

NEW

ENGINE EXHAUST CONDENSATION PARTICLE COUNTER MODELS 3790A & 3790A-10



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 12-year proven track record for reliability and accurately measuring concentrations to meet the standards of the GRPE Particle Measurement Program (PMP), including Euro 6 Regulations 83 and 49, as well as upcoming Euro 7 regulations.

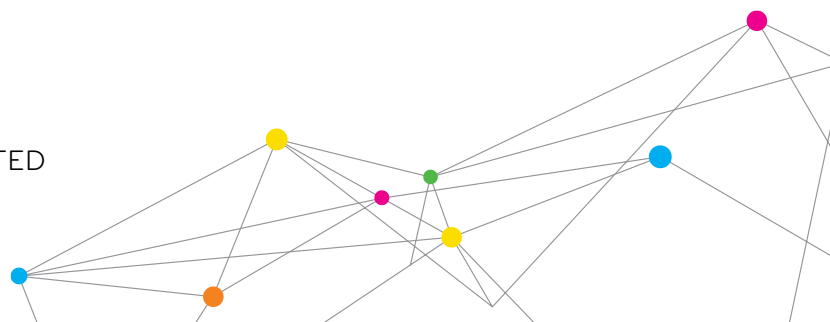
The Engine Exhaust Condensation Particle Counter (EECPC) Model 3790A is fully compliant for light-duty and heavy-duty vehicle certification in accordance with all Euro 6 Regulations 83 and 49 requirements. Built upon the proven rugged, reliable, and highly repeatable performance of the TSI 2nd generation CPC technology, the EECPC Model 3790A incorporates a wide assortment of design improvements and features such as anti-spill, anti-flooding design, 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

- + 23 nm or 10 nm lower detection limit per PMP requirements
- + Achieves a linear response to particle concentration from 1 to 10,000 /50,000 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 ISO 27891
- + Achieves readability of 0.1 particles/cm³
- + Internal pulse height monitor to indicate measurement quality
- + 10 Hz data rate for modal analysis



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SPECIFICATIONS

ENGINE EXHAUST CONDENSATION PARTICLE COUNTER MODEL 3790A & 3790A-10

SPECIFIC MODEL SPECIFICATIONS

3790A	D ₅₀ Efficiency	50% ±12% at 23 nm
	D ₉₀ Efficiency	>90% at 41 nm
	Concentration	10,000 particles/cm ³
3790A-10	D ₅₀ Efficiency	50-80% at 10 nm
	D ₉₀ Efficiency	>90% at 15 nm
	Concentration	50,000 particles/cm ³

FOR ALL MODELS

Max. Detectable Particle

>3 µm

Particle Concentration

Single particle counting from 0 to upper concentration range with continuous, live-time coincidence correction

Concentration Accuracy

±10% compared to traceable standard

Calibration Method

Calibrated in accordance with ISO 27891 per PMP

Concentration Linearity

Linear response from 1 to upper concentration range 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 50% RH, non-condensing
Pressure 75 to 105 kPa (0.75 to 1.05 atm.)
Altitude Up to 2,000m

Working Fluid

Reagent-grade n-butyl alcohol (not included) with automatic filling from external fill bottle

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

TO ORDER

Condensation Particle Counter

Specify	Description
3790A	Engine Exhaust Condensation Particle Counter (23 nm) with TSI Aerosol Instrument Manager software (version 10)
3790A-10	Engine Exhaust Condensation Particle Counter (10 nm) with TSI Aerosol Instrument Manager software (version 10)

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)

Accessories must be ordered separately

Specifications are subject to change without notice.

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USA	Tel: +1 800 874 2811	India	Tel: +91 80 67877200
UK	Tel: +44 149 4 459200	China	Tel: +86 10 8219 7688
France	Tel: +33 1 41 19 21 99	Singapore	Tel: +65 6595 6388
Germany	Tel: +49 241 523030		