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Find the *TSI 3760A* at our website: ***Click HERE***

PRODUCT

INFORMATION

# Model 3760A/3762 Condensation Particle Counters

Our Model 3760A and 3762 Condensation Particle Counters (CPCs) are a bit unusual. They're small, yet rugged. They're highly sensitive, yet reasonably priced. They offer many of the same performance features you've seen in other TSI CPCs, yet they are quite easy to use. What we have, then, are a couple of unique sensors ideal for use in remote environments as well as the research laboratory. And they continue the tradition of quality and reliability for which TSI is known.

The high signal-to-noise ratio inherent in these CPCs limits false background counts to nearly zero. That's why they detect submicrometer particles with such remarkable accuracy. Both models sample and count particles on a continuous basis and respond to concentration changes in just a few seconds. The key difference between them is that the 3762 operates at twice the flow rate of the 3760A.

Both CPCs sample and count submicrometer particles down to 0.011 micrometer, in air and inert gases.* With an optional TSI Particle Size Selector, you're able to select eleven particle-size cutpoints from 0.011 to 0.096 micrometer using the 3760A, and from 0.011 to 0.065 micrometer using the 3762. An additional set of diffusion screens allows cutpoints up to 0.19 and 0.123 micrometer with the 3760A and 3762, respectively.

Models 3760A and 3762 are part of a complete family of scientific CPCs offered by TSI. A comparison chart included in this document. Contact your TSI representative for more information.



*Models 3760A and 3762 are safe for use with inert gases like nitrogen, argon, and helium.

**Small, low-cost CPCs with 0.011-µm sensitivity**

## APPLICATIONS

- Basic aerosol research
- Outdoor and indoor air monitoring
- Filter and air-cleaner testing
- Particle shedding and component tests
- Atmospheric and climate studies
- Particle counter calibration (when used as the reference standard)
- Combustion and engine exhaust studies
- Inhalation or exposure-chamber studies

TSI®

## OPERATION

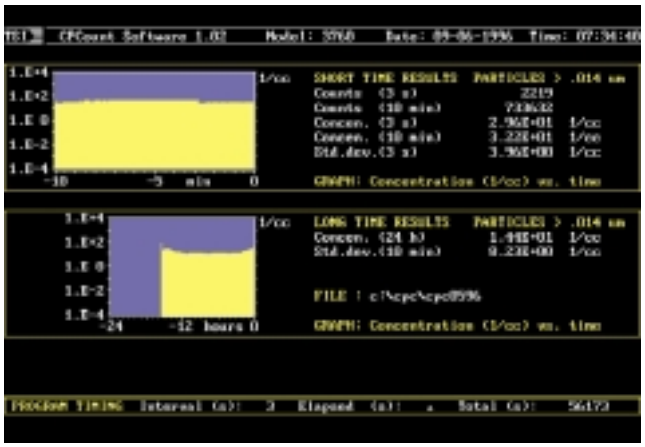
Like our other CPCs, Models 3760A and 3762 condense alcohol vapor onto particles in the sample flow, creating aerosol droplets large enough to be detected efficiently with a light-scattering technique. Upon entering the CPC, the aerosol sample passes through a saturator block where alcohol evaporates into the sample stream, saturating the flow with alcohol vapor. The sample then passes into a vertical condenser tube cooled by a thermoelectric heat pump. Here, the alcohol vapor supersaturates and condenses onto virtually all particles above the minimum detectable size, regardless of chemical composition.†

