

PSM-400 MPX Slurry Particle Size Analyzer

Continuous, Online Particle Size
Monitoring of Mineral Slurries

The PSM-400 MPX Particle Size Monitor (PSM) provides accurate, real-time, in-stream particle size distribution analysis of slurries on up to three streams with five particle size fractions measured simultaneously. It can accommodate streams with distributions between p80 of 290 and 25 microns. By utilizing feedback from the PSM, plant operators can optimize grinding circuit performance. This will improve product quality, enhance metal recovery and reduce energy costs.



Features

The PSM-400 MPX continuously measures and reports:

- Five particle size fractions simultaneously
- Slurry density or percent-solids
- Up to three streams with a multiplexer
- Period averages, trends and historical data logging

The PSM-400 MPX can be used in grinding circuits in the following ways:

- To detect cyclone disturbances, such as blockage and roping in cyclone underflow
- To maximize mill throughput at a constant grind size
- To avoid over-grinding and slimes production (due to change in ore type, etc.)

The PSM-400 MPX Slurry Particle Size Analyzer from Thermo Electron Corporation provides online analysis of particle size distributions and percent-solids. The PSM-400 utilizes ultrasound absorption technology, a highly accurate (0.75% absolute at one sigma) analysis technique that Thermo has used for over 30 years. The PSM's rugged design allows it to operate continuously in harsh environments. A large, representative flow passes the transducers and it requires no dilution (up to 60% solids).

Traditional grinding circuit control is based on feed rate or power control loops. The PSM-400 MPX multipoint analyses enable product size-based grinding circuit control. This allows optimization of both recovery and throughput.

The PSM system calibrates easily. It has a modern user interface and communication links fully compatible with plant information and control systems. Thermo has a global network of expert service engineers to support your operations.

The PSM-400 MPX is skid-mounted for easy and quick plant installation. It is comprised of three main components:

1. Sample Conditioner: vacuum assisted slurry centrifuge for sampling and de-aeration
2. Sample Analysis Module: comprises the flow cell for the ultrasonic transducers; a calibration sampler that doubles as a production composite sampler and a system of valves for standardization and bypass
3. Control and Display Module

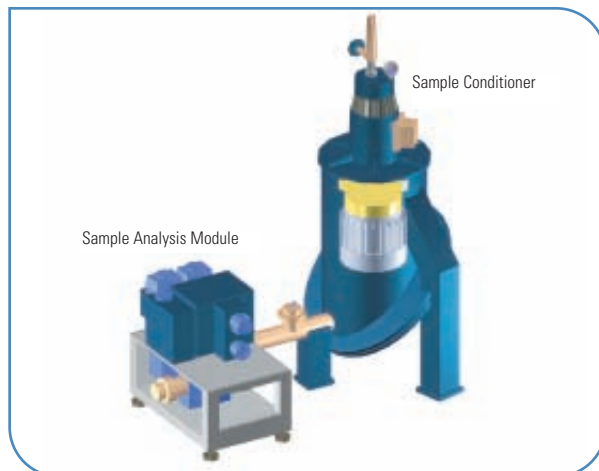
A primary sampler, such as a SamStat reverse flow sampler from Thermo, is required in most applications and can be offered in a total engineered package.

On cyclone overflow streams, the PSM-400 MPX can be combined with the Analysis and Sampling Station (AnStat) to provide an integrated engineered solution for metallurgical sampling, elemental analysis and particle size analysis.

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Specification	
Analysis Performance	
Number of Streams	One stream standard; Two or three streams multiplexed optional at extra cost; Up to five size fractions and percent-solids for each stream may be analyzed
Size Fractions Ranges	Distributions with top size no greater than 1 mm, and p80 of 290 microns (μ) down; Must be sub-sets of the overall measurement range and can be +295 μ down to -8 μ
Sample Flow Rate Required	2 m ³ /hr to 4.5 m ³ /hr of representative sample from process (e.g., via Thermo's SamStat reverse flow sampler); Slurry can be 4% to 60% solids by weight and solids S.G. of 2 to 5.5
Ultrasonic Transmitters	Six frequencies selected at design stage to suit process particle size and percent-solids range
Accuracy	Typically 0.75% absolute one sigma at target grind for both size and percent-solids; Output percent by weight, passing or retained, correlated to laboratory screening
Utilities Required	
Electrical Power	Sample Conditioner: 3.8 kW (5 HP), 50/60 Hz, 190-575 VAC, 3-phase, heavy-duty motor; Peak power 4.6 kW with water heater on
Instrument Air	Instrument-quality air; Clean and dry to 0.1 μ with dew point <+2°C (<+35.6°F); Pressure nominally 690 kPa (100 psi) with 450 kPa to 800 kPa allowable; Maximum consumption = 303 liters per minute
Cooling Air	Instrument air used for cabinet cooling; Intermittent service; Duty cycle depends upon maximum plant ambient operating temperature; Duty cycle will be in excess of 60% at +45°C (+113°F) ambient
Standardization Water	Only clean, fresh, potable water may be used; Volume dependent upon frequency of standardization, normally once per day, requiring about 12 liters (3 gallons) per day
Water for Sample Acquisition (Vacuum)	Process water; Eductor/aspirator needs 275-550 kPa (40-80 psi) and flow rate of 2.7 m ³ /hr; Can be recirculated as an option
Communications Links	
Internal: PSM-400 to PC	Each unit requires two pairs of shielded twisted pair (1.5 mm) instrumentation cable; Maximum length 1 km (3280 ft) for point-to-point current-loop to RS-232 connection
External: PSM-400 to Control System	4-20 mA analog current loops; Up to 16 x 12-bit channels
PC to Customer Control System and LAN	Ethernet link using TCP/IP protocol including OPC or EIA; RS-232, RS-422 serial lines (MODBUS)
Off-Site Modem	One data-quality phone line or VPN internet link
Dimensions	
Standard MPX	1840 mm (72.44 in) H x 1770 mm (69.69 in) L x 1120 mm (44.09 in) W
Weight	700 kg (1543.24 lb)
Standards	
Electrical Rating	IP66
Quality Assurance	Adelaide manufacturing facility ISO-9001:2000 certified

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