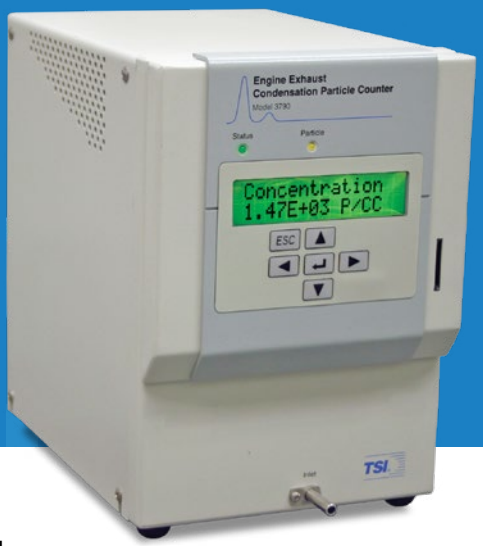
Knowledge Beyond Measure.

Engine Exhaust Condensation Particle Counters

Models 3790A & 3790A-10



A purposed-designed instrument for the measurement of solid particle number (PN) concentration of exhaust emissions.

The Engine Exhaust Condensation Particle Counters (EECPC) have 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 EECPCs 3790A and 3790A-10 are 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 gerneration CPC technology, the EECPCs incorporate 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 (for 3790A) or 10 nm (for 3790A-10) lower detection limit per PMP requirements
- Achieve a linear response to particle concentration from 1 to 10,000 /50,000 particles/cm^3 with $R^2 \geq 0.97$
- Achieve a counting accuracy of ±10% against a traceable standard
- Operate under full flow conditions using single particle counting
- Incorporate continuous, live-time coincidence correction for maximum accuracy
- Calibrated in full compliance with ISO 27891
- Achieve readability of 0.1 particles/cm^3
- Internal pulse height monitor to indicate measurement quality
- 10 Hz data rate for modal analysis

Specifications

Engine Exhaust Condensation Particle Counters

Models 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 (R^2) ≥ 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/cm^3

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

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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