

ENGINE EXHAUST CONDENSATION PARTICLE COUNTER MODEL 3790A

The Engine Exhaust Condensation Particle Counter (EECPC) Model 3790A is a purpose-designed instrument for the measurement of solid particle number (PN) concentration of exhaust emissions. The 3790A has a 10-year proven track record for reliability and accurately measuring concentrations to meet the standards of the GRPE Particle Measurement Program (PMP), including Euro 5 Regulation 83 and Euro 6 Regulation 49, as well as Euro VI standards.



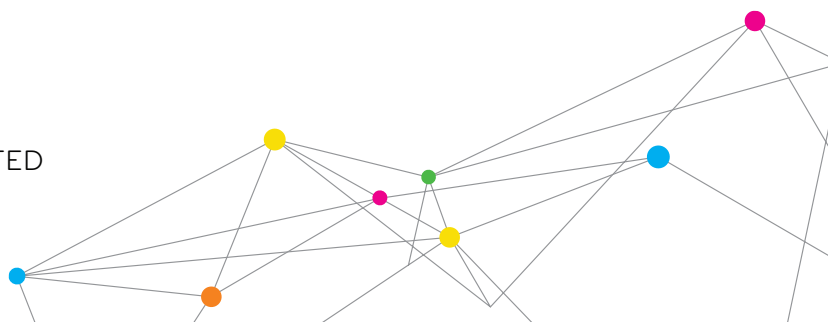
The Engine Exhaust Condensation Particle Counter (EECPC) Model 3790A is fully compliant for light-duty and heavy-duty vehicle certification in accordance with all Euro 5 Regulation 83 and Euro 6 Regulation 49 requirements. Built upon the proven rugged, reliable, and highly repeatable performance of the TSI 2nd generation CPC technology, the EECPC Model 3790A incorporates a wide assortment of design improvements and features such as anti-spill, anti-flooding design, condensate removal system, adjustable, internal calibration factor, removable saturator for ease of maintenance, built-in microprocessor with USB, RS-232 and Ethernet communication interfaces, touch-panel membrane keys and a display for setting-up instrument operating parameters, viewing particle number concentration and count data, interrogating instrument status, and data storage capabilities.

Features and Benefits

- + Meets the lower particle size detection limit at the defined D_{50} and D_{90} counting efficiencies
- + Achieves a linear response to particle concentration from 1 to 10,000 particles/cm³ with $R^2 \geq 0.97$
- + Achieves a counting accuracy of $\pm 10\%$ against a traceable standard
- + Operates under full flow conditions using single particle counting
- + Incorporates continuous, live-time coincidence correction for maximum accuracy
- + Calibrated in full compliance with proposed requirements
- + Achieves readability of 0.1 particles/cm³
- + Internal pulse height monitor to indicate measurement quality
- + 10 Hz data rate for model analysis



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SPECIFICATIONS

ENGINE EXHAUST CONDENSATION PARTICLE COUNTER MODEL 3790A

Lower particle size detection characteristics

D ₅₀ efficiency	50% ± 12% at 23 nm
D ₉₀ efficiency	> 90% at 41 nm

Max. Detectable Particle

> 3 µm

Particle Concentration Range

Single particle counting from 0 to 10,000 particles/cm³ with continuous, live-time coincidence correction

Concentration Accuracy

±10% compared to standard

Calibration Method

Calibrated against aerosol electrometer and electrostatically classified particles; Unit incorporates an adjustable, internal calibration factor

Concentration Linearity

Linear response from 1 to 10,000 particles/cm³ with correlation coefficient (R²) ≥ 0.97

Aerosol Sample

Flow Rate	1.0 L/min (0.035 cfm); NIST traceable
Flow Control	Volumetric flow using critical orifice; differential pressure across critical orifice is monitored; external vacuum required (not included)

Response Time

< 5 sec for 95% response to concentration step change

Averaging Interval

1, 2, 3, 4, 5, 6, 10, 12, 15, 20, 30 or 60 seconds via front panel; more selections available using software

False Background Counts

< 0.001 particle/cm³

Environmental Operating Conditions (ambient)

Temperature	10 to 35°C
Humidity	0 to 90% RH, non-condensing
Pressure	75 to 105 kPa (0.75 to 1.05 atm.)

Working Fluid

Reagent-grade n-butyl alcohol (not included)

Condensate Removal

All condensate is collected and removed automatically by a constant-flow-rate micropump

Communications

Protocol	Command set based on ASCII
Interfaces	
RS-232	9-pin, D-sub connector
USB	Type B connector, USB 2.0 compatible at 12 MB
Ethernet	8-wire RJ-45 jack, 10/100 BASE-T, TCP/IP

Input/Output

Analog Output	BNC connector, 0 to 10V proportional to concentration (configurable)
Pulse Output	BNC connector, TTL level pulse, 350 nanosec width (nominal)
Analog Input	Two BNC connectors, 0 to 10V for logging data from external sensors

Data Logging and Storage

SD/MMC flash memory card

Software

Supplied with Aerosol Instrument Manager® software, CPC module

Calibration Check

Recommended annually

Required Utilities

Power	100 to 240 VAC, 50/60 Hz, 200 W maximum
Vacuum Source	60 kPa (18 in. Hg) min. gauge

Front Panel Features

Aerosol sample inlet, particle and status indicator lights, 2-line LCD display, touch-panel membrane key buttons

Dimensions (L x W x H)

260 mm × 180 mm × 250 mm (10 in. × 7 in. × 10 in.)

Weight

5.5 kg (12 lbs)

Date Rate

10 Hz

Specifications are subject to change without notice.

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TO ORDER

Condensation Particle Counter

Specify	Description
3790A	Engine Exhaust Condensation Particle Counter with TSI Aerosol Instrument Manager software

Accessories

Specify	Description
3032	Vacuum Pump, 115 V
3032-1	Vacuum Pump, 230V/50Hz
3032-EC	Vacuum Pump, 230V (Europe only)
1031515	Maintenance Kit (includes 2 micropump filters, 3 butanol fill/drain filters, and 2 saturator wicks)
379020A	Rotating Disk Thermodiluter
379030	Thermal Conditioner Air Supply

Accessories must be ordered separately