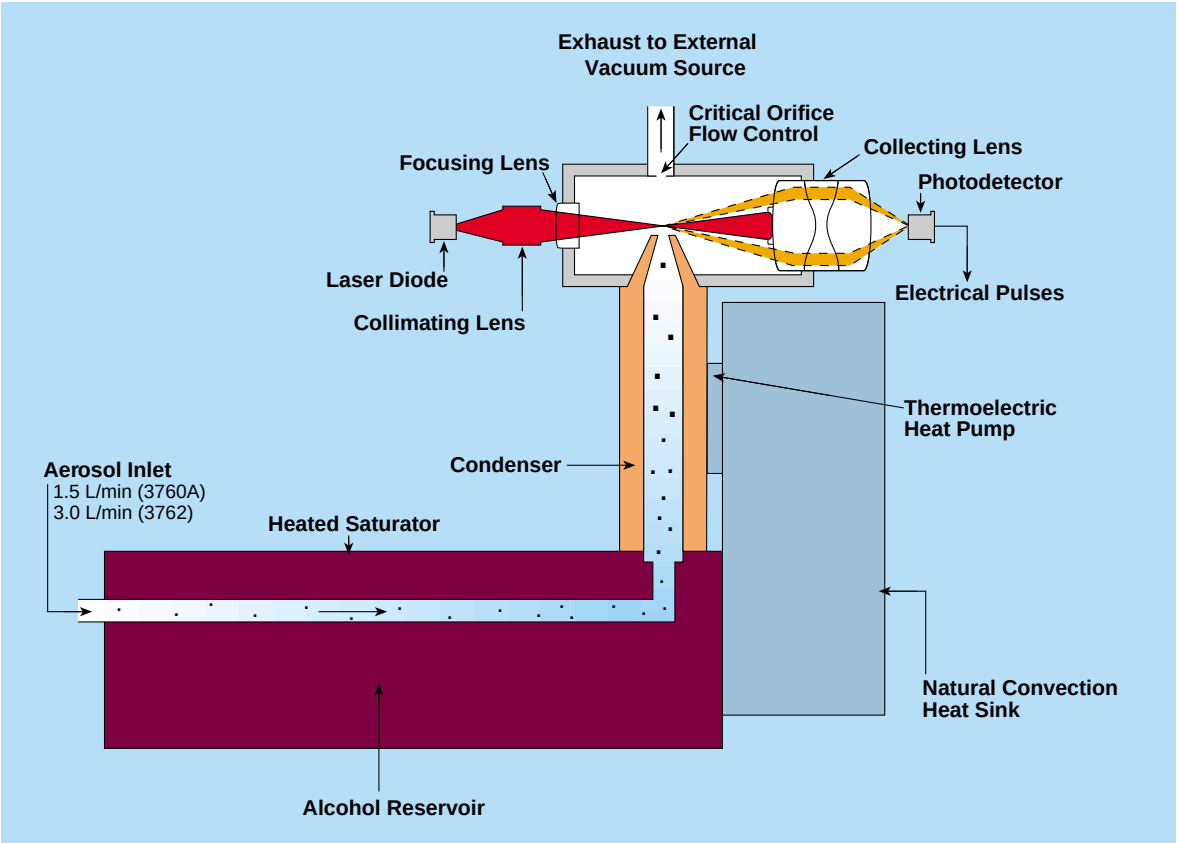
As they leave the condenser tube, the droplets pass one at a time through a single-particle-counting optical detector. The pulse of light scattered by each droplet traversing the laser beam is collected, focused onto a photodetector, and transformed into an electrical signal.

†For particles of varying chemical composition, some variation in detection efficiency occurs at the minimum detectable size. See explanation in TSI paper A83.

## SOFTWARE

Both CPCs come with software that allows you to view, save, retrieve and print your concentration data. Designed for use with IBM-compatible personal computers, the CPCount™ Software uses pull-down menus for simple operation. It charts data automatically in two different time frames, allowing you to view trends and details at the same time.





