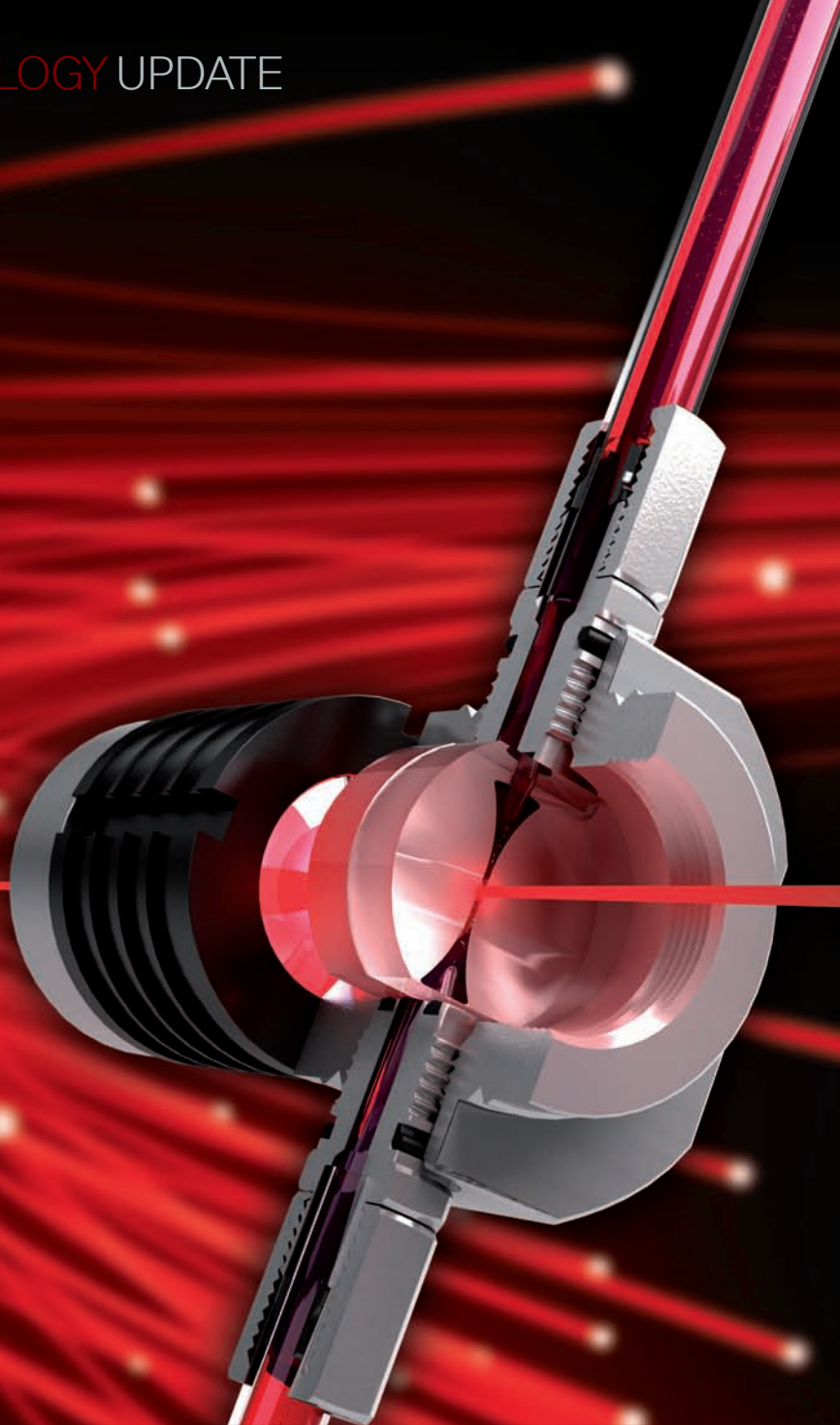


PAMAS Sensor Measuring Cell



THE NEW ONLINE PARTICLE COUNTER S50DP
AUTOMATICALLY DILUTES DARK SAMPLE FLUIDS
PRIOR TO MEASUREMENT AND THUS REDUCES THE
SAMPLE'S TURBIDITY LEVEL.

PAMAS

S50DP:

PARTICLE COUNTER WITH INTEGRATED DILUTION SYSTEM FOR FLUID ANALYSIS

By PAMAS

The German company PAMAS develops, manufactures and distributes Automatic Particle Counters for fluid contamination control. The PAMAS product range includes measuring instruments for long-term condition monitoring of liquids like hydraulic or lubricating oil and for contamination analysis of particulate matter in water, pharmaceutical suspensions and many other fluids. Designed specifically for stationary online measurement of dark fluids, PAMAS has developed a new particle counter: the PAMAS S50DP. With its integrated dilution system, this online particle counter automatically dilutes dark sample fluids prior to measurement and thus reduces the sample's turbidity level.

