

# TEOM® Series 1105 Diesel Particulate Monitor



## Advanced Diesel Particulate Monitoring

- Filter-Based Collection
- Real-Time, Direct Mass Measurement / Dilution Ratio
- Results Correlate with Regulatory Test Procedures
- Unsurpassed Repeatability
- Detailed Views of Transient Emission Profiles

Direct Measurement of  
Diluted Diesel Exhaust Mass Concentration in Real Time

Analyze • Detect • Measure • Control™

**Thermo**  
ELECTRON CORPORATION

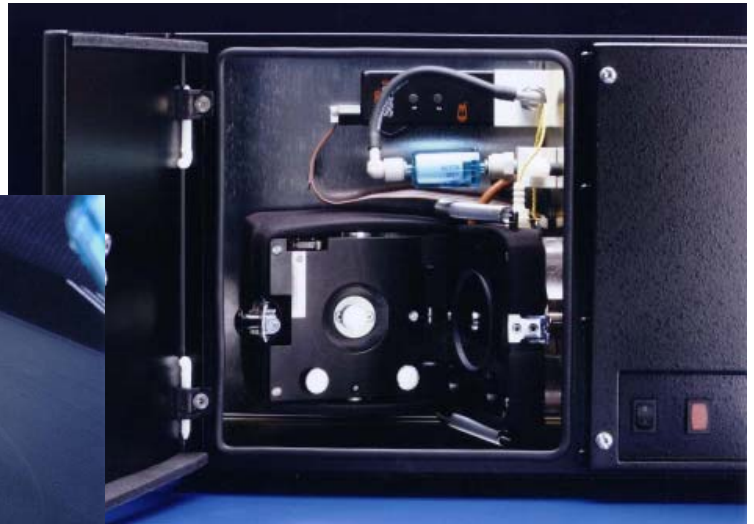
## Unique Principle of Operation

The TEOM Series 1105 Diesel Particulate Monitor incorporates a patented inertial balance that directly measures the mass collected on an exchangeable filter cartridge. It monitors the change in the natural oscillating frequency of a tapered element (see photo) as additional mass collects on the filter. The sample flow passes through the filter, where particulate matter collects, and then continues through the hollow tapered element on its way to a dynamic flow control system and vacuum pump.

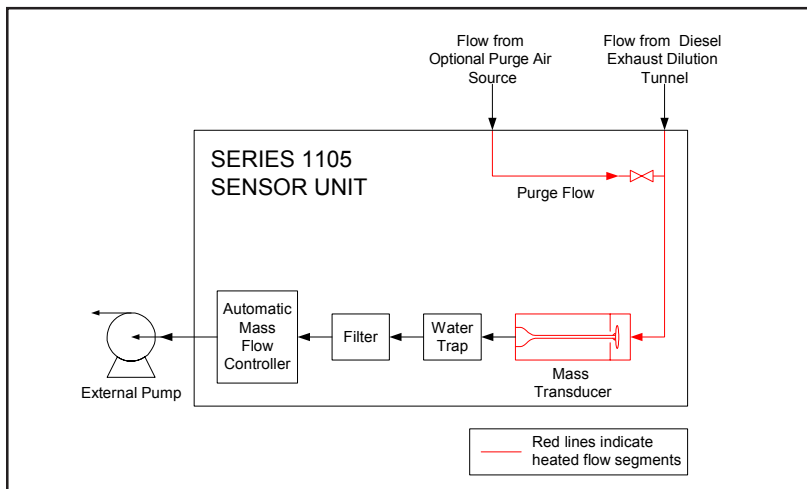
The TEOM mass transducer does not require recalibration because it is specially designed and constructed from non-fatiguing materials. Its mass calibration may be verified, however using an optional Mass Calibration Verification Kit that contains a filter of known mass. A flow controller maintains the sample flow rate input by the user.



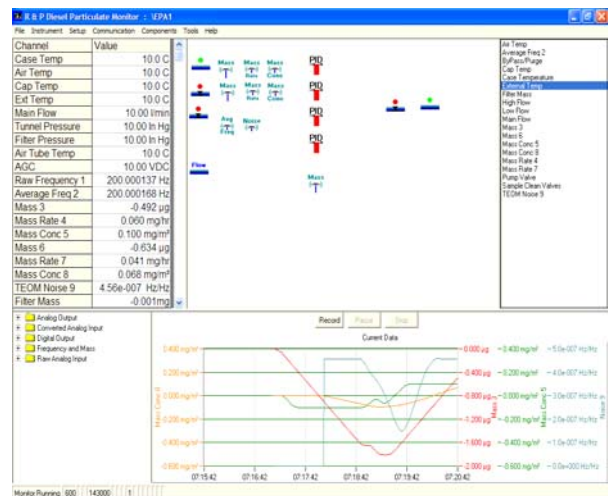
Tapered Element.



