



® Knowledge Beyond Measure.

# Condensation Particle Counter

Model 3750-CEN10



## For ultrafine particle monitoring compliant to EN 16976:2024\*

The Condensation Particle Counter (CPC) 3750-CEN10 is designed in full compliance with EN 16976:2024\*. This CPC ensures precise monitoring of ultrafine particles (UFPs) in the atmosphere, meeting the highest standards of accuracy and reliability.

The CPC 3750-CEN10 builds on a multi-generation lineage of TSI® full-flow CPCs, which have served as the gold standard in nanoparticle counting for several decades. The new updates extend the concentration range, provide easier use for everyone with an intuitive direct-touch user interface, new software, and secure internal data storage for months of data.

Built on decades of experience with particle counting technologies, the CPC 3750-CEN10 is made for 24/7/365 operation. When complemented with accessories for sampling – as well as temperature and humidity measurement – the resulting system is the cornerstone of your ambient air monitoring station. For hot-spots of ultrafine particles (UFPs) with high concentrations, a diluter is available.

With the goal of bringing consistency to the measurement of UFPs in ambient air, EN 16976:2024\* outlines precise criteria for both the CPC and the accompanying Sampling System. The 3750-CEN10 CPC meets all criteria specified in EN 16976:2024.

In addition, the 3750-CEN10 is fully integrated into the Scanning Mobility Particle Sizer™ (SMPS™) family. The SMPS™ 3938W50-CEN10 enables ambient air monitoring stations to measure size distributions of ultrafine particles in compliance with CEN/TS 17434:2020.

\*EN 16946 is formerly known as the Technical Specification CEN/TS 16976, and established by the European Committee for Standardization (CEN).

## Features and Benefits

- Compliant with EN 16976:2024\*
- Detection efficiency at low particle size:
  - D50 = 10 nm ± 1.0 nm
  - D90 < 20 nm
- Verification and calibration of a new CPC by the World Calibration Centre for Aerosol Physics (WCCAP), Leibniz Institute for Tropospheric Research (TROPOS) is included with order
- Extended concentration range up to 100,000 particles/cm<sup>3</sup> without dilution (for dilution, see 'Accessories')
- Compatible with the Scanning Mobility Particle Sizer™ (SMPS™) 3938
- Integrate data directly into a network, or export from software (auto-export available)
- Reliable internal memory – store weeks of data for continuous monitoring
- Water removal system - compatible with high-humidity environments
- Diagnostics with Pulse Height Monitoring
- Data rate up to 50 Hz - capture highly dynamic processes
- Fast response to rapid changes in aerosol concentration (T10-90 < 1 sec)

## Applications

- Air quality monitoring for particle number concentration (EN 16976:2024\*)
- Atmospheric monitoring for particle size distribution (CEN/TS 17434, if part of 3938W50-CEN10)
- Health effect studies
- Basic aerosol research



## Specifications

# Condensation Particle Counter

Model 3750-CEN10

### Particle Size Range

10 nm minimum detectable particle size (D50), verified with monodisperse silver particles at TROPOS

Efficiency of 90% at  $D_p < 20$  nm

> 3  $\mu$ m max. detectable particle size

### Particle Concentration Range

Up to 100,000 ( $1 \times 10^5$ ) particles/cm<sup>3</sup>

Single particle counting mode with continuous live-time coincidence correction

### Particle Concentration Accuracy

$\pm 5\%$  at  $< 100,000$  particles/cm<sup>3</sup>

### False Background Counts

$< 0.001$  particles/cm<sup>3</sup> based on 12-hour average

### Response Time

(Response time is described as a percentage of a concentration step change)

< 1 second for 90% to 10% (T10-90, T90-10)

$\sim 2$  seconds for 0 to 95% (T95)

### Flow System

$1.0 \pm 0.05$  L/min inlet and counting flow (volumetric)

Requires external vacuum source capable of 60 kPa (18 in Hg) minimum gauge (below atmospheric pressure); Pump model 3032-EC, listed under 'Accessories', meets this requirement

### Liquid System

Butanol (n-Butyl alcohol, not included) used as working fluid

Internal water removal pump to remove condensate; beneficial in humid environments. Always ensure that aerosol sample is dried in compliance with CEN requirements.

### Data Storage

Internal memory lasts for  $\sim 1$  year of data at 50 Hz data rate

### Communication Interfaces

Ethernet port for remote connection: 8-wire RJ-45 jack, 10/100 BASE-T, TCP/IP).

Configurable for automated (DHCP) or manual network settings.

USB type C to connect CPC directly to computer (cable included)

USB type B for external memory drives; a Wifi adapter can be used

Pulse output: BNC connector, TTL level pulse, nominally 350 ns wide

Embedded touch-display

### Ambient Operating Conditions

Temperature 10 to 35°C (50 to 95°F)

Humidity 0 to 90% RH, non-condensing

Pressure 75 to 105 kPa (0.75 to 1.05 atm)

### Electrical

100 to 240 VAC, 50/60 Hz, 200 W maximum

### Accessories

3750200	Sampling System for Atmospheric Particles
3333-10	Aerosol Diluter
RHT3000	Relative Humidity and Temperature Sensor
375X-2LBOTTLE	2 L fill bottle
AIM11CPCMONTRIAL	CPC Monitoring Software Trial: permits current TSI customers already using AIM 11 to temporarily access monitoring-specific software features
AIMCPCMONITORING	Aerosol Instrument Manager (monitoring license)

### Dimensions (H x W x D)

27.5 cm x 18.3 cm x 29.9 cm (10.83 in. x 7.21 in. x 11.76 in.), not including fill bottle and bracket

### Weight

$\sim 6.6$  kg ( $\sim 14.6$  lbs)

### To Order

Specify	Description
3750-CEN10	Condensation Particle Counter, D50 = 10 nm
3750-MKIT	Maintenance kit for CPC
3750-WKIT	Wick replacement kit for CPC
3032	Vacuum pump 110 V (US)
3032-EC	Vacuum pump 230 V (EU)
3032-1	Vacuum pump 230 V (UK)

Specifications are subject to change without notice.

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