

# AEROSOL SENSOR WELAS<sup>®</sup> 2300



The model 2300 aerosol sensors are equipped with a very big measurement volume and are used for coincidence-free measurement with a maximum number concentrations up to 40,000 particles/cm<sup>3</sup>. These sensors are therefore suitable for indoor air measurements and for filter testing in accordance with EN779. Measuring range: 0.2 – 10 μm / 0.3 – 17 μm / 0.6 – 40 μm / 2 – 100 μm.

## MODEL VARIATIONS



Aerosol sensor welas<sup>®</sup> 2300 H  
Pressure-resistant version up to 1 bar overpressure and heatable up to 250 °C



Aerosol sensor welas<sup>®</sup> 2300 HP  
耐压版本，最高承受10 bar 过压，可加热至120 °C



Aerosol sensor welas<sup>®</sup> 2300 P  
Pressure-resistant version up to 10 barg overpressure

## 工作原理

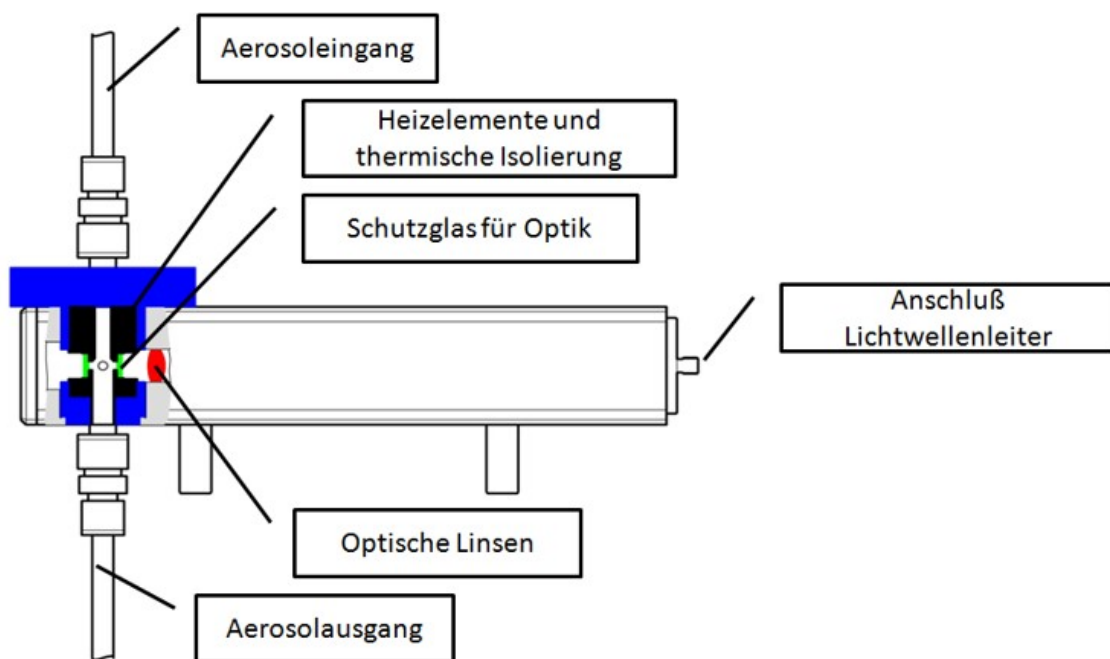
### AEROSOL SENSOR FOR NUMBER CONCENTRATIONS UP TO 40,000 PARTICLES/CM<sup>3</sup>

welas<sup>®</sup> digital and Promo<sup>®</sup> systems are based on scattered-light analysis on a single particle. The particles to be measured pass through a T-shaped, optically delineated measuring volume illuminated by a white light source. This generates a scattered-light pulse whose level is a measure of the concentration.

The following special feature guarantees the high size classification accuracy and the high size resolution:

- 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

Trouble-free and reliable measurement of large particles up to 40  $\mu\text{m}$  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.



The table below shows the theoretical minimum separation of the particles at a given number concentration. At a number concentration of  $10^3$  per  $\text{cm}^3$ , the optical measuring volume must not be larger than  $1 \text{ mm}^3$ .

| Number Concentration [P/m <sup>3</sup> ] | Number Concentration [P/m <sup>3</sup> ] | Particle Distance [cm] | Particle Distance [mm] | Particle Distance [μm] |
|--|--|------------------------|------------------------|------------------------|
| 1  | 10 <sup>-6</sup>                         | 100                    | 1000                   |                        |
| 10 <sup>3</sup>                          | 10 <sup>-3</sup>                         | 10                     | 100                    |                        |
| 10 <sup>6</sup>                          | 1  | 1                      | 10                     |                        |
| 10 <sup>9</sup>                          | 10 <sup>3</sup>                          |                        | 1                      | 1000                   |
| 10 <sup>12</sup>                         | 10 <sup>6</sup>                          |                        | 0,1                    | 100                    |
| 10 <sup>15</sup>                         | 10 <sup>9</sup>                          |                        | 0,01                   | 10                     |
| 10 <sup>18</sup>                         | 10 <sup>12</sup>                         |                        | 0,001                  | 1                      |

Table 2: Number Concentration

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



For concentrations up to 1,000,000 particles/cm<sup>3</sup>, the welas<sup>®</sup> 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 offer a higher counting rate at the same number concentration.

The welas<sup>®</sup> sensors are characterized by an excellent agreement of counting efficiency and particle size resolution. This means that the measurement results are highly comparable in terms of the number of concentration and particle size measured when using different sensors.



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

### Extension/Accessories

Special measuring cuvettes allow the use of the welas<sup>®</sup> 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

## 优势

- The sensors are easily replaceable
- World's smallest and most robust sensors in the 2000 series
- Excellent agreement of all sensors regarding particle size and particle concentration
- Minimization of particle losses in long sampling lines by the easy installation of the sensor directly at the sampling point
- Sensors for in-situ measurements
- Measurement in explosive environments in the 2000 series (without heating)
- Easy to clean
- Simple operation
- Reliable function
- Low maintenance
- Reduces your operating costs

## 标准和证书

EN 779

## 技术数据

|                          |   |
|--------------------------|---|
| 测量范围(数量浓度)               | 0 – 4 • 10 <sup>4</sup> particles/cm <sup>3</sup> |
| 测量范围(粒径)                 | 0.2 – 105 μm (4 measurement ranges)               |
| 体积流量                     | 5 l/min (others on demand)                        |
| Thermodynamic conditions | +10 – +40 °C, -100 – +50 mbarg                    |
| Light source             | Xenon arc lamp 35 W                               |
| Dimensions               | 50 • 250 • 100 mm (H • W • D)                     |
| 重量                       | Approx. 2.8 kg                                    |

## 应用领域

- 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/zh/product/aerosolsensorwelas2300>