

Aerosol sensor welas[®] 2500

Aerosol sensor with optical fibre technology for number concentrations up to 4,000 particles/cm³



Model Variations



Aerosol sensor welas[®] 2500 HP

Aerosol sensor pressure-resistant up to 10 bar overpressure and heatable up to 120°C



Aerosol sensor welas[®] 2500 P

Aerosol sensor pressure-resistant up to 10 bar overpressure

Aerosol sensor welas[®] 2500

Description

The model 2500 aerosol sensors are equipped with a very small measurement volume and are used for coincidence-free measurement with a maximum number concentrations up to 4,000 particles/cm³. This aerosol sensor allows statistically reliable measurements in low raw gas concentrations down to clean room class 100,000 and for filter testing according to ASHRAE 52.2.

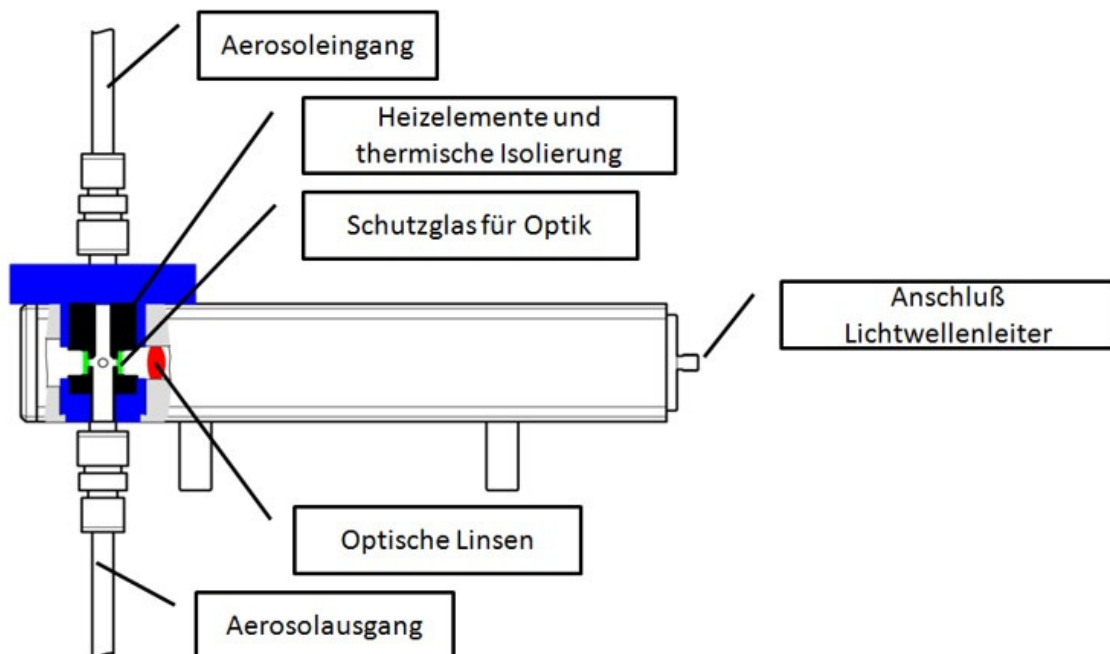
range: 0.3 – 17 µm / 0.6 – 40 µm / 2 – 105 µm. **Functional principle:**[®] digital and Promo[®] digital are based on scattered-light analysis on a single particle. The particles to be measured pass through a T-shaped, optically delineated measuring volume that is illuminated by a white light source. This generates a scattered-light pulse whose level is a measure for the concentration.

The high size classification accuracy and the high size resolution are guaranteed by the following special feature:

- White light and 90° light-scattering detection
→ **unambiguous calibration curve**
- Patented T-aperture technology for a T-shaped measurement technology
→ **no border zone error**
- New digital individual signal processing for the analysis of the scattered-light pulse
→ **coincidence detection and correction which enables measurement in up to 5 times higher concentrations**

Example: the welas[®] sensor aerosol guide heatable up to 250°C (see variations)

-free and reliable measurement of large particles up to 40 µm in the sensor is guaranteed by the vertical aerosol duct at a high volume flow of 5 l/min and a large sampling tube diameter.



