Product data sheet

Palas® welas® digital 2000

Applications

- 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

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- Respiratory function: Inhalate / exhalate (particle size and number)

Benefits

- Measuring range of 0.2 to 100 µm (4 measuring ranges selectable in one device)
- Up to four measuring ranges in only one device:
  - 0,2 µm – 10 µm
  - 0,3 µm – 17 µm
  - 0,6 µm – 40 µm
  - 2 µm – 100 µm (additionally for sensors 2300 and 2500)
- Up to 128 size channels per measuring range
- Concentration range of 1 particle/cm³ to 106 particles/cm³
- Calibration curves for different refractive indices
- Very high and reproducible counting efficiency rate starting at 0.2 µm (see Graph 2)
- High temporal resolution down to 10 ms
- Optical fibre technology
- Measurement in potentially explosive environment
- Long service life of the light source of 2000 h
- Extensive PDControl and FTControl software
- Simple operation
- Calibration, cleaning and lamp replacement can all be performed independently by the customer
- Low maintenance
- Reliable function

ParteQ

Description

The welas® digital 2000 is a flexible, powerful and economical light-scattering spectrometer system, which determines particle concentration and size precisely and reliably.

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

- 0.2 µm – 10 µm
- 0.3 µm – 17 µm
- 0.6 µm – 40 µm
- 2 µm – 100 µm (additionally for sensors 2300 and 2500).

welas® digital 2000 is famous for up to 128 size channels per measuring range and a concentration range from < 1 particle/cm^3 to 10^6 particles/cm^3.

The device is characterized by its optical fibre technology, too. The welas® sensor is connected via a fiber optic cable with a length up to 50 m with the welas® digital control unit.

This leads to a minimization of particle losses in long sampling lines by simply installing the sensor directly at the sampling location.

Connection via fiber-optic cable allows the welas® 2000 and 2000 P series sensors to be easily connected to the control and evaluation unit and interchanged as required.

The welas® sensors are equipped with different sized measurement volumes. This allows adaptation of the measuring device to the particle concentration present in the application, such that a high counting rate can be achieved with a short measuring time.

The aerosol sensors allow reliable measurement in the concentration range from < 1 particle/cm^3 up to 10^6 particles/cm^3.

The welas® digital is based on scattered-light analysis on a single particle. In the welas® digital, the special advantages of the well-known and internationally acclaimed welas® system are combined with new and fast digital individual signal processing and coincidence correction is enabled.

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

- White light and 90° light-scattering detection

Unambiguous calibration curve

- Patented T-aperture

No border zone error

- New digital individual signal processing

Coincidence detection and correction of the individual signal making it possible to measure in higher concentrations.

The welas® digital measurement technology

welas® digital offers a new, fast 20 MHz signal processing processor, which analyses the progression of each particle signal. This makes it possible to recognise coincidental events in light scattering measurement technology at the individual

signal and correct them (according to Dr. Umhauer / Prof. Dr. Sachweh).

This way it is possible to increase the maximum concentration limit up to 10^6 particles/cm^3 (welas® 2070 sensor).

Also in low concentrations < 1 particle/cm^3 with the welas® 2500 sensor, this leads to a higher measuring accuracy.

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

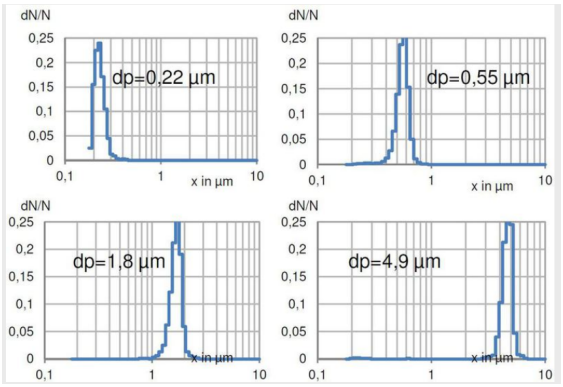

Fig. 1: Resolution capability and classification accuracy

The welas® digital is characterized by its very high counting efficiency starting from 0.2 µm!

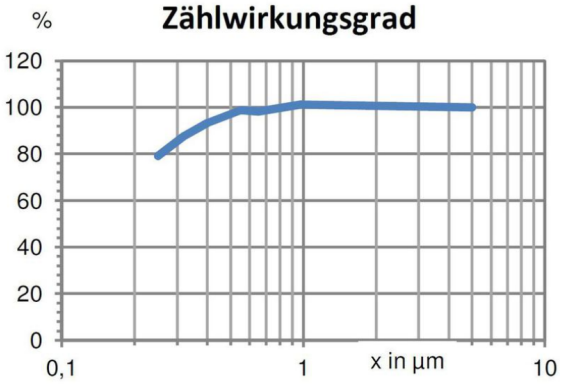

Fig. 2: Example with 2200 sensor, in relation to LAS-X II

The welas® PDControl digital software

The welas® digital is controlled via a laptop using the PDControl software. The software allows particle measurements and calibration of the measurement device. In addition, the measurements can be analyzed and compared in detail with a temporal resolution down to 10 ms.

Specifications

Interfaces	USB, ethernet, RS232/485, Wi-Fi
Measurement range (size)	0.2 µm – 10 µm, 0.3 µm – 17 µm, 0.6 µm – 40 µm, 2 µm – 100 µm
Size channels	Up to 64/decade
Measuring principle	Optical light-scattering

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Measurement range (number concentration)	< 1 • 106 particles/cm^3
Time resolution	≥ 10 ms
Thermodynamic conditions	10 – 40 °C, -100 – 50 mbarg
Volume flow	5 l/min
Data acquisition	20 MHz processor, 256 raw data channels, digital
Light source	Xenon arc lamp 35 W
User interface	Laptop
Power supply	115 – 230 V, 50 – 60 Hz
Housing	Table housing, optionally with mounting brackets for rack-mounting
Dimensions	185 • 450 • 315 mm (H • W • D) (19" compatible)
Software	PDControl, FTControl

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