

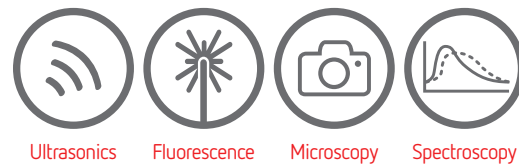
EX-100M/1000M

Side Stream ppm, Solids and Oil Droplet Water Analyzer



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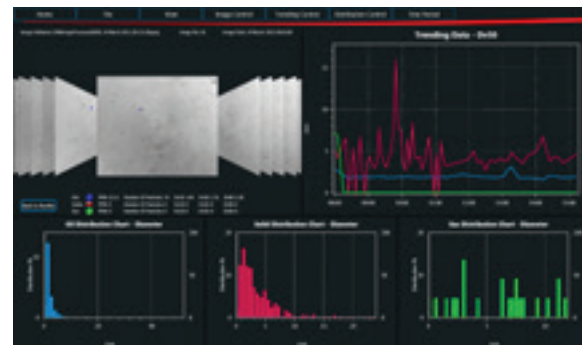
Ultrasonics Fluorescence Microscopy Spectroscopy

The EX-100M is a side stream Oil in Water analyzer that combines video microscopy measurement for particle size analysis with the highly accurate Laser Induced Fluorescence oil content measurement technique. This allows measurement of Total Suspended Solids (TSS), oil droplet size and gas bubble size whilst still accurately measuring concentration of oil in water.

In addition to the EX-100M features, the EX-1000M model offers spectral analysis.

Features

- Patented ultrasonic cleaning
- Combination of Laser Induced Fluorescence (LIF) and video microscopy measurement
- Side stream format
- Periodic homogenisation of sample
- Sample point
- Various measurement ranges configurable from 0-1,000ppm
- Accuracy 1% and measurement repeatability 99% for concentration
- Accuracy $\pm 4\%$ and measurement repeatability 98% for microscopy data
- Particle and droplet size information e.g. Dv10, Dv50 and Dv90 data
- Immediate on-screen results
- Additional offline reprocessing capability for review of results
- Remote management and diagnosis
- Easy to install (no sample conditioning)
- Multiple communications options - 4-20mA, HART, Modbus, Extended Ethernet or WiFi
- Optional integrated spectrometer
- Automatic PDF report generation



Benefits

- Easy to use
- Ability to measure and distinguish between oil, solids and gas particles
- Low Cost Of Ownership (COO) with zero routine maintenance
- No degradation of signal or recalibration
- Side stream format offers improved sample control
- Droplet size compensation with homogenized samples
- Sample point facilitates laboratory correlation
- Remote control and monitoring (ideal for un-manned locations and remote process monitoring)

Fluorescence Specification

Measurement principle	Laser Induced Fluorescence (LIF)
Range	0-20,000ppm*
* User may select any desired measurement from 0 -10ppm, 0-100ppm, 0-1,000ppm up to 0-20,000ppm	
Accuracy	$\pm 1\%$ of measurement range
Repeatability	> 99%
Response time	< 1 Second, continuous results

Spectrometer Specification

Emission Wavelength Range	400-1,100nm
Resolution	0.5nm

Microscopy Specification

Measurement principle	CCD Camera 2D Image
Image resolution	2 Million Pixels
Illumination	Controlled LED (lifetime 5 years)
Number of images per dataset	1-500 Images (User Configurable)
Time between each image	0.1 to 10 Seconds (User Configurable)
Imaging modes	Flowing, Static, High Gas Content Mode

Microscopy Image Processing

Advanced Sensors Image Processing Engine (no 3rd party Algorithms)

Shape and object matching used to classify objects in the image

No need to change parameters for different turbidity of samples, due to automatic exposure time and multi-level image threshold algorithms

Microscopy Measured Items

Content ppm	Hydrocarbon droplets, Suspended Solids, Gas
Size distribution	Hydrocarbons droplets, Suspended Solids, Gas
Turbidity	Measurements in AU

Microscopy ppm

Range	0-1,000ppm
Calibration	4 parameter curve fit with gain correction
Auto-Calibration	Microscopy ppm can auto calibrate to Fluorescence measurement

Microscopy Measured Parameters

ppm	Turbidity
% Concentration	No. of Objects Per Image
High sensitivity circularity	Aspect Ratio
Convexity	Elongation
Size	DV10, DV50 and DV90
Diameter ped (circle of equal perimeter)	Configurable Object Sharpness
Length, width	Volume, Area

Microscopy Size Range

Dimensional range	1-450um
Accuracy	$\pm 4\%$ of measurement range
Repeatability	> 98%
Calibration	Particle size calibrated with standardized beads

Microscopy Turbidity	
Range	0-1,500 AU Light
Frequency	White light
Measurement timeline	Every Image Cycle
Data Storage	
Image storage	30-60 days depending on schedule
Data of every particle measured	Rolling FIFO 120 days storage
MiView Offline Software	
Powerful client software for complete analysis of data from system	
Connect live to the analyzer over the network for real-time analysis	
View historical data for process review	
Look at the performance of processes at different points	
Generate reports automatically from the data	
Operating Conditions	
Process temperature	0°C to 200°C
Process pressure	0-35 barg (180 barg optional)
Process flow	0-25 l/min (0-1,000l/min optional)
Operational ambient temperature	-20°C to 55°C
Cleaning	Ultrasonic (automatic)
Utilities	
Power supply	110 or 230 VAC (pre-configured), 50-60 Hz
Power consumption	60W normal, 300W peak
Instrument air	5-8 barg (for pneumatic valve; electric valve option available)
Weight & Dimensions	
Weight (including stand, standard pneumatic Stainless Steel valve assembly, termination box and isolation switch)	Stainless Steel Enclosure: 140.5Kg
Dimensions	670W x 640D x 1120H mm
Clear space	500mm front and rear
Communications	
4-20 mA	Passive
Ethernet	Standard
HART, Modbus, Optional Wireless (WiFi), Extended Ethernet	Optional
Remote access	Standard
Internal data storage	>10 years
Security	Multiple level password protection
Additional Information	
Flange fitting	1" ANSI RF standard, options available
Wetted parts	SS 316L (option of CR22, CR25, Monel, Inconel, Hastelloy, Titanium)
Sample take off point	Standard – integral to analyzer
Viewing window	Standard
Homogenisation	Ultrasonic
Gas removal, solids removal, temp. Conditioning, flow control	Not Required
Discrepancy for oil droplet size	Automatic Oil Droplet Size compensation
Ingress protection	IP66
Enclosure material	SS 316L
ATEX Exd II 2 G IIB T4, IECEX, USA and Canada Class 1 Div 1	
Size calibration of objects conforms to ASTM E1951 standard guide for calibrating reticles and light microscope magnifications	
User configurable alarm	