



Dekati®
ePNC™ Particle Number Sensor

Compact and robust design

Easy integration into OEM measurement systems

Consistent performance at low cost of ownership



Dekati® ePNC™ Particle Number Sensor

The Dekati® ePNC™ is an innovative particle number (PN) counter sensor designed specifically for easy integration in OEM instruments such as Portable Emission Measurement Systems (PEMS) for Real Driving Emission (RDE), emission monitoring & control systems and Periodic Testing and Inspection (PTI) testing. The sensor fulfils the metrological requirements of Real Driving Emission (RDE) Regulation and is thus also fully in line with the applicable requirements for PTI testing in various countries. The Dekati® ePNC™'s unique design is the result of Dekati Ltd's 30 years of experience in developing instruments for fine particle measurements.

Construction and operation

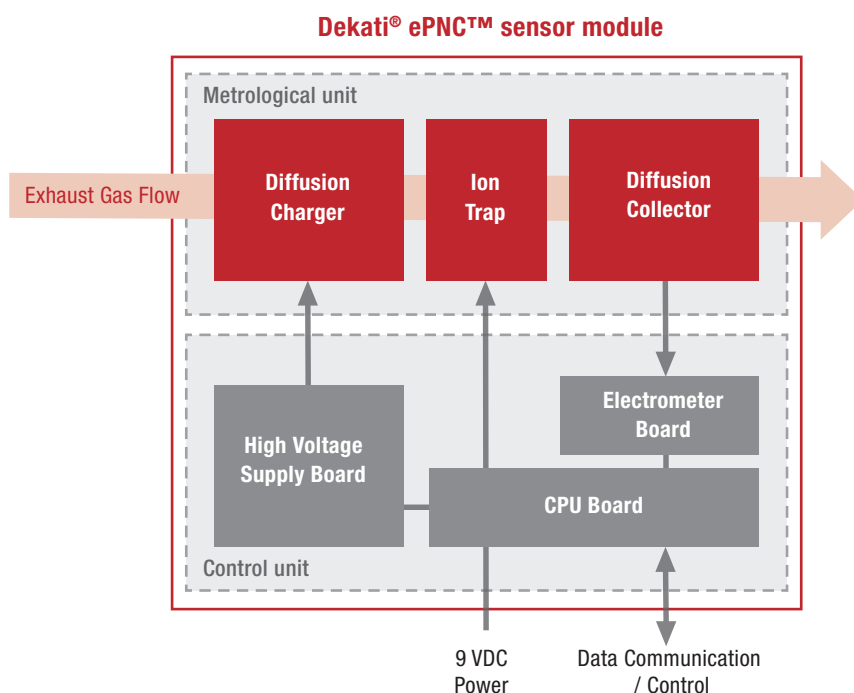
The ePNC™ sensor's compact structure makes device integration simple and straightforward. Its modular structure consists of a separate control and metrological unit. The control unit takes care of the control systems and data communications, whereas the replaceable metrological unit contains the particle measurement system, making service and maintenance easy and cost effective.

The particle counting technology of the Dekati® ePNC™ sensor is based on diffusion charging, diffusion particle collection and electrical detection of collected particles. Its unique, patented low-pressure operation provides an electrical current signal that is directly proportional to the particle number (PN) concentration.



The ePNC™ sensor's modular structure consists of a separate control and metrological unit.

For use as a complete particle counter system, the Dekati® ePNC™ is combined with a dedicated sample conditioning system that is designed by Dekati experts to ensure consistent performance in accordance with applicable legislation. Its under-pressure operation eliminates the need for any dilution systems, thus enhancing accuracy and durability while lowering costs. Due to its advanced technology and innovative design, the Dekati® ePNC™ sensor is future-proof and can be easily upgraded to comply with forthcoming stricter metrological requirements.



Construction schematic and operating principle of the Dekati® ePNC™.

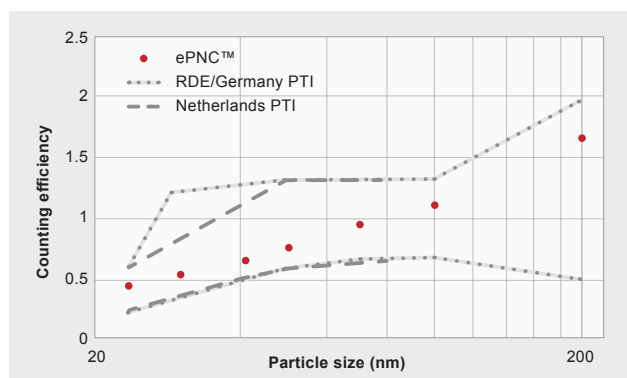
Features

- Particle number sensor for use in OEM emission measurement devices and monitoring systems
- Real-time particle number concentration measurements according to RDE Regulation (EU) 2017/1154 and EU Commission Recommendation (EU) 2023/688
- Innovative, modular design optimized for easy maintenance and low cost of ownership
- Easily replaceable pre-calibrated metrological unit reduces service down-time
- Accurate and repeatable performance confirmed during extensive lab and field testing
- Consistent operation in long term use
- Low power consumption, ideal for battery-powered devices
- Robust and durable construction for long-term use in workshop environments
- Validated for EMC compatibility, vibration and other environmental effects
- Easy communication and control interface, state-based operation
- Welmec-compliant data-protection mode
- Full manufacturing traceability for each individual sensor

Performance

The Dekati® ePNC™ system is independently certified for compliance with the RDE Regulation (EU) 2017/1154 regulation for particle number concentration measurements and as such also meets the provisions for particle number testing for PTI set forth by EU Commission Recommendation (EU) 2023/688. This makes the Dekati® ePNC™ suitable for use in both PEMS and PTI instruments, in accordance with regulatory metrological requirements in various countries.

