



® Knowledge Beyond Measure.

Sampling System for Atmospheric Particles

Model 3750200



System for representative and accurate sampling and conditioning of atmospheric aerosol. Compliant to EN 16976 and CEN/TS 17434.

Sampling particles from ambient air is not trivial. Varying wind conditions, humidity, and particle losses are all barriers to obtaining representative data. The Sampling System for Atmospheric Particles 3750200 is designed to match the requirements of two CEN standards, thus permitting a harmonized measurement of sub-micrometer airborne particles. Proven components - such as the PM10 inlet and the effective and low-maintenance membrane (Nafion™) dryer - enable the standardized measurement of ultrafine and fine particles in the atmosphere.

Applications

- Air quality monitoring for ultrafine and fine particle number concentrations and size distributions
- Atmospheric research
- ACTRIS aerosol in-situ network and CEN oriented monitoring networks
- Monitoring according to the Ambient Air Quality Directive (EU) 2024/2881

Features and Benefits

- EN 16976 and CEN/TS 17434 compliant
- Particle diffusion losses <25% for 10 nm and <30% for 7 nm particles.
- Penetration efficiency and drying of entire sampling system theoretically calculated and experimentally verified (see References to scientific publications¹ on the back page).
- Efficient and low maintenance aerosol drying: relative humidity (RH) reduced to < 40%
- Supports operation with up to 4 particle counters/sizers without biasing the measurements with a well characterized 4-way flow splitter (4 L/min in standard configuration), modification possible.

CEN stands for European Committee for Standardization. CEN is an association – officially recognized by the European Union and by the European Free Trade Association – that brings together the national standardization bodies of 33 European countries. CEN is committed to develop European Standards for various kinds of products, materials, services and processes.



Specifications

Sampling System for Atmospheric Particles

Model 3750200

Particle Size Range

Recommended for 7 or 10 nm as smallest particle sizes. Upper size cut 2.5 µm (with cyclone) or 10 µm (without cyclone)*.

* sampling system also available as 3750210 without PM10 sampling head.

Flow Rate

16.7 L/min at inlet

Up to 4.0 L/min aerosol flow (adjustable) at sampling port

Humidity Reduction

Aerosol humidity reduced to < 40% RH using Nafion™ dryer for outdoor dewpoints < 25° C, a vacuum of 225 mbar, and indoor temperature of > 20° C.

For more humid conditions (dewpoint > 25° C), a stronger vacuum pump may be necessary.

Particle Transmission Efficiency

Particle transmission efficiency at standard operating setup:

> 75% at 10 nm

> 70% at 7 nm

Main losses due to diffusion losses are:

<25% for particles size of 10 nm

<30% for particle size of 7 nm

Theoretically and experimentally characterized and published¹.

¹References:

Tritscher et al. 2021. Harmonization of UFP Measurements: Characterization of Primary Components of an Inlet Sampling System, EAC Birmingham, UK, 2021.

Schmitt et al. 2024. In-depth characterization of an ambient sampling inlet system at the steady-state SAPHIR-STAR chamber, EAC Tampere, Finland, 2024.

| Description | Quantity Needed | Included with 3750200 | Accessory Available from TSI® Separately | User Supplied |
|--|-----------------|-----------------------|--|---------------|
| US-EPA Approved PM10 Inlet | 1 | • | | |
| Nation® Dryer | 1 | • | | |
| Dryer to Inlet Fitting | 1 | • | | |
| PM2.5 Cyclone | 1 | • | | |
| Conductive Tubing | 10 inch | • | | |
| Four-way Flow Splitter | 1 | • | | |
| Temperature & RH Sensor | 1 | | • | |
| Vacuum Pump | 1 | | • | |
| Flowmeter | optional | | • | |
| Roof Port | optional | | | • |
| Tripod or Guy Wires | optional | | | • |
| Stainless Steel Sampling Tube 1.25" OD x 0.062" wall thickness | 1.5 m* | • | | |

*other length of tubing needs to be supplied by user.



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The Sampling System for Atmospheric Particles 3750200 is designed to sample and condition aerosol in preparation for measurement by the Condensation Particle Counter (CPC) 3750-10 / 3750-CEN10 and by the Scanning Mobility Particle Sizer™ (SMPS™) 3938W50-CEN. The humidity and temperature sensor RHT3000 is installed at the inlet of the 3750-10 / 3750-CEN10 (or SMPS™); this sensor provides relative humidity and temperature data for the sample, as required by EN 16976:2024 and CEN/TS 17434.

To Order

Sampling System for Atmospheric Aerosol

| Specify | Description |
|----------|---|
| 3750200* | Sampling System for Atmospheric Monitoring compliant to EN 16976 and CEN/TS 17434 |

Recommended Accessories

| Specify | Description |
|---------|--|
| VBME8NT | Vacuubrand Membrane Pump ME8NT (recommended in EMEA) |
| 3032-EC | Vacuum Pump (230 VAC) |
| 3033 | Oil-free rotating vane Vacuum Pump |

Optional Accessories

| Specify | Description |
|---------|---|
| RHT3000 | Relative Humidity and Temperature Sensor |
| 3333-10 | Aerosol Diluter for CPC (dilution ratio 10:1) |
| 4048 | Flow Calibrator, up to 200 L/min |
| 4148 | Flow Calibrator, up to 20 L/min |

*3750200 available without PM10 head as Model 3750210

Accessories must be ordered separately

Specifications are subject to change without notice.

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