Size limitation of the optical measuring volume

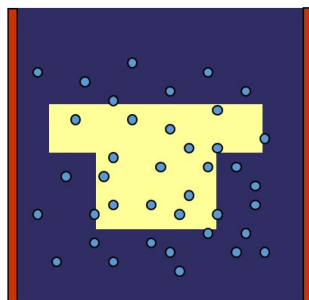
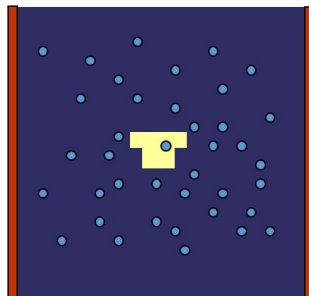
table below shows the theoretical minimum separation of the particles at a given number concentration. a number concentration of 10³ per cm³ the optical measuring volume must not be larger than 1 mm³.

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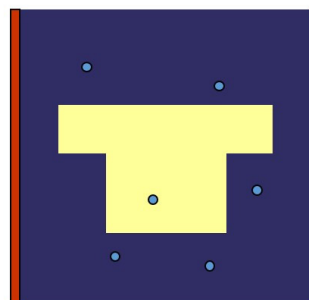
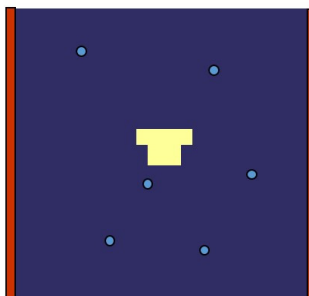
Anzahl-konzentr. [P/m ³]	Anzahl-konzentr. [P/cm ³]	Partikel-abstand [cm]	Partikel-abstand [mm]	Partikel-abstand [μm]
1	10 ⁻⁶	100	1000	
10 ³	10 ⁻³	10	100	
10 ⁶	1	1	10	
10 ⁹	10 ³		1	1000
10 ¹²	10 ⁶		0,1	100
10 ¹⁵	10 ⁹		0,01	10
10 ¹⁸	10 ¹²		0,001	1

customer can select a sensor with the appropriate measuring volume size depending on the concentration to be measured.

