



The Promo<sup>®</sup> 3000 is a light-scattering aerosol spectrometer system with two sensors for particle size analysis and concentration determination that can be equipped with all welas<sup>®</sup> sensors. On Promo<sup>®</sup> 3000, the welas<sup>®</sup> sensors equipped with different measurement volumes, as required, can be easily connected via fiber optic cables and interchanged as needed. These sensors allow reliable measurement in the concentration range from < 1 particle/cm<sup>3</sup> up to 10<sup>6</sup> particles/cm<sup>3</sup> and are available for measurement in gases and liquids.

Promo<sup>®</sup> 3000 is famous for up to 128 size channels per measuring range and a concentration range from < 1 particle/cm<sup>3</sup> to 10<sup>6</sup> particles/cm<sup>3</sup>.

## MODEL VARIATIONS



Promo<sup>®</sup> 3000 H  
With heating control up to 250 °C for welas<sup>®</sup> aerosol sensors



Promo<sup>®</sup> 3000 HP  
Version with automatic regulation of sampling volume flow by the aerosol sensors welas<sup>®</sup> under overpressure up to 10 bar or in temperatures to 120 °C



Promo<sup>®</sup> 3000 P  
With automatic control of the sampling volume flow by the welas<sup>®</sup> aerosol sensors under overpressure of 2 to 10 bar

## OPERATION PRINCIPLE

### SCATTERED-LIGHT AEROSOL SPECTROMETER SYSTEM WITH TWO SENSORS FOR QUASI-SIMULTANEOUS MEASUREMENTS

A touch display ensures user-friendly operation. Measurements can be started quickly, and all data, such as the current number distribution, number concentration, and 24 further statistical values, can be evaluated and displayed in real time.

Measurements are performed continuously with Promo® as a standalone measuring device (i.e., without an external computer), and measurements are performed continuously. All incoming data can be stored with a maximum temporal resolution of 1 s. Promo® can therefore measure and save data over weeks independently. For data transfer, Promo® can also be integrated into a company network.

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

On Promo® 3000, two welas® sensors are supplied with one light source, and a photomultiplier detects the scattered light pulses. This enables a quasi-simultaneous particle measurement at two sampling locations up to 100 meters apart.

With Promo® 3000, the user effectively has two scattered-light spectrometers in one device with the same device characteristics:

- Particle size resolution capability
- Particle size classification accuracy
- Counting efficiency
- Zero counting rate

The various welas® sensors are characterized by perfect conformity of counting efficiency and particle size resolution (see product data sheet: welas® sensors”).

All welas® 2000 series sensors can be used with the Promo® 3000. The quasi-simultaneous particle size and quantitative particle determination offer particular advantages for characterizing separators with fluctuating raw gas concentrations.

#### Opto-mechanical switching

Using optomechanical switching, the two connected sensors can be easily controlled. The sensors are controlled automatically with the software.

The particular advantage over a manual measurement selector switch:

- Faster change of the measurement location
- No deposits in sampling lines
- Long service life; no wear of the seals due to dust particles