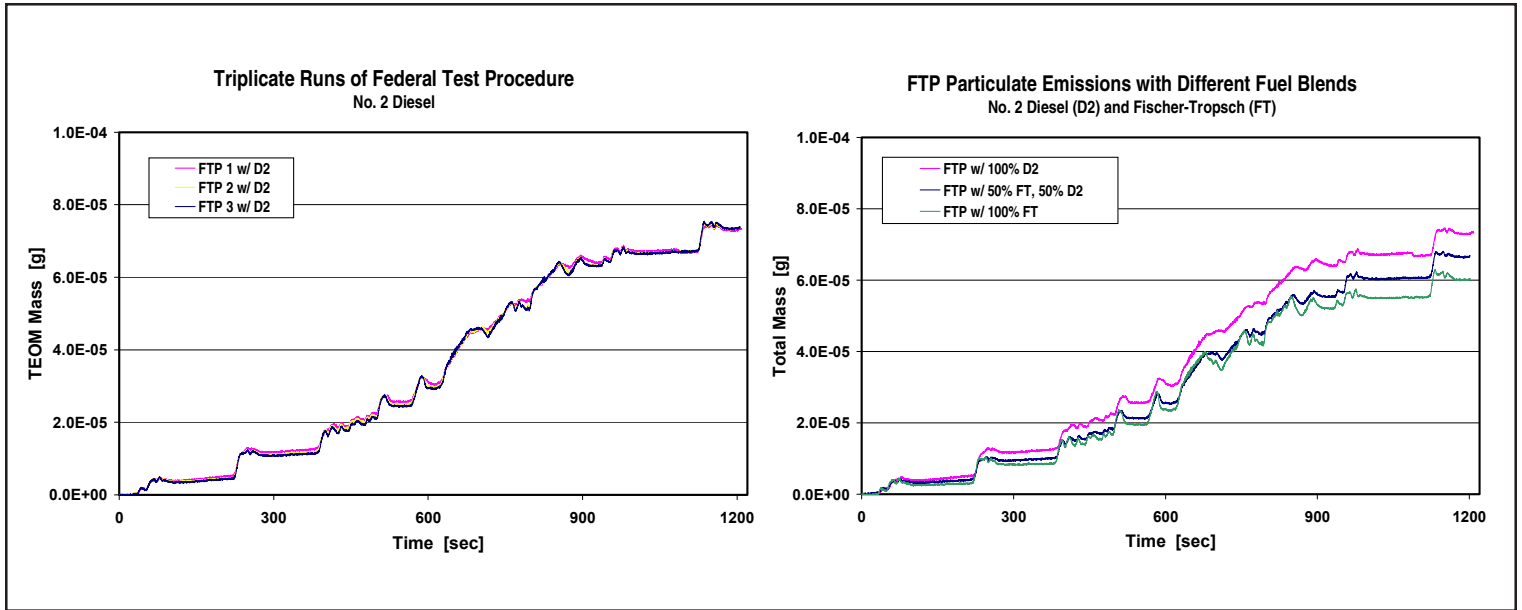
Instrument with Mass Transducer Open (top). Exchanging the Sample Filter (left).



System flow schematic

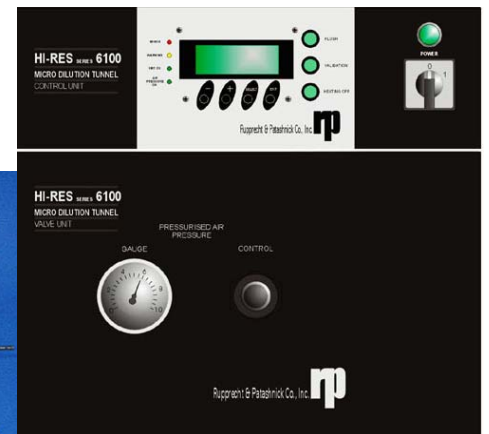
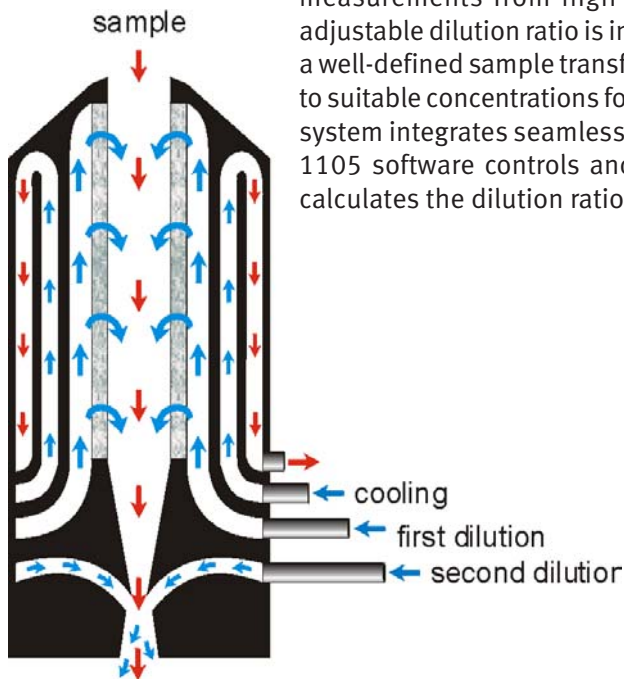