Hohe Konzentration



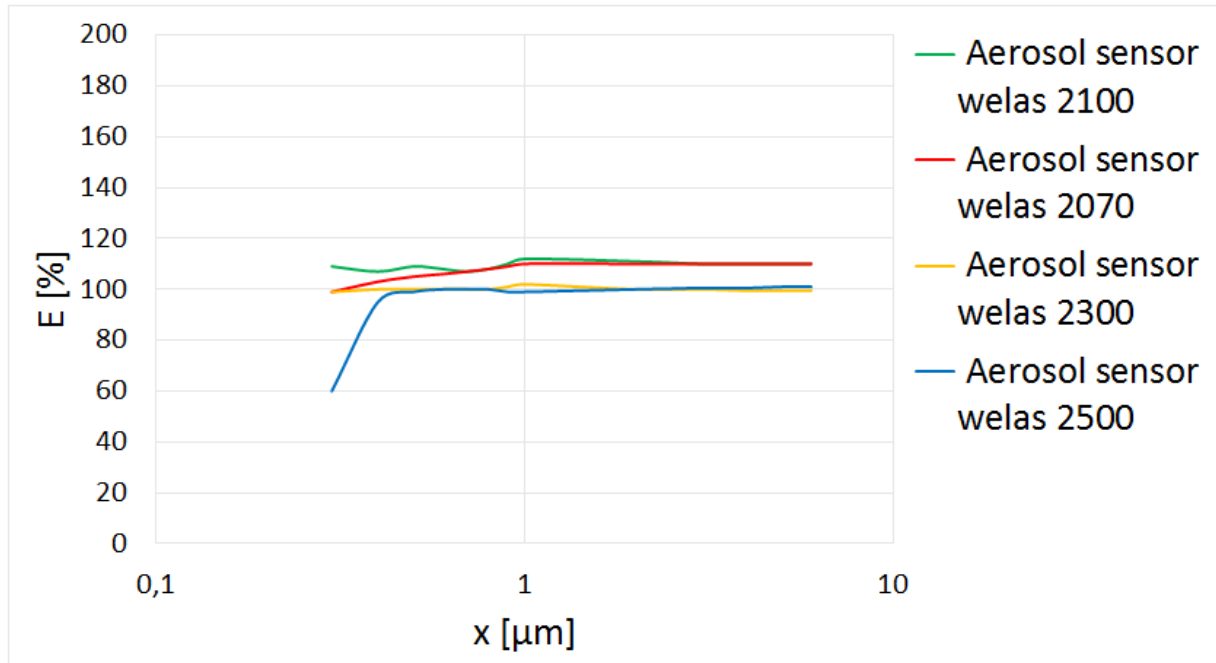
Niedrige Konzentration



concentrations up to 1,000,000 particles/cm³ the welas[®] 2070 sensor with a small measuring volume is used. This ensures the smallest measuring volume such that only one particle ever enters the measuring volume. In low concentrations, the models with a larger measuring volume offers the advantage of a higher counting rate at the same number concentration. **Agreement of the sensors** The welas[®] sensors are characterized by a particularly good agreement of counting efficiency and particle size

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resolution. means that the measurement results are highly comparable in terms of the number concentration and particle size measured when using different sensors.



Graph 1: Counting efficiency of various sensors in relation to the welas[®] 2200 sensor (in the measuring range 0.2 – 10 µm)

Pressure-resistant and heatable aerosol sensors with a special cuvette for the variants P, H and HP

measuring cuvettes allow the use of the welas[®] aerosol sensors even under unusual measuring conditions. These are available:

- heatable sensors up to 250°C; higher temperatures on request
- pressure-resistant sensors up to 10 bar overpressure
- sensor resistant against chemically aggressive media

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Benefits

- Die Sensoren sind einfach auswechselbar
- Weltkleinste und robusteste Sensoren in der Serie 2000
- Sehr gute Übereinstimmung aller Sensoren bezüglich Partikelgröße und Partikelkonzentration (siehe Diagramm 1)
- Minimierung von Partikelverlusten in langen Probenahmeleitungen durch einfache Installation des Sensors direkt am Probenahmeort
- Sensoren für In-Situ Messungen
- Messung in explosionsgefährdeter Umgebung in der Serie 2000 (ohne Heizung)
- Einfach zu reinigen
- Einfache Bedienung
- Zuverlässige Funktion
- Wartungsarm
- Senkt Ihre Betriebskosten

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Datasheet

<i>Parameter</i>	<i>Description</i>
Measurement range (size)	0.3 – 105 µm (3 measurement ranges)
Measurement range (number C_N)	0 – 4 • 10 ³ particles/cm ³
Thermodynamic conditions	+10 – +40°C, -100 – +50 mbarg
Volume flow	5 l/min (others on demand)
Light source	Xenon arc lamp 35 W
Dimensions	50 • 250 • 100 mm (H • W • D)
Weight	approx. 2.8 kg

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Applications

- Abscheidegradbestimmung von KFZ-Innenraumfiltern, Motorluftfiltern, Raumluftfiltern, Druckluftfiltern, Staubsaugerfiltern, abreinigbaren Filtern, Elektrofiltern, Ölabscheidern, Kühlschmierstoffabscheidern, Nassabscheidern, Zyklonen und anderen Abscheidern
- Isotherme und isobare Partikelgrößen- und Mengenbestimmung, z. B. in der Automobil-, Chemie-, Pharma- und Lebensmittelindustrie
- Untersuchung schneller, instationärer Prozesse
- Test von Rauchmeldern
- Partikelmessung zur Wolkenbildung
- Emissionsmessungen
- Immissionsmessungen

Palas GmbH
Partikel- und Lasermesstechnik
Greschbachstrasse 3 b
76229 Karlsruhe
Germany

Managing Partner:
Dr.-Ing. Maximilian Weiß
Commercial Register:
register court: Mannheim
company registration number: HRB 103813
USt-Id: DE143585902



Contact: E-Mail: mail@palas.de Internet: www.palas.de Tel: +49 (0)721 96213-0 Fax: +49 (0)721 96213-33