



Promo® 1000 is a light-scattering aerosol spectrometer system for particle size analysis and concentration determination that can be equipped with all [welas® 1100 and 1200 sensors](#)¹. These sensors allow reliable measurement in the concentration range from < 1 particle/cm³ - $5 \cdot 10^5$ particles/cm³.

With Promo® 1000, particle sizes above 120 nm can be reliably measured, as the unique high-power xenon high-pressure lamp with very high light intensity and the photomultiplier are directly integrated into the aerosol sensor.

Unique are up to four measuring ranges in only one device:

- 0.12 μm – 3.5 μm (additionally in [welas® 1000](#) and Promo® 1000)
- 0.2 μm – 10 μm
- 0.3 μm – 17 μm
- 0.6 μm – 40 μm

Promo® 1000 is famous for up to 128 size channels per measuring range and a concentration range from < 1 particle/cm³ to $5 \cdot 10^5$ particles/cm³.

¹welas® 1100 and 1200 sensors: <https://www.palas.de/en//en/product/aerosolsensorswelas1000>

MODEL VARIATIONS



Promo[®] 1000 H
With heating regulation up to 120 °C for welas[®] aerosol sensors



Promo[®] 1000 HP
Mit automatischer Regelung des Probenahmenvolumenstroms durch die Aerosolsensoren welas[®] unter Überdruck von 2 bis 10 bar oder in Temperaturen bis 120 °C



Promo[®] 1000 P
With automatic regulation of sampling volume flow by the aerosol sensors welas[®] under overpressure up to 10 bar

DESCRIPTION

Promo® 1000 is a light-scattering aerosol spectrometer system for particle size analysis and concentration determination that can be equipped with all [welas® 1100 and 1200 sensors](#)². These sensors allow reliable measurement in the concentration range from < 1 particle/cm³ - $5 \cdot 10^5$ particles/cm³.

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SCATTERED-LIGHT AEROSOL SPECTROMETER SYSTEM FOR PARTICLE MEASUREMENT FROM 120 NM

A touch display ensures user-friendly operation. Measurements can be started quickly, and all data, such as the current number distribution and the number concentration, as well as 24 further statistical values, can be evaluated and displayed in real-time. All incoming data can be stored with a max. the temporal resolution of 1 s. For data transfer, Promo® can also be integrated into a company network.

Promo® has a standard interface and can be controlled by a process control system or a simple Labview program. The Promo® measurement technology:

Promo® has a new, fast 20 MHz signal processing processor, which analyses the progression of each particle signal.

This makes it possible to recognize coincidental events in light scattering measurement technology at the individual signal and correct them (according to Dr. Umhauer / Prof. Dr. Sachweh). This way, increasing the maximum concentration limit to $5 \cdot 10^5$ particles/cm³ is possible⁵ particles/cm³.

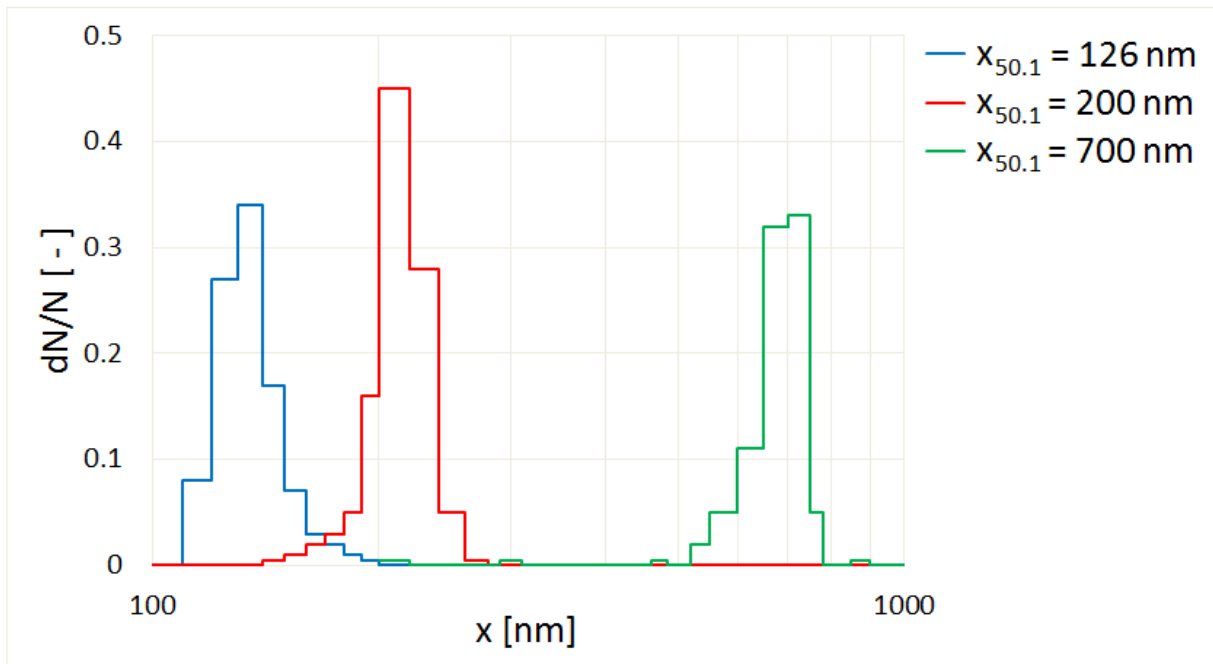
Furthermore, the new signal detection electronics, which include a new, powerful logarithmic A/D converter, allow particles of 120 nm to be measured with a 50 % counting efficiency.

