

TUNABLE RESISTIVE PULSE SENSING (TRPS)



IZON

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MEASURE NANOPARTICLES WITH UNPARALLELED PRECISION.

Measure individual particle size, concentration, and charge, with unparalleled precision and accuracy. Tunable Resistive Pulse Sensing (TRPS) measures nanoparticles suspended in electrolytes on a particle-by-particle basis as they pass through a nanopore. This is a huge step forward as the more commonly used light scattering techniques only provide bulk estimates with low accuracy and very low precision. Used in over 45 countries, and included in over 400 publications, TRPS instruments are a key requirement for analysing nanoparticles scientifically and correctly.

- ✓ **Rapid, Simple & Reliable**

Measure individual nanoparticles, with sub-nm precision.

- ✓ **Simultaneous size & concentration measurement**

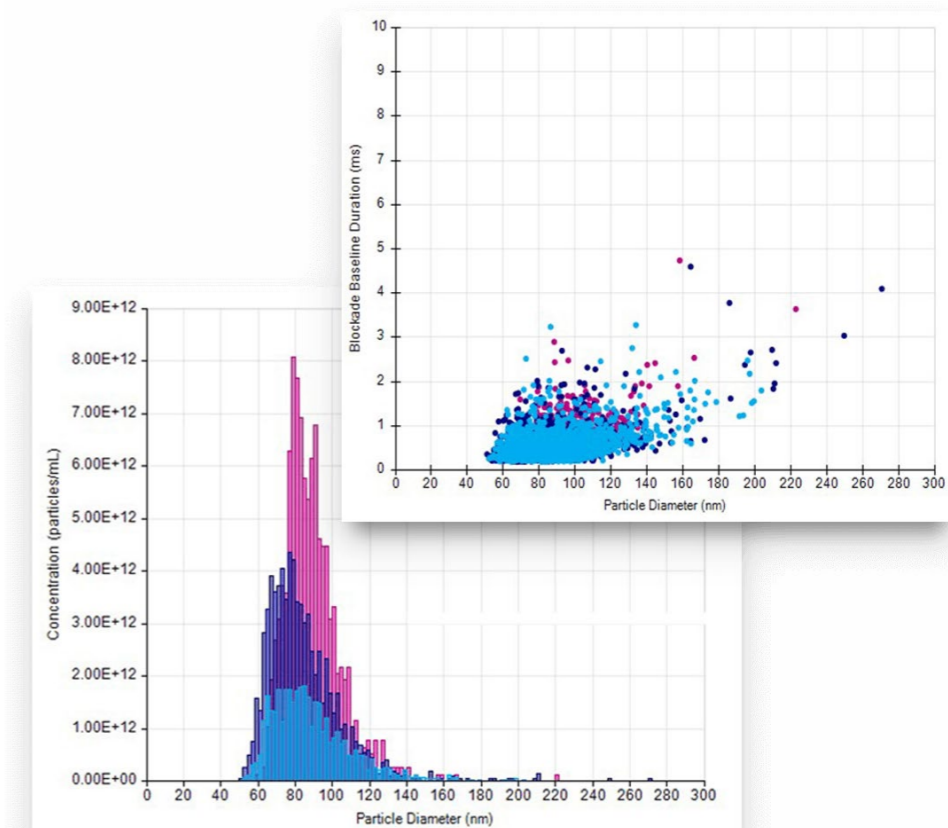
Obtain accurate particle concentration in each size band.

- ✓ **Single -particle zeta potential measurement**

Measure the zeta potential of each individual particle.

MEASURE INDIVIDUAL PARTICLES, WITH SUB-NM PRECISION.

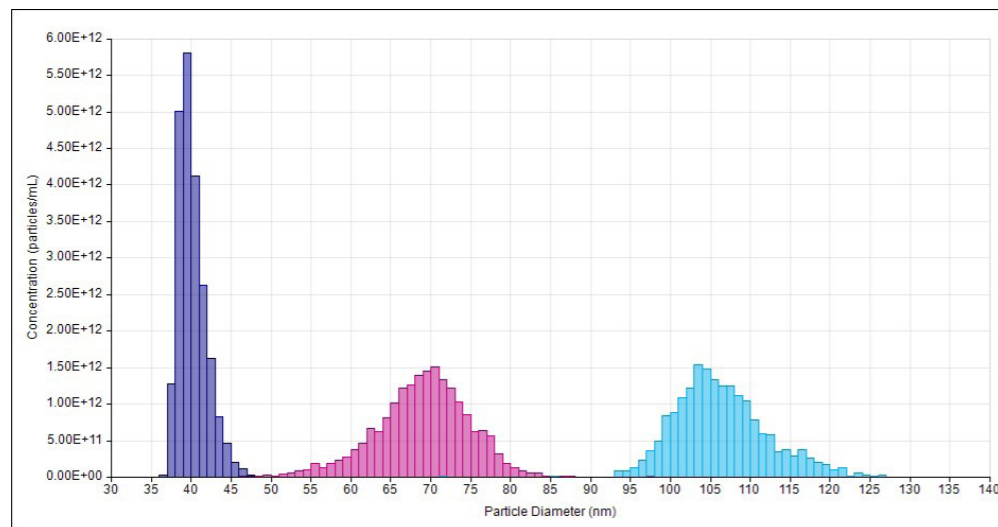
The precision, resolution, and accuracy of size measurement in TRPS is unmatched by any other nanoparticle analysis technique. The transient current pulse caused by a particle traversing the pore is directly proportional to particle volume, enabling a highly precise and repeatable measurement of size to be achieved; in ideal conditions TRPS offers sub nm resolution of diameter. Every particle measured is compared to a set of NIST traceable calibration particles of known size, which ensures accuracy and repeatability. This calibration step enables the real size distribution of a particle set to be generated to a very high precision and accuracy. The measurement of particle concentration is also the best available, with data accuracy on a linear scale. By way of comparison, DLS is unable to measure concentration at all, and NTA is only accurate on a log scale and is too coarse for most scientific purposes.



