

PAMAS SLS-25/25

Fluid contamination analysis down to 1 $\mu\text{m(c)}$



PAMAS SLS-25/25
**The Scattered Light Sensor
for contamination analysis of
particle sizes down to 0.5 μm
according to ISO 21501-2 or down
to 1 $\mu\text{m(c)}$ according to ISO 11171**

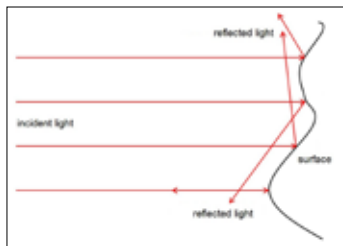
Application:

Optical particle measurement of small particle sizes in liquids via light scattering method:

- for filter test rigs (e.g. integrated in particle counter PAMAS 4132)
- for laboratory analyses of very small particle sizes in clean liquids or in oil (e.g. integrated in PAMAS SVSS or PAMAS SBSS)
- for field analyses with portable particle counters in the rugged case PAMAS GO (e.g. PAMAS S40 GO or PAMAS S4031 GO)

Analysis of small particle sizes via optical Light Scattering Technology

For the analysis of submicron particles, PAMAS has developed the Scattered Light Sensor **PAMAS SLS-25/25**. Contrary to sensors working in light extinction technology, this sensor is able to detect particle sizes down to 0.5 microns. Due to this high sensitivity, the **PAMAS SLS-25/25** is used for laboratory analysis of submicron particles in ultraclean liquids and in hydraulic or lubricating oil, as well as for filter test rigs. Furthermore, the Scattered Light Sensor may also be integrated in portable measuring instruments (in the rugged case PAMAS GO) enabling the particle analysis in the field.



Scattered Light is caused by light reflexion on a surface

Calibration of the Scattered Light Sensor

For oil applications, Scattered Light Sensors are calibrated with ISO MTD (Medium Test Dust) whose size distribution is defined and certified by NIST (National Institute of Standards and Technology). For other applications, SL-sensors are calibrated with monodisperse latex particles whose diameter is also traceable.

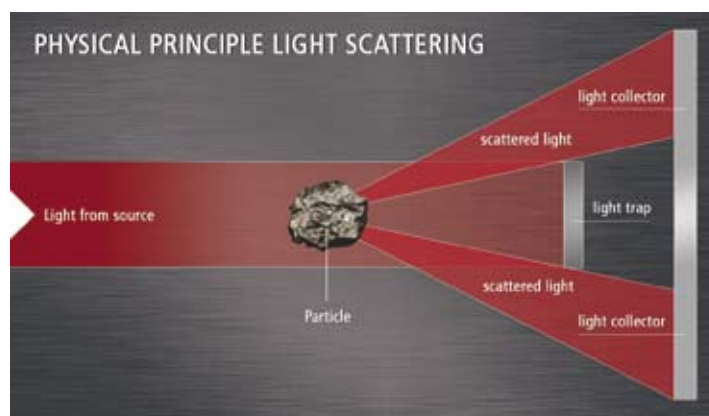
Liquid Particle Sensor using Light Scattering Technology for the analysis of submicron particle sizes

As all other PAMAS sensors, the PAMAS SLS-25/25 is based on a volumetric sample cell which offers highest precision by measuring 100% of the sample volume. Since volumetric sensor technology counts each single particle, PAMAS sensors are able to measure ultraclean liquids down to class 000 (SAE AS 4059) or class 0/0/0 (ISO 4406).

The high sensitivity of this sensor, detecting particles as small as 0.5 μm , cannot be achieved in light obscuration technology

as the submicron particles are limited by the light diffraction and the amplification of small light signals on the detector. That is the reason why only scattered light technology can be used for particle counting in the submicron range.

Like all other PAMAS sensors, the PAMAS SLS-25/25 is fitted with a long-life, vibration insensitive laser light source with a wavelength of 638 nm. The sensor may be used for online or batch sampling applications.



Physical principle of Light Scattering

Procedure of the Light Scattering Method

Light rays shining on a surface are reflected and the refracted rays scatter in all directions. The procedure of the Light Scattering Technique is similar to that of Light Extinction: on their flow path, the particles also flow through the illuminated volume of the measuring cell. In the case

of Light Scattering, the scattered light rays are analysed instead of the extinguished ones. The light rays which are not deflected or scattered are absorbed by a separate light trap. If there aren't any particles in the measuring cell, the light is completely absorbed by the light trap.

Technical Data

Sensor orifice:
250 μm x 250 μm

Size ranges:

- 0,5 – 20 μm (according to the calibration standard ISO 21501 for water and for pharmaceutical applications)
- 1 – 30 μm (c) (according to the calibration standard ISO 11171 for oil applications)

Maximum particle concentration:

13.000 particles per millilitre at a coincidence rate of 7.8% and a nominal flow rate of 10 ml/min

Flow rate range:

The flow rate can be modified in a range between 10 and 25 ml/min.

Application:

- for filter test rigs (e.g. integrated in particle counter PAMAS 4132)
- for laboratory analyses of very small particle sizes in clean liquids or in oil (e.g. integrated in PAMAS SVSS or PAMAS SBSS)
- for field analyses with portable particle counters in the rugged case PAMAS GO (e.g. PAMAS S40 GO or PAMAS S4031 GO)

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