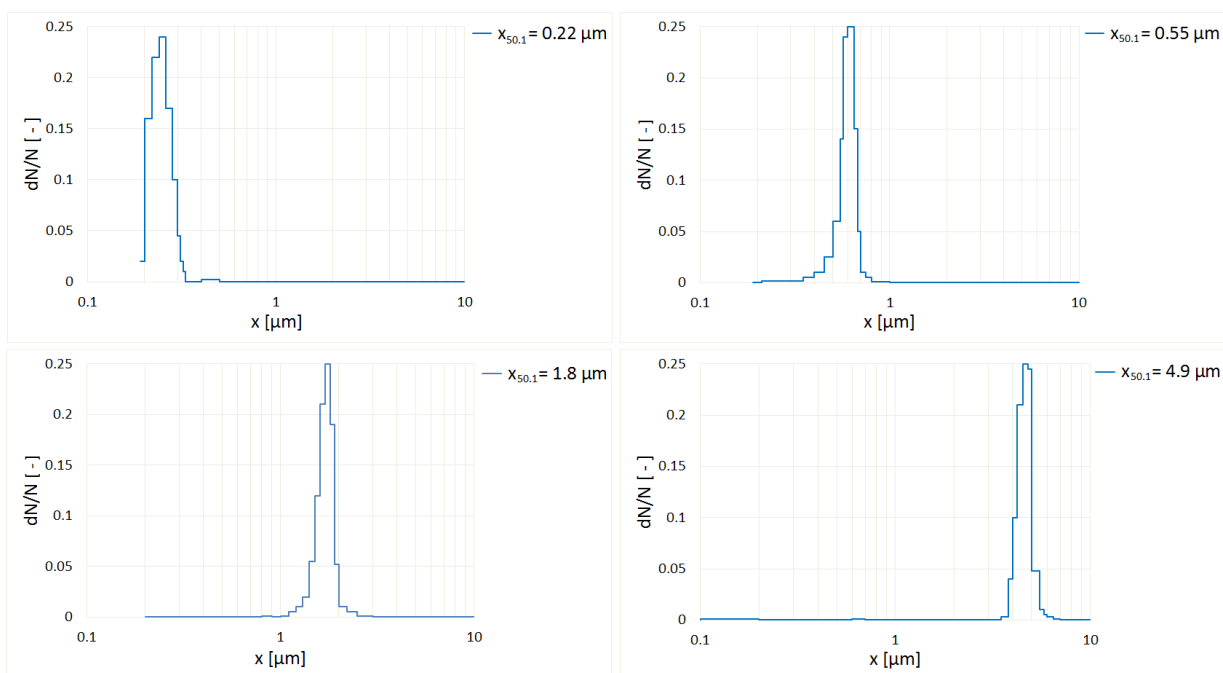
The Promo® measurement technology

The Promo® has a new, fast 20 MHz signal processing processor, which analyses the interference of each particle. This makes it possible to recognize coincidental events based on the scattered light signal, i.e., more than one particle in the measurement volume at one time can be identified from the individual signal and corrected (according to Dr. Umhauer / Prof. Dr. Sachweh).

This makes it possible to increase the maximum concentration limit to  $10^6$  particles/cm<sup>3</sup> (welas<sup>®</sup> 2070 sensor). Also, low concentrations of  $< 1$  particle/cm<sup>3</sup> with the welas<sup>®</sup> 2500 sensor lead to higher measuring accuracy.