SIMULTANEOUS SIZE AND CONCENTRATION MEASUREMENT.

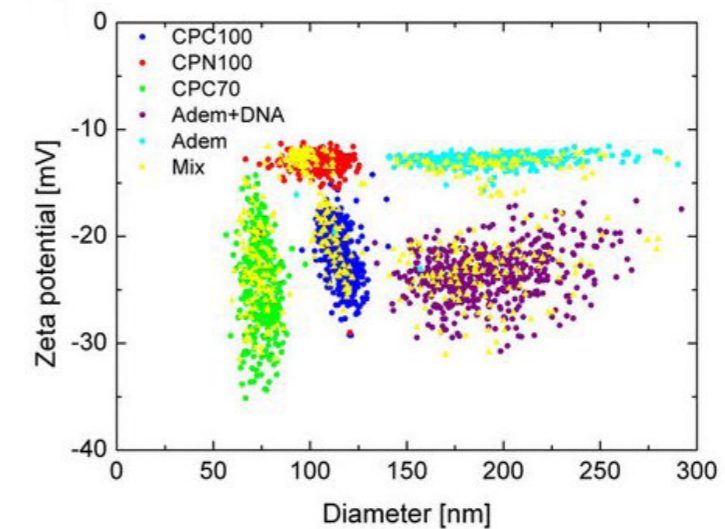
TRPS provides a calibrated measurement of the true size and concentration distribution of nanoparticles. It adds an additional layer of essential information by providing the concentration of particles in each size band. A 2-D histogram of concentration vs size is the correct way to describe nanoparticles. A vague wavy line on a log scale is not.

In fields such as nanomedicine, particle number and size both need to be known to design, predict, and monitor the particle and drug interactions. Size and concentration are both essential components of physico-chemical equivalence, as is surface charge. Aggregation assessments also require both the size and number of particles to be known before and after the change. In the EV field, particles are typically very heterogeneous. A standardised approach to measuring them is required, which TRPS does inherently. Small changes in EV properties may indicate important biomedical or research information. It is a requirement, therefore, that the measurement data is accurate and detailed enough for the user to be confident that those differences are real and correctly quantified.



SINGLE-PARTICLE ZETA POTENTIAL MEASUREMENT.

The unique capability of TRPS to simultaneously measure particle size and zeta potential (which is a measure of surface charge) reproducibly on a particle-by-particle basis with high precision and accuracy presents a new and powerful approach for the life sciences. Applications include: investigating and understanding nano-bio interactions, establishing physico-chemical equivalence, and the discrimination of sub-populations within a sample. Through the use of charged probes like aptamers biological equivalence can also be confirmed or not.



WHATEVER PARTICLE YOU'RE MEASURING, TRPS HAS YOU COVERED.

TRPS is used in a wide range of applications:



Exosomes

Fast, easy & pure isolation. Accurate & dependable measurement.



Nanomedicine

A comprehensive measurement suite for nanosized drug products.



Vaccine and Virus Formulation

Truly quantitative measurement of total viral titre.



General particles and bubbles

Highly accurate & quantitative measurement of individual particles & bubbles.



Diagnostics

Validate your development data with TRPS measurements.

qNano Gold Specifications:

Analysis range

40 nm to 10 μ m

Concentration range

1E5 to 1E11 / mL (size dependent)

Electrolyte properties

Physiological

Weight

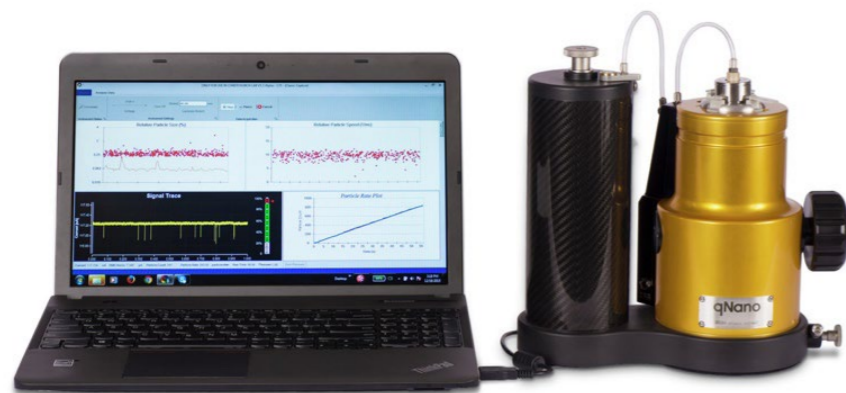
5 kg

Footprint

265 x 140 mm

Height

275 mm



HOW DOES TRPS WORK?

The impedance of a nanopore in an electrolyte fluid cell is sampled 50,000 times per second. Sample particles are driven through the nanopore by applying a combination of pressure and voltage, and each particle causes a resistive pulse or "blockade" signal that is detected and measured by the application software.

- ✓ Blockade magnitude is directly proportional to the volume of each particle.
- ✓ Blockade duration changes with the velocity of the particle and can be used to calculate the surface charge of each particle.
- ✓ Blockade frequency is used to determine particle concentration.
- ✓ Magnitude, duration and frequency values are converted into respective particle properties by calibration with particles of known size, concentration and surface charge.

FIND OUT MORE.

Visit www.izon.com for more information.