High classification accuracy, high-resolution capability, and a high counting efficiency are the prerequisites for unambiguous particle measurement.

The best size classification accuracy and the best size resolution are guaranteed by the following special features (see Graph 1):

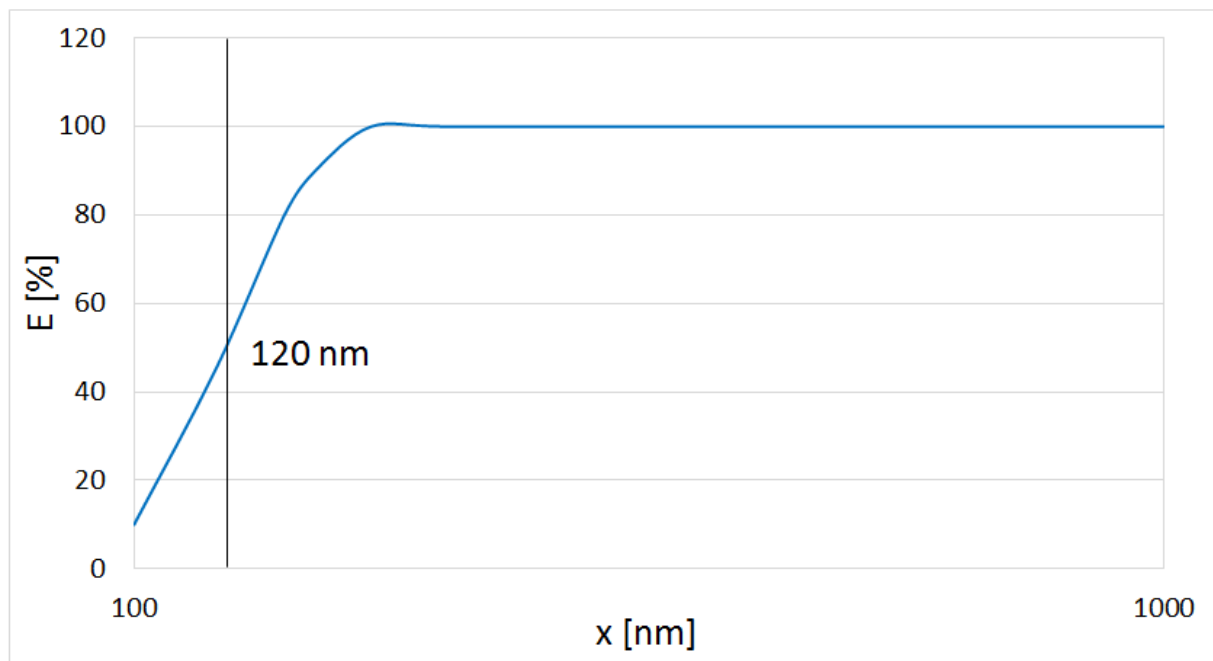
- White light and 90° light-scattering detection \Rightarrow Unambiguous calibration curve
- Patented T-aperture \Rightarrow No border zone error
- New digital individual signal processing \Rightarrow Coincidence detection and correction of the individual signal making it possible to measure higher concentrations

²welas® 1100 and 1200 sensors: <https://www.palas.de/en//en/product/aerosolsensorswelas1000>



Graph 1: Resolution capability and classification accuracy (1200 sensor)

The Promo® is characterized by its high counting efficiency starting from 0.12 μm !