# MODEL 3760A/3762 SPECIFICATIONS

**Particle size range**
*Minimum detectable particle:* 50% of 11-nm particles, NaCl in 50% RH $N_2$
*Maximum detectable particle:* >3 µm
**Particle concentration range**
*3760A:* 0 to 10,000 particles/cm$^3$
*3762:* 0 to 5,000 particles/cm$^3$
(10.5% coincidence at maximum concentration)
**Concentration accuracy:** ±10% compared to standard
**False background counts:** <0.00005 particle/cm$^3$
**Response time**
*3760A:* <3 sec for 95% response to concentration step change
*3762:* <1.5 sec for 95% response to concentration step change
**Aerosol medium:** Recommended for use with air; safe for use with inert gases such as nitrogen, argon, and helium (Performance specifications, except where indicated, are for air.)
**Light source:** 50-mW, 780-nm laser diode
**Flow**
*Aerosol flow rate*
3760A: 1.5 L/min (0.05 cfm) ±10%
3762: 3.0 L/min (0.1 cfm) ±10%
*Purge flow rate:* 1.0 L/min (0.035 cfm)
*Flow control:* External vacuum with critical orifice
*Flow sensor:* Internal sensing by measuring vacuum supplied to the critical orifice (With sufficient vacuum, the critical orifice provides the specified flow.)
**Condensing liquid**
*Working fluid:* Reagent-grade n-butyl alcohol (not supplied with instrument)
*Reservoir capacity:* 350 ml
*Mean time between fills*
3760A: 7-day supply at 22°C ambient temperature
3762: 4-day supply at 22°C ambient temperature
*Filling system:* Manually initiated electronic liquid fill or autofill once per day
**Communications**
*Protocol:* Command set based on ASCII characters
*Interface:* RS-232, 9-pin, "D" subminiature connector, pinouts compatible with standard IBM PC/AT-style RS-232 cables and interfaces
**Voltage output:** Square pulse, 15 V, 500 ± 100 ns
**Software:** CPCount™ software (provided with instrument)
**Calibration check:** Recommended annually
**Required utilities**
*Power:* Selectable, 100/120/230/240 VAC, 50/60 Hz, 25 W maximum (CE certification available)
*Vacuum:* 450 mm (18 in.) Hg minimum gauge
**Physical features**
*Front panel:* Aerosol sample inlet, liquid-level window, indicator lights (particle, laser, flow, temperature, liquid status), fill button
*Rear panel:* Power connector, fuse, 9-pin serial connector, BNC connector, autofill DIP switch, liquid-fill and drain connectors, vacuum port
**Dimensions (LWH):** 19 cm × 22 cm × 19 cm (7.5 in. × 8.5 in. × 7.5 in.)
**Weight:** 5.5 kg (12 lbs)
**Environmental operating conditions**
*Ambient temperature range:* 10 to 35°C
*Ambient humidity range:* 0 to 90% RH, noncondensing

Specifications are subject to change without notice. Design specifications for Models 3760A and 3762 are covered in U.S. patent number 4,790,650. The technique of using a condensation particle counter with diffusion screens to select specific size ranges is covered in U.S. patent number 5,072,626.

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# COMPARISON CHART

| TSI CONDENSATION PARTICLE COUNTERS | 3760A/3762 | 3010 | 3022A | 3025A |
|---|---|---|---|---|
| Minimum particle size (50% efficiency, nm) | 11 | 10 | 7 | 3 |
| Aerosol flow rate (cm³/min) | 1500/3000 | 1000 | 300 | 30 |
| Upper concentration limit (particles/cm³) | $10^4$/5×$10^3$ | $10^4$ | $10^7$ | $10^5$ |
| Lower concentration sensitivity (particles/cm³) | 0 | 0 | 0 | 0 |
| False background counts (particle/cm³) | <0.00005 | <0.00001 | <0.01 | <0.01 |
| Response time (sec for 95% response) | <3/<1.5 | <5 | <13 | 1 |
| Vacuum source | External | External | Internal pump | Internal pump |
| SMPS‡ compatibility | No | Yes | Yes | Yes |

‡Scanning Mobility Particle Sizer (TSI Model 3936)




*TSI offers the most complete set of scientific CPCs available anywhere. The comparison chart at left shows their major differences. Contact your TSI representative for more information.*

## TO ORDER

| *Specify* | *Description* |
|---|---|
| 3760A | Condensation Particle Counter (1.5 L/min) with CPCount™ software |
| 3762 | Condensation Particle Counter (3.0 L/min) with CPCount™ software |

**Optional accessories (order separately):**

| | |
|---|---|
| 3032 | Vacuum Pump |
| 376060 | Particle Size Selector (includes 11 screens) |
| 376061 | PSS screens (12) |



