# ENVI-CPC 100




The ENVI-CPC 100 is a butanol-based particle counter with high efficiency for monitoring ultrafine particle (UFP) concentrations in the ambient air. The Model 100 is designed for typical concentrations of up to $10^5$ particles/$cm^3$. It can be combined with different systems for measuring the size distribution and concentration of UFP. The system meets the requirements of the current standard EN 16976:2024 (Harmonized measurement of number concentrations using CPC) in all areas. It can be operated directly with a NAFION® based sampling system if desired.

## Operation principle

## Nanoparticle counter for ambient air monitoring with integrable NAFION® aerosol dryer

The aerosol pre-dried by the NAFION® dryer is fed directly to the evaporator unit by the internally adjustable and controlled diaphragm pump, which is saturated with the working liquid n-butanol.

The butanol flows in a spiral trough inside the cylinder to the base of the evaporator.

The non-evaporated residue is pumped back into the reservoir by a second pump. This actively ensures permanent saturation of the evaporator and simultaneously prevents 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 the volume flow. This is especially important for long-term measurements in the ambient air. The user can calibrate the volume flow.

The detection of the condensed particles is done by an optical sensor, which determines the concentrations and size distribution of the condensed particles and thus allows a simple and efficient quality control.

In addition to the usual factory calibration and adjustment of the cut-off according to EN 16976:2024, Palas offers certification of the instrument at the WCCAP (World Calibration Center for Aerosol Physics at the Leibniz Institute for Tropospheric Research).

The ENVI-CPC system has a 7″ touch display for visualization and control. The system supports a standardized interface with different remote control and network application protocols, e.g., Modbus and Bayern-Hessen protocol. All necessary calculations and evaluations are performed directly on the device. A laptop for monitoring, changing settings, or visualization is not needed.

## Comparison measurements

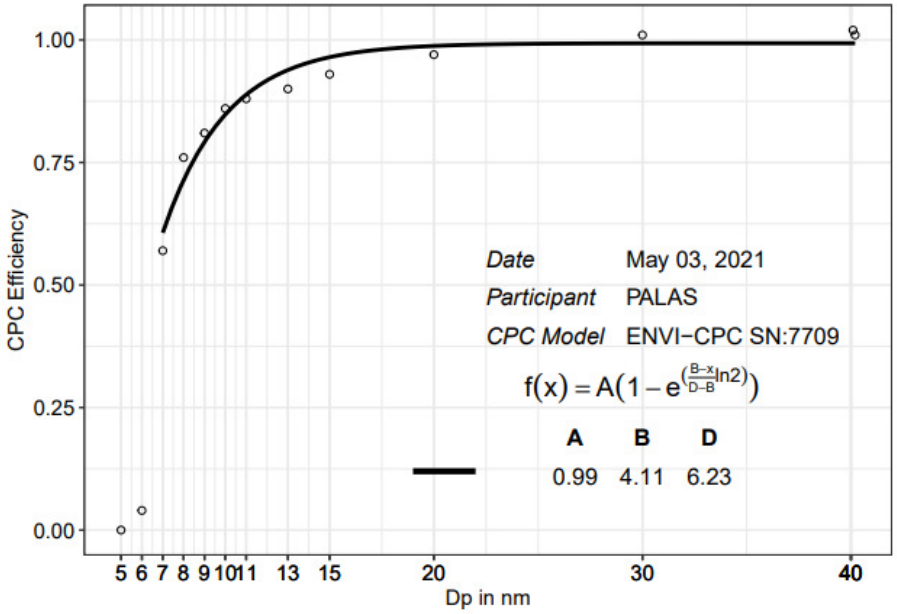


Fig. 1: Counting efficiency curve of the ENVI-CPC system measured at the Leibniz Institute for Tropospheric Research

## Extensions/Accessories

The ENVI-CPC system can be equipped with a meteorological sensor that monitors temperature, pressure, humidity, wind speed, wind direction, and precipitation type and intensity of the outdoor air. A climate-controlled weather protection enclosure is available.

## BENEFITS

- The unique, patented way of providing the working fluid for unattended operation for months
- Intuitive user interface with sophisticated software for data evaluation
- Limitless, integrated network connectivity that supports remote operation and data storage on the internet
- Powerful software package
- Low maintenance

## NORMS AND CERTIFICATES

EN 16976:2024-09, ISO 27891:2015

# DATASHEET

| | |
|---|---|
| Measuring principle | Condensation of ultrafine particles with optical measurement of concentrations |
| Measurement range (number $C_N$) | $10^5$ particles/$cm^3$ (single count mode) |
| Measurement range (size) | > 3 $\mu$m |
| Volume flow | 0.9 l/min +/- 2% (optional 0.5 l/min additional) (pressure loss isotherme capillary) |
| Time resolution | 1s - 60s |
| Interfaces | USB, Ethernet (LAN), weather station/butanol level sensor, RS-232, T/rH sensor |
| User interface | Touchscreen, 800 • 480 pixel, 7″ (17.78 cm) |
| Protocols | UDP, UIDEP, B/H, MODBUS TCP/RTU, ASCII TCP/Seriell |
| Data logger storage | Approx. 6 GB data storage (2 years) |
| 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 | Long term stable LED |
| Housing | Tabletop device |
| 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 | $t_{90}$ < 3 s |
| Working fluid | n-Butanol (>99.5%) |
| Dimensions | 330 • 380 • 240 mm (H • W • D) |
| Weight | Approx. 10 kg |
| Resolution | Min. 1s |
| Data Management | Prepared for connection to the Palas Cloud MyAtmosphere (“MyAtmosphere-ready”); Internet access and separate registration required. The MyAtmosphere terms of use apply. |

## Applications

- Aerosol Research
- Environmental measurements
- Environmental monitoring measurement networks
- Workplace safety and occupational exposure studies
- Traffic emission monitoring
- Health studies
- Mobile aerosol studies

Mehr Informationen:
https://www.palas.de/en/product/envicpc100