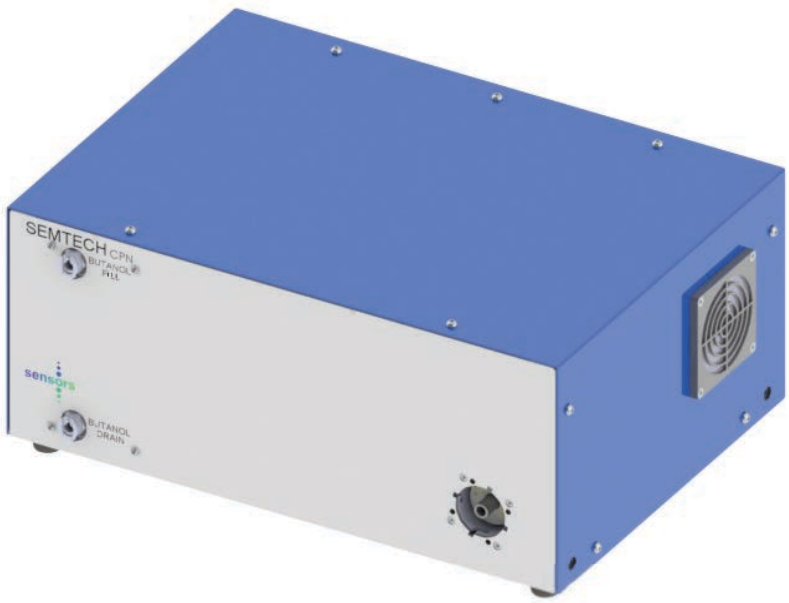
Emissions
Measurement
Solutions

SEMTECH® CPN

Condensation Particle Number
On-Board PEMS

Innovation.
Built on Experience.



The SEMTECH® CPN is a real-time, on-board measurement device for the quantification of solid particle number concentrations in automotive exhaust.

The unit fulfills the full requirements of the EU RDE PN-PEMS measurement criteria.

Technology: The SEMTECH® CPN measurement module closely follows the design specifications for the EU regulatory test-cell particle measurement program (PMP), notably RDE-LDV, (EU) 2017/1151. In brief, the PMP and SEMTECH® CPN measurement system is described as being; a sampling probe with heated line, a hot dilution unit to provide initial dilution (PND1), a volatile particle remover (VPR), a second stage diluter (PND2) and a particle measurement instrument.

Sensors Inc, as used in all PMP systems, uses a condensation particle counter for the measurement of the particle number concentrations. Condensation particle counters are the preferred choice of instruments because they are linear, independent to changes in particle size and have the required large dynamic range of operation. The incoming particles are mixed with a vapor (e.g. Butanol) and then cooled to facilitate condensation of the vapor onto the particles. This condensation causes the particles to grow and be easily detected using laser optics.

As shown in the on-vehicle picture, the battery powered SEMTECH® CPN and SEMTECH® DS+ can be easily mounted and operated under the RDE test conditions and is immune from shock and vibration during real world driving.

Official RDE Testing [Gaseous and PN]

The CPN offers the following benefits:

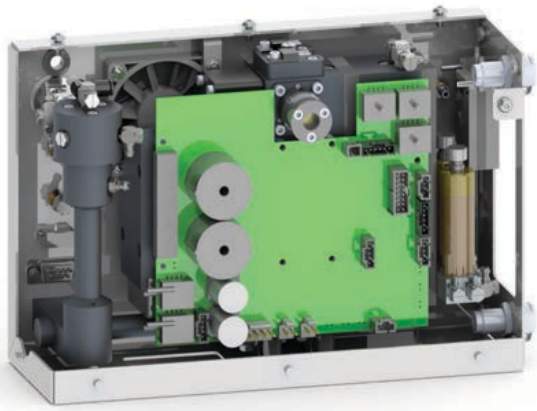
Low Cost of Ownership: With little maintenance required, the CPN remains a low cost solution throughout the life of the system.

All Day Testing: An optional large butanol reservoir ensures uninterrupted, extended testing.

Real-Time Data: The system is capable of second-by-second data acquisition, for real-time testing.

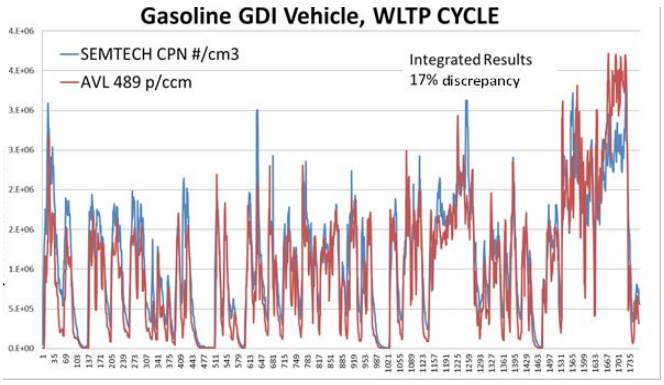
Large Dynamic Range: Two dilution stages are used, making the system capable of accurate measurements over a large dynamic concentration range.

Portable System: The system is designed for real-world testing in a PEMS package. It can be used as a stand-alone measurement device.



Internal CPC Module

Heated Line: In order to maintain the integrity of the resulting data, the exhaust sample must be maintained at 100°C (+/- 5°C). Sensors has developed an innovative, low power, heated line that controls the temperature of the sample during transport to the CPN.



CPN SPECIFICATIONS

Parameter	CPN
Particle Size (Lower Limit)	Minimum: 23 nm Maximum: d50 (Correlation to PMP system demonstrated)
Particle Concentration Range	CPC 0-10^4 #/cm^3 Single count mode
Measurement Range	Adjustable by PND_2 dilution ratio (Exceeds that of diffusion charger devices)
Dimensions (W x D x H)	43.6 x 31.1 x 18.0 cm 17.2 x 12.3 x 7.1 inches
Weight	Approximately 20 k (44 lbs.)
Power Requirements	12 VDC <200W at steady state (including 1m heated sampling line)
Operating Environment	-10°C to 40°C, 860-1020 mbar [up to 1500 m above sea level]

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