Fluid cleanliness of oil, water or fuel can be

monitored through optical particle counting. An automatic particle counter detects and measures particulate contaminants in the fluid. Optical particle counters work with the help of light. In optical measurement proceedings, the light beams through the liquid. The electromagnetic waves may be deflected or absorbed when meeting the particles in the measuring cell. The light effect on the particles is analyzed with the help of a previously calibrated optical electronic hardware. The measuring result provides information on the number of particles per milliliter and on the size of each single particle.

This technique has its limitations. For example: in case of dark fluids, the sensor's laser beam is not able to penetrate the medium. To enable


particle counting of dark fluids, the sample fluid's absorption needs to be reduced before analysis. The optical particle counting technique is also difficult to use if the level of contamination greatly exceeds the sensor's maximum particle concentration level, if the fluid contains undissolved additives or if the sample's viscosity is too high for an accurate measurement. In such cases, sample dilution with solvents helps to achieve reliable measuring results. For batch and bottle sampling, the dilution agent can simply be added manually. However, if operating fluids are analysed online, an online particle counter is directly integrated as a fixed installation into the system like hydraulic, lubricating oil system or fuel tank. The sample liquid is drawn from the system via a bypass line and analyzed directly



online during operation.

To enable continuous condition monitoring of difficult fluids such as the above mentioned ones, PAMAS has developed a new online particle counter: The PAMAS S50DP online particle counter has an automatic dilution system that adds a programmable amount of solvent online to the difficult sample. The system's inner structural design ensures that the solvent and sample fluids are thoroughly mixed. This helps to get a good homogeneity of the mixture and hence accurate, repeatable measuring results.

The PAMAS S50DP online particle counter is well suited for the analysis of fuel containing free water: Without prior dilution, free water in fuel would lead to false measurements. The diluting agent increases water solubility in the sample, so the water drops are no longer detected.

Other application examples are highly contaminated liquids. Without prior dilution, the coincidence error quote of such sample fluids would be too high due to particle over concentration.  www.pamas.de

The PAMAS S50DP is equipped with a wear resistant ceramic piston pump. The pump provides a constant flow rate of 25 ml/min at

a pressure range from 0 to 6 bar.

With its eight different size channels, the PAMAS S50DP counts particles in eight size classes. The instrument measures the particle sizes $> 4 \mu\text{m(c)}$, $> 6 \mu\text{m(c)}$, $> 10 \mu\text{m(c)}$, $> 14 \mu\text{m(c)}$, $> 21 \mu\text{m(c)}$, $> 25 \mu\text{m(c)}$, $> 38 \mu\text{m(c)}$ and $> 70 \mu\text{m(c)}$. The integrated PAMAS HX particle sensor is calibrated in compliance with the ISO 11171 standard, and it measures sample fluids with a maximum concentration of up to 24,000 particles per milliliter at a coincidence quote of 7.8%.

For data transfer, the user has the choice between digital and analogue interfaces. A RS485 data interface is part of the instrument's standard equipment for digital data transfer free from interference. The optional analogue 4-20 mA channel transmits data to a PLC (Programmable Logic Controller). This interface function makes the PAMAS S50DP an effective instrument for condition monitoring.

To report and analyze measuring results, PAMAS provides two different software tools: The online visualization software PAMAS POV has been developed for the online visualization of measuring results and for long-term trend monitoring. The component test software

PAMAS PCT helps to monitor parts and roll off cleanliness. With the aid of the software tools, measuring results are reported according to common cleanliness standards (e.g. ISO 4406 or SAE AS 4059). Furthermore, the measuring parameter can be set up individually and adapted to the specific application profile.

At Hanover fair 2015, PAMAS presents its newly developed particle counter PAMAS S50DP, located in Hall 23 at Booth No: A49.

About the Contributor

PAMAS was founded in 1992, it develops, manufactures and distributes high quality products for liquid particle counting and particle size analysis. The highly sophisticated optical sensors are manufactured at the company plant in Germany. Due to its own department for Research and Development, PAMAS is a market leader for high-quality liquid particle counting systems.

To know more about the author, you can write to us. Your feedback is welcome and should be sent at: mayur@eawater.com. Published letters in each issue will get a one-year complimentary subscription of EverythingAboutWater Magazine.