

Model 3065 Low-Flow Thermodenuder

Removes precursors and volatile particles from your aerosol sample

The Model 3065 Low-Flow Thermodenuder is a continuous flow-through device designed to remove gaseous precursors and volatile particles from an aerosol sample for subsequent measurement of dry particle size. Basically, it consists of two parts: a desorber section where the sample is heated to temperatures of up to 400°C, and an adsorption tube surrounded by an annular bed of activated carbon.

In most hot-gas aerosol applications, solid particles are mixed with gaseous compounds. For example, automotive exhaust contains solid carbonaceous and ash particles and a variety of volatile organic and sulfur compounds. When cooling takes place due to the transport of that mixture in transport systems or dilution tunnels, condensation processes may occur. Depending on supersaturation conditions, new, volatile nanoparticles can be formed by nucleation. Heterogeneous condensation can take place on the surface of the solid particles, as well.

Applications

The presence of volatile particles and their gaseous precursors can have great influence over the size measurement of particulate exhaust emissions when the exhaust is cooled and diluted. The

Model 3065 has been optimized for use with a TSI Scanning Mobility Particle Sizer (SMPS). When combined with a SMPS, the Thermodenuder is suitable for determining the fractions of solid and volatile components in vehicle exhaust, particularly to:

- Characterize traps or diesel particle filter (DPF) systems
- Measure particle size at constant volume sampling (CVS) tunnels
- Study reformulated (for example, low-sulfur) fuels, and fuels with additives

Other SMPS applications include measurements of:

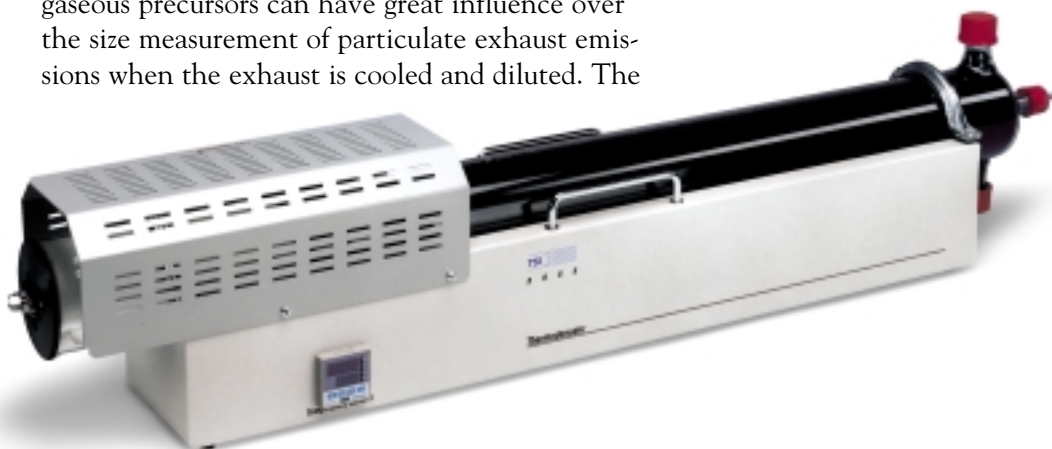
- Emissions from direct-heating boilers
- Exhaust from industrial stacks
- Emissions from biomass burning

Operation

The hot aerosol or exhaust gas containing particles is directed into the Thermodenuder, where it is heated to a preset temperature. A built-in micro-processor controller achieves precise adjustment of the temperature, and displays actual and set values. The temperature can be varied easily with three or

four key strokes on the temperature controller.

Volatile particles evaporate at the preset temperature during their residence time inside the Thermode-



nuder. Activated carbon surrounding the flowpath of the particle-gas mixture adsorbs the volatile compounds as they penetrate a gas-permeable screen. Particles do not come in contact with the activated carbon, minimizing particle losses in the adsorption section. As a result, only particles in the solid state are left in the sample.

Specifications

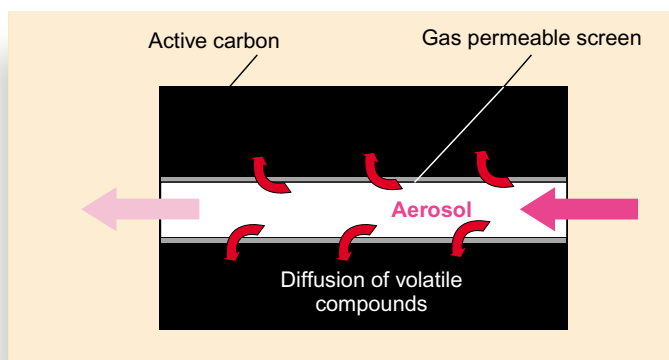
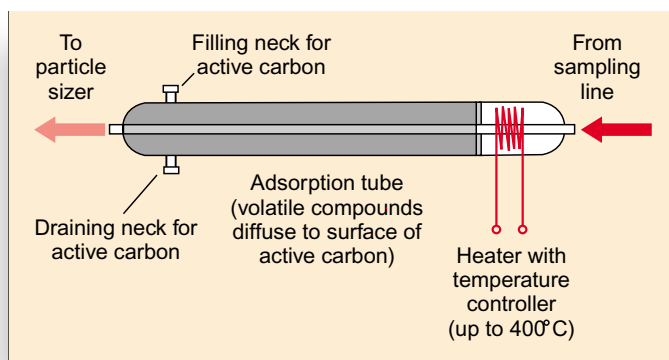
Mode of Operation	Heating to preset temperatures and adsorption of volatile particles
Solid Particle Type	Material not evaporating at set temperature
Adsorption Material	Activated carbon
Adsorption Material Volume	6 L
Temperature Range	0 to 400°C ± 1°C
Temperature Controller	WIKA GCS
Flow Range	0.2 to 2 L/min, optimal 0.5 to 1 L/min
Sampling Line Connector	6-mm Swagelok® fitting
Power Supply	230 VAC standard, 110 VAC upon request
Dimensions (LWH)	110 cm × 26 cm × 17 cm (43.3 in. × 10.2 in. × 6.7 in.)
Weight	11.5 kg (25 lb)

Specifications subject to change without notice.

To Order

Specify	Description
3065	Low-Flow Thermodenuder

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