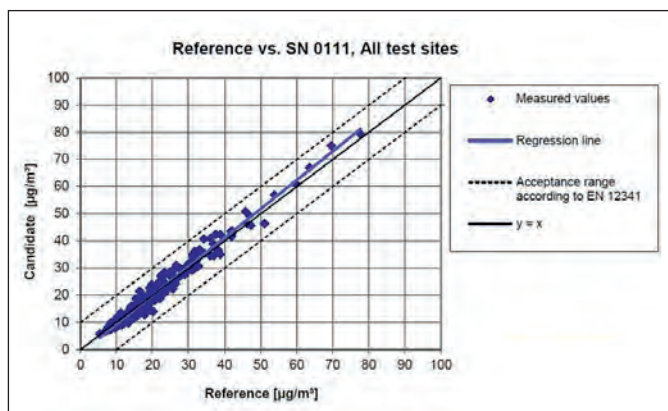
- Function and its description in the manual
- Repeatability standard deviation at the zero point
- Influence of the ambient temperature on the zero and span point (Fidas® -20 °C to +50 °C)
- Accuracy and consistency of volume flow
- Tightness of the measuring system

Important results from the TÜV-Rheinland report

Candidates Fidas® 200 S SN 0111 & SN 0112	
Reference LV53 (2 for PM ₁₀ and PM _{2.5} each)	

All comparisons PM _{2.5} (with applied slope & offset correction)	
number of value pairs	225
uncertainty between Fidas® test devices	0.44 µg/m³ (allowed: 2.5 µg/m³)
uncertainty between the reference measurement devices	0.58 µg/m³ (allowed: 2.5 µg/m³)
slope b	0.999
intercept a	0.012
expanded measurement uncertainty W _{CM}	10.17% (allowed: 25 %)

All comparisons PM ₁₀ (with applied slope & offset correction)	
number of value pairs	227
uncertainty between Fidas® test devices	0.64 µg/m³ (allowed: 2.5 µg/m³)
uncertainty between the reference measurement devices	0.62 µg/m³ (allowed: 2.5 µg/m³)
slope b	0.999
intercept a	0.015
expanded measurement uncertainty W _{CM}	7.22% (allowed: 25 %)



Reference equivalence function for PM₁₀ for device 1

Testing in accordance with

- VDI 4202-1, VDI 4203-3
- DIN EN 12341 (PM₁₀), DIN EN 14907 (PM_{2.5})
- and the equivalence guideline

Certified in accordance with

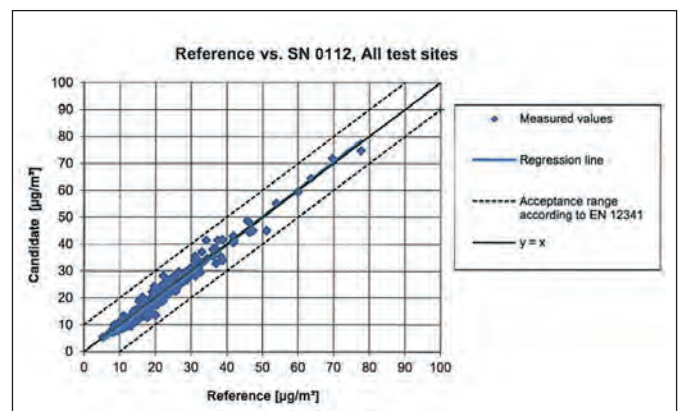
- DIN EN 15267-1 and -2 (Federal Gazette [*Bundesanzeiger*] 1 April 2014) especially for measurements ordered by authorities in accordance with DIN EN 14181

The most important results are shown in the table.

It is important to emphasise that the expanded measurement uncertainty is well below the permitted measurement uncertainty and the data availability of > 99 % for both devices was very high.

Fidas® 200 S has patented online status monitoring and can be verified and calibrated easily at any time on-site using CalDust 1100 calibration dust.

The Fidas® system is another Palas® innovation.



Reference equivalence function for PM₁₀ for device 2





For over 30 years now, Palas® has stood for excellent quality, cost-efficiency and reliability in aerosol and particle technology. Renowned companies, universities and research institutions in around 60 countries put their trust in Palas® precision technology.

OUR CORE COMPETENCIES

- Filter test systems*
- Aerosol spectrometer systems*
- Fine dust monitoring systems
- Nanoparticle measurement technology
- Particle generation systems*
- Dilution systems*
- Clean room particle technology
- Special developments
- Calibration systems*
- Services
- Training courses and seminars

* Palas® is the market leader in these product groups.

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