

# TSI NPET 3795

## Nanoparticle Emissions Tester



The TSI Nanoparticle Emissions Tester (NPET) Model 3795 is a portable, accurate instrument capable of measuring total solid particle number emissions from a variety of diesel-powered sources, including construction machinery, buses, stationary gensets, and more.

Featuring a robust, user-friendly design, the NPET can be used in the field by researchers, regulatory inspectors, and maintenance personnel alike.

Sampling from combustion sources is often challenging due to the presence of volatile material. Volatile components are extremely sensitive to sampling conditions and can grow existing particles and form new particles through condensation.

By evaporating and oxidizing volatile particles, the NPET 3795 measures only the remaining solid particles.

The NPET 3795 fully meets Swiss Regulation 941.242 for the periodic certification of diesel-powered machinery equipped with a DPF.

Not only is it a rugged, mobile and a cost effective instrument, but it also comes with a software package optimized for Microsoft Windows 8 tablet allowing for ease of use in laboratory and field testing applications of on and off road equipment.

A sophisticated instrument in a simple package, the NPET 3795 combines a traditionally complex system of components into a portable, robust measure-

ment tool. The five key design components include:

**Sampling Probe:** A stainless steel sample probe with built-in diluter and removable clamp allows for easy measurement of high concentration particle number emissions directly from the tailpipe.

**Preconditioner:** a 1.0 $\mu$ m cyclone removes large particles while a water trap removes water droplets from the exhaust gas sample.

**Recirculating dilution flow conditioner:** A silica desiccant dryer and two high capacity HEPA filters efficiently dry and clean the recirculating dilution flow for continuous operation with no loss of accuracy.

**Volatile particle remover:** a catalytic stripper heated to 350°C evaporates, and oxidizes volatile components to remove them from the sample stream.

**Particle counter:** An isopropanol-based CPC provides accurate, direct measurement of particle number emissions at high and low concentrations over the entire range of temperature and altitude conditions.

### KEY FEATURES

- Direct measurement of particle number concentration using proven CPC technology
- Sampling probe with integrated dilution to measure concentrations up to 5,000,000 particles/cm<sup>3</sup>
- Built-in catalytic stripper for volatile particle removal
- Wide environmental operating range - 10°C to 40°C and 0-3,000m
- Two measurement modes:  
**General:** Real-time data logging for research  
**Official:** Swiss Regulation SR 941.242 certification in less than one minute
- Easy to use software optimized for touch screen operation

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**SPECIFICATIONS** Specifications subject to change without notice

<b>Size</b>	26 x 33 x 57cm / 10.2 x 13 x 22.4 inch	<b>Particle concentration range &amp; accuracy</b>	Single particle counting (nominal 10:1 dilution) is 1000 to $5 \times 10_6$ particles/cm <sup>3</sup> ; $\pm 10\%$ compared to standard
<b>Weight</b>	13.1 kg / 28.9 lbs.	<b>Flow rates (nominal)</b>	Instrument inlet: 0.7L/min; CPC Aerosol: 0.1L/min; CPC Bypass: 0.6L/min
<b>Temperature &amp; Pressure</b>	-10°C to +40°C / 14°F to +104°F	<b>Condensing Liquid Working fluid</b>	99.5%+ reagent-grade isopropyl alcohol
<b>70 kPa to 106 kPa</b>	98db	<b>Filling system</b>	
<b>Power requirement</b>	100 to 240 VAC, 50/60 Hz, 100 W nominal, 200 W peak	<b>Sample time per fill</b>	
<b>Ethernet</b>	8-wire RJ-45 jack, 10/100 BASE-T, TCP/IP	<b>Catalytic stripper</b>	350°C >99% of 30 nm, NMD polydisperse Tetracontane (C40H82)
<b>Software</b>	Microsoft®Windows® 7 or 8 compatible; optimized for touchscreen	<b>Aerosol medium</b>	Designed to sample high temperature (up to 300°C), corrosive (NO <sub>x</sub> , HC, H <sub>2</sub> O, H <sub>2</sub> SO <sub>4</sub> ) engine exhaust gas
<b>Consumables</b>	HEPA filters (x2), Cobalt-free silica desiccant cartridge, 99.5%+ reagent-grade isopropyl alcohol	<b>Optional accessories</b>	HEPA filter, Dryer cartridge, 30ml Isopropyl alcohol bottles (16), O-ring kit, Wick assembly, Hose and probe assembly, Windows®8 tablet with ruggedized case and Ethernet dongle
<b>Response time</b>	T10-90% and T90-10% 4±0.5 seconds T0-90% 8±0.5 seconds	<b>Calibration</b>	Recommended annually
<b>Sampling Interval</b>	10Hz (Official test mode) 1Hz (General sampling mode)	<b>Part no.</b>	73-2000
<b>Particle size range</b>	<50% at 23nm >50% at 41nm		
<b>Detection efficiency: Max. detectable particle:</b>	Limited to 1µm by inlet cyclone		



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