The innovative design of the sensor guarantees minimal effect of particle size on the instrument response and linearity over a wide particle concentration range. The ePNC™ sensor performance is consistent and repeatable, even in harsh workshop environments.

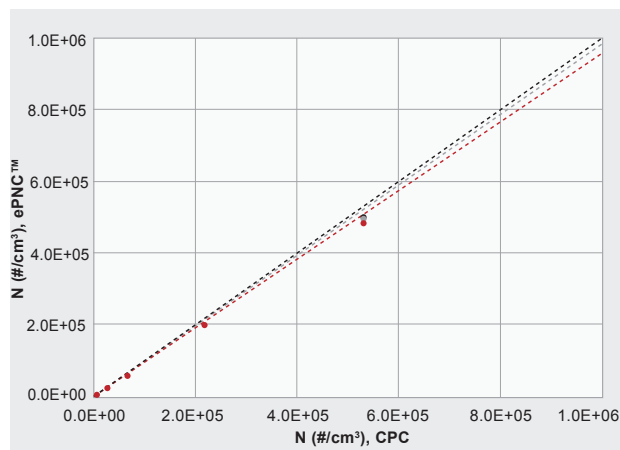


The ePNC™ counting efficiency is well within the requirements of the RDE and PTI regulations

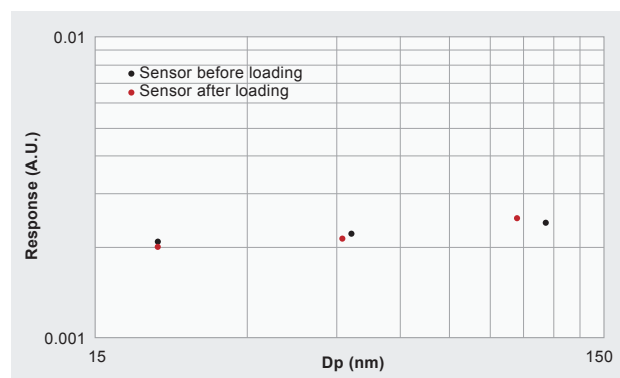


Innovations for Industrial Particle Measurements

- Simplicity
- Accuracy
- Durability
- Consistent performance
- Easy maintenance
- Easy integration



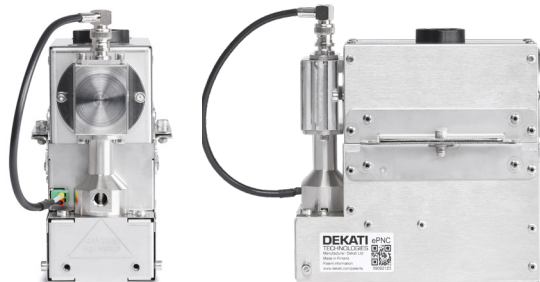
Sensor response vs. CPC number concentration for three different ePNC™ units



The ePNC™ sensor response stays stable even after continuous long term loading with high concentrations of soot particles

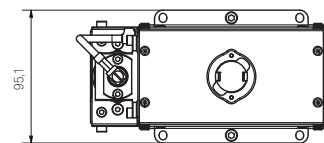
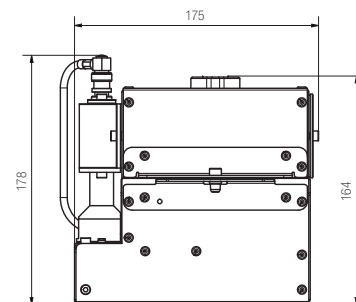


Dekati® ePNC™



Specifications

Sensitivity	1000 #/cm ³
Maximum concentration	1.5 e7 #/cm ³
Particle size range	23-200 nm (built-in readiness for 10 nm)
Sampling interval	1 s
Counting efficiency	In compliance with RDE Regulation (EU)2017/1154 and EU Commission Recommendation (EU) 2023/688
Weight	2.15 kg
Power consumption	2 W
Operating voltage	9 V DC
Calibration	According to JRC Real Driving Emissions (RDE) technical report EUR 29036 EN
Data communication	RS-232 Serial communication



Dimensions in millimeters

Scale MT PKS100E Field Calibration System



The particle counter calibration system **PKS100E** is a portable salt particle generator with an internal reference detector. It is an all-in-one solution for easy and fast calibration and verification of various particle measurement instruments and is widely used in the PTI sector.

The output particle number concentrations are variable up to 500.000 #/cm³ and are continuously monitored by an integrated **Dekati® ePNC™** reference particle number sensor. The generated particle size is constant regardless of the selected concentrations.

For more information: www.scale-mt.de/en/products

Publications

Laakkonen et al, 2023, "Effect of operation pressure on the response of ePNC particle number concentration sensor", IEEE Sensors Journal, doi: 10.1109/JSEN.2023.3329519.

Laakkonen et al, 2023, "ePNC Diffusion-Charging Based Particle Number Counting Technology as Alternative to Condensation Particle Counting Based Methods". SAE Technical Paper 2024-26-0342.

DEKATI
TECHNOLOGIES

Dekati Technologies – Innovations for Industrial Particle Measurements

Dekati Technologies, a specialized brand division of Dekati Ltd., delivers advanced particle sensors and measurement systems tailored for demanding industrial environments. Backed by over 30 years of expertise in particle measurement, our solutions combine high accuracy, durability, and cost-efficiency—making them ideal for large-scale particle monitoring. Every system is engineered with flexible integration options to seamlessly fit into diverse industrial processes and customer-specific setups.

CERTIFIED
ISO 9001

