PALAS®

U-SMPS System

ULTRAFINE PARTICLES IN AEROSOLS

Universal Scanning Mobility Particle Sizer

Made in Germany

U-SMPS System: Sizing and counting of nano scaled particles

Particles smaller than 0.1 µm have a significant impact not only on health, but also on a wide range of environmental processes such as particulate matter and cloud formation.

Their formation and their effects have long been the focus of scientific attention. For this purpose, systems of different technologies are used for direct or indirect measurement of particle size and concentration.

The U-SMPS System manufactured by Palas® in Germany meet the diverse normative and technological requirements and have been used successfully for many years in aerosol research and by official measurement networks or private companies.

Application examples

AEROSOL RESEARCH

CLIMATIC RESEARCH

EMISSION SOURCE ALLOCATION

WORKPLACE MEASUREMENTS

FILTER TESTING

COMBUSTION

Principle of operation

The classification of particles by means of the so-called “electric mobility“ and subsequent concentration measurement is a common method for determining the size resolution and distribution of nanoscaled particles in many application areas such as the analysis of synthetically produced nanoparticles or measurement of ultrafine particles of the ambient air.

The determination of size distribution and number concentration is performed by a multi-step procedure:

- Generation of an electrically neutral aerosol (neutralizer):
  For example, XRC 049 (X-ray source), KR-85-370 (radioactive source)
- Continuous, logarithmically ascending size selection (classifier):
  DEMC SYSTEM, classifier column
- Parallel measurement of raw concentrations (counter):
  UF-CPC SYSTEM, ENVI-CPC SYSTEM, CHARME® SYSTEM
- Raw data inversion (back calculation to original concentrations)
- Diffusion correction (compensation of particle losses due to diffusion processes)

U-SMPS System

All systems provided by Palas® for this purpose can be combined and interchanged with each other, thus enabling exact adaptation to the respective application and customer requirements. The open architecture and the interfaces allow third-party systems to be connected in parallel or exclusively to measure the number concentration for comparison.

For example

CLASSIFIER

DEMC 2000

NEUTRALIZER

XRC 049

COUNTER

UF-CPC 100

U-SMPS 2100 Measurement range: 8 – 1,200 nm, C_N= 0 – 10^8 particles/cm^3

Special advantages and benefits

Flexibility

- Control unit accepts DMAs and counters from different well known manufacturers
- Supports multiple interfaces and remote access

Latest Technology

- Continuous and fast-scanning principle of measurement
- User-friendly 7“ touchscreen with GUI
- Direct graphical visualization of measured data
- Integrated data logger with high storage volume

Best Price-Performance Ratio

- Low maintenance
- Reliable functions
- Low operating costs

Technical features

Measuring principle	Universal scanning mobility particle sizer
Measurement range (number C_N)	0 – 10^8 particles/cm^3
Measurement range (size)	4 nm – 1.2 µm
Size channels	Max. 256 (128 / decade)
User interface	Touchscreen, 800 • 480 pixel, 7 “ (17.78 cm)
Data logger storage	4 GB
Software	PDAnalyze
Adjustment range (voltage)	1 – 10,000 V
Volume flow (sheath air)	2.5 – 14 l/min
Volume flow (sample)	0.9 l/min (third-party counters: 0.5 – 1.5 l/min)
Installation conditions	+10 – +30 °C (others on demand)
Power supply	115 – 230 V, 50/60 Hz

Palas®, founded in 1983 and headquartered in Karlsruhe, Baden-Württemberg, Germany, specializes in the development of high-precision instruments for the generation, measurement and analysis of aerosol particles and is the world's leading developer and manufacturer in this field. Palas Instruments (Shanghai) Co., Ltd. is a wholly owned subsidiary of Hong Kong Palas (Asia) Limited. As one of the global branches of Palas GmbH, it has legally obtained the Palas trademark authorized by Palas GmbH in Exclusive use rights in China and Asia.

As an ISO 9001:2015 certified company, Palas® helps customer to achieve the testing capability of filter media and filter element in accordance with ISO 16890, ISO 11155-1, ISO 5011, ISO 29463-3, EN 1822-3, ISO 17536, ISO 12500 via tester solution. In terms of environmental protection, Palas® also complies with a number of environmental monitoring industry standards (EN 15267, HJ653, etc.).

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