



Knowledge Beyond Measure.

# Condensation Particle Counter

Model 3750-10 / 3750-CEN10



## For ultrafine particle monitoring, with optional EN 16976:2024\* calibration

This Condensation Particle Counter (CPC) helps to ensure precise monitoring of ultrafine particles (UFPs) in the atmosphere, meeting the highest standards of accuracy and reliability.

The model 3750-CEN10 is identical to the model 3750-10 in terms of hardware and settings; both are derivatives of TSI Model 3750, which has different settings and a  $D_{50} = 7$  nm. The difference between the 3750-CEN10 and the 3750-10 is that the 3750-CEN10 has an extra calibration performed; this calibration is compliant with EN 16976\*

Both CPCs build 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 over a year 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 areas with high concentrations of UFPs ('hot spots'), 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 CEN-SMPS enables ambient air monitoring stations to measure size distributions of ultrafine particles in compliance with CEN/TS 17434:2020.

\*EN 16976 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\*
- High detection efficiency at ultrafine particle sizes ( $D_{50} = 10$  nm  $\pm 1$  nm;  $D_{90} < 20$  nm)
- Verification and calibration of the new CPC was done by the World Calibration Centre for Aerosol Physics (WCCAP), Leibniz Institute for Tropospheric Research (TROPOS)
- A full CEN-compliant calibration according to EN 16976:2024 is included with model 3750-CEN10
- Measures up to 100,000 particles/cm<sup>3</sup> without dilution
- Compatible with with the Scanning Mobility Particle Sizer SMPS™ Spectrometer 3938
- Easy network integration and automated data export
- Reliable internal memory for continuous monitoring
- Designed for high-humidity environments
- Built-in diagnostics with pulse height monitoring to notify users of required maintenance at earliest stage
- High-speed data (up to 50 Hz) and fast response ( $< 1$  s)
- AIM Monitoring software upgrade enables auto-recovery for uninterrupted operation during power failures in unattended environments, synchronized runs, and standardized data exports
- Flexible data transfer via CSV, serial, or JSON protocols

## Applications

- Air quality monitoring for particle number concentration (EN 16976:2024\*)
- Atmospheric monitoring for particle size distribution (CEN/TS 17434, if part of CEN-SMPS)
- ACTRIS compliant and listed as approved particle counter
- Health effect studies
- Basic aerosol research



## Specifications

# Condensation Particle Counter

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### 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

$> 3 \mu\text{m}$  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 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)

### 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 for $> 3$ weeks of unattended operation.
AIM11CPCMONTRIAL	CPC Monitoring Software Trial: permits current TSI customers already using AIM 11 to temporarily access monitoring-specific software features
AIM11CPCMONITORING	Aerosol Instrument Manager (monitoring license); recommended for continuous monitoring operation with AIM software
CCVF100	Compact Catalytic Vapor Filter to eliminate the hydrocarbon vapors emitted from the butanol/alcohol-based CPC exhaust

### 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
3750-10	Condensation Particle Counter D50=10 nm
3750-CEN10	Condensation Particle Counter D50=10 nm with CEN calibration (using silver aerosol)
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)
VBME8NT	Vacuubrand Membrane Pump (for EMEA); recommended with CCVF100 and 3750200 inlet

Specifications are subject to change without notice.

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