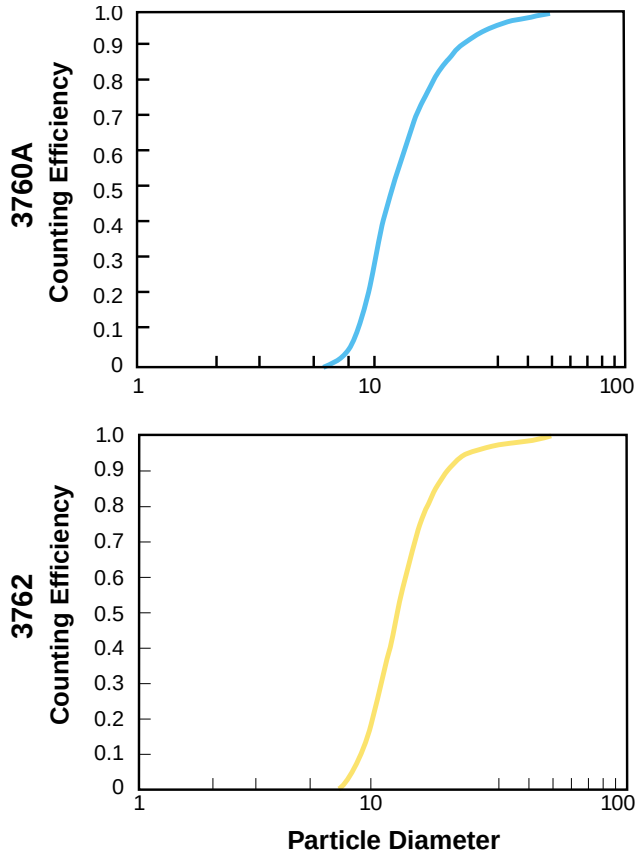
*An optional Particle Size Selector enables you to choose your lower cutoff point. It attaches easily to either CPC and can be configured for the cutoff points shown at right. An additional set of diffusion screens (available separately) lets you select cutpoints up to 0.190 micrometer (Model 3760A) and 0.123 micrometer (Model 3762).*

**50% Particle-Size Cut Using Particle Size Selector**

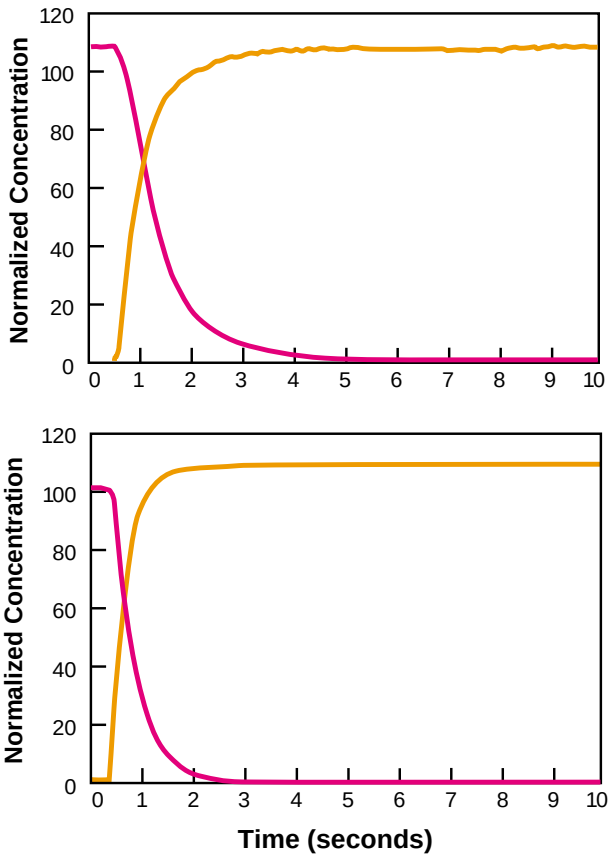
| Screens | 3760A (1.5 L/min) | 3762 (3.0 L/min) |
|---|---|---|
| 0 | 0.011 | 0.011 |
| 1 | 0.014 | 0.011 |
| 2 | 0.024 | 0.017 |
| 3 | 0.033 | 0.023 |
| 4 | 0.042 | 0.029 |
| 5 | 0.050 | 0.034 |
| 6 | 0.058 | 0.040 |
| 7 | 0.066 | 0.045 |
| 8 | 0.074 | 0.050 |
| 9 | 0.081 | 0.055 |
| 10 | 0.089 | 0.060 |
| 11 | 0.096 | 0.065 |

Cutoff points are expressed in micrometers.

*Particle-detection efficiency curve (NaCl particles in nitrogen at 50% R.H.)*




*Response time for a concentration step-change at time = 0*





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