UF-CPC 50



The UF-CPC 50 is a butanol-based nanoparticle counter with high efficiency. It measures the number concentrations of ultrafine particles (UFP) in aerosols. Model 50 (Full Flow)is designed for concentrations of up to 10^4 particles/cm^3. Thus, it is ideally suited for measuring the lowest concentrations alone or as part of an overall system for measuring the size distribution and concentration of, e.g., synthetically produced aerosols (Scanning Mobility Particle Spectrometer / Mobility Particle Size Spectrometer).

The patented evaporator and condensation module is maintenance-free. This allows continuous operating times of up to one year.

Operation principle

Condensation particle counter for number concentration up to 10^7 particles/cm^3 (photometric mode)

The aerosol is fed directly to the evaporator unit by the internally adjustable and controlled diaphragm pump, saturated with the working liquid n-butanol. The butanol flows in a spiral trough inside the cylinder to the base of the evaporator. The unevaporated residue is pumped back into the reservoir by a second pump. This actively ensures permanent saturation of the evaporator while preventing deposits from forming on the inner walls.

In contrast to a control with a critical nozzle, contamination of the system cannot lead to a drop in volume flow. This is particularly important for long-term measurements. The user can also calibrate the volume flow.

The condensed particles are detected by an optical sensor, which determines the concentrations and size distribution of the condensed particles. This enables simple and efficient quality control.

The system is typically delivered with a cut-off D50 = 4.5 nm (measured with generated and selected NaCl particles). Others are adjustable and can be used optionally.

In the expert mode for research, the user can adjust various parameters to individual needs via the 7″ touch screen.

The UF-CPC system supports a standardized interface with various protocol selection options, such as Modbus or ASCII protocol, for process monitoring applications. All measured data, including the corresponding settings, is stored directly on the device. Thus, the data can be accessed and visualized directly at any time.

Extensions/Accessories

An air-conditioned weatherproof housing is available for the system.

BENEFITS

- Full flow analysis, no internal flow splitting
- Intuitive user interface with sophisticated software for data analysis
- Unlimited network compatibility that supports remote control and data storage on the Internet
- Visualization of all operating and measurement data
- Integrated interface for process control applications
- Lower detection efficiency D50 adjustable to 10 nm (others on request)

NORMS AND CERTIFICATES

ISO 27891:2015

DATASHEET

Measuring principle	Condensation of ultrafine particles with optical measurement of concentrations
Measurement range (number C_N)	10^4 particles/cm^3 (single count mode), 10^4 – 10^7 particles/cm^3 (nephelometric mode)
Measurement range (size)	4 – >3,000 nm
Volume flow	0.9 l/min (others on request)
Time resolution	Min. 1s
Interfaces	TCP-IP ASCII, MODBUS, UDP, AK (on request)
User interface	Touchscreen, 800 • 480 pixel, 7″ (17.78 cm)
Protocols	UDP, UIDEP, B/H, MODBUS TCP/RTU, ASCII TCP/Seriell
Data logger storage	4 GB
Software	PDAnalyze
Detection efficiency (at low particle size)	D50 = 10 ± 1 nm (others on request); D90 < 20 nm, D95 @ 40 nm ± 10 nm, D90 @ 1000 nm ± 100 nm
Data acquisition	Digital, 20 MHz processor, 256 raw data channels
Light source	LED
Power supply	90 – 264 V, 50/60 Hz
Power consumption	Average power consumption: 40 W
Installation conditions	+10 – +30 °C (others on request)
Accuracy	5% (single count mode), 10% (nephelometric mode)
Response time	t_{90} < 2.8 s, $t_{90–10}$ < 2.0 s
Working fluid	n-Butanol (>99.5%)
Dimensions	290 • 240 • 350 mm (H • W • D)
Weight	Approx. 10 kg
Resolution	Min. 1s
Data Management	Prepared for connection to the Palas Cloud MyAtmosphere (“MyAtmosphere-ready”)

APPLICATIONS

- Aerosol research
- Combustion engine emission testing
- Brake dust emission testing
- Test of filters and air cleaners
- Environmental measurements
- Studies on working place pollution and working place safety
- Studies on inhalation and health effects
- Process surveillance
- Studies on the emission of printers

Mehr Informationen:
https://www.palas.de/en/product/ufcpc50