

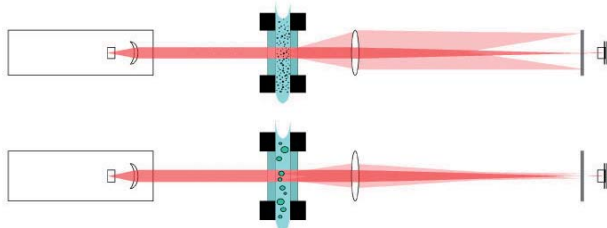


PSI 500™ Particle Size Analyzer

PSI 500™ Particle Size Analyzer is an on-line sizing system for mineral slurries. It is used to monitor and control wet mineral processes, primarily grinding, classification and thickening. The PSI 500™ automatically takes samples from a process stream and measures their particle size distribution in the range of 1-500 µm. The system reports the analysis results to the plant's automation system to be used for real-time process control.

The analyzer system comprises of a standard stand-alone device with a few options in the measurement technology to cover the particle size range of interest optimally. The primary sampling from the process stream is engineered in the analyzer delivery project using the range of primary samplers, to ensure representativity and trouble-free operation and transport of the sample to the analyzer.

The particle size analysis is based on laser diffraction with multiple scatter calculations to enhance the ability to work with dense slurries. Due to the fundamental nature of the analysis method, no calibration against a reference analysis is required. However, if the plant practice has other preferences, the primary measurement results can be correlated to a reference method (sieve, sedigraph etc.) using calculation models. There are a wide variety of particle size distribution



Small particles diffract laser beam light more than coarse particles. The diffraction pattern is measured by a sensor array and the resulting signals are used to calculate particle size distribution. A beam power detector measures non-diffracted laser beam for sample dilution control.

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characteristics that can be selected as outputs to the plant automation system through the system configuration.

The system operates on a continuous basis 24 hours a day, with minimal manual maintenance needs. The daily maintenance routines include checking the sampling system and cleaning possible buildup in the secondary sampler. Otherwise the maintenance is mostly done by preventive maintenance calls by Outotec customer service.

Analysis performance

Sample streams

- PSI 500 is available with 1, 2 or 3 sample inlets.
- Primary sample flow rate: 50...170 l/min

Sample handling

- Sample dilution to 0.5% (vol.) typical
- Composite sampling of undiluted slurry
- Primary sampler cleaning by timed intervals

Analytical

- Size range: 1-500 micrometers, size range can be optimized according to application.
- Measurement data output: 20 fractions (%vol. \pm x mm or mesh), particle size percentiles (mm)%, blaine number (m²/kg), specific surface (m²/cm³)
- Precision: 1-2% (abs.) for any fraction based on a glass bead sample measurement.
- Accuracy: when compared to other particle sizing methods than laser diffraction, differences occur due to different influence of particle shape, particle specific gravity etc. to the analysis. The system allows correlation of the measured particle size data to other measurements by independent calibration samples; however, this correlation is application dependent.

- Measurement interval: 3 minutes per sample line (includes wash time)

Options

Primary sampler control option: Remote control for water and sample valves allows automatic cleaning of the primary sampler at user specified intervals.

Window washing mechanism: For some applications, in addition to acid washing, use of window washing mechanism is recommended to prevent optical sensor head window getting dirty.

DCS connection alternatives:

- DCS connection via RS 485: Modbus RTU or Ethernet: OPC/ Modbus TCP
- Remote diagnostics connection via RS 485/TCP-IP

Remote service connection options: Remote connections can be used for the setup parameters, display of the analyzer status and analysis results and diagnostics. A VPN connection or dial up modem line is required.

Additional sample inlet option: The number of primary sample lines can be upgraded on-site with one or two additional sample inlets up to 3.

Quality assurance

PSI 500™ Particle Size Analyzer is CE marked according to European Union Directives.

Outotec Minerals Oy's quality system is ISO 9001 certified. The company has a quality management policy to ensure that the expectations of customers are met.

PSI 500™ Particle Size Analyzer is a trademark of Outotec Oyj.