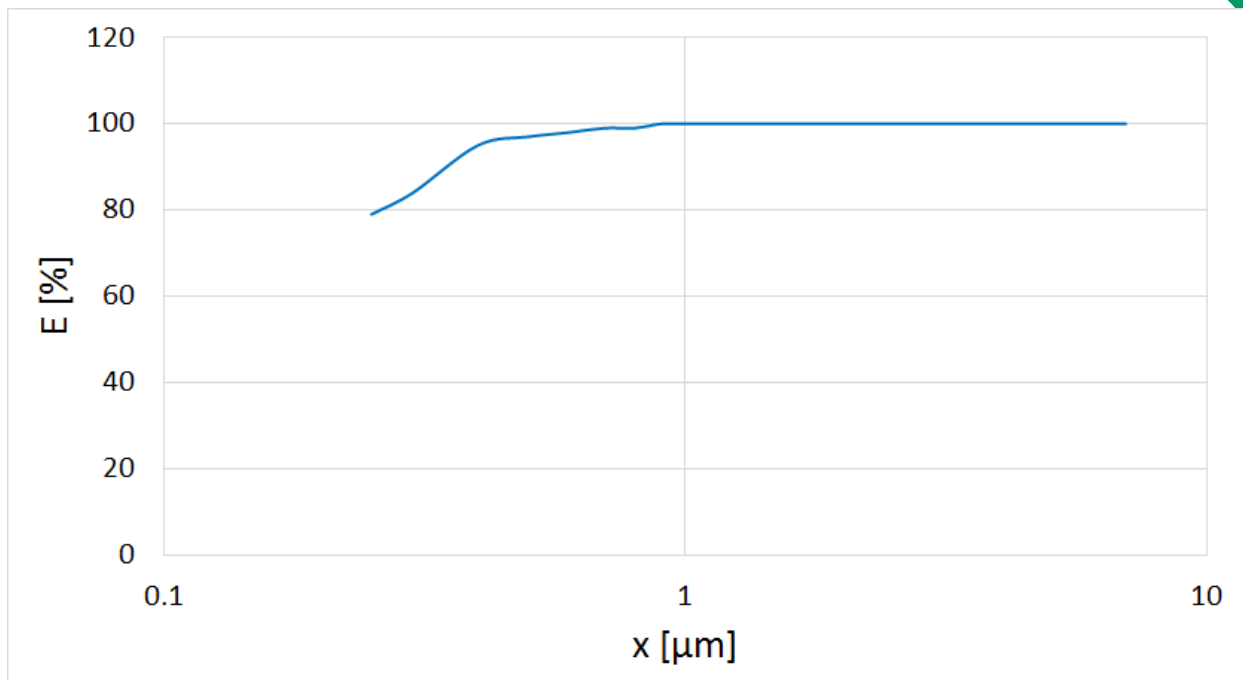
High classification accuracy and large particle size resolution (see Graph 1) are guaranteed by the following special features:

- 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.



Graph 1: Example with 2200 sensor

The Promo<sup>®</sup> aerosol spectrometer is characterized by its high counting efficiency starting from  $0.2 \mu\text{m}$ !



Graph 2: Example with 2200 sensor, in relation to LAS-X II

## BENEFITS

- Very high size resolution
- Concentration range from  $< 1$  particle/cm<sup>3</sup> to  $10^6$  particles/cm<sup>3</sup>
- Calibration curves for different refractive indices
- Very high and reproducible counting efficiency starting at  $0.2 \mu\text{m}$
- Optical fiber technology
- Easy operation thanks to large touch display
- Calibration, cleaning, and lamp replacement can be performed independently by the customer
- External control via RS 232 or Ethernet
- Low maintenance

## DATASHEET

Measuring principle	Optical light-scattering
Measurement range (number $C_N$ )	$< 1 \cdot 10^6$ particles/cm <sup>3</sup>
Measurement range (size)	0.2 – 10 $\mu$ m, 0.3 – 17 $\mu$ m, 0.6 – 40 $\mu$ m, 2 – 100 $\mu$ m
Volume flow	5 l/min
Size channels	Max. 128 (64/decade)
Time resolution	1 s
Interfaces	USB, Ethernet (LAN), Wi-Fi, RS-232/485
User interface	Touchscreen, 800 • 480 pixel, 7" (17.78 cm)
Data logger storage	4 GB Compact Flash
Software	PDControl, FTControl, PDAnalyze
Thermodynamic conditions	+10 – +40 °C, -100 – 50 mbar
Data acquisition	Digital, 20 MHz processor, 256 raw data channels
Light source	Xenon arc lamp 35 W
Housing	Table housing, optional: with mounting brackets for rack-mounting
Support options	Direct remote access, Palas webserver service
Operating system	Windows embedded
Power supply	115 – 230 V, 50/60 Hz
Power consumption	100 W
Installation conditions	+5 – +40 °C (control unit)
Dimensions	185 • 450 • 315 mm (H • W • D) (19")
Weight	Control unit: approx. 8 kg, sensor: approx. 2.8 kg

## APPLICATIONS

- Emission monitoring of installations
- Control of grinding and classification processes
- Monitoring of production processes in the food, pharmaceuticals and chemicals industries
- Testing of complete filters, inertial and wet separators or electrostatic precipitators



Mehr Informationen:  
<https://www.palas.de/en/product/promo3000>