Graph 2: Counting efficiency with the welas® 1200 sensor

Extensions/Accessories

The Promo® 1000 sensors:

A powerful light source characterizes the welas®1100 and 1200 aerosol sensors [welas® 1100 and 1200 aerosol sensors³](#) are characterized by a powerful light source, and the photomultiplier are directly integrated into the sensor. This technology offers the best size resolution, classification accuracy, and a low detection limit.

The measurement volume size is crucial for coincidence-free particle size and particle number measurement.

With measurements in coincidence, the diameter is measured too large and the number too small. Theoretically, for a coincidence-free size, i.e., a maximum of one particle in the measuring volume, at a number concentration of 10^3 particles/cm³, the measurement volume extension must not be higher than 1 mm³.

³welas® 1100 and 1200 sensors: <https://www.palas.de/en//en/product/aerosolsensorswelas1000>

BENEFITS

- Measuring range of 120 nm to 40 μm (4 measuring ranges selectable in one device)
- Up to four measuring ranges in only one device:
 - 0.12 μm – 3.5 μm (additionally in welas® 1000 and Promo® 1000)
 - 0.2 μm – 10 μm
 - 0.3 μm – 17 μm
 - 0.6 μm – 40 μm
- Up to 128 size channels per measuring range
- Concentration range from $< 1 \text{ particle/cm}^3$ to $5 \cdot 10^5 \text{ particles/cm}^3$
- Calibration curves for different refractive indices
- Very high and reproducible counting efficiency rate starting at 0.12 μm

- High temporal resolution down to 10 ms
- PDAnalyze analysis software
- Calibration, cleaning and lamp replacement can all be performed independently by the customer
- External control by RS 232 or Ethernet
- Optional: Software PDControl for operation as welas® digital available
- Simple operation
- Low maintenance
- Reliable function
- Reduces your operating expenses

DATASHEET

Measurement range (number C_N)	$< 5 \cdot 10^5$ Partikel/cm ³
Size channels	Max. 128 (64/decade)
Measurement range (size)	0.12 – 3.5 μm , 0.2 – 10 μm , 0.3 – 17 μm , 0.6 – 40 μm
Measuring principle	Optical light-scattering
Volume flow	5 l/min, 1.6 l/min
Time resolution	1 s
Thermodynamic conditions	+10 – +40 °C, -100 – 50 mbar
Data acquisition	Digital, 20 MHz processor, 256 raw data channels
Light source	Xenon Hochdrucklampe 75 W
User interface	Touchscreen, 800 • 480 pixel, 7" (17.78 cm)
Housing	Table housing, optional: with mounting brackets for rack-mounting
Weight	Control unit: approx. 8 kg, sensor: approx. 18 kg
Operating system	Windows embedded
Data logger storage	4 GB Compact Flash
Software	PDControl, FTControl
Installation conditions	+5 – +40 °C (control unit)
Interfaces	USB, Ethernet (LAN), Wi-Fi, RS-232/485
Power supply	115 – 230 V, 50/60 Hz
Dimensions	185 • 450 • 315 mm (H • W • D) (19")

CASE STUDIES

- Determination of the separation efficiency of car interior filters, engine air filters, room air filters, compressed air filters, vacuum cleaner filters, cleanable filters, electrostatic precipitators, oil separators, cooling lubricant separators, wet scrubbers, cyclones and other separators
- Isothermal and isobaric particle size and quantitative determination, for instance in the automobile, chemical, pharmaceutical and food industries
- Analysis of fast, transient processes
- Inspection of smoke detectors
- Particle formation for cloud formation
- Emission measurements
- Immission measurements



Mehr Informationen:
<https://www.palas.de/product/promo1000>