The TEOM monitor's unsurpassed repeatability allows researchers to gauge the effect that fuel changes and/or other parameters have on engine emission performance. For example, the graphs below depict the emission reduction that can be realized by changing the fuel type.

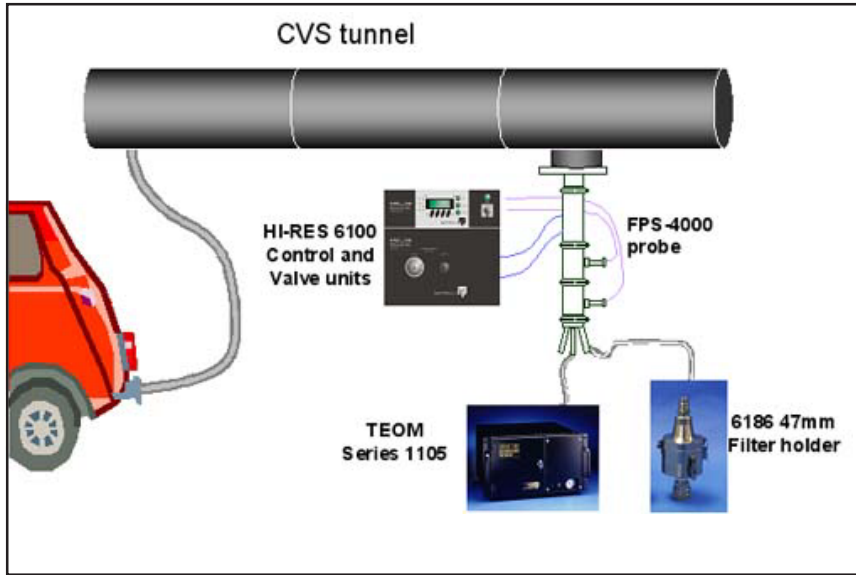


## HI-RES™ Series 6100 Micro Diluter

The HI-RES Series 6100 Micro Diluter is a complete sampling system for particle measurements from high concentrations and from hot and humid conditions. The adjustable dilution ratio is in two phases; controlled temperatures and rapid dilution allow a well-defined sample transformation from vehicle exhaust or power plant stack conditions to suitable concentrations for most measurement devices. This system integrates seamlessly with the TEOM Series 1105. The 1105 software controls and monitors the 6100 system and calculates the dilution ratio second by second.



Series 6100 Control Unit, Value Unit and Probe



Typical sampling setup from CVS

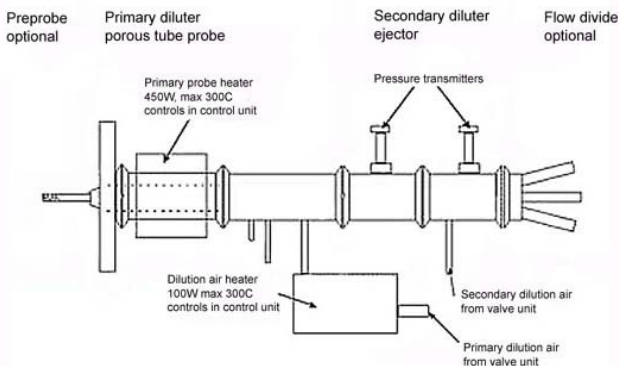
## Advanced Applications

The TEOM Series 1105 monitor with the HI-RES Series 6100 Micro Diluter is designed to provide correlated filter-based mass measurements. It provides measurements for either steady state or transient test cycles. This system can be used for the applications below:

- Automotive exhaust particulate mass concentration and size distribution studies
- Pre- and post-particulate control device measurements (% removal efficiency)
- Aircraft engines
- Marine engines
- Power plant stack measurements
- Process industry monitoring
- Pilot reactor studies
- A variety of combustion studies



Series 1105 and 6100 setup



Series 6100 